GIBELA

2024 -03- 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	1	PRA.FT1140.05	YES
☐ DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	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
TS213	M3	Goodness	14/03/24	**SI.FT1140.52**	01/08

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SELF INSPECTION INDUSTRIAL QUALITY

Rev:09	Projet: PRASA	SI.FT1140.52
Date: 2022/05/31		

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	NOK	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05				✓							
PRA.FT1140.05									✓		14-03-24

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	NOK	Signature/Date
Measuring Tape	GIBTA 0281	23/01/23-23/01/24	✓		
Vernier Calliper	GIBVA 0050	29/11/23-29/11/24	✓		
Torque Wrench 320Nm	A9696009	21/03/23-21/03/24	✓		
Torque Wrench 150N.m	B7217566	07/03/23-07/03/24	✓		
Torque Wrench 35N.m	D2311023	07/03/23/07/03/24	✓		

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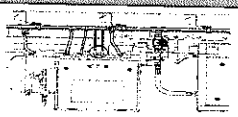
II - Self Inspection - Items to Check

II.1 - Items to Check

Item	Picture/Sketch	Description	Criteria/Record	OK	NOK	N.A.	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		✓			M.A 14/03/24
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): 10.05 bar Final pressure (FP): 9.8 bar FP - IP = 0.13 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓			M.A 14/03/24
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓			M.A 14/03/24
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 17/12/23	✓			M.A 14/03/24
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)	EQUIPMENT DESCRIPTION / WEIGHT (kg) Gangway 360	✓			M.A 14/03/24
06		The pressure difference between air spring on each bogie when raise the pressure was maintened < 0.3 bar.		✓			M.A 14/03/24
07		Measuremat recorded with empty suspention and loaded are on conformity with tolerances of the project.		✓			M.A 14/03/24
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓			M.A 14/03/24

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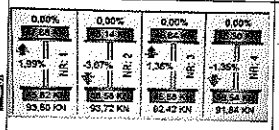
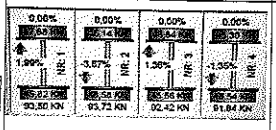
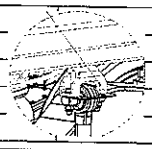
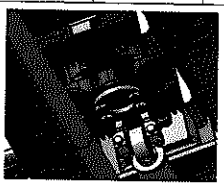
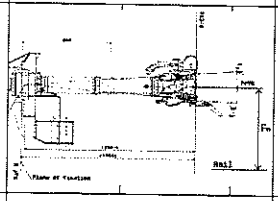
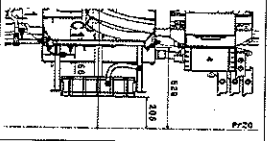
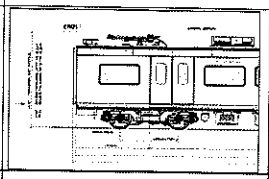
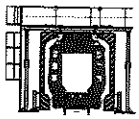
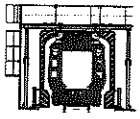
SELF INSPECTION INDUSTRIAL QUALITY

Rev:09	Projet: PRASA	SI.FT1140.52
Date: 2022/05/31		

Item	Picture/Sketch	Description	Criteria/Record	OK	NOK	N/A	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓			MA T 14/03/24
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).		✓			MA T 14/03/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of ≤ 4%.		✓			MA T 14/03/24
12		1 - Record shims thicknes used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I 0 II 0 III 0 IV 0	✓			MA T 14/03/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓			MA T 14/03/24
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. -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	✓			MA T 14/03/24

GIBELO	SELF INSPECTION INDUSTRIAL QUALITY	Rev:09 Date: 2022/05/31	Projet: PRASA	SI.FT1140.52

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

END#1

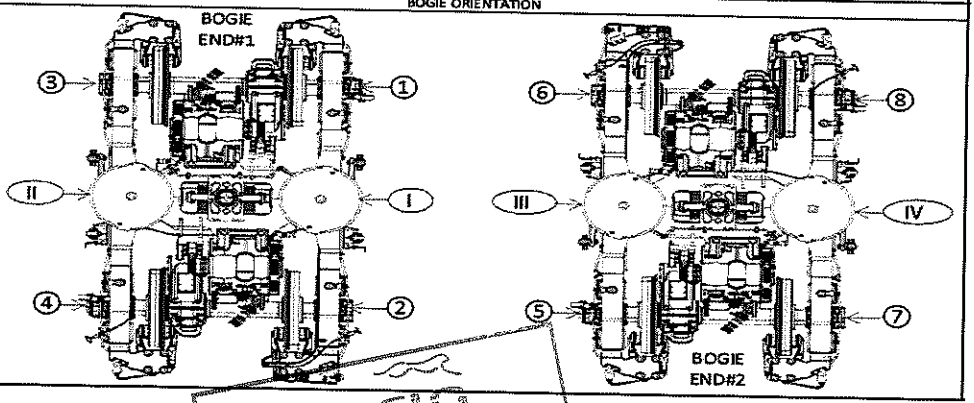
DESCRIPTION	TOLERANCE		LEFT SIDE 6	5	4	3	2	1	RIGHT SIDE 1	2	3	4	5	6	
AIR SPRING HEIGHT (EMPTY)	N/A	A`II													A`I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII					256	256	250	257					AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII													EI
AIR SPRING PRESSURE	≤ 0.3 (CII - CI)	CII					2.79	2.77	2.60	2.63					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 (JII - JI)	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					255	253	257	257					AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII													EIV
AIR SPRING PRESSURE	≤ 0.3 (CIV - CIII)	CIII					2.67	2.64	2.18	2.78					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 - JIII)	JIII													JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII													XIV
SHIMS OF ANTI-ROLL BAR	N/A	YIII													YIV

LEFT SIDE — END#2 — RIGHT SIDE

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

WEIGHT COMPENSATION	
EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	
SECUNDARY MEASUREMENTS (ONLY TC CARS)	
AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	

BOGIE ORIENTATION



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

DESCRIPTION	TOLERANCE		LEFT SIDE 6	5	4	3	2	1	END#1	1	2	3	4	5	6	RIGHT SIDE	
AIR SPRING HEIGHT (EMPTY)	N/A	A`II															A`I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII															AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII															EI
AIR SPRING PRESSURE	≤ 0.3 (CI - CII)	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	KII															KI
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (JI - JII)	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															AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII															EIV
AIR SPRING PRESSURE	≤ 0.3 (CIV - CIII)	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 (JIV - JIII)	JIII															JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII															XIV
SHIMS OF ANTI-ROLL BAR	N/A	YIII															YIV
			LEFT SIDE						END#2							RIGHT SIDE	

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

WEIGHT COMPENSATION	
EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	
SECUNDARY MEASUREMENTS (ONLY TC CARS)	
AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	

BOGIE ORIENTATION

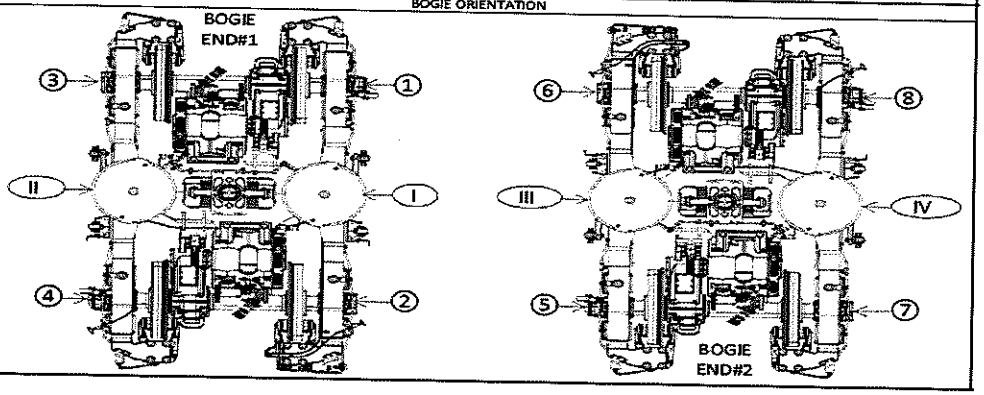

Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM			THEORETICAL VALUES													
			TC1 CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		TC2 CAR			
			TBext	TBint	MB1	MB1	MB1	MB2	MB2	MB1	MB1	MB1	TBint	TBext		
Pivot lateral stop gaps difference [mm]	$Jn-Jn+1$ (i≠N)	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4		
Air Spring height (mm)	A_n (i=N)	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]	C_n (i≠N)	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.)		
	$C_I - C_{II}$ $C_{III} - C_{IV}$		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]	D_1; D_5	Fig. 6	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}	35^{+12}_{-3}		
	D_2; D_6															
	D_3; D_7															
	D_4; D_8															
Carbody Floor height [mm]	E_n (i≠N)	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]	N_n (i≠N)	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]	F_1	Fig. 8	895 (Ref.)		760 (Ref.)		760 (Ref.)		760 (Ref.)		760 (Ref.)		895 (Ref.)			
	F_2	Fig. 9	760 (Ref.)		760 (Ref.)		760 (Ref.)		760 (Ref.)		760 (Ref.)		760 (Ref.)			
Pivot Vertical gap [mm]	K_n	Fig. 10	30^{+13}_{-3}	30^{+15}_{-3}	30^{+13}_{-3}	30^{+15}_{-3}	30^{+15}_{-3}	30^{+15}_{-3}	30^{+13}_{-3}	30^{+13}_{-3}	30^{+13}_{-3}	30^{+13}_{-3}	30^{+15}_{-3}	30^{+15}_{-3}		

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

References for secondary suspention empty
A`n Air spring height empty

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

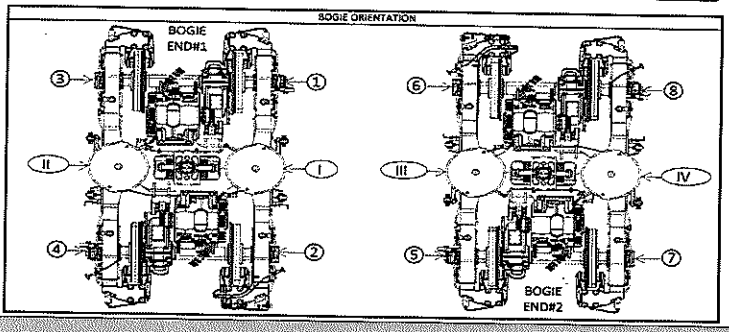
Item	Reference [mm]	END#1				END#2			
		Right Side		Left Side		Left Side		Right Side	
A'n	N/A	A'I	241	A'II	241	A'III	239	A'IV	239
An	254 to 261	AI	255	AII	255	AIII	255	AIV	256
Bn = An - A'n	N/A	BI	14	BII	14	BIII	16	BIV	17
En	1106 ±10 mm	EI	1114	EII	1108	EIII	1111	EIV	1110
Item	Reference [bar]	END#1				END#2			
		Right Side		Left Side		Left Side		Right Side	
Cn	Table 02 (*)	CI	2.62	CII	2.75	CIII	2.64	CIV	2.75
Cn - Cn+1	Diference ≤ 0,3	CI - CII	0.13			CIII - CIV	0.11		
Gauge serial number	N/A	91B05875		91B05875		91B05875		91B05875	
Item	Reference [mm]	END#1				END#2			
		Right Side		Left Side		Left Side		Right Side	
Dn	Table 01 (*)	D1	45.80	D3	45.54	D5	45.58	D8	45.95
		D2	45.50	D4	44.95	D6	45.99	D7	45.81
Kn	25 to 45	KI	36.92			KII	36.40		
Jn	Diference ≤ 4	JI	24.15	JII	26.21	JIII	24.38	JIV	25.74

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

Table 01 D Theorethical 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 Theorethical 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



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

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Item	Description of defects	NOK	OK	Signature/Date

II.2 - Check List REX

Check List Items

Item	Picture/Drawing	Description Description	Criteria /Record	OK	NOK	N/A	Signature/Date
01	N/A	To complete REX	Refer to REX. New defects must be added on the REX	✓			14/03/24

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!	14/03/24	Operations Manager	
			Every auto inspection performed conforms to specification or in case of discrepancy the same is approved by the competent party.	14/03/24	Industrial quality	
			There are activities pendings 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", 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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Gibela Rail Transport Consortium RF (Pty)
Ltd
2 Shosholoza Avenue
Dunnottar X7
Ekurhuleni, 1590, South Africa
Reception: +27 (0)10 600 0651

TRAIN SET 213	REF: GIB0000001672_J0 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 ≤ 3%	
		17.87	17.93	0.17%	PASS	
	Weight Mesured vs Predicted	Weight Mesured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Tolerance [%]	Criteria Min≤Diff≤Max
		35.80	35.90	0.28%	1.36%	PASS

Test Participants				
Name	Company	Department	Signature	Date
[illegible]	GIBELA	EOC	[signature]	14/03/2024