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2024 -03- 1 6

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PRASA PROJECT



SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION

This document and the information contemplated therein have to be considered as Confidential Information pursuant to the provisions of Clause 25 of the MSA, and treated as such.

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			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 214	M3	Andrew	18/03/24	SI.FT1140.52	01/08



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projet:
PRASA

SI.FT1140.52

Car:

NCR:



Safety Related

Work Station

FT1140

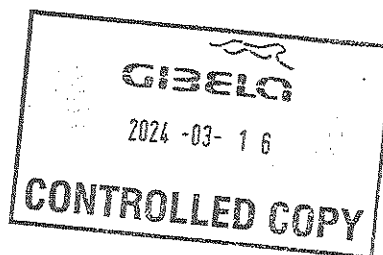
I - Document and Instrument Control

I.1 - Documents control

Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	OK	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05											
PRA.FT1140.05											

I.2 - Instruments Control - Monitoring and Measuring Instrument Control (Used for all instrument with calibration needed)

Instruments description	Serial number	Calibration or Verification Validation Date	OK	OK	Signature/Date
Measuring tape	GIBTA 028	23/11/23 - 23/11/24	✓		18/03/24
Vernier Caliper	GIBVR 0050	21/11/23 - 21/11/24	✓		18/03/24
Torque Wrench 330 N.m	A9630053	21/03/23 - 21/03/24	✓		18/03/24
Torque Wrench 150 N.m	B7217566	01/03/23 - 01/03/24	✓		18/03/24
Torque Wrench 35 N.m	D2511023	07/03/23 - 01/03/24	✓		18/03/24





SELF INSPECTION INDUSTRIAL QUALITY

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II - Self Inspection - Items to Check

II.1 - Items to Check

11.1 - Items to Check														
Item	Picture/Sketch	Description	Criteria/Record	OK	ADJ	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		✓		 18/03/24								
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): 2.27 bar Final pressure (FP): 2.26 bar FP - IP = 0.01 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓		 18/03/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 18/03/24								
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 19/12/2023	✓		 18/03/24								
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>SANGUARY</td><td>760</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	SANGUARY	760					✓		 18/03/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)													
SANGUARY	760													
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 18/03/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 18/03/24								
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 18/03/24								

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2022/05/31

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Item	Photo/Check	Description	Criteria/Record	OK	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓	 15/03/24
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).		✓	 15/03/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	 15/03/24
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	✓	 18/03/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	 18/03/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 695mm (+/-10mm) (Using levelled rail)	TC CAB #1= _____ mm		N/A
15		FOR TC CARS Height of Eurobalise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= _____ mm		N/A
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 trimming)		N/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		N/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	✓	 18/03/24

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

DESCRIPTION	TOLERANCE	LEFT SIDE						RIGHT SIDE					
		6	5	4	3	2	1	1	2	3	4	5	6
AIR SPRING HEIGHT (EMPTY)	N/A	A'i											A'i
AIR SPRING HEIGHT (FULL)	min 254 max 261	Aii	256	255	255	255	254	249	252	255	254	255	Aii
FLOOR COVERING HEIGHT	min 1096 max 1116	Eii											Eii
AIR SPRING PRESSURE	≤ 0.3 (Ci - Ci)	Cii	2,6	2,63	2,74	2,78	2,87	2,52	2,62	2,71	2,81	2,78	Cii
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3											D3
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4											D4
PIVOT VERTICAL GAP	min 25 max 32	Kii											Kii
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Ji - Ji)	Jii											Jii
QTY OF TURNS OF LEVELLING ROD	N/A	Xii	2 1/4	0	0	0	1/4	1 1/4	0	3/4	0	0	Xii
SHIMS OF ANTI-ROLL BAR	N/A	Yii											Yii
AIR SPRING HEIGHT (EMPTY)	N/A	A'iii											A'iii
AIR SPRING HEIGHT (FULL)	min 254 max 261	A'iiii	253	255	250	246	244	249	251	255	255	256	A'iiii
FLOOR COVERING HEIGHT	min 1096 max 1116	E'iii											E'iii
AIR SPRING PRESSURE	≤ 0.3 (Civ - Civ)	C'iii	2,80	2,94	2,77	2,62	2,50	2,85	2,78	2,74	2,65	2,70	C'iii
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5											D5
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6											D6
PIVOT VERTICAL GAP	min 25 max 32	K'iii											K'iii
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Jiv - Jiv)	J'iii											J'iii
QTY OF TURNS OF LEVELLING ROD	N/A	X'iii	0	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	0	3/4	0	X'iii
SHIMS OF ANTI-ROLL BAR	N/A	Y'iii											Y'iii

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

EQUIPMENT

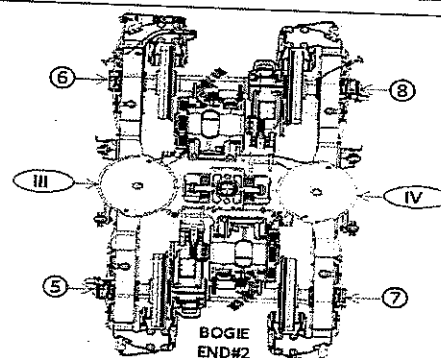
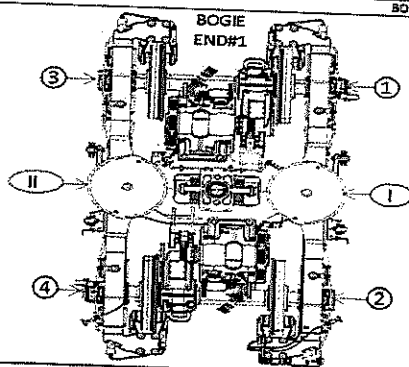
WEIGHT

SECONDARY MEASUREMENTS (ONLY TC CARS)

AUTOMATIC COUPLER

HEIGHT

ANTENNA HEIGHT



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

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

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT
COMPENSATION

EQUIPMENT

WEIGHT

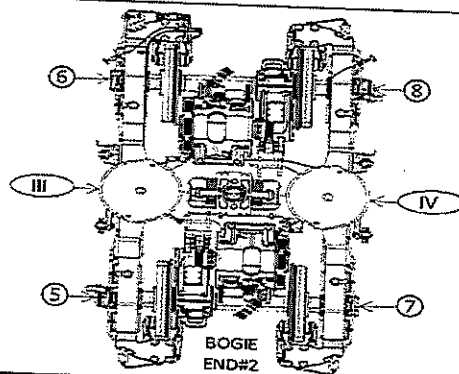
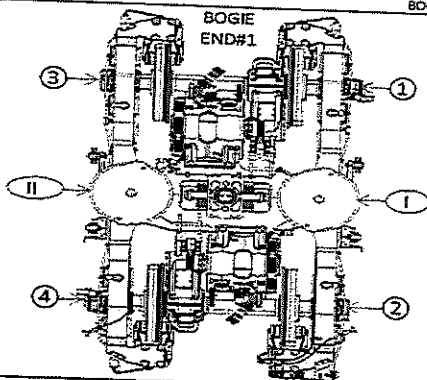
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TO CARS)

AUTOMATIC COUPLER

HEIGHT



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

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT

COMPENSATION

EQUIPMENT

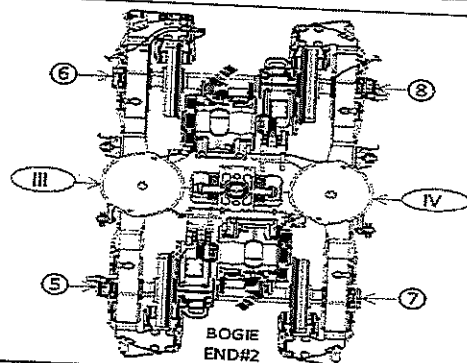
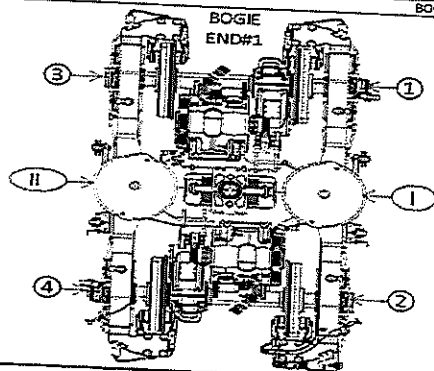
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TO CARS)AUTOMATIC COUPLER
HEIGHT

ANTENNA HEIGHT



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

ITEM		THEORETICAL VALUES													
		TOL CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		TOL CAR			
		TBext	TBint	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2	TBint	TBext		
Photo lateral stop gaps difference (mm)	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4		
Air Spring height (mm)	Fig. 5	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁		
Air spring pressure at AW0 (Bar)	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,87 (Ref.)	2,91 (Ref.)	3,02 (Ref.)	2,83 (Ref.)	2,85 (Ref.)	3,07 (Ref.)	2,83 (Ref.)	2,87 (Ref.)	2,83 (Ref.)	2,87 (Ref.)		
Primary Suspension gaps (mm)	Fig. 6	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.		
Carbody Floor height (mm)	Fig. 7	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		
Bolster 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		
Coupling End height (mm)	Fig. 8 Fig. 9	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)		
Photo Vertical gap (mm)	Fig. 10	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃		



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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	241	A'ii	241	A'iii	238	A'iv	239
An	254 to 261	Ai	257	Aii	258	Aiii	256	Aiv	258
Bn = An - A'n	N/A	Bi	16	Bii	17	Biii	18	Biv	19
En	1106 ±10 mm	Ei	1112	Eii	1111	Eiii	1109	Eiv	1110
Item	Reference [bar]	END#1				END#2			
		Right Side		Left Side		Left Side		Right Side	
Cn	Table 02 (*)	Ci	2,77	Cii	2,69	Ciii	2,77	Civ	2,69
Cn - Cn+i	Difference ≤ 0,3	Ci - Cii 0,08				Ciii - Civ 0,08			
Gauge serial number	N/A	GIB05875				GIB05875			
Item	Reference [mm]	END#1				END#2			
		Right Side		Left Side		Left Side		Right Side	
Dn	Table 01 (*)	Di	46,40	Di	46,41	Di	45,80	Di	46,62
		Dz	46,77	Dz	46,87	Dz	45,60	Dz	46,80
Kn	25 to 45	Ki	35,08				Kii	35,95	
Jn	Difference ≤ 4	Ji	24,49	Jii	25,35	Jiii	25,80	Jiv	25,08

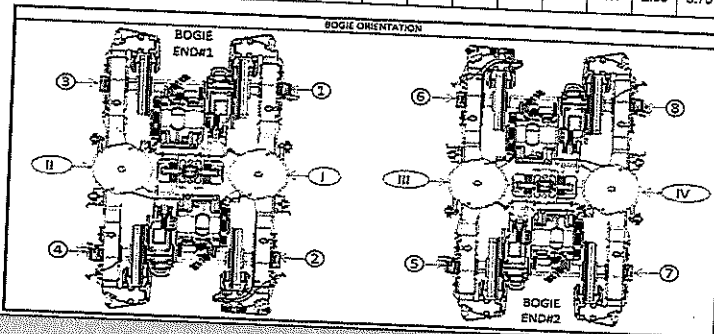
(*) Reference, only include values, isn't approval criteria.

Table 01
D Theoretical Values

	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	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	

Table 02
C Theoretical Values

	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	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

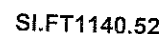


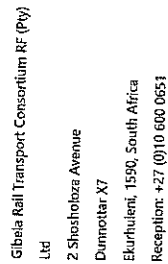
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Weighing report from Test and Commissioning (Final measurements after Levelling and Weighing fine)

Quality Manager / Team Leader



PC09 WEIGHING REPORT

Test Participants				Date
Name	Company	Department	Signature	
L. S.	GIBELA	EOC	[Signature]	18/03/24