




CONFIDENTIAL INFORMATION



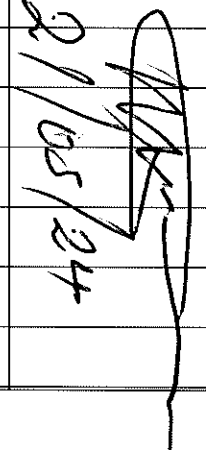
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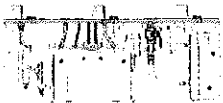

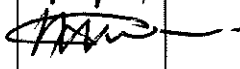

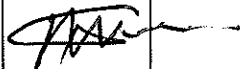

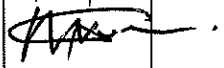

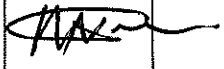

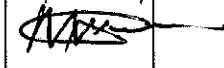

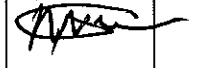
APPLICATION REFERENCE



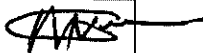
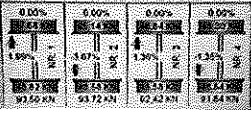
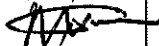
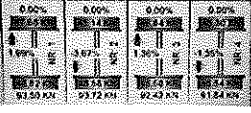

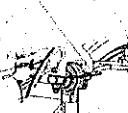





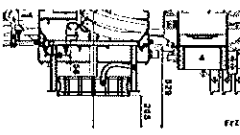

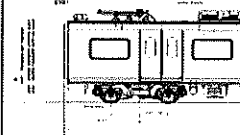
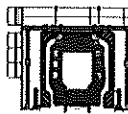
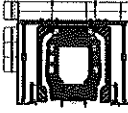

MOUNTING	DESCRIPTION	STATION	CAR TYPE						WORK INSTRUCTION	SAFETY? 
			TC1	M4	M1	M2	M3	TC2		
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140	1	1	1	1		PRA.FT1140.04	YES
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1					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
TS224	TC2	GOODNESS	21/05/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Projet: PRASA	SI.FT1140.52						
			Date: 5/31/2022								
Car:	NCR:		Work Station FT1140								
 Safety Related											
I - Document and Instrument Control											
I.1 - Documents control											
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	NO	Signature/Date
PRA.FT1140.04							K				✓ 21/05/24
PRA.FT1140.05											
PRA.FT1140.05											
I.2 - Instruments Control - Monitoring and Measuring Instrument Control (Used for all instrument with calibration needed)											
Instrument description	Serial number		Calibration or Verification Validation Date		OK	NO	Signature/Date				
Measuring Tape	GIBTA 0276		26/10/23		✓						
Verier Caliper	GIBVR 0056		06/06/23		✓						
Torque Wrench 35NM	D2811023		19/12/23		✓						
Torque Wrench 150NM	D28622009		19/12/23		✓						
Torque Wrench 320NM	A9630027		21/12/23		✓						
Torque Wrench 530NM	A9630053		21/12/23		✓						
Torque Wrench 1711M	D2866619		19/12/23		✓						

	<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Project: PRASA	SI.FT1140.52									
			Date:											
			5/31/2022											
II - Self Inspection - Items to Check														
II.1 - 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		✓		MOL 21/05/24								
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): 10.5 bar Final pressure (FP): 10.5 bar FP - IP = 0 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓		MOL 21/05/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 21/05/24								
04		Measurement Inspection was done with car on condition AWO and the rail leveled. (The load cells system must be leveled and calibrated)	Calibration Validation Date 19/12/23	✓		 21/05/24								
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 border="1"> <thead> <tr> <th>EQUIPMENT DESCRIPTION</th> <th>WEIGHT (kg)</th> </tr> </thead> <tbody> <tr> <td>Driver Seat</td> <td>✓</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Driver Seat	✓					✓		 21/05/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)													
Driver Seat	✓													
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 21/05/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 21/05/24								
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 21/05/24								

		<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Proj: PRASA	SI.FT1140.52
		Date:				
		5/31/2022				
Item	Picture/Sketch	Description	Criteria/Record	OK	NO	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		✓		 21/05/24
10		The difference of weight between the left and right wheels of each axis, must be ≤ 4%. (Verify on the T&C equipment if all arrows are in green).		✓		 21/05/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of ≤ 4%.		✓		 21/05/24
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	✓		 21/05/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 21/05/24
14		FOR TC CARS F = Height of the center of Automatic coupler F = 895mm (+5 / -10mm) (Using levelled rail)	TC CAB #1 = 896 mm	✓		 21/05/24
15		FOR TC CARS Height of Eurobase Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1 = 198 mm	✓		 21/05/24
16		Check pantograph piping air tightness. Test performance according to VII 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	✓		 21/05/24



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Proj:
PRASA

SI.FT1140.52

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'
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII					258	257						AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII												EI
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CII					266	267						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 (J1 - J)	JII												J1
QTY OF TURNS OF LEVELLING ROD	N/A	XII												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'n
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII					255	256						An
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII												En
AIR SPRING PRESSURE	≤ 0.3 (QIV - Q)	CIII					285	282						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 (JIV - J)	JIII												JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII												XIV
SHIMS OF ANTI-ROLL BAR	N/A	YIII												YIV
		LEFT SIDE						RIGHT SIDE						

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

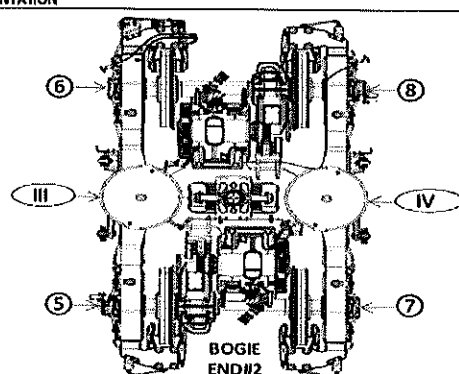
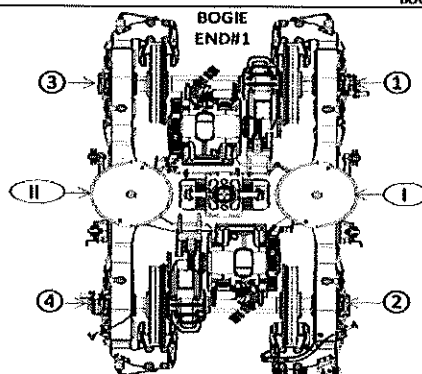
GOOD	LOWER	HIGHER
✓	↓	↑

WEIGHT COMPENSATION:

EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	

SECONDARY MEASUREMENTS (ONLY TO CARS):

AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Proj:
PRASA

SI.FT1140.52

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'
AIR SPRING HEIGHT (FULL)	min 284 max 261	AII												AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII												EI
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CI												CI
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 (AI - A)	JII												JII
QTY OF TURNS OF LEVELLING ROD	N/A	XII												XII
SHIMS OF ANTI-ROLL BAR	N/A	YII												YII
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6	
AIR SPRING HEIGHT (EMPTY)	N/A	A'III												A'III
AIR SPRING HEIGHT (FULL)	min 284 max 261	AIII												AIII
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII												EIII
AIR SPRING PRESSURE	≤ 0.3 (QIV - QIV)	CIII												CIII
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5												D5
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6												D6
PIVOT VERTICAL GAP	min 25 max 32	KIII												KIII
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (AIV - AIV)	JIII												JIII
QTY OF TURNS OF LEVELLING ROD	N/A	XIII												XIII
SHIMS OF ANTI-ROLL BAR	N/A	YIII												YIII

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

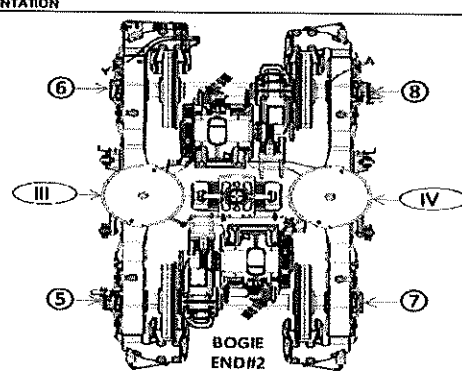
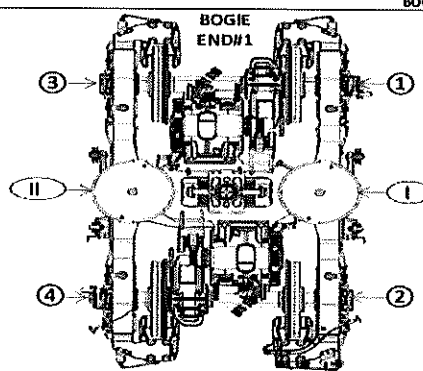


Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES											
		TCL CAR		M4 CAR		M3 CAR		M2 CAR		M3 CAR		TCL 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
Air Spring height [mm]	Fig. 5	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄	255 ⁺⁵ ₋₄
Air spring pressure at AWD [Bar]	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,87 (Ref.)	2,83 (Ref.)	3,02 (Ref.)	2,91 (Ref.)	3,07 (Ref.)	2,85 (Ref.)	2,83 (Ref.)	2,87 (Ref.)	2,83 (Ref.)	3,76 (Ref.)
	C ₁ - C ₂	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 ₃ - 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.
Primary Suspension gaps [mm]	Fig. 6	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄	35 ⁺³ ₋₄
	D ₃₁ D ₄												
	D ₃₂ D ₆												
	D ₃₃ D ₇												
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 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅	850 ⁺²⁵ ₋₂₅
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.)	895 (Ref.)	760 (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.)
Pivot 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

	<h2 style="margin: 0;">SELF INSPECTION INDUSTRIAL QUALITY</h2>	Rev:09	Project: PRASA	<h3 style="margin: 0;">SI.FT1140.52</h3>
		Date:		
		5/31/2022		

Levelling report from Production (Final measurements after Levelling 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 233	A'ii 233	A'ia 240	A'iv 241
An	254 to 261	Ai 257	Aii 259	Aia 257	Aiv 257
Bn = An - A'n	N/A	Bi 24	Bii 26	Bia 17	Biv 16
En	1109 ±10 mm	Ei 1111	Eii 1114	Eia 1111	Eiv 1106

Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3.56	Cii 3.62	Cia 2.84	Civ 2.83
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,06		Cia - Civ 0,01	
Gauge serial number	N/A	GIB05873	GIB05873	GIB05873	GIB05873

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 43.34	D3 43.13	D5 43.72	D6 43.99
		D2 43.96	D4 44.52	D5 43.63	D7 43.79
Kn	25 to 45	Ki 28.58	Kii 36.12	Kia 36.12	Kiv 36.12
Jn	Difference ≤ 4	Ji 25.24	Jii 25.30	Jia 26.40	Jiv 24.71

(*) 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	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	35 ⁺¹² ₋₅

Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	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

BOGIE ORIENTATION

BOGIE
END#1

BOGIE
END#2

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

[illegible]



Gibela Rail Transport Consortium RF (Pty)
Ltd
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TRAIN SET 224	REF: GIB0000001672_JO PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

TC2	Balance across front and rear bogies	Front Bogie [Tons]		Rear Bogie [Tons]		Longitudinal Imbalance [%]		Criteria Longitudinal Imbalance $\leq 10\%$	
		18.54		15.58		8.68%		PASS	
	Weight Measured vs Predicted	34.12		34.42		Weight Difference [%]	Tolerance [%]	Criteria MinDiff/Max	PASS
						0.88%	1.62%		

Test Participants			
Name	Company	Department	Date
Thedo Musi	Gibela	EOC	21/03/24