trailer (full, semi-, centre-axle) with air brake system acc. to
71/320/EEC, last amended by 98/12/EC and 2006/96/EC or UN/ECE-R.13.11

distribution: DOMETT T&T
7A9D35012B1023020
JH111109

please note!

This brake calculation is made under consideration of
-the legal precriptions mentioned above in the version valid alt the time of making the program (V6.10.05.21).
-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 V6.10.05.21 db 26.05.2010

vehicle manufacturer: DOMETT T&T

trailer model : 4AX F/T TIPPER

trailer type : 4-axle-full-trailer

remarks : air / hydraulic / VA suspension
WABCO TRAILER - EBS
TRISTOP 3+4: 24/30
265/70 R 19,5

axle 1 + 2 + 3 + 4 : ROR, B 350 x 200, RDW 1914 0492,

| | | unladen | laden |
|---|---|---|---|
| total mass | P in kg | 5400 | 30000 |
| axle 1 | P1 in kg | 1500 | 7500 |
| axle 2 | P2 in kg | 1500 | 7500 |
| axle 3 | P3 in kg | 1200 | 7500 |
| axle 4 | P4 in kg | 1200 | 7500 |
| wheel base | E in mm | 4900 - 4900 | |
| centre of gravity height | h in mm | 1000 | 1800 |

| | | axle 1 | axle 2 | axle 3 | axle 4 |
|---|---|---|---|---|---|
| no. of combined axles | | 1 | 1 | 1 | 1 |
| no. of brake chambers per axle line | KDZ | 2 | 2 | 2 | 2 |
| The power output corresponds to | | FE 747 | FE 747BC | 0051.0BC | 0051.0 |
| brake chamber manufacturer | | TSE | TSE | TSE | TSE |
| chamber size | | 24 | 24 | 24/30 | 24/30 |
| lever length | lBh in mm | 127 | 127 | 127 | 127 |
| brake factor | [-] | 9.09 | 9.09 | 9.09 | 9.09 |
| 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 | 27.0 | 27.0 | 27.0 | 27.0 |

| calculation: | | | | | |
|---|---|---|---|---|---|
| chamber pressure(rdyn min) | pH at z=22,5%bar | 2.5 | 2.5 | 2.2 | 2.2 |
| chamber pressure(rdyn max) | pH at z=22,5%bar | 2.5 | 2.5 | 2.2 | 2.2 |
| chamber press.(servo) | pcha at pm6,5bar bar | 6.6 | 6.6 | 4.9 | 4.9 |
| piston force | ThA at pm6,5bar N | 9127 | 9127 | 6942 | 6942 |
| brake force(rdyn min) | T lad. at pm6,5bar N | 49622 | 49622 | 37642 | 37642 |
| brake force(rdyn max) | T lad. at pm6,5bar N | 49622 | 49622 | 37642 | 37642 |
| brake force within 1 % rolling friction proportion | % | 24.6 | 24.6 | 25.4 | 25.4 |

| | | |
|---|---|---|
| braking rate z laden | 0.593 | for rdyn min |
| z = sum (TR)/PRmax | 0.593 | 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
           EBS relay valve

  brake cylinder: TSE 24S

axle 2:
  valve 1: 971 002 ... 0 WABCO
           EBS emergency valve

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

  brake cylinder: TSE 24S

axle 3:
  valve 1: 971 002 ... 0 WABCO
           EBS emergency valve

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

  brake cylinder: TSE 2430GC

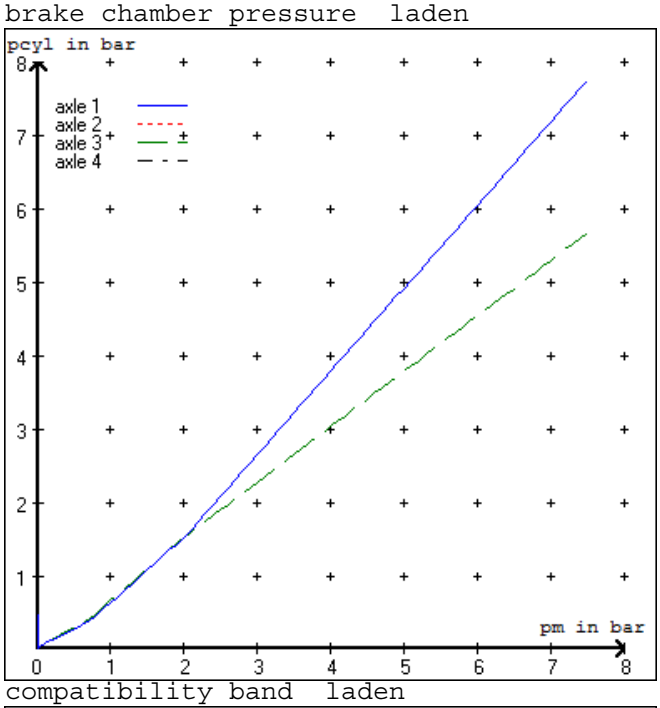
axle 4:
valve 1: 971 002 ... 0 WABCO
EBS emergency valve

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

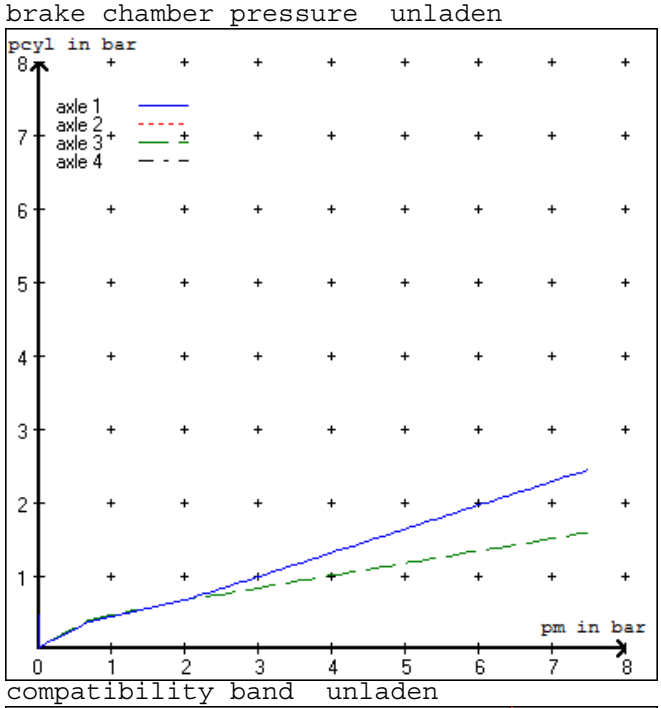
brake cylinder: TSE 2430GC

| | | | | | | |
|---|---|---|---|---|---|---|
| test type III (zIII = 0.30) | for rdyn min : | axle1 | axle2 | axle3 | axle4 | |
| at pm 3.6 bar => | pcha in bar : | 3.3 | 3.3 | 2.7 | 2.7 | |
| test type III (zIII = 0.06) | for rdyn min : | axle1 | axle2 | axle3 | axle4 | |
| at pm 1.2 bar => | pcha in bar : | 0.8 | 0.8 | 0.8 | 0.8 | |

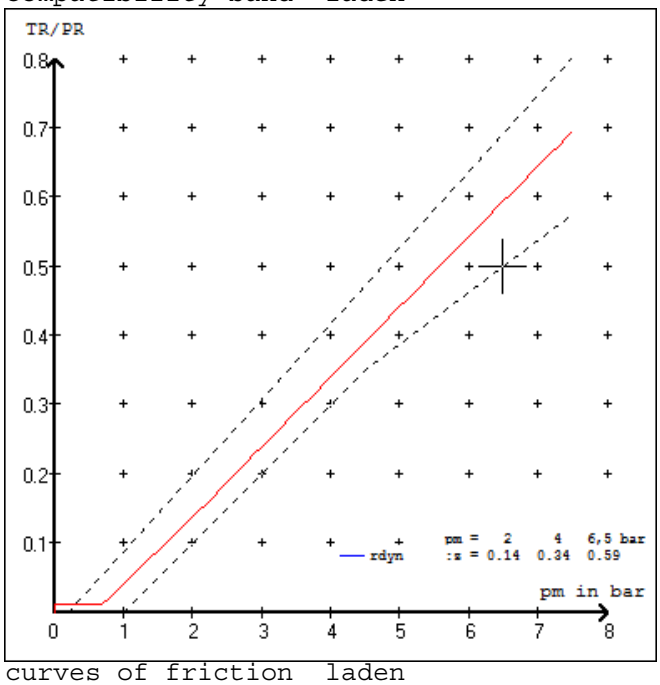
brake chamber pressure laden



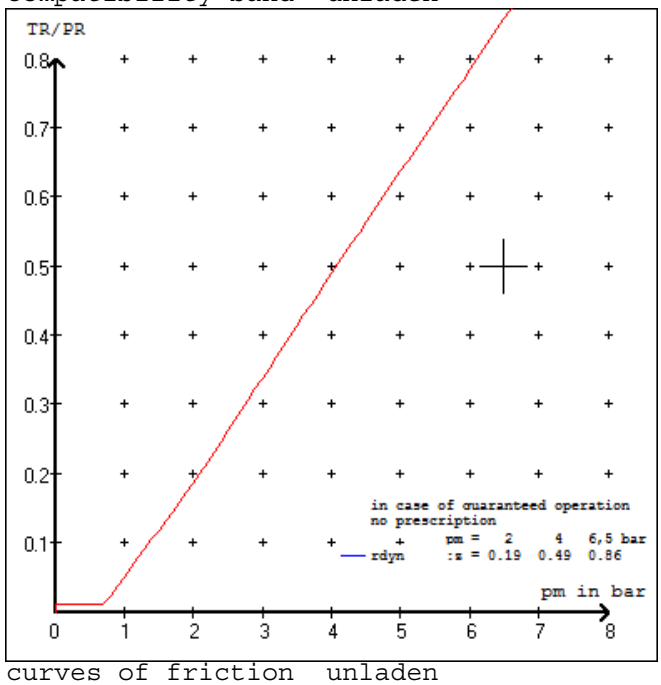

brake chamber pressure unladen



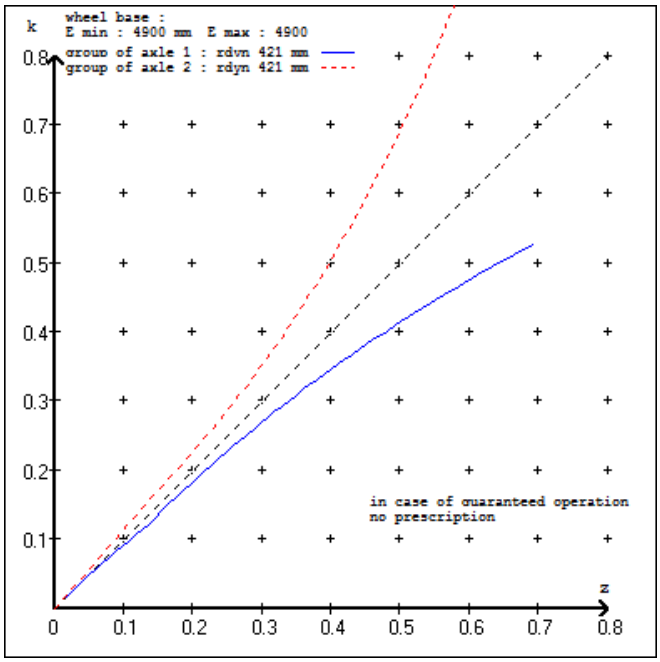

compatibility band laden



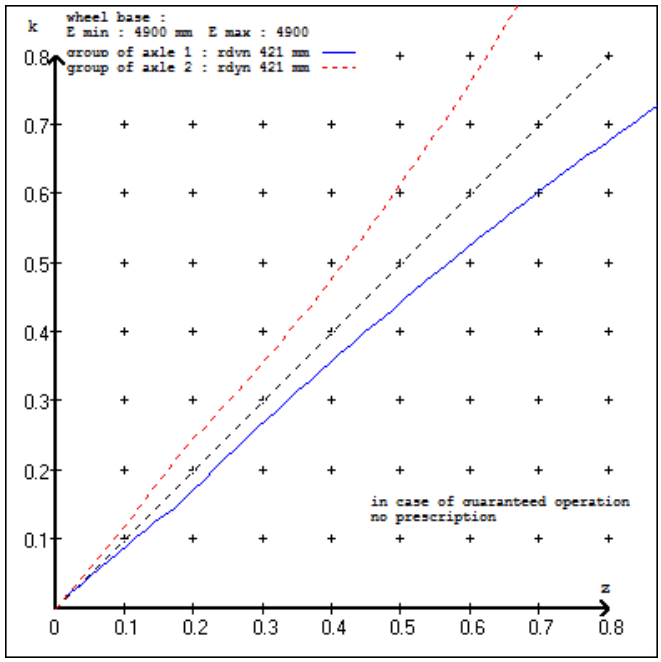

compatibility band unladen




curves of friction laden




curves of friction unladen



vehicle manufacturer: DOMETT T&T
trailer model : 4AX F/T TIPPER
trailer type : 4-axle-full-trailer

brake chamber and lever length :
axle 1 : 2 x type/diameter 24 (TSE) lever length 127 mm
axle 2 : 2 x type/diameter 24 (TSE) lever length 127 mm
axle 3 : 2 x type/diameter 24/30 (TSE) lever length 127 mm
axle 4 : 2 x type/diameter 24/30 (TSE) lever length 127 mm

brake diagram :

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

EBS input data
==========
vehicle manufacturer: DOMETT T&T
trailer model : 4AX F/T TIPPER
trailer type : 4-axle-full-trailer
brake calculation no. : TP 50555A

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 = 0.000
(laden condition) 2.0 bar z = 0.132
6.5 bar z = 0.590

| 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 | 1500 | to be entered by the vehicle manufact. | 2.1 | 7500 | to be entered by the vehicle manufact. | 0.4 | 1.5 | 6.6 |
| 2 | 1500 | | 2.1 | 7500 | | 0.4 | 1.5 | 6.6 |
| 3 | 1200 | | 1.4 | 7500 | | 0.4 | 1.5 | 4.9 |
| 4 | 1200 | | 1.4 | 7500 | | 0.4 | 1.5 | 4.9 |
| 5 | 0 | | 0,0 | 0 | | 0,0 | 0,0 | 0,0 |

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 fallen below.
==========

| axle 1 | | axle 2 | | axle 3 | | axle 4 | |
|---|---|---|---|---|---|---|---|
| axle load | pcyl | axle load | pcyl | axle load | pcyl | axle load | pcyl |
| 1500 | 2.1 | 1500 | 2.1 | 1200 | 1.4 | 1200 | 1.4 |
| 2000 | 2.5 | 2000 | 2.5 | 1700 | 1.7 | 1700 | 1.7 |
| 2500 | 2.9 | 2500 | 2.9 | 2200 | 2.0 | 2200 | 2.0 |
| 3000 | 3.2 | 3000 | 3.2 | 2700 | 2.2 | 2700 | 2.2 |
| 3500 | 3.6 | 3500 | 3.6 | 3200 | 2.5 | 3200 | 2.5 |
| 4000 | 4.0 | 4000 | 4.0 | 3700 | 2.8 | 3700 | 2.8 |
| 4500 | 4.3 | 4500 | 4.3 | 4200 | 3.1 | 4200 | 3.1 |
| 5000 | 4.7 | 5000 | 4.7 | 4700 | 3.3 | 4700 | 3.3 |
| 7500 | 6.6 | 7500 | 6.6 | 7500 | 4.9 | 7500 | 4.9 |

data sheet to EC/ECE vehicle type-approval certificate concerning braking equipment: according to 98/12/EC annex IX 2.7.4 / ECE R13 annex 11

axle 1 : reference axle: ROR brake lining: ROR 329 AF
test report : RDW 1914 0492 date : 11.02.1999
axle 2 : reference axle: ROR brake lining: ROR 329 AF
test report : RDW 1914 0492 date : 11.02.1999
axle 3 : reference axle: ROR brake lining: ROR 329 AF
test report : RDW 1914 0492 date : 11.02.1999
axle 4 : reference axle: ROR brake lining: ROR 329 AF
test report : RDW 1914 0492 date : 11.02.1999

calc. verif. of residual (hot) braking force type III
(item 4.2 of appendix I to annex VII)

| | | |
|---|---|---|
| axle 1 | (rdyn 421 mm) | T = 20.8 % Fe |
| axle 2 | (rdyn 421 mm) | T = 20.8 % Fe |
| axle 3 | (rdyn 421 mm) | T = 17.4 % Fe |
| axle 4 | (rdyn 421 mm) | T = 17.4 % Fe |

calculated actuator stroke in mm
(item 4.3.1.1 of appendix I to annex VII)

| | | |
|---|---|---|
| axle 1 | (sp = 74 mm) | s = 52 mm |
| axle 2 | (sp = 74 mm) | s = 52 mm |
| axle 3 | (sp = 63 mm) | s = 52 mm |
| axle 4 | (sp = 63 mm) | s = 52 mm |

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

| | |
|---|---|
| axle1 | ThA = 9127 N |
| axle2 | ThA = 9127 N |
| axle3 | ThA = 6942 N |
| axle4 | ThA = 6942 N |

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

| | | |
|---|---|---|
| axle 1 | (rdyn 421 mm) | T = 45827 N |
| axle 2 | (rdyn 421 mm) | T = 45827 N |
| axle 3 | (rdyn 421 mm) | T = 34781 N |
| axle 4 | (rdyn 421 mm) | T = 34781 N |

| | basic test of subject trailer (z) | type III (calculated) residual (hot)braking |
|---|---|---|
| braking rate of the vehicle (item 4.3.2 to appendix I to annex VII) | 0.59 | 0.55 |

required braking rate (items 1.3.3 and 1.6.2 to annex II) >= 0,4 and >= 0,6*z (0.36)

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

| | | |
|---|---|---|
| axle 1 | (rdyn 421 mm) | T = 45827 N |
| axle 2 | (rdyn 421 mm) | T = 45827 N |
| axle 3 | (rdyn 421 mm) | T = 34781 N |
| axle 4 | (rdyn 421 mm) | T = 34781 N |

| | basic test of subject trailer (z) | type III (calculated) residual (hot)braking |
|---|---|---|
| braking rate of the vehicle (item 4.3.2 to appendix I to annex VII) | 0.59 | 0.55 |

required braking rate (items 1.3.3 and 1.6.2 to annex II) >= 0,4 and >= 0,6*z (0.36)

spring parking brake

| | | axle 3 | axle 4 |
|---|---|---|---|
| no of TRISTOP-actuators per axle line | KDZ | 2 | 2 |
| TRISTOP-actuator type | | 24/30 | 24/30 |
| lever length | lBh in mm | 127 | 127 |
| stat. tyre radius | rstat max in mm | 401 | 401 |
| at a stroke of | s in mm | 30 | 30 |
| min. force of spring brake | TFZ in N | 6360 | 6360 |
| sp.brake chamber no 925 ... ... . | | 376 005 0376 005 0 | |
| sp.brake chamber no 925 ... ... . | | 376 2.. 0376 2.. 0 | |
| release pressure | pLs in bar | 4.9 | 4.9 |

calculation:

| | | | |
|---|---|---|---|
| ratio until road | | 2.8789 | 2.8789 |
| iFb = lBh*Eta*C*rBt/(2*rBn*rstat) | | | |
| | for rstat in mm | 401 | 401 |
| brake force of spring br. Tf | in N | 35395 | 35395 |
| Tf = (TFZ*KDZ-2*Co/lBh)*iFb | | | |

| | | |
|---|---|---|
| braking rate | zf laden | 0.251 |
| zf = 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 = 3579 mm for E = 4900 mm
==========
min Ef = 3579 mm for E = 4900 mm
==========

| | | | |
|---|---|---|---|
| min Ef | = | | minimum distance between front axle(s) (trailer) or support (semitrailer) 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 | = | 1800 mm | height of center of gravity - laden |
| PR | = | 15000 kg | maximum bogie mass - laden |
| P | = | 30000 kg | maximum total mass - laden |
| nf | = | 2 | no. of axle(s) with TRISTOP spring brake actuators |
| ng | = | 2 | 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<br>6.6 | 4913<br>41840 | |
| axle 2 | 1.0<br>6.6 | 4913<br>41840 | |
| axle 3 | 1.0<br>4.9 | | 5265<br>31739 |
| axle 4 | 1.0<br>4.9 | | 5265<br>31739 |

VIN - no.:

| | Axle(s) / Achse(n) | | | | |
|---|---|---|---|---|---|
| brake cylinder type (service / parking)<br>Bremszylinder Typ (Betrieb / Fest) | 24/ | 24/ | 24/30 | 24/30 | / |
| Maximum stroke smax = ...mm<br>maximaler Hub smax = ....mm | 67 | 67 | 64 | 64 | |
| Lever length = ....mm<br>Hebellänge = ....mm | 127 | 127 | 127 | 127 | |