

GIBELQ

2024-07-23

CONTROL

PRASA PROJECT

GIBELQ



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		
☐	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140	1	X	1	1		PRA.FT1140.04	YES
☐	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1				1	PRA.FT1140.05	YES
☐	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
☐	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	1	1	1	1	PRA.FT1140.05	YES
☐										
☐										
☐										

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 337	M1	Andrew	23/07/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Date: 5/31/2022	Project: PRASA	SI.FT1140.52				
Gert:	NGR:		Work Station FT1140							
 Safety Related										
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		✓							✓	<i>[Signature]</i> 23/07/24
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				
Messuring tape	GIBTA 00276		26-08-23 - 26-08-24		✓	<i>[Signature]</i> 23/07/24				
Venier Caliper	GIBVR 0050		06-08-23 / 06-08-24		✓	<i>[Signature]</i> 23/07/24				
Torque Wrench 35 N.m	D2511023		19-12-23 - 19-12-24		✓	<i>[Signature]</i> 23/07/24				
Torque Wrench 180 N.m	D28622009		19-12-23 - 19-12-24		✓	<i>[Signature]</i> 23/07/24				
Torque Wrench 320 N.m	A96 30027		21-12-23 - 21-12-24		✓	<i>[Signature]</i> 23/07/24				





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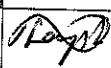
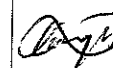
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II - Self Inspection - Items to Check

II.1 - Items to Check

IL1 - Items to Check

Item	Picture/Sketch	Description	Critical/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		✓		 23/07/24										
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): 4.53 bar Final pressure (FP): 3.75 bar FP - IP = 0.78 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓		 23/07/24										
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 23/07/24										
04		Measurement inspection was done with car on condition AWO and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration Validation Date 19.12.2023	✓		 23/07/24										
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)	<table><thead><tr><th>EQUIPMENT DESCRIPTION</th><th>WEIGHT (kg)</th></tr></thead><tbody><tr><td>CIANGLIWAY</td><td>360</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	CIANGLIWAY	360							✓		 23/07/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)															
CIANGLIWAY	360															
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 23/07/24										
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 23/07/24										
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 23/07/24										

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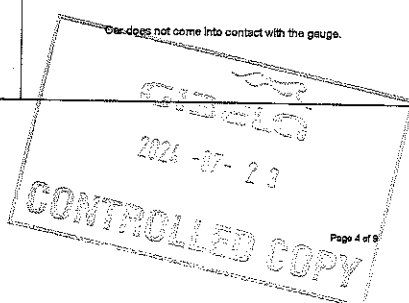
Date:

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Item	Picture/Sketch	Description	Criteria/Record	C.H.	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓	 23/07/20
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).		✓	 23/07/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	 23/07/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I 0.00 II 0.00 III 0.00 IV 0.00		 23/07/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	 23/07/24
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 Eurobelise 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)	✓	 23/07/20
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	✓	 23/07/24
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓	 23/07/24





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

		END#1												
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}						256	261					A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}												E ^I
AIR SPRING PRESSURE	≤ 0.3 (O _I - O _I)	C ^{II}						2.89	2.90					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 ^{II} - J ^I)	J ^{II}												J ^I
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}						1 1/4	1					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}						256	262					A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}												E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (O _{IV} - O _{IV})	C ^{III}						2.80	2.83					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}						0	1					X ^{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{III}												Y ^{IV}
			LEFT SIDE						RIGHT SIDE					

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

GOOD	LOWER	HIGHER
✓	↓	↑

WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

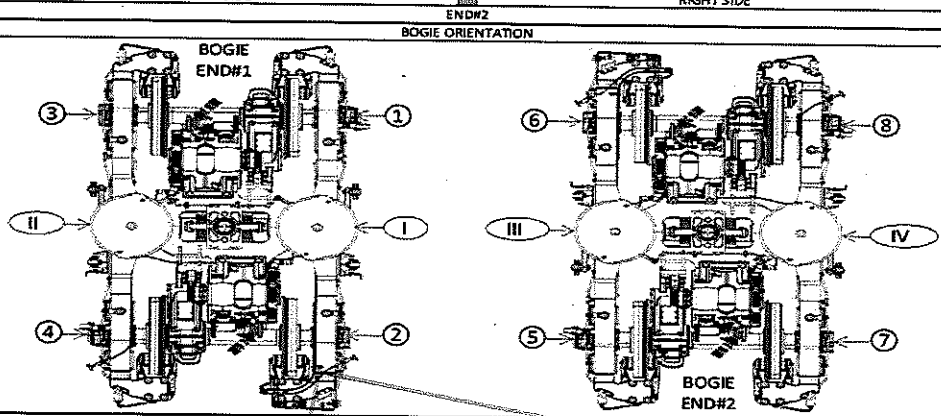
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



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

DESCRIPTION	TOLERANCE	END#1												END#2											
		LEFT SIDE						RIGHT SIDE						LEFT SIDE						RIGHT SIDE					
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{II}												A ^{IV}											A ^{IV}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{II}												A ^{IV}											A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}												E ^{IV}											E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (Q _I - Q _I)	C ^{II}												C ^{IV}											C ^{IV}
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ³												D ⁷											D ⁷
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁴												D ⁸											D ⁸
PIVOT VERTICAL GAP	min 25 max 32	K ^{II}												K ^{IV}											K ^{IV}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _I - J _I)	J ^{II}												J ^{IV}											J ^{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}												X ^{IV}											X ^{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{II}												Y ^{IV}											Y ^{IV}
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{III}												A ^{IV}											A ^{IV}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{III}												A ^{IV}											A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}												E ^{IV}											E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (Q _V - Q ₈)	C ^{III}												C ^{IV}											C ^{IV}
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁵												D ⁷											D ⁷
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁶												D ⁸											D ⁸
PIVOT VERTICAL GAP	min 25 max 32	K ^{III}												K ^{IV}											K ^{IV}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _{IV} - J _{III})	J ^{III}												J ^{IV}											J ^{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{III}												X ^{IV}											X ^{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{III}												Y ^{IV}											Y ^{IV}

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

GOOD LOWER HIGHER

✓ ↓ ↑

WEIGHT COMPENSATION

EQUIPMENT

WEIGHT

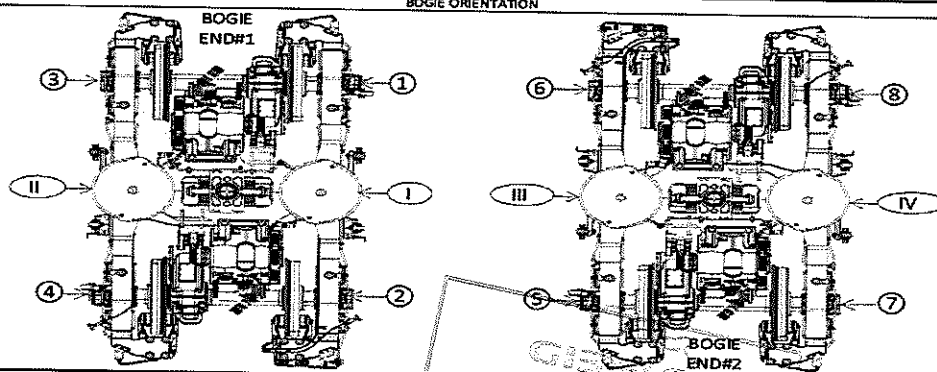
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



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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	MB1	MB1	MB2	MB2	MB1	MB1	MB1	MB1	TBint	TBext
Pivot lateral stop gaps difference (mm)	Jn-In+1 (a+b)	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
	Air Spring height (mm)	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄	255 ⁺⁶ ₋₄
Air spring pressure at AWD [bar]	A _n (a+b)	Fig. 5												
	C _n (a+b)	Fig. 5												
	C ₁ - C ₂	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.)
	C ₃ - C ₄	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.	0,3 Máx.
Primary Suspension gaps (mm)	D ₁ D ₂	Fig. 6												
	D ₂ D ₃	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄	35 ⁺¹² ₋₄
	D ₃ D ₄													
	D ₄ D ₁													
Carbody Floor height (mm)	E _n (a+b)	Fig. 7												
	Height (mm)	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	1106 ⁺¹⁰ ₋₁₀
Bolster height (mm)	N _n (a+b)	Fig. 7												
	Height (mm)	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	850 ⁺³ ₋₇
Coupling End height (mm)	F ₁	Fig. 8												
	F ₂	Fig. 9												
Pivot Vertical gap (mm)	K _n	Fig. 10												
	Height (mm)	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅	30 ⁺¹⁵ ₋₅

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Leveling report from Production (Final measurements after Levelling and Weighting 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

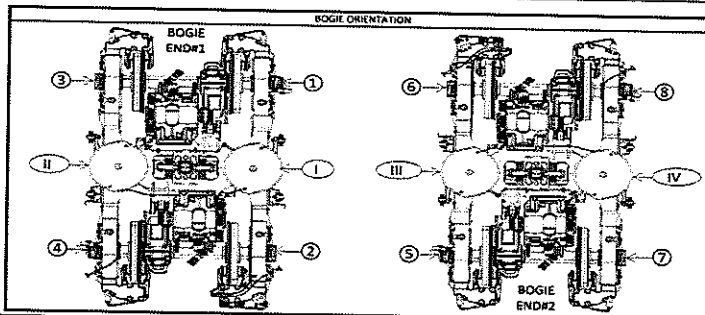
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 241	A'ii 242	A'iii 243	A'iv 241
An	254 to 261	Ai 256	Aii 258	Aiii 258	Aiv 256
Bn = An - A'n	N/A	Bi 15	Bii 16	Biii 15	Biv 15
En	1106 ±10 mm	Ei 1108	Eii 1109	Eiii 1112	Eiv 1108
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 2,77	Civ 2,81
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,03		Ciii - Civ 0,04	
Gauge serial number	N/A	G1B05873		G1B05873	
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 43,49	D3 43,31	D5 45,27	D6 44,78
		D2 42,97	D4 43,39	D5 45,72	D7 44,59
Kn	25 to 45	Ki 37,77		Kii 37,47	
Jn	Difference ≤ 4	Ji 26,10	Jii 24,39	Jiii 25,04	Jiv 26,66

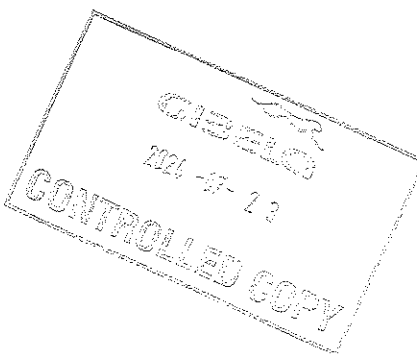
(*) Reference, only include values, isn't approval criteria.

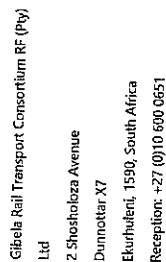
Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
D=	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅	35 ⁺¹² ₋₅

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 Weighting fine)





	Front bogie [Tons]	Rear bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 3%
M1	18.61	18.08	1.44%	PASS
	Weight Measured vs Predicted	Weight Predicted [Tons]	Weight Difference [%]	Criteria Misclassification
	36.69	35.87	0.47%	1.37% PASS

NAME		Company		Department	Test Participants		Signature	Date
Puleraf		GIBELA Rail		EDC			<i>[Signature]</i>	23/07/20