



# Heavy Vehicle Specialist Certificate

Heavy Vehicle Specialist Inspector and Inspecting Organisation

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

CHRIS CARRE

ID

CJC

Vehicle Registration\*

VIN / Chassis Number

7A9E20010D1023126

Component being certified:

Chassis Modification

Load Anchorage

Log Bolsters

Certification Category

Towing Connection

Brakes

SRT

HUEK

Description of Work

CARRY OUT SET UP OF TRAILER EBS SYSTEM.

ROLL STABILITY FUNCTION (RSS) ACTIVATED + TESTED AS FOR START UP PROTOCOL.

Code/Standard Certified to

HUBNZ 32015/2 SCHED 5.

Component Load Rating(s)

33000 KG.

General Drawing Number(s)

N/A.

Supporting Documents

BRAKE DESIGN CERTIFICATE - JH130104.

\*Special Conditions

WARNING LIGHT MUST ILLUMINATE WHEN IGNITION IS SWITCHED ON + THEN EXTINGUISH IMMEDIATELY OR WHEN VEHICLE EXCEEDS 7 KPH.

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

18.02.2013

Number

428581

COF Vehicle Inspector ID:

COF Vehicle Inspector Signature:

Date

All fields excluding those marked with \* must be completed before this certificate can be accepted.

# GOUGH *Transpecs*

P.O.Box 98-971 , South Auckland Mail Centre

J.HIRST (JEH)

DATE 18-Feb-13 BRAKE SYSTEM 12/24V EBS

CERT. NO. JH130104 PREV EXEMPTION HVB13/013

VIN / CHASSIS 7A9E20010D1023126

BRAKE CHAMBERS FRONT 14 (TSE max stroke 64mm)

BRAKE CHAMBERS REAR 1416 (TSE max stroke 64mm)

SLACK LENGTH FRONT 69 mm TYRE SIZE FRONT 265 70 R 19.5

SLACK LENGTH REAR 69 mm TYRE SIZE REAR 265 70 R 19.5

THIS VEHICLE COMPLIES WITH THE NZ LINING MATERIAL FRONT JURID 539

HVBR 32015/2 - SCHEDULE 5 LINING MATERIAL REAR JURID 539

<b>WABCO</b>		<b>TRAILER EBS-E</b>				GGVS/ADR TUEH TB 2007 - 019.00 TDB0749								
HERSTELLER MANUFACTURER CONSTRUCTEUR		DOMETT				GIO	Pin1	Pin3	Pin4					
TYP TYPE TYPE		5AFT C/SIDE				1	---	---	---					
FAHRZEUG IDENT.NR CHASSIS NUMBER NUMERO DE CHASSIS		7A9E20010D1023126				2	---	---	---					
BREMSRECHNUNG NR BRAKE CALCULATION NO CALCUL DE FREINAGE NO		TP50764				3	ALS2	ALS2	---					
POLRADZAHNZAHL c.d./s.f POLE WHEEL TEETH c.d./s.f DENTS ROUE DENTEE c.d./s.f		90	90	ABS-System ABS-Systeme ABS	4S/3M	4	---	---	---					
RBB RSS	Einfaehbereifung Single Tyre Moote simple			Lenkachsen Steering axle Essieu vnteur		5	DIAG	DIAG	DIAG					
	Zweifelsbereifung Twin Tyre Moote jumelee	X		Kopplaches Fahrzeug Châssis de Trailer Vehicule critique		6	---	---	---					
Subsystems		---		I/O		7	---	---	---					
	pm (bar)		6.5	pm (bar)		0.7	2.0	---	6.5		(bar)			
ACHSE AXLE ESSEU													1.0	Pz
	p2									---	TYP TYPE	(mm)	(mm)	TR (daN)
1	1600	0.8	1.7	7500	4.9	0.4	1.4	---	6.2	-	14	64	69	495 3771
2	1600	0.8	1.7	7500	4.9	0.4	1.4	---	6.2	-	14	64	69	495 3771
3	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483 2877
4	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483 2877
5	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483 2877

# WABCO

## START-UP PROTOCOL

System	Trailer EBS-E	WABCO part number	480 102 080 0
Production date	2012-12-07	Serial number	897001041200D
Serial number (modulator)	000000018484		
Fingerprint Customer EOL / Customer Development / Flash Program	W503643 / 2013-02-18 ; 00000000 / 0000-00-00 ; 00000000 / 0000-00-00		

# WABCO

## TRAILER EBS-E

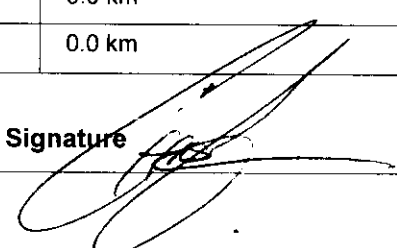
GGVS/ADR TUEH TB 2007 - 019.00  
TDB0749

HERSTELLER MANUFACTURER CONSTRUCTEUR	DOMETT			GIO	Pin1	Pin3	Pin4
TYP TYPE TYPE	5AFT C/SIDE			1	---	---	---
FAHRZEUG IDENT.NR. CHASSIS NUMBER NUMERO DE CHASSIS	7A9E20010D1023126			2	---	---	---
BREMSENRECHNUNGS NR. BRAKE CALCULATION NO. CALCUL DE FREINAGE NO.	TP50764			3	ALS2	ALS2	---
POLRADZAHNEZAHL c-d   e-f POLE WHEEL TEETH c-d   e-f DENTS ROUE DENTÉE c-d   e-f	90	90	ABS-System ABS-System Système ABS	4	---	---	---
RSS RSS RSS	Einfaßbereifung Single Tyre Monte simple		Lenkachse Steering axle Essieu vireur	5	DIAG	DIAG	DIAG
	Zwillingsbereifung Twin Tyre Monte jumelle	X	Kippkritisches Fahrzeug Critical Trailer Véhicule critique	6	---	---	---
Subsystems	---		I/O	7	---	---	---

ACHSE AXLE ESSIEU	pm (bar)		6.5		pm (bar)		0.7		2.0		---		6.5		TYP TYPE	(mm)	(mm)	(bar)	
	↓ (kg)	○	↓ (kg)	○	↓ (kg)	○	↓ (kg)	○	↓ (kg)	○	↓ (kg)	○	1.0	Pz					
1	1600	0.8	1.7	7500	4.9	0.4	1.4	---	6.2	-	14	64	69	495	3771				
2	1600	0.8	1.7	7500	4.9	0.4	1.4	---	6.2	-	14	64	69	495	3771				
3	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483	2877				
4	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483	2877				
5	1300	0.6	1.4	6000	3.9	0.4	1.4	---	4.8	-	14 / 16	64	69	483	2877				

Diagnostic memory	OK	Warning lamp control	OK
Parameter setting	carried out	Stop light power supply	Not tested
EBS pressure test	Not tested	Lifting axle test	Not tested
Redundancy test	OK	ECAS distance sensor calibration	Not tested
ABS sensor assignment	OK	Distance sensor Axle load calibr	Not tested
RTR check	Not tested	Leak test	Not tested
Immobilizer test	Not tested	Signal outputs TEBS	Not tested
Signal inputs	Not tested		

Diagnostic memory ELEX	Not tested	Signal outputs ELEX	Not tested
TailGUARDlight	Not tested	TailGUARD	Not tested

Manufacturer	DOMETT	Vehicle ident. no	7A9E20010D1023126
Vehicle type	5AFT C/SIDE	Odometer reading	0.0 km
next Service	0 km	Trip reading	0.0 km
Tested by	Chris Clarke	Signature 	
Date	2013-02-18 4:06:54 p.m.		

## **NOTICE TO VEHICLE OPERATOR**

This trailer is equipped with an Electronic Brake System.

To comply with the New Zealand Heavy Vehicle Brake RULE, it must be used only in conjunction with a truck/tractor equipped with a 5 or 7 pin ABS/EBS power supply socket.

Failure to connect to such supply invalidates Brake Rule compliance.

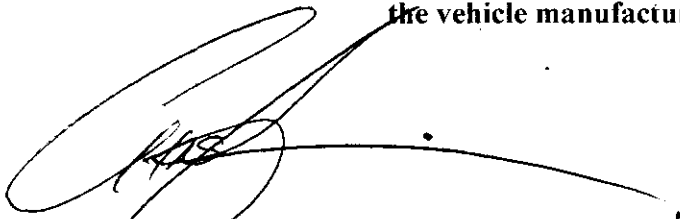
The trailer ABS/EBS warning light on the towing vehicle dashboard must illuminate when the ignition is switched on and extinguish when the vehicle is in motion.

If the light does not illuminate when ignition is switched on, the system must be checked. If the light remains illuminated when the vehicle is in motion, Brake Rule compliance is compromised. Repairs must be made as soon as possible.

### **NB:**

If this vehicle is fitted with mechanical (spring) suspension, the load sense valving has been adjusted to suit exactly the performance of the original springs. In event of replacement being required, original equipment springs **must** be fitted to ensure correct ongoing operation. Fitment of non genuine springs can affect operation and therefore, compliance.

**If you are unsure of your responsibilities and/or obligations, please contact either the vehicle manufacturer or myself.**

A handwritten signature in black ink, appearing to read 'C.J. Clarke', is written over a horizontal line. The signature is stylized and loops back under the line.

C.J. Clarke (CJC HVEK)

## NOTICE TO VEHICLE OPERATOR

**THIS VEHICLE HAS A BRAKE SYSTEM WHICH HAS BEEN DESIGNED AND FITTED IN ACCORDANCE WITH THE NEW ZEALAND HEAVY VEHICLE BRAKE RULE 32015: SCHEDULE 5.**

**IF THIS VEHICLE IS OPERATED IN CONJUNCTION WITH NON-CODED VEHICLES, THERE MAY BE OPERATIONAL FACTORS WHICH NEED TO BE TAKEN INTO CONSIDERATION.**

**PLEASE REFER TO THE CERTIFIER FOR FURTHER INFORMATION.**

### **EXCERPT FROM NZ HEAVY VEHICLE BRAKE RULE 32015**

#### **10.1 Responsibilities of operators**

*A person who operates a vehicle must ensure that the vehicle complies with this Rule*

#### **10.2 Responsibilities of repairers**

*A person who repairs or adjusts a brake must ensure that the repair or adjustment:*

- (a) does not prevent the vehicle from complying with the rule; and*
- (b) complies with Land Transport Rule: Vehicle Repair 1998.*

#### **10.3 Responsibilities of modifiers**

*A person who modifies a vehicle so as to affect the braking performance of the vehicle must:*

- (a) ensure that the modification does not prevent the vehicle from complying with this rule; and*
- (b) notify the operator that the vehicle must be inspected and, if necessary, certified by a person or organisation appointed to carry out specialist inspection and certification of heavy vehicle brakes.*

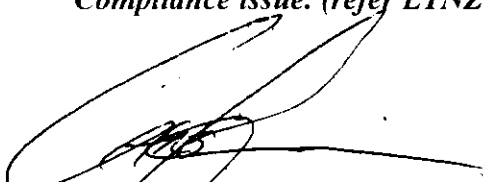
#### **10.5 Responsibilities of manufactures and retailers**

*A person may manufacture, stock, or offer for sale a brake or its components. Intended for fitting to a vehicle to be used on New Zealand roads, only if that brake or component:*

- (a) complies with this Rule; and*
- (b) does not prevent a repair to a vehicle, its structure, systems, components and equipment from complying with this Rule.*

**IF YOU ARE UNSURE ABOUT YOUR RESPONSIBILITIES, PLEASE CONTACT THE VEHICLE MANUFACTURER, OR MYSELF.**

**COMPLAINTS.** *Complaints and Warranty issues which relate to Brake Certification will be acknowledged within 7 working days and a resolution proposed within 25 working days. Resolution of complaints and Warranty issues is subject to Transpecs Warranty policy. Customers have the right to appeal to the Land Transport Safety Authority if dissatisfied with a Compliance issue. (refer LTNZ Deed Of Appointment Para 47.4) NZTA Helpdesk 0800 699 000*



**C.J. Clarke (CJC HVEK)**

# HVBR WORKSHEET

(PROCEDURE & COMPLIANCE DOCUMENTATION SHEET)

CERTIFICATE No.

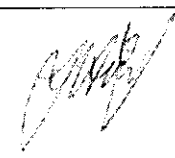
CUSTOMER NAME

CUSTOMER ORDER No.  DATE RECEIVED

VEHICLE TYPE

REG No.  CHASSIS No.

## BRIEF SPECIFICATION AS CERTIFIED TO HVBR

BRAKE CHAMBERS: Type: 14 (TSE): Max stroke = 64 mm    Lever length = 69 mm Type: 1416 (TSE): Max stroke = 64 mm    Lever length = 69 mm	
BRAKE VALVES:	Ratio Valve Setting: EBS CONTROL Test Points: 3 4 5 7
FRICITION LINING: (All) Lining Brand	<u>OEM</u> Aftermarket JURID 539
<u>EBS CONTROL</u> : SPECIAL CONDITIONS APPLY – SEE INSTRUCTION ON LT400 <u>VALVES</u> : AS PER DATA SHEET ATTACHED <u>TYRE SIZE</u> : 265 70 R 19.5	
NOTES PACKING SLIP NO. <input type="text" value="SO1522798"/>	PROCESS TIME: <input type="text" value="1"/>
Brake calculation TP50764: MERITOR CHAMBERS ARE TSE	
COMPLETION DATE : 16 <sup>TH</sup> Feb 2013	SIGNATURE 

## Statement of Compliance with the New Zealand Heavy Brake Rule

Documentation required to support Statements of Compliance with the New Zealand Heavy Brake Rule, to be made available to the Statutory Authority on request, must include all calculations and test reports.

### Confirmation of compliance

I confirm that the vehicle identified on page 1 of this Statement of Compliance complies with all relevant requirements of the current New Zealand Heavy Vehicle Brake Rule 32015/2, Schedule 5.

Date: 16<sup>th</sup> Feb 2013

Signed: 

### Certifier's identification

Name: J E Hirst

Phone (bus): (09) 980 7300 Fax (bus): (09) 980 7306

Postal address: Transport Specialties, Cnr Kerrs & Ash Roads  
Wiri, Auckland, PO Box 98 971 Manukau City 2241

Position: JEH

### Confirmation of continued compliance of modification

I confirm the brake system of the vehicle identified on page 1 of this Statement of Compliance as modified by myself, continues to comply with all the relevant requirements of the current New Zealand Heavy Vehicle Brake Rule 32015/2, Schedule 5.

Date: \_\_\_\_\_ Signed: \_\_\_\_\_

Certifier's identification: JEH

Name:

Phone (bus): (09) 980 7300 Fax (bus): (09) 980 7306

Postal address: Transport Specialties Ltd  
Cnr Kerrs & Ash Roads, Wiri, Auckland  
PO Box 98 971, Manukau City 2241



NZ TRANSPORT AGENCY  
WAKA KOTAHU

**NATIONAL OFFICE**

50 Victoria Street  
Private Bag 6995  
Wellington 6141  
New Zealand  
T 64 4 894 5400  
F 64 4 894 6100

[www.nzta.govt.nz](http://www.nzta.govt.nz)

Exemption: HVB13/013

**EXEMPTION FROM SPECIFIED REQUIREMENTS OF LAND TRANSPORT RULE:  
Heavy-vehicle Brakes 2006, Rule 32015**

Pursuant to Section 166(1) of the Land Transport Act 1998, and pursuant to the powers delegated to me, I Jackie Hartley, Administrator (Assessments) hereby exempt the motor vehicle specified in Schedule 1 hereto from the section of Land Transport Rule: Heavy-vehicle Brakes 2006 (the Rule) listed in Schedule 2, subject to the conditions specified in Schedule 3.

**SCHEDULE 1:**

Make/Model: **Domett T & T Ltd, 5 axle full-trailer**  
VIN/CHASSIS: **7A9E20010D1023126**

**SCHEDULE 2: - Exempted Requirement**

**Section 2.3(9);** The parking brake of a vehicle, whether or not it is being operated as a combination vehicle, must be able to be applied by the driver from the normal driving position using one control only.

**SCHEDULE 3: - Conditions of this exemption:**

- 1) The vehicle must be fitted with a Wabco park-release emergency valve (PREV), Part Number: 971 002 900 0.
- 2) The vehicle must be fitted with the Wabco PREV name plate, Part Number 971 002 103 4, adjacent to the PREV.
- 3) The vehicle must still be fitted with a parking brake that complies with all parking brake requirements in the Rule other than the requirement in Clause 2.3(9) of the Rule.
- 4) The installation of the PREV must be approved in writing by Gough Transpecs or an NZ Transport Agency appointed HVEK certifier acting on behalf of, and under instruction from, Gough Transpecs; Gough Transpecs must keep a written record of all approvals.
- 5) An HVEK certifier in 4) must be fully trained in end of line procedures for Wabco electronically controlled braking systems.
- 6) Gough Transpecs must provide full operator training in the use of the PREV and furnish the operator with full written operating instructions for the PREV.
- 7) The vehicle must not be modified in any way while operating under this exemption.
- 8) This original exemption must be kept by Gough Transpecs.
- 9) A copy of this exemption (printed on a silver WABCO Sticker) must be affixed to the exempted vehicle as close to the WABCO PREV as possible.
- 10) The sticker in 9) must be legible and include all printed areas of this original exemption letter.
- 11) This exemption can be revoked at any time in writing by the NZ Transport Agency.

Signed at Wellington this 23<sup>rd</sup> day of January 2013.

Jackie Hartley  
Administrator (Assessments)



trailer (full, semi-, centre-axle) with air brake system acc. to UN/ECE-R.13.11

distribution: DOMETT  
7A9E20010D1023126  
JH130104

please note! This brake calculation is made under consideration of  
-the legal precriptions mentioned above in the version valid at the time of making the program (V6.12.08.27).  
-the functional characteristics of our products as well as the data of the brake out of the test approvals of the axle manufacturers, and  
-the other vehicle data included in the brake calculation.  
Please check whether these data correspond to the actual vehicle data.  
Our conditions of delivery apply (particularly section 9.0).  
In any case we commend to do a braking harmonisation!  
WABCOBrake V6.12.08.27 db 30.08.2012

vehicle manufacturer: DOMETT  
trailer model : SAFT C/SIDE  
trailer type : 5-axle-full-trailer  
remarks : air / hydraulic / VA suspension  
WABCO TRAILER -- EBS  
TRISTOP 3+4+5: T.14/16  
265/70 R 19,5

axle 1 + 2 + 3 + 4 + 5 : SAF, PAN 19-1, TDB 0749 ECE,

		<u>unladen</u>	<u>laden</u>
total mass	P in kg	7100	33000
axle 1	P1 in kg	1600	7500
axle 2	P2 in kg	1600	7500
axle 3	P3 in kg	1300	6000
axle 4	P4 in kg	1300	6000
axle 5	P5 in kg	1300	6000
wheel base	E in mm	7380 - 7380	
centre of gravity height	h in mm	1090	2062

	<u>axle 1</u>	<u>axle 2</u>	<u>axle 3</u>	<u>axle 4</u>	<u>axle 5</u>
no. of combined axles	1	1	1	1	1
no. of brake chambers per axle line KDZ	2	2	2	2	2
The power output corresponds to	BZ 122.1	BZ 122.1	BZ 119.6	BZ 119.6	BZ 119.6
brake chamber manufacturer	Meritor	Meritor	Meritor	Meritor	Meritor
chamber size	14.	14.	T.14/16	T.14/16	T.14/16
lever length	69	69	69	69	69
brake factor	23.03	23.03	23.03	23.03	23.03
dyn. rolling radius	rdyn min in mm	421	421	421	421
dyn. rolling radius	rdyn max in mm	421	421	421	421
threshold torque	Co Nm	6.0	6.0	6.0	6.0

calculation:

chamber pressure (rdyn min) pH at z=22,5%bar	2.3	2.3	2.0	2.0	2.0
chamber pressure (rdyn max) pH at z=22,5%bar	2.3	2.3	2.0	2.0	2.0
chamber press. (servo) pcha at pm6,5bar bar	6.2	6.2	4.8	4.8	4.8
piston force	5988	5988	4586	4586	4586
brake force (rdyn min) T lad. at pm6,5bar N	45338	45338	34589	34589	34589
brake force (rdyn max) T lad. at pm6,5bar N	45338	45338	34589	34589	34589
brake force within 1 % rolling friction proportion	20.0	20.0	20.0	20.0	20.0

braking rate z laden 0.601 for rdyn min  
z - sum (TR)/PRmax 0.601 for rdyn max

Trailer may only be operated in combination with trucks/tractors with ISO 7638 supply (5 or 7 polar).

brake diagram :

maximum pressure: 8.5 bar

axle 1:

valve 1: 971 002 ... 0 WABCO  
EBS emergency valve

valve 2: 480 207 0.. 0 WABCO or 480 207 2.. 0  
EBS relay valve

brake cylinder: Meritor 14HSCLD64

axle 2:

valve 1: 971 002 ... 0 WABCO  
EBS emergency valve

valve 2: 480 207 0.. 0 WABCO or 480 207 2.. 0  
EBS relay valve

brake cylinder: Meritor 14HSCLD64

axle 3:

valve 1: 971 002 ... 0 WABCO  
EBS emergency valve

valve 2: 480 102 ... 0 WABCO  
EBS trailer modulator

brake cylinder: Meritor 1416HTLD64

axle 4:

valve 1: 971 002 ... 0 WABCO  
EBS emergency valve

valve 2: 480 102 ... 0 WABCO  
EBS trailer modulator

brake cylinder: Meritor 1416HTLD64

axle 5:

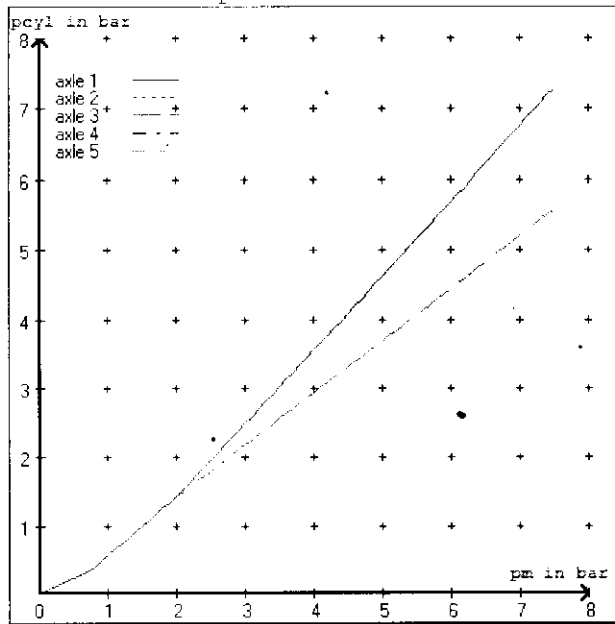
valve 1: 971 002 ... 0 WABCO  
EBS emergency valve

valve 2: 480 102 ... 0 WABCO  
EBS trailer modulator

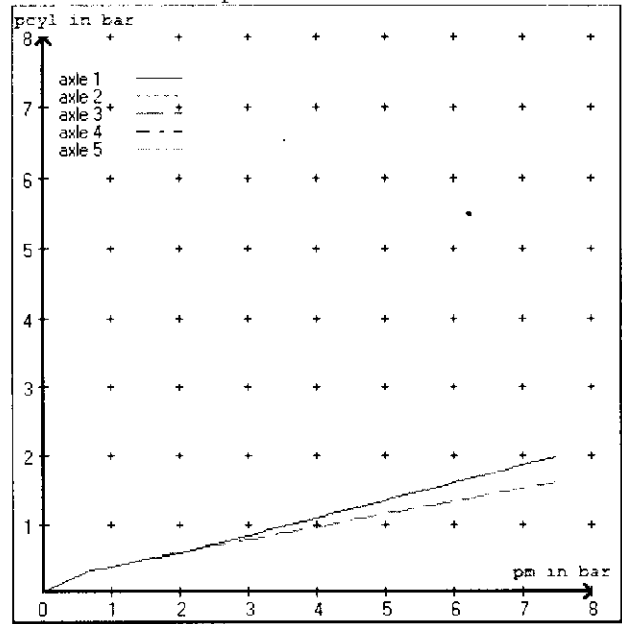
brake cylinder: Meritor 1416HTLD64

test type III (zIII = 0.30)	for rdyn min :	axle1	axle2	axle3	axle4	axle5
at pm 3.6 bar =>	pcha in bar :	3.1	3.1	2.6	2.6	2.6
test type III (zIII = 0.06)	for rdyn min :	axle1	axle2	axle3	axle4	axle5
at pm 1.2 bar =>	pcha in bar :	0.7	0.7	0.7	0.7	0.7

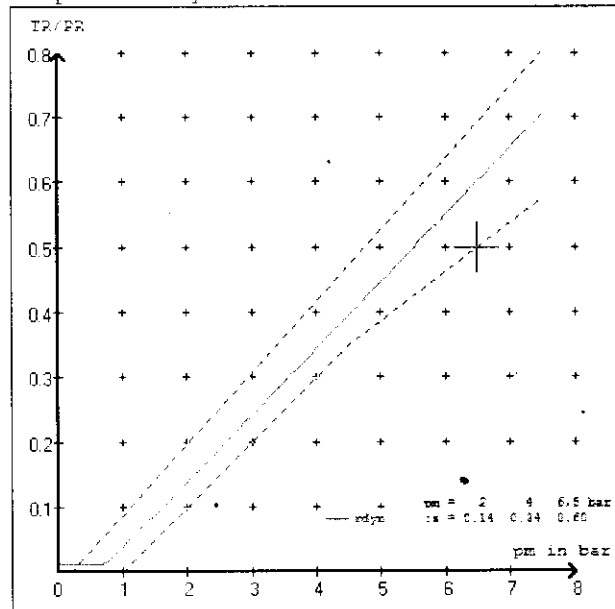
brake chamber pressure laden



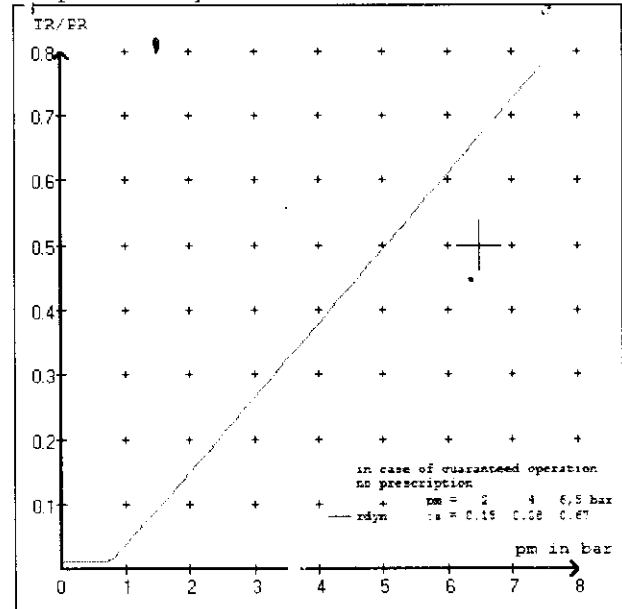
brake chamber pressure unladen



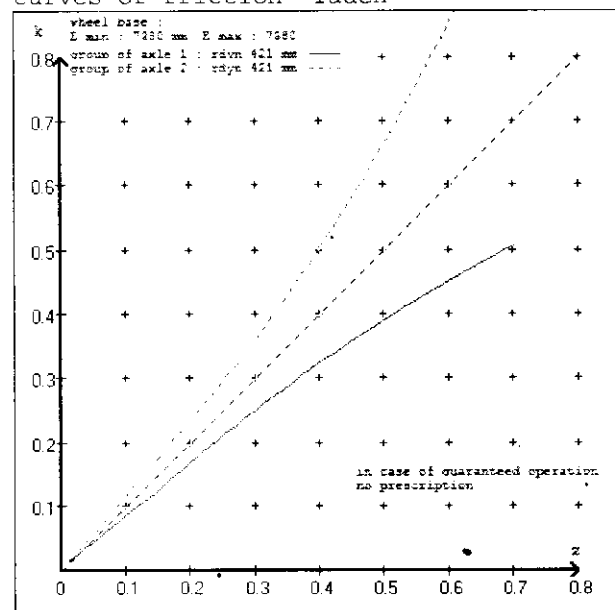
compatibility band laden



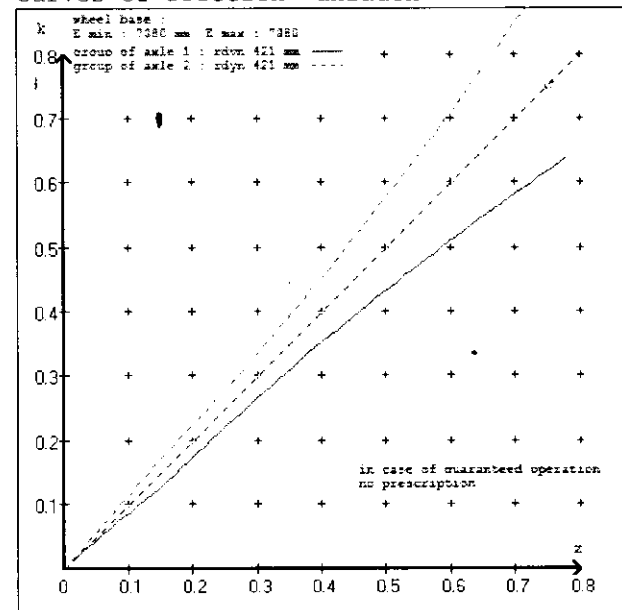
compatibility band unladen



curves of friction laden



curves of friction unladen



vehicle manufacturer: DOMETT  
 trailer model : 5AFT C/SIDE  
 trailer type : 5-axle-full-trailer,

brake chamber and lever length :

axle 1 : 2 x type/diameter 14. (Meritor) lever length 69 mm  
 axle 2 : 2 x type/diameter 14. (Meritor) lever length 69 mm  
 axle 3 : 2 x type/diameter T.14/16 (Meritor) lever length 69 mm  
 axle 4 : 2 x type/diameter T.14/16 (Meritor) lever length 69 mm  
 axle 5 : 2 x type/diameter T.14/16 (Meritor) lever length 69 mm

brake diagram :

valve :

971 002 ... 0 WABCO EBS emergency valve  
 480 207 0.. 0 WABCO EBS relay valve or 480 207 2.. 0  
 480 102 ... 0 WABCO EBS trailer modulator

EBS input data

=====

vehicle manufacturer: DOMETT  
 trailer model : 5AFT C/SIDE  
 trailer type : 5-axle-full-trailer  
 brake calculation no. : TP 50764A

tire circumference main axle : 2650 for rdyn max  
 tire circumference auxiliary axle : 2650 for rdyn max

assignment pm / deceleration z: pm 0.7 bar z = 0.010  
 (laden condition) 2.0 bar z = 0.142  
 6.5 bar z = 0.600

control pressure pm			6,5	control pressure pm			0.7	2.0	6.5
axle	axle load unladen	bellow pr. unladen	brake pr. unladen	axle load laden	bellow pr. laden	brake pr. laden			
1	1600	to be	1.7	7500	to be	0.4	1.4	6.2	
2	1600	entered by	1.7	7500	entered by	0.4	1.4	6.2	
3	1300	the vehicle	1.4	6000	the vehicle	0.4	1.4	4.8	
4	1300	manufact.	1.4	6000	manufact.	0.4	1.4	4.8	
5	1300		1.4	6000		0.4	1.4	4.8	

The unladen values indicated in the above table are values for the basic parameter set. Higher unladen axle loads and liftaxles are automatically recognized and do not require separate adjustment. The above unladen axle loads must not be faller: below.

=====

axle 1	axle 2	axle 3	axle 4	axle 5
axle load pcy1	axle load pcy1	axle load pcy1	axle load pcy1	axle load pcy1
1600 1.7	1600 1.7	1300 1.4	1300 1.4	1300 1.4
2100 2.1	2100 2.1	1800 1.8	1800 1.8	1800 1.8
2600 2.5	2600 2.5	2300 2.1	2300 2.1	2300 2.1
3100 2.8	3100 2.8	2800 2.5	2800 2.5	2800 2.5
3600 3.2	3600 3.2	3300 2.8	3300 2.8	3300 2.8
4100 3.6	4100 3.6	3800 3.2	3800 3.2	3800 3.2
4600 4.0	4600 4.0	4300 3.6	4300 3.6	4300 3.6
5100 4.4	5100 4.4	4800 3.9	4800 3.9	4800 3.9
7500 6.2	7500 6.2	6000 4.8	6000 4.8	6000 4.8

data sheet to ECE vehicle type-approval certificate concerning braking equipment: according to ECE R13 annex 11

axle 1	: reference axle: SAF	SBW 1937-...	brake lining: Jurid 539
	test report :	TDB 0749 ECE	date : 13.10.2008
axle 2	: reference axle: SAF	SBW 1937-...	brake lining: Jurid 539
	test report :	TDB 0749 ECE	date : 13.10.2008
axle 3	: reference axle: SAF	SBW 1937-...	brake lining: Jurid 539
	test report :	TDB 0749 ECE	date : 13.10.2008
axle 4	: reference axle: SAF	SBW 1937-...	brake lining: Jurid 539
	test report :	TDB 0749 ECE	date : 13.10.2008
axle 5	: reference axle: SAF	SBW 1937-...	brake lining: Jurid 539
	test report :	TDB 0749 ECE	date : 13.10.2008

calc. verif. of residual (hot) braking force type III  
(item 4.2.1 of appendix 2 to annex 11)

axle 1	(rdyn 421 mm)	T = 21.7 % Fe
axle 2	(rdyn 421 mm)	T = 21.7 % Fe
axle 3	(rdyn 421 mm)	T = 17.9 % Fe
axle 4	(rdyn 421 mm)	T = 17.9 % Fe
axle 5	(rdyn 421 mm)	T = 17.9 % Fe

calculated actuator stroke in mm  
(item 4.3.1.1 of appendix 2 to annex 11)

axle 1	(sp = 57 mm)	s = 39 mm
axle 2	(sp = 57 mm)	s = 39 mm
axle 3	(sp = 56 mm)	s = 39 mm
axle 4	(sp = 56 mm)	s = 39 mm
axle 5	(sp = 56 mm)	s = 39 mm

average thrust output in N at pm = 6,5 bar (however max. pcha = 7,0 bar)

axle1	ThA = 5988 N
axle2	ThA = 5988 N
axle3	ThA = 4586 N
axle4	ThA = 4586 N
axle5	ThA = 4586 N

calc. residual (hot) braking force in N  
(item 4.3.1.4 of appendix 2 to annex 11)

axle 1	(rdyn 421 mm)	T = 35708 N
axle 2	(rdyn 421 mm)	T = 35708 N
axle 3	(rdyn 421 mm)	T = 27248 N
axle 4	(rdyn 421 mm)	T = 27248 N
axle 5	(rdyn 421 mm)	T = 27248 N

	basic test	type III
	of subject	(calculated)
braking rate of the vehicle	trailer (E)	residual
(item 4.3.2 to appendix 2 to annex 11)	0.60	(hot)braking
		0.47
required braking rate		>= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)		>= 0,6*E (0.36)

axle 1	(rdyn 421 mm)	T = 35708 N
axle 2	(rdyn 421 mm)	T = 35708 N
axle 3	(rdyn 421 mm)	T = 27248 N
axle 4	(rdyn 421 mm)	T = 27248 N
axle 5	(rdyn 421 mm)	T = 27248 N

	basic test	type III
	of subject	(calculated)
braking rate of the vehicle	trailer (E)	residual
(item 4.3.2 to appendix 2 to annex 11)	0.60	(hot)braking
		0.47
required braking rate		>= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)		>= 0,6*E (0.36)

spring parking brake

	axle 3	axle 4	axle 5
no of TRISTOP-actuators per axle line KDZ	2	2	2
TRISTOP-actuator type	T.14/16	T.14/16	T.14/16
lever length                      lBh in mm	69	69	69
stat. tyre radius                  rstat max in mm	401	401	401
at a stroke of                      s            in mm	30	30	30
min. force of spring brake        TFZ in N	6160	6160	6160
sp.brake chamber no Meritor.....	4	4	4
release pressure                    pLs in bar	4.8	4.8	4.8

calculation:

ratio until road	3.9674	3.9674	3.9674
$iFb = lBh * \eta * C * rBt / (rBn * rstat)$ for rstat            in mm	401	401	401
brake force of spring br. Tf    in N	59654	59654	59654
$Tf = (TFZ * KDZ - 2 * Co / lBh) * iFb$			
braking rate                        zf laden	0.563		
$zf = \text{sum}(Tf) / P + 0,01$			

Test of the frictional connection required by the parking brake

minimum wheelbase/minimum supporting width min Ef necessary  
to fulfil the regulations

$$\min Ef = E * (1 - PR/P + zferf * h/E) / (1 - zferf / (fzul * nf/ng))$$

min Ef = 4807 mm    for E = 7380 mm  
 =====  
 min Ef = 4807 mm    for E = 7380 mm  
 =====

min Ef =                    minimum distance between front axle(s) (trailer) or support (scmitrailer)  
 and the rear axle(s) (resultant of the bogie)  
 E                    -                    wheel base  
 fzul                =            0.80            maximum permissible frictional connection required  
 zferf                =            0.18            maximum required braking ratio of the parking brake  
 h                    =            2062 mm        height of center of gravity - laden  
 PR                  =            18000 kg        maximum bogie mass - laden  
 P                    =            33000 kg        maximum total mass - laden  
 nf                    =            3                no. of axle(s) with TRISTOP spring brake actuators  
 ng                    =            3                no. of bogie axle(s)

reference values

reference values for z = 50% for max rdyn: 421 mm

	pz [bar]	T [N]	T [N]
axle 1	1.0 6.2	4958 37719	
axle 2	1.0 6.2	4958 37719	
axle 3	1.0 4.8		4835 28776
axle 4	1.0 4.8		4835 28776
axle 5	1.0 4.8		4835 28776

VIN - no.:

	Axle(s) / Achse(n)				
brake cylinder type (service / parking) Bremszylinder Typ (Betrieb / Fest)	14./	14./	T.14/16	T.14/16	T.14/16
Maximum stroke smax = ...mm maximaler Hub smax = ....mm	64	64	64	64	64
Lever length = ....mm Hebellänge = ....mm	69.08	69.08	69.08	69.08	69.08

