

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	X	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	1	PRA.FT1140.05	YES
<input type="checkbox"/>	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	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 821	M2	ANDREAO	07/05/24	SI.FT1140.52	01/08



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

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5/31/2022

Projet:
PRASA

SI.FT1140.52

Cnr:

INCR:

Work Station

FT1140



Safety Related

I - Document and Instrument Control

I.1 - Documents control

Document	T01	M1	M2	M3	M4	T02	Revision	Remark	OK	NO	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05			✓						✓		<i>[Signature]</i> 02/05/24
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	NO	Signature/Date
Measuring Tape	GIBTA 0276	26/10/23 - 26/10/24 ✓			<i>[Signature]</i> 7/05/24
Vernier Caliper	GIBVR 0056	06/06/23 - 06/06/24 ✓			
Torque Wrench 200MM	D2511023	18/12/23 - 18/12/24 ✓			
Torque Wrench 150MM	D2862009	18/12/23 - 18/12/24 ✓			
Torque Wrench 35MM	A9680027	21/12/23 - 21/12/24 ✓			



SELF INSPECTION INDUSTRIAL QUALITY

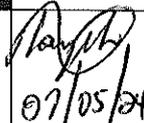
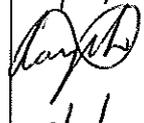
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II - Self Inspection - Items to Check

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		✓		 07/05/24
02		Check underframe pipe system Air tightness. Test performance according to WI PRA.FT.1130.15.	The test was performed and no leak was observed. Initial pressure (IP): 10.61 bar Final pressure (FP): 9.916 bar FP - IP = 0.695 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓		 07/05/24
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 07/05/24
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 19_12_24			 02/05/24
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)	EQUIPMENT DESCRIPTION GANCRWAY WEIGHT (kg) 360	✓		 02/05/24
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 07/05/24
07		Measurement recorded with empty suspension and loaded are in conformity with tolerances of the project.		✓		 07/05/24
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 07/05/24



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Item	Picture/Reference	Description	Criteria/Record	✓	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		✓	<i>[Signature]</i> 07/05/24
10		The difference of weight between the left and right wheels of each axle must be $\leq 4\%$. (Verify on the T&C equipment if all arrows are in green).		✓	<i>[Signature]</i> 07/05/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	<i>[Signature]</i> 07/05/24
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	✓	<i>[Signature]</i> 07/05/24
13		Pivot fixation	1- M20 x 98 screws with application of torque according to PRA FT1140.04 / 05	✓	<i>[Signature]</i> 07/05/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5 / -10mm) (Using levelled rail)	TC CAB #1= _____ mm		M/A
15		FOR TC CARS Height of Eurobase 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)	✓	<i>[Signature]</i> 07/05/24
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	✓	<i>[Signature]</i> 07/05/24
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓	<i>[Signature]</i> 07/05/24



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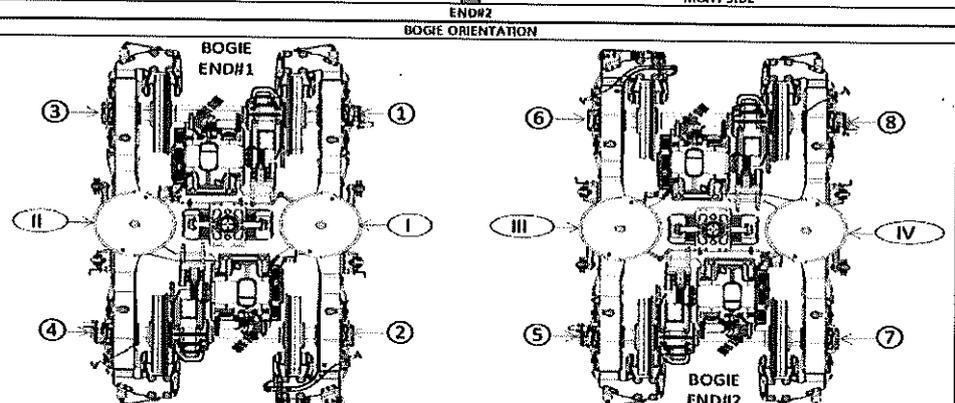
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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

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			256	257	251	240	249	258				Ai
FLOOR COVERING HEIGHT	min 1096 max 1116	Eii												Ei
AIR SPRING PRESSURE	≤ 0.3 (Ci - Cj)	Cii			2,92	2,00	2,02	1,76		2,98				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 (A1 - A2)	Jii												Ji
QTY OF TURNS OF LEVELLING ROD	N/A	Xii					0 1/2	1 1/2	1 3/4				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			258	257	266	260	256	288				Aiv
FLOOR COVERING HEIGHT	min 1096 max 1116	Eiii												Eiv
AIR SPRING PRESSURE	≤ 0.3 (Cv - Cw)	Ciii			2,86	2,87	2,74	2,95	2,69	2,71				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 - Aw)	Jiii												Jiv
QTY OF TURNS OF LEVELLING ROD	N/A	Xiii					0 1/2	1 1/2	0				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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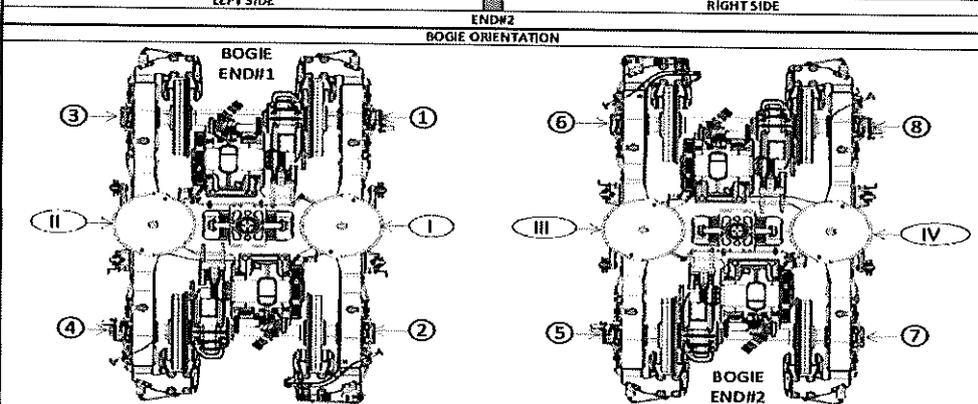
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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

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 (Qi - Qi)	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 (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	/	/	/	/	/	/	/	/	/	/	/	Aiv
FLOOR COVERING HEIGHT	min 1096 max 1116	Eiii	/	/	/	/	/	/	/	/	/	/	/	Eiv
AIR SPRING PRESSURE	≤ 0.3 (Qiv - Qi)	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 - J)	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		





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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		M3 CAR		TCL CAR	
	TBext	TBint	MB1	MB2	TBint	TBext								
Pivot lateral stop gaps difference [mm]	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Air Spring height [mm]	3,76	2,82	2,87	2,83	3,02	2,91	3,07	2,85	2,83	2,87	2,83	2,87	2,83	3,76
Air spring pressure at AWD [Bar]	0,3 Max.													
Primary Suspension gaps [mm]	D ₂ :D ₃	35 ^{+0,3} _{-0,4}												
	D ₂ :D ₄	35 ^{+0,3} _{-0,4}												
	D ₃ :D ₇	35 ^{+0,3} _{-0,4}												
	D ₆ :D ₈	35 ^{+0,3} _{-0,4}												
Carbody floor height [mm]	1106 ^{+0,3} _{-0,4}													
Booster height [mm]	850 ^{+0,3} _{-0,4}													
Coupling End height [mm]	F ₁	895 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)									
	F ₂	760 (Ref.)												
Pivot Vertical gap [mm]	K ₁	30 ^{+0,3} _{-0,4}												
	K ₂	30 ^{+0,3} _{-0,4}												



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Leveling report from Production (Final measurements after Leveling 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'1 241	A'1 242	A'2 240	A'2 240
An	254 to 261	A1 258	A1 257	A2 256	A2 257
Bn = An - A'n	N/A	B1 17	B1 15	B2 16	B2 17
En	1106 ±10 mm	E1 1111	E1 1110	E2 1109	E2 1112

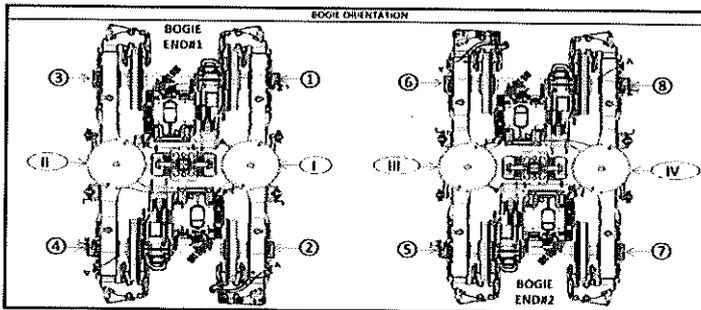
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	C1 2,91	C1 3,01	C2 2,78	C2 2,76
Cn - Cn+1	Diference ≤ 0,3	C1 - C1 0,1	C1 - C1 0,02	C2 - C2 0,02	C2 - C2 0,02
Gauge serial number	N/A	G1B05873	G1B05873	G1B05873	G1B05873

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 44,08	D1 45,06	D2 45,43	D2 46,95
		D2 45,25	D2 43,20	D3 45,17	D3 46,24
Kn	25 to 45	K1 33,20	K1 36,51	K2 36,51	K2 36,51
Jn	Diference ≤ 4	J1 26,0	J1 25,63	J2 25,83	J2 25,45

(*) 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											

Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb2	Mb1	Mb1	Mb1	Tbin	Tbex
C=	3.78	2.82	2.87	2.83	3.02	2.91	3.07	2.85	2.83	2.87	2.83	3.78



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

