

GIBELO

2024 -03- 26

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PRASA PROJECT

GIBELO



SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION



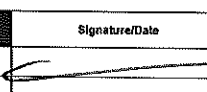
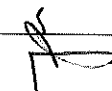
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APPLICATION REFERENCE



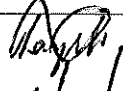


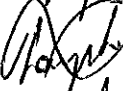





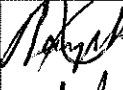



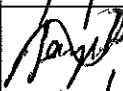
MOUNTING	DESCRIPTION	STATION	CAR TYPE						WORK INSTRUCTION	SAFETY ?
			TC1	M4	M1	M2	M3	TC2		
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING M CAR	FT1140		1	1	1	1	PRA.FT1140.04	YES
<input type="checkbox"/>	DTR3-PROCE-14	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1					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	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



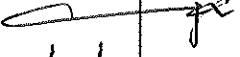

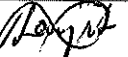
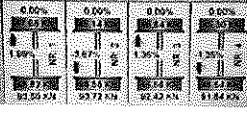
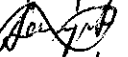







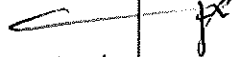

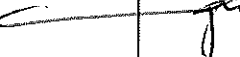
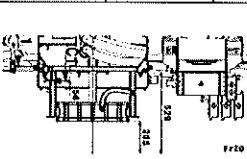

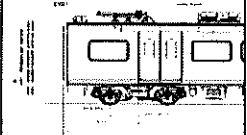
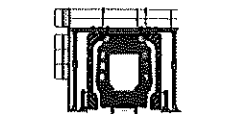
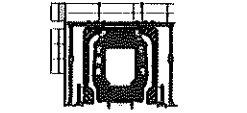

TUE	CAR	OPERATOR NAME	DATE	SELF INSPECTION NUMBER	PAGES
TS 216	Tc 2	Andrew	26/03/24	SI.FT1140.52	01/08


	<h1>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	NO	Signature/Date
PRA.FT1140.04						✓			✓		 26/03/24
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	NO	Signature/Date				
Measuring tape	CIBTA 0281		22/10/23 - 26/10/24		✓		 26/03/24				
Vannier Calliper	CIBVR 0085		06/06/23 - 06/06/24		✓						
Torque wrench 320NM	A9686053		21/12/23 - 21/12/24		✓						
Torque wrench 150NM	D28622008		19/12/23 - 19/12/24		✓						
Torque wrench 35NM	D2511023		19/12/23 - 19/12/24		✓						
Torque wrench 17NM	D2861617		17/07/23 - 17/12/24		✓						
Torque wrench 580NM	A9630053		21/08/23 - 21/08/24		✓						



		SELF INSPECTION INDUSTRIAL QUALITY		Rev:09 Date: 5/31/2022	Project: PRASA	SI.FT1140.52								
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		✓		 26/03/24								
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): 99.2 bar Final pressure (FP): 99.0 bar FP - IP = 0.2 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓		 26/03/24								
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 AWO and the rail levelled. (The load cells system must be levelled and calibrated)	Calibration Validation Date 19/12/2023	✓		 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 border="1"> <thead> <tr> <th>EQUIPMENT DESCRIPTION</th> <th>WEIGHT (kg)</th> </tr> </thead> <tbody> <tr> <td>Driver's Seat</td> <td>100</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Driver's Seat	100					✓		 26/03/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)													
Driver's Seat	100													
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 leveling measurements are according to the reference. (Values out of reference must be recortied on "Description of defects")		✓		 26/03/24								


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		SELF INSPECTION INDUSTRIAL QUALITY		Rev:09		Projat: PRASA	SI.FT1140.52
				Date:			
		5/31/2022					
Item	Picture's sketch	Description	Criteria/Record	OK	NO	Signature/Date	
09		Check that the leveling rods are torqued and have torque marker.		✓		 26/03/24	jc
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).		✓		 26/03/24	
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓		 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 	✓		 26/03/24	jc
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓		 26/03/24	jc
14		FOR TC CARS F= Height of the center of Automatic coupler F = 895mm (+5/-10mm) (Using levelled rail)	TC CAB #1= <u>897</u> mm	✓		 26/03/24	jc
15		FOR TC CARS Height of Eurobalse Antenna = 205mm (+/-10mm) (Using levelled rail)	TC CAB #1= <u>198</u> mm	✓		 26/03/24	jc
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	✓		 26/03/24	


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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}				252	257	255	252	255	256			A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}												E ^I
AIR SPRING PRESSURE	≤ 0.3 (O _I - O _I)	C ^{II}						350	359					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 _I)	J ^{II}												J ^I
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{II}					1 1/2	1 1/2	1 1/2	1 1/2				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}				259	261	260	255	259	258			A ^{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{III}												E ^{IV}
AIR SPRING PRESSURE	≤ 0.3 (O _V - O _R)	C ^{III}						293	272					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 _V - A _R)	J ^{III}												J ^{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ^{III}					1 1/2	1 1/2	1 1/2	1 1/2				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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SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Projeto:
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	AII											AI
FLOOR COVERING HEIGHT	min 1096 max 1116	EII											EI
AIR SPRING PRESSURE	≤ 0.3 (QI - Q)	CII											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 (AI - A)	JII											JI
QTY OF TURNS OF LEVELLING ROD	N/A	XII											XI
SHIMS OF ANTI-ROLL BAR	N/A	YII											YI
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	AIII											AIV
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII											EIV
AIR SPRING PRESSURE	≤ 0.3 (QV - QII)	CIII											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 (XV - XII)	JIII											JIV
QTY OF TURNS OF LEVELLING ROD	N/A	XIII											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

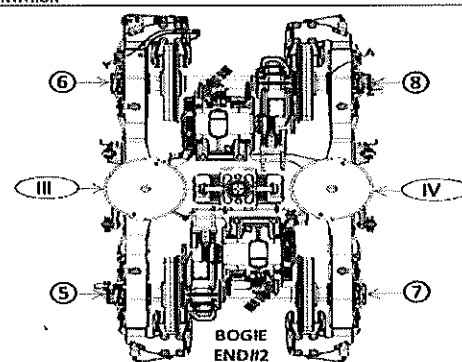
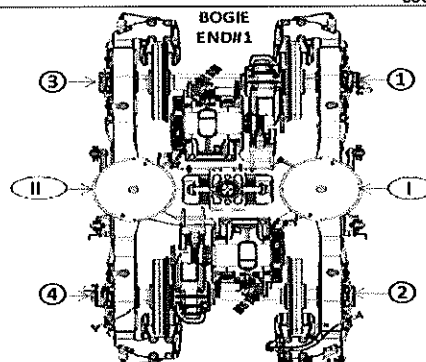
WEIGHT

EQUIPMENT

WEIGHT

SECONDARY MEASUREMENTS
(ONLY TC CARS)AUTOMATIC COUPLER
HEIGHT

ANTENNA HEIGHT



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

THEORETICAL VALUES																	
ITEM	TCL CAR		M4 CAR		M1 CAR		M2 CAR		M3 CAR		T2 CAR						
	TBack	THint	M81	M81	M81	M82	M82	M81	M81	M81	TBack						
Pivot lateral stop gap difference [mm]	Fig. 4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4						
Air Spring height [mm]	Fig. 5	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅	255 ⁺⁶ ₋₅						
Air spring pressure at AWD [Bar]	Fig. 5	3,76	2,82	2,87	2,83	3,02	2,91	3,07	2,85	2,87	2,83	3,76					
		0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.	0,3 Min.					
		(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)					
Primary Suspension gaps [mm]	Fig. 6	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃	35 ⁺² ₋₃					
		D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅	D ₃ -D ₅					
		D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆	D ₃ -D ₆					
		D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	D ₃ -D ₇	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						
Bolster height [mm]	Fig. 7	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅	850 ⁺⁵ ₋₅						
Coupling End height [mm]	Fig. 8	895	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	895					
	Fig. 9	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760	(Ref.)	760					
Pivot Vertical gap [mm]	Fig. 10	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋₅	30 ⁺²⁵ ₋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 Weighting fine)

References for secondary suspension empty

A'n Air spring height empty

References for secondary suspension full

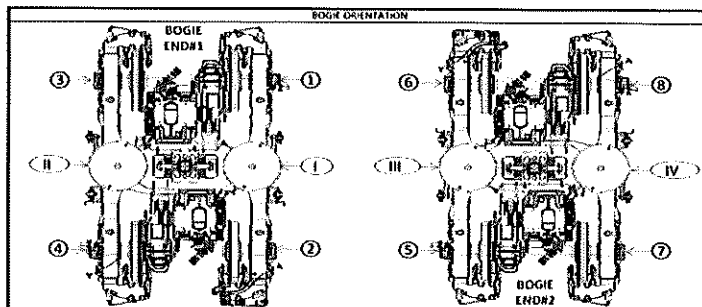
An Air spring height
 Bn Difference between measurement A'n and An
 En Floor covering height
 Cn Air spring pressure
 Dn Primary suspension
 Kn Pivot Vertical gap
 Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 233	A'u 236	A'is 242	A'iv 241
An	254 to 261	AI 256	An 259	As 257	Av 260
Bn = An - A'n	N/A	Bi 23	Ba 23	BS 15	Bv 19
En	1106 ±10 mm	Ei 1112	Ea 1101	Es 1110	Eiv 1112
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 3,50	Ct 3,63	Cs 2,85	Cv 2,83
Cn - Cn+1	Difference ≤ 0,3	Ci - Ct 0,13		Cs - Cv 0,02	
Gauge serial number	N/A	GIB05878 GIB05878		GIB05878 GIB05878	
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	Di 44,15	Ds 42,97	Ds 44,66	Da 45,36
		Dz 45,56	Dt 43,0	Ds 44,33	Dt 44,44
Kn	25 to 45	Ki 34,44		Ki 34,57	
Jn	Difference ≤ 4	Ji 26,04	Jt 25,03	Ja 25,08	Jv 27,54

(*) 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)



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TRAIN SET 216	REF: GIB0000001672_JD PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

TC2	Balance across front and rear bogies	Front Bogie [Tons]	Rear Bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance \leq 10%
		18.41	15.53	8.49%	PASS
	Weight Measured vs Predicted	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Tolerance [%]
		33.94	34.46	1.51%	1.62% Criteria MinDiff/Max PASS

Test Participants			
Name	Company	Department	Date
Puley Zanele	Gibela	EOC	13/14/2024