

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		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 234	M1	P. SEISA	05/07/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY	Rev:09	Proj: PRASA	SI.FT1140.52
		Date: 5/31/2022		

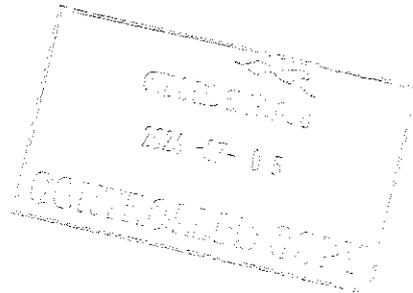
Car:	NCR:	Work Station: FT1140
------	------	-------------------------



I - Document and Instrument Control

I.1 - Documents control										
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	Signature/Date
PRA.FT1140.04										
PRA.FT1140.05		X							✓	<i>[Signature]</i> 08/07/24
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	Signature/Date
Measuring tape	GIBTA 0276	26/10/23-26/10/24	✓	<i>[Signature]</i> 28/07/24
Vernier Calliper	GIBVR 0050	06/08/23-06/08/24	✓	
Torque Wrench 320 N.m	A9690019	19/12/23-19/12/24	✓	
Torque Wrench 150 N.m	B7217566	21/12/23-21/12/24	✓	
Torque Wrench 35 N.m	D511023	21/12/23-21/12/24	✓	





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Project:
PRASA

SI.FT1140.52

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		✓		 05/07/24
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): <u>0.10</u> bar Final pressure (FP): <u>0.07</u> bar FP - IP = <u>0.03</u> bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓		 05/07/24
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 05/07/24
04		Measurement inspection was done with car on condition AWD and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration, Validation, Date <u>19/12/24</u>	✓		 05/07/24
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 <u>GRANICWAY</u> WEIGHT (kg) <u>360</u>	✓		 05/07/24
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 05/07/24
07		Measuremet recorded with empty susspention and loaded are in conformity with tolerances of the project.		✓		 05/07/24
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 05/07/24



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projet:
PRASA

SI.FT1140.52

N°	Picture/Sketch	Description	Criteria/Record	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		 05/07/24
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).		 05/07/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		 05/07/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I 00 II 00 III 00 IV 00	 05/07/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	 05/07/24
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. -Roam piping connection fittings(Roof arch and door trimming)	 05/07/24
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	 05/07/24
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	 05/07/24



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Proj:
PRASA

SI.FT1140.52

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

DESCRIPTION	TOLERANCE	END#1												
		LEFT SIDE						RIGHT SIDE						
		6	5	4	3	2	1	1	2	3	4	5	6	
AIR SPRING HEIGHT (EMPTY)	N/A	A _{1i}	/	/	/	/	/	/	/	/	/	/	/	A _{1r}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A _{1ii}	/	/	/	/	256	254	/	/	/	/	/	A _{1r}
FLOOR COVERING HEIGHT	min 1096 max 1116	E _{1i}	/	/	/	/	1112	1104	/	/	/	/	/	E _{1r}
AIR SPRING PRESSURE	≤ 0.3 (C _{1i} - C ₁)	C _{1i}	/	/	/	/	3,003	2,83	/	/	/	/	/	C _{1r}
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₃	/	/	/	/	/	/	/	/	/	/	/	D ₁
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₄	/	/	/	/	/	/	/	/	/	/	/	D ₂
PIVOT VERTICAL GAP	min 25 max 32	K _{1i}	/	/	/	/	/	/	/	/	/	/	/	K _{1r}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _{1i} - J ₁)	J _{1i}	/	/	/	/	/	/	/	/	/	/	/	J _{1r}
QTY OF TURNS OF LEVELLING ROD	N/A	X _{1i}	/	/	/	/	/	/	/	/	/	/	/	X _{1r}
SHIMS OF ANTI-ROLL BAR	N/A	Y _{1i}	/	/	/	/	/	/	/	/	/	/	/	Y _{1r}
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6	
AIR SPRING HEIGHT (EMPTY)	N/A	A _{1iii}	/	/	/	/	/	/	/	/	/	/	/	A _{1iv}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A _{1iiiii}	/	/	/	/	256	253	/	/	/	/	/	A _{1iv}
FLOOR COVERING HEIGHT	min 1096 max 1116	E _{1iii}	/	/	/	/	1106	1111	/	/	/	/	/	E _{1iv}
AIR SPRING PRESSURE	≤ 0.3 (C _{1v} - C _{1r})	C _{1iii}	/	/	/	/	270	2,92	/	/	/	/	/	C _{1v}
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₅	/	/	/	/	/	/	/	/	/	/	/	D ₇
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ₆	/	/	/	/	/	/	/	/	/	/	/	D ₈
PIVOT VERTICAL GAP	min 25 max 32	K _{1iii}	/	/	/	/	/	/	/	/	/	/	/	K _{1iv}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _{1v} - J _{1r})	J _{1iii}	/	/	/	/	/	/	/	/	/	/	/	J _{1v}
QTY OF TURNS OF LEVELLING ROD	N/A	X _{1iii}	/	/	/	/	/	/	/	/	/	/	/	X _{1v}
SHIMS OF ANTI-ROLL BAR	N/A	Y _{1iii}	/	/	/	/	/	/	/	/	/	/	/	Y _{1v}

COMPARE EACH TENTATIVE WITH THE TOLERANCE AND IDENTIFY EACH MEASURE AS BELOW			BOGIE ORIENTATION	
GOOD	LOWER	HIGHER		
✓	↓	↑		
WEIGHT COMPENSATION				
EQUIPMENT				
WEIGHT				
EQUIPMENT				
WEIGHT				
SECONDARY MEASUREMENTS (ONLY TO CARS)				
AUTOMATIC COUPLER HEIGHT				
ANTENNA HEIGHT				



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09
Date:
5/31/2022

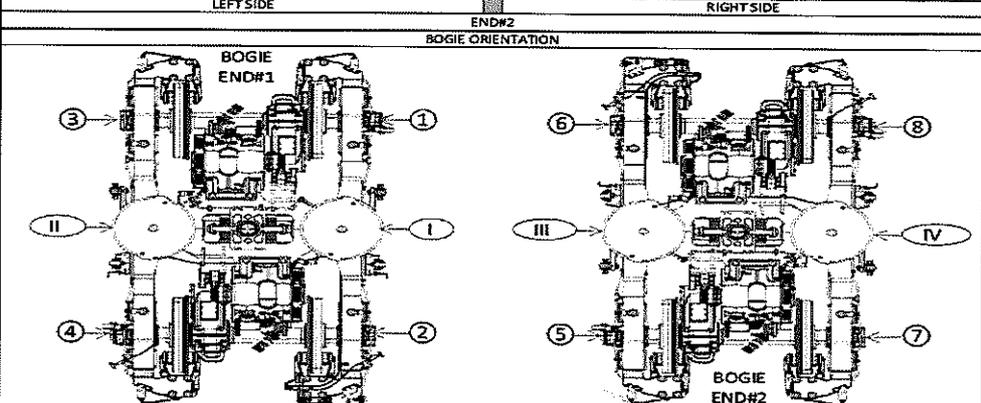
Projet:
PRASA

SI.FT1140.52

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

		END#1											
		LEFT SIDE						RIGHT SIDE					
DESCRIPTION	TOLERANCE	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 - Q)	Cii	/	/	/	/	/	/	/	/	/	/	Ci
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5	/	/	/	/	/	/	/	/	/	/	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 - 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	/	/	/	/	/	/	/	/	/	/	Aiv
FLOOR COVERING HEIGHT	min 1096 max 1116	Eiii	/	/	/	/	/	/	/	/	/	/	Eiv
AIR SPRING PRESSURE	≤ 0.3 (Qv - Qa)	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 - Jiv)	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		
SECURDARY MEASUREMENTS (ONLY TO CARS)		
AUTOMATIC COUPLER HEIGHT		
ANTENNA HEIGHT		





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09
Date:
5/31/2022

Project:
PRASA

SI.FT1140.52

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

ITEM	THEORETICAL VALUES													
	TC1 CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		M3 CAR		TC2 CAR	
	TBot	TBot	MB1	MB2	TBot	TBot								
Pivot lateral stop gaps difference [mm]	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Air Spring height [mm]	Fig. 5	255 ⁺⁶ ₋₁												
Air spring pressure at AWD [bar]	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,83 (Ref.)	2,91 (Ref.)	2,85 (Ref.)	3,07 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	2,87 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	3,76 (Ref.)
Primary Suspension gaps [mm]	C ₁ -C ₁₁	0,3 Máx.												
	C ₃ -C ₇	0,3 Máx.												
	D ₁ D ₅	35 ⁺¹¹ ₋₃												
	D ₂ D ₆	35 ⁺¹¹ ₋₃												
Carbody Floor height [mm]	Fig. 7	1106 ⁺¹⁰ ₋₁₀												
Booster height [mm]	Fig. 7	850 ⁺⁸ ₋₇												
Coupling End height [mm]	F ₁	895 (Ref.)	760 (Ref.)	895 (Ref.)	760 (Ref.)									
	F ₂	760 (Ref.)												
Pivot Vertical gap [mm]	K ₁₁	30 ⁺¹⁵ ₋₅												
		30 ⁺¹⁵ ₋₅												



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Proj:
PRASA

SI.FT1140.52

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 242	A'ii 244	A'iii 242	A'iv 242
An	254 to 261	Ai 256	Aii 256	Aiii 256	Aiv 257
Bn = An - A'n	N/A	Bi 14	Bii 12	Biii 14	Biv 15
En	1106 ±10 mm	Ei 1104	Eii 1112	Eiii 1106	Eiv 1111

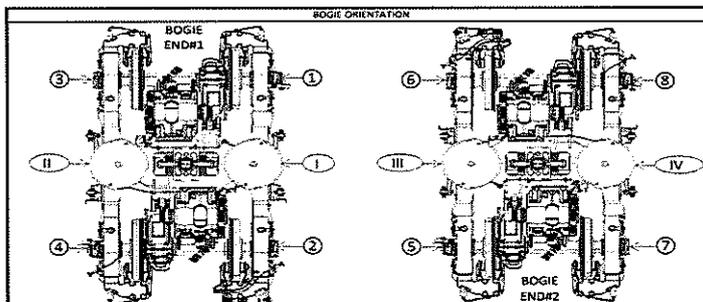
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2.91	Cii 2.94	Ciii 2.78	Civ 2.82
Cn - Cn+1	Difference ≤ 0,3	0,03		0,04	
Gauge serial number	N/A	G1B05873	G1B05873	G1B05873	G1B05873

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 43.85	D2 44.39	D3 44.77	D4 45.61
		D5 44.63	D6 43.19	D7 45.47	D8 44.85
Kn	25 to 45	36.45		36.49	
Jn	Diference ≤ 4	Ji 24.56	Jii 26.33	Jiii 26.61	Jiv 24.60

(*) 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	Tbin	Tbex	
D=	35 ⁺¹² / ₋₅											

Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	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	



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



Gibela Rail Transport Consortium RF (Pty)
Ltd
2 Shosholoza Avenue
Dunrobert X7
Ekurhuleni, 1590, South Africa
Reception: +27 (0)10 600 0651

TRAIN SET Z34
REF: GIB000001672 JO PRASA WEIGHT BALANCE EN
PCOB WEIGHING REPORT

Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance 5.0%
	18.55	18.00	1.50%	PASS
Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Tolerance [%]
	36.55	36.87	0.85%	1.37%
				Criteria MineDiffMax
				PASS

GIBELA	
Name	Date
ELWS	08/07/2024
Company	Department
GIBELA Rail	EOC
Signature	
<i>[Signature]</i>	