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2024-06-28

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PRASA PROJECT



SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION



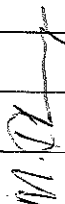
This document and the information contemplated therein have to be considered as Confidential Information pursuant to the provisions of Clause 25 of the MSA, and treated as such.

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	X	1		PRA.FT1140.04	YES	
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	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"/>	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 232	M2	Goodness	28/06/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY		Rev:09 Date: 5/31/2022	Project: PRASA	SI.FT1140.52						
	Car:		NCR:		Work Station FT1140						
<div style="display: flex; align-items: center; justify-content: center;">  Safety Related </div>											
I - Document and Instrument Control											
I.1 - Documents control											
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	NOK	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05		✓							✓		M.C. 28/06/24
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	NOK	Signature/Date				
Measuring Tape	GIBTA 0276		26/10/23-26/10/24		✓						
Vernier calliper	GIBRE 0056		06/06/23-06/06/24		✓						
Torque wrench 35 Nm	D2511023		19/12/23-19/12/24		✓						
Torque wrench 150 Nm	D28622609		19/12/23-19/12/24		✓		 28/06/24				
Torque wrench 320 Nm	A9680027		21/12/23-21/12/24		✓						





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

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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		<input checked="" type="checkbox"/>	<input type="checkbox"/>	 27/06/24								
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) 12.6 bar Final pressure (FP) 9.96 bar FP - IP = 2.64 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	<input checked="" type="checkbox"/>	<input type="checkbox"/>	 27/06/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24								
04		Measurement inspection was done with car on condition AW0 and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration Validation Date 19/12/24	<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24								
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><thead><tr><th>EQUIPMENT DESCRIPTION</th><th>WEIGHT (kg)</th></tr></thead><tbody><tr><td>GATEWAY</td><td>360</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	GATEWAY	360					<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)													
GATEWAY	360													
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24								
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		<input checked="" type="checkbox"/>	<input type="checkbox"/>	 28/06/24								

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Item	Picture/Sketch	Description	Criteria/Record	OK	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		✓	MCL 28/06/24
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).		✓	MCL 28/06/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	MCL 28/06/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I II III IV	✓	MCL 28/06/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	MCL 28/06/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5 / -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. -Roof piping connection fittings(Roof arch and door trimming)	✓	MCL 29/06/24
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	✓	29/06/24
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓	29/06/24

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

		END#1												
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	AII					260 252	259 258						AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII												EI
AIR SPRING PRESSURE	≤ 0.3 (Ci - Qi)	CII					2.909	3.01						CI
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3												D1
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4												D2
PIVOT VERTICAL GAP	min 25 max 32	KII												KI
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Ji - Ji)	JII												Ji
QTY OF TURNS OF LEVELLING ROD	N/A	XII					12	1 1/2						Xi
SHIMS OF ANTI-ROLL BAR	N/A	YII												Yi
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	AIII					255 252	256 256						AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII												EIV
AIR SPRING PRESSURE	≤ 0.3 (Ov - Qv)	CIII					2.86	2.59						CIV
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5												D7
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6												D8
PIVOT VERTICAL GAP	min 25 max 32	KIII												KIV
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Jv - Jv)	JIII												JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII					11	1 1/2						XIV
SHIMS OF ANTI-ROLL BAR	N/A	YIII												YIV

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

EQUIPMENT

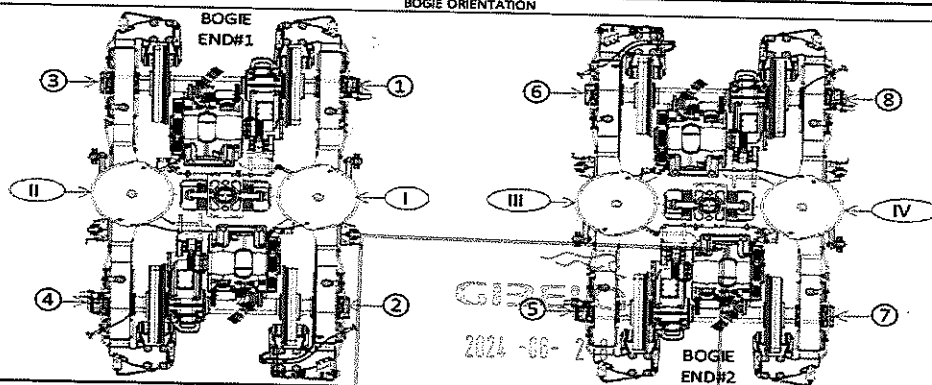
WEIGHT

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	END#1												END#2											
		LEFT SIDE						RIGHT SIDE						LEFT SIDE						RIGHT SIDE					
AIR SPRING HEIGHT (EMPTY)	N/A	A'II																							A'I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AI																							AI
FLOOR COVERING HEIGHT	min 1096 max 1136	EII																							EI
AIR SPRING PRESSURE	≤ 0.3 (Ci - Ci)	CII																							CI
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3																							D1
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4																							D2
PIVOT VERTICAL GAP	min 25 max 32	KI																							KI
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Xi - Xj)	JII																							Ji
QTY OF TURNS OF LEVELLING ROD	N/A	XII																							Xi
SHIMS OF ANTI-ROLL BAR	N/A	YII																							Yi
AIR SPRING HEIGHT (EMPTY)	N/A	A'III																							A'IV
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII																							AIV
FLOOR COVERING HEIGHT	min 1096 max 1136	EIII																							EIV
AIR SPRING PRESSURE	≤ 0.3 (CiV - Ci)	CIII																							CIV
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5																							D7
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6																							D8
PIVOT VERTICAL GAP	min 25 max 32	KIII																							KIV
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (XiV - Xj)	JIII																							JiV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII																							XiV
SHIMS OF ANTI-ROLL BAR	N/A	YIII																							YiV

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

GOOD LOWER HIGHER



WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

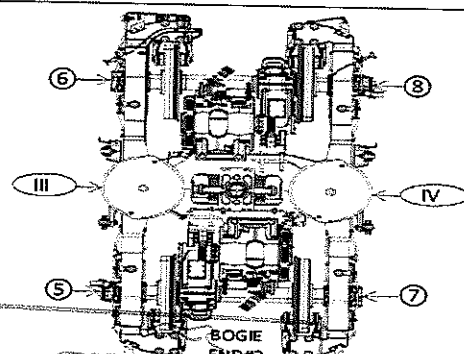
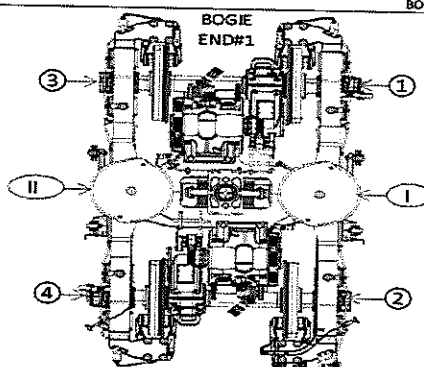
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TC CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



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

ITEM		THEORETICAL VALUES											
		TCL CAR		M4 CAR		M3 CAR		M2 CAR		M1 CAR		M3 CAR	
		TBext	TBint	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2
Pivot lateral stop gaps difference [mm]	Jn-Jn+1 (1+0)	Fig. 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Air Spring height [mm]	A _n (1+0)	Fig. 5	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁	255 ⁺⁴ ₋₁
Air spring pressure at AWD [Bar]	C _n (1+0)	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,83 (Ref.)	3,02 (Ref.)	2,91 (Ref.)	3,07 (Ref.)	2,85 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	2,83 (Ref.)
Primary Suspension gaps [mm]	C ₁ - C ₄	Fig. 5	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.
	D ₁ /D ₂	Fig. 6	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 ₃ /D ₄	Fig. 6	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 ₅ /D ₆	Fig. 6	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 ₇ /D ₈	Fig. 6	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
Carbody Floor height [mm]	E _n (1+0)	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
Bolster height [mm]	N _n (1+0)	Fig. 7	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇	850 ⁺⁵ ₋₇
Coupling End height [mm]	F ₁	Fig. 8	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)
	F ₂	Fig. 9	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]	K _n	Fig. 10	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃





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Leveling report from Production (Final measurements after Leveling and Weighting 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

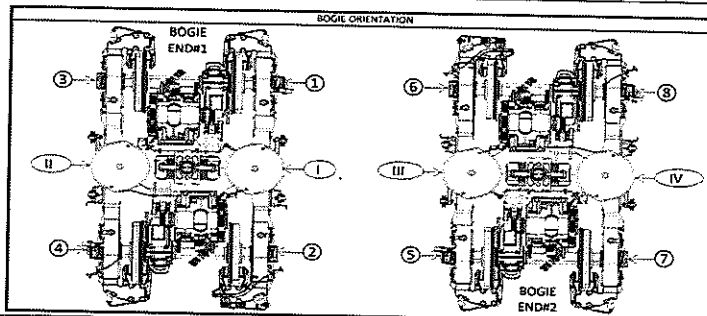
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 240	A'ii 240	A'iii 243	A'iv 242
An	254 to 261	Ai 258	Aii 258	Aiii 256	Aiv 258
Bn = An - A'n	N/A	Bi 18	Bii 18	Biii 13	Biv 16
En	1106 ±10 mm	Ei 1114	Eii 1115	Eiii 1101	Eiv 1109
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2.90	Cii 3.01	Ciii 2.75	Civ 2.73
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0.11		Ciii - Civ 0.02	
Gauge serial number	N/A	G1B05873	G1B05873	G1B05873	G1B05873
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 44.74	D2 44.31	D3 44.60	D4 45.56
		D2 45.18	D4 44.09	D5 45.12	D7 44.70
Kn	25 to 45	Ki 35.14		Kii 35.32	
Jn	Difference ≤ 4	Ji 25.90	Jii 24.83	Jiii 25.74	Jiv 24.62

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

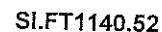
Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
D=	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$	$35 \pm \frac{+12}{-5}$

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



Weighting report from Test and Commissioning (Final measurements after Leveling and Weighting fine)





Quality Manager / Team Leader



Gibela Rail Transport Consortium RF (Pty)
Ltd
2 Shosholozu Avenue
Dunnettar X7
Ekurhuleni, 1590, South Africa
Reception: +27 (0)10 600 0651

TRAIN SET 232	REF: GIB0000001672 JO PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

M2	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 3%
		18.66	17.94	1.97%	PASS
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria MinDiffMax
		36.60	37.05	1.25%	PASS

Test Participants			
Name	Company	Department	Date
Pulegy Zune	GIBELA	EOC	28/06/24