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2024-06-24

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PRASA PROJECT

SELF INSPECTION SHEET

CONFIDENTIAL INFORMATION



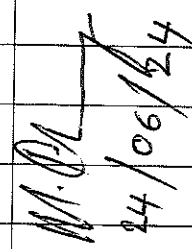
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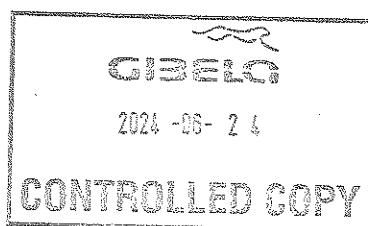
APPLICATION REFERENCE

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	X	1	1	1		PRA.FT1140.04	YES
<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
<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 232	M4	Khumyana	24/06/24	SI.FT1140.52	01/08

	SELF INSPECTION INDUSTRIAL QUALITY		Rev:09	Projet: PRASA	SI.FT1140.52						
			Date: 5/31/2022								
Cat:	NCR:		Work Station: FT1140								
 Safety Related											
I - Document and Instrument Control											
I.1 - Documents control											
Document	TC1	M1	R2	ND	M4	TC2	Revision	Remark	OK	NOK	Signature/Date
PRA.FT1140.04											
PRA.FT1140.05					✓				✓		MCA 24/06/24
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	NOK	Signature/Date				
Measuring Tape	GibTA 0276		26/11/23-26/10/24		✓						
Vernier Calliper	GibVR 0056		06/06/23-06/06/24		✓						
Torque wrench 35NM	D2511023		19/12/23-19/12/24		✓						
Torque wrench 150N.M	D28622609		19/12/23-19/12/24		✓						
Torque Wrench 320N.M	A9650027		21/12/23-21/12/24		✓		 24/06/24				



SELF INSPECTION INDUSTRIAL QUALITY

Rev.03

Date:

5/31/2022








Project:
PRASA

SI.FT1140.52

II - Self Inspection - Items to Check

II.1 - Items to Check

IL1 - Items to Check

Item	Picture/Sketch	Description	Critical/Record	UK	PR	PR	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		✓			M.OL 24/06/24								
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): 10.2 bar Final pressure (FP): 10.3 bar FP - IP = 0.1 bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0.2 bar	✓			M.OL 24/06/24								
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓			M.OL 24/06/24								
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	✓			M.OL 24/06/24								
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>Gangway</td><td>300</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>	EQUIPMENT DESCRIPTION	WEIGHT (kg)	Gangway	300					✓			M.OL 24/06/24
EQUIPMENT DESCRIPTION	WEIGHT (kg)														
Gangway	300														
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓			M.OL 24/06/24								
07		Measuremet recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓			M.OL 24/06/24								
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓			M.OL 24/06/24								

SELF INSPECTION
INDUSTRIAL QUALITY

Item	Picture/Sketch	Description	Criteria/Record	OK	Signature/Date
09		Check that the leveling rods are torqued and have torque marker.		✓	M.OL 24/06/24
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).		✓	M.OL 24/06/24
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	M.OL 24/06/24
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 0	✓	M.OL 24/06/24
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	M.OL 24/06/24
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 Eurobaise Antenne = 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. -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	✓	 24/06/24

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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'III											
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII				251	257	257	259					AIII											
FLOOR COVERING HEIGHT	min 1096 max 1116	EII												EIII											
AIR SPRING PRESSURE	≤ 0.3 (Ci - Qi)	CII				2.71	2.77	2.80	2.82					CIII											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3												D5											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4												D6											
PIVOT VERTICAL GAP	min 25 max 32	KII												KIII											
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (Ji - Ji')	JII												JIII											
QTY OF TURNS OF LEVELLING ROD	N/A	XII												XIII											
SHIMS OF ANTI-ROLL BAR	N/A	YII												YIII											
AIR SPRING HEIGHT (EMPTY)	N/A	A'III												A'IV											
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII				258	256	257	257					AIV											
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII												EIV											
AIR SPRING PRESSURE	≤ 0.3 (Qv - Qi)	CIII				2.75	2.71	2.7	2.72					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 (Jv - Jv')	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

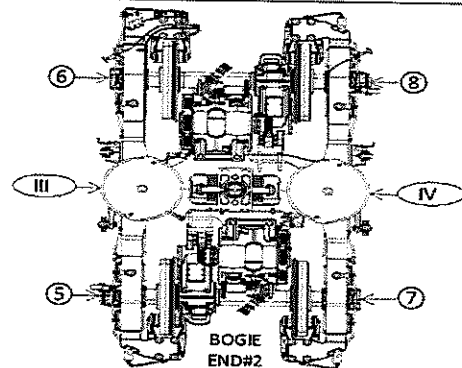
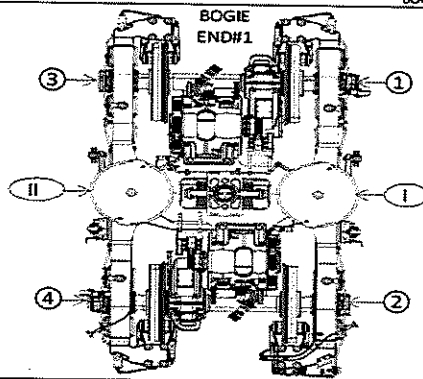
WEIGHT

SECONDARY MEASUREMENTS (ONLY TC CARS)

AUTOMATIC COUPLER

HEIGHT

ANTENNA HEIGHT





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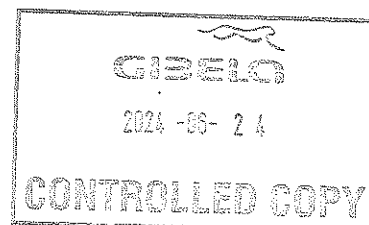
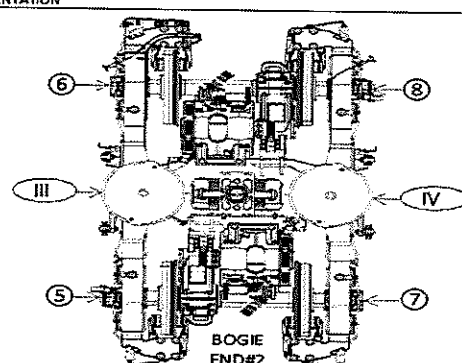
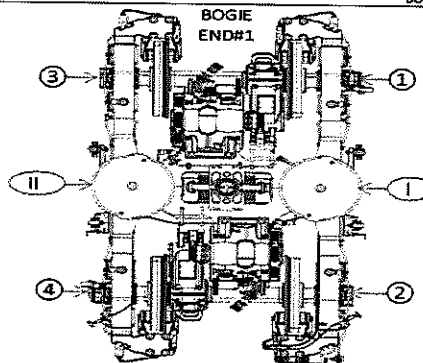
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DRAFT TO MEASUREMENTS DURING LEVELLING (ALL UNITS MUST BE IN mm/bar/kg)

		LEFT SIDE						RIGHT SIDE					
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6
AIR SPRING HEIGHT (EMPTY)	N/A	A`II											
AIR SPRING HEIGHT (FULL)	min 254 max 261	AII											
FLOOR COVERING HEIGHT	min 1096 max 1116	EII											
AIR SPRING PRESSURE	≤ 0.3 (CI - C)	CII											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D3											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D4											
PIVOT VERTICAL GAP	min 25 max 32	KII											
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (JI - J)	JII											
QTY OF TURNS OF LEVELLING ROD	N/A	XII											
SHIMS OF ANTI-ROLL BAR	N/A	YII											
DESCRIPTION	TOLERANCE	6	5	4	3	2	1	1	2	3	4	5	6
AIR SPRING HEIGHT (EMPTY)	N/A	A`III											
AIR SPRING HEIGHT (FULL)	min 254 max 261	AIII											
FLOOR COVERING HEIGHT	min 1096 max 1116	EIII											
AIR SPRING PRESSURE	≤ 0.3 (CIv - CI)	CIII											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D5											
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D6											
PIVOT VERTICAL GAP	min 25 max 32	KIII											
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (JIV - JIII)	JIII											
QTY OF TURNS OF LEVELLING ROD	N/A	XIII											
SHIMS OF ANTI-ROLL BAR	N/A	YIII											

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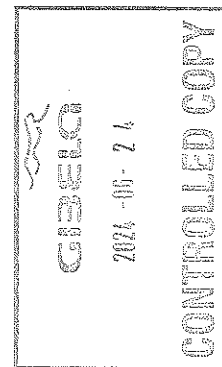
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Table 1 - Reference Values and Measurement Tolerances for the Car Levelling.

ITEM		THEORETICAL VALUES											
		TCL CAR		M1 CAR		M2 CAR		M3 CAR		TCL CAR			
		TBert	TBlnt	MB1	MB2	MB2	MB1	MB1	MB1	TBert	TBlnt	MB1	TBert
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 AWD [Bar]	Fig. 5	3,76 (Ref.)	2,82 (Ref.)	2,87 (Ref.)	2,91 (Ref.)	3,07 (Ref.)	2,85 (Ref.)	2,83 (Ref.)	2,87 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	3,76 (Ref.)
C ₁ -C ₄ C ₁₀ -C ₁₇	Fig. 5	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.	0,3 Mdx.
Primary Suspension gaps [mm]	Fig. 6	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}
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^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}	850^{+5}_{-7}
Coupling End height [mm]	Fig. 8 Fig. 9	895 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	760 (Ref.)	895 (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}





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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

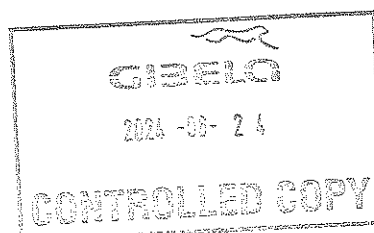
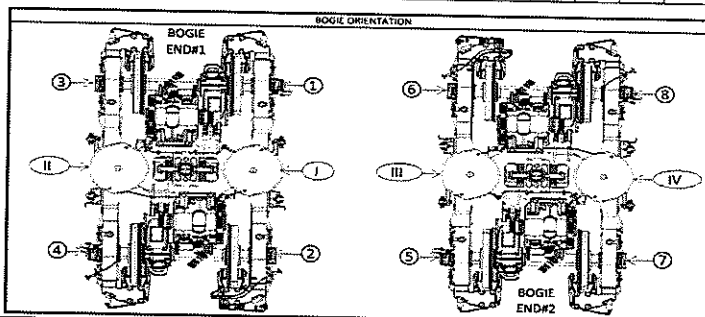
An Air spring height
Bn Difference between measurement A'n and An
En Floor covering height
Cn Air spring pressure
Dn Primary suspension
Kn Pivot Vertical gap
Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 243	A'ii 241	A'is 242	A'iv 242
An	254 to 261	Ai 259	Aii 259	Ais 259	Aiv 258
Bn = An - A'n	N/A	Bi 16	Bii 18	Bis 17	Biv 16
En	1105 ±10 mm	Ei 1114	Eii 1108	Eis 1116	Eiv 1105
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	Ci 2.67	Cii 2.76	Cis 2.74	Civ 2.76
Cn - Cn+1	Difference ≤ 0,3	Ci - Cii 0.09		Cis - Civ 0.02	
Gauge serial number	N/A	G1B05873	G1B05873	G1B05873	G1B05873
Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Dn	Table 01 (*)	D1 45.35	D3 44.83	D5 44.47	D6 45.04
		D2 45.43	D4 45.85	D5 45.07	D7 45.82
Kn	25 to 45	Ki 35.16		Kii 32.25	
Jn	Difference ≤ 4	Ji 24.54	Jii 26.07	Jis 25.79	Jiv 24.73

(*) 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]

Gibela Rail Transport Consortium RF (Pty)
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Dunnotar X7
Ekurhuleni, 1590, South Africa
Reception: +27 (0)10 600 0651



TRAIN SET 232	
PC09 WEIGHING REPORT	

M4	Balance across front and rear bogies	Front Bogie [Tons]		Rear Bogie [Tons]		Longitudinal Imbalance [%]		Criteria Longitudinal Imbalance ≤ 3%	
		17.81		17.81		0.00%		PASS	
		Weight Measured [Tons]		Weight Predicted [Tons]		Weight Difference [%]		Tolerance [%]	
	Weight Measured vs Predicted	35.62		35.95		0.92%		1.36%	PASS
								Criteria MinsDiff≤Max	

Test Participants			
Name	Company	Department	Date
Thato Musi	Gibela	EOC	25/06/2024