

| PROJECT         | CUSTOMER | VEHICLE        |
|-----------------|----------|----------------|
| Xtrapolis-PRASA | PRASA    | 290 – M4 – VPT |

RTR Vehicle Pre-Testing TS290 M4 Report  
GIB0000008317




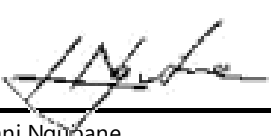

|           | CREATED       | VERIFIED        | APPROVED        | DISTRIBUTION  |
|-----------|---------------|-----------------|-----------------|---|
| Name      | Vusumuzi ZULU | Lindani Ngubane | Kgomotso NKOANA | Confidentiality Category<br><i>Restricted</i> <i>Project</i> <i>Normal</i><br><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |
| Date      | 16/7/2025     | 16/7/2025       | 16/7/2025       | 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  | 16/7/2025 | Creation              | Vusumuzi ZULU |

## Internal validations

|                 | Name            | Function            | Date      | Signature   |
|-----------------|-----------------|---------------------|-----------|---|
| <b>Creator</b>  | Vusumuzi ZULU   | EPU Manager         | 16/7/2025 | X <br>Vusumuzi ZULU<br>EPU Manager             |
| <b>Verifier</b> | Lindani Ngubane | Serial Test Manager | 16/7/2025 | X <br>Lindani Ngubane<br>Serial Test Manager |
| <b>Approver</b> | Kgomotso NKOANA | Test Expert         | 16/7/2025 | X <br>Kgomotso NKOANA<br>Test Expert         |

## Execution Plan

|                   |          |
|-------------------|----------|
| <b>Start Date</b> | 1/7/2025 |
| <b>End Date</b>   | 1/7/2025 |

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## Section 1 – Purpose / Objectives

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### 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.

### 4. Traction motors

The objective of this procedure is to verify the wiring configuration of the motors. This is to ensure that all the motors are wired the same and shall rotate in the same direction in operation



|   |  |                            |
|---|--|----------------------------|
| Serial Tests Report<br>TS290 – M4 – VPT<br>RTR Vehicle Pre-Testing Report | Document Reference<br>GIB0000008317<br>Version: A0 | Emission date<br>16/7/2025 |
|---|--|----------------------------|


## Section 2 – Protective Bonding and Return Current

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### 2.1 Instructions list

### 2.1.1 012\_PB-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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10003 | A    | Use the Tool List to record the serial number of the Ohmmeter that will be used in this test  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10004 | 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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10005 | 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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10006 | 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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10007 | A    | Visually identify and inspect that the earthing cables of the 1st and 2nd axle of the 1st and 2nd Bogie Frame are properly connected to the axle brushes  |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10008 | A    | Disconnect from the axle box the earthing cable of the 1st and 2nd axle of the 1st and 2nd Bogie Frame of the M4 car  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10009 | R    | All the earthing cables of the M4 car are disconnected  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10010 | A    | Connect the earthing cable of the 1st axle in the 1st Bogie Frame   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10011 | R    | Only the earthing cable of the 1st axle of the 1st Bogie Frame is connected   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10012 | A    | Using an ohmmeter measure the impedance between the car body to rail  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10013 | R    | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |   | OK            | 0.00324      | Carol Gumedé<br>425280<br>01.07.2025 | M4      |

|       |   |   |  |    |          |  |    |
|-------|---|---|--|----|----------|--|----|
| 10014 | A | Disconnect the earthing cable of the 1st axle of the 1st bogie frame        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10015 | R | Earthing cable disconnected   |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10016 | A | Connect the earthing cable of the 2nd axle in the 1st Bogie Frame           |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10017 | R | Only the earthing cable of the 2nd axle of the 1st Bogie Frame is connected |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10018 | A | Using an ohmmeter measure the impedance between the car body to rail        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10019 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)                                   |  | OK | 0.00119  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10020 | R | Earthing cable disconnected   |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10021 | A | Disconnect the earthing cable of the 2nd axle of the 1st bogie frame        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10022 | I | Earthing of Equipment on the Underframe                                     |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10023 | A | Connect the earthing cable of the 1st axle in the 2nd Bogie Frame           |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10024 | R | Only the earthing cable of the 1st axle of the 2nd Bogie Frame is connected |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10025 | A | Using an ohmmeter measure the impedance between the car body to rail        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10026 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)                                   |  | OK | 0.002756 | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10027 | A | Disconnect the earthing cable of the 1st axle of the 2nd bogie frame        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10028 | R | Earthing cable disconnected   |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10029 | A | Connect the earthing cable of the 2nd axle in the 2nd Bogie Frame           |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10030 | R | Only the earthing cable of the 1st axle of the 2nd Bogie Frame is connected |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10031 | A | Using an ohmmeter measure the impedance between the car body to rail        |  | OK |          | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10032 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)                                   |  | OK | 0.001276 | Carol Gumedede<br>425280               | M4 |



|       |   |   |  |    |           |                                      |    |
|-------|---|---|--|----|-----------|--------------------------------------|----|
|       |   |   |  |    |           | 01.07.2025                           |    |
| 10033 | A | Reconnect all earthing cables of the 1st and 2nd axle of the 1st and 2nd Bogie Frame  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10034 | R | All earthing cables connected on the 1st and 2nd Bogie Frame  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10035 | A | Visually inspect that the earthing cable connecting the Traction Inverter Case to M4 car body is properly connected and related bolts are correctly torqued   |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10036 | R | Traction Inverter Case visually grounded and torque is correctly marked   |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10037 | A | Using an ohmmeter measure the impedance between the Traction Inverter Case and the car body   |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10038 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.0011009 | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10039 | A | Visually inspect that the earthing cable connecting the Line Inductor Case to M4 car body is properly connected and related bolts are correctly torqued.  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10040 | R | Line Inductor Case visually grounded and torque is correctly marked   |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10041 | A | Using an ohmmeter measure the impedance between the Line Inductor Case and the car body   |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10042 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00324   | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10043 | A | Visually inspect that the earthing cable connecting the Traction Motors of the 1st and 2nd axle of the 1st Bogie Frame to the car body is properly connected and related bolts are correctly torqued. |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10044 | R | Traction Motors visually grounded and torque is correctly marked  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10045 | A | Using an ohmmeter measure the impedance between the Traction Motor of the 1st and 2nd axle of the 1st Bogie Frame and the car body  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10046 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00303   | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10047 | A | Visually inspect that the earthing cable connecting the Traction Motors of the 1st and 2nd axle of the 2nd Bogie Frame to the car body is properly connected and related bolts are correctly torqued. |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10048 | R | Traction Motors visually grounded and torque is correctly marked  |  | OK |           | Carol Gumedé<br>425280<br>01.07.2025 | M4 |

|       |   |   |  |    |         |                                      |    |
|-------|---|---|--|----|---------|--------------------------------------|----|
| 10049 | A | Using an ohmmeter measure the impedance between the Traction Motor of the 1st and 2nd axle of the 2nd Bogie Frame and the car body                            |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10050 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00113 | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10051 | I | Earthing of Interior Equipment  |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10052 | A | Visually inspect that the earthing cable connecting the LV3 cubicle, and the car body is properly connected and related bolts are correctly torqued           |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10053 | R | LV3 cubicle visually grounded and torque is correctly marked  |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10054 | A | Using an ohmmeter measure the impedance between the LV3 cubicle and the car body  |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10055 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00409 | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10056 | A | Visually inspect that the earthing cable connecting the LV6 cubicle, and the car body is properly connected and related bolts are correctly torqued           |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10057 | R | LV6 cubicle visually grounded and torque is correctly marked  |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10058 | A | Using an ohmmeter measure the impedance between the LV6 cubicle and the car body  |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10059 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.008   | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10060 | I | Earthing of Equipment on the Roof   |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10061 | A | Visually inspect that the earthing cable connecting the 1st Braking Resistor Box to M4 car body is properly connected and related bolts are correctly torqued |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10062 | R | 1st Braking Resistor Box visually grounded and torque is correctly marked   |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10063 | A | Using an ohmmeter measure the impedance between the 1st Braking Resistor Box and the car body   |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10064 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00409 | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10065 | A | Visually inspect that the earthing cable connecting the Saloon HVAC to M4 car body is properly connected and related bolts are correctly torqued              |  | OK |         | Carol Gumedé<br>425280<br>01.07.2025 | M4 |

|       |   |   |  |    |          |                                      |    |
|-------|---|---|--|----|----------|--------------------------------------|----|
| 10066 | R | Saloon HVAC visually grounded and torque is correctly marked  |  | OK |          | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10067 | A | Using an ohmmeter measure the impedance between the Saloon HVAC and the car body  |  | OK |          | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10068 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.00121  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10069 | A | Visually inspect that the earthing cable connecting the 2nd Braking Resistor Box to M4 car body is properly connected and related bolts are correctly torqued |  | OK |          | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10070 | R | 2nd Braking Resistor Box visually grounded and torque is correctly marked   |  | OK |          | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10071 | A | Using an ohmmeter measure the impedance between the 1st Braking Resistor Box and the car body   |  | OK |          | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10072 | R | ImpedanceResult Max : $x \leq 0.05$ (Ohm)   |  | OK | 0.001054 | Carol Gumedé<br>425280<br>01.07.2025 | M4 |




|   |  |                            |
|---|--|----------------------------|
| Serial Tests Report<br>TS290 – M4 – VPT<br>RTR Vehicle Pre-Testing Report | Document Reference<br>GIB0000008317<br>Version: A0 | Emission date<br>16/7/2025 |
|---|--|----------------------------|

## Section 3 – Reflectometry

### 3.1 Instructions list

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

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            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 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            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 10003 | I    | The Cable Analyzer Module DSX-5000 will be used to validate cabling   |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 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="#">[9-56-43-308052_DSX 5000 User Manual.pdf]</a>                        |  | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 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_P01 for PACIS and TS021_T01 for TCMS. |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 10006 | I    | TCMS cabling  |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 10007 | A    | From: [25A10 CRS1 (Local: +LV3; Connector: 25XP10_X3)] to: [25A11 CRS2 (Local: +LV3; Connector: 25XP11_X4)]<br><br>NOTE: Cable is crossed<br>TSX_M4_T01                                     |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 10008 | A    | From: [25A10 CRS1 (Local: +LV3; Connector: 25XP10_X4)] to: [(Local: +END1; Connector: 90XP12.All)]<br><br>NOTE: Cable is straight<br>TSX_M4_T02   |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |
| 10009 | A    | From: [25A14 TBR (Local: +LV3; Connector: 25XP14_ETH0)] to: [(Local: +END1; Connector: 90XR11.All)]   |   | OK            |              | Carol Gumedede<br>425280<br>01.07.2025 | M4      |

|       |   |   |  |    |  |                                      |    |
|-------|---|---|--|----|--|--------------------------------------|----|
|       |   | NOTE: Cable is crossed<br>TSX_M4_T03  |  |    |  |                                      |    |
| 10010 | A | From: [25A11 CRS2 (Local: +LV3;<br>Connector: 25XP11_X3)] to: [Inter-car<br>(Local: +END2; Connector: 90XP22.all)]<br><br>NOTE: Cable is crossed<br>TSX_M4_T04  |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10011 | A | From: [25A14 TBR (Local: +LV3;<br>Connector: 25XP14_ETH1)] to: [Inter-car<br>(Local: +END2; Connector: 90XP22.al)]<br><br>NOTE: Cable is straight<br>TSX_M4_T05   |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10012 | A | From: [(Local: +END1; Connector:<br>90XR12.El)] to: [Inter-car (Local: +END2;<br>Connector: 90XP21.al)]<br><br>NOTE: Cable is straight<br>TSX_M4_T06  |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10013 | A | From: [(Local: +END1; Connector:<br>90XR11.El)] to: [Inter-car (Local: +END2;<br>Connector: 90XP21.all)]<br><br>NOTE: Cable is straight<br>TSX_M4_T07   |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10014 | I | Pacis cabling   |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10015 | A | From: [(Local: +END1; Connector: -<br>90XR11.El)] to: [Inter-car (Local: +END2;<br>Connector: -90XP21.el)]<br><br>NOTE: Cable is straight<br>TSX_M4_P01   |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10016 | A | From: [54A10 SWITCH ETHERNET<br>(CRS1) (Local: +LV6; Connector:<br>54XP10_X7)] to: [ (Local: +END1;<br>Connector: -90XR12.El)]<br><br>NOTE: Cable is crossed<br>TSX_M4_P02                              |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10017 | A | From: [54A11 SWITCH ETHERNET<br>(CRS2) (Local: +LV6; Connector:<br>54XP11_X8)] to: [ (Local: +END2;<br>Connector: -90XP22.el)]<br><br>NOTE: Cable is straight<br>TSX_M4_P03                             |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10018 | A | From: [54A11 SWITCH ETHERNET<br>(CRS2) (Local: +LV6; Connector:<br>54XP11_X7)] to: [54A10 SWITCH<br>ETHERNET (CRS1) (Local: +LV6;<br>Connector: 54XP10_X8)]<br><br>NOTE: Cable is crossed<br>TSX_M4_P04 |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10019 | A | All cables have been validated on M4  |  | OK |  | Carol Gumedé                         | M4 |

|       |   |  |  |    |  |  |    |
|-------|---|--|--|----|--|--|----|
|       |   |  |  |    |  | 425280<br>01.07.2025                     |    |
| 10020 | R | Download all the results from Fluke and save them on PC with folder name "M4_TSxx" |  | OK |  | Oageng Kegakilwe<br>514498<br>03.07.2025 | M4 |
| 10021 | R |  |  | OK |  | Oageng Kegakilwe<br>514498<br>03.07.2025 | M4 |

## Section 4 – Config

### 4.1 Instructions list

#### 4.1.1 CONFIG-Vehicle 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            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10002 | A    | Check continuity on all pins of End 1 connector 90XP15 & 90XP14 to ground   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10003 | R    | There is no continuity  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10004 | A    | Check continuity on all pins of End 2 connector 90XP15 & 90XP14 to ground   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10005 | R    | There is no continuity  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10006 | I    | Fire Detection_67   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10007 | I    | Smoke Detector Address Configuration  |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10008 | A    | Remove and configure the Smoke Detector 67A2 (+PA1) according to the figure below                                 |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10009 | A    | Reconnect Smoke Detector 67A2   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10010 | A    | Remove and configure the Smoke Detector 67A3 (+PA3) according to the figure below                                 |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10011 | I    | Line Heat Detection   |   | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10012 | R    | Measure the resistance between point 1 and point 4 of the connector 67XP3_11Result Min/Max : 550<= x<= 700 (Ohms) |   | OK            | 559          | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10013 | A    | Reconnect Smoke Detector 67A3   |   | OK            |              | Carol Gumedé<br>425280               | M4      |



|       |   |   |  |    |  |  |    |
|-------|---|---|--|----|--|--|----|
|       |   |   |  |    |  | 01.07.2025                             |    |
| 10014 | I | OTDR LOOP   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10015 | I | Check the continuity between the following points:  |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10016 | A | From: [ +IV1 (local: +END1 Connector - 90XR13.B (pin1))] to: [local: +END2 Connector - 90XP23.b(pin1)]  |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10017 | A | From: [ -IV1 (local: +END1 Connector - 90XR13.B (pin2))] to: [local: +END2 Connector - 90XP23.b (pin2)] |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |

## Section 5 – Traction Motors

### 5.1 Instructions list

#### 5.1.1 011\_TRM-Traction Motors

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

| N°    | Type | Instruction   | File   | Result status | Result value | Operator                             | Vehicle |
|-------|------|---|--|---------------|--------------|--------------------------------------|---------|
| 10001 | I    | Traction Motors (SPP = 11)  |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10002 | I    | Ensure all the CONNECTORS are fully ASSEMBLED before running a continuity test.   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10003 | I    | The following test is used to confirm the wiring of the traction motors.  |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10004 | I    | SAFETY NOTICE: It is important to ensure that there is no 400Vac power supply on the vehicle.   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10005 | A    | Switch OFF the 400Vac power supply at the source and disconnect the supply cables from the vehicle  |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10006 | R    | There is no 400Vac available on the vehicle   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10007 | I    | Bogie 1 (MB1)   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10008 | I    | Visual Inspection   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10009 | A    | For motor 1 and motor 2 connect 11XR1 and 11XR2 and visually inspect that the following cables are connected from - 11XR1 connector to -11M1 motor and - 11XR2 connector to -11M2 motor respectively. NOTE: the cable configuration should be straight, none should cross the other |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10010 | I    | Motor 2   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |
| 10011 | R    | [ -11XR2 connector (local: UND - 11XP2_2.X1 pin 1)] connected to: [ - 11XT2 motor terminals (U) -11M2].   |  | OK            |              | Carol Gumedé<br>425280<br>01.07.2025 | M4      |

|       |   |   |  |    |  |  |    |
|-------|---|---|--|----|--|--|----|
| 10012 | R | [ -11XR2 connector (local: UND - 11XP2_2.X2 pin 1)] connected to: [ - 11XT2 motor terminals (V) -11M2].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10013 | R | [ -11XR2 connector (local: UND - 11XP2_2.X3 pin 1)] connected to: [ - 11XT2 motor terminals (W) -11M2].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10014 | R | -11M2 Motor terminals PE connected to - 11GND2.   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10015 | I | Motor 1   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10016 | R | [ -11XR1 connector (local: UND - 11XP1_2.X1 pin 1)] connected to: [ - 11XT1 motor terminals (U) -11M1].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10017 | R | [ -11XR1 connector (local: UND - 11XP1_2.X2 pin 1)] connected to: [ - 11XT1 motor terminals (V) -11M1].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10018 | R | [ -11XR1 connector (local: UND - 11XP1_2.X3 pin 1)] connected to: [ - 11XT1 motor terminals (W) -11M1].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10019 | R | -11M1 Motor terminals PE connected to - 11GND.  |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10020 | I | Bogie 2 (MB2)   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10021 | I | Visual Inspection   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10022 | A | For motor 3 and motor 4 visually inspect that the following cables are connected from -11XR3 connector to -11M3 motor and -11XR4 connector to -11M4 motor respectively. NOTE: the cable configuration should be straight, none should cross the other |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10023 | I | Motor 3   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10024 | R | [ -11XR3 connector (local: UND - 11XP3_2.X1 pin 1)] connected to: [ - 11XT3 motor terminals (U) -11M3].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10025 | R | [ -11XR3 connector (local: UND - 11XP3_2.X2 pin 1)] connected to: [ - 11XT3 motor terminals (V) -11M3].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10026 | R | [ -11XR3 connector (local: UND - 11XP3_2.X3 pin 1)] connected to: [ - 11XT3 motor terminals (W) -11M3].   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10027 | R | -11M3 Motor terminals PE connected to - 11GND3.   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |
| 10028 | I | Motor 4   |  | OK |  | Carol Gumedede<br>425280<br>01.07.2025 | M4 |

|       |   |   |  |    |  |                                      |    |
|-------|---|---|--|----|--|--------------------------------------|----|
| 10029 | R | [ -11XR4 connector (local: UND - 11XP4_2.X1 pin 1)] connected to: [ - 11XT4 motor terminals (U) -11M4]. |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10030 | R | [ -11XR4 connector (local: UND - 11XP4_2.X2 pin 1)] connected to: [ - 11XT4 motor terminals (V) -11M4]. |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10031 | R | [ -11XR4 connector (local: UND - 11XP4_2.X3 pin 1)] connected to: [ - 11XT4 motor terminals (W) -11M4]. |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |
| 10032 | R | -11M4 Motor terminals PE connected to - 11GND.  |  | OK |  | Carol Gumedé<br>425280<br>01.07.2025 | M4 |

## Section 6 – Report summaries

### 6.1 Results status

| Test Instruction Sheet                | Compliant | Incomplete | Non-compliant |
|---------------------------------------|-----------|------------|---------------|
| Protective Bonding and Return Current | X         |            |               |
| Reflectometry                         | X         |            |               |
| Config                                | X         |            |               |
| Traction Motors                       | X         |            |               |

### 6.2 Tools used

| Function        | Tool name              | Tool number          | Next Calibration date |
|-----------------|------------------------|----------------------|-----------------------|
| 012_PB          | Megger                 | Megger               | 8/25/2025             |
| 025_NET_054_PIS | Cable Analyser DSX5000 | Fluke machine_Gibela | 12/31/2025            |
| CONFIG          | Multimeter             | Multimeter 2         | 9/30/2025             |