

GIBEL

PRASA PROJECT



SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION



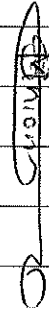
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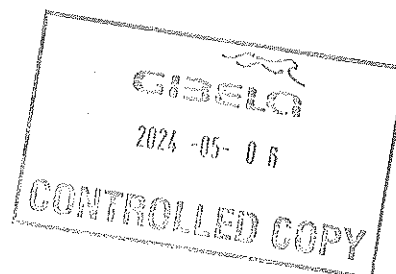
APPLICATION REFERENCE



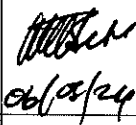


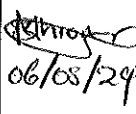

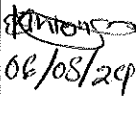

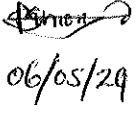

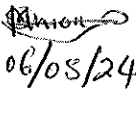

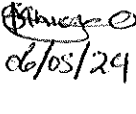

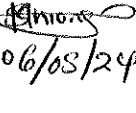
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			TC1	M4	M1	M2	M3	TC2		
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<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1				1	PRA.FT1140.05	YES
<input type="checkbox"/>	DTR3-PROCE-17	LEVELLING, WEIGHTING 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
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<input type="checkbox"/>										
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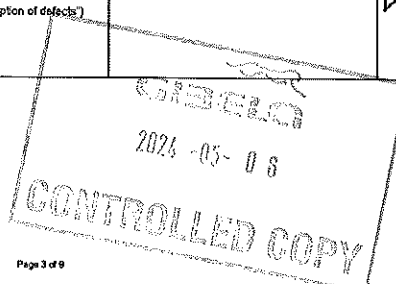
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7	2/11/2020	UPDATE OF AIR TIGHTNESS TEST TIME FROM 4 MIN TO 5 MIN. ADD PANTOGRAPH AIR TIGHTNESS.	APPROVER	GIVEN SILOWA	2/11/2020
			CHECKER	SIMON MOKOENA	2/11/2020
			COMPILER	COMFORT MALATJI	2/11/2020
8	9/13/2021	ADDING GAUGE MEASUREMENT CHECK ON 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




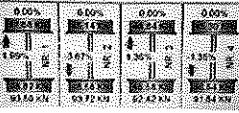
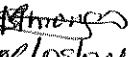
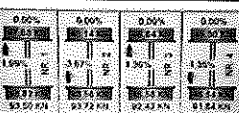
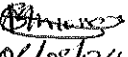



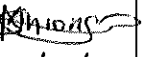
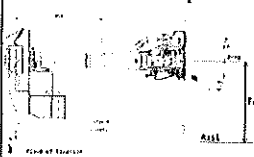

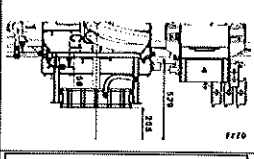

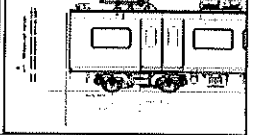
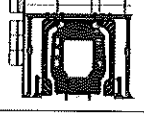


TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS 221	TC1	Sandile	06/08/24	SI.FT1140.52	01/08

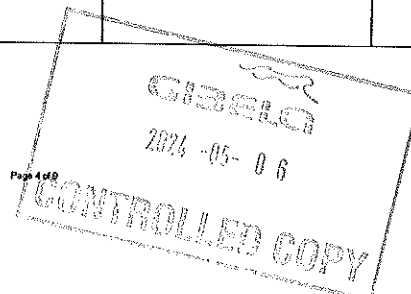
	<h1 style="margin: 0;">SELF INSPECTION INDUSTRIAL QUALITY</h1>										Rev:09	Project: PRASA	SI.FT1140.52			
											Date:					
											5/31/2022					
Car:			NCR:					Work Station				FT1140				
 Safety Related																
I - Document and Instrument Control																
I.1 - Documents control																
Document	TC1	M1	M2	M3	M4	TC2	Revision	Remark	OK	NOK	Signature/Date					
PRA.FT1140.04	X								✓		Signature 06/08/24					
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	NOK	Signature/Date							
Measuring tape	WBT A 0276					26/10/23 / 26/10/25	✓		06/05/24 							
Vernier Caliper	WBR 0056					06/11/23 / 06/11/24	✓									
Torque wrench 320 N.m	A96 80027					21/12/23 - 21/11/24	✓									
Torque Wrench 150 N.m	D28622009					19/12/23 - 19/12/24	✓									
Torque Wrench 35 N.m	D2511023					19/12/23 - 17/12/24	✓									
Torque Wrench 530 N.m	A96 30053					21/12/23 - 21/12/24	✓									
Torque wrench	D28617					19/12/23 / 19/12/24	✓									



	<h1>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	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		✓		 06/05/24										
02		Check underframe pipe system A3 tightness Test performance according to VII PRA FT1130.15.	The test was performed and no leak was observed. Initial pressure (IP): 2.87 bar Final pressure (FP): 2.84 bar FP - IP = 0.03 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drop more than 0.2 bar	✓		 06/05/24										
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓		 06/05/24										
04		Measurement inspection was done with car on condition AWO and the rail leveled. (The load cells system must be leveled and calibrated)	Calibration Validation Date 24/12/19	✓		 06/05/24										
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 test)	<table border="1"> <thead> <tr> <th>EQUIPMENT DESCRIPTION</th> <th>WEIGHT (kg)</th> </tr> </thead> <tbody> <tr> <td>Drivers Seat</td> <td>60</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)	Drivers Seat	60							✓		 06/05/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)															
Drivers Seat	60															
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓		 06/05/24										
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓		 06/05/24										
08		All leveling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓		 06/05/24										



		<h1>SELF INSPECTION INDUSTRIAL QUALITY</h1>		Rev:09	Projel: PRASA	SI.FT1140.52
				Date: 5/31/2022		
Item	Picture/Sketch	Description	Criteria/Record	✓	✗	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		✓		 06/08/24
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)		✓		 06/08/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of ≤ 4%.		✓		 06/08/24
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I <u>2mm</u> II <u>0</u> III <u>2mm</u> IV <u>0</u>	✓		 06/08/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 06/08/24
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5 / -10mm) (Using levelled rail)	TC CAB #1= <u>896</u> mm	✓		 06/08/24
15		FOR TC CARS Height of Eurobalise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= <u>199</u> mm	✓		 06/08/24
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)			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	✓		 06/08/24





SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projct:
PRASA

SL.FT1140.52

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

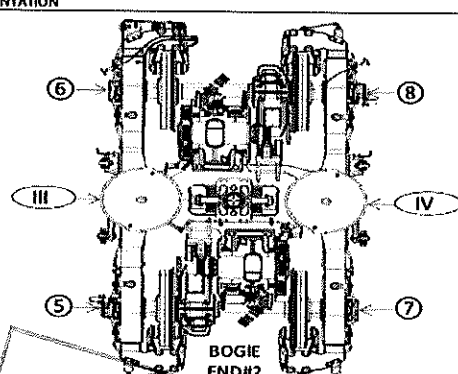
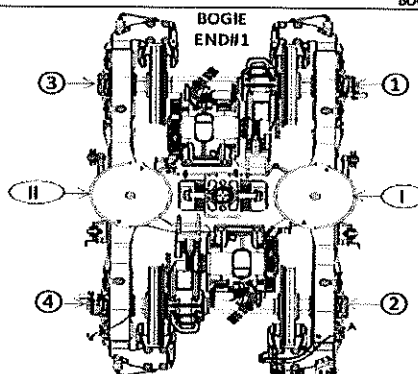
DESCRIPTION	TOLERANCE	END#1											
		LEFT SIDE						RIGHT SIDE					
AIR SPRING HEIGHT (EMPTY)	N/A	A'II											A'I
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII			285	255	245	246	253	256			AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII			1110	1112	1109	1110	1110	1103			EI
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CII			3,56	3,58	3,52	3,52	3,57	3,62			CI
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3											D1
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4											D2
PIVOT VERTICAL GAP	min 25 max 32	KII											KI
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (II - I)	JII											JI
QTY OF TURNS OF LEVELLING ROD	N/A	XII				3/4	2 1/2	2 1/2	3/4	1 1/2			XI
SHIMS OF ANTI-ROLL BAR	N/A	YII											YI
AIR SPRING HEIGHT (EMPTY)	N/A	A'III											A'IV
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII			255	254	246	247	255	251			AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII			1107	1106	1110	1109	1110	1106			EIV
AIR SPRING PRESSURE	≤ 0.3 (QIV - QII)	CIII			2,91	2,87	2,81	2,69	2,78	2,74			CIV
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5											D7
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6											D8
PIVOT VERTICAL GAP	min 25 max 32	KIII											KIV
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (IV - III)	JIII											JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII				3/4	2 1/2	2 1/2	3/4	1 1/2			XIV
SHIMS OF ANTI-ROLL BAR	N/A	YIII											YIV

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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2024-05-06

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SELF INSPECTION INDUSTRIAL QUALITY

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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 234 max 261	A ^{II}											A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}											E ^I
AIR SPRING PRESSURE	≤ 0.3 (Q _I - Q)	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 ^{II}											K ^I
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (A ^I - A)	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 234 max 261	A ^{III}											A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}											E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (Q _V - Q _I)	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 (A ^{IV} - A ^{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 FACT MEASURE AS BELOW

GOOD	LOWER	HIGHER
✓	↓	↑

WEIGHT
COMPENSATION

EQUIPMENT

WEIGHT

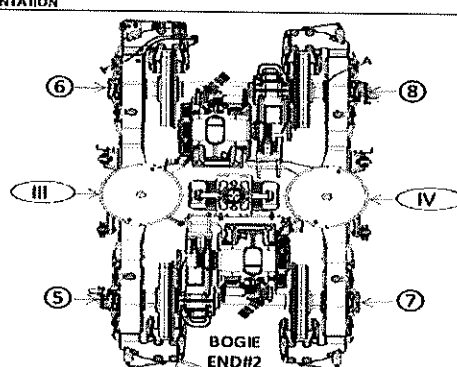
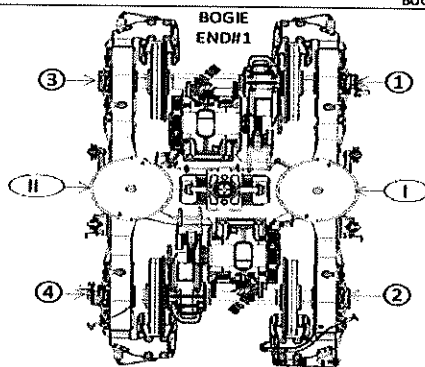
EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT

ANTENNA HEIGHT



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2021-05-06
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Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES											
		TCL CAR		M4 CAR		M3 CAR		M2 CAR		M3 CAR		T2 CAR	
		TBext	TBlnt	MB1	MB2	MB1	MB2	MB2	MB1	MB1	MB2	TBlnt	TBext
Pivot lateral stop gaps difference [mm]	J ₁₂ -J ₁₃ (12-13)	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Air Spring height [mm]	A ₁ (12-13)	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
Air spring pressure at AWD [Bar]	C ₁ (12-13)	Fig. 5	3,76 (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.)	3,76 (Ref.)
	C ₂ - C ₃		0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.
	C ₄ - C ₅		0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.	0,3 Max.
Primary Suspension gaps [mm]	D ₁ ; D ₂	Fig. 6	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂	35 ⁺² ₋₂
	D ₃ ; D ₄		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
	D ₅ ; D ₆		850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂
	D ₇ ; D ₈		895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (Ref.)	760 (Ref.)
Carbody Floor height [mm]	E ₁ (12-13)	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
Bolster height [mm]	N ₁ (12-13)	Fig. 7	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂	850 ⁺² ₋₂
Coupling End height [mm]	F ₁	Fig. 8	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)
	F ₂	Fig. 9	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]	K ₁	Fig. 10	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃	30 ⁺³ ₋₃



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projeto:
PRASA

SI.FT1140.52

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

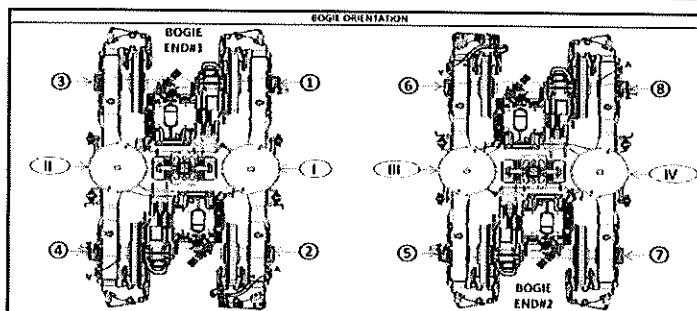
An Air spring height
Bn Difference between measurement A'n and An
En Floor covering height
Cn Air spring pressure
Dn Primary suspension
Kn Pivot Vertical gap
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 234	A'ii 233	A'is 242	A'iv 242
An	254 to 261	Ai 256	Aii 255	Ais 257	Aiv 258
Bn = An - A'n	N/A	Bi 22	Bii 22	Bis 15	Biv 16
En	1108 ±10 mm	Ei 1110	Eii 1103	Eis 1107	Eiv 1106
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3,59	Cii 3,55	Cis 2,91	Civ 2,73
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0,04		Cis - Civ 0,18	
Gauge serial number	N/A	GIB05873	GIB05873	GIB05873	GIB05873
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	Di 42,06	Dii 43,15	Dis 43,79	Div 44,46
		D2 42,83	D4 43,04	D5 43,60	D7 45,73
Kn	25 to 45	Ki 32,21		Ku 37,03	
Jn	Difference ≤ 4	Ji 24,97	Jii 26,10	Jis 24,90	Jiv 25,17

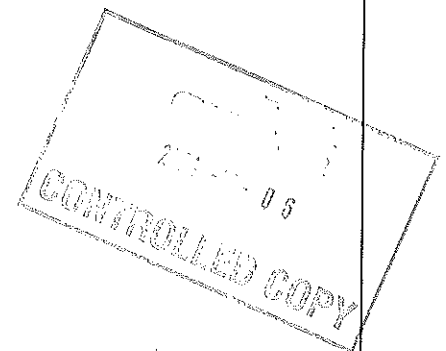
(*) Reference, only include values, isn't approval criteria.

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



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



[illegible]

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TRAIN SET 220	REF: GIB000001672_JO PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

TCL	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance $\leq \pm 10\%$
		18.57	15.57	8.79%	PASS
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Tolerance [%]
		34.14	34.42	0.83%	1.62%
					Criteria MinDiffMax
					PASS

Test Participant			
Name	Company	Department	Date
Thato Mushi	Gibela	EOS	20/05/24