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2024-02-23

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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	1	1		PRA.FT1140.04	YES
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	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	2020/02/11	UPDATE OF AIR TIGHTNESS TEST TIME FROM 4 MIN TO 5 MIN. ADD PANTOGRAPH AIR TIGHTNESS.	APPROVER	GIVEN SILOWA	2020/02/11
			CHECKER	SIMON MOKOENA	2020/02/11
			COMPILER	COMFORT MALATJI	2020/02/11
8	2021/09/13	ADDING GAUGE MEASUREMENT CHECK ON THE SI.	APPROVER	MAKOFANE LUCY	2021/09/13
			CHECKER	RATAU EDISON	2021/09/13
			COMPILER	TSAKANI KHOSA	2021/09/13
9	2022/05/31	pressure valve (APV) Isolation	APPROVER	MAKHURUPETJI THABANG	2022/05/31
			CHECKER	HAZEL MGIBA	2022/05/31
			COMPILER	RATAU EDISON	2021/05/31

TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS 209	TC 2	Goodness	23/02/24	SI.FT1140.52	01/08

	<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>	Rev:09	Projet: PRASA	SI.FT1140.52
		Date:		

2022/05/31

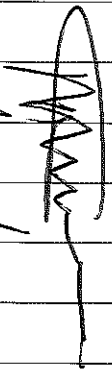
Car:	NCR:	Work Station	FT1140
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Safety Related

I - Document and Instrument Control

I.1 - Documents control									
Document	TC1	K1	K2	K3	K4	TC2	Revision	Remark	Signature/Date
PRA.FT1140.04	✓								✓ 23/02/24
PRA.FT1140.05									
PRA.FT1140.06									

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	✓	 23/02/2024
Vernier Caliper	GIBVC 0056	06/06/23-06/06/24	✓	
Torque Wrench 530N.M	A9630053	21/12/23-21/12/24	✓	
Torque Wrench 320N.M	A9650027	21/12/23-21/12/24	✓	
Torque Wrench 150N.M	D2862009	19/12/23-19/12/24	✓	
Torque Wrench 35N.M	D2511023	19/12/23-19/12/24	✓	
Torque Wrench 17N.M	D2861617	19/12/23-19/12/24	✓	





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

2022/05/31

Projet:
PRASA

SI.FT1140.52

II - Self Inspection - Items to Check

II.1 - Items to Check

IL1 - 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		✓		 23/02/24								
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): 10.00 bar Final pressure (FP): 9.37 bar FP - IP = 0.63 APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓		 23/02/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 23/02/24								
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 19/12/24	✓		 23/02/24								
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>Driver Seat</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Driver Seat	60					✓		 23/02/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)													
Driver Seat	60													
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 23/02/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 23/02/24								
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 23/02/24								

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GIBELQ		SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Project: PRASA	SI.FT1140.52
				Date: 2022/05/31		
Item	Picture/Sketch	Description	Criteria/Record	✓		Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓		 23/02/24
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).		✓		 23/02/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓		 23/02/24
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 6	✓		 23/02/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 23/02/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5 / -10mm) (Using levelled rail)	TC CAB #1= 596 mm	✓		 23/02/24
15		FOR TC CARS Height of Eurobalise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= 205 mm	✓		 23/02/24
16		Check pantograph piping air tightness. Test performance according to VRI PRA.FT1140.17.	The test was performed and no leak was observed. -Roof piping connection fittings. -Roof piping connection fittings(Roof arch and door trimming)			N/A
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			N/A
18		Car does not come into contact with the gauge.	No Contact with Car and Gauge -GO Contact with Car and Gauge - NO GO	✓		 23/02/24

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SELF INSPECTION INDUSTRIAL QUALITY

Rev:08

Date:

2022/05/31

Projet:
PRASA

SI.FT1140.52

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 ¹ _{II}	/	/	/	/	/	/	/	/	/	/	/	A ¹ _I	
AIR SPRING HEIGHT (FULL)	min 254 max 261	A _{II}	/	/	/	/	/	257	260	/	/	/	/	A _I	
FLOOR COVERING HEIGHT	min 1096 max 1116	E _{II}	/	/	/	/	/	1112	1115	/	/	/	/	E _I	
AIR SPRING PRESSURE	≤ 0.3 (C _I - C _I)	C _{II}	/	/	/	/	/	3.52	3.65	/	/	/	/	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 ¹ _{III}	/	/	/	/	/	/	/	/	/	/	/	/	A ¹ _{IV}
AIR SPRING HEIGHT (FULL)	min 254 max 261	A _{III}	/	/	/	/	/	257	255	/	/	/	/	/	A _{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E _{III}	/	/	/	/	/	1100	1108	/	/	/	/	/	E _{IV}
AIR SPRING PRESSURE	≤ 0.3 (C _{IV} - C _{IV})	C _{III}	/	/	/	/	/	287	267	/	/	/	/	/	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

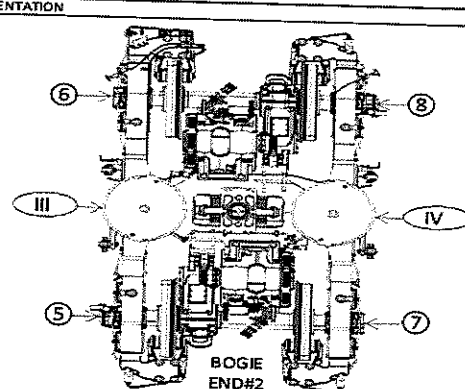
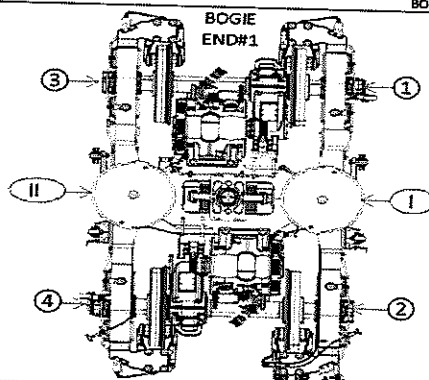
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TC 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	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}																	A ^I
AIR SPRING PRESSURE	≤ 0.3 (Q _I - Q _I)	C ^{II}																	E ^I
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ³																	C ^I
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁴																	D ¹
PIVOT VERTICAL GAP	min 25 max 32	K ^{II}																	D ²
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (J _I - J _I)	J ^{II}																	K ^I
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}																	J ^I
SHIMS OF ANTI-ROLL BAR	N/A	Y ^{II}																	X ^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 (Q _{IV} - Q _{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

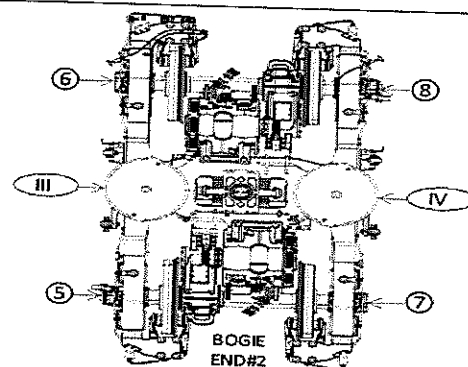
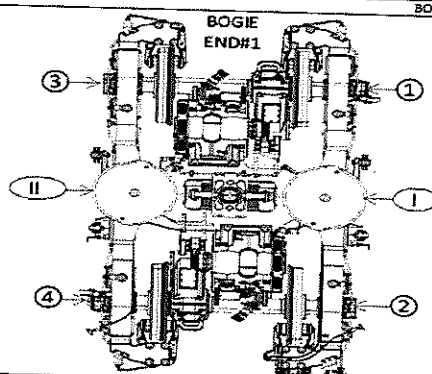


Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES											
		T1 CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		T2 CAR	
		T1Ext	T1Int	M4B1	M4B2	M1B1	M1B2	M2B1	M2B2	M3B1	M3B2	T2Ext	T2Int
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 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁	255 ⁺⁶ ₋₁
Air spring pressure at AWO [Bar]	Fig. 5	3,76	2,82	2,87	2,91	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.)
		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]	Fig. 6	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃	35 ⁺¹⁵ ₋₃
Carbody Floor height [mm]	Fig. 7	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.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	895	(Ref.)
	Fig. 9	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)
Pivot Vertical gap [mm]	Fig. 10	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

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

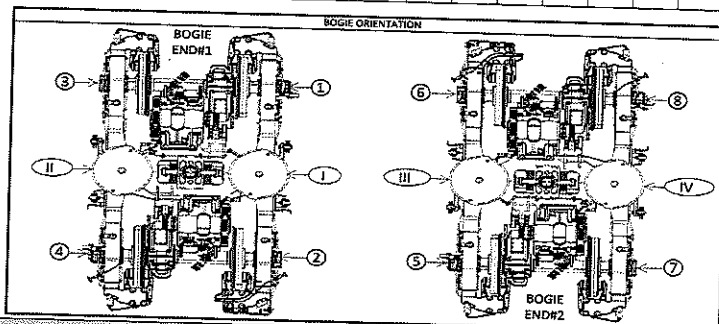
An Air spring height
Bn Difference between measurement A'n and An
En Floor covering height
Cn Air spring pressure
Dn Primary suspension
Kn Pivot Vertical gap
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 231	A'i 231	A'ii 242	A'iv 241
An	254 to 261	Ai 260	Aii 257	Aii 257	Aiv 255
Bn = An - A'n	N/A	Bi 29	Bii 26	Bii 15	Biv 14
En	1106 ±10 mm	Ei 1115	Eii 1112	Eii 1100	Eiv 1108
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3,65	Cii 3,52	Cii 2,87	Civ 2,67
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,13		Cii - Civ 0,2	
Gauge serial number	N/A	GIB05875	GIB05875	GIB05875	GIB05875
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 43,32	D2 44,47	Ds 44,22	Ds 45,98
		D2 44,09	Ds 44,69	Ds 44,34	D7 45,75
Kn	25 to 45	30,94		30,15	
Jn	Difference ≤ 4	Ji 25,30	Jii 25,55	Jii 25,15	Jiv 25,12

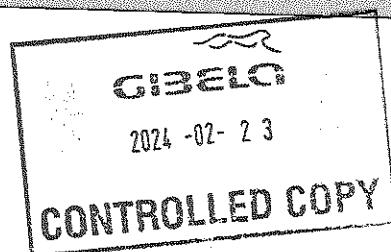
(*) Reference, only include values, isn't approval criteria.

Table 01 D Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	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

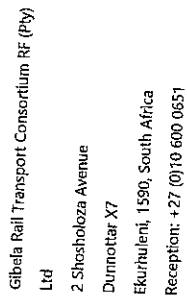
Table 02 C Theoretical Values	TC1		M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb1	Mb1	Mb2	Mb1	Mb1	Mb1	Mb1	Tbin	Tbex
C=	3,76	2,82	2,87	2,83	3,02	2,91	3,07	2,85	2,83	2,87	2,83	3,76



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



[illegible]



PC09 WEIGHING REPORT

[illegible]