VCA, 1 Eastgate Office Centre,
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Report Number: TSS389116 Issue: 0

Test Report: Reference Axle

Legislation

UNECE Regulation 13.11 to Supplements 10 - 13, Annex 11, Appendix 3

Test Details

Location of Test:	Garching / München
Date of Test:	14.11.2011 (TUV SUD test date) 28.03.2017 (VCA Paperwork)
VCA Representative(s):	Erdal Çınarcı, Serdar Şahbudak
Manufacturer's Representative(s):	No Attendance
Reason for Test Report:	~~New approval / Extension of approval~~ / Test report only

Manufacturer Details

Name and Address:	ÖZKOÇ İLAVE DİNGİL SAN. TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sk. No:5 PK:42050 Selçuklu / Konya
Type:	TRAX LWB
Commercial Description:	Not applicable
Category:	O3/O4

Conclusion

The above mentioned component was tested in accordance with the above mentioned legislation and was found to comply in all respects.

	Test witnessed by*:	Test approved by*:
Signature:	Serdar Şahbudak	Erdal Çınarcı
Name:	Erdal Çınarcı	
Position:	Type Approval Engineer	
Date:	28.03.2017	

**To be signed by different persons, even when the Technical Service and Approval Authority are the same or alternatively, a separate Approval Authority authorisation is issued with the report.*

List of Annexes

Annex	No of Pages	Subject
I	5	Information Document. Document no: OKC 003 rev. 00 dated 16.01.2017

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Worst Case Rationale

The axle was tested according to ECE-R13.11 by TÜV SÜD AUTOMOTIVE GMBH with test report number 361-101-11. There is no any changes about axle/brake configuration and technical spec. The report was only updated to the latest supplement of regulation. Due to there is no additional technical requirement according to latest supplement, the previous results are still valid and given below.

Note: Include information on variants and versions this report covers, as applicable

Tests Required

	Yes, NA, See Report … / Approval … / Annex …
General:	Yes
Test Record:	Yes

Component Specification

Axle Identification Number:	ID1- TRAX LWB 4222

Manufacturer's Documentation

Manufacturer's documentation is complete and reflects the agreed specification for the component tested and covers all variants and versions agreed in the worst case rationale.	Yes

Facility and Equipment Checks

Calibration certificates checked and valid, recorded in the following table:	NA

Equipment	Serial / Certificate No.	Calibration due*
-	-	-
-	-	-
-	-	-

**Specify calibrated date + (interval) or calibration due date.*

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Test Requirements	Complies Yes / NA

General

Note: Test report as prescribed in section 3.9 of Appendix 2 to Annex 11.

1.1. Axle manufacturer name and address:

ÖZKOÇ İLAVE DİNGİL SAN. TİC. LTD. ŞTİ.
Konya Organize Sanayi Bölgesi 13. Sk. No:5 PK:42050
Selçuklu / Konya

1.1.1. Make of axle manufacturer: TRAX

1.2. Brake manufacturer name and address:

See item 1.1.

1.2.1. Brake identifier ID2-: 420 x 220

1.2.2. Automatic brake adjustment device:

- ~~Integrated~~*
- Non-integrated*

**Strikethrough, as appropriate.*

1.3. Manufacturer's information document: OKC 003

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Test Record

The following data is recorded for each test:

2.1.	Test code:	ID4- TSS389116	
2.2.	Test specimen:	Drum Brake	
	Test variant:	S-cam Brake	
2.2.1.	Axle code:	See below	
2.2.1.1.	Axle identifier:	ID1- TRAX LWB 4222	
2.2.1.2.	Identification of tested axle:	TRAX LWB 4222	
2.2.1.3.	Test axle load (Fe identifier):	ID3- 14715	
2.2.2.	Brake:	See below	
2.2.2.1.	Brake identifier:	ID2- 420 x 220	
2.2.2.2.	Identification of tested brake:	420 x 220	
2.2.2.3.	Maximum stroke capability of the brake: *Note: Applies to disc brakes only.*	NA	mm
2.2.2.4.	Effective length of the cam shaft: *Note: Applies to drum brakes only.*	640	mm
2.2.2.5.	Material variation: *Note: As per paragraph 3.8 (m) of Appendix 2 to this annex.*	NA	
2.2.2.6.	Brake: - Drum* - ~~Disc~~* **Strikethrough, as appropriate.*		
2.2.2.6.1.	Actual test mass of drum/~~disc~~: **Strikethrough, as appropriate.*	66	kg
2.2.2.6.2.	Nominal external diameter of disc: *Note: Applies to disc brakes only.*	NA	mm
2.2.2.6.3.	Type of cooling of the disc: - ~~Ventilated~~* - ~~Non-ventilated~~* **Strikethrough, as appropriate.*		

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2.2.2.6.4. Integrated hub:
- ~~With~~*
- ~~Without~~*

**Strikethrough, as appropriate.*

2.2.2.6.5. Disc with integrated drum:
- ~~With parking brake function~~*
- ~~Without parking brake function~~*

**Strikethrough, as appropriate.*
Note: Applies to disc brakes only.

2.2.2.6.6. Geometric relationship between disc friction surfaces and disc mounting: NA

Examples: One piece, casted, connection on action side.

2.2.2.6.7. Base material: Grey Cast Iron

2.2.2.7. Brake:
- Lining*
- ~~Pad~~*

**Strikethrough, as appropriate.*

2.2.2.7.1. Manufacturer: Eren Balatacılık San. ve Tic. A.Ş.

2.2.2.7.2. Make: EREN

2.2.2.7.3. Type: M761-4687-220

2.2.2.7.4. Method of attachment: Riveted
- Lining*
- ~~Pad~~ on the brake shoe*
- ~~Back plate~~*

**Strikethrough, as appropriate.*

2.2.2.7.5.
~~Thickness of back plate~~: -- mm*
Weight of shoes: 6,6 kg*

**Strikethrough, as appropriate.*

2.2.2.7.6. Base material: Steel
- ~~Back plate~~*
- Brake shoe*

**Strikethrough, as appropriate.*

2.2.3. Automatic brake adjustment device: See below

**Not applicable in the case of integrated automatic brake adjustment device.*

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2.2.3.1. Manufacturer name and address:

Haldex Brake Products AB
Instrumentgatan 15 Box 501 261 14 Landskrona, Sweden

2.2.3.2.	Make:	HALDEX
2.2.3.3.	Type:	S-ABA 80022
2.2.3.4.	Version:	0
2.2.4.	Wheel(s):	a) 315/80 R22,5 (Twin) b) 385/65 R22,5

Note: For dimensions, see Figures 1A and 1B in Appendix 5 to this annex.

2.2.4.1. Reference tyre rolling radius (R_e) at test axle load (F_e): 500 mm

2.2.4.2. Data of the fitted wheel during testing:

Tyre Size	Rim Size	X_e (mm)	D_e (mm)	E_e (mm)	G_e (mm)
385/65 R22,5	22,5	294	285,5	39	10

2.2.5.	Lever length le:	180 mm
2.2.6.	Actuator:	See below
2.2.6.1.	Manufacturer:	Wabco
2.2.6.2.	Make:	Wabco
2.2.6.3.	Type:	36” (2306*p-791)
2.2.6.4.	(Test) identification number:	--
2.3.	Test results:	See below

Note: Corrected to take account of rolling resistance of 0.01·F_e.

2.3.1. In the case of vehicles of categories O_2 and O_3 where the O_3 trailer has been subject to the Type I test:

Test Type	0	I	
Annex 11, Appendix 2, paragraph:	3.5.1.2	3.5.2.2/3	3.5.2.4
Test speed (km/h)	40	40	40
Brake actuator pressure p_e (kPa)	613	--	613
Braking time (mins)	--	2,55	--
Braking force developed T_e (daN)	8492,2	--	7917,2
Brake efficiency T_e/F_e	0,58	0,07	0,54
Actuator stroke s_e (mm)	56	--	57
Brake input torque C_e (Nm)	2400	--	2400
Brake input threshold torque $C_{0,e}$ (Nm)	30	--	30

2.3.2. In the case of vehicles of categories O_3 and O_4 where the O_3 trailer has been subject to the Type III test:

Test Type	0	III	
Annex 11, Appendix 2, paragraph:	3.5.1.2.	3.5.3.1.	3.5.3.2.
Initial test speed (km/h)	60	60	60
Final test speed (km/h)	0	30	0
Brake actuator pressure p_e (kPa)	650	--	650
Number of brake applications	--	20	--
Duration of brake cycle	--	60	--
Braking force developed T_e (daN)	7505	4415	7962,2
Brake efficiency T_e/F_e	0,51	0,3	0,54
Actuator stroke s_e (mm)	59	--	64
Brake input torque C_e (Nm)	2555	--	2555
Brake input threshold torque $C_{0,e}$ (Nm)	30	--	30

2.3.3. *This item is to be completed only when the brake has been subject to the test procedure defined in paragraph 4 of Annex 19 to this regulation, to verify the cold performance characteristics of the brake by means of the brake factor (BF).*

2.3.3.1. Brake factor B_F: 8,25

2.3.3.2. Declared threshold torque $C_{0,dec}$: 30 Nm

2.3.4 Performance of the automatic brake adjustment device, if applicable.

Yes see below

2.3.4.1. Free running according to paragraph 3.6.3 of Annex 11, Appendix 2:

- Yes*
- ~~No~~*

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**Strikethrough, as appropriate.*

Application Range

3.	Application range specifies the axle/brake variants that are covered in this test report, by showing which variables are covered by the individual test codes.	NA
4.	Test has been carried out and the results reported, in accordance with Appendix 2 to Annex 11 and, where appropriate, paragraph 4 of Annex 19 – Part 1 to Regulation No. 13, as last amended by the 11 series of amendments.	Yes
4.	At the end of the test defined in paragraph 3.6 of Annex 11, Appendix 2, the requirements of paragraph 5.2.2.8.1 of Regulation No. 13 are deemed to be fulfilled. *Note: Only to be completed when an automatic brake wear adjustment device is installed.*	Yes

Remarks

None

Note: VCA apply measurement uncertainty to calibrated items but not test results.

1. GENERAL

	Name and address of axle or vehicle manufacturer	ÖZKOÇ İLAVE DİNGİL SAN. TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sk. No:5 PK: 42050 Selçuklu / Konya

2. AXLE DATA

2.1.	Manufacturer (name and address)	ÖZKOÇ İLAVE DİNGİL SAN. TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sk. No:5 PK: 42050 Selçuklu / Konya
2.2.	Type / variant	TRAX LWB
2.3.	Axle identifier	ID1- TRAX LWB 4222
2.4.	Test axle load (F_e)	14715 daN
2.5.	Wheel and brake data according to the following Figures 1A and 1B	

Figure 1A

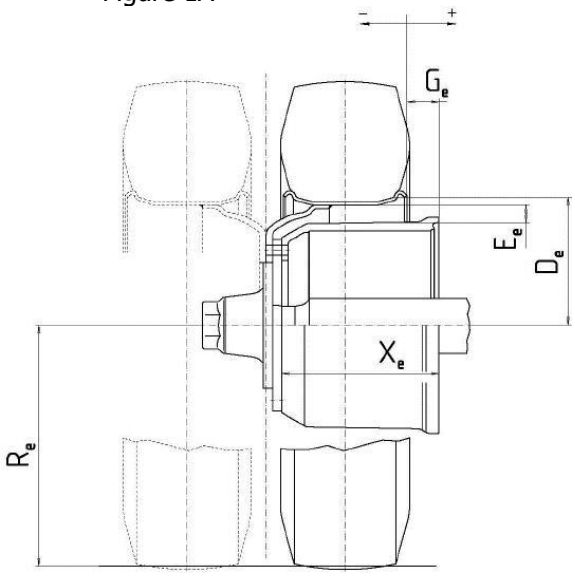
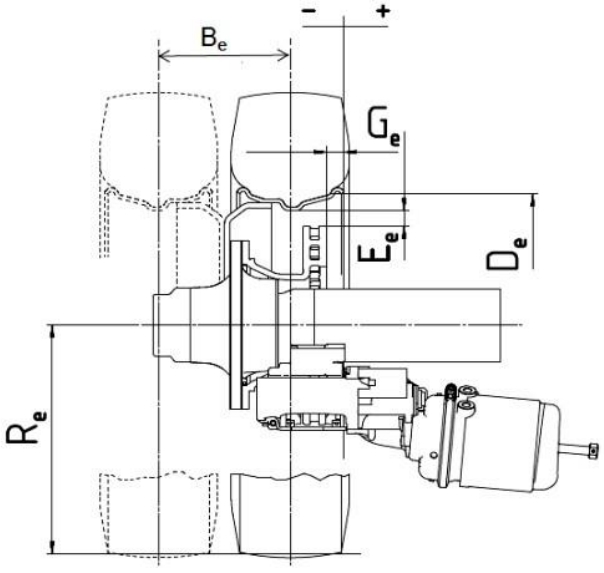


Figure 1B



Tyre	Rim	D_e (mm)	E_e (mm)	G_e (mm)	R_e (mm)	B_e (mm)	X_e (mm)
315/80 R22,5 (Twin)	22,5x9,00	Min 285,5	Min 39	Min 10	Min 500	--	Min 294

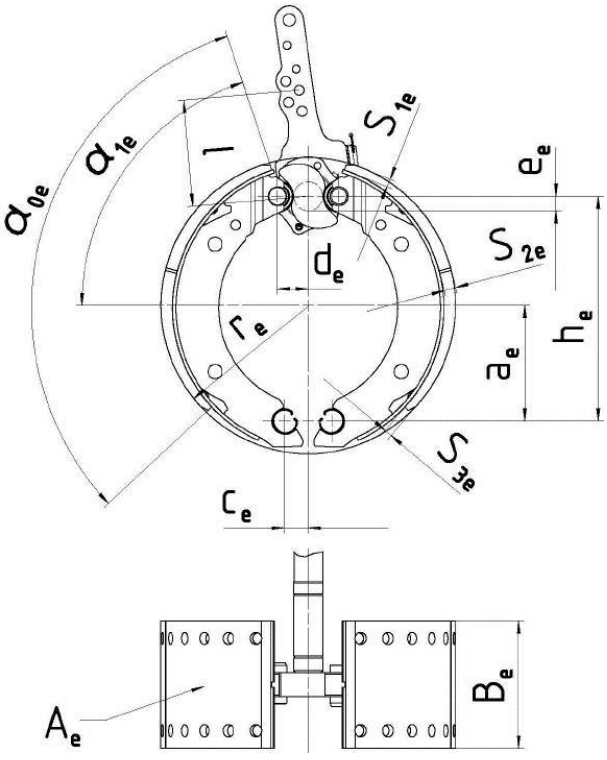
385/65 R22,5	22,5x11,75	Min 285,5	Min 39	Min 10	Min 500	--	Min 294

3. BRAKE

3.1. *General Information*

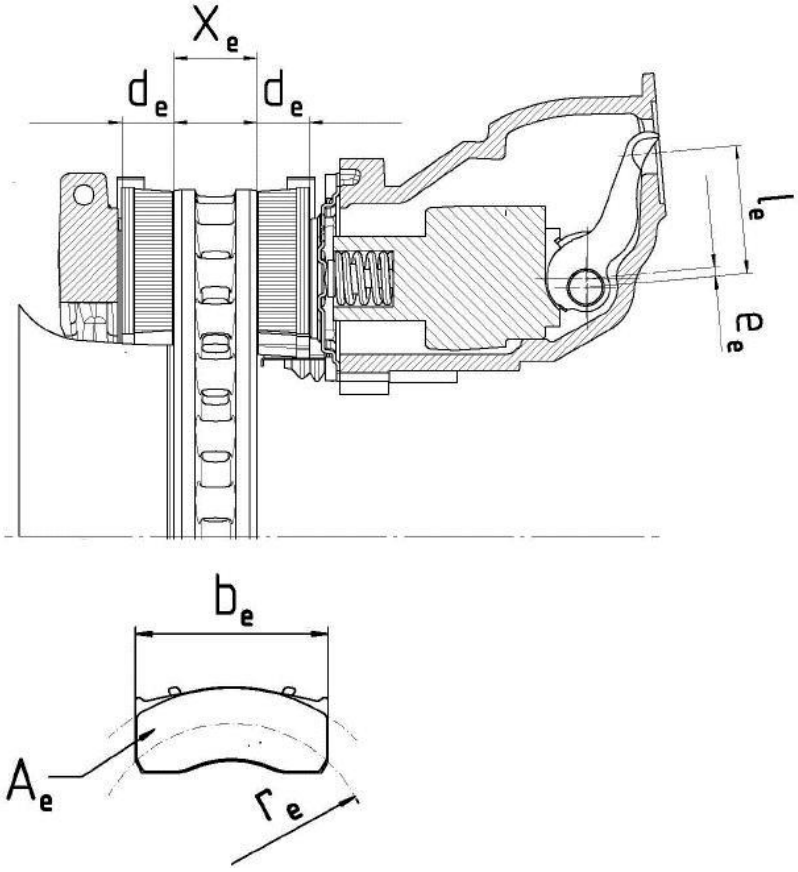
3.1.1.	Name	ÖZKOÇ
3.1.2.	Manufacturer (Name and address)	See item 1.
3.1.3.	Type of brake	Drum Brake
3.1.3.1.	Variant	S-cam Brake
3.1.4.	Brake identifier	ID2- 420x220
3.1.5.	Brake data according to the following Figures 2A and 2B	
3.1.6	Brake Factor (B_f)	8,25

Figure 2A



a_e (mm)	h_e (mm)	c_e (mm)	d_e (mm)	e_e (mm)	α_{0e} (°)	α_{1e} (°)	B_e (mm)	r_e (mm)	A_e (cm^2)	S_{1e} (mm)	S_{2e} (mm)	S_{3e} (mm)
163,7	317,7	33	42	14	114	70	220	210	1700	11,57	17,22	11,57

Figure 2B



X_e (mm)	d_e (mm)	e_e (mm)	l_e (mm)	b_e (mm)	A_e (cm^2)	r_e (mm)
--	--	--	--	--	--	--

3.2.	*Drum brake data*	
3.2.1.	Brake adjustment device (external/internal)	External
3.2.1.1.	Manufacturer (Name and address)	Haldex Brake Products AB Instrumentgatan 15 Box 501 261 14 Landskrona Sweden
3.2.1.2.	Make	HALDEX
3.2.1.3.	Type	S-ABA 80022
3.2.2.	Declared maximum brake input torque (C_{max})	2800 Nm
3.2.3.	Mechanical efficiency (η)	0,9
3.2.4.	Declared brake input threshold torque ($C_{0,dec}$)	30 Nm

3.2.5.	Efficiency length of the cam shaft	≤640 mm
3.3.	*Brake drum*	
3.3.1.	Max. diameter of friction surface (wear limit)	420 mm
3.3.2.	Base material	Cast iron
3.3.3.	Declared mass	66 kg
3.3.4.	Nominal mass	66 kg
3.3.5.	Permitted range of the brake drum mass	68 kg
3.4.	*Brake Lining*	
3.4.1.	Manufacturer (Name and address)	EREN BALATACILIK SAN.VE TİC.A.S 13 Sokak No:6 Kemalpasa Organize Sanayi Bölgesi Kemalpaşa/İzmir
3.4.2.	Make	EREN
3.4.3.	Type	M761-4687-220
3.4.4.	Identification (type identification on lining)	M761-4687-220
3.4.5.	Minimum thickness (wear limit)	5 mm
3.4.6.	Method of attaching friction material to brake shoe	Riveted
3.4.6.1.	Worst case of attachment (in the case of more than one)	N/A
3.4.6.2.	Base material of the brake shoe	Steel
3.4.6.3.	Range of the weight of the brake shoes (without brake lining)	6,6 kg
3.5.	*Disk brake data*	
3.5.1.	Connection type to the axle (axial, radial, integrated etc.)	N/A
3.5.2.	Brake adjustment device (external / integrated)	N/A
3.5.3.	Max. actuation stroke	N/A
3.5.4.	Declared maximum input force (Th_{Amax})	N/A
3.5.4.1.	Declared maximum brake input torque (C_{max}) $C_{max} = Th_{Amax} * l_e$	N/A
3.5.5.	Friction radius (r_e)	N/A
3.5.6.	Lever length (l_e)	N/A
3.5.7.	Input/output ratio (i) (l_e/e_e)	N/A

3.5.8.	Mechanical efficiency (η)	N/A
3.5.9.	Declared brake input threshold force ($Th_{A0,dec}$)	N/A
3.5.9.1.	$C_{0,dec} = Th_{A0,dec} * l_e$	N/A
3.5.10.	Minimum rotor thickness (wear limit)	N/A
3.6.	*Brake disc data*	
3.6.1.	Disc type description	N/A
3.6.2.	Connection/mounting to the hub	N/A
3.6.3.	Ventilation (yes/no)	N/A
3.6.4.	Declared mass	N/A
3.6.5.	Nominal mass	N/A
3.6.6.	Declared external diameter	N/A
3.6.7.	Minimum external diameter	N/A
3.6.8.	Inner diameter of friction ring	N/A
3.6.9.	Width of ventilation channel (if appl.)	N/A
3.6.10.	Base material	N/A
3.7.	*Brake pad data*	
3.7.1.	Manufacturer and address	N/A
3.7.2	Make	N/A
3.7.3.	Type	N/A
3.7.4.	Identification (type identification on pad back plate)	N/A
3.7.5.	Minimum thickness (wear limit)	N/A
3.7.6.	Method of attaching friction material to pad back plate	N/A
3.7.6.1.	Worst case of attachment (in case of more than one)	N/A