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2024-06-23

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PRASA PROJECT




SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION



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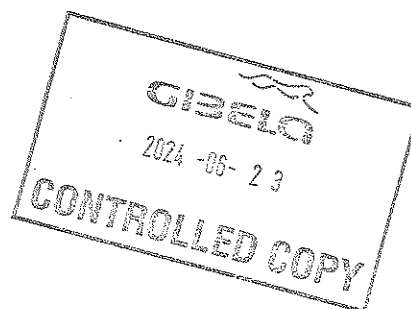
APPLICATION REFERENCE

MOUNTING	DESCRIPTION	STATION	CAR TYPE						WORK INSTRUCTION	SAFETY ? 
			TC1	M4	M1	M2	M3	TC2		
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140		1	1	1	1	PRA.FT1140.04	YES
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1					PRA.FT1140.05	YES
<input type="checkbox"/>	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
<input type="checkbox"/>	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
<input type="checkbox"/>										
<input type="checkbox"/>										
<input type="checkbox"/>										

REV	DATE	MODIFICATION CONTENT	RESPONSIBLE	NAME	DATE
7	2/11/2020	UPDATE OF AIR TIGHTNESS TEST TIME FROM 4 MIN TO 5 MIN. ADD PANTOGRAPH AIR TIGHTNESS.	APPROVER	GIVEN SILOWA	2/11/2020
			CHECKER	SIMON MOKOENA	2/11/2020
			COMPILER	COMFORT MALATJI	2/11/2020
8	9/13/2021	ADDING GAUGE MEASUREMENT CHECK ON THE SI.	APPROVER	MAKOFANE LUCY	9/13/2021
			CHECKER	RATAU EDISON	9/13/2021
			COMPILER	TSAKANI KHOSA	9/13/2021
9	5/31/2022	pressure valve (APV) Isolation	APPROVER	MAKHURUPETJI THABANG	5/31/2022
			CHECKER	HAZEL MGIBA	5/31/2022
			COMPILER	RATAU EDISON	5/31/2021

TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS 231	TC2	Andrew	23/06/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Project: PRASA	SI.FT1140.52					
			Date: 5/31/2022							
Car:		NCR:		Work Station FT1140						
 Safety Related										
1 - Document and Instrument Control										
1.1 - Documents control										
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	CR	Signature/Date
PRA.FT1140.04						✓			✓	Dagut 23/06/24
PRA.FT1140.05										
PRA.FT1140.05										
1.2 - Instruments Control - Monitoring and Measuring Instrument Control (Used for all instrument with calibration needed)										
Instruments description	Serial number		Calibration or Verification Validation Date		CR	Signature/Date				
Torque Wrench 320 N.m	A9650027		21/12/23 - 21/12/24		✓	Dagut 23/06/24				
Torque Wrench 530 N.m	A9630053		21/12/23 - 21/12/24		✓	Dagut 23/06/24				
Torque wrench 150 N.m	B8721822		19/12/23 - 19/12/24		✓	Dagut 23/06/24				
Torque wrench 17 N.m	A2861617		19/12/23 - 19/12/24		✓	Dagut 23/06/24				
Torque wrench 35 N.m	D2511023		19/12/23 - 19/12/24		✓	Dagut 23/06/24				
Measuring tape	GIBTA 0276		26/10/22 - 26/10/24		✓	Dagut 23/06/24				
Vernier Caliper	GIBPR 0056		27/02/24 - 27/02/25		✓	Dagut 23/06/24				





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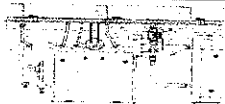

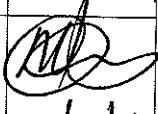












5/31/2022

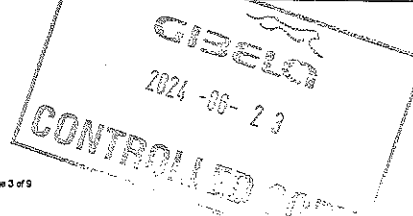
Project:
PRASA

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II - Self Inspection - Items to Check

II.1 - Items to Check

IL1 - Items to Check																
Item	Picture/Sketch	Description	Criteria/Record	OK	Not OK	Signature/Date										
01		Ensure that the average pressure valve (APV) is isolated by capping the two input pipes at the fittings installing the blanking fitting on the pipes highlighted		✓		 22/06/24										
02		Check underframe pipe system Air tightness. Test performance according to WI PRA.FT1130.15.	The test was performed and no leak was observed. Initial pressure (IP): 10.00 bar Final pressure (FP): 9.93 bar FP - IP = 0.07 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓		 22/06/24										
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		23/06/24 										
04		Measurement inspection was done with car on condition AWO and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration Validation Date <u>19/12/23</u>	✓		23/06/24 										
05		In case of the equipments not installed, equivalent weight of the item should be added in the same place to simulate the equipment. (Any simulated weight, add on pending list)	<table><tr><th>EQUIPMENT DESCRIPTION</th><th>WEIGHT (kg)</th></tr><tr><td>DRIVER'S SEAT</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	DRIVER'S SEAT	60							✓		 23/06/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)															
DRIVER'S SEAT	60															
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0,3 bar.		✓		 23/06/24										
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		23/06/24 										
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 23/06/24										





SELF INSPECTION INDUSTRIAL QUALITY

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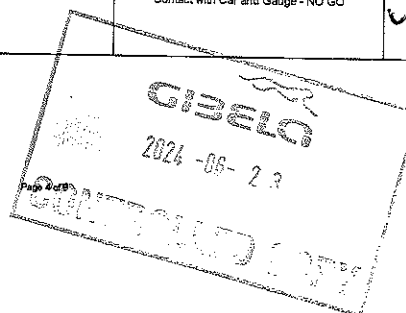
Date:

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Item	Picture/Sketch	Description	Criteria/Record	OK	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓	 23/06/24
10		The difference of weight between the left and right wheels of each axis, must be $\leq 4\%$. (Verify on the T&C equipment if all arrows are in green).		✓	 23/06/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	 23/06/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I 0 II 0 III 0 IV 0	✓	 23/06/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	 23/06/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm(+5/-10mm) (Using levelled rail)	TC CAB #1= 895 mm	✓	 23/06/24
15		FOR TC CARS Height of Eurabalse Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= 196 mm	✓	 23/06/24
16		Check pantograph piping air tightness. Test performance according to WI PRA.FT1140.17.	The test was performed and no leak was observed. -Roof piping connection fittings. -Room piping connection fittings(Roof arch and door trimring)	✓	 M/A
17		Pantograph does not come in contact with the higher height gauge when passing through.	No Contact with Pantograph and Gauge -GO Contact with Pantograph and Gauge - NO GO	✓	 M/A
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓	 23/06/24





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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

DESCRIPTION	TOLERANCE	END#1												END#2											
		LEFT SIDE						RIGHT SIDE						LEFT SIDE						RIGHT SIDE					
AIR SPRING HEIGHT (EMPTY)	N/A	A'i												A'iv											
AIR SPRING HEIGHT (FULL)	min 254 max 261	A'ii						260	252	251	258			A'iv											
FLOOR COVERING HEIGHT	min 1096 max 1116	E'ii												E'iv											
AIR SPRING PRESSURE	≤ 0.3 (Ci - Ci)	C'ii						3,51	3,60					C'iv											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3												D7											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4												D8											
PIVOT VERTICAL GAP	min 25 max 32	K'ii												K'iv											
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Ji - Ji)	J'ii												J'iv											
QTY OF TURNS OF LEVELLING ROD	N/A	X'ii						1 1/2	1 1/2	1 1/2	1 1/2			X'iv											
SHIMS OF ANTI-ROLL BAR	N/A	Y'ii												Y'iv											
AIR SPRING HEIGHT (EMPTY)	N/A	A'iii												A'iv											
AIR SPRING HEIGHT (FULL)	min 254 max 261	A'iii						257	257	256	257			A'iv											
FLOOR COVERING HEIGHT	min 1096 max 1116	E'iii												E'iv											
AIR SPRING PRESSURE	≤ 0.3 (Civ - Cii)	C'iii						2,88	2,74					C'iv											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5												D7											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6												D8											
PIVOT VERTICAL GAP	min 25 max 32	K'iii												K'iv											
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Jiv - Jii)	J'iii												J'iv											
QTY OF TURNS OF LEVELLING ROD	N/A	X'iii						0	0	1 1/2	0			X'iv											
SHIMS OF ANTI-ROLL BAR	N/A	Y'iii												Y'iv											

COMPARE EACH TENTATIVE WITH
THE TOLERANCE AND IDENTIFY
EACH MEASURE AS BELOW

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT
COMPENSATION

EQUIPMENT

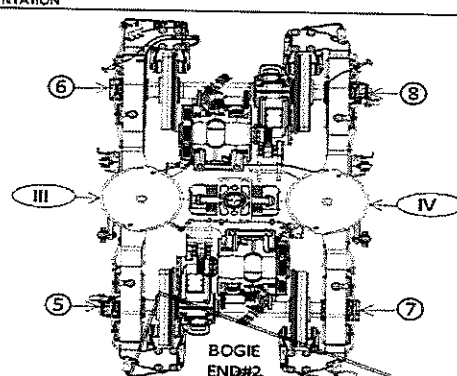
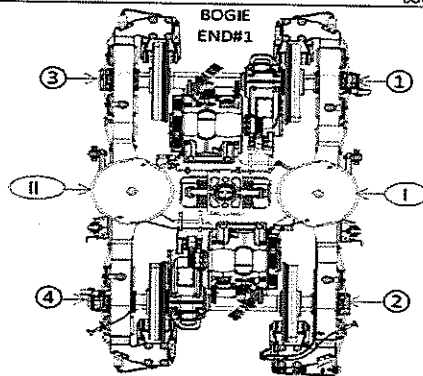
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TO CARS)AUTOMATIC COUPLER
HEIGHT

ANTENNA HEIGHT

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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

		END#1													
		LEFT SIDE						RIGHT SIDE							
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6		
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{II}												A ^I	
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{II}												A ^I	
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}												E ^I	
AIR SPRING PRESSURE	≤ 0.3 (C _I - C _I)	C ^{II}												C ^I	
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₅												D ₁	
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₄												D ₂	
PIVOT VERTICAL GAP	min 25 max 32	K ^{II}												K ^I	
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _I - J _I)	J ^{II}												J ^I	
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}												X ^I	
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{II}												Y ^I	
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6		
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{III}												A ^{IV}	
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{III}												A ^{IV}	
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}												E ^{IV}	
AIR SPRING PRESSURE	≤ 0.3 (C _{IV} - C _{III})	C ^{III}												C ^{IV}	
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₅												D ₇	
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₆												D ₈	
PIVOT VERTICAL GAP	min 25 max 32	K ^{III}												K ^{IV}	
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _{IV} - J _{III})	J ^{III}												J ^{IV}	
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{III}												X ^{IV}	
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{III}												Y ^{IV}	

COMPARE EACH TENTATIVE WITH THE TOLERANCE AND IDENTIFY EACH MEASURE AS BELOW

GOOD LOWER HIGHER

WEIGHT
COMPENSATION

EQUIPMENT

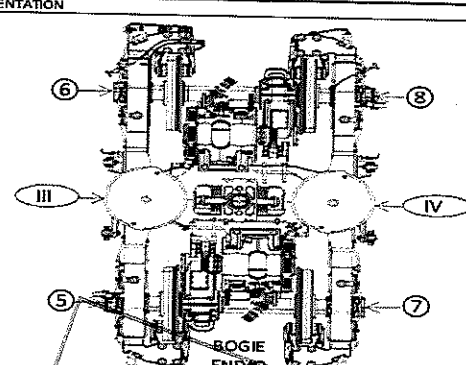
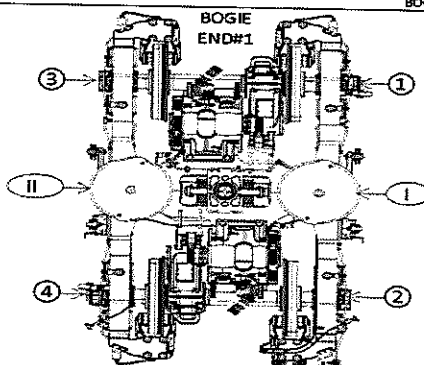
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TO CARS)AUTOMATIC COUPLER
HEIGHT

ANTENNA HEIGHT



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Rev:09

Date:

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Projet:
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SI.FT1140.52

Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES														TOL CAR	
		TOL CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		TOL CAR					
		TBext	TBint	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2	TBint	TBext				
Pivot lateral stop gaps difference [mm]	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	
Air Spring height [mm]	Fig. 5	255 ⁺⁸ ₋₃	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	255 ⁺⁸ ₋₁	
Air spring pressure at AWO [Bar]	Fig. 5	3,76 [Ref.]	2,82 [Ref.]	2,83 [Ref.]	2,91 [Ref.]	3,02 [Ref.]	2,91 [Ref.]	3,07 [Ref.]	2,85 [Ref.]	2,83 [Ref.]	2,83 [Ref.]	2,87 [Ref.]	2,83 [Ref.]	2,83 [Ref.]	3,76 [Ref.]	3,76 [Ref.]	
Primary Suspension gaps difference [mm]	C ₁ -C ₄	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	0,3 Máx.	
	C ₅ -C ₈																
	D ₁ ; D ₅	35 ⁺¹⁰ ₋₅	35 ⁺¹² ₋₄	35 ⁺¹² ₋₃	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	
	D ₂ ; D ₄																
	D ₃ ; D ₇																
Carbody Floor height [mm]	D ₄ ; D ₈																
	E ₁ -E ₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	1106 ⁺¹⁰ ₋₁₀	
Booster height [mm]	Fig. 7	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	850 ⁺³ ₋₇	
Coupling End height [mm]	Fig. 8	895 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	895 [Ref.]	895 [Ref.]	
	Fig. 9	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	760 [Ref.]	
Pivot Vertical gap [mm]	Fig. 10	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	

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Leveling report from Production (Final measurements after Levelling and Weighing fine)

References for secondary suspension empty

A'n Air spring height empty

References for secondary suspension full

An Air spring height

Bn Difference between measurement A'n and An

En Floor covering height

Cn Air spring pressure

Dn Primary suspension

Kn Pivot Vertical gap

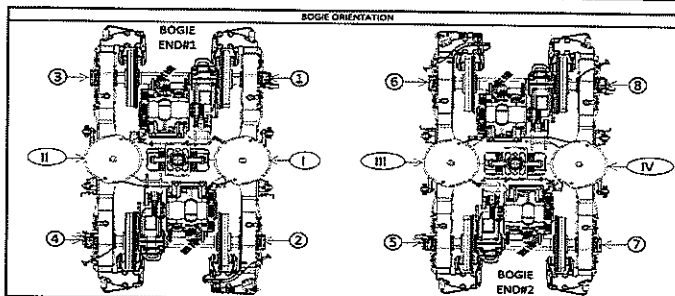
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 234	A'v 235	A'iv 240	A'v 241
An	254 to 261	Ai 256	Av 258	Av 256	Av 257
Bn = An - A'n	N/A	Bi 22	Bv 23	Bv 16	Bv 16
En	1106 ±10 mm	Ei 1108	Ei 1109	Ei 1107	Ei 1110
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3.63	Cv 3.61	Cv 2.87	Cv 2.78
Cn - Cn	Difference ≤ 0,3	Ci - Cv 0,02		Cv - Cv 0,09	
Gauge serial number	N/A	91805873	91805873	91805873	91805873
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 42.25	D2 43.09	D2 43.21	D2 43.72
		D2 42.61	D4 42.96	D2 42.66	D2 45.01
Kn	25 to 45	K1 28.55		K1 36.17	
Jn=J1-J2+1	Difference ≤ 4	Ji 25.33	Ji 25.45	Ji 25.56	Ji 25.14

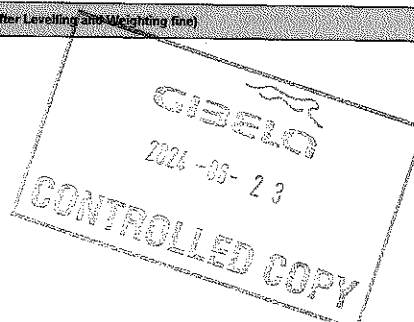
(*) Reference, only include values, isn't approval criteria.

Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	Tbin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
D=	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅

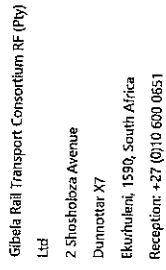
Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	Tbin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
C=	3.76	2.82	2.87	2.83	3.02	2.91	3.07	2.85	2.83	2.87	2.83	3.76



Weighing report from Test and Commissioning (Final measurements after Levelling and Weighing fine)



[illegible]



	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance $\leq 10\%$
TC2	18.45	15.54	8.56%	PASS
	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria Min-DiffMax
	33.99	34.42	1.26%	1.62% PASS

[illegible]