TÜV AUSTRIA AUTOMOTIVE GMBH
Deutschstraße 10
A-1230 Wien
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TECHNICAL REPORT

21-TAMO-0134

Base Part: ID4- 21-TAMO-0134

Suffix: 00

Reference Axle

Regulation (EC/EU) / Regulation No. **ECE-R13**

Taking into consideration amendment No. **11** supplement **16**

Annex 11, Appendix 3

0.	**Test Details**	
0.1.	Manufacturer's name and address:	**ÖZKOÇ İLAVE DİNGİL SAN. VE TİC. LTD. ŞTİ.** **Konya Organize Sanayi Bölgesi 13. Sok. NO:5 42050** **SELÇUKLU/KONYA/TURKEY**
0.2.	Brief description (Component Specification):	**TR 3210**
0.3.	Submitted test on:	**10.07.2018**
0.4.	Test Location: Test Date: Paperwork Date :	**KONYA/TURKEY** **10.07.2018** **04.02.2021**
0.5.	Reason(s) for extension/correction of test report:	**Not Applicable**
0.6.	**Testing Equipment Used**	

Equipment	**Equipment Code**	**Next Calibration Date**
Vbox	28	27.02.2019
Manometer	127	02.12.2018
Manometer	128	02.12.2018
Manometer	129	02.12.2018
Laser Thermometer	96	02.12.2018
Tyre Pressure Gauge	72	12.08.2018
Tape Measure	91	05.12.2018

0.7.	**Selection of worst case (Selection of versions/variants for testing):**
	The axle type ID1- TR 3210 with ID2- 325x100 brake configuration tested according to regulation. There is not any axle/brake variant configuration included to this application. There is also one tyre dimension for testing. For that reason test results only valid for tested axle type.

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1. 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. VE TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sok. NO:5 42050 SELÇUKLU/KONYA/TURKEY
1.1.1.	Make of axle manufacturer:	
1.2.	Brake manufacturer name and address:	See item 1.1.
1.2.1.	Brake identifier ID2-:	325x100
1.2.2.	Automatic brake adjustment device (~~Integrated~~ or Non-integrated):	Non-integrated
1.3.	Manufacturer's information document:	OZK-TR-001

2. Test Record

The following data form has to be taken Annex 11 – Appendix 3 has to be recorded for each test:

2.1.	Test code:	21-TAMO-0134
2.2.	Test specimen: Test variant:	Axle with drum brake S-cam brake
2.2.1.	**Axle code:**	
2.2.1.1.	Axle identifier:	ID1- TR 3210
2.2.1.2.	Identification of tested axle:	TR 3210
2.2.1.3.	Test axle load (Fe identifier):	ID3- 5178 daN
2.2.2.	**Brake:**	
2.2.2.1.	Brake identifier:	ID2- 325x100
2.2.2.2.	Identification of tested brake:	325x100
2.2.2.3.	Maximum stroke capability of the brake : *Note: Applies to disc brakes only.*	NA
2.2.2.4.	Effective length of the cam shaft: *Note: Applies to drum brakes only.*	700 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 or ~~Disc~~):**	
2.2.2.6.1.	Actual test mass of drum*/~~disc*:~~ **Strikethrough, as appropriate.*	19,3
2.2.2.6.2.	Nominal external diameter of disc: *Note: Applies to disc brakes only.*	NA
2.2.2.6.3.	Type of cooling of the disc: (~~Ventilated~~ or ~~non-ventilated~~)	NA
2.2.2.6.4.	Integrated hub: (~~with~~ or ~~without~~)	NA
2.2.2.6.5.	Disc with integrated drum: (~~With parking brake function~~ or ~~Without parking brake function~~)	NA

Note: Applies to disc brakes only.

2.2.2.6.6.	Geometric relationship between disc friction surfaces and disc mounting: *Examples: One piece, casted, connection on action side.*	NA
2.2.2.6.7.	Base material:	Grey Cast Iron
2.2.2.7.	**Brake (Lining or ~~Pad~~):**	
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:	44561
2.2.2.7.4.	Method of attachment (Lining or ~~Pad~~ on the brake shoe or ~~Back plate~~) : **Strikethrough, as appropriate.*	Riveted
2.2.2.7.5.	~~Thickness of back plate~~*: Weight of shoes*: Or other describing information (Manufacturer's information document)*: **Strikethrough, as appropriate.*	--- mm* 3,00 kg* None
2.2.2.7.6.	Base material of ~~Back plate~~*/ Brake shoe*: **Strikethrough, as appropriate.*	Steel (S 235)
2.2.3.	**Automatic brake adjustment device** **Not applicable in the case of integrated automatic brake adjustment device.*	
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
2.2.3.4.	Version:	80022
2.2.4.	**Wheel(s)** *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):	434 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)
285/70 R19,5	19,5x7,50	146	180	70	+55

2.2.5. **Lever length le:** 180 mm

2.2.6. **Actuator:**

2.2.6.1. Manufacturer: Moniva Otomotiv Gıda San. Tic. A.Ş.

2.2.6.2. Make: MONIVA

2.2.6.3. Type: 16/24 Spring Brake Chamber

2.2.6.4. (Test) identification number: TSS377051

2.3. **Test results**
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)	650	100	650
Braking time (mins)	N/A	2.33	N/A
Braking force developed T_e (daN)	2819	363	2613
Brake efficiency T_e/F_e	0.54	0.07	0.50
Actuator stroke s_e (mm)	50	N/A	50
Brake input torque C_e (Nm)	1202	N/A	1202
Brake input threshold torque $C_{0,e}$ (Nm)	30	N/A	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	40	0
Brake actuator pressure p_e (kPa)	650	280	650
Number of brake applications	N/A	20	N/A
Duration of brake cycle	N/A	60	N/A
Braking force developed T_e (daN)	2871	1553	2508
Brake efficiency T_e/F_e	0.55	0.3	0.48
Actuator stroke s_e (mm)	50	N/A	50
Brake input torque C_e (Nm)	1202	N/A	1202
Brake input threshold torque $C_{0,e}$ (Nm)	30	N/A	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:	5,50
2.3.3.2.	Declared threshold torque $C_{0,dec}$:	30 Nm
2.3.4	Performance of the automatic brake adjustment device, if applicable:	
2.3.4.1.	Free running according to paragraph 3.6.3 of Annex 11, Appendix 2: -Yes* ~~-No~~* **Strikethrough, as appropriate.*	
3	**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

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4. Annexes

Anlage *Annex*	I	Verwendungsbereich *Range of application*	**5**	Seiten *Pages*

5. Final Statement

The information document as mentioned under No. 1.3 and the type described therein are in compliance with the test specification mentioned above. The worst case was selected in accordance with document (QAA-TAA-002_Selection process for worst case).

This report includes pages 1 to 8. The test report may be reproduced and published fully and by the client only.

Wien / *Vienna*, 04.02.2021

TÜV AUSTRIA AUTOMOTIVE GMBH

Inspector

Zehra DOĞAN

1. GENERAL

	Name and address of axle or vehicle manufacturer	ÖZKOÇ İLAVE DİNGİL SAN. VE TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sok. NO:5 42050 SELÇUKLU/KONYA/TURKEY
1.1.	Commercial Description	325/100
1.2.	Category	O3&O4

2. AXLE DATA

2.1.	Manufacturer (name and address)	ÖZKOÇ İLAVE DİNGİL SAN. VE TİC. LTD. ŞTİ. Konya Organize Sanayi Bölgesi 13. Sok. NO:5 42050 SELÇUKLU/KONYA/TURKEY
2.1.1.	Make of axle manufacturer	
2.2.	Type / variant	TR 3210
2.3.	Axle identifier	ID1- TR 3210
2.4.	Test axle load (F_e)	**5178 daN**
2.5.	Wheel and brake data according to the following Figures 1A and 1B	

Figure 1A

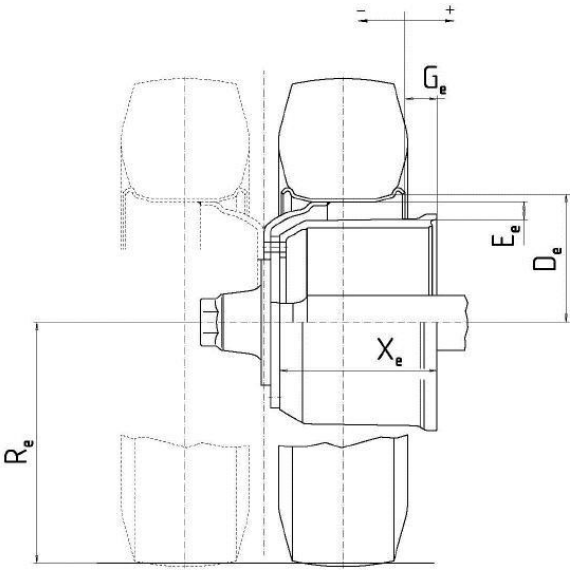
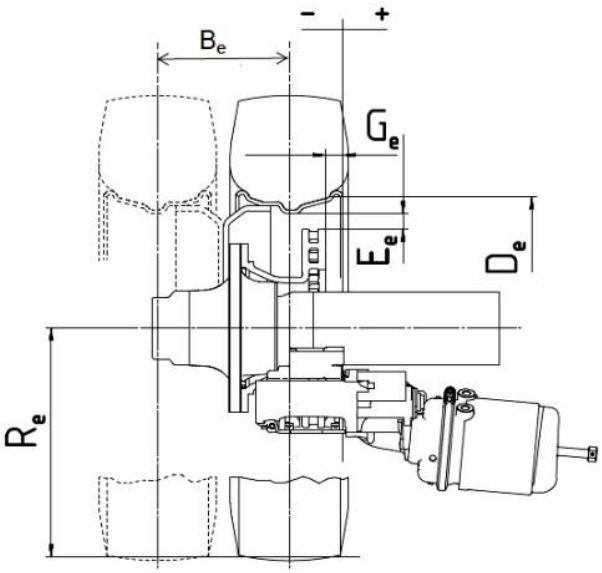


Figure 1B



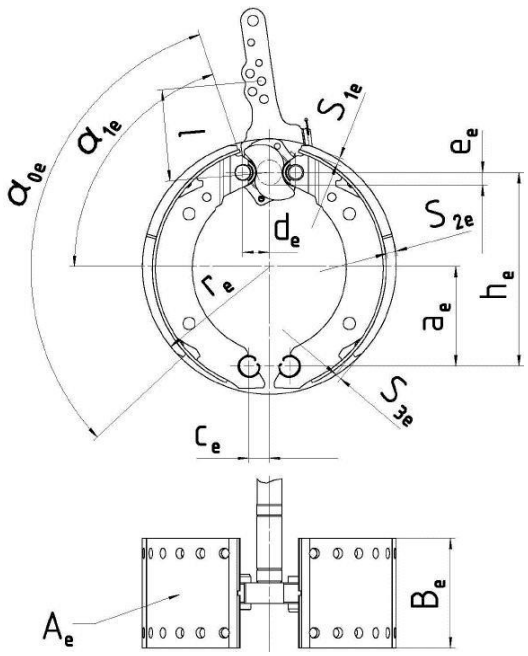
Tyre	Rim	D_e (mm)	E_e (mm)	G_e (mm)	R_e (mm)	B_e (mm)	X_e (mm)
285/70R19,5	19,5 x 7,5	180	70	+55	434	--	146

3. BRAKE

3.1. *General Information*

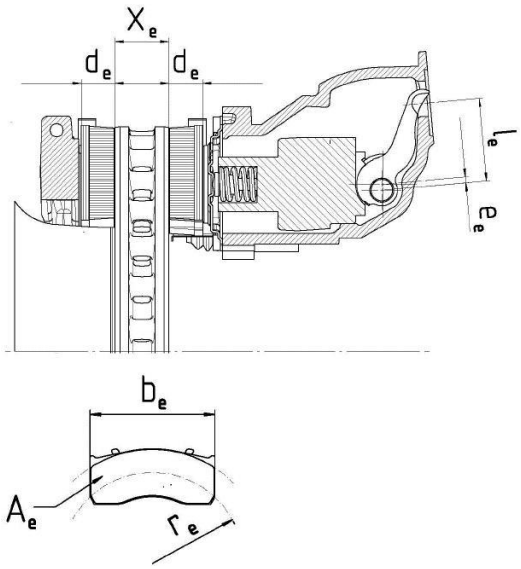
3.1.1.	Name	**ÖZKOÇ**
3.1.2.	Manufacturer (Name and address)	See item 1.
3.1.3.	Type of brake	Drum Brake
3.1.3.1.	Variant	S-Cam brake
3.1.4.	Brake identifier	ID2- 325x100
3.1.5.	Brake data according to the following Figures 2A and 2B	
3.1.6	Brake Factor (B_f)	5,50

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)
115	225	0	13	15	109	54	100	162,5	508,5	11,60	11,60	11,60

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
3.2.1.4.	Version	80022
3.2.2.	Declared maximum brake input torque (C_{max})	2900 Nm
3.2.3.	Mechanical efficiency (η)	0,95
3.2.4.	Declared brake input threshold torque ($C_{0,dec}$)	30 Nm
3.2.5.	Efficiency length of the cam shaft	700 mm
3.3.	*Brake drum*	
3.3.1.	Max. diameter of friction surface (wear limit)	325 mm

3.3.2.	Base material	Grey Cast iron
3.3.3.	Declared mass	19 kg
3.3.4.	Nominal mass	19,3 kg
3.3.5.	Permitted range of the brake drum mass	19-24 kg
3.4.	*Brake Lining*	
3.4.1.	Manufacturer (Name and address)	Eren Balatacılık San. Ve Tic. A.Ş. Kemalpaşa Organize Sanayi Bölgesi 13. Sokak No:6 Kemalpaşa / İzmir / Türkiye
3.4.2.	Make	EREN
3.4.3.	Type	44561
3.4.4.	Identification (type identification on lining)	EREN M77
3.4.5.	Minimum thickness (wear limit)	5,0 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 (St 37)
3.4.6.3.	Range of the weight of the brake shoes (without brake lining)	3,0 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