PROJECT	CUSTOMER	VEHICLE
Xtrapolis-PRASA	**PRASA**	**230– M3 – VFT**

RTR Vehicle Functional Static Testing TS230 M3 Report

GIB0000006596

	CREATED	VERIFIED	APPROVED	DISTRIBUTION
Name	Vusumuzi ZULU	Sifiso LUKHELE	Kgomotso NKOANA	Confidentiality Category *Restricted* ☐ *Project* ☐ *Normal* ☑
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Table of modifications

Rev	Date	Modifications Content	Writer
A0	24/06/2024	Creation	Vusumuzi ZULU

Internal validations

	Name	Function	Date	Signature
Creator	Vusumuzi ZULU	EPU Manager	24/06/2024	X Vusumuzi ZULU EPU Manager
Verifier	Sifiso LUKHELE	Serial Test Manager	24/06/2024	X Sifiso LUKHELE Serial Test Manager
Approver	Kgomotso NKOANA	Test Expert	24/06/2024	X Kgomotso NKOANA Test Expert

Execution Plan

Start Date	20/06/2024
End Date	20/06/2024

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Section 1 – Purpose / Objectives

Section 2 – Energy Distribution

2.1 Instructions list

2.1.1 015_NRG-Energy Distribution

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Energy Distribution (SPP=015)		OK		Amanda Ntuli - 526239	M3
10002	I	Initial Conditions		OK		Amanda Ntuli - 526239	M3
10003	I	All the Circuit Breakers should be OPEN		OK		Amanda Ntuli - 526239	M3
10004	I	Test bench should be connected but with no power supply		OK		Amanda Ntuli - 526239	M3
10005	I	NO 400Vac should be connected to the car		OK		Amanda Ntuli - 526239	M3
10006	A	Close Circuit Breaker 15Q3 (Normal Line)		OK		Amanda Ntuli - 526239	M3
10007	I	Voltage Isolation 110Vdc		OK		Amanda Ntuli - 526239	M3
10008	I	230Vac and 400Vac Circuit breaker		OK		Amanda Ntuli - 526239	M3
10009	A	Close Circuit Breaker 13Q1		OK		Amanda Ntuli - 526239	M3
10010	A	Close the circuit breaker 13Q3		OK		Amanda Ntuli - 526239	M3
10011	I	Normal and Permanent Power Supply		OK		Amanda Ntuli - 526239	M3
10012	I	110Vdc Permanent Train Line Apply 110Vdc on -93XT304_1 pin 4 to simulate Permanent Train Line		OK		Amanda Ntuli - 526239	M3
10013	A	Apply 110Vdc on the Normal Line using the external power supply		OK		Amanda Ntuli - 526239	M3
10014	A	Measure 110Vdc between 90XR50.X1/1 (+) and 90XR50.X2/1 (-) (intercar connector). [Normal line]		OK		Amanda Ntuli - 526239	M3
10015	I	Permanent Line Circuit Breaker		OK		Amanda Ntuli - 526239	M3
10016	A	Close Circuit Breaker 15Q4 for battery voltage above 80Vdc and close it(permanent Line)		OK		Amanda Ntuli - 526239	M3
10017	I	230Vac Circuit Breaker		OK		Amanda Ntuli - 526239	M3
10018	A	Close Circuit Breaker 13Q2		OK		Amanda Ntuli - 526239	M3

10019	A	Close Circuit Breaker 13Q3		OK		Amanda Ntuli - 526239	M3
10020	I	230Vac and 400Vac Voltage Supply		OK		Amanda Ntuli - 526239	M3
10021	A	Apply 400Vac to the Vehicle, either on End1 or End2		OK		Amanda Ntuli - 526239	M3
10022	A	Perform a phase rotation measurement on Connector 90XR62 between phases U(X3),V(X2),W(X1) and ensure the rotation is in the correct direction.		OK		Amanda Ntuli - 526239	M3
10023	R	Phase rotation between U,V,W is correct		OK		Amanda Ntuli - 526239	M3
10024	A	Perform a phase rotation measurement on Connector 90XR52 between phases U(X1),V(X2),W(X3) and ensure the rotation is in the correct direction		OK		Amanda Ntuli - 526239	M3
10025	R	Phase rotation between U,V,W is correct		OK		Amanda Ntuli - 526239	M3
10026	A	Check 230Vac between points L and N of socket -13XT1		OK		Amanda Ntuli - 526239	M3
10027	R	230Vac present		OK		Amanda Ntuli - 526239	M3
10028	A	Check 230Vac between points L and N of socket -13XT2		OK		Amanda Ntuli - 526239	M3
10029	R	230Vac present		OK		Amanda Ntuli - 526239	M3
10030	A	Remove connector 57XP1__10		OK		Amanda Ntuli - 526239	M3
10031	A	Remove connector 93XP150		OK		Amanda Ntuli - 526239	M3
10032	A	Close circuit breaker 34Q1 and 57Q1		OK		Amanda Ntuli - 526239	M3
10033	A	Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 57XP1__10 (10.b1,10a2,10a1)		OK		Amanda Ntuli - 526239	M3
10034	R	400Vac +- 5% tolerance is measured between all three phases of 57XP1__10		OK		Amanda Ntuli - 526239	M3
10035	A	Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 93XP150 (E2,E3,E1)		OK		Amanda Ntuli - 526239	M3
10036	R	400Vac +- 5% tolerance is measured between all three phases on connector 93XP150		OK		Amanda Ntuli - 526239	M3
10037	A	Put back connector 57XP1__10		OK		Amanda Ntuli - 526239	M3

10038	A	Put back connector 93XP150		OK		Amanda Ntuli - 526239	M3
10039	A	Switch off the 400Vac power supply from the socket		OK		Amanda Ntuli - 526239	M3
10040	I	Auxiliary Converters Command		OK		Amanda Ntuli - 526239	M3
10041	A	Battery Connection Train Lines Measure continuity between END 1 90XR14 pin 30 END 2 90XP24 pin 30		OK		Amanda Ntuli - 526239	M3
10042	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10043	A	Battery Disconnection Train Lines Measure continuity between END 1 90XR14 pin 31 END 2 90XP24 pin 31		OK		Amanda Ntuli - 526239	M3
10044	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10045	A	IES StatusTrain Lines Measure continuity between END 1 90XR15 pin 61 END 2 90XP25 pin 61 and END 1 90XR15 pin 62 END 2 90XP25 pin 62		OK		Amanda Ntuli - 526239	M3
10046	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3

Section 3 – TCMS Network

3.1 Instructions list

3.1.1 025_NET-TCMS Network

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	TCMS Network (SPP=25)		OK		Amanda Ntuli - 526239	M3
10002	I	Initial conditions		OK		Amanda Ntuli - 526239	M3
10003	I	Vehicle test bench should be configured as TC1: 1. TC1 Dataplugs 2. MCE switch set to TC1		OK		Amanda Ntuli - 526239	M3
10004	A	110Vdc supply to the Normal Train line is ON		OK		Amanda Ntuli - 526239	M3
10005	I	Power Supply to the Router Switches		OK		Amanda Ntuli - 526239	M3
10006	I	Power supply to the 25A10 SWITCH ETHERNET (CRS1)		OK		Amanda Ntuli - 526239	M3
10007	A	Close Circuit Breaker 25Q10		OK		Amanda Ntuli - 526239	M3
10008	R	CRS1 25A10 is ON		OK		Amanda Ntuli - 526239	M3
10009	I	Power supply to the 25A11 SWITCH ETHERNET (CRS2)		OK		Amanda Ntuli - 526239	M3
10010	A	Close Circuit Breaker 25Q11		OK		Amanda Ntuli - 526239	M3
10011	R	CRS2 25A11 is ON		OK		Amanda Ntuli - 526239	M3
10012	I	Power supply to the 25A14 ETHERNET REPEATER (TBR)		OK		Amanda Ntuli - 526239	M3
10013	A	Close Circuit Breaker 25Q14		OK		Amanda Ntuli - 526239	M3
10014	R	TBR 25A14 is ON		OK		Amanda Ntuli - 526239	M3
10015	A	Close Circuit Breaker 25Q6		OK		Amanda Ntuli - 526239	M3

10016	A	Close Circuit Breaker 25Q7		OK		Amanda Ntuli - 526239	M3
10017	I	Ethernet Loop		OK		Amanda Ntuli - 526239	M3
10018	A	For each CRS, check that the Ethernet Loop LEDs are flashing		OK		Amanda Ntuli - 526239	M3
10019	R	CRS1 has LEDs on ports X3 and X4 flashing		OK		Amanda Ntuli - 526239	M3
10020	R	CRS2 has ONLY LED on port X4 flashing		OK		Amanda Ntuli - 526239	M3
10021	R	Check on the Test Bench DDU that all Router Switches are available on the network		OK		Amanda Ntuli - 526239	M3
10022	I	Power Supply to the BRIOMS		OK		Amanda Ntuli - 526239	M3
10023	I	Power supply to the 25A6 BRIOM 40/10 ETH 6		OK		Amanda Ntuli - 526239	M3
10024	R	BRIOM 25A6 is ON		OK		Amanda Ntuli - 526239	M3
10025	A	Check visually that ground braid is connected to BRIOM.		OK		Amanda Ntuli - 526239	M3
10026	I	Power supply to the 25A7 BRIOM 40/10 ETH 7		OK		Amanda Ntuli - 526239	M3
10027	R	BRIOM 25A7 is ON		OK		Amanda Ntuli - 526239	M3
10028	A	Check visually that ground braid is connected to BRIOM		OK		Amanda Ntuli - 526239	M3

Section 4 – Cabin Control

4.1 Instructions list

4.1.1 020_CAB-Cabin Control

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Cabin Control (SPP=020)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Train Lines		OK		Sinazo Mkhwa - 529940	M3
10003	A	Cab Selected On Train - Train Lines Measure continuity between END1 90XR14 pin 3 END2 90XP24 pin 3		OK		Sinazo Mkhwa - 529940	M3
10004	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10005	A	Cab Active TC1 Train Lines Measure continuity between END1 90XR14 pin 4 END2 90XP24 pin 4		OK		Sinazo Mkhwa - 529940	M3
10006	R	Both pins are continuous.		OK		Sinazo Mkhwa - 529940	M3
10007	A	Cab Active TC2 Train Lines Measure continuity between END1 90XR14 pin 5 END2 90XP24 pin 5		OK		Sinazo Mkhwa - 529940	M3
10008	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10009	A	Master Key TC1 Train Lines Measure continuity between END1 90XR14 pin 17 END2 90XP24 pin 17		OK		Sinazo Mkhwa - 529940	M3
10010	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3

Section 5 – Internal Lighting

5.1 Instructions list

5.1.1 052_LGT-Internal Lighting

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Internal Lighting (SPP=52)		OK		Mpumelelo Sithole - 529980	M3
10002	I	Initial Conditions		OK		Mpumelelo Sithole - 529980	M3
10003	I	110Vdc Normal line is ON		OK		Mpumelelo Sithole - 529980	M3
10004	I	Cleaning Light Command		OK		Mpumelelo Sithole - 529980	M3
10005	A	110Vdc Permanent Train Line Apply 110V on 93XT304_1 pin 4 to simulate permanent supply		OK		Mpumelelo Sithole - 529980	M3
10006	A	Close Circuit Breaker 52Q3		OK		Mpumelelo Sithole - 529980	M3
10007	A	Close Circuit Breaker 52Q4		OK		Mpumelelo Sithole - 529980	M3
10008	A	Close Circuit Breaker 52Q5		OK		Mpumelelo Sithole - 529980	M3
10009	R	All saloon emergency lights (low intensity) are OFF on all light modules (Left + Right)		OK		Mpumelelo Sithole - 529980	M3
10010	A	Turn Cleaning Light Switch 52S6 to ON position.		OK		Mpumelelo Sithole - 529980	M3
10011	R	All saloon emergency lights (low intensity) are (ON) on all light modules (Left + Right)		OK		Mpumelelo Sithole - 529980	M3
10012	A	Reset Circuit Breaker 52Q5 (Open and Close)		OK		Mpumelelo Sithole - 529980	M3
10013	A	Close Circuit Breaker 52Q1		OK		Mpumelelo Sithole - 529980	M3
10014	A	Close Circuit Breaker 52Q2		OK		Mpumelelo Sithole - 529980	M3

10015	R	All saloon emergency lights (low intensity) are ON (on) all light modules (Left + Right)		OK		Mpumelelo Sithole - 529980	M3

Section 6 – PACIS System

6.1 Instructions list

6.1.1 054_PIS-PACIS System

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	PACIS System IO (SPP=054)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Initial conditions		OK		Sinazo Mkhwa - 529940	M3
10003	I	110Vdc Normal line is connected and ON		OK		Sinazo Mkhwa - 529940	M3
10004	I	Circuit Breakers		OK		Sinazo Mkhwa - 529940	M3
10005	A	Close Circuit Breaker 54Q1		OK		Sinazo Mkhwa - 529940	M3
10006	A	Close Circuit Breaker 54Q2		OK		Sinazo Mkhwa - 529940	M3
10007	A	Close Circuit Breaker 54Q10		OK		Sinazo Mkhwa - 529940	M3
10008	A	Close Circuit Breaker 54Q11		OK		Sinazo Mkhwa - 529940	M3
10009	A	Close Circuit Breaker 55Q2		OK		Sinazo Mkhwa - 529940	M3
10010	A	Close Circuit Breaker 55Q3		OK		Sinazo Mkhwa - 529940	M3
10011	R	All 'Pacis System' circuit breakers are closed		OK		Sinazo Mkhwa - 529940	M3
10012	I	Power Supply of Router Switches		OK		Sinazo Mkhwa - 529940	M3
10013	I	Ethernet Switch CRS1		OK		Sinazo Mkhwa - 529940	M3
10014	R	CRS1 is ON		OK		Sinazo Mkhwa - 529940	M3
10015	I	Ethernet Switch CRS2		OK		Sinazo Mkhwa - 529940	M3
10016	R	CRS2 is ON		OK		Sinazo Mkhwa - 529940	M3
10017	I	DPAI-1		OK		Sinazo Mkhwa - 529940	M3
10018	R	DPAI-1 is ON		OK		Sinazo Mkhwa - 529940	M3
10019	I	DPAI-2		OK		Sinazo Mkhwa - 529940	M3
10020	R	DPAI-2 is ON		OK		Sinazo Mkhwa - 529940	M3
10021	I	Lateral Display 'LAT1'		OK		Sinazo Mkhwa - 529940	M3

10022	R	The PWR (power) LED is ON on the Lateral Display 'LAT1'		OK		Sinazo Mkhwa - 529940	M3
10023	I	Lateral Display 'LAT2'		OK		Sinazo Mkhwa - 529940	M3
10024	R	The PWR (power) LED is ON on the Lateral Display 'LAT2'		OK		Sinazo Mkhwa - 529940	M3
10025	I	Interior Display 'INT1'		OK		Sinazo Mkhwa - 529940	M3
10026	R	The PWR (power) LED is ON on the Interior Display 'INT1'		OK		Sinazo Mkhwa - 529940	M3
10027	I	Interior Display 'INT2'		OK		Sinazo Mkhwa - 529940	M3
10028	R	The PWR (power) LED is ON on the Interior Display 'INT2' is ON		OK		Sinazo Mkhwa - 529940	M3
10029	I	Impedance of Loudspeaker		OK		Sinazo Mkhwa - 529940	M3
10030	I	Saloon Speakers Commanded by DPAI-1		OK		Sinazo Mkhwa - 529940	M3
10031	A	Measure the impedance connector '54XP1_X4' between pins:z32(+) and z30 (-)		OK		Sinazo Mkhwa - 529940	M3
10032	R	Impedance Result Max : x <= 32.00 (Ohm)		OK	29.3	Sinazo Mkhwa - 529940	M3
10033	I	Saloon Speakers Commanded by DPAI-2		OK		Sinazo Mkhwa - 529940	M3
10034	A	Measure the impedance connector '54XP2_X4' between pins:z32(+) and z30 (-)		OK		Sinazo Mkhwa - 529940	M3
10035	R	Impedance Result Max : x <= 32.00 (Ohm)		OK	29	Sinazo Mkhwa - 529940	M3

Section 7 – Train Ground Communication

7.1 Instructions list

7.1.1 062_ETS-ERTMS

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	ERTMS (SPP=062)		OK		Sinazo Mkhwa - 529940	M3
10002	A	ERTMS Bypass Train Lines Check continuity between END1 90XR14 pin 11 END2 90XP24 pin 11		OK		Sinazo Mkhwa - 529940	M3
10003	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10004	A	Emergency Brake ERTMS 1 Train Lines Check continuity between END1 90XR14 pin 18 END2 90XP24 pin 18		OK		Sinazo Mkhwa - 529940	M3
10005	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10006	I	Emergency Brake ERTMS 2 Train Lines Check continuity between END1 90XR14 pin 20 END2 90XP24 pin 20		OK		Sinazo Mkhwa - 529940	M3
10007	R	Both pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10008	I	Eurobalise Antenna Cable		OK		Sinazo Mkhwa - 529940	M3
10009	A	Check continuity between [Intercar(LOCAL: +END1; Connector - 90XR10) and Intercar (LOCAL:+END2; connector -90XP20)] according to the image below		OK		Sinazo Mkhwa - 529940	M3

10010	R	Eurobalise Antenna cable is correctly configured		OK		Sinazo Mkhwa - 529940	M3

Section 8 – Rescue Mode and Emergency Disconnection

8.1 Instructions list

8.1.1 027_ERM-Rescue Mode and Emergency Disconnection

I - Information A - Action R - Result NE - Not Executed

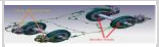
N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Rescue Mode and Emergency Disconnection (SPP=027)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Backup Mode		OK		Sinazo Mkhwa - 529940	M3
10003	A	Backup Mode Train Lines Check continuity between END1 90XR15 pin 23 END2 90XP25 pin 23 and 27K1 A1		OK		Sinazo Mkhwa - 529940	M3
10004	R	All points are continuous		OK		Sinazo Mkhwa - 529940	M3
10005	A	Check continuity between 27K1 A2 and Ground		OK		Sinazo Mkhwa - 529940	M3
10006	R	The points are continuous		OK		Sinazo Mkhwa - 529940	M3
10007	I	Emergency Disconnection		OK		Sinazo Mkhwa - 529940	M3
10008	A	Emergency Disconnection Train Lines Check continuity between END1 90XR15 pin 24 END2 90XP25 pin 24		OK		Sinazo Mkhwa - 529940	M3
10009	R	All points are continuous		OK		Sinazo Mkhwa - 529940	M3

Section 9 – Emergency Brake

9.1 Instructions list

9.1.1 044_UBK-Emergency Brake

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Emergency Brake (SPP=044)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Initial Conditions		OK		Sinazo Mkhwa - 529940	M3
10003	I	No PEAs are activated		OK		Sinazo Mkhwa - 529940	M3
10004	I	110Vdc Normal power supply should be connected to the vehicle and ON		OK		Sinazo Mkhwa - 529940	M3
10005	I	Visual Inspection		OK		Sinazo Mkhwa - 529940	M3
10006	A	Physically and visually inspect all the Disk Break Units (DBU) and brake pads, to ensure they are securely fitted		OK		Sinazo Mkhwa - 529940	M3
10007	R	All the brake DBUs are correctly installed and all the brake pads are correctly installed and locked		OK		Sinazo Mkhwa - 529940	M3
10008	A	Check the pipe installation		OK		Sinazo Mkhwa - 529940	M3
10009	R	All the pipes are installed on the vehicle		OK		Sinazo Mkhwa - 529940	M3
10010	A	Check all the Passenger Emergency Alarm handles, and ensure they are connected to their respective connectors		OK		Sinazo Mkhwa - 529940	M3
10011	R	All the PEAs are installed and connected		OK		Sinazo Mkhwa - 529940	M3
10012	I	Train Lines		OK		Sinazo Mkhwa - 529940	M3
10013	A	Emergency Brake Loop Train Lines Check continuity between END1 90XR24 pin 8 END2 90XP34 pin 8		OK		Sinazo Mkhwa - 529940	M3

10014	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10015	A	Emergency Brake Loop Override Train Lines Check continuity between END1 90XR24 pin 9 END2 90XP34 pin 9		OK		Sinazo Mkhwa - 529940	M3
10016	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10017	I	Emergency Brake Train Line Check continuity between END1 90XR25 pin 67 END2 90XP35 pin 67		OK		Sinazo Mkhwa - 529940	M3
10018	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10019	A	PEA Loop OTDR Train Lines Check continuity between END1 90XR24 pin 10 END2 90XP34 pin 10		OK		Sinazo Mkhwa - 529940	M3
10020	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10021	A	PEA Loop Train Lines Check continuity between END1 90XR25 pin 95 END2 90XP35 pin95		OK		Sinazo Mkhwa - 529940	M3
10022	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10023	A	PEA Reset Check continuity on Timer Relay 44D1 between points A1 and B1. Check continuity on Timer Relay 44D1 between points A4, B3 and C4		OK		Sinazo Mkhwa - 529940	M3
10024	R	The Points are continuous.		OK		Sinazo Mkhwa - 529940	M3

Section 10 – Service Brake

10.1 Instructions list

10.1.1 040_SBK-Service Brake

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Service Brake (SPP=040)		OK		Amanda Ntuli - 526239	M3
10002	I	Initial Conditions		OK		Amanda Ntuli - 526239	M3
10003	I	No air supply to the vehicle		OK		Amanda Ntuli - 526239	M3
10004	I	All brake panel cocks are in normal position (not isolated)		OK		Amanda Ntuli - 526239	M3
10005	I	110Vdc Normal power supply should be connected to the vehicle and ON		OK		Amanda Ntuli - 526239	M3
10006	I	Follow the procedure in the document below to upload software onto the TBCU electronic		OK		Amanda Ntuli - 526239	M3
10007	I	Power Supply		OK		Amanda Ntuli - 526239	M3
10008	A	Remove the connector 10XR12_XCB2 from the propulsion box		OK		Amanda Ntuli - 526239	M3
10009	A	Close Circuit Breaker 33Q1, 33Q3 and 33Q5		OK		Amanda Ntuli - 526239	M3
10010	A	Check the voltage on connector 10XR12_XCB2 between pins 4 (+) and 69 (-) ; 4(+) and 67(-); and 5(+) and 68(-)		OK		Amanda Ntuli - 526239	M3
10011	R	Battery Voltage (above 80Vdc) is measured on connector 10XR12_XCB2 between pins 4 (+) and 69 (-) ; 4(+) and 67(-); and 5(+) and 68(-)		OK		Amanda Ntuli - 526239	M3
10012	A	Open Circuit Breaker 33Q1 and 33Q3, Replace connector 10XR12_XCB2 on the propulsion box, and Close Circuit breaker 33Q1 and 33Q3		OK		Amanda Ntuli - 526239	M3

10013	A	Remove the connector -40XP2_C2_16 from pneumatic brake panel		OK		Amanda Ntuli - 526239	M3
10014	A	Close Circuit Breaker 40Q1		OK		Amanda Ntuli - 526239	M3
10015	A	Check the voltage on connector 40XP2_C2_16 between pins 13 (+) and 31 (-)		OK		Amanda Ntuli - 526239	M3
10016	R	Battery Voltage (above 80Vdc) is measured on connector 40XP2_C2_16 between pins 13 (+) and 31 (-)		OK		Amanda Ntuli - 526239	M3
10017	A	Open Circuit Breaker 40Q1, Replace connector -40XP2_C2_16 on the pneumatic brake panel, and Close Circuit breaker -40Q1		OK		Amanda Ntuli - 526239	M3
10018	R	The pneumatic brake panel 40A2 is ON		OK		Amanda Ntuli - 526239	M3
10019	I	Train Lines		OK		Amanda Ntuli - 526239	M3
10020	A	EB Reduced Train Lines Check continuity between END1 90XR15 pin 60 END2 90XP25 pin 60		OK		Amanda Ntuli - 526239	M3
10021	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10022	A	Brake Applied Train Lines Check continuity between END1 90XR15 pin 50 END2 90XP25 pin 50		OK		Amanda Ntuli - 526239	M3
10023	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10024	A	Remote Isolation Train Lines Check continuity between END1 90XR15 pin 59 END2 90XP25 pin 59		OK		Amanda Ntuli - 526239	M3
10025	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3

Section 11 – Holding and Parking Brake

11.1 Instructions list

11.1.1 045_PBK-Holding and Parking Brake

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Holding and Parking Brake (SPP_045)		OK		Amanda Ntuli - 526239	M3
10002	I	Initial Conditions		OK		Amanda Ntuli - 526239	M3
10003	A	Using the tools list on the side of your screen, record the serial number of the manometer that will be used during this test		OK		Amanda Ntuli - 526239	M3
10004	A	Check that the pressure on Test point C2.11/1 is >5bar		OK		Amanda Ntuli - 526239	M3
10005	I	Visual Inspection		OK		Amanda Ntuli - 526239	M3
10006	A	Check the installation of the manual parking brake release components (lever + cable)		OK		Amanda Ntuli - 526239	M3
10007	R	The lever is securely fixed (tight) and the cable is correctly attached to the bogie (there is no excess cable and all clamps are installed)		OK		Amanda Ntuli - 526239	M3
10008	I	Circuit Breaker		OK		Amanda Ntuli - 526239	M3
10009	A	Close Circuit Breaker 33Q3		OK		Amanda Ntuli - 526239	M3
10010	A	Close Circuit Breaker 33Q5		OK		Amanda Ntuli - 526239	M3
10011	I	Parking Brake Pressure Switch		OK		Amanda Ntuli - 526239	M3
10012	R	Read Defined Variable [TT] (TBCU3)LI_PARK_BR_RELEASE = 1.0		OK	1	Amanda Ntuli - 526239	M3
10013	R	Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 0.0		OK	0	Amanda Ntuli - 526239	M3
10014	R	Read Defined Variable [TT] (MPU1)tbcu3_parkbrakerelease = 1.0		OK	1	Amanda Ntuli - 526239	M3
10015	R	Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 0.0		OK	0	Amanda Ntuli - 526239	M3
10016	A	Parking Brake Applied Train Lines Check continuity between END1 90XR15 pin 77		OK		Amanda Ntuli - 526239	M3

		END2 90XP25 pin 77					
10017	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10018	A	Remote Parking Command Train Lines Check continuity between END1 90XR15 pin 68 END2 90XP25 pin 68		OK		Amanda Ntuli - 526239	M3
10019	R	Both points are continuous		OK		Amanda Ntuli - 526239	M3
10020	I	Parking Brake Applied		OK		Amanda Ntuli - 526239	M3
10021	I	For this section of the test, ensure that the pressure on test point C2.11/1 is ALWAYS BELOW 4.8 Bar. if it goes above, turn the Isolation cock C2.3.2 to CLOSE position to drain the air		OK		Amanda Ntuli - 526239	M3
10022	A	Position the Isolation cock C2.3.2 in CLOSE position. Allow the parking brake air pressure to drain to below 4.5 Bar. Use the test point C2.11/1 to verify the air pressure <4.5 Bar		OK		Amanda Ntuli - 526239	M3
10023	R	Pressure at test point C2.11/1 <4.5 Bar		OK		Amanda Ntuli - 526239	M3
10024	R	Read Defined Variable [TT] (TBCU3)LI_PARK_BR_RELEASE = 0.0		OK	0	Amanda Ntuli - 526239	M3
10025	R	Read Defined Variable [TT] (MPU1)tbcu3_parkbrakerelease = 0.0		OK	0	Amanda Ntuli - 526239	M3
10026	A	Return the Isolation cock C2.3.2 to OPEN position		OK		Amanda Ntuli - 526239	M3
10027	R	Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 1.0		OK	1	Amanda Ntuli - 526239	M3
10028	R	Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 1.0		OK	1	Amanda Ntuli - 526239	M3
10029	R	Read Defined Variable [TT] (TBCU3)LI_PARK_BR_DC = 0.0		OK	0	Amanda Ntuli - 526239	M3
10030	R	Read Defined Variable [TT] (MPU1)tbcu3_parkbrakeisoldc = 0.0		OK	0	Amanda Ntuli - 526239	M3
10031	R	Read Defined Variable [TT] (MPU1)li_pbk_m3parkbrakeisol = 0.0		OK	0	Amanda Ntuli - 526239	M3
10032	A	Position the Isolation cock C2.3.2 in CLOSE position		OK		Amanda Ntuli - 526239	M3

10033	R	Read Defined Variable [TT] (MPU1)li_pbk_m3parkbrakeisol = 1.0		OK	1	Amanda Ntuli - 526239	M3
10034	R	Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 0.0		OK	0	Amanda Ntuli - 526239	M3
10035	R	Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 0.0		OK	0	Amanda Ntuli - 526239	M3
10036	R	Read Defined Variable [TT] (TBCU3)LI_PARK_BR_DC = 1.0		OK	1	Amanda Ntuli - 526239	M3
10037	R	Read Defined Variable [TT] (MPU1)tbcu3_parkbrakeisoldc = 1.0		OK	1	Amanda Ntuli - 526239	M3
10038	A	Return the Isolation cock C2.3.2 to OPEN position		OK		Amanda Ntuli - 526239	M3

Section 12 – Air Condition

12.1 Instructions list

12.1.1 057_HVA-HVAC_TK

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Air Conditioning (SPP=057)		NE			M3
10002	I	Power Supply		NE			M3
10003	A	Close Circuit Breaker 57Q2		NE			M3
10004	A	Remove Connector 57XP1_5 from HVAC Panel		NE			M3
10005	A	Force [] (MPU1)lo_hva_m3hvacinhibr1___1 = 0		NE			M3
10006	A	Force [] (MPU1)lo_hva_m3hvacinhibr2___1 = 0		NE			M3
10007	R	Check battery voltage (above 80Vdc) between points 11 and 9 of the connector 57XP1_5		NE			M3
10008	A	Force [] (MPU1)lo_hva_m3hvacinhibr2___1 = 1		NE			M3
10009	R	Check 0Vdc between points 11 and 9 of the connector 57XP1_5		NE			M3
10010	A	Force [] (MPU1)lo_hva_m3hvacinhibr1___1 = 1		NE			M3
10011	R	Check 0Vdc between points 11 and 9 of the connector 57XP1_5		NE			M3
10012	R	Check 0Vdc between points 10 and 9 of the connector 57XP1_5		NE			M3
10013	A	Force [] (MPU1)lo_hva_m3hvacinhibr2___1 = 0		NE			M3
10014	A	Force [] (MPU1)lo_hva_m3emergventil___1 = 1		NE			M3
10015	R	Check 0Vdc between points 11 and 9 of the connector 57XP1_5		NE			M3
10016	R	Check battery voltage (above 80Vdc) between points 10 and 9 of the connector 57XP1_5		NE			M3

10017	A	Release [] (MPU1)Io_hva_m3emergventil___1		NE			M3
10018	A	Release [] (MPU1)Io_hva_m3hvacinhibr1___1		NE			M3
10019	A	Release [] (MPU1)Io_hva_m3hvacinhibr2___1		NE			M3
10020	A	Put back the connector 57XP1_5 on the HVAC panel		NE			M3
10021	I	HVAC Electronic Power Supply		NE			M3
10022	A	Close Circuit Breaker F1 on the HVAC Panel		NE			M3
10023	A	Turn the control switch to AUTO position on the HVAC Panel		NE			M3
10024	R	The HVAC electronic is ON		NE			M3
10025	A	Open Circuit Breaker F1 on the HVAC Panel		NE			M3
10026	R	The HVAC electronic is OFF		NE			M3
10027	A	Close Circuit Breaker F1 on the HVAC Panel		NE			M3
10028	I	Software Upload		NE			M3
10029	I	Follow the procedure in the document below to upload software onto the HVAC electronic		NE			M3
10030	A			NE			M3
10031	A			NE			M3
10032	I	Sensor's Grade		NE			M3
10033	I	Each temperature sensor has calibrated grade information. The sensor must be setup with this information.		NE			M3
10034	A	The label with sensor grade information is found inside the HVAC frame, near the filter. Inside the train, open the ceiling filter access, rotate a damper and read the label.		NE			M3

10035	R	Sensor grade for HVAC Return Air (RAS) is:		NE			M3
10036	R	Sensor grade for HVAC Duct Air (DAS) is:		NE			M3
10037	R	Sensor grade for HVAC Fresh Air (FAS) is:		NE			M3
10038	R	Sensor grade for HVAC Duct Air 2 (DAS2) is:		NE			M3
10039	A	In the maintenance software, select the "Application settings" page and click the "Sensors" tab		NE			M3
10040	A	Enter the data found on the label for each grade. Then, click "Save settings".		NE			M3
10041	A	Open Circuit Breaker F1 on the HVAC Panel		NE			M3
10042	I	Checking 400Vac		NE			M3
10043	A	Ensure that the 400Vac Shore Supply is connected to the vehicle, else connect it		NE			M3
10044	A	Close Circuit Breaker 57Q1		NE			M3
10045	A	Measure 400Vac (+-5%) in the Terminal Block next to the connector '57XP1_10.A / '57XP1_10.B' on the HVAC Panel		NE			M3
10046	R	400Vac (+-5%) is measured between each of the phases		NE			M3
10047	A	On the HVAC Panel, with a phasemeter, check the correct Phase Rotation between points L1- Phase R, L2- Phase S and L3- Phase T.		NE			M3
10048	R	The phase rotation is correct between all three phases		NE			M3
10049	I	Saloon HVAC		NE			M3
10050	A	Close Circuit Breaker F1 on the HVAC Panel		NE			M3
10051	A	Force [] (MPU1)lo_hva_m3hvacinhibr2___1 = 1		NE			M3
10052	A	Force [] (MPU1)lo_hva_m3hvacinhibr1___1 = 1		NE			M3

10053	A	Force [] NRG_HvacM350Cmd = 0		NE			M3
10054	R	HVAC unit turns ON and starts to work		NE			M3
10055	I	Reconnect the laptop to the HVAC maintenance software using HCU Finder		NE			M3
10056	R	The Exhaust fans are Turned Off (Confirm on Forced tab that Actual exhauster speed is OFF)		NE			M3
10057	I	Forced Mode (Saloon HVAC)		NE			M3
10058	I	To force any mode on HVAC, please follow the manual below to open the communication channel with the HVAC. Connection should be through the HVAC Electronic Device in the HC cubicle.		NE			M3
10059	I	In the maintenance software, select the 'Forced' tab, and use the "Required working mode" drop down box to force the following modes:		NE			M3
10060	I	Ventilation Mode		NE			M3
10061	A	Force Ventilation mode on the Saloon HVAC		NE			M3
10062	R	All saloon HVAC units work in Ventilation mode. Not heating/cooling		NE			M3
10063	R	The Exhaust fans are Turned OFF		NE			M3
10064	I	Cooling Mode		NE			M3
10065	A	Force Cooling mode on the Saloon HVAC		NE			M3
10066	R	All saloon HVAC units work in Cooling mode		NE			M3
10067	R	The Exhaust fans are Turned OFF		NE			M3
10068	I	Heating Mode		NE			M3
10069	A	Force Heating mode on the Saloon HVAC		NE			M3
10070	R	All saloon HVAC units work in Heating mode		NE			M3
10071	R	The Exhaust fans are Turned OFF		NE			M3
10072	I	Automatic Mode		NE			M3

10073	A	Force Self-Test on the Saloon HVAC		NE			M3
10074	R	All saloon HVAC units work according to the mode described in the "Actual working mode"		NE			M3
10075	R	The Exhaust fans are Turned OFF		NE			M3
10076	I	HVAC Faults		NE			M3
10077	A	Open Circuit Breaker 57Q1		NE			M3
10078	R	All saloon HVAC units STOP working		NE			M3
10079	A	Close Circuit Breaker 57Q1		NE			M3
10080	R	All saloon HVAC units START working		NE			M3
10081	A	In the maintenance software, select the "Alarms / Warnings" tab		NE			M3
10082	I	For the next sections, walk through the whole car and physically check (feel) that the HVAC is functioning as desired		NE			M3
10083	A	Ensure there are no active faults on the HVAC		NE			M3
10084	R	No active faults identified on the HVAC unit		NE			M3
10085	A	Release [] (MPU1)lo_hva_m3hvacinhibr1___1		NE			M3
10086	A	Release [] (MPU1)lo_hva_m3hvacinhibr2___1		NE			M3
10087	A	Release [] NRG_HvacM350Cmd		NE			M3
10088	I	END TEST		NE			M3

12.1.2 057_HVA_SME-HVAC_SME

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	HVA_057 Air Conditioning		OK		Sizwe Sibanyoni - 484647	M3
10002	I	Initial conditions		OK		Sizwe Sibanyoni - 484647	M3
10003	A	Car Should be Prepared with CVS running and 400V ac available in the car		OK		Sizwe Sibanyoni - 484647	M3
10004	I	HVAC AC Power Supply		OK		Sizwe Sibanyoni - 484647	M3
10005	A	Close Circuit Breaker 13Q1 and 13Q5		OK		Anthonia Mabowa - 494131	M3
10006	A	Check on the DDU if the HVAC is offline		OK		Sizwe Sibanyoni - 484647	M3
10007	I	Checking 400Vac		OK		Sizwe Sibanyoni - 484647	M3
10008	A	Close Circuit Breaker 57Q1		OK		Sizwe Sibanyoni - 484647	M3
10009	A	Disconnect connector 57XP4_X5 and Measure 400Vac between all 3 phases which are a1- phase L1, a2- Phase L2 and b1- phase L3 of connector 57XP4_X5		OK		Sizwe Sibanyoni - 484647	M3
10010	R	400Vac measured between all phases		OK		Sizwe Sibanyoni - 484647	M3
10011	A	On same connector 57XP4_X5, with a phasemeter, check the correct Phase Rotation between points a1- Phase L1, a2- Phase L2 and b1- Phase L3.		OK		Sizwe Sibanyoni - 484647	M3
10012	R	The phase rotation is correct between all three phases		OK		Sizwe Sibanyoni - 484647	M3
10013	I	Saloon HVAC		OK		Sizwe Sibanyoni - 484647	M3
10014	A	Close Circuit Breaker 57Q2		OK		Sizwe Sibanyoni - 484647	M3
10015	A	Allow the HVAC to initialize and check on the DDU if the HVAC is online		OK		Sizwe Sibanyoni - 484647	M3
10016	R	HVAC unit is online and starts to work		OK		Sizwe Sibanyoni - 484647	M3
10017	I	HVAC web portal		OK		Sizwe Sibanyoni - 484647	M3
10018	A	The attached document is a procedure on how to navigate around the maintenance		OK		Sizwe Sibanyoni - 484647	M3

		software.					
10019	I	Connect the laptop to the HVAC maintenance software using web browser. Enter the following IP address on the web browser 10.136.xxx.31 xxx represents the train number Login: maint Password: maint		OK		Sizwe Sibanyoni - 484647	M3
10020	R	On status tab, Active mode is off for both cab and saloon		OK		Sizwe Sibanyoni - 484647	M3
10021	A	Go to Alarms tab and clear all the alarms for saloon and cabin		OK		Sizwe Sibanyoni - 484647	M3
10022	I	HVAC inhib		OK		Paseka Ditlhakanyane - 491468	M3
10023	A	Force [] (MPU1)lo_hva_m3hvacinhibr1___1 = 1		OK	1	Anthonia Mabowa - 494131	M3
10024	A	Force [] (MPU1)lo_hva_m3hvacinhibr2___1 = 1		OK	1	Anthonia Mabowa - 494131	M3
10025	I	HVAC 50% restriction		OK		Anthonia Mabowa - 494131	M3
10026	A	Force [] NRG_HvacM350Cmd = 0		OK	0	Anthonia Mabowa - 494131	M3
10027	I	Full "Self test" saloon		OK		Anthonia Mabowa - 494131	M3
10028	I	For the following tests make sure on the webHMI tab you change contoller to be controlled by webHMI and not MPU		OK		Anthonia Mabowa - 494131	M3
10029	A	Before running the full test, please click on reset test to reset the previous results.		OK		Anthonia Mabowa - 494131	M3
10030	A	Select Full-Test on the Saloon HVAC		OK		Anthonia Mabowa - 494131	M3
10031	R	All saloon HVAC units work according to the mode described in the "ACTIVE MODE" on the status tab		OK		Anthonia Mabowa - 494131	M3
10032	R	When the test is complete, please check if the status is showing as "TEST PASS" and the test took 3 mins +/- 2 seconds for each mode.		OK		Anthonia Mabowa - 494131	M3
10033	I	Forced Mode (Saloon HVAC)		OK		Anthonia Mabowa - 494131	M3
10034	I	During all tests Walk through the whole car and physically check (feel) that the HVAC is functioning as desired		OK		Anthonia Mabowa - 494131	M3

10035	I	Go to maintenance tab to force the following modes		OK		Anthonia Mabowa - 494131	M3
10036	I	Cooling Mode		OK		Anthonia Mabowa - 494131	M3
10037	A	Select forced Cooling mode on the Saloon HVAC and let it run for 5 mins		OK		Anthonia Mabowa - 494131	M3
10038	R	All HVAC units are cooling		OK		Anthonia Mabowa - 494131	M3
10039	I	Heating Mode		OK		Anthonia Mabowa - 494131	M3
10040	A	Select forced Heating mode on the Saloon HVAC and let it run for 5 mins		OK		Anthonia Mabowa - 494131	M3
10041	R	All HVAC units are heating		OK		Anthonia Mabowa - 494131	M3
10042	I	HVAC Faults		OK		Anthonia Mabowa - 494131	M3
10043	A	In the maintenance software, select the "Alarms" tab		OK		Anthonia Mabowa - 494131	M3
10044	A	Ensure there are no active faults on the HVAC for the Saloon. Use the highlighted drop down to navigate between saloon and cabin.		OK		Anthonia Mabowa - 494131	M3
10045	R	No active faults identified on the HVAC unit		OK		Anthonia Mabowa - 494131	M3
10046	A	Release [] (MPU1)lo_hva_m3hvacinhibr1__1		OK		Anthonia Mabowa - 494131	M3
10047	A	Release [] (MPU1)lo_hva_m3hvacinhibr2__1		OK		Anthonia Mabowa - 494131	M3
10048	A	Release [] NRG_HvacM350Cmd		OK		Anthonia Mabowa - 494131	M3
10049	I	End of test		OK		Anthonia Mabowa - 494131	M3

Section 13 – Fire Protection

13.1 Instructions list

13.1.1 067_FSD-Fire Protection

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Fire Protection System (SPP=067)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Fire Detection Train Lines		OK		Sinazo Mkhwa - 529940	M3
10003	A	Fire Detection Train Lines Check continuity between END1 90XR14 pin 21 END2 90XP24 pin 21		OK		Sinazo Mkhwa - 529940	M3
10004	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10005	I	Continuity Test		OK		Sinazo Mkhwa - 529940	M3
10006	I	The following steps are continuity tests between the two points described in each step. Use a multimeter for this test.		OK		Sinazo Mkhwa - 529940	M3
10007	A	From : [(local: +END1 -90XR13.B (pin 4))] to: [-Inter-connector (local: +END2 -90XP23.b pin 4)]		OK		Sinazo Mkhwa - 529940	M3
10008	A	From : [(local: +END1 -90XR13.B (pin 5))] to: [-Inter-connector (local: +END2 -90XP23.b pin 5)]		OK		Sinazo Mkhwa - 529940	M3
10009	A	From : [(local: +END1 -90XR13.A (pin 7))] to: [-Inter-connector (local: +END2 -90XP23.a pin 7)]		OK		Sinazo Mkhwa - 529940	M3
10010	A	From : [(local: +END1 -90XR13.A (pin 8))] to: [-Inter-connector (local: +END2 -90XP23.a pin 8)]		OK		Sinazo Mkhwa - 529940	M3

Section 14 – Traction and Electric Brake

14.1 Instructions list

14.1.1 033_TRC-Traction and Electric Brake

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Traction and Electric Brake (SPP=033)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Circuit Breakers and Configuration		OK		Sinazo Mkhwa - 529940	M3
10003	A	Close Circuit Breaker 33Q2		OK		Sinazo Mkhwa - 529940	M3
10004	A	Close Circuit Breaker 33Q4		OK		Sinazo Mkhwa - 529940	M3
10005	A	Close Circuit Breaker 33Q5		OK		Sinazo Mkhwa - 529940	M3
10006	I	Circuit Breaker 33Q1 and 33Q3 must be Opened		OK		Sinazo Mkhwa - 529940	M3
10007	I	110Vdc Normal Traction EL Train Line Apply bridge piece between END2 90XP25 pin 14 and pin 42		OK		Sinazo Mkhwa - 529940	M3
10008	A	Close Circuit Breaker 33Q1		OK		Sinazo Mkhwa - 529940	M3
10009	A	Close Circuit Breaker 33Q3		OK		Sinazo Mkhwa - 529940	M3
10010	R	Read Defined Variable [TT] (TBCU3)LI_CAR_ID3 = 1.00		OK	1	Sinazo Mkhwa - 529940	M3
10011	I	The TBCU should appear on TCMS network on DDU screen		OK		Sinazo Mkhwa - 529940	M3
10012	I	Train Lines		OK		Sinazo Mkhwa - 529940	M3
10013	A	Forward Train Lines Check continuity between END1 90XR15 pin 25 END2 90XP25 pin 25		OK		Sinazo Mkhwa - 529940	M3

10014	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10015	A	Reverse Train Lines Check continuity between END1 90XR15 pin 30 END2 90XP25 pin 30		OK		Sinazo Mkhwa - 529940	M3
10016	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10017	A	Traction Train Lines Check continuity between END1 90XR15 pin 31 END2 90XP25 pin 31		OK		Sinazo Mkhwa - 529940	M3
10018	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10019	A	No Brake Train Lines Check continuity between END1 90XR15 pin 32 END2 90XP25 pin 32		OK		Sinazo Mkhwa - 529940	M3
10020	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10021	A	Traction Interlock Bypass Train Lines Check continuity between END1 90XR14 pin 6 END2 90XP24 pin 6		OK		Sinazo Mkhwa - 529940	M3
10022	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10023	A	Traction Interlock Train Lines Check continuity between END1 90XR15 pin 41 END2 90XP25 pin 41 and -10XP12_XCB2 pin 8		OK		Sinazo Mkhwa - 529940	M3
10024	R	All pins are continuous		OK		Sinazo Mkhwa - 529940	M3
10025	I	110Vdc Normal Traction EL Train Line Remove bridge peice on END2 90XP25 pin 49 and pin 42		OK		Sinazo Mkhwa - 529940	M3
10026	I	Coolant Liquid		OK		Sinazo Mkhwa - 529940	M3
10027	A	Check that the coolant level is atleast 1/2 of the sight glass level indicator	☒	OK		Sinazo Mkhwa - 529940	M3
10028	R	Coolant Liquid Level is OK		OK		Sinazo Mkhwa - 529940	M3

10029	I	End of Test		OK		Sinazo Mkhwa - 529940	M3

Section 15 – Passenger Doors

15.1 Instructions list

15.1.1 050_DOR-Passenger Doors

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	I	Passenger Doors (SPP=050)		OK		Sinazo Mkhwa - 529940	M3
10002	I	Initial conditions		OK		Sinazo Mkhwa - 529940	M3
10003	I	110Vdc Normal power supply is connected to the vehicle and ON		OK		Sinazo Mkhwa - 529940	M3
10004	I	Circuit Breaker		OK		Sinazo Mkhwa - 529940	M3
10005	A	Close Circuit Breaker 50Q1		OK		Sinazo Mkhwa - 529940	M3
10006	R	DCU 1 is powered ON		OK		Sinazo Mkhwa - 529940	M3
10007	R	Check on the DDU that DCU1 is online		OK		Sinazo Mkhwa - 529940	M3
10008	A	Close Circuit Breaker 50Q2		OK		Sinazo Mkhwa - 529940	M3
10009	R	DCU 2 is powered ON		OK		Sinazo Mkhwa - 529940	M3
10010	R	Check on the DDU that DCU2 is online		OK		Sinazo Mkhwa - 529940	M3
10011	A	Close Circuit Breaker 50Q3		OK		Sinazo Mkhwa - 529940	M3
10012	R	DCU 3 is powered ON		OK		Sinazo Mkhwa - 529940	M3
10013	R	Check on the DDU that DCU3 is online		OK		Sinazo Mkhwa - 529940	M3
10014	A	Close Circuit Breaker 50Q4		OK		Sinazo Mkhwa - 529940	M3
10015	R	DCU 4 is powered ON		OK		Sinazo Mkhwa - 529940	M3
10016	R	Check on the DDU that DCU4 is online		OK		Sinazo Mkhwa - 529940	M3
10017	A	Close Circuit Breaker 50Q5		OK		Sinazo Mkhwa - 529940	M3
10018	R	DCU 5 is powered ON		OK		Sinazo Mkhwa - 529940	M3
10019	R	Check on the DDU that DCU5 is online		OK		Sinazo Mkhwa - 529940	M3
10020	A	Close Circuit Breaker 50Q6		OK		Sinazo Mkhwa - 529940	M3
10021	R	DCU 6 is powered ON		OK		Sinazo Mkhwa - 529940	M3

10022	R	Check on the DDU that DCU6 is online		OK		Sinazo Mkhwa - 529940	M3
10023	A	Close Circuit Breaker 50Q7		OK		Sinazo Mkhwa - 529940	M3
10024	I	Car ID Code		OK		Sinazo Mkhwa - 529940	M3
10025	A	Using the DDU on the test bench, check that all the doors on M4 are available - as in the picture below		OK		Sinazo Mkhwa - 529940	M3
10026	R	All doors are available		OK		Sinazo Mkhwa - 529940	M3
10027	I	Train Lines and Safety Loop		OK		Sinazo Mkhwa - 529940	M3
10028	A	ERTMS Auth Left Train Lines Check continuity between END1 90XR15 pin 44 END2 90XP25 pin 44		OK		Sinazo Mkhwa - 529940	M3
10029	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10030	A	ERTMS Auth Right Train Lines Check continuity between END1 90XR15 pin 47 END2 90XP25 pin 47		OK		Sinazo Mkhwa - 529940	M3
10031	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10032	A	Doors Open Train Lines Check continuity between END1 90XR15 pin 66 END2 90XP25 pin 66		OK		Sinazo Mkhwa - 529940	M3
10033	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10034	A	Door Close Right Train Lines Check continuity between END1 90XR15 pin 78 END2 90XP25 pin 78		OK		Sinazo Mkhwa - 529940	M3
10035	A	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10036	A	Door Close Left Train Lines Check continuity between END1 90XR15 pin 79 END2 90XP25 pin 79		OK		Sinazo Mkhwa - 529940	M3
10037	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3

10038	A	Door Auth Left Train Lines Check continuity between END1 90XR15 pin 85 END2 90XP25 pin 85		OK		Sinazo Mkhwa - 529940	M3
10039	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10040	A	Door Auth Right Train Lines Check continuity between END1 90XR15 pin 84 END2 90XP25 pin 84		OK		Sinazo Mkhwa - 529940	M3
10041	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10042	A	V<3km/h Train Lines Check continuity between END1 90XR15 pin 29 END2 90XP25 pin 29		OK		Sinazo Mkhwa - 529940	M3
10043	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10044	A	Door Auth Left Train Lines Check continuity between END1 90XR15 pin 85 END2 90XP25 pin 85		OK		Sinazo Mkhwa - 529940	M3
10045	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10046	A	Door Auth Right Train Lines Check continuity between END1 90XR15 pin 84 END2 90XP25 pin 84		OK		Sinazo Mkhwa - 529940	M3
10047	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10048	A	Safety Doors Loop Train Lines Check continuity between END1 90XR15 pin 96 END2 90XP25 pin 96		OK		Sinazo Mkhwa - 529940	M3
10049	R	Both points are continuous		OK		Sinazo Mkhwa - 529940	M3
10050	I	Left Side Doors		OK		Sinazo Mkhwa - 529940	M3
10051	I	Door 1		OK		Sinazo Mkhwa - 529940	M3
10052	I	Use bridge pieces to apply voltage on the passenger door mechanism to simulate the following signals: - Door Auth Left		OK		Sinazo Mkhwa - 529940	M3

		- Door Open Left - V<3km/h					
10053	A	Apply bridge pieces on 50XP1_X11 between slot 2,3,4 and 15		OK		Sinazo Mkhwa - 529940	M3
10054	A	Force [TT] (MPU1)lo_dor_m3opendoorleft = 1.00		OK		Amanda Ntuli - 526239	M3
10055	R	Check that the door opens in 3 sec (+1/-0)		OK		Sinazo Mkhwa - 529940	M3
10056	R	Check that the GREEN LED on both sides of the door blink while the door opens [Safety Request: Prasa8-05]		OK		Sinazo Mkhwa - 529940	M3
10057	I	Door Opening Gap		OK		Sinazo Mkhwa - 529940	M3
10058	A	Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door)		OK		Sinazo Mkhwa - 529940	M3
10059	R	Door 1 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1393	Amanda Ntuli - 526239	M3
10060	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Amanda Ntuli - 526239	M3
10061	R	Door 1 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1401	Amanda Ntuli - 526239	M3
10062	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Sinazo Mkhwa - 529940	M3
10063	R	Door 1 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1396	Amanda Ntuli - 526239	M3
10064	I	Door 3		OK		Amanda Ntuli - 526239	M3
10065	A	Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door)		OK		Sinazo Mkhwa - 529940	M3
10066	R	Door 3 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1393	Amanda Ntuli - 526239	M3
10067	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Sinazo Mkhwa - 529940	M3
10068	R	Door 3 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1400	Amanda Ntuli - 526239	M3

10069	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Amanda Ntuli - 526239	M3
10070	R	Door 3 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1395	Amanda Ntuli - 526239	M3
10071	I	Door 5		OK		Amanda Ntuli - 526239	M3
10072	I	Door Opening Gap		OK		Amanda Ntuli - 526239	M3
10073	A	Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door)		OK		Amanda Ntuli - 526239	M3
10074	R	Door 5 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1392	Amanda Ntuli - 526239	M3
10075	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Amanda Ntuli - 526239	M3
10076	R	Door 5 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1401	Amanda Ntuli - 526239	M3
10077	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Amanda Ntuli - 526239	M3
10078	R	Door 5 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1396	Amanda Ntuli - 526239	M3
10079	I	Right Side Doors		OK		Amanda Ntuli - 526239	M3
10080	I	Door 2		OK		Sinazo Mkhwa - 529940	M3
10081	A	Use bridge pieces to apply voltage on the passenger door mechanism to simulate the following signals: - Door Auth Right - Door Open Right - V<3km/h		OK		Sinazo Mkhwa - 529940	M3
10082	A	Apply bridge pieces on 50XP2_X11 between slot 2,3,4 and 15		OK		Sinazo Mkhwa - 529940	M3
10083	A	Force [TT] (MPU1)lo_dor_m3opendoorright = 1.00		OK		Amanda Ntuli - 526239	M3
10084	R	Check that the door opens in 3 sec (+1/-0)		OK		Amanda Ntuli - 526239	M3
10085	R	Check that the GREEN LED on both sides of the door blink while the door opens. [Safety Request: Prasa8-05]		OK		Amanda Ntuli - 526239	M3

10086	I	Door Opening Gap		OK		Amanda Ntuli - 526239	M3
10087	A	Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door).		OK		Amanda Ntuli - 526239	M3
10088	R	Door 2 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1393	Amanda Ntuli - 526239	M3
10089	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Amanda Ntuli - 526239	M3
10090	R	Door 2 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1399	Amanda Ntuli - 526239	M3
10091	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Amanda Ntuli - 526239	M3
10092	R	Door 2 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1395	Amanda Ntuli - 526239	M3
10093	I	Door 4		OK		Amanda Ntuli - 526239	M3
10094	I	Door Opening Gap		OK		Amanda Ntuli - 526239	M3
10095	A	Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door)		OK		Amanda Ntuli - 526239	M3
10096	R	Door 4 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1392	Amanda Ntuli - 526239	M3
10097	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Amanda Ntuli - 526239	M3
10098	R	Door 4 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1400	Amanda Ntuli - 526239	M3
10099	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Amanda Ntuli - 526239	M3
10100	R	Door 4 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1396	Amanda Ntuli - 526239	M3
10101	I	Door 6		OK		Amanda Ntuli - 526239	M3
10102	I	Door Opening Gap		OK		Amanda Ntuli - 526239	M3
10103	A	Measure the opening gap of the door. (This measurement must be done at the		OK		Amanda Ntuli - 526239	M3

		BOTTOM of the door)					
10104	R	Door 6 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1394	Amanda Ntuli - 526239	M3
10105	A	Measure the opening gap of the door. (This measurement must be done at the top of the door)		OK		Amanda Ntuli - 526239	M3
10106	R	Door 6 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1402	Amanda Ntuli - 526239	M3
10107	A	Measure the opening gap of the door. (This measurement must be done in the middle of the door)		OK		Amanda Ntuli - 526239	M3
10108	R	Door 6 gap Result Min/Max : 1390<= x <= 1410 (mm)		OK	1397	Amanda Ntuli - 526239	M3
10109	I	Obstacle Detection		OK		Amanda Ntuli - 526239	M3
10110	A	Position an obstacle on the floor in the centre of the door closing line for all the doors		OK		Sinazo Mkhwa - 529940	M3
10111	A	Remove the bridge piece on 50XP1_X11 pin 2		OK		Sinazo Mkhwa - 529940	M3
10112	A	Remove the bridge piece on 50XP2_X11 pin 2		OK		Sinazo Mkhwa - 529940	M3
10113	R	The doors will hit the obstacle, reopen and try to close again 3 times. On the third attempt it will stop and stand ajar - free to be opened manually		OK		Sinazo Mkhwa - 529940	M3
10114	A	Safety Doors Loop Train Lines Check continuity between END1 90XR15 pin 96 END2 90XP25 pin 96		OK		Sinazo Mkhwa - 529940	M3
10115	R	There is no continuity between the two points		OK		Sinazo Mkhwa - 529940	M3
10116	A	Put back the bridge piece on 50XP1_X11 pin 2		OK		Sinazo Mkhwa - 529940	M3
10117	A	Put back the bridge piece on 50XP2_X11 pin 2		OK		Sinazo Mkhwa - 529940	M3
10118	R	The door opens fully		OK		Sinazo Mkhwa - 529940	M3
10119	A	Remove the obstacle		OK		Amanda Ntuli - 526239	M3

10120	A	Release [TT] (MPU1)lo_dor_m3opendoorleft		OK		Amanda Ntuli - 526239	M3
10121	A	Release [TT] (MPU1)lo_dor_m3opendoorright		OK		Amanda Ntuli - 526239	M3
10122	A	Remove the bridge pieces on connector 50XP1_X11		OK		Amanda Ntuli - 526239	M3
10123	A	Remove the bridge pieces on connector 50XP2_X11		OK		Amanda Ntuli - 526239	M3

Section 16 – Vehicle Normalization

16.1 Instructions list

16.1.1 093_NORM-Vehicle Normalization

I - Information A - Action R - Result NE - Not Executed

N°	Type	Instruction	File	Result status	Result value	Operator	Vehicle
10001	R	On LV3 all Connectors are tightened		OK		Amanda Ntuli - 526239	M3
10002	I	Initial Conditions		OK		Amanda Ntuli - 526239	M3
10003	I	The VFT procedures are all completed		OK		Amanda Ntuli - 526239	M3
10004	I	Vehicle Normalization Check		OK		Amanda Ntuli - 526239	M3
10005	R	On LV3 all Circuit Breakers are installed and secured		OK		Amanda Ntuli - 526239	M3
10006	R	On LV3 all Dataplugs are installed, tightened and earth braids are fastened		OK		Amanda Ntuli - 526239	M3
10007	R	On LV3 there are no missing components, device, wiring or connectors.		OK		Amanda Ntuli - 526239	M3
10008	R	On LV6 all Dataplugs are installed, tightened and earth braids are fastened		OK		Amanda Ntuli - 526239	M3
10009	R	On LV6 all Connectors are tightened		OK		Amanda Ntuli - 526239	M3
10010	R	On LV6 there are no missing components, device, wiring or connectors.		OK		Amanda Ntuli - 526239	M3
10011	R	On HC Cubicle the Controller is installed and properly tightened and its connectors are tightened		OK		Amanda Ntuli - 526239	M3
10012	R	All DCUs are properly installed and secured		OK		Amanda Ntuli - 526239	M3
10013	R	All Internal Displays are properly installed and secured		OK		Amanda Ntuli - 526239	M3
10014	R	All Light Covers are properly installed		OK		Amanda Ntuli - 526239	M3

10015	R	All Saloon Fire Detectors are properly installed and secured		OK		Amanda Ntuli - 526239	M3
10016	R	All covers are normalised inside the car		OK		Amanda Ntuli - 526239	M3
10017	R	On the Underframe, TBCU Agate is installed and properly tightened		OK		Amanda Ntuli - 526239	M3
10018	R	On the Underframe, Speed Sensors are installed and properly tightened		OK		Amanda Ntuli - 526239	M3
10019	R	On the LVB, all Circuit Breakers are installed and properly tightened		OK		Amanda Ntuli - 526239	M3
10020	R	On the LVB, all Relays and Timers are installed and properly tightened		OK		Amanda Ntuli - 526239	M3
10021	R	On the LVB, BRIOMs are installed and properly tightened		OK		Amanda Ntuli - 526239	M3
10022	R	On the LVB there are no missing components, device, wiring or connectors.		OK		Amanda Ntuli - 526239	M3
10023	R	On the Underframe, all Connectors are tightened		OK		Amanda Ntuli - 526239	M3
10024	R	All underframe covers are normalised		OK		Tshegofatso Setshogwe - 404572	M3
10025	R	On END1 the Octopus cables are disconnected from the car and properly stored.		OK		Amanda Ntuli - 526239	M3
10026	R	On END2 the Octopus cables are disconnected from the car and properly stored.		OK		Amanda Ntuli - 526239	M3
10027	R	The Test Bench is switched OFF and the Octopus cables are disconnected and properly stored		OK		Amanda Ntuli - 526239	M3
10028	R	ALL P.Os of this car are closed		OK		Tshegofatso Setshogwe - 404572	M3
10029	I	End Of Test		OK		Amanda Ntuli - 526239	M3

Section 17 – Report summaries

17.1 Results status

Test Instruction Sheet	Compliant	Incomplete	Non-compliant
Vehicle Normalization	X		
Train Ground Communication	X		
Traction and Electric Brake	X		
TCMS Network	X		
Service Brake	X		
Rescue Mode and Emergency Disconnection	X		
Passenger Doors	X		
PACIS System	X		
Internal Lighting	X		
Holding and Parking Brake	X		
Fire Protection	X		
Energy Distribution	X		
Emergency Brake	X		
Cabin Control	X		
Air Condition	X		

17.2 Tools used

Function	Tool name	Tool number
015_NRG	Phasemeter	Phasemeter
054_PIS	Multimeter	Multimeter 2
057_HVA_SME	Phasemeter	Phasemeter
062_ETS	Multimeter	Multimeter 2
067_FSD	Multimeter	Multimeter 2

Vehicle	Equipment	Expected version	Version loaded

M3			