

CONFIDENTIAL INFORMATION




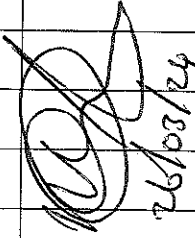
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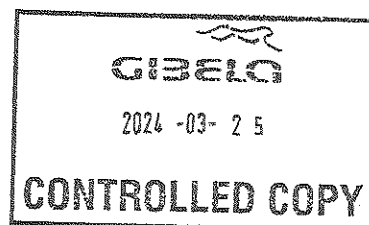
APPLICATION REFERENCE

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	<input checked="" type="checkbox"/>	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
15 216	M1	P. Sisi	26/03/24	SI.FT1140.52	01/08





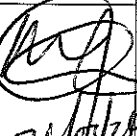








	<h2 style="margin: 0;">SELF INSPECTION INDUSTRIAL QUALITY</h2>		Rev:09	Projet: PRASA	SI.FT1140.52				
			Date: 5/31/2022						
Car:		NCR:		Work Station FT1140					
 Safety Related									
I - Document and Instrument Control									
I.1 - Documents control									
Document	TC1	M1	M2	M3	TC2	Revision	Remark	OK	Signature/Date
PRA.FT1140.04									
PRA.FT1140.05		X						✓	 26/03/24
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			
Vener Calliper	GIBUR 0056		06/06/23-06/06/24		✓	 26/03/24			
Measuring Tape	GIBTA 0276		26/10/23-26/10/24		✓				
Torque Wrench 35N.m	D2511023		19/12/23-19/12/24		✓				
Torque Wrench 150N.m	D28622009		19/12/23-19/12/24		✓				
Torque Wrench 320N.m	A9650027		21/12/23-21/12/24		✓				

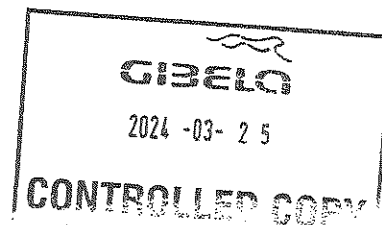




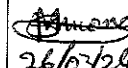
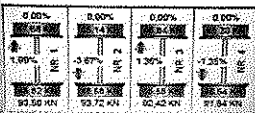

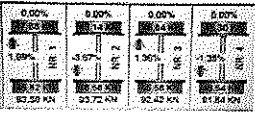






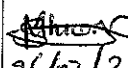


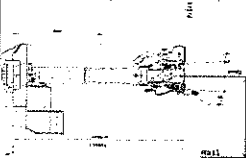
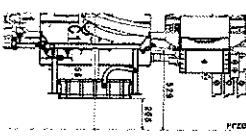
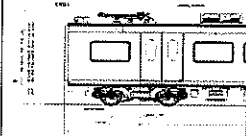

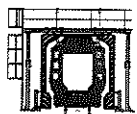

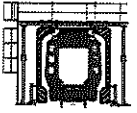

	<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>	Rev:08	Proj: PRASA	SI.FT1140.52
		Date:		
		5/31/2022		

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		✓	M.O.T 25/03/24								
02		Check underframe pipe system Air tightness. Test performance according to WI PRAFT1130.15.	The test was performed and no leak was observed. Initial pressure (IP): 0.03 bar Final pressure (FP): 0.01 bar FP - IP = 0.03 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓	M.O.T 25/03/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓	 26/03/24								
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 14/12/2023	✓	 26/03/24								
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><tr><th>EQUIPMENT DESCRIPTION</th><th>WEIGHT (kg)</th></tr><tr><td>Gangways</td><td>360</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Gangways	360					✓	 26/03/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)												
Gangways	360												
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓	 26/03/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓	 26/03/24								
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓	 26/03/24								



		<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09 Date: 5/31/2022		Project: PRASA		SI.FT1140.52	
Ref	Picture/Detail	Description	Criteria/Record	OK	NO	Signature/Date			
09		Check that the levelling rods are torqued and have torque marker.		✓		 26/03/24			
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).		✓		 26/03/20			
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of ≤4%.		✓		 26/03/24			
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I  II  III  IV 	✓		 26/03/20			
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 26/03/24			
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 VI 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)	✓		 26/03/24			
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	✓		 26/03/24			
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓		 26/03/24.			



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Project:
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	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 ^{II}											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 ^I											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 ^{III}											C ^{IV}
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 ^{IV}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J ^{IV} - J ^{IV})	J ^{III}											J ^{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{III}											X ^{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{III}											Y ^{IV}

COMPARE EACH TENTATIVE WITH
THE TOLERANCE AND IDENTIFY
EACH MEASURE AS BELOW

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT
COMPENSATION

EQUIPMENT

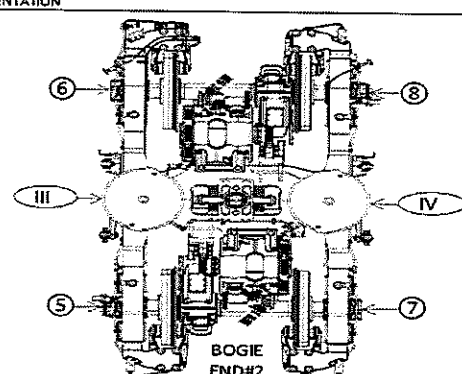
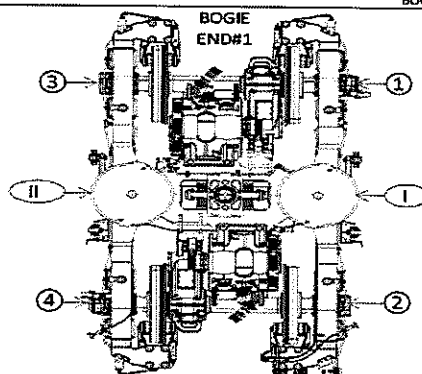
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TO CARS)AUTOMATIC COUPLER
HEIGHT

ANTENNA HEIGHT



GIBELO

2024 -03- 2 5

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SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Project:
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	A ^{II}					258	258					A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}					1110	1110					E ^I
AIR SPRING PRESSURE	≤ 0.3 (Q _I - Q)	C ^{II}					2.98	2.87					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)	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
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{III}											A ^{IV}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{III}					257	257					A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}					1103	1104					E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (Q _{IV} - Q _{III})	C ^{III}					2.70	2.86					C ^{IV}
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 ^{IV}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _{IV} - J _{III})	J ^{III}											J ^{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{III}											X ^{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{III}											Y ^{IV}

COMPARE EACH TENTATIVE WITH THE TOLERANCE AND IDENTIFY EACH MEASURE AS BELOW:

GOOD LOWER HIGHER



WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

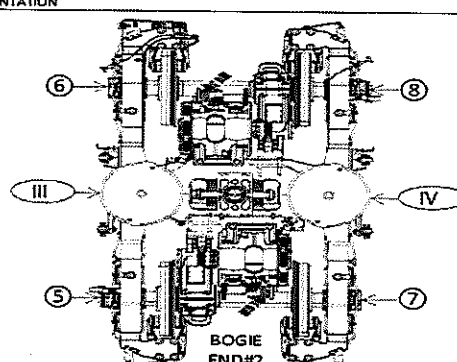
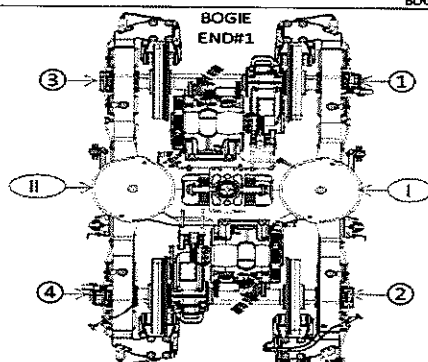
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TC CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT




GIBELQ

2024-03-25

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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		TCL CAR	
		TBext	TBint	MB1	MB2	MB1	MB2	MB2	MB1	MB1	MB2	TBint	TBext
Pivot lateral stop gaps difference (mm)	Fig. 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Air Spring height (mm)	Fig. 5	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}	255^{+4}_{-4}
Air spring pressure at AWD (Bar)	Fig. 5	3,76	2,82	2,87	2,83	3,02	2,91	3,07	2,85	2,83	2,87	2,83	3,76
		(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Primary Suspension gaps (mm)	$C_1 - C_0$	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.
	$C_{10} - C_{11}$	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.
	$D_{11} D_{15}$	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅
	$D_{11} D_{16}$	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅	35 ⁺¹⁰ ₋₅
Carbody Floor height (mm)	Fig. 6	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)	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)	Fig. 8	895 (Ref.)	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)
Pivot Vertical gap (mm)	Fig. 9	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)
	Fig. 10	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅	30 ⁺¹⁰ ₋₅

	<h1>SELF INSPECTION 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

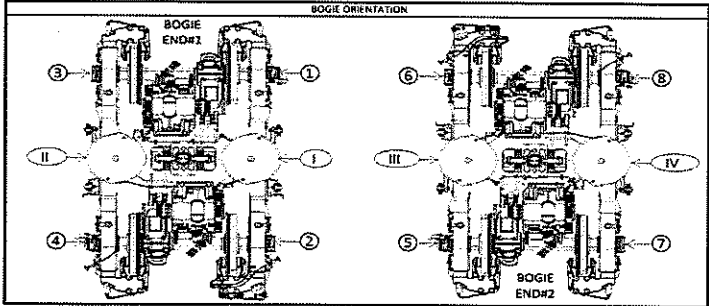
 References for secondary suspension full
 An Air spring height
 Bn Difference between measurement A'n and An
 En Floor covering height
 Cn Air spring pressure
 Dn Primary suspension
 Kn Pivot Vertical gap
 Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 239	A'ii 241	A'iii 241	A'iv 238
An	254 to 261	Ai 256	Aii 258	Aiii 258	Aiv 257
Bn = An - A'n	N/A	Bi 17	Bii 17	Biii 17	Biv 19
En	1106 ±10 mm	Ei 1110	Eii 1110	Eiii 1108	Eiv 1107
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2.086	Cii 2.094	Ciii 2.76	Civ 2.83
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0.08		Ciii - Civ 0.07	
Gauge serial number	N/A	51B05875 51B05875		51B05875 51B05875	
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 44.15	D2 44.48	D3 45.16	D4 46.09
		Dz 45.09	Ds 43.62	Dt 45.97	Du 45.21
Kn	25 to 45	Ki 36.18		Kii 35.78	
Jn	Difference ≤ 4	Ji 26.37	Jii 25.02	Jiii 25.51	Jiv 25.12

(*) 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	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	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






2024 -03- 2 5

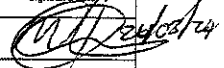
CONTROLLED COPY

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

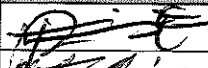

	<h1 style="margin: 0;">SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Project: PRASA	SI.FT1140.52
			Date:		
			5/31/2022		

Item	Description of defects	N°	Date	Signature

II.2 - Check List REX

Check List Items						
Item	Picture/Drawing	Description	Criteria/Record	Yes	No	Signature/Date
01	N/A	To complete REX	Refer to REX. New defects must be added on the REX	✓		

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!	25/03/2024	Operations Manager		
		Every auto inspection performed conforms to specification or in case of discrepancy the same is approved by the competent party.	25/03/2024	Industrial Quality		
	NO GO	There are activities pending 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		

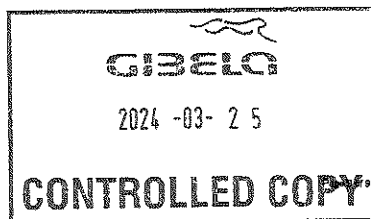
In case of "NO GO", describe blocking problems

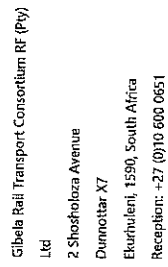
In case of "NO GO", the operations manager must define below action plan to ensure "GO":

Item	Description	Action	Responsible	Status

Operations Manager / Team Leader

Quality Manager / Team Leader





	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 3%
M1	18.61	18.17	1.20%	PASS
	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria Min/Diff/Max
	36.78	36.87	0.23%	1.37% PASS

Test Participants			
Name	Company	Department	Date
5/125	GIBELA Rail	EOC	26/03/2024