

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	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
TS 212	TC2	B. Nkomo	07/03/24	SI.FT1140.52	01/08

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



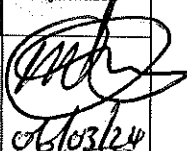
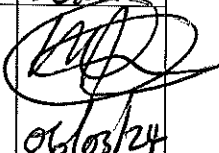



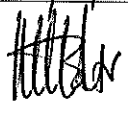



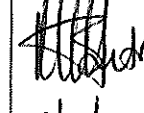




Car:	NCR:	Work Station: FT1140
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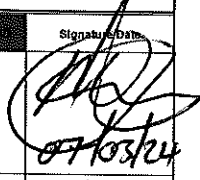
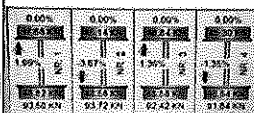
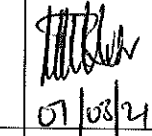
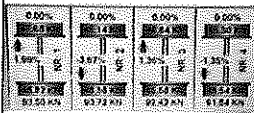
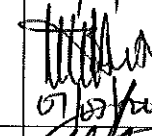





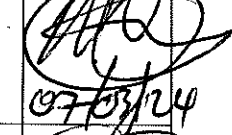




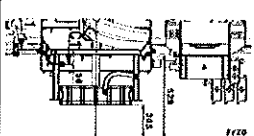
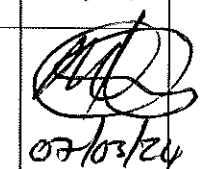
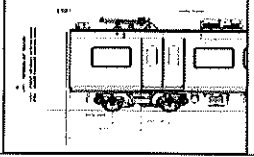
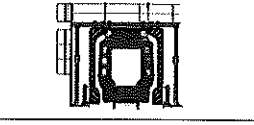
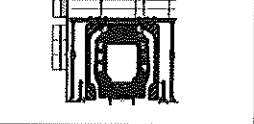
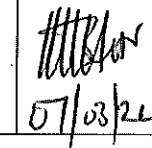
Safety Related

I - Document and Instrument Control

I.1 - Documents control									
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	Signature/Date
PRA.FT1140.04						✓			✓
PRA.FT1140.05									
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
Torque wrench 50NM	A 9630053	21/12/23 - 21/12/24	✓		
Torque wrench 320NM	A 9650027	21/12/23 - 21/12/24	✓		
Torque wrench 150NM	D28622009	19/12/23 - 19/12/24	✓		
Torque wrench 35NM	D2511023	19/12/23 - 19/12/24	✓		
Torque wrench 17NM	D2861617	19/12/23 - 19/12/24	✓		
Measuring tape	LIBTA 0276	26/06/23 - 26/06/24	✓		
Vernier Calliper	LIBUR 0056	06/06/23 - 06/06/24	✓		

 GIBELQ	<h1 style="text-align: center;">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	Criterias/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		✓		 06/03/24						
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): 4.92 bar Final pressure (FP): 0.92 bar FP - IP: 0.02 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓		 06/03/24						
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 07/03/24						
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 _ / _ / _	✓		 07/03/24						
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)	<table border="1"> <thead> <tr> <th>EQUIPMENT DESCRIPTION</th> <th>WEIGHT (kg)</th> </tr> </thead> <tbody> <tr> <td>Driver seat</td> <td>60</td> </tr> <tr> <td>Whipper system</td> <td>10</td> </tr> </tbody> </table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Driver seat	60	Whipper system	10	✓		 07/03/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)											
Driver seat	60											
Whipper system	10											
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 07/03/24						
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 07/03/24						
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 07/03/24						

		SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Projet: PRASA	SI.FT1140.52
				Date: 5/31/2022		
09			Check that the leveling rods are torqued and have torque marker.		✓	 07/03/24
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).		✓	 07/03/24
11			Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	 07/03/24
12			1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I  II  III  IV 	✓	 07/03/24
13			Pivot fixation	1- M20 x 60 screws with application of torque according to PRA.FT1140.04 / 05	✓	 07/03/24
14			FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5/-10mm) (Using levelled rail)	TC CAB #1= <u>896</u> mm	✓	 07/03/24
15			FOR TC CARS Height of Eurobaise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= <u>200</u> mm	✓	 07/03/24
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	✓	 07/03/24



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projeto:
PRASA

SI.FT1140.52

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											A'I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII			255	257	257	255	257	260			Ai
FLOOR COVERING HEIGHT	min 1096 max 1116	EII			1101	1106	1106	1105	1107	1112			Ei
AIR SPRING PRESSURE	± 0.3 (O1 - O2)	CII			3.63	3.68	3.70	3.39	3.42	3.47			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 (A1 - A2)	JII											Ji
QTY OF TURNS OF LEVELLING ROD	N/A	XII					0	1/2 P	1 P				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			257	259	256	252	255	256			Aiv
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII			1106	1109	1105	1103	1109	1110			Eiv
AIR SPRING PRESSURE	± 0.3 (Ov - O2)	CIII			2.81	2.76	2.71	2.91	2.89	2.82			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 (Av - A2)	JIII											Jiv
QTY OF TURNS OF LEVELLING ROD	N/A	XIII					0	3/4 P	1/2 P	3/4 P			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

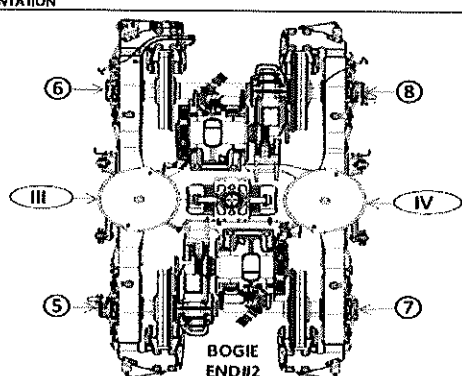
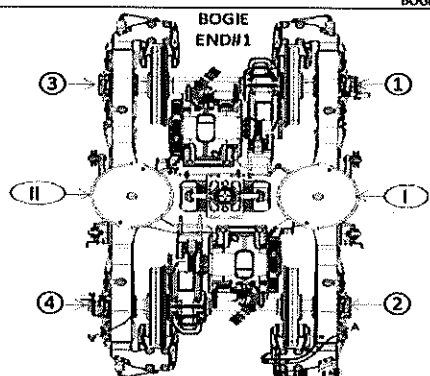
EQUIPMENT

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	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											AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII											EI
AIR SPRING PRESSURE	± 0.3 (Ci - Ci)	CII											CI
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3											D3
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4											D2
PIVOT VERTICAL GAP	min 25 max 32	KII											KI
PIVOT LATERAL STOP GAPS DIFFERENCE	± 4 (Ai - Ai)	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 - Cii)	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 (Kiv - Ki)	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		

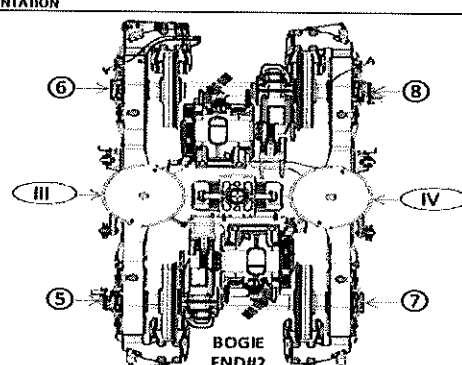
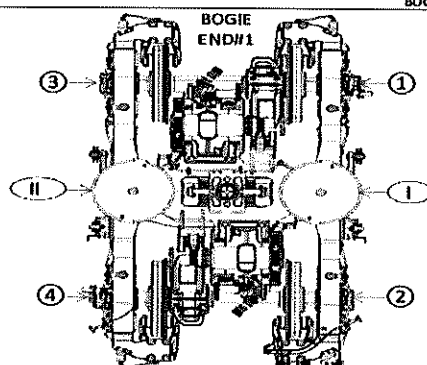



Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES											
		TCL CAR		M4 CAR		M3 CAR		M2 CAR		M5 CAR		T2 CAR	
		TBext	TBint	MB1	MB1	MB1	MB2	MB2	MB1	MB1	MB1	TBint	TBext
		≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Pivot lateral stop gap difference [mm]	J ₁₂ /J ₁₋₁ [1,1,1]	Fig. 4											
Air Spring height [mm]	A ₀ [1,1,1]	Fig. 5											
Air spring pressure at AWD [Bar]	C ₁ -C ₂ C ₃ -C ₄ [1,1,1]	Fig. 5											
Primary Suspension gaps [mm]	D ₃ /D ₅	Fig. 6											
	D ₃ /D ₆												
	D ₃ /D ₇												
	D ₃ /D ₈												
Carbody Floor height [mm]	E ₁ /E _{1,1,1}	Fig. 7											
Bolster height [mm]	N ₁ /N _{1,1,1}	Fig. 7											
Coupling End height [mm]	F ₂	Fig. 8											
	F ₂	Fig. 9											
Pivot Vertical gap [mm]	K ₁	Fig. 10											

	<h1>SELF INSPECTION</h1> <h1>INDUSTRIAL QUALITY</h1>	Rev:09	Project: PRASA	SI.FT1140.52
		Date:		
		5/31/2022		

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

References for secondary suspension empty

A'n Air spring height empty

References for secondary suspension full

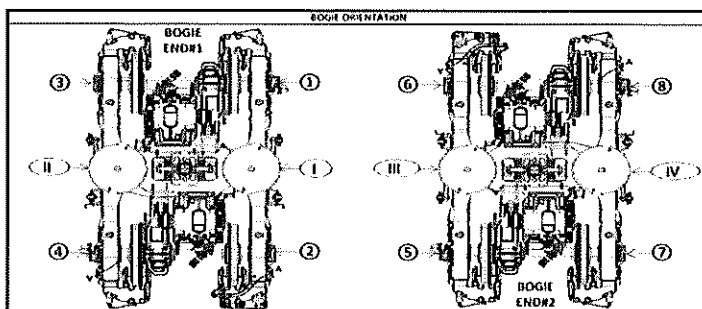
An Air spring height
 Bn Difference between measurement A'n and An
 En Floor covering height
 Cn Air spring pressure
 Dn Primary suspension
 Kn Pivot Vertical gap
 Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 234	A'ii 233	A'iii 235	A'iv 238
An	254 to 261	At 260	Aii 255	Aiii 257	Anv 256
Bn = An - A'n	N/A	Bi 26	Bii 22	Biii 22	Biv 18
En	1106 ±10 mm	Ei 1112	Eii 1101	Eiii 1106	Eiv 1110
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3.47	Cii 3.63	Ciii 2.81	Civ 2.82
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0.16		Ciii - Civ 0.01	
Gauge serial number	N/A	81B05871	81B05871	81B05871	81B05871
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	Di 44.58	Dii 42.78	Diii 44.51	Div 44.06
		Dv 45.27	Dvi 44.08	Dvii 44.29	Dviii 44.05
Kn	25 to 45	Ki 32.67		Kii 34.94	
Jn	Difference ≤ 4	Ji 25.59	Jii 25.48	Jiii 24.79	Jiv 26.09

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

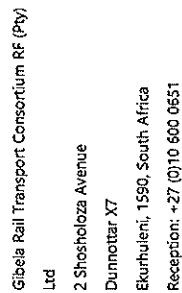
Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
D=	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅


Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	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 Levelling and Weighing fine)

[illegible]



Test Participants				
Name	Company	Department	Signature	Date
Doolhana	Gibela	EOC		06/03/2024
N.N.				