

GIBELO

2024-03-20

CONTROLLED COPY

PRASA PROJECT


GIBELO

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.

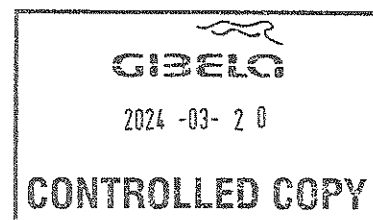
APPLICATION REFERENCE


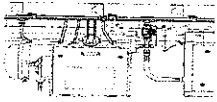
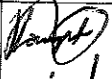










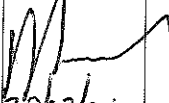

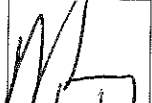
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			TC1	M4	M1	M2	M3	TC2		
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<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1				1	PRA.FT1140.05	YES
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<input type="checkbox"/>										
<input type="checkbox"/>										

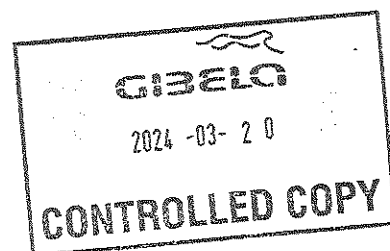
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7	2/11/2020	UPDATE OF AIR TIGHTNESS TEST TIME FROM 4 MIN TO 5 MIN. ADD PANTOGRAPH AIR TIGHTNESS.	APPROVER	GIVEN SILOWA	2/11/2020
			CHECKER	SIMON MOKOENA	2/11/2020
			COMPILER	COMFORT MALATJI	2/11/2020
8	9/13/2021	ADDING GAUGE MEASUREMENT CHECK ON 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



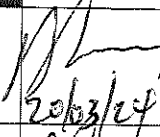
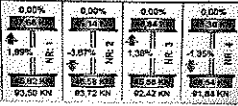
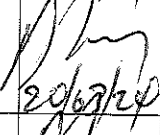
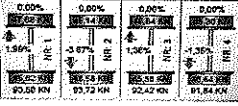
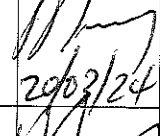
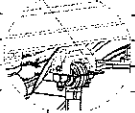




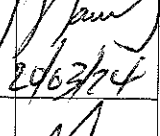
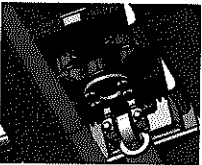
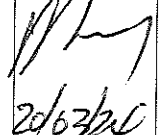
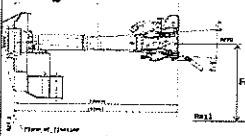
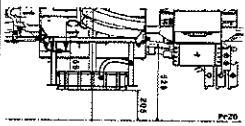
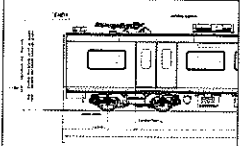
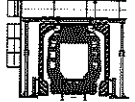
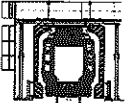
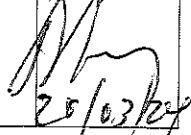
TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS 215	M4	Makofane	20/03/24	SI.FT1140.52	01/08

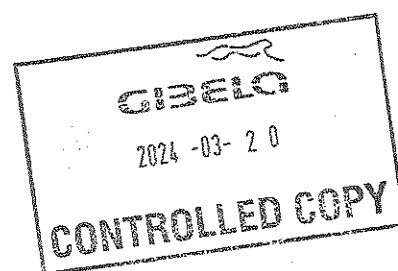
	SELF INSPECTION INDUSTRIAL QUALITY		Rev:08 Date: 5/31/2022	Project: PRASA	SI.FT1140.52																																																						
	Car: _____ NCR: _____		Work Station: FT1140																																																								
<div style="display: flex; align-items: center; justify-content: center;">  Safety Related </div>																																																											
I - Document and Instrument Control																																																											
L1 - Documents control																																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: 0.7em;">Document</th> <th style="font-size: 0.7em;">TC1</th> <th style="font-size: 0.7em;">M1</th> <th style="font-size: 0.7em;">M2</th> <th style="font-size: 0.7em;">M3</th> <th style="font-size: 0.7em;">M4</th> <th style="font-size: 0.7em;">TC2</th> <th style="font-size: 0.7em;">Revision</th> <th style="font-size: 0.7em;">Remark</th> <th style="font-size: 0.7em;">OK</th> <th style="font-size: 0.7em;">NOK</th> <th style="font-size: 0.7em;">Signature/Date</th> </tr> </thead> <tbody> <tr> <td style="font-size: 0.8em;">PRA.FT1140.04</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td style="font-size: 0.8em;">PRA.FT1140.05</td> <td></td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td></td><td style="font-size: 0.9em;">M4 20/03/24</td> </tr> <tr> <td style="font-size: 0.8em;">PRA.FT1140.05</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	NOK	Signature/Date	PRA.FT1140.04												PRA.FT1140.05					✓				✓		M4 20/03/24	PRA.FT1140.05																						
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L2 - Instruments Control - Monitoring and Measuring Instrument Control (Used for all Instrument with calibration needed)																																																											
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	<h1 style="text-align: center;">SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Project: 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		✓	 20/03/24								
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): 9.76 bar Final pressure (FP): 9.73 bar FP - IP = 0.03 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓	 20/03/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓	 20/03/24								
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 19/12/23	✓	 20/03/24								
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 border="1"> <thead> <tr> <th>EQUIPMENT DESCRIPTION</th> <th>WEIGHT (kg)</th> </tr> </thead> <tbody> <tr> <td>GarageWAY</td> <td>36</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	GarageWAY	36					✓	 20/03/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)												
GarageWAY	36												
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓	 20/03/24								
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓	 20/03/24								
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓	 20/03/24								



		<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09 Date: 5/31/2022	Project: PRASA	SI.FT1140.52
Item	Picture/Sketch	Description	Criteria/Record	OK	NG	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓		 20/03/24
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).		✓		 20/03/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of ≤ 4%.		✓		 20/03/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I  II  III  IV 	✓		 20/03/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 20/03/24
14		FOR TC CARS F = Height of the center of Automatic coupler F = 885mm (+5 / -10mm) (Using levelled rail)	TC CAB #1 = _____ mm			M/A
15		FOR TC CARS Height of Eurobalise Antenna = 205mm (+/-10mm) (Using levelled rail)	TC CAB #1 = _____ mm			M/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)			M/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			M/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	✓		 20/03/24





SELF INSPECTION INDUSTRIAL QUALITY

Rev:08

Date:

5/31/2022

Projet:
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}			259	258	259	269	257	259			A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}											E ^I
AIR SPRING PRESSURE	≤ 0.3 (C ^{II} - C ^I)	C ^{II}			2.73	2.78	2.79	2.74	2.74	2.73			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 ^{II})	J ^{II}											J ^I
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}					27						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	253	249	261	254	257			A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}											E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (C ^{IV} - C ^{III})	C ^{III}			2.76	2.76	2.78	2.70	2.79	2.79			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}					27						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

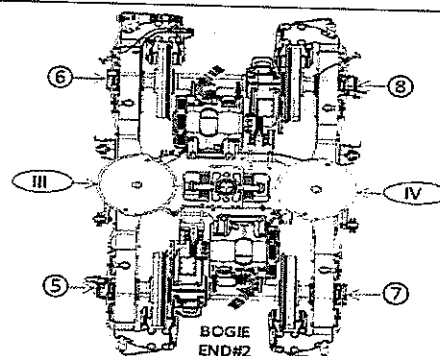
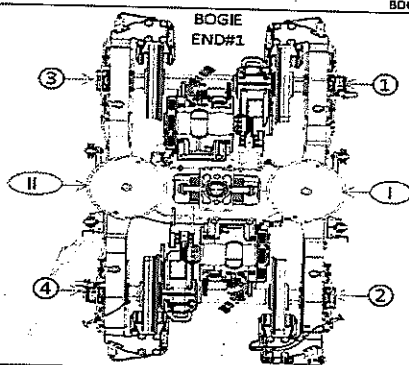
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TC CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



GIBELQ

2024 -03- 2 0

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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)

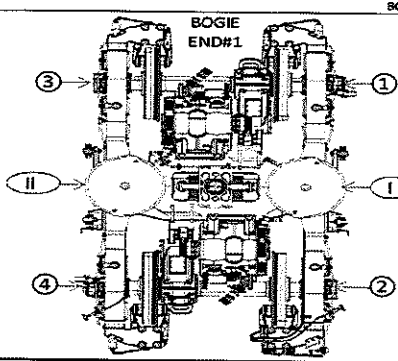
DESCRIPTION	TOLERANCE	LEFT SIDE						RIGHT SIDE						
		6	5	4	3	2	1	1	2	3	4	5	6	
AIR SPRING HEIGHT (EMPTY)	N/A	A ^{II}											A ^I	
AIR SPRING HEIGHT (FULL)	min 254 max 261	A ^{II}											A ^I	
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}											E ^I	
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QTY 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}
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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
✓	↓	↑

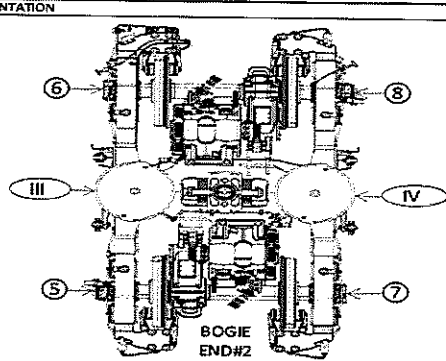
WEIGHT COMPENSATION	
EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	

SECONDARY MEASUREMENTS (ONLY TC CARS)	
AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	

BOGIE END#1



BOGIE END#2



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2024-03-20

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

ITEM		THEORETICAL VALUES															
		TZ CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		TZ CAR					
		TBext	TBint	M41	M42	M11	M12	M21	M22	M31	M32	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 ⁺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 AWO (Bar)	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,83 (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.)	3,76 (Ref.)				
Primary Suspension gaps (mm)	C ₁ -C ₆ C ₃ -C ₇	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 ₁ -D ₅	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 ₁ -D ₃																
	D ₃ -D ₅																
	D ₃ -D ₇																
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				
Boiler height (mm)	Fig. 7	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇	850 ⁺¹⁵ ₋₇				
Coupling End height (mm)	Fig. 8	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	895 (Ref.)				
	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.)				
Pivot Vertical gap (mm)	Fig. 10	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃	30 ⁺¹⁵ ₋₃				

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SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Project:
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 239	A'ii 242	A'iii 241	A'iv 240
An	254 to 261	Ai 257	Aii 258	Aiii 256	Aiv 258
Bn = An - A'n	N/A	Bi 18	Bii 16	Biii 15	Biv 18
En	1106 ±10 mm	Ei 1112	Eii 1109	Eiii 1109	Eiv 1111
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2,72	Cii 2,73	Ciii 2,81	Civ 2,75
Cn - Cn	Difference ≤ 0,3	Ci - Cii 0,01		Ciii - Civ 0,06	
Gauge serial number	N/A	G1B05875	G1B05875	G1B05875	G1B05875
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	Di 46,25	Dis 45,70	Dis 45,87	Dis 45,83
		Ds 46,89	Ds 46,15	Ds 46,55	Ds 45,80
Kn	25 to 45	Ki 35,70		Ki 31,64	
Jn=J1-J2+1	Difference ≤ 4	Ji 25,43	Jii 24,44	Jiii 23,80	Jiv 26,59

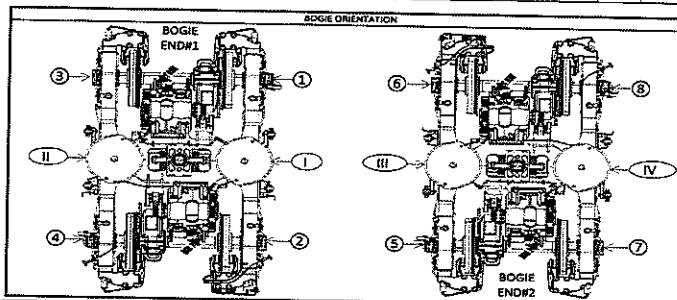
(*) Reference, only include values, isn't approval criteria.

Table 01
D Theoretical Values

TC1	M4		M1		M2		M3		TC2	
	Tbex	TBin	Mb1	Mb2	Mb1	Mb2	Mb1	Mb2	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}

Table 02
C Theoretical Values

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



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



[illegible]



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TRAIN SET 215	PC09 WEIGHING REPORT
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M4	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance $\leq 3\%$
		17.83	17.79	0.14%	PASS
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria Min/Diff/Max
		35.77	35.95	0.50%	1.36% PASS

Test Participants			
Name	Company	Department	Date
Dunthorn	Gibela	EOC	20/03/2014
M-N			