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2024-02-29

PRASA PROJECT

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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		
☐	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140	1	1	1	X		PRA.FT1140.04	YES
☐	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1				1	PRA.FT1140.05	YES
☐	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
☐	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
☐										
☐										
☐										

REV	DATE	MODIFICATION CONTENT	RESPONSIBLE	NAME	DATE
7	2020/02/11	UPDATE OF AIR TIGHTNESS TEST TIME FROM 4 MIN TO 5 MIN. ADD PANTOGRAPH AIR TIGHTNESS.	APPROVER	GIVEN SILOWA	2020/02/11
			CHECKER	SIMON MOKOENA	2020/02/11
			COMPILER	COMFORT MALATJI	2020/02/11
8	2021/09/13	ADDING GAUGE MEASUREMENT CHECK ON THE SI.	APPROVER	MAKOFANE LUCY	2021/09/13
			CHECKER	RATAU EDISON	2021/09/13
			COMPILER	TSAKANI KHOSA	2021/09/13
9	2022/05/31	pressure valve (APV) Isolation	APPROVER	MAKHURUPETJI THABANG	2022/05/31
			CHECKER	HAZEL MGIBA	2022/05/31
			COMPILER	RATAU EDISON	2021/05/31

TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS210	M3	Goodness	28/02/2024	SI.FT1140.52	01/08



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

2022/05/31

Projet:
PRASA

SI.FT1140.52

Car:

NOR:



Safety Related

Work Station

FT1140

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											
PRA.FT1140.05											
PRA.FT1140.05				✓					✓		<i>[Signature]</i> 28/02/24

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	NO	Signature/Date
Measuring Tape	GIBTA 0276	26/10/23-26/10/24	✓		
Vernier Caliper	GIBVA 0056	06/06/23-06/06/24	✓		
Torque Wrench 35N.M	D2511023	19/12/23-19/12/24	✓		
Torque Wrench 150N.M	D28622609	19/12/23-19/12/24	✓		
Torque Wrench 320N.M	A9650027	21/12/23-21/12/24	✓		

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Rev:09

Date:

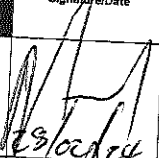
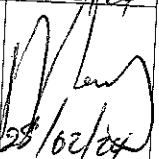
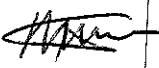
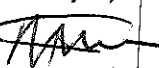
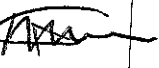
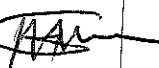
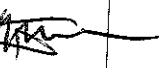
2022/05/31

Projet:
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SI.FT1140.52

II - Self Inspection - Items to Check

II.1 - 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		☒	☐	 28/02/24										
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) 9.84 bar Final pressure (FP) 9.82 bar FP - IP = 0.02 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	☒	☐	 28/02/24										
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		☒	☐	 28/02/24										
04		Measurement inspection was done with car on condition A/W0 and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration Validation Date 19/12/23	☒	☐	 28/02/24										
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>Gangway</td><td>360</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)	Gangway	360							☒	☐	 28/02/24
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.		☒	☐	 28/02/24										
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		☒	☐	 28/02/24										
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		☒	☐	 28/02/24										

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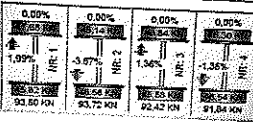
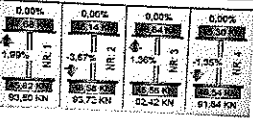
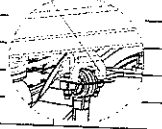
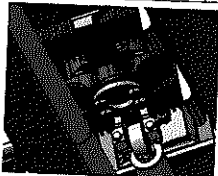
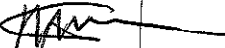
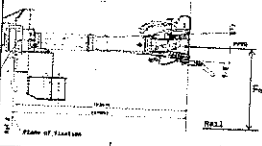
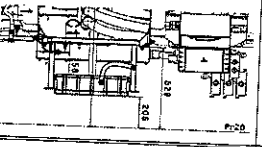
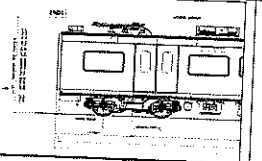
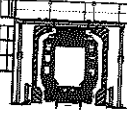
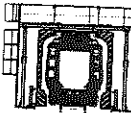
Rev:09

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2022/05/31

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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.		☒	 28/02/24										
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).		☒	 28/02/24										
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		☒	 28/02/24										
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	<table><thead><tr><th colspan="2">THICKNESS (mm)</th></tr></thead><tbody><tr><td>I</td><td>0</td></tr><tr><td>II</td><td>0</td></tr><tr><td>III</td><td>0</td></tr><tr><td>IV</td><td>0</td></tr></tbody></table>	THICKNESS (mm)		I	0	II	0	III	0	IV	0	☒	 28/02/24
THICKNESS (mm)															
I	0														
II	0														
III	0														
IV	0														
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	☒	 28/02/24										
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+8 / -10mm) (Using levelled rail)	TC CAB #1= _____ mm		M/A										
15		FOR TC CARS Height of Eurobalise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= _____ mm		M/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)		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	☒	 29/02/24										

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

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

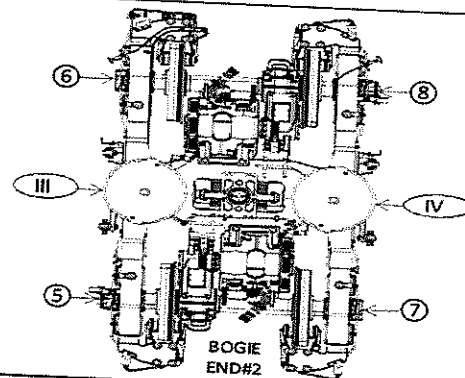
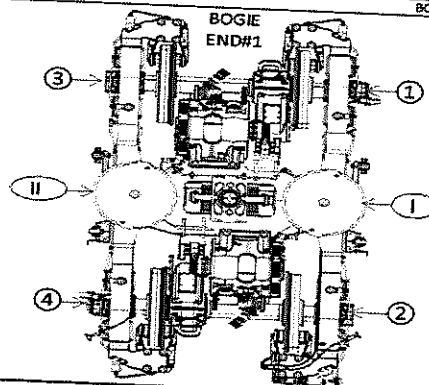
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



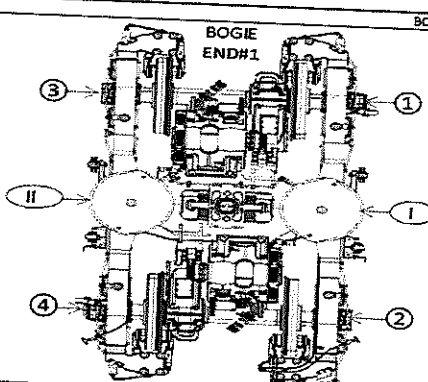
DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

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}													
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 _{II} - 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 _{IV} - Q _{II})	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}

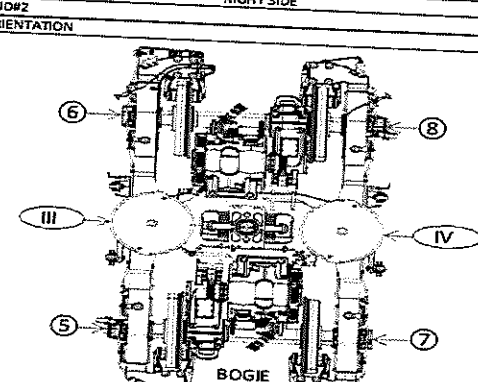
COMPARE EACH TENTATIVE WITH THE TOLERANCE AND IDENTIFY EACH MEASURE AS BELOW		
GOOD	LOWER	HIGHER
✓	↓	↑

WEIGHT COMPENSATION	
EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	

SECONDARY MEASUREMENTS (ONLY TO CARS)	
AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	



BOGIE
END#1



BOGIE
END#2

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

ITEM		THEORETICAL VALUES											
		TC1 CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		TC2 CAR	
		TBext	TBint	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2	TBint	TBext
Pivot lateral stop gap difference [mm]	Jn-Jm+1 (1 to 6)	Fig. 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Air Spring height [mm]	A _n (1 to 6)	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
Air spring pressure at AWO [Bar]	C _n (1 to 6) C ₁ - C ₆ C ₁₀ - C ₁₇	Fig. 5	3,76 (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.)
Primary Suspension gaps [mm]	D ₁ : D ₅ D ₂ : D ₆ D ₃ : D ₇ D ₄ : 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 to 6)	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 to 6)	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
Coupling End height [mm]	F ₁ F ₂	Fig. 8 Fig. 9	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	760 (Ref.)
Pivot Vertical gap [mm]	K _n	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

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 241	A'ii 240	A'iii 243	A'iv 241
An	254 to 261	Ai 257	Aii 257	Aiii 259	Aiv 258
Bn = An - A'n	N/A	Bi 16	Bii 17	Biii 16	Biv 17
En	1106 ±10 mm	Ei 1107	Eii 1111	Eiii 1107	Eiv 1113
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2,74	Cii 2,75	Ciii 2,76	Civ 2,73
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,01		Ciii - Civ 0,03	
Gauge serial number	N/A	G1B05875		G1B05875	
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 46,32	D2 46,83	D3 45,82	D4 46,51
		D2 46,50	D4 45,59	D5 45,75	D7 46,27
Kn	25 to 45	Ki 33,92		Kj 34,03	
Jn	Difference ≤ 4	Ji 25,12	Jii 25,59	Jiii 26,22	Jiv 25,23

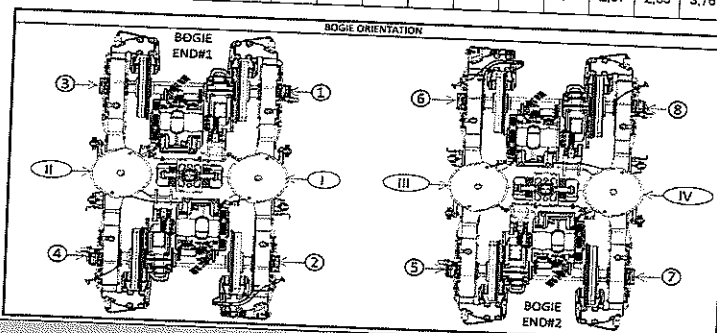
(*) Reference, only include values, isn't approval criteria.

Table 01
D Theoretical Values

TC1		M4		M1		M2		M3		TC2	
Tbex	Tbin	Mb1	Mb2	Mb1	Mb2	Mb1	Mb2	Mb1	Mb2	Tbin	Tbex
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	Mb2	Mb1	Mb2	Mb1	Mb2	Mb1	Mb2	Tbin	Tbex
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)



2024-02-29

CONTROLLED COPY

SI.FT1140.52

[illegible]

11.2 - Check List REX

Check List Items						
Item	Pictures/Drawing	Description	Criteria/Records	OK	NO	Remarks
01	N/A	To complete REX	Refer to REX. New defects must be added on the REX	☒	☐	☐
				Signature/Date [Signature] 23/02/24		

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	If activities are not complete, the missing activities must not impact the next stage!	29/02/24	Operations Manager	
			Every auto inspection performed conforms to specification or in case of discrepancy the same is approved by the competent party.	29/02/24	Industrial Quality	
			There are activities pending that impact/stop the activities of the next process Obs: (To describe problems below)		Operations Manager	
				There are non-conformities Impact the quality of the product and there is no corrective action defined yet)		Industrial Quality
In case of "NO GO", describe blocking problems						

In case of "NO GO", describe blocking problems

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

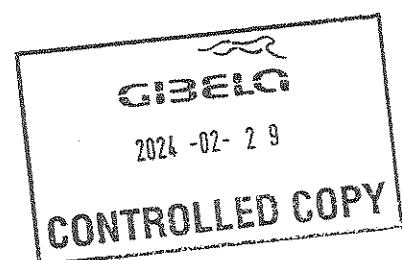
Item	Description	Action	Responsible	Status

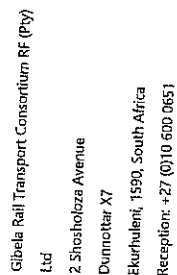
Operations Manager / Team Leader

Quality Manager / Team Leader

Operations Manager / Team Leader

Quality Manager / Team Leader





TRAIN SET 210	REF: GIB000001672 JO PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

M3	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance $\leq 3\%$
		17.85	17.92		
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	PASS
		35.77	35.90	0.36%	
					Criteria MinDiff=Max
					PASS

[illegible]