



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	X					1	PRA.FT1140.05	YES
<input type="checkbox"/>	DTR3-PROCE-17	LEVELLING, WEIGHTING AND BALANCING TC CAR	FT1140	1	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	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 MALATI	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
TS234	TC1	Andrew	08/07/24	SI.FT1140.52	01/08



SELF INSPECTION INDUSTRIAL QUALITY

Rev:09

Date:

5/31/2022

Project:
PRASA

SI.FT1140.52

Car:

NGR:

Work Station

FT1140



Safety Related

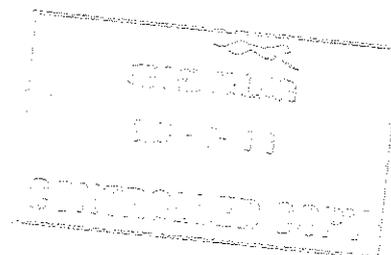
I - Document and Instrument Control

I.1 - Documents control

Document	TCT	MT	MS	MD	MA	TCT	Revision	Remark	OK	Signature/Date
PRA.FT1140.04	✓								✓	Dangit 08/07/24
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	31/10/23 - 31/10/24	✓	Dangit 08/07/24
Vernier Caliper	GIBVR 0050	08/08/23 - 08/08/24	✓	Dangit 08/07/24
Torque Wrench 35 mm	A251033	21/12/23 - 21/12/24	✓	Dangit 08/07/24
Torque Wrench 150 N.m	B737566	21/12/23 - 21/12/24	✓	Dangit 08/07/24
Torque Wrench 320 N.m	A7690019	19/12/23 - 19/12/24	✓	Dangit 08/07/24
Torque Wrench 17 N.m	D3861617	19/12/23 - 19/12/24	✓	Dangit 08/07/24
Torque Wrench 530 N.m	A9650053	19/12/23 - 19/12/24	✓	Dangit 08/07/24





SELF INSPECTION INDUSTRIAL QUALITY

Rev:08

Date:

5/31/2022

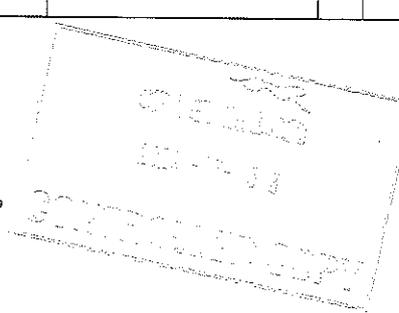
Project:
PRASA

SI.FT1140.52

II - Self Inspection - Items to Check

II.1 - Items to Check

Item	Picture/Sketch	Description	Criteria/Record	OK	NO	NO	NO	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		✓				 08/07/24
02		Check underframe pipe system Air tightness. Test performance according to WI PRAFT1130.15.	The test was performed and no leak was observed. Initial pressure (IP): <u>10.04</u> bar Final pressure (FP): <u>9.77</u> bar FP - IP = <u>0.04</u> bar APPROVAL CRITERIA: After 5 minutes the pressure cannot drops more than 0,2 bar	✓				 08/07/24
03		Movement performed at least 50m to shudder the car. And position on the leveled load cell, with wheels on the center.		✓				 08/07/24
04		Measurement inspection was done with car on condition AW0 and the rail leveled. (The load cells system must be levelled and calibrated)	Calibration Validation Date <u>19.12.2023</u>	✓				 08/07/24
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)	EQUIPMENT DESCRIPTION <u>DRIVER'S SEAT</u> WEIGHT (kg) <u>60</u>	✓				 08/07/24
06		The pressure difference between air spring on each bogie when raise the pressure was maintained < 0.3 bar.		✓				 08/07/24
07		Measurement recorded with empty suspension and loaded are on conformity with tolerances of the project.		✓				 08/07/24
08		All levelling measurements are according to the reference. (Values out of reference must be recorded on "Description of defects")		✓				 08/07/24





SELF INSPECTION INDUSTRIAL QUALITY

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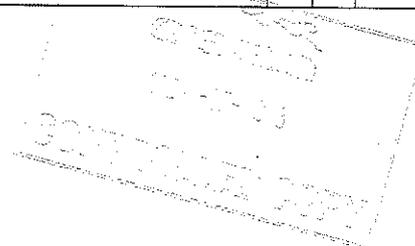
Date:

5/31/2022

Projet: PRASA

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Item	Picture/Sketch	Description	Criteria/Record	Pass	Signature/Date
09		Check that the levelling rods are torqued and have torque marker.		✓	<i>Dauph</i> 08/07/22
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).		✓	<i>Dauph</i> 08/07/22
11		Remove the car, move back onto the load cells and repeat the step 09. Confirm if both are in the tolerance of $\leq 4\%$.		✓	<i>Dauph</i> 08/07/22
12		1 - Record shims thickness used on rod. 2 - All screws were torqued and have torque marker.	THICKNESS (mm) I II III IV	✓	<i>Dauph</i> 08/07/22
13		Pivot fixation	1- M20 x 90 screws with application of torque according to PRA.FT1140.04 / 05	✓	<i>Dauph</i> 08/07/22
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	✓	<i>Dauph</i> 08/07/22
15		FOR TC CARS Height of Eurobalise Antenna = 205mm(+/-10mm) (Using levelled rail)	TC CAB #1= <u>195</u> mm	✓	<i>Dauph</i> 08/07/22
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	✓	<i>Dauph</i> 08/07/22





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

DESCRIPTION	TOLERANCE	END#1												
		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 ¹ _{II}				257	251	253	256					A ¹ _I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ¹ _{II}												E ¹ _I
AIR SPRING PRESSURE	≤ 0.3 (C _I - C _I)	C ¹ _{II}					356	3162						C ¹ _I
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ³ _I												D ³ _I
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁴ _I												D ⁴ _I
PIVOT VERTICAL GAP	min 25 max 32	K ¹ _{II}												K ¹ _I
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (H _I - J _I)	J ¹ _{II}												J ¹ _I
QTY OF TURNS OF LEVELLING ROD	N/A	X ¹ _{II}					1 1/2	1 1/2						X ¹ _I
SHIMS OF ANTI-ROLL BAR	N/A	Y ¹ _{II}												Y ¹ _I
DESCRIPTION	TOLERANCE	END#2												
		LEFT SIDE						RIGHT SIDE						
		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 ¹ _{III}				257	257	261	256					A ¹ _{IV}
FLOOR COVERING HEIGHT	min 1096 max 1116	E ¹ _{III}												E ¹ _{IV}
AIR SPRING PRESSURE	≤ 0.3 (C _{IV} - C _{IV})	C ¹ _{III}					244	3.91						C ¹ _{IV}
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁵ _I												D ⁵ _I
PRIMARY SUSPENSION	SEE TABLE (ONLY REF)	D ⁶ _I												D ⁶ _I
PIVOT VERTICAL GAP	min 25 max 32	K ¹ _{III}												K ¹ _{IV}
PIVOT LATERAL STOP GAPS DIFFERENCE	≤ 4 (X _{IV} - Z _{IV})	J ¹ _{III}												J ¹ _{IV}
QTY OF TURNS OF LEVELLING ROD	N/A	X ¹ _{III}					1 1/2	1 1/2	1 1/2	1 1/2				X ¹ _{IV}
SHIMS OF ANTI-ROLL BAR	N/A	Y ¹ _{III}												Y ¹ _{IV}

COMPARE EACH TENTATIVE WITH THE TOLERANCE AND IDENTIFY EACH MEASURE AS BELOW

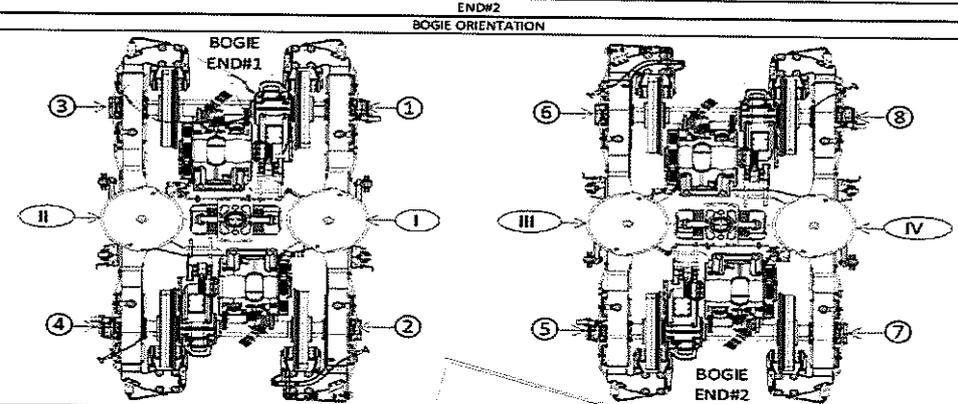
GOOD	LOWER	HIGHER
✓	↓	↑

WEIGHT COMPENSATION

EQUIPMENT	
WEIGHT	
EQUIPMENT	
WEIGHT	

SECONDARY MEASUREMENTS (ONLY TO CARS)

AUTOMATIC COUPLER HEIGHT	
ANTENNA HEIGHT	





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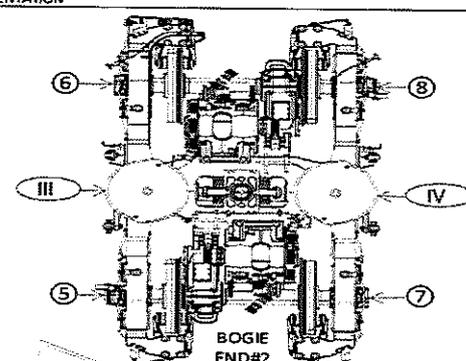
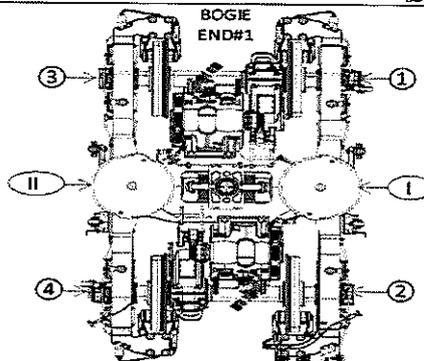
SI.FT1140.52

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 254 max 261	A ^I	/	/	/	/	/	/	/	/	/	/	/	A ^I
FLOOR COVERING HEIGHT	min 1096 max 1116	E ^{II}	/	/	/	/	/	/	/	/	/	/	/	E ^I
AIR SPRING PRESSURE	≤ 0.3 (C ^I - C ^I)	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 (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 ^{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 (C ^{IV} - C ^{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		





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

ITEM	THEORETICAL VALUES															
	TC1 CAR		M4 CAR		M3 CAR		M2 CAR		M1 CAR		M2 CAR		M1 CAR		TC2 CAR	
	TBext	TBint	MB1	MB2	TBint	TBext										
Pivot lateral stop gaps difference (mm)	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Air Spring height (mm)	255 ⁺⁶ ₋₁															
Air spring pressure at AWO (Bar)	3,76 (Ref.)	2,82 (Ref.)	2,87 (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.)	2,87 (Ref.)	2,83 (Ref.)	2,83 (Ref.)	3,76 (Ref.)
Primary Suspension gaps (mm)	C ₁ -C ₁	0,3 Máx.														
	C ₂ -C ₂	0,3 Máx.														
	D ₁ D ₅	35 ⁺¹⁵ ₋₅														
	D ₂ D ₄	35 ⁺¹⁵ ₋₅														
Carbody Floor height (mm)	1106 ⁺¹⁰ ₋₁₀															
Booster height (mm)	850 ⁺⁵ ₋₇															
Coupling End height (mm)	F ₁	895 (Ref.)	760 (Ref.)	895 (Ref.)	760 (Ref.)											
	F ₂	760 (Ref.)														
Pivot Vertical gap (mm)	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

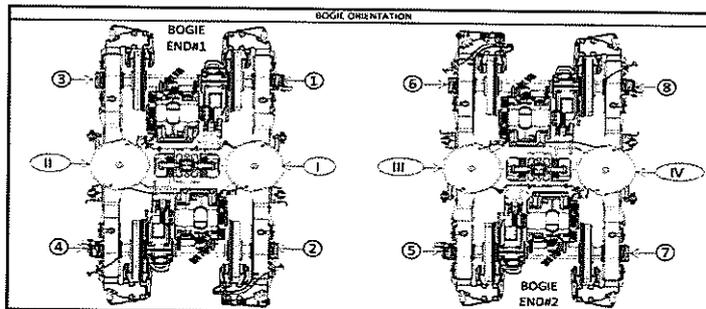
- An Air spring height
- Bn Difference between measurement A'n and An
- En Floor covering height
- Cn Air spring pressure
- Dn Primary suspension
- Kn Pivot Vertical gap
- Jn Pivot Lateral stop gaps difference

Item	Reference [mm]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
A'n	N/A	A'i 235	A'ii 236	A'iii 240	A'iv 241
An	254 to 261	Ai 256	Aii 258	Aiii 256	Aiv 258
Bn = An - A'n	N/A	Bi 21	Bii 22	Biii 16	Biv 17
En	1106 ±10 mm	Ei 1107	Eii 1109	Eiii 1108	Eiv 1112
Item	Reference [bar]	END#1		END#2	
		Right Side	Left Side	Left Side	Right Side
Cn	Table 02 (*)	3,60	3,62	2,91	2,83
Cn - Cn+1	Diference ≤ 0,3	0,02		0,08	
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 (*)	D1 41,47	D3 43,19	D5 42,47	D7 42,99
		D2 41,49	D4 41,06	D6 42,53	D8 44,83
Kn	25 to 45	30,31		32,87	
Jn	Diference ≤ 4	Ji 25,55	Jii 26,34	Jiii 25,58	Jiv 26,50

(*) 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)

Gibela Rail Transport Consortium RF (Pty)
 Ltd
 2 Shosholoza Avenue
 Dunmottar X7
 Ekurhuleni, 1590, South Africa
 Reception: +27 (0)10 600 0651



TRAIN SET 234	REF: GIB000001672_ID PRASA WEIGHT BALANCE EN
	PC09 WEIGHING REPORT

	Front bogie [Tons]	Rear bogie [Tons]	Longitudinal Imbalance [%]	Criteria Longitudinal Imbalance ≤ 10%
TC1	18.45	15.57	8.47%	PASS
	Weight Measured [Tons]	Weight Predicted [Tons]	Weight Difference [%]	Criteria Min. Diff. Max
	34.02	34.42	1.17%	1.62%
				PASS

Name	Test Participant	Date
Company	Signature	
Gibela	EOS	