

| PROJECT          | CUSTOMER | VEHICLE         |
|------------------|----------|-----------------|
| X'trapolis-PRASA | PRASA    | 277 – TC1 – VPT |

RTR Vehicle Pre-Testing TS277 TC1 Report  
GIB0000008029



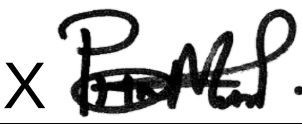
|           | CREATED             | VERIFIED       | APPROVED        | DISTRIBUTION                                                                                                                                                        |
|-----------|---------------------|----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name      | Nhlakanipho MASONDO | Sifiso LUKHELE | Kgomotso NKOANA | Confidentiality Category<br><i>Restricted</i> <i>Project</i> <i>Normal</i><br><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |
| Date      | 11/04/2025          | 11/04/2025     | 11/04/2025      | Control Category<br><i>Controlled</i> <i>Not Controlled</i><br><input checked="" type="checkbox"/> <input type="checkbox"/>                                         |
| Signature |                     |                |                 | Language<br><b>EN</b>                                                                                                                                               |

This report has been automatically generated from TES version 1.

## Table of modifications

| Rev | Date       | Modifications Content | Writer              |
|-----|------------|-----------------------|---------------------|
| A0  | 11/04/2025 | Creation              | Nhlakanipho MASONDO |

## Internal validations

|                 | Name                | Function            | Date       | Signature                                                                                                                       |
|-----------------|---------------------|---------------------|------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Creator</b>  | Nhlakanipho MASONDO | EPU Manager         | 11/04/2025 | X <br>Nhlakanipho MASONDO<br>EPU Manager      |
| <b>Verifier</b> | Sifiso LUKHELE      | Serial Test Manager | 11/04/2025 | X <br>Sifiso LUKHELE<br>Serial Test Manager |
| <b>Approver</b> | Kgomotso NKOANA     | Test Expert         | 11/04/2025 | X <br>Kgomotso NKOANA<br>Test Expert        |

## Execution Plan

|                   |            |
|-------------------|------------|
| <b>Start Date</b> | 27/03/2025 |
| <b>End Date</b>   | 27/03/2025 |



## Contents

---

### Section 1 - Purpose / Objectives

### Section 2 - Protective Bonding

2.1 Instructions list

### Section 3 - Reflectometry

3.1 Instructions list

### Section 4 - Config

4.1 Instructions list

### Section 5 - Report summaries

5.1 Results status

5.2 Tools used

## Section 1 – Purpose / Objectives

---

### 1. Protective Bonding

The objective of this procedure is to verify the return path of the current to the ground.

### 2. Reflectometry

The objective of this procedure is to verify the integrity of the ethernet cables.

### 3. Config

The objective of this procedure is to set up car ID for specific systems such as fire and to verify wiring to the speed sensors and OTDR.



|                                                                            |                                                    |                             |
|----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------|
| Serial Tests Report<br>TS277 – TC1 – VPT<br>RTR Vehicle Pre-Testing Report | Document Reference<br>GIB0000008029<br>Version: A0 | Emission date<br>11/04/2025 |
|----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------|



Serial Tests Report  
TS277 – TC1 – VPT  
RTR Vehicle Pre-Testing Report

Document Reference  
GIB0000008029  
Version: A0

Emission date  
11/04/2025

## Section 2 – Protective Bonding

---

### 2.1 Instructions list

### 2.1.1 012-Protective Bonding and Return Current

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

| N°    | Type | Instruction                                                                                                                                                                                                                                                               | File                                                                                | Result status | Result value | Operator                              | Vehicle |
|-------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|--------------|---------------------------------------|---------|
| 10001 | I    | Return Circuit: car body to Ground                                                                                                                                                                                                                                        |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10002 | I    | The purpose of this test is to confirm that the car body of each car in the train is connected to ground via the earthing brush which will ensure that current from the overhead wire is returned to the substation without damage to equipment or risk of electric shock |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10003 | A    | The Ohmmeter shall be off                                                                                                                                                                                                                                                 |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10004 | A    | Use the Tool List to record the serial number of the Ohmmeter that will be used for this test                                                                                                                                                                             |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10005 | A    | Ensure that the current setpoint is 50A and voltage <50V (applicable for all impedance measurement) on the Ohmmeter device to be used for the test.                                                                                                                       |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10006 | I    | For all impedance measurements of the car body to ground the positive terminal shall be connected to the car body and the negative terminal to the rail                                                                                                                   |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10007 | I    | For all other impedance measurements, the positive terminal shall be connected to the tested subject and the negative terminal to the car body shell.                                                                                                                     |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10008 | A    | Visually identify and inspect that the earthing cables of the 1st axle of 1st bogie frame and the 2nd axle of 2nd bogie frame are properly connected to the axle brushes.                                                                                                 |  | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10009 | A    | Disconnect from the axle box the earthing cable of the 2nd axle of 2nd bogie frame                                                                                                                                                                                        |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10010 | R    | Only the earthing cable of the 1st axle of the 1st bogie frame is connected                                                                                                                                                                                               |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10011 | A    | Measure the car body to ground impedance                                                                                                                                                                                                                                  |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10012 | R    | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                                                                                                                                 |                                                                                     | OK            | 0.001637     | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |
| 10013 | A    | Disconnect the earthing cable of 1st axle of 1st bogie frame                                                                                                                                                                                                              |                                                                                     | OK            |              | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1     |

|       |   |                                                                                                                                                                |  |    |         |                                       |     |
|-------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|---------|---------------------------------------|-----|
| 10014 | A | Connect the earthing cable of the 2nd axle of 2nd bogie frame                                                                                                  |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10015 | R | Only the earthing cable of the 2nd axle of the 2nd bogie frame of TC1 car is connected                                                                         |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10016 | A | Measure the car body to ground impedance                                                                                                                       |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10017 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                      |  | OK | 0.00146 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10018 | A | Connect the earthing cable of the 1st axle of 1st bogie frame                                                                                                  |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10019 | I | Earthing of Equipment on the Underframe                                                                                                                        |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10020 | A | Visually inspect that the earthing cable connecting the Auxiliary Converter Case to TC1 car body is properly connected and related bolts are correctly torqued |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10021 | R | Auxiliary Converter visually grounded and torque is correctly marked                                                                                           |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10022 | A | Measure the impedance between the Auxiliary Converter Case and the car body                                                                                    |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10023 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                      |  | OK | 0.00179 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10024 | A | Visually inspect that the earthing cable connecting the Battery Box to the car body is properly connected and the related bolts are correctly torqued          |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10025 | R | Battery Box visually grounded and torque is correctly marked                                                                                                   |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10026 | A | Measure the impedance between the Battery Box Case and the car body                                                                                            |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10027 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                      |  | OK | 0.00174 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10028 | A | Visually inspect that the earthing cable connecting the Eurobalise Antenna to the car body is properly connected and the related bolts are correctly torqued   |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10029 | R | Eurobalise Antenna visually grounded and torque is correctly marked                                                                                            |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10030 | A | Measure the impedance between the Eurobalise Antenna and the car body                                                                                          |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10031 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                      |  | OK | 0.00364 | Mvelo Mthembu<br>425564               | TC1 |



|       |   |                                                                                                                                                            |  |    |          |                                       |     |
|-------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----------|---------------------------------------|-----|
|       |   |                                                                                                                                                            |  |    |          | 27.03.2025                            |     |
| 10032 | A | Visually inspect that the earthing cable connecting the LVB/Brake Module to the car body is properly connected and the related bolts are correctly torqued |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10033 | R | LVB/Brake Module visually grounded and torque is correctly marked                                                                                          |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10034 | A | Measure the impedance between the LVB/Brake and the car body                                                                                               |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10035 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                  |  | OK | 0.00174  | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10036 | I | Earthing of Equipment on the Exterior                                                                                                                      |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10037 | I | Exterior Front                                                                                                                                             |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10038 | A | Visually inspect that the earthing cable connecting the Front Coupler to the car body is properly connected and the related bolts are correctly torqued    |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10039 | R | Front Coupler visually grounded and torque is correctly marked                                                                                             |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10040 | A | Measure the impedance between the Front Coupler and the car body                                                                                           |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10041 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                  |  | OK | 0.001186 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10042 | I | Earthing of Equipment on the Roof                                                                                                                          |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10043 | A | Visually inspect that the earthing cable connecting the Saloon HVAC to the car body is properly connected and the related bolts are correctly torqued      |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10044 | R | Saloon HVAC visually grounded and torque is correctly marked                                                                                               |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10045 | A | Measure the impedance between the Saloon HVAC and the car body                                                                                             |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10046 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                  |  | OK | 0.001772 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10047 | A | Visually inspect that the earthing cable connecting the Cab HVAC to the car body is properly connected and the related bolts are correctly torqued         |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10048 | R | Cab HVAC visually grounded and torque is correctly marked                                                                                                  |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |

|       |   |                                                                                                                                                                 |  |    |          |                                       |     |
|-------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----------|---------------------------------------|-----|
| 10049 | A | Measure the impedance between the Cab HVAC and the car body                                                                                                     |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10050 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                       |  | OK | 0.000868 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10051 | I | Earthing of interior equipment                                                                                                                                  |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10052 | I | Cabin                                                                                                                                                           |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10053 | A | Visually inspect that the earthing cable connecting LV1 cubicle to the car body is properly connected and the related bolts are correctly torqued               |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10054 | R | LV1 visually grounded and torque is correctly marked                                                                                                            |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10055 | A | Measure the impedance between the LV1 cubicle and the car body                                                                                                  |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10056 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                       |  | OK | 0.00074  | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10057 | A | Visually inspect that the earthing cable connecting LV2 cubicle to the car body is properly connected and the related bolts are correctly torqued               |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10058 | R | LV2 visually grounded and torque is correctly marked                                                                                                            |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10059 | A | Measure the impedance between the LV2 cubicle and the car body                                                                                                  |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10060 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                       |  | OK | 0.000725 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10061 | A | Visually inspect that the earthing cable connecting Under Desk Left cubicle to the car body is properly connected and the related bolts are correctly torqued   |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10062 | R | Under Desk Left cabinet visually grounded and torque is correctly marked                                                                                        |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10063 | A | Measure the impedance between the Under Desk Left cabinet and the car body                                                                                      |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10064 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                                       |  | OK | 0.000767 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10065 | A | Visually inspect that the earthing cable connecting Under Desk Middle cabinet to the car body is properly connected and the related bolts are correctly torqued |  | OK |          | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |

|       |   |                                                                                                                                                   |  |    |         |                                       |     |
|-------|---|---------------------------------------------------------------------------------------------------------------------------------------------------|--|----|---------|---------------------------------------|-----|
| 10066 | R | Under Desk Middle cabinet visually grounded and torque is correctly marked                                                                        |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10067 | A | Measure the impedance between the Under Desk Middle cabinet and the car body                                                                      |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10068 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                         |  | OK | 0.00503 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10069 | A | Measure the impedance between the Master Controller and the car body                                                                              |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10070 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                         |  | OK | 0.00115 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10071 | A | Measure the impedance between the Foot Heater and the car body                                                                                    |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10072 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                         |  | OK | 0.00437 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10073 | I | Saloon                                                                                                                                            |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10074 | A | Visually inspect that the earthing cable connecting LV7 cubicle to the car body is properly connected and the related bolts are correctly torqued |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10075 | R | LV7 visually grounded and torque is correctly marked                                                                                              |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10076 | A | Measure the impedance between the LV7 cubicle and the car body                                                                                    |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10077 | R | Impedance Result Max: $x \leq 0.05$ (Ohm)                                                                                                         |  | OK | 0.00547 | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |
| 10078 | I | END OF TEST                                                                                                                                       |  | OK |         | Mvelo Mthembu<br>425564<br>27.03.2025 | TC1 |



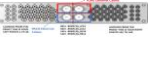
|                                                                            |                                                    |                             |
|----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------|
| Serial Tests Report<br>TS277 – TC1 – VPT<br>RTR Vehicle Pre-Testing Report | Document Reference<br>GIB0000008029<br>Version: A0 | Emission date<br>11/04/2025 |
|----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------|

## Section 3 – Reflectometry

### 3.1 Instructions list

#### 3.1.1 025\_NET\_054\_PIS-Network Cabling Integrity Test

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

| N°    | Type | Instruction                                                                                                                                                                                         | File                                                                                | Result status | Result value | Operator                               | Vehicle |
|-------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|--------------|----------------------------------------|---------|
| 10001 | I    | Network Cabling Integrity Test                                                                                                                                                                      |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10002 | I    | It is necessary to check the network cables to ensure that they have been installed correctly to improve the overall operation of the system.                                                       |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10003 | I    | The Cable Analyzer Module DSX-5000 will be used to validate cabling                                                                                                                                 |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10004 | I    | Register as a new Operator on the DSX-5000. Check on the manual below on how to register as a new Operator. <a href="#">[14-48-12-308038_DSX 5000 User Manual.pdf]</a>                              |  | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10005 | I    | When saving the tests results for each line, it should be named by its trainset number (X) and the test code (Indicated in the test step). i.e. TS021_TC1_P01 for PACIS and TS021_TC1_T01 for TCMS. |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10006 | I    | Use the pictures below for coupler test                                                                                                                                                             |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10007 | I    | Front Coupler                                                                                                                                                                                       |  | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10008 | I    | DB9 pin out                                                                                                                                                                                         |  | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10009 | I    | TCMS cabling                                                                                                                                                                                        |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10010 | A    | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH7)] to: [54A13 Train Router Switch (Local: +LV1; Connector: 54XP13_ETHCPU)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T01        |                                                                                     | OK            |              | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1     |
| 10011 | A    | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH4)] to:                                                                                                                         |                                                                                     | OK            |              | Celiwe Sokhela<br>491462               | TC1     |

|       |   |                                                                                                                                                                                                   |  |    |  |                                        |     |
|-------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|--|----------------------------------------|-----|
|       |   | [25A11 Ethernet Switch (CRS2) (Local: +LV1; Connector: 25XP11_X4)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T02                                                                                   |  |    |  | 27.03.2025                             |     |
| 10012 | A | From: [25A11 Ethernet Switch (CRS2) (Local: +LV1; Connector: 25XP11_X3)]<br>to: [25A12 Switch Ethernet (CRS3) (Local: +LV1; Connector: 25XP12_X4)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T03   |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10013 | A | From: [25A12 Ethernet Switch (Local: +LV1; Connector: 25XP12_X8)] to:<br>[25A18 MAINTENANCE INTERFACE (Local: +LV1; Connector: 25XP18_ETH)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T04          |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10014 | A | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH1)] to:<br>[25A14 Ethernet Repeater (TBR) (Local: +LV7; Connector: 25XP14_ETH0)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T05 |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10015 | A | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH5)] to:<br>[25A10 Ethernet Switch (CRS1) (Local: +LV7; Connector: 25XP10_X3)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T06    |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10016 | A | From: [25A12 Switch Ethernet (CRS3) (Local: +LV1; Connector: 25XP12_X3)]<br>to: [25A13 Switch Ethernet (CRS4) (Local: +LV7; Connector: 25XP13_X4)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T07   |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10017 | A | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH3)] to:<br>[Inter-car (Local: +END2; 90XP11.all)]<br><br>NOTE: Cable is Straight<br>TSX_TC1_T08                               |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10018 | A | From: [25A10 Ethernet Switch (CRS1) (Local: +LV7; Connector: 25XP10_X4)]<br>to: [Inter-car (Local: +END2; 90XP11.all)]<br><br>NOTE: Cable is Straight<br>TSX_TC1_T09                              |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10019 | A | From: [25A13 Ethernet Switch (Local: +LV7; Connector: 25XP13_X3)] to: [Inter-car (Local: +END2; 90XP12.all)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_T10                                         |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |

|       |   |                                                                                                                                                                                                                                                                                                                            |  |    |  |                                        |     |
|-------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|--|----------------------------------------|-----|
| 10020 | A | From: [25A14 TBR (Local: +LV7; Connector: 25XP14_ETH1)] to: [Inter-car (Local: +END2; 90XP12.al)]<br><br>NOTE: Cable is Straight<br>TSX_TC1_T11                                                                                                                                                                            |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10021 | A | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH0)] to: [Coupler 041 (Local: CLP; Connector: 90XR120_LC14)]<br>TSX_TC1_T12<br><br>NOTE: Cable is crossed<br>NOTE: For this test, use the male coupler connector provided. Please refer to the picture above for the correct location of connector.     |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10022 | A | From: [25A15 Train Router Switch (Local: +LV1; Connector: 25XP15_ETH2)] to: [Coupler 141 (Local: +CLP; Connector: 90XR120_RC14)]<br>TSX_TC1_T13<br><br>NOTE: Cable is Straight<br>NOTE: For this test use the female coupler connector provided. Please refer to the above picture for correct location for the connector. |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10023 | A | From: [ UHF Ethernet Cable (63XP1_X4) (Local: +LV2)] to: [ UHF Handheld Ethernet Cable (Local: UDR - Under Driver Right); (63XP2_X1)]<br>TSX_TC1_T14<br><br>NOTE: Cable is straight with 8 wires                                                                                                                           |  | OK |  | Ntobeko Ndlovu<br>421595<br>29.03.2025 | TC1 |
| 10024 | I | Pacis cabling                                                                                                                                                                                                                                                                                                              |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10025 | A | From: [TRS 54A13 (Local: +LV1; Connector: 54XP13_ETH7)] to: [Inter-car (Local: +END2; 90XP12.el)]<br><br>NOTE: Cable is straight<br>TSX_TC1_P01                                                                                                                                                                            |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10026 | A | From: [CRS1 54A10 (Local: +LV7; Connector: 54XP10_X7)] to: [Inter-car (Local: +END2; 90XP11.el)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_P02                                                                                                                                                                              |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10027 | A | From: [54A13 TRS (Local: +LV1; Connector: 54XP13_ETH6)] to: [54A10 CRS1 (Local: +LV7; Connector: 54XP10_X8)]<br><br>NOTE: Cable is crossed<br>TSX_TC1_P03                                                                                                                                                                  |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10028 | A | From: [54A42 RACK UMC (EBM) (Local: +LV1; Connector: 54XP42_X2) to:                                                                                                                                                                                                                                                        |  | OK |  | Celiwe Sokhela<br>491462               | TC1 |

|       |   |                                                                                                                                                                                                                                                                                                                                      |  |    |  |                                        |     |
|-------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|--|----------------------------------------|-----|
|       |   | [Coupler 042 (Local: +CLP; Connector: 90XR120_LE12)]<br>TSX_TC1_P04<br><br>NOTE: Cable is crossed<br>NOTE: For this test, use the male coupler connector and the DB9 connector provided. Refer to the picture above for the correct location of the connector.                                                                       |  |    |  | 27.03.2025                             |     |
| 10029 | A | From: [54A42 RACK UMC (EBM) (Local: +LV1; Connector: 54XP42_X8) to: [Coupler 142 (Local: +CLP; Connector: 90XR120_RE12)]<br>TSX_TC1_P05<br><br>NOTE: Cable is straight<br>NOTE: For this test use the female coupler connector and the DB9 connector provided. Refer to the picture above for the correct location of the connector. |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10030 | A | All cables have been validated on TC1                                                                                                                                                                                                                                                                                                |  | OK |  | Celiwe Sokhela<br>491462<br>27.03.2025 | TC1 |
| 10031 | R | Download all the results from Fluke and save them on PC with folder name "TC1_TSxx"                                                                                                                                                                                                                                                  |  | OK |  | Ntobeko Ndlovu<br>421595<br>30.03.2025 | TC1 |
| 10032 | I | END OF TEST                                                                                                                                                                                                                                                                                                                          |  | OK |  | Ntobeko Ndlovu<br>421595<br>30.03.2025 | TC1 |

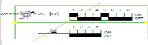
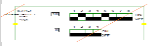


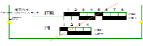
## Section 4 – Config

### 4.1 Instructions list

#### 4.1.1 CONF-Car Configuration

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

| N°    | Type | Instruction                                                                                  | File                                                                                | Result status | Result value | Operator                                | Vehicle |
|-------|------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|--------------|-----------------------------------------|---------|
| 10001 | I    | Configuration Checks                                                                         |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10002 | A    | Check continuity between 93XT104_1 pin 50 and Ground point                                   |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10003 | R    | There is no continuity                                                                       |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10004 | I    | If there is continuity above, the wire 19203LE is pinched on the compressor isolation cock.  |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10005 | A    | Check continuity on all pins of connector 90XP15 & 90XP14 to ground                          |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10006 | R    | There is no continuity except pin 62 of connector 90XP15                                     |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10007 | A    | Check continuity on all pins of the coupler to ground.                                       |                                                                                     | OK            |              | Nokuzola Mdluli<br>491469<br>30.03.2025 | TC1     |
| 10008 | R    | There is no continuity                                                                       |                                                                                     | OK            |              | Nokuzola Mdluli<br>491469<br>30.03.2025 | TC1     |
| 10009 | I    | Smoke Detector Address Configuration                                                         |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10010 | A    | Remove and configure the Smoke Detector 67A4 in the cabin, according to the figure attached. |  | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10011 | A    | Reconnect Smoke Detector 67A4                                                                |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10012 | A    | Remove and configure the Smoke Detector 67A2 (+PA1) according to the figure attached.        |  | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |
| 10013 | A    | Reconnect Smoke Detector 67A2                                                                |                                                                                     | OK            |              | TIVANI Angel<br>542257<br>27.03.2025    | TC1     |

|       |   |                                                                                                                                                                         |                                                                                   |    |       |                                      |     |
|-------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----|-------|--------------------------------------|-----|
| 10014 | A | Remove and configure the Smoke Detector 67A3 (+PA3) according to the figure attached.                                                                                   |  | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10015 | R | Measure the resistance (LHD- Line Heat Detection from Static Converter Box) between point 1 and point 4 of the connector 67XP3_11. Result Min/Max: 550<= x<= 700 (Ohms) |                                                                                   | OK | 601.4 | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10016 | A | Reconnect Smoke Detector 67A3                                                                                                                                           |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10017 | I | OTDR LOOP                                                                                                                                                               |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10018 | I | Check the continuity between the following points:                                                                                                                      |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10019 | A | From: [61A2 Speed Indicator IN+ (local: +DD4)] to: [Local(+END2) Connector: - 90XP13.b pin1]                                                                            |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10020 | A | From: [61A2 Speed Indicator OUT- (local: +DD4)] to: [Local(+END2) Connector: - 90XP13.b pin 2]                                                                          |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |
| 10021 | I | END OF TEST                                                                                                                                                             |                                                                                   | OK |       | TIVANI Angel<br>542257<br>27.03.2025 | TC1 |

## Section 5 – Report summaries

### 5.1 Results status

| Test Instruction Sheet | Compliant | Incomplete | Non-compliant |
|------------------------|-----------|------------|---------------|
| Protective Bonding     | X         |            |               |
| Reflectometry          | X         |            |               |
| Config                 | X         |            |               |

### 5.2 Tools used.

| Function        | Tool name              | Tool number            | Next Calibration date |
|-----------------|------------------------|------------------------|-----------------------|
| 012             | Megger                 | Megger                 | 8/25/2025             |
| 025_NET_054_PIS | Cable Analyser DSX5000 | Cable analyser DSX5000 | 4/29/2025             |
| CONF            | Multimeter             | Meter 1                | 8/31/2025             |

| Vehicle                     | Equipment | Expected version | Version loaded |
|-----------------------------|-----------|------------------|----------------|
| 104770992-104771637-277-259 |           |                  |                |