TÜV AUSTRIA AUTOMOTIVE GMBH
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TECHNICAL REPORT

24-TAMO-0025

Base Part: ID4- 24-TAMO-0025

Suffix: 00

Reference Axle

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

Taking into consideration amendment No. **12** supplement **02**

Annex 11, Appendix 3

0.	**Test Details**	
0.1.	Manufacturer's name and address:	**MUSTAFA CEYLAN ENDÜSTRİ ANONİM ŞİRKETİ** **3.Organize Sanayi 3.Sokak No:7** **SELÇUKLU/KONY/TÜRKİYE**
0.2.	Brief description (Component Specification):	**12 ton Disc Brake Trailer Axle**
0.3.	Submitted test on:	**27.12.2023**
0.4.	Test Location: Test Date:	**KONYA** **27.12.2023-28.12.2023**
0.5.	Reason(s) for ~~extension~~/correction of test report:	**Not Applicable**
0.6.	**Testing Equipment Used**	

Equipment	**Equipment Code**	**Next Calibration Date**
MANOMETER	*127*	*03.08.2024*
MANOMETER	*128*	*03.08.2024*
MANOMETER	*129*	*03.08.2024*
V-BOX	*126*	*13.07.2024*
LASER THERMOMETER	*96*	*03.08.2024*

0.7.	**Selection of worst case (Selection of versions/variants for testing):**
	The axle type ID1- NA-0910-ST/DT with ID2- MCD 3745 brake configuration tested according to regulation. There is also one tyre dimension for testing. For that reason test result 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:	**MUSTAFA CEYLAN ENDÜSTİ ANONİM ŞİRKETİ** **3. Organize Sanayi 3. Sokak No:7** **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-:	MCD 3745
1.2.2.	Automatic brake adjustment device (Integrated or ~~Non-integrated~~):	Integrated
1.3.	Manufacturer's information document no:	NA-0910-ST/DT

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:	24-TAMO-0025
2.2.	Test specimen:	Axle with disc brake
	Test variant:	Floating Caliper
2.2.1.	**Axle code:**	See below
2.2.1.1.	Axle identifier:	ID1- NA-0910-ST/DT
2.2.1.2.	Identification of tested axle:	NA-0910-ST/DT
2.2.1.3.	Test axle load (Fe identifier):	11980 daN
2.2.2.	**Brake:**	
2.2.2.1.	Brake identifier:	ID2- MCD 3745
2.2.2.2.	Identification of tested brake:	MCD 3745
2.2.2.3.	Maximum stroke capability of the brake : *Note: Applies to disc brakes only.*	54 mm
2.2.2.4.	Effective length of the cam shaft: *Note: Applies to drum brakes only.*	N/A
2.2.2.5.	Material variation: *Note: As per paragraph 3.8 (m) of Appendix 2 to this annex.*	N/A
2.2.2.6.	**Brake (Drum or Disc):**	
2.2.2.6.1.	Actual test mass of ~~drum~~*/disc*: **Strikethrough, as appropriate.*	30 kg
2.2.2.6.2.	Nominal external diameter of disc: *Note: Applies to disc brakes only.*	370 mm
2.2.2.6.3.	Type of cooling of the disc: (Ventilated or ~~non-ventilated~~)	Ventilated
2.2.2.6.4.	Integrated hub: (with or ~~without~~)	With
2.2.2.6.5.	Disc with integrated drum: (~~With parking brake function~~ or Without parking brake function) *Note: Applies to disc brakes only.*	Without parking brake function

2.2.2.6.6.	Geometric relationship between disc friction surfaces and disc mounting: *Examples: One piece, casted, connection on action side.*	Single Part
2.2.2.6.7.	Base material:	Grey Cast Iron
2.2.2.7.	**Brake (~~Lining~~ or Pad):**	
2.2.2.7.1.	Manufacturer:	Honeywell Bremsbelag GmbH
2.2.2.7.2.	Make:	Jurid
2.2.2.7.3.	Type:	Jurid 539
2.2.2.7.4.	Method of attachment (~~Lining~~ or Pad on the ~~brake shoe~~ or Back plate) : **Strikethrough, as appropriate.*	Pressed
2.2.2.7.5.	Thickness of back plate*: ~~Weight of shoes*:~~ Or other describing information (Manufacturer's information document)*: **Strikethrough, as appropriate.*	10 mm* -- kg* None
2.2.2.7.6.	Base material of Back plate*/ ~~Brake shoe~~*: **Strikethrough, as appropriate.*	Steel
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:	N/A
2.2.3.2.	Make:	N/A
2.2.3.3.	Type:	N/A
2.2.3.4.	Version:	N/A
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 R 19,5	8,25 x 19,5	--	248	24	-10

2.2.5.	**Lever length le:**	76 mm

2.2.6. **Actuator:**

2.2.6.1. Manufacturer: ARFESAN A.Ş.

2.2.6.2. Make: ARFESAN

2.2.6.3. Type: 16"

2.2.6.4. (Test) identification number: BC 0013.0

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:	3.5.1.4	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)	7533.6	839.1	6419
Brake efficiency T_e/F_e	0.63	0.07	0.54
Actuator stroke s_e (mm)	53.005	N/A	53.005
Brake input torque C_e (Nm)	500.308	N/A	500.308
Brake input threshold torque $C_{0,e}$ (Nm)	26.78	N/A	26.78

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)	6955.6	3666	6130
Brake efficiency T_e/F_e	0.58	0.31	0.51
Actuator stroke s_e (mm)	53.005	N/A	53.005
Brake input torque C_e (Nm)	500.308	N/A	500.308
Brake input threshold torque $C_{0,e}$ (Nm)	26.78	N/A	26.78

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: 31.87

2.3.3.2. Declared threshold torque $C_{0,dec}$: 26.78 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.	N/A
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

Annex 1 Informcation documents (acc. to 1.3) 5 Pages

5. Final Statement

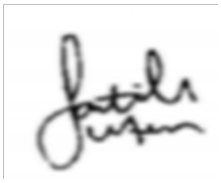
The information document as mentioned under No. 1.3 and the type described therein are in compliance with the test specification mentioned above. The worst case was selected in accordance with document (QAA-TAA-002_Selection process for worst case).

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

Wien / *Vienna*, 17.01.2024

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



Fatih Uzun
Recognized Expert/Signature

Ramazan Tüzün
Recognized Expert/Signature

1. GENERAL

	Name and address of axle or vehicle manufacturer	MUSTAFA CEYLAN ENDÜSTRİ ANONİM ŞİRKETİ 3. Organize Sanayi 3. Sokak No:7 SELÇUKLU/KONYA/TURKEY
1.1.	Commercial Description	12 Ton Disc Brake Trailer Axle
1.2.	Category	O3&O4

2. AXLE DATA

2.1.	Manufacturer (name and address)	MUSTAFA CEYLAN ENDÜSTRİ ANONİM ŞİRKETİ 3. Organize Sanayi 3. Sokak No:7 SELÇUKLU/KONYA/TURKEY
2.1.1.	Make of axle manufacturer	
2.2.	Type / variant	MCD-3745-10T-ST/DT
2.3.	Axle identifier	ID1-NA-0910-ST/DT
2.4.	Test axle load (F_e)	**ID3-11980 daN**
2.5.	Wheel and brake data according to the following Figures 1A and 1B	

Figure 1A

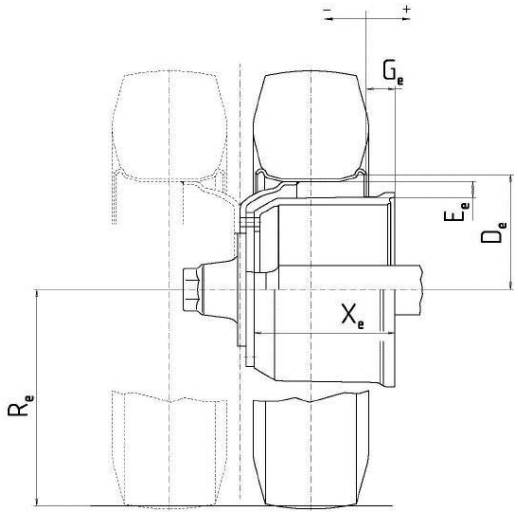
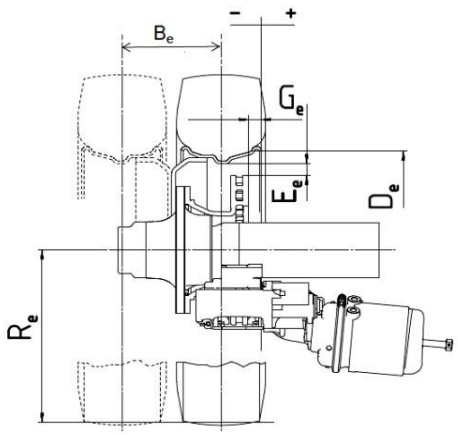


Figure 1B



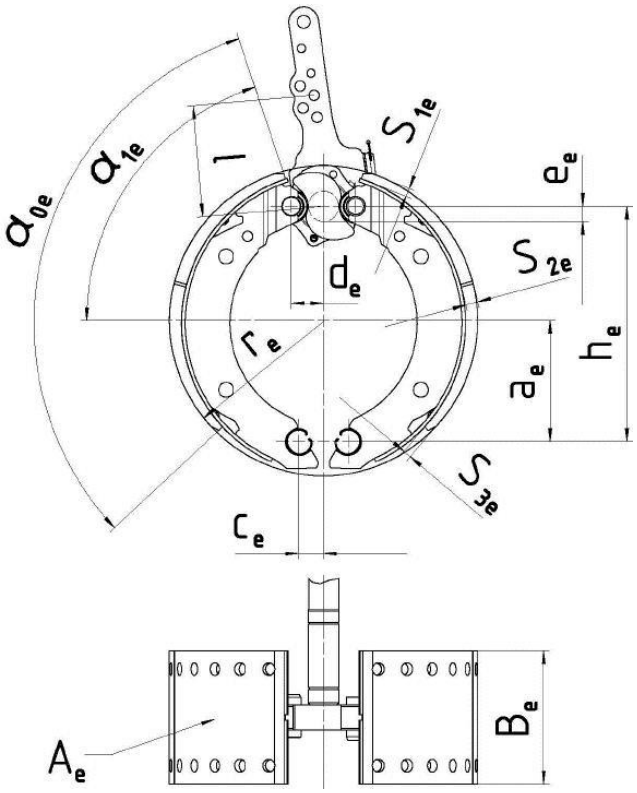
Tyre	Rim	D_e (mm)	E_e (mm)	G_e (mm)	R_e (mm)	B_e (mm)	X_e (mm)
285/70 R19,5	8.25x19,5	248	24	-10	434	--	--

3. BRAKE

3.1. *General Information*

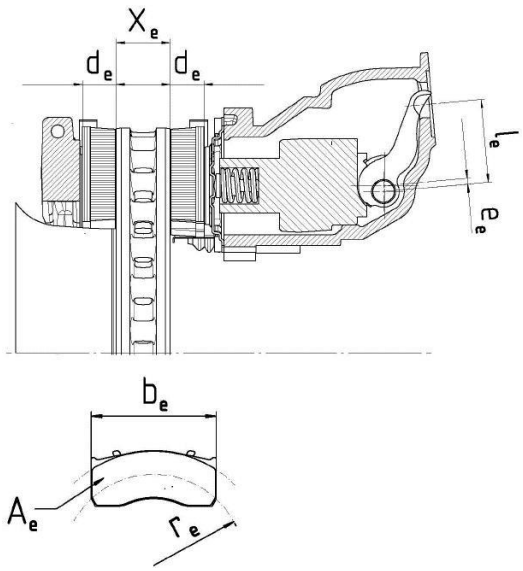
3.1.1.	Name	**MUSTAFA CEYLAN**
3.1.2.	Manufacturer (Name and address)	See item 1.
3.1.3.	Type of brake	Disc Brake
3.1.3.1.	Variant	Floating Caliper
3.1.4.	Brake identifier	ID2- MCD 3745
3.1.5.	Brake data according to the following Figures 2A and 2B	
3.1.6	Brake Factor (B_f)	31,87

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)
-	-	-	-	-	-	-	-	-	-	-	-	-

Figure 2B



X_e (mm)	d_e (mm)	e_e (mm)	l_e (mm)	b_e (mm)	A_e (cm^2)	r_e (mm)
45	30	4,9	76	210,7	2x148	149

3.2. *Drum brake data*

3.2.1.	Brake adjustment device (external/internal)	N/A
3.2.1.1.	Manufacturer (Name and address)	N/A
3.2.1.2.	Make	N/A
3.2.1.3.	Type	N/A
3.2.1.4.	Version	N/A
3.2.2.	Declared maximum brake input torque (C_{max})	N/A
3.2.3.	Mechanical efficiency (η)	N/A
3.2.4.	Declared brake input threshold torque ($C_{0,dec}$)	N/A
3.2.5.	Efficiency length of the cam shaft	N/A

3.3.	*Brake drum*	
3.3.1.	Max. diameter of friction surface (wear limit)	N/A
3.3.2.	Base material	N/A
3.3.3.	Declared mass	N/A
3.3.4.	Nominal mass	N/A
3.3.5.	Permitted range of the brake drum mass	N/A
3.4.	*Brake Lining*	
3.4.1.	Manufacturer (Name and address)	N/A
3.4.2.	Make	N/A
3.4.3.	Type	N/A
3.4.4.	Identification (type identification on lining)	N/A
3.4.5.	Minimum thickness (wear limit)	N/A
3.4.6.	Method of attaching friction material to brake shoe	N/A
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	N/A
3.4.6.3.	Range of the weight of the brake shoes (without brake lining)	N/A
3.5.	*Disk brake data*	
3.5.1.	Connection type to the axle (axial, radial, integrated etc.)	integrated
3.5.2.	Brake adjustment device (external / integrated)	integrated
3.5.3.	Max. actuation stroke	54 mm
3.5.4.	Declared maximum input force (Th_{Amax})	900 daN
3.5.4.1.	Declared maximum brake input torque (C_{max}) $C_{max} = Th_{Amax} * l_e$	700 Nm
3.5.5.	Friction radius (r_e)	149 mm
3.5.6.	Lever length (l_e)	76 mm

3.5.7.	Input/output ratio (i) (l_e/e_e)	15,5
3.5.8.	Mechanical efficiency (η)	0,99
3.5.9.	Declared brake input threshold force ($Th_{A0,dec}$)	176,15 N
3.5.9.1.	$C_{0,dec} = Th_{A0,dec} * l_e$	26,78 Nm
3.5.10.	Minimum rotor thickness (wear limit)	37 mm
3.6.	*Brake disc data*	
3.6.1.	Disc type description	Ventilated flange disc
3.6.2.	Connection/mounting to the hub	Fixed by screw
3.6.3.	Ventilation (yes/no)	Yes
3.6.4.	Declared mass	30-35 kg
3.6.5.	Nominal mass	30 kg
3.6.6.	Declared external diameter	377 mm
3.6.7.	Minimum external diameter	375 mm
3.6.8.	Inner diameter of friction ring	216 mm
3.6.9.	Width of ventilation channel (if appl.)	12 mm
3.6.10.	Base material	Grey Cast iron
3.7.	*Brake pad data*	
3.7.1.	Manufacturer and address	Honeywell Bremsbelaag GmbH
3.7.2	Make	Jurid
3.7.3.	Type	Jurid 539
3.7.4.	Identification (type identification on pad back plate)	Jurid 539 FF 39
3.7.5.	Minimum thickness (wear limit)	10 mm
3.7.6.	Method of attaching friction material to pad back plate	Pressed on back plate
3.7.6.1.	Worst case of attachment (in case of more than one)	N/A