



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	X	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 219	M1		22/04/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY	Rev:09	Projet: PRASA	SI.FT1140.52
		Date:		

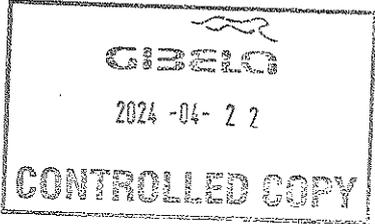
Car:	NCR:	Work Station:	FT1140
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I - Document and Instrument Control

I.1 - Documents control									
Document	TC1	M1	M2	M3	M4	TC2	Revised	Remark	Signature/Date
PRA.FT1140.04		X							<i>M/ 23/04/24</i>
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	Signature/Date
<i>Measuring TAPE</i>	<i>GIBTA 0276</i>	<i>26/10/23-26/10/24</i>	<i>✓</i>	<i>M/ 23/04/24</i>
<i>Vernier Caliper</i>	<i>GIBVR 0056</i>	<i>06/10/23-06/10/24</i>	<i>✓</i>	<i>23/04/24</i>
<i>Torque Wrench 320MM</i>	<i>A9650027</i>	<i>21/12/23-21/12/24</i>	<i>✓</i>	<i>22/04/24</i>
<i>Torque Wrench 150MM</i>	<i>D2862009</i>	<i>19/12/23-19/12/24</i>	<i>✓</i>	<i>22/04/24</i>
<i>Torque Wrench 35MM</i>	<i>D2511023</i>	<i>07/08/23-07/08/24</i>	<i>✓</i>	<i>22/04/24</i>





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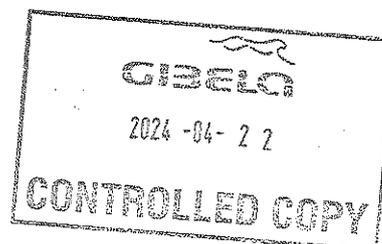
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II - Self Inspection - Items to Check

II.1 - Items to Check

Item	Picture/Sketch	Description	Criteria/Record	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		<input checked="" type="checkbox"/>	 23/04/24
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): 1.0 bar Final pressure (FP): 0.56 bar FP - IP = 0.44 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	<input checked="" type="checkbox"/>	 22/04/24
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		<input checked="" type="checkbox"/>	 23/04/24
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 19/12/23	<input checked="" type="checkbox"/>	 23/04/24
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) 360 (simulated) 360	<input checked="" type="checkbox"/>	 22/04/24
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		<input checked="" type="checkbox"/>	 23/04/24
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project		<input checked="" type="checkbox"/>	 23/04/24
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		<input checked="" type="checkbox"/>	 23/04/24





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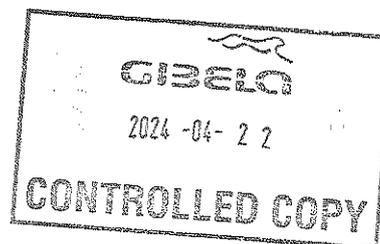
Date:

5/31/2022

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Item	Picture/Sketch	Description	Criteria/Procedure	Y	N	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓		 22/04/24
10	 0.00% 0.00% 0.00% 0.00% 1.99% -5.97% 1.30% -1.35% 93.50 kN 93.72 kN 92.42 kN 91.84 kN	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).		✓		 23/04/24
11	 0.00% 0.00% 0.00% 0.00% 1.89% -5.97% 1.30% -1.35% 92.59 kN 93.72 kN 92.42 kN 91.84 kN	Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓		 23/04/24
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	✓		 22/04/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 22/04/24
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)	✓		 22/04/24
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	✓		 22/04/24
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓		 23/04/24





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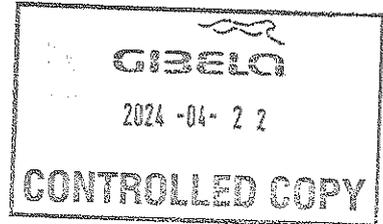
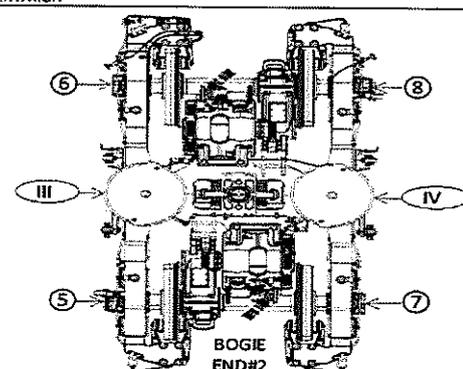
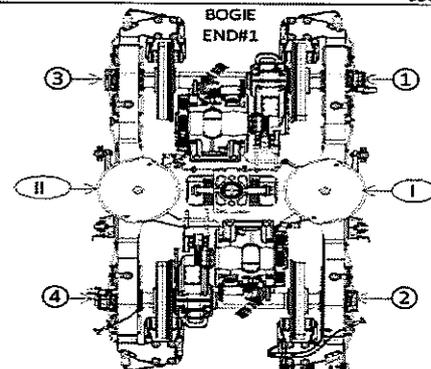
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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

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 ¹	/	/	/	/	/	/	/	/	/	/	/	/
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ⁱⁱ	/	/	/	259	257	258	251	256	257	/	/	/
FLOOR COVERING HEIGHT	min 1096 max 1116	E ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
AIR SPRING PRESSURE	≤ 0.3 (Ci - Ci)	C ⁱⁱ	/	/	/	2.92	2.91	3.58	4.84	2.82	3.02	/	/	/
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ^s	/	/	/	/	/	/	/	/	/	/	/	/
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁴	/	/	/	/	/	/	/	/	/	/	/	/
PIVOT VERTICAL GAP	min 25 max 32	K ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Ji - Ji)	J ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
QTY OF TURNS OF LEVELLING ROD	N/A	X ⁱⁱ	/	/	/	/	/	/	1 1/2	/	/	/	/	/
SHIMS OF ANTI-ROLL BAR	N/A	Y ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
AIR SPRING HEIGHT (EMPTY)	N/A	A ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ⁱⁱⁱ	/	/	/	258	258	258	246	253	256	/	/	/
FLOOR COVERING HEIGHT	min 1096 max 1116	E ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
AIR SPRING PRESSURE	≤ 0.3 (Civ - Cii)	C ⁱⁱⁱ	/	/	/	2.88	2.81	4.39	3.27	2.79	2.82	/	/	/
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ^s	/	/	/	/	/	/	/	/	/	/	/	/
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁶	/	/	/	/	/	/	/	/	/	/	/	/
PIVOT VERTICAL GAP	min 25 max 32	K ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Jiv - Jii)	J ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/
QTY OF TURNS OF LEVELLING ROD	N/A	X ⁱⁱⁱ	/	/	/	/	/	/	2 1/2	1	/	/	/	/
SHIMS OF ANTI-ROLL BAR	N/A	Y ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	/

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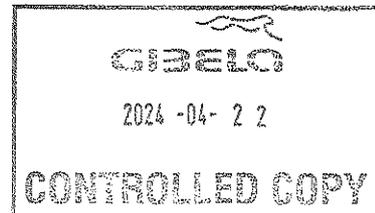
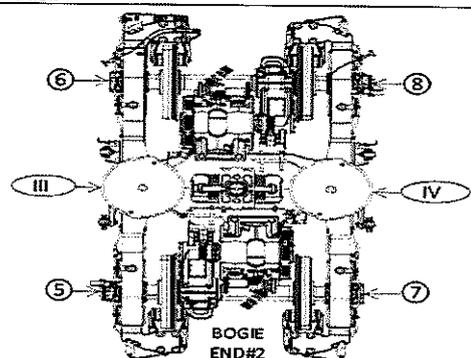
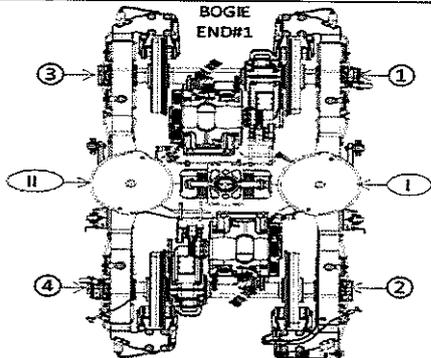
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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

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	A ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	A ⁱ
FLOOR COVERING HEIGHT	min 1096 max 1116	E ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	E ⁱ
AIR SPRING PRESSURE	≤ 0.3 (C ⁱ - C ⁱ)	C ⁱ	/	/	/	/	/	/	/	/	/	/	/	C ⁱ
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 ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	K ⁱ
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J ⁱ - J ⁱ)	J ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	J ⁱ
QTY OF TURNS OF LEVELLING ROD	N/A	X ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	X ⁱ
SHIMS OF ANTI-ROLL BAR	N/A	Y ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	Y 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	/	/	/	/	/	/	/	/	/	/	/	E ^{iv}
AIR SPRING PRESSURE	≤ 0.3 (C ^{iv} - C ^{iv})	C ⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	C ^v
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 ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	K ^v
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J ^{iv} - J ^{iv})	J ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	J ^v
QTY OF TURNS OF LEVELLING ROD	N/A	X ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	X ^v
SHIMS OF ANTI-ROLL BAR	N/A	Y ⁱⁱⁱ	/	/	/	/	/	/	/	/	/	/	/	Y ^v

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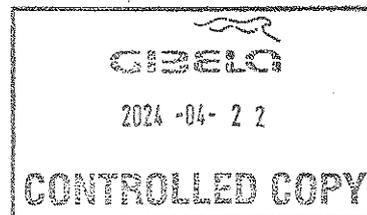
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Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM	THEORETICAL VALUES													
	TC1 CAR		M4 CAR		ME CAR		M2 CAR		M3 CAR		TC2 CAR			
	TPert	TBIrt	MB1	MB2	MB1	MB2	MB1	MB2	MB1	MB2	MB1	TBIrt	TBIrt	
Pivot lateral stop gaps difference (mm)	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	
Air Spring height (mm)	255 ⁺⁶ ₋₄													
Air spring pressure at AWO (Bar)	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.)	2,83 (Ref.)	3,76 (Ref.)	
Primary suspension gaps (mm)	C ₁₁ -C ₁₁	0,3 Máx.												
	C ₂₁ -C ₂₁	0,3 Máx.												
	D ₁₁ /D ₅	35 ⁺¹¹ ₋₅												
	D ₂₁ /D ₆	35 ⁺¹¹ ₋₅												
Carbody floor height (mm)	1106 ⁺¹⁰ ₋₁₀													
Booster height (mm)	850 ⁺⁵ ₋₇													
Coupling End height (mm)	F ₁	895 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)									
	F ₂	760 (Ref.)												
Pivot Vertical gap (mm)	30 ⁺¹⁵ ₋₅													





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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

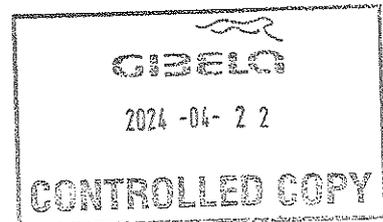
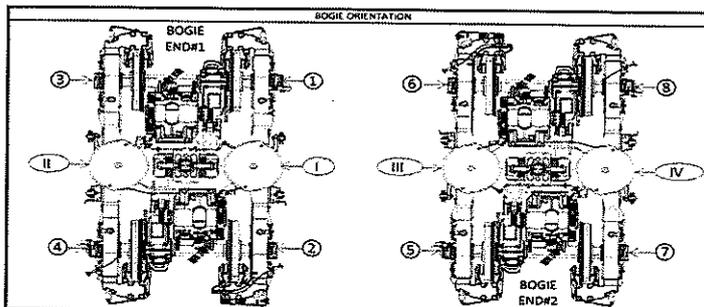
- An Air spring height
- Bn Difference between measurement A'n and An
- En Floor covering height
- Cn Air spring pressure
- Dn Primary suspension
- Kn Pivot Vertical gap
- Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 239	A'ii 241	A'iii 242	A'iv 240
An	254 to 281	Ai 257	Aii 258	Aiii 258	Aiv 256
Bn = An - A'n	N/A	Bi 18	Bii 17	Biii 16	Biv 16
En	1106 ±10 mm	Ei 1110	Eii 1113	Eiii 1112	Eiv 1112
Item	Reference [bar]	END#1		END#2	
Cn	Table 02 (*)	Ci 2,78	Cii 2,81	Ciii 2,91	Civ 2,93
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,03		Ciii - Civ 0,02	
Gauge serial number	N/A	G1B05873	G1B05873	G1B05873	G1B05873
Item	Reference [mm]	END#1		END#2	
Dn	Table 01 (*)	D1 42,92	D3 44,55	D5 45,52	D6 45,97
		D2 44,27	D4 44,12	D5 46,59	D7 46,08
Kn	25 to 45	K1 31,16		K2 32,17	
Jn	Difference ≤ 4	Ji 25,78	Jii 24,97	Jiii 24,98	Jiv 25,05

(*) 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											

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)

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



TRAIN SET 219 REF: GIB0000001672_JO PRASA WEIGHT BALANCE EN
 PC09 WEIGHING REPORT

	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 3%
M1	18.67	18.13	1.47%	PASS
	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria MinDiffMax
	36.80	36.87	0.18%	1.37% PASS

Name	Company	Department	EOC	Signature	Date
Huley Curone	GIBELA Rail	EOC		[Signature]	30/4/2024