

TECHNICAL REPORT

22-TAMO-0102

Base Part: ID4- 22-TAMO-0102

Suffix: 00

Reference Axle

Regulation (ECE/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:	ÇAYIROVA OTOMOTİV SANAYİ VE TİCARET A.Ş. BÜYÜKKAYACIK OSB MAH. 3.NOLU SK. NO:3 SELÇUKLU/KONYA/TÜRKİYE	
0.2.	Brief description (Component Specification):	ÇAYIROVA FD4012 AIR SUSPENSION AXLE	
0.3.	Submitted test on:	NA	
0.4.	Test Location: Test Date:	KONYA 18.10.2022	
0.5.	Reason(s) for extension/correction of test report:	NA	
0.6.	Testing Equipment Used		
	Equipment	Equipment Code	Next Calibration Date
	Vbox	108	22.08.2023
	Manometer	127	17.08.2023
	Manometer	128	17.08.2023
	Manometer	129	17.08.2023
	Laser Thermometer	96	04.08.2023
	Tape Measurement	201	30.05.2023
0.7.	Selection of worst case (Selection of versions/variants for testing):		
	The axle type ID1-FD4012 with ID2-400x120 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.		

1. General

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

- 1.1. Axle manufacturer name and address:

ÇAYIROVA OTOMOTİV SANAYİ VE TİCARET A.Ş.
BÜYÜKKAYACIK OSB MAH. 3.NOLU SK. NO:3
SELÇUKLU/KONYA/TÜRKİYE

- 1.1.1. Make of axle manufacturer:



- 1.2. Brake manufacturer name and address:

See item 1.1.

- 1.2.1. Brake identifier ID2-:

400x120

- 1.2.2. Automatic brake adjustment device (~~Integrated~~ or Non-integrated):

Non-integrated

- 1.3. Manufacturer's information document no:

CYR-4012-R13
Dated on 21.10.2022

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:	
2.2.	Test specimen:	Axle with drum brake
	Test variant:	Drum Brake
2.2.1.	Axle code:	See Below
2.2.1.1.	Axle identifier:	ID1-FD4012
2.2.1.2.	Identification of tested axle:	NA
2.2.1.3.	Test axle load (Fe identifier):	ID3- 10497 daN
2.2.2.	Brake:	
2.2.2.1.	Brake identifier:	ID2-400x120
2.2.2.2.	Identification of tested brake:	NA
2.2.2.3.	Maximum stroke capability of the brake :	NA
	<i>Note: Applies to disc brakes only.</i>	
2.2.2.4.	Effective length of the cam shaft:	660 mm
	<i>Note: Applies to drum brakes only.</i>	
2.2.2.5.	Material variation:	NA
	<i>Note: As per paragraph 3.8 (m) of Appendix 2 to this annex.</i>	
2.2.2.6.	Brake (Drum or Disc):	
2.2.2.6.1.	Actual test mass of drum*/disc*:	35,6 kg
	<i>*Strikethrough, as appropriate.</i>	
2.2.2.6.2.	Nominal external diameter of disc:	NA
	<i>Note: Applies to disc brakes only.</i>	
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
	<i>Note: Applies to disc brakes only.</i>	

2.2.2.6.6.	Geometric relationship between disc friction surfaces and disc mounting: <i>Examples: One piece, casted, connection on action side.</i>	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												
2.2.2.7.2.	Make:	EREN												
2.2.2.7.3.	Type:	M71												
2.2.2.7.4.	Method of attachment (Lining or Pad on the brake shoe or Back plate) : <i>*Strikethrough, as appropriate.</i>	Riveted												
2.2.2.7.5.	Thickness of back plate*: Weight of shoes*: Or other describing information (Manufacturer's information document)*: <i>*Strikethrough, as appropriate.</i>	NA 4,2 kg* NA												
2.2.2.7.6.	Base material of Back plate* / Brake shoe*: <i>*Strikethrough, as appropriate.</i>	Steel (St 37)												
2.2.3.	Automatic brake adjustment device <i>*Not applicable in the case of integrated automatic brake adjustment device.</i>													
2.2.3.1.	Manufacturer name and address:	GEÇGEL METAL DÖKÜM MAK. OTO. SAN. TİC. LTD. ŞTİ. Konya Org. San. Bölgesi Büyük Kayacık Mah. Yaylacık Cad. Güneştepe Sok. No:5 Selçuklu / Konya												
2.2.3.2.	Make:	GTS												
2.2.3.3.	Type:	78-772												
2.2.3.4.	Version:	5964												
2.2.4.	Wheel(s) <i>Note: For dimensions, see Figures 1A and 1B in Appendix 5 to this annex.</i>													
2.2.4.1.	Reference tyre rolling radius (R _e) at test axle load (F _e):	555 mm												
2.2.4.2.	Data of the fitted wheel during testing:													
<table><tr><th>Tyre Size</th><th>Rim Size</th><th>X_e (mm)</th><th>D_e (mm)</th><th>E_e (mm)</th><th>G_e (mm)</th></tr><tr><td>445/65 R 22.5</td><td>22.5x14.00</td><td>163</td><td>235</td><td>15</td><td>-40</td></tr></table>			Tyre Size	Rim Size	X _e (mm)	D _e (mm)	E _e (mm)	G _e (mm)	445/65 R 22.5	22.5x14.00	163	235	15	-40
Tyre Size	Rim Size	X _e (mm)	D _e (mm)	E _e (mm)	G _e (mm)									
445/65 R 22.5	22.5x14.00	163	235	15	-40									

- 2.2.5. **Lever length l_e :** 180 mm
- 2.2.6. **Actuator:** See Below
- 2.2.6.1. Manufacturer: ARFESAN A.Ş.
- 2.2.6.2. Make: ARFESAN
- 2.2.6.3. Type: 30"
- 2.2.6.4. (Test) identification number: See Below

2.3. **Test results**

Note: Corrected to take account of rolling resistance of $0.01 \cdot F_e$.

- 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:	3.5.1.4	3.5.2.2/3	3.5.2.4
Test speed (km/h)	40	40	40
Brake actuator pressure p_e (kPa)	650	N/A	650
Braking time (mins)	N/A	2,55	N/A
Braking force developed T_e (daN)	5711,6	734,8	4737,2
Brake efficiency T_e/F_e	0,54	0,07	0,45
Actuator stroke s_e (mm)	55	N/A	60
Brake input torque C_e (Nm)	2235,6	N/A	2235,6
Brake input threshold torque $C_{0,e}$ (Nm)	91,87	N/A	91,87

- 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	N/A	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)	6686,0	3210,0	4940,2
Brake efficiency T_e/F_e	0,64	0,31	0,47
Actuator stroke s_e (mm)	55	N/A	60
Brake input torque C_e (Nm)	2235,6	N/A	2235,6
Brake input threshold torque $C_{0,e}$ (Nm)	91,87	N/A	91,87

- 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 : 8,65

2.3.3.2. Declared threshold torque $C_{0,dec}$: 91,87

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

5. 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. Yes

Note: Only to be completed when an automatic brake wear adjustment device is installed.

4. Annexes

Annex 1 Information documents (acc. to 1.3) 5 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, 09.12.2022

TÜV AUSTRIA AUTOMOTIVE GMBH

- ☐ Benannter Technischer Dienst der National Standards Authority of Ireland (NSAI), Technical Service Number 103
Designated Technical Service by the National Standards Authority of Ireland (NSAI), Technical Service Number 103



Zehra Doğan

Recognized Expert/Signature

 Römork ve Treyler Ekipmanları	TRAILER AXLE & BRAKE INFORMATION DOCUMENT	Date	21.10.2022
		Document Nr.	CYR-4012-R13
	According to ECE R13.11, Annex 11, Appendix 5 ANNEX I	Revision Nr.	00
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1. GENERAL

Name and address of axle or vehicle manufacturer

ÇAYIROVA OTOMOTİV SANAYİ VE TİCARET A.Ş.
KONYA ORGANİZE SANAYİ BÖLGESİ 3. SOKAK
NO:3 SELÇUKLU/KONYA/TÜRKİYE
FD4012
O3&O4

- 1.1. Commercial Description
1.2. Category

2. AXLE DATA

- 2.1. Manufacturer (name and address)

ÇAYIROVA OTOMOTİV SANAYİ VE TİCARET A.Ş.
KONYA ORGANİZE SANAYİ BÖLGESİ 3. SOKAK
NO:3 SELÇUKLU/KONYA/TÜRKİYE

- 2.1.1. Make of axle manufacturer



- 2.2. Type / variant

FD4012

- 2.3. Axle identifier

ID1- **FD4012**

- 2.4. Test axle load (F_e)
2.5. Wheel and brake data according to the following
Figures 1A and 1B

10497 daN

Figure 1A

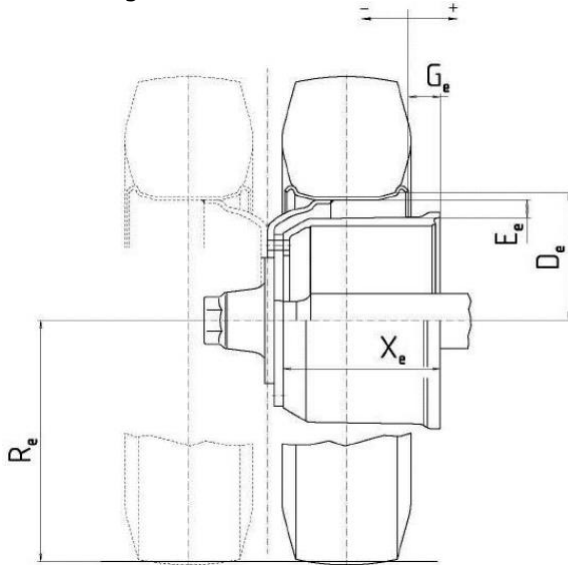
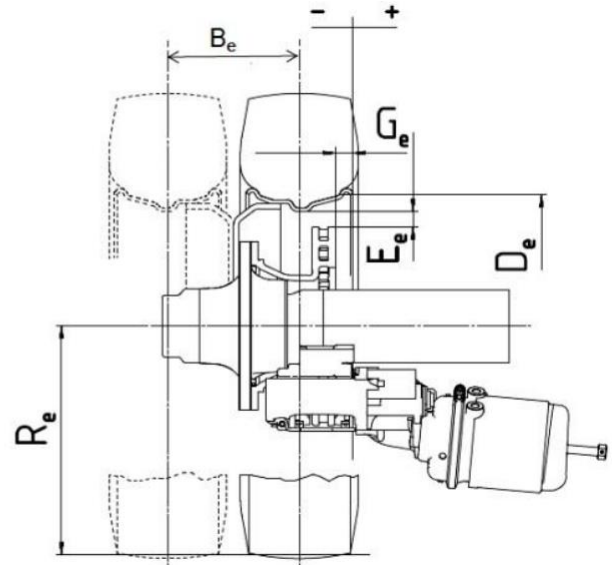


Figure 1B



Tyre	Rim	D_e (mm)	E_e (mm)	G_e (mm)	R_e (mm)	B_e (mm)	X_e (mm)
445/65 R22,5	22,5 X 14,00	235	15	-40	555	--	163

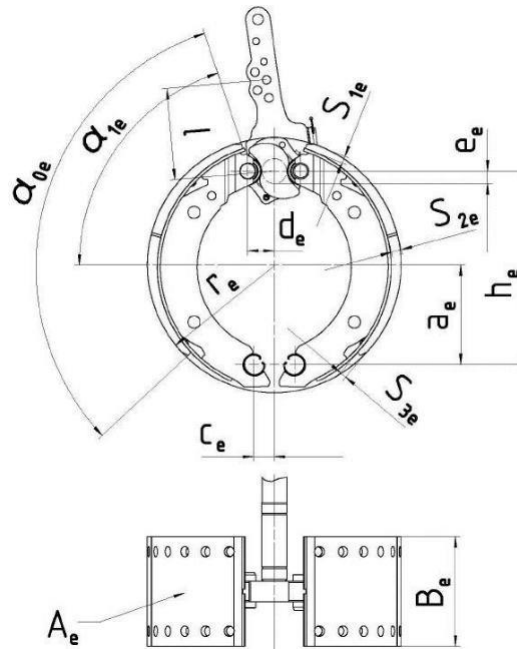
 Römork ve Treylar Ekipmanları	TRAILER AXLE & BRAKE INFORMATION DOCUMENT	Date	21.10.2022
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3. BRAKE

3.1. General Information

- 3.1.1. Name **ÇAYIROVA**
- 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- 400x120**
- 3.1.5. Brake data according to the following
Figures 2A and 2B
- 3.1.6. Brake Factor (Br) **8,65**

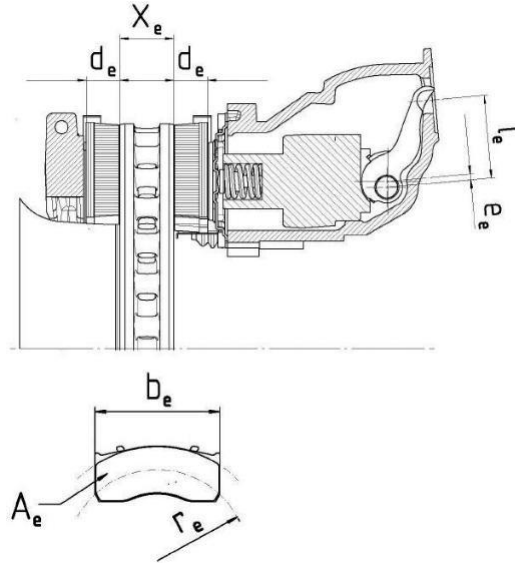
Figure 2A



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)
164	317,3	33,3	44	15	115	72,6	200	209	2x794,5	11,2	17,2	11,2

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Figure 2B



X_e (mm)	d_e (mm)	e_e (mm)	l_e (mm)	b_e (mm)	A_e (cm ²)	r_e (mm)
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3.2. Drum brake data

3.2.1. Brake adjustment device (external/internal)

External

3.2.1.1. Manufacturer (Name and address)

GEÇGEL METAL DÖKÜM MAK. OTO. SAN. TİC.
LTD. ŞTİ.
Konya Org. San. Bölgesi Büyük Kayacık Mah.
Yaylacık Cad. Güneştepe Sok. No:5
Selçuklu / KONYA /TURKEY
GTS

3.2.1.2. Make

3.2.1.3. Type

78-772

3.2.1.4. Version

5964

3.2.2. Declared maximum brake input torque (C_{max})

2950 Nm

3.2.3. Mechanical efficiency ()

0,9

3.2.4. Declared brake input threshold torque ($C_{0,dec}$)

91,87 Nm

3.2.5. Efficiency length of the cam shaft

660 mm

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3.3. *Brake drum*

3.3.1.	Max. diameter of friction surface (wear limit)	418 mm
3.3.2.	Base material	Grey Cast iron
3.3.3.	Declared mass	35,6 kg
3.3.4.	Nominal mass	44 kg
3.3.5.	Permitted range of the brake drum mass	40-45 kg

3.4. *Brake Lining*

3.4.1.	Manufacturer (Name and address)	EREN BALATACILIK SAN.VE TİC A.Ş 13 SOKAK NO:6 KEMALPAŞA ORGANİZE SANAYİ BÖLGESİ KEMALPAŞA/ İZMİR/TURKEY
3.4.2.	Make	EREN
3.4.3.	Type	M71
3.4.4.	Identification (type identification on lining)	M71
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 (St 37)
3.4.6.3.	Range of the weight of the brake shoes (without brake lining)	4,2 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

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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 ()	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.	<i>Brake disc data</i>	
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.	<i>Brake pad data</i>	
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