



PRASA PROJECT

CONFIDENTIAL INFORMATION



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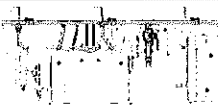
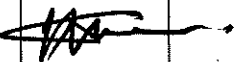
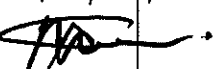



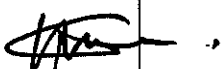

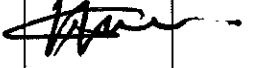

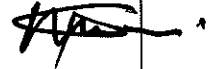

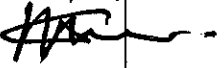


APPLICATION REFERENCE




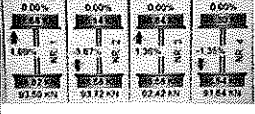

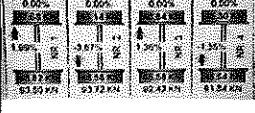
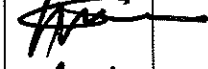




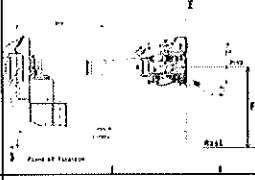
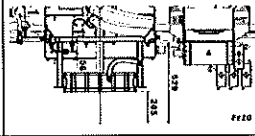
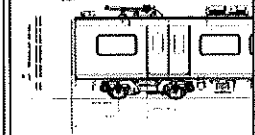

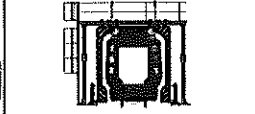

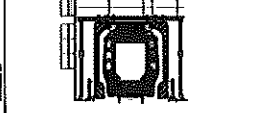

MOUNTING	DESCRIPTION	STATION	CAR TYPE						WORK INSTRUCTION	SAFETY ? 
			TC1	M4	M1	M2	M3	TC2		
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140	1	<input checked="" type="checkbox"/>	1	1		PRA.FT1140.04	YES
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING 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
TS220	M1	Goodness	26/04/24	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							
 Safety Related											
I - Document and Instrument Control											
I.1 - Documents control											
Document	TC1	M1	M2	M3	M4	TC3	Revision	Remark	OK	NOK	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05		X							✓		[Signature]
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		✓		26/04/24 [Signature]				
Venier Caliper	GIBVR 0056		06/06/23-06/06/24		✓						
Torque Wrench 35NM	D2511023		19/12/23-19/12/24		✓						
Torque Wrench 320m	A9650027		21/12/23-21/12/24		✓						
Torque Wrench 150nm	D2822009		19/12/23-19/12/24		✓						

	<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Project: PRASA	SI.FT1140.52								
			Date:										
			5/31/2022										
II - Self Inspection - Items to Check													
E.1 - Items to Check													
Item	Picture/Sketch	Description	Criteria/Record	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		✓	 26/04/24								
02		Check underframe pipe system Air tightness Test performance according to WI PRAFT1130.15.	The test was performed and no leak was observed. Initial pressure (IP) 10'00 Final pressure (FP) 9'84 FP - IP = 0'16 APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓	 26/04/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓	 26/04/24								
04		Measurement inspection was done with car on condition AW0 and the rail leveled. (The load cells system must be leveled and calibrated)	Calibration Validation Date _ / _ / _	✓	 26/04/24								
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>Gangway</td> <td>360</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Gangway	360					✓	 26/04/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)												
Gangway	360												
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓	 26/04/24								
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓	 26/04/24								
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓	 26/04/24								

		<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09 Date: 5/31/2022	Project: PRASA	SI.FT1140.52
Item	Picture/Sketch	Description	Criteria/Record	OK	Signature/Date	
09		Check that the leveling rods are torqued and have torque marker.		✓	 26/04/24	
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).		✓	 26/04/24	
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	 26/04/24	
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	✓	 26/04/24	
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	 26/04/24	
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 trimmings	✓	 26/04/24	
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	✓	 26/04/24	
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓	 26/04/24	



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PRASA

SI.FT1140.52

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

DESCRIPTION	TOLERANCE	END#1												RIGHT SIDE					
		LEFT SIDE						RIGHT SIDE						RIGHT SIDE					
AIR SPRING HEIGHT (EMPTY)	N/A	A'II																	A'I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII						257	257										AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII																	EI
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CII						1104	1104										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 (AI - A)	JII																	JI
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'IV
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII						257	258										AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII																	EIV
AIR SPRING PRESSURE	≤ 0.3 (QIV - QI)	CIII						111	115										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 (AIV - AV)	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

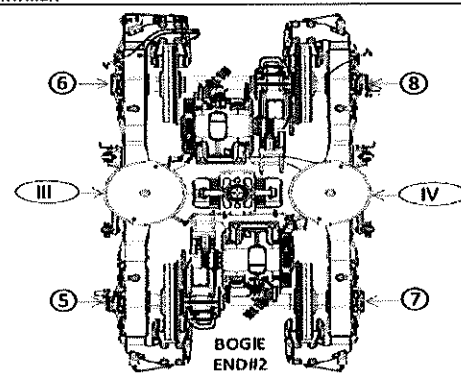
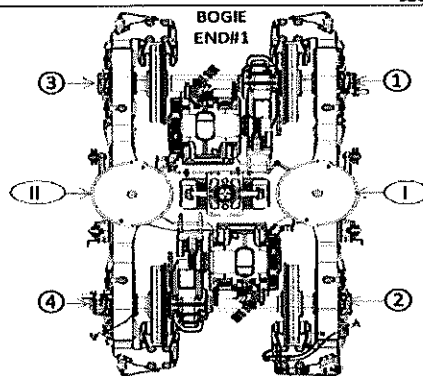
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT





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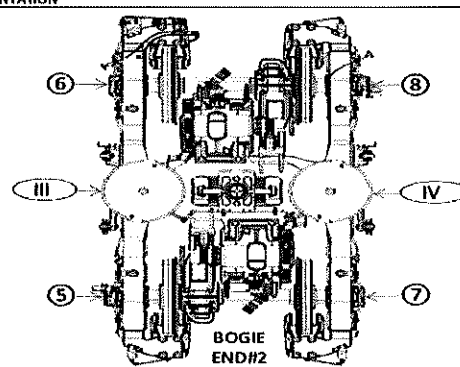
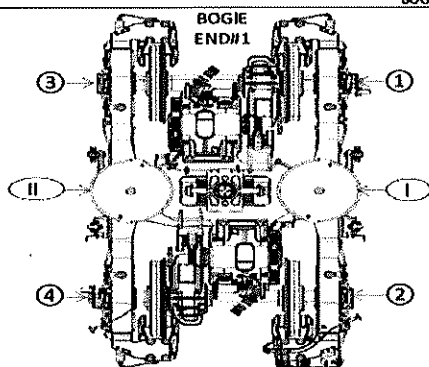
SI.FT1140.52

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	AII												AIII											AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EII												EIII											EIV
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CII												CIII											CIV
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3												D5											D7
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4												D6											D8
PIVOT VERTICAL GAP	min 25 max 32	KII												KIII											KIV
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (AI - A)	JII												JIII											JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XII												XIII											XIV
SHIMS OF ANTI-ROLL BAR	N/A	YII												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		M1 CAR		M2 CAR		M3 CAR		TCL CAR	
		TBox	TBlnt	MB1	MB1	MB1	MB1	MB2	MB2	MB1	MB1	TBlnt	TBox
Pivot lateral stop gap difference [mm]	Fig. 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Air Spring height [mm]	Fig. 5	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}	255^{+8}_{-5}
Air spring pressure at AWD [Bar]	Fig. 5	3,76	2,82	2,83	3,02	2,91	3,07	2,85	2,83	2,87	2,83	2,83	3,76
		(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
		0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.	0,3 Mbar.
		35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅
Primary Suspension gap [mm]	Fig. 6	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅	35 ⁺²⁵ ₋₅
		D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄	D ₃ ; D ₄
		D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆	D ₅ ; D ₆
		D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈	D ₇ ; D ₈
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 ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅	850 ⁺²⁵ ₋₅
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 ⁺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

	<h1 style="text-align: center;">SELF INSPECTION</h1> <h1 style="text-align: center;">INDUSTRIAL QUALITY</h1>	Rev:09	Project: PRASA	SI.FT1140.52
		Date:		
		5/31/2022		

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

References for secondary suspension empty
A'n Air spring height empty

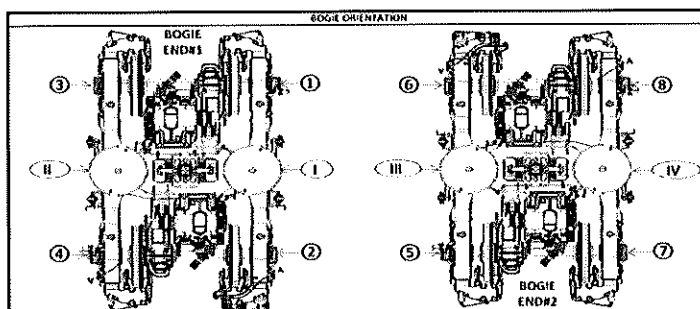
References for secondary suspension full
An Air spring height
Bn Difference between measurement A'n and An
En Floor covering height
Cn Air spring pressure
Dn Primary suspension
Kn Pivot Vertical gap
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 240	A'u 238	A'is 239	A'uv 239
An	254 to 261	Al 257	Au 257	Ais 257	Auv 258
Bn = An - A'n	N/A	Bl 17	Bu 19	Bis 18	Buv 19
En	1106 ±10 mm	Ei 1114	Eu 1107	Eis 1111	Euv 1115
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2.93	Cu 2.94	Cis 2.81	Cuv 2.81
Cn - Cn±	Difference ≤ 0,3	Ci - Cu 0,01		Cis - Cuv 0	
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 43.45	D3 44.50	D6 44.37	D8 45.11
		D2 44.88	D4 43.92	D5 45.55	D7 44.04
Kn	25 to 45	Ku 36.79		Kis 33.96	
Jn	Difference ≤ 4	Ji 24.40	Ju 26.01	Jis 25.70	Juv 23.59


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

Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbox	Tbin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbox
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	
	Tbox	Tbin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbox
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 Levelling and Weighting fine)

	<h1 style="margin: 0;">SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Project: PRASA	SI.FT1140.52
			Date: 5/31/2022		

Item	Description of defects	OK	NOK	Signature/Date

B2 - Check List REX

Check List Items						
Item	Picture/Drawing	Description	Criteria/Record	OK	NOK	Signature/Date
01	N/A	To complete REX	Refer to REX. New defects must be added on the REX	✓		<i>[Signature]</i> 26/04/24

Self Inspection - Final Result

Is the car good to advance to the next workstation/process? (Approval of Operations Manager/Team Leader and Industrial Quality)		DATE	NAME	SIGNATURE
HOLD POINT	GO	26/4/24	Pulera Operations Manager	<i>[Signature]</i>
		26/04/24	Felton Industrial Quality	<i>[Signature]</i>
	NO			

If activities are not complete, the missing activities must not impact the next stage!
 Every auto inspection performed conforms to specification or in case of discrepancy the same is approved by the competent party.

There are activities pending that impact/stop the activities of the next process
 Obs.: (To describe problems below)
 There are non-conformities impact the quality of the product and there is no corrective action defined yet!

In case of "NO GO", describe blocking problems

In case of "NO GO", the operations manager must define below action plan to ensure "GO":

Item	Description	Action	Responsible	Status

Operations Manager / Team Leader

Quality Manager / Team Leader



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Ltd
2 Shosholoza Avenue
Dunnotar X7
Ekurhuleni, 1590, South Africa
Reception: +27 (0)10 600 0651

TRAIN SET 220	REF: GIB0000001572_JO PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

M1	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 3%
		18.06	18.59	1.45%	PASS
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Tolerance [%]
		36.65	36.87	0.58%	1.37%
					Criteria MinsDiffsMax PASS

Test Participants			
Name	Company	Department	Date
Mufeng Zwane	GIBELA Rail	EOC	26/11/24