

| PROJECT          | CUSTOMER | VEHICLE       |
|------------------|----------|---------------|
| X'trapolis-PRASA | PRASA    | 271– M1 – VFT |

RTR Vehicle Functional Static Testing TS271 M1 Report  
GIB0000007923



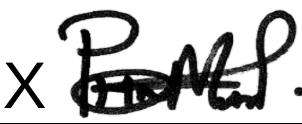
|           | CREATED             | VERIFIED       | APPROVED        | DISTRIBUTION                                                                                                                                                        |
|-----------|---------------------|----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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"/> |
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| Signature |                     |                |                 | Language<br><b>EN</b>                                                                                                                                               |

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## Table of modifications

| Rev | Date       | Modifications Content | Writer              |
|-----|------------|-----------------------|---------------------|
| A0  | 07/03/2025 | Creation              | Nhlakanipho MASONDO |

## Internal validations

|                 | Name                | Function            | Date       | Signature                                                                                                                       |
|-----------------|---------------------|---------------------|------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Creator</b>  | Nhlakanipho MASONDO | EPU Manager         | 07/03/2025 | X <br>Nhlakanipho MASONDO<br>EPU Manager      |
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## Execution Plan

|                   |            |
|-------------------|------------|
| <b>Start Date</b> | 27/02/2025 |
| <b>End Date</b>   | 28/02/2025 |

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## Section 1 – Purpose / Objectives

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### 1. Energy Distribution

Ensure the distribution of 110Vdc and 400Vac through the vehicle from the battery and Auxiliary converter

### 2. TCMS Network

Verify the working of the TCMS network and its core elements, i.e TRS, CRS.

### 3. Cabin Control

Verify the cabin control functions in both normal and backup modes, their commanding of the train lines, and the TCMS response to each function.

### 4. Internal Lighting

Verify the working of all internal lighting functions.

### 5. PACIS System

Verify power supply to all PACIS network equipment.

### 6. Train-Ground Communication

Setup the Train-to-ground systems, and verify correct installation of the antennas by VSWR test.

### 7. Pantograph

The objective of this procedure is to ensure the correct control and operation of the pantograph.

### 8. Rescue Mode and Emergency Disconnection

The objective of this procedure is to verify the correct operation of the emergency disconnection function, as well as the correct activation of the Back-Up mode.

### 10. Emergency Brake

The objective of this procedure is to verify all electrical components of the Emergency braking system.

### 11. Service Brake

The objective of this procedure is to verify all electrical components of the Service brake system.

### 12. Holding and Parking Brake

The objective of this procedure is to verify all electrical components of the Parking/holding brake system.

### 13. Passenger Doors

The objective of this procedure is to ensure the proper operation of the train doors.

### 14. Air Conditioning

Verify the voltage distribution to and correct operation of the HVAC system

### 15. Fire protection

The objective of this procedure is to verify the configuration of the fire detection units, as well as the presence of the safety resistor in the auxiliary converter.

### 16. Traction and Electric Brake

Verify all the train lines associated with the traction and electric brake systems of the train

### 18. Vehicle Normalization

The objective of this procedure is to ensure that all connectors, panels and covers are normalized.



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## Section 2 – Energy Distribution

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### 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            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10002 | I    | Initial Conditions                                                                                |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10003 | I    | All the Circuit Breakers should be OPEN                                                           |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10004 | I    | Test bench should be connected with no active output voltage                                      |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10005 | I    | NO 400Vac should be connected to the car                                                          |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10006 | I    | 110Vdc Circuit Breaker                                                                            |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10007 | A    | Close Circuit Breaker 15Q3 (Normal Line)                                                          |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10008 | I    | 230Vac and 400Vac Circuit breakers                                                                |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10009 | A    | Close Circuit Breaker 13Q1                                                                        |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10010 | I    | Normal and Permanent Power Supply                                                                 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10011 | I    | 110Vdc Permanent Train Line<br>Dev1/40 = END1 90XP24 pin 29<br>Dev5/40 = END2 90XP34 pin 29       |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10012 | A    | Force [NI] Dev1/40 = 1.0                                                                          |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10013 | R    | Read Defined Variable [NI] Dev5/40 = 1.0                                                          |      | OK            | 1            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10014 | A    | Apply 110Vdc on the Normal Line using the external power supply                                   |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10015 | A    | Measure 110Vdc between 90XR50.X1/1 (+) and 90XR50.X2/1 (-) (intercar connector).<br>[Normal line] |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |

|       |   |                                                                                                                                                 |  |    |  |                                        |    |
|-------|---|-------------------------------------------------------------------------------------------------------------------------------------------------|--|----|--|----------------------------------------|----|
| 10016 | I | Permanent Line Circuit Breakers                                                                                                                 |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10017 | A | Check for battery voltage (above 80Vdc) on Circuit Breaker 15Q4 and close it (permanent Line)                                                   |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10018 | I | 230Vac Circuit Breakers                                                                                                                         |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10019 | A | Close Circuit Breaker 13Q2                                                                                                                      |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10020 | A | Close Circuit Breaker 13Q3                                                                                                                      |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10021 | I | 230Vac and 400Vac Voltage Supply                                                                                                                |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10022 | A | Apply 400Vac to the Vehicle on End 1 or End 2                                                                                                   |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10023 | 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 |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10024 | R | Phase rotation between U,V,W is correct                                                                                                         |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10025 | A | Perform a phase rotation measurement on Connector 90XR52_1 between phases U(X1),V(X2),W(X3) and ensure the rotation is in the correct direction |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10026 | R | Phase rotation between U,V,W is correct                                                                                                         |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10027 | A | Check 230Vac between points L and N of socket -13XT1                                                                                            |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10028 | R | 230Vac present                                                                                                                                  |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10029 | A | Check 230Vac between points L and N of socket -13XT2                                                                                            |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10030 | R | 230Vac present                                                                                                                                  |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10031 | A | Remove the connector 57XP1_10                                                                                                                   |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10032 | A | Remove the connector 93XP150                                                                                                                    |  | OK |  | Carol Gumedede<br>425280<br>27.02.2025 | M1 |

|       |   |                                                                                                     |  |    |   |                                        |    |
|-------|---|-----------------------------------------------------------------------------------------------------|--|----|---|----------------------------------------|----|
| 10033 | A | Close the circuit breaker 34Q1 and 57Q1                                                             |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10034 | A | Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 57XP1_10 (10b1,10a2,10a1)           |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10035 | R | 400Vac +- 5% tolerance is measured between all three phases on connector 93XP150 (E2,E3,E1)         |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10036 | A | Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 93XP150                             |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10037 | R | 400Vac +- 5% tolerance is measured between all three phases on circuit breaker 57Q1                 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10038 | A | Put back the connector 57XP1_10                                                                     |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10039 | A | Put back the connector 93XP150                                                                      |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10040 | I | Auxiliary Converters Command                                                                        |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10041 | I | Battery Connection Train Lines<br>Dev1/79 = END 1 90XR24 pin 30<br>Dev5/79 = END 2 90XP34 pin 30    |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10042 | A | Force [NI] Dev1/79 = 1.0                                                                            |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10043 | R | Read Defined Variable [NI] Dev5/79 = 1.0                                                            |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10044 | A | Force [NI] Dev1/79 = 0.0                                                                            |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10045 | R | Read Defined Variable [NI] Dev5/79 = 0.0                                                            |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10046 | I | Battery Disconnection Train Lines<br>Dev1/75 = END 1 90XR24 pin 31<br>Dev5/75 = END 2 90XP34 pin 31 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10047 | A | Force [NI] Dev1/75 = 1.0                                                                            |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10048 | R | Read Defined Variable [NI] Dev5/75 = 1.0                                                            |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |

|       |   |                                                                                         |  |    |   |                                        |    |
|-------|---|-----------------------------------------------------------------------------------------|--|----|---|----------------------------------------|----|
| 10049 | A | Force [NI] Dev1/75 = 0.0                                                                |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10050 | R | Read Defined Variable [NI] Dev5/75 = 0.0                                                |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10051 | I | IES StatusTrain Lines<br>Dev1/86 = END 1 90XR25 pin 61<br>Dev2/87 = END 1 90XR25 pin 62 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10052 | A | Force [NI] Dev1/86 = 1.0                                                                |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10053 | R | Read Defined Variable [NI] Dev2/87 = 1.0                                                |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10054 | A | Force [NI] Dev1/86 = 0.0                                                                |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10055 | R | Read Defined Variable [NI] Dev2/87 = 0.0                                                |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10056 | I | Switch off the 400Vac power supply at the socket                                        |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |



|                                                                                        |                                                    |                             |
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## 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 Io (SPP=25)                                                                        |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10002 | I    | Initial conditions                                                                              |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10003 | I    | Vehicle test bench should be configured as TC1:<br>1. TC1 Dataplugs<br>2. MCE switch set to TC1 |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10004 | R    | On DDU TCMS screen the TC1 cab is in BLUE colour                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10005 | I    | Power Supply to the Router Switches                                                             |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10006 | I    | Power supply to the 25A10 SWITCH ETHERNET (CRS1)                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10007 | A    | Close Circuit Breaker 25Q10                                                                     |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10008 | R    | CRS1 25A10 is ON                                                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10009 | I    | Power supply to the 25A11 SWITCH ETHERNET (CRS2)                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10010 | A    | Close Circuit Breaker 25Q11                                                                     |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10011 | R    | CRS2 25A11 is ON                                                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10012 | I    | Power supply to the 25A14 ETHERNET REPEATER (TBR)                                               |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |

|       |   |                                                                                   |  |    |  |                                       |    |
|-------|---|-----------------------------------------------------------------------------------|--|----|--|---------------------------------------|----|
| 10013 | A | Close Circuit Breaker 25Q14                                                       |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10014 | R | TBR 25A14 is ON                                                                   |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10015 | A | Close Circuit Breaker 25Q6                                                        |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10016 | A | Close Circuit Breaker 25Q7                                                        |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10017 | I | Ethernet Loop                                                                     |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10018 | A | For each CRS, check that the Ethernet Loop LEDs are flashing                      |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10019 | R | CRS1 has LEDs on ports X3 and X4 flashing                                         |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10020 | R | CRS2 has ONLY LED on port X4 flashing                                             |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10021 | R | Check on the Test Bench DDU that all Router Switches are available on the network |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10022 | I | Power Supply to the BRIOMS                                                        |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10023 | I | Power supply to the 25A6 BRIOM 40/10 ETH 6                                        |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10024 | R | BRIOM 25A6 is ON                                                                  |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10025 | A | Check visually that ground braid is connected to BRIOM                            |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10026 | I | Power supply to the 25A7 BRIOM 40/10 ETH 7                                        |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10027 | R | BRIOM 25A7 is ON                                                                  |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |



## 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            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10002 | I    | Train Lines                                                                             |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10003 | I    | Cab Selected on Train Lines<br>Dev1/1 = END1 90XR24 pin 3<br>Dev5/1 = END2 90XP34 pin 3 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10004 | A    | Force [NI] Dev1/1 = 1.0                                                                 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10005 | R    | Read Defined Variable [NI] Dev5/1 = 1.0                                                 |      | OK            | 1            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10006 | A    | Force [NI] Dev1/1 = 0.0                                                                 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10007 | R    | Read Defined Variable [NI] Dev5/1 = 0.0                                                 |      | OK            | 0            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10008 | I    | Cab Active TC1 Train Lines<br>Dev1/2 = END1 90XR24 pin 4<br>Dev5/2 = END2 90XP34 pin 4  |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10009 | A    | Force [NI] Dev1/2 = 1.0                                                                 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10010 | R    | Read Defined Variable [NI] Dev5/2 = 1.0                                                 |      | OK            | 1            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10011 | A    | Force [NI] Dev1/2 = 0.0                                                                 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10012 | R    | Read Defined Variable [NI] Dev5/2 = 0.0                                                 |      | OK            | 0            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |

|       |   |                                                                                            |  |    |   |                                      |    |
|-------|---|--------------------------------------------------------------------------------------------|--|----|---|--------------------------------------|----|
| 10013 | I | Master Key TC1 Train Lines<br>Dev1/73 = END1 90XR24 pin 17<br>Dev5/73 = END2 90XP34 pin 14 |  | OK |   | Carol Gumedé<br>425280<br>27.02.2025 | M1 |
| 10014 | A | Force [NI] Dev1/73 = 1.0                                                                   |  | OK |   | Carol Gumedé<br>425280<br>27.02.2025 | M1 |
| 10015 | R | Read Defined Variable [NI] Dev5/73 = 1.0                                                   |  | OK | 1 | Carol Gumedé<br>425280<br>27.02.2025 | M1 |
| 10016 | A | Force [NI] Dev1/73 = 0.0                                                                   |  | OK |   | Carol Gumedé<br>425280<br>27.02.2025 | M1 |
| 10017 | R | Read Defined Variable [NI] Dev5/73 = 0.0                                                   |  | OK | 0 | Carol Gumedé<br>425280<br>27.02.2025 | M1 |



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## Section 5 – Internal Lighting

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### 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=052)                                                           |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10002 | I    | Initial Conditions                                                                    |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10003 | I    | The 110Vdc Normal line is ON                                                          |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10004 | I    | Cleaning Lighting Command                                                             |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10005 | I    | 110Vdc Permanent Train Line<br>Dev1/40 = END1 90XR24 pin 29                           |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10006 | A    | Force [NI] Dev1/40 = 1.0                                                              |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10007 | A    | Close Circuit Breaker 52Q5                                                            |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10008 | A    | Close Circuit Breaker 52Q3                                                            |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10009 | A    | Close Circuit Breaker 52Q4                                                            |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10010 | I    | Lighting 33% Train Line<br>Dev1/8 = END1 90XR25 pin 27                                |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10011 | A    | Force [NI] Dev1/8 = 1.0                                                               |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10012 | R    | The saloon RIGHT side emergency lights<br>(low intensity) are ON on all light modules |      | OK            |              | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1      |
| 10013 | R    | The saloon LEFT side emergency lights<br>(low intensity) are ON on all light modules  |      | OK            |              | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1      |
| 10014 | I    | Lighting 33% Train Line<br>Dev5/8 = END2 90XP35 pin 27                                |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025    | M1      |
| 10015 | R    | Read Defined Variable [NI] Dev5/8 = 1.0                                               |      | OK            | 1            | Carol Gumede<br>425280<br>27.02.2025    | M1      |

|       |   |                                                                                          |  |    |   |                                        |    |
|-------|---|------------------------------------------------------------------------------------------|--|----|---|----------------------------------------|----|
| 10016 | I | Lighting 33% Train Line<br>Dev1/8 = END1 90XR25 pin 27                                   |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10017 | A | Force [NI] Dev1/8 = 0.0                                                                  |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10018 | I | Lighting 33% Train Line<br>Dev5/8 = END2 90XP35 pin 27                                   |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10019 | R | Read Defined Variable [NI] Dev5/8 = 0.0                                                  |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10020 | R | All saloon emergency lights (low intensity)<br>are OFF on all light modules (Left+Right) |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10021 | A | Turn Cleaning Staff Lights Switch 52S6 to<br>ON position                                 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10022 | I | Lighting 33% Train Line<br>Dev5/8 = END2 90XP35 pin 27                                   |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10023 | R | Read Defined Variable [NI] Dev5/8 = 1.0                                                  |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10024 | R | All saloon emergency lights (low intensity)<br>are ON on all light modules (Left+Right)  |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10025 | A | Reset Circuit Breaker 52Q5 (Open and<br>Close)                                           |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10026 | R | Read Defined Variable [NI] Dev5/8 = 0.0                                                  |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10027 | I | Main Lighting Command                                                                    |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10028 | A | Close Circuit Breaker 52Q1                                                               |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10029 | A | Close Circuit Breaker 52Q2                                                               |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10030 | R | All saloon emergency lights (low intensity)<br>are ON on all light modules (Left+Right)  |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10031 | I | Lighting 33% Train Line<br>Dev5/8 = END2 90XP25 pin 27                                   |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10032 | R | Read Defined Variable [NI] Dev5/8 = 0.0                                                  |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10033 | I | Main Lighting Command Train Line<br>Dev1/32 = END1 90XR25 pin 26                         |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |

|       |   |                                                                                      |  |    |   |                                        |    |
|-------|---|--------------------------------------------------------------------------------------|--|----|---|----------------------------------------|----|
| 10034 | A | Force [NI] Dev1/32 = 1.0                                                             |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10035 | I | Main Lighting Command Train Line<br>Dev5/24 = END2 90XP35 pin 26                     |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10036 | R | Read Defined Variable [NI] Dev5/24 = 1.0                                             |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10037 | R | The saloon LEFT side main lighting (high intensity) is ON on all light modules       |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10038 | R | The saloon RIGHT side main lighting (high intensity) is ON on all light modules      |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10039 | I | Main Lighting Command Train Line<br>Dev1/32 = END1 90XR25 pin 26                     |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10040 | A | Force [NI] Dev1/32 = 0.0                                                             |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10041 | R | All saloon emergency lights (low intensity) are ON on all light modules (Left+Right) |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |



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## Section 6 – Train-Ground Communication

### 6.1 Instructions list

#### 6.1.2 064\_COM-Train-Ground Communication

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

| N°    | Type | Instruction                                                                                                                                                                                                                                                | File | Result status | Result value | Operator                             | Vehicle |
|-------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|--------------|--------------------------------------|---------|
| 10001 | I    | Train-Ground Communication (SPP=064)                                                                                                                                                                                                                       |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10002 | A    | Using the tool list on the side of your screen, note the serial number of the antenna cable tester used in this procedure                                                                                                                                  |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10003 | I    | Antenna cable tester Calibration                                                                                                                                                                                                                           |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10004 | I    | PERFORM THIS CALIBRATION BEFORE TESTING EACH CABLE                                                                                                                                                                                                         |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10005 | A    | Select "preset", then Set the test frequency by selecting "FREQ/DIST" then setting the start and stop frequency, select "calibrate", then "Full 1-port" then Calibrate the Antenna cable tester using the 0.5m extension cable and the T-calibration unit. |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10006 | I    | GSM Cable                                                                                                                                                                                                                                                  |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10007 | A    | Ensure the frequency range is 876MHz - 961.34MHz; Connect the GSM cable of the Netbox to the measuring cable and note the resulting waveform                                                                                                               |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10008 | R    | The maximum peak of the waveform is Result Max : $x \leq 2.13$ ()                                                                                                                                                                                          |      | OK            | 1.5          | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10009 | A    | Save the waveform result with the following name:<br>TS#(#-Train number)_NBX_ GSM1                                                                                                                                                                         |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10010 | A    | Recalibrate the tester. Ensure the frequency range is 1.71GHz - 1.88GHz;                                                                                                                                                                                   |      | OK            |              | TIVANI Angel<br>542257               | M1      |



|       |   |                                                                                                                                                                                                                  |                                                                                    |    |      |                                      |    |
|-------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----|------|--------------------------------------|----|
|       |   | Connect the GSM cable of the Netbox to the measuring cable and note the resulting waveform                                                                                                                       |                                                                                    |    |      | 27.02.2025                           |    |
| 10011 | R | The maximum peak of the waveform is Result Max : $x \leq 2.13$ ()                                                                                                                                                |                                                                                    | OK | 1.31 | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10012 | A | Save the waveform result with the following name:<br>TS#(#-Train number)_NBX_ GSM2                                                                                                                               |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10013 | I | GPS Cable                                                                                                                                                                                                        |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10014 | A | Recalibrate the tester. Ensure the frequency range is 1200MHz - 1600MHz; Connect the GPS cable of the Netbox to the measuring cable and note the resulting waveform                                              |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10015 | A | On the cable tester, select "MEAS" and select F1 "Distance to Fault"                                                                                                                                             |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10016 | I | Ensure that the resulting waveform is such as in the picture on the right. The peak of the graph should be at a point $>8m$ ; before that, the graph should be flat. Maximum value before the peak should be 1.2 |  | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10017 | R | The maximum peak of the waveform is Result Max : $x \leq 1.2$ ()                                                                                                                                                 |                                                                                    | OK | 1.12 | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10018 | A | Save the waveform result with the following name:<br>TS#(#-Train number)_NBX_ GPS                                                                                                                                |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10019 | I | Wifi Cable                                                                                                                                                                                                       |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10020 | A | Recalibrate the tester. Ensure the frequency range is 1710MHz - 2700MHz; Connect the WiFi cable of the Netbox to the measuring cable and note the resulting waveform                                             |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10021 | R | The maximum peak of the waveform is Result Max : $x \leq 2.45$ ()                                                                                                                                                |                                                                                    | OK | 1.33 | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10022 | A | Save the waveform result with the following name:<br>TS#(#-Train number)_NBX_ WiFi1                                                                                                                              |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10023 | A | Recalibrate the tester. Ensure the frequency range is 4.9GHz - 5.935GHz;                                                                                                                                         |                                                                                    | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |

|       |   |                                                                                        |  |    |      |                                      |    |
|-------|---|----------------------------------------------------------------------------------------|--|----|------|--------------------------------------|----|
| 10024 | R | The maximum peak of the waveform is<br>Result Max : x <= 2.45 ()                       |  | OK | 1.63 | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10025 | A | Save the waveform result with the<br>following name:<br>TS#(#-Train number)_NBX_ WiFi2 |  | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10026 | A | Close Circuit Breaker 64Q1                                                             |  | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10027 | R | Check that the Netbox turns ON                                                         |  | OK |      | TIVANI Angel<br>542257<br>27.02.2025 | M1 |

### 6.1.1 062\_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            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10002 | I    | ERTMS Bypass Train Lines<br>Dev1/33 = END1 90XR24 pin 11<br>Dev5/37 = END2 90XP34 pin 11            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10003 | A    | Force [NI] Dev1/33 = 1.0                                                                            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10004 | R    | Read Defined Variable [NI] Dev5/37 = 1.0                                                            |      | OK            | 1            | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10005 | A    | Force [NI] Dev1/33 = 0.0                                                                            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10006 | R    | Read Defined Variable [NI] Dev5/37 = 0.0                                                            |      | OK            | 0            | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10007 | I    | Emergency Brake ERTMS 1 Train Lines<br>Dev1/88 = END1 90XR24 pin 18<br>Dev5/88 = END2 90XP34 pin 18 |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10008 | A    | Force [NI] Dev1/88 = 1.0                                                                            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10009 | R    | Read Defined Variable [NI] Dev5/88 = 1.0                                                            |      | OK            | 1            | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10010 | A    | Force [NI] Dev1/88 = 0.0                                                                            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10011 | R    | Read Defined Variable [NI] Dev5/88 = 0.0                                                            |      | OK            | 0            | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10012 | I    | Emergency Brake ERTMS 2 Train Lines<br>Dev1/80 = END1 90XR24 pin 20<br>Dev5/80 = END2 90XP34 pin 20 |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10013 | A    | Force [NI] Dev1/80 = 1.0                                                                            |      | OK            |              | TIVANI Angel<br>542257<br>27.02.2025 | M1      |
| 10014 | R    | Read Defined Variable [NI] Dev5/80 = 1.0                                                            |      | OK            | 1            | TIVANI Angel<br>542257<br>27.02.2025 | M1      |

|       |   |                                                                                                                                                  |                                                                                     |    |   |                                      |    |
|-------|---|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|---|--------------------------------------|----|
| 10015 | A | Force [NI] Dev1/80 = 0                                                                                                                           |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10016 | R | Read Defined Variable [NI] Dev5/80 = 0                                                                                                           |                                                                                     | OK | 0 | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10017 | I | Wheel Sensor Continuity Test                                                                                                                     |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10018 | I | Use the multimeter to test the continuity                                                                                                        |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10019 | A | Check continuity between [62B1 WHEEL SENSOR (Local:+MB2; Connector 62XP1_1) and Intercar(Local:+END2; connector 90XP33.c )]                      |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10020 | R | There is a continuity between: pin B & pin 2, pin A & pin 1, pin C & pin 7, pin D & pin 8                                                        |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10021 | R | There is a continuity between: pin F & pin 4, pin E & pin 3, pin G & pin 9, pin H & pin 10                                                       |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10022 | R | There is a continuity between: pin L & pin 6, pin K & pin 5, pin M & pin 11, pin N & pin 12                                                      |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10023 | I | Eurobalise Antenna Cable                                                                                                                         |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10024 | A | Check continuity between [Intercar(LOCAL: +END1; Connector - 90XR20) and Intercar (LOCAL:+END2; connector -90XP30)] according to the image below |  | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |
| 10025 | R | Eurobalise Antenna cable is correctly configured                                                                                                 |                                                                                     | OK |   | TIVANI Angel<br>542257<br>27.02.2025 | M1 |



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## Section 7 – Pantograph

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### 7.1 Instructions list

### 7.1.1 021\_PNT-Pantograph

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

| N°    | Type | Instruction                                                                  | File | Result status | Result value | Operator                                 | Vehicle |
|-------|------|------------------------------------------------------------------------------|------|---------------|--------------|------------------------------------------|---------|
| 10001 | I    | Pantograph (SPP = 021)                                                       |      | OK            |              | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10002 | I    | There should be no air in the main pipe                                      |      | OK            |              | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10003 | R    | Measure 0 Bar at point K2.8 using the pressure gauge                         |      | OK            |              | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10004 | A    | Ensure that the pantograph isolation valve K2.5 is normalised (not isolated) |      | OK            |              | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10005 | I    | Initial Conditions                                                           |      | OK            |              | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10006 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1drainingcockr1 = 1.0            |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10007 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1drainingcockr2 = 1.0            |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10008 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr1 = 1.0          |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10009 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr2 = 1.0          |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10010 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxpressswitchr1 = 1.0          |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10011 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxpressswitchr2 = 1.0          |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10012 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor1 = 1.0              |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10013 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor2 = 1.0              |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10014 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr1 = 1.0           |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10015 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr2 = 1.0           |      | OK            | 1            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |
| 10016 | R    | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr1 = 0.0              |      | OK            | 0            | Mphato Mphahlele<br>480716<br>27.02.2025 | M1      |

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|       |   |                                                                                                                                                          |  |    |   |                                          |    |
|-------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|---|------------------------------------------|----|
| 10017 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr2 = 0.0                                                                                          |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10018 | I | Auxiliary Compressor                                                                                                                                     |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10019 | A | Close Circuit Breaker 21Q1                                                                                                                               |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10020 | A | Close Circuit Breaker 21Q2                                                                                                                               |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10021 | A | Close Circuit Breaker 21Q3                                                                                                                               |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10022 | R | The Auxiliary compressor 21M1 turns ON                                                                                                                   |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10023 | R | Read Defined Variable [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr1 = 1.0                                                                                   |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10024 | R | Read Defined Variable [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr2 = 1.0                                                                                   |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr1 = 0.0                                                                                      |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10026 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr2 = 0.0                                                                                      |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10027 | A | Force [TT]<br>(MPU1)lo_pnt_m1raisepantor1 = 1.0                                                                                                          |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10028 | A | Allow the pressure to rise. Using the pressure gauge, check that the pressure at point K2.8 > 3.8Bar. (VERIFY BEFORE MOVING TO THE NEXT STEP)            |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10029 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr1 = 1.0                                                                                          |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10030 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr2 = 1.0                                                                                          |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10031 | R | The pantograph is raised                                                                                                                                 |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10032 | A | Allow the pressure to rise. Using the pressure gauge, check that the pressure at point K2.8 is between 6 - 7Bar. (VERIFY BEFORE MOVING TO THE NEXT STEP) |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10033 | R | The Auxiliary compressor 21M1 turns OFF                                                                                                                  |  | OK |   | Mphato Mphahlele<br>480716               | M1 |

|       |   |                                                                                                                                                                   |  |    |   |                                          |    |
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|       |   |                                                                                                                                                                   |  |    |   | 27.02.2025                               |    |
| 10034 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr1 = 1.0                                                                                               |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10035 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1auxcpcontactorr2 = 1.0                                                                                               |  | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10036 | A | Turn the pantograph isolation valve K2.5<br>to isolated position                                                                                                  |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10037 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1drainingcockr1 = 0.0                                                                                                 |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10038 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1drainingcockr2 = 0.0                                                                                                 |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10039 | A | Force [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr1 =<br>0.0                                                                                                         |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10040 | A | Force [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr2 =<br>0.0                                                                                                         |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10041 | A | Drain the air by putting the isolation valve<br>K2.5 in half way position                                                                                         |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10042 | R | Using the pressure gauge, check that the<br>Pantograph drops at 3.3 Bar.                                                                                          |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10043 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr1 = 0.0                                                                                                   |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10044 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr2 = 0.0                                                                                                   |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10045 | A | Turn the pantograph isolation valve K2.5<br>to normal position                                                                                                    |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10046 | A | Release [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr1                                                                                                                |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10047 | A | Release [TT]<br>(MPU1)lo_pnt_m1startauxiliarcompr2                                                                                                                |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10048 | R | The Auxiliary compressor 21M1 turns ON                                                                                                                            |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10049 | A | Allow the pressure to rise. Using the<br>pressure gauge, check that the pressure at<br>point K2.8 is between 6 - 7Bar. (VERIFY<br>BEFORE MOVING TO THE NEXT STEP) |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10050 | R | The Auxiliary compressor 21M1 turns OFF                                                                                                                           |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |



|       |   |                                                                                                             |                                                                                   |    |   |                                          |    |
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| 10051 | I | Isolation and Earthing                                                                                      |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10052 | A | In the HV Box , check that all the Green Keys are present.                                                  |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10053 | A | In the HV Box , set the HVB1 valve to Isolated position - to isolate the pantograph                         |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10054 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr1 = 0.0                                          |                                                                                   | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10055 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr2 = 0.0                                          |                                                                                   | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10056 | A | Turn the Earthing Switch to grounded position                                                               |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10057 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor1 = 0.0                                             |                                                                                   | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10058 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor2 = 0.0                                             |                                                                                   | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10059 | A | Turn the Earthing Switch to back to Normal position                                                         |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10060 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor1 = 1.0                                             |                                                                                   | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10061 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1earthpantor2 = 1.0                                             |                                                                                   | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10062 | A | Set the HVB1 valve to Normal position                                                                       |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10063 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr1 = 1.0                                          |                                                                                   | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10064 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantoisolatedr2 = 1.0                                          |                                                                                   | OK | 1 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10065 | A | Normalize the HV box and remove all spare/duplicate keys (green/yellow/blue)                                |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10066 | I | Pantograph Mechanical Test                                                                                  |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10067 | I | Housed Height Measurement, Pantograph Over-Height Measurement, Automatic Drop Device and Control Force Test |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10068 | I | Initial Conditions                                                                                          |                                                                                   | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |

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| 10069 | I | There should be no air in the main pipe                                                                                                                                                                                                               |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10070 | R | Measure 0 Bar at point K2.8 using the pressure gauge                                                                                                                                                                                                  |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10071 | A | Ensure that the pantograph isolation valve K2.5 is normalised (not isolated)                                                                                                                                                                          |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10072 | I | Housed Height Measurement                                                                                                                                                                                                                             |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10073 | I | The purpose of this test is to ensure that the housed height of the pantograph complies with the specified dimensions<br><br>The train must be positioned on a levelled track without any overhead catenary                                           |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10074 | A | Measure the perpendicular height (using a measuring tape and ruler extended from points A, B and C of the pantohead) of the pantograph on natural housed position (between the roof of the train and the pantograph collector head at points A, B, C) |  | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10075 | A | Ensure that no part of the pantograph is higher than 486mm above the roof                                                                                                                                                                             |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10076 | R | A<br>Result Max : $x \leq 486$ (mm)                                                                                                                                                                                                                   |                                                                                   | OK | 484 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10077 | R | B<br>Result Max : $x \leq 486$ (mm)                                                                                                                                                                                                                   |                                                                                   | OK | 485 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10078 | R | C<br>Result Max : $x \leq 486$ (mm)                                                                                                                                                                                                                   |                                                                                   | OK | 484 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10079 | A | Check that the centre of the pantograph head corresponds with the track centreline in the housed position (Use marked ruler to compare)                                                                                                               |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10080 | R | Pantograph aligned with the track centreline in housed position                                                                                                                                                                                       |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10081 | I | Automatic Drop Device                                                                                                                                                                                                                                 |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10082 | I | The purpose of this test is to verify the correct operation of the automatic drop device (ADD) and will be performed by simulating the activation of the ADD pressure switch.                                                                         |                                                                                   | OK |     | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |

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| 10083 | A | Tie a cable on pantograph head collector                                                                                                                                                                                                                                            |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10084 | A | Close Circuit Breaker 21Q3                                                                                                                                                                                                                                                          |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10085 | A | Close Circuit Breaker 21Q1                                                                                                                                                                                                                                                          |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10086 | A | Close Circuit Breaker 21Q2                                                                                                                                                                                                                                                          |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10087 | R | The Auxiliary compressor 21M1 turns ON                                                                                                                                                                                                                                              |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10088 | A | Force [TT]<br>(MPU1)lo_pnt_m1raiseantor1 = 1.0                                                                                                                                                                                                                                      |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10089 | I | Allow the pressure to rise, and the<br>pantograph to raise                                                                                                                                                                                                                          |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10090 | R | The pantograph is raised                                                                                                                                                                                                                                                            |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10091 | A | Activate the ADD manually on the roof by<br>operating the bleeding screw (PT3) on the<br>pan head to simulate a loss of air supply                                                                                                                                                  |  | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10092 | R | The pressure of the test point PT12 drops<br>to 0 bar                                                                                                                                                                                                                               |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10093 | A | On the roof, close the bleeding screw<br>(PT3) to reset the ADD                                                                                                                                                                                                                     |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10094 | R | Fault reset and equipment normalized                                                                                                                                                                                                                                                |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10095 | A | Release [TT]<br>(MPU1)lo_pnt_m1raiseantor1                                                                                                                                                                                                                                          |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10096 | R | Pantograph is lowered                                                                                                                                                                                                                                                               |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10097 | I | Pantograph Over-Height Measurement                                                                                                                                                                                                                                                  |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10098 | I | The purpose of the next test is to verify<br>that the pantograph over-height detection<br>and auto dropping functions are calibrated<br>and work correctly. This test simulates the<br>condition when a pantograph is incorrectly<br>raised in an area without any overhead<br>line |                                                                                     | OK |  | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10099 | I | You will be required to time the rising and<br>dropping of the pantograph using a                                                                                                                                                                                                   |                                                                                     | OK |  | Mphato Mphahlele<br>480716               | M1 |

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|       |   | stopwatch. measure the time from the moment the pantograph starts to rise until the pantograph reaches maximum raised position; then time from the moment the pantograph starts dropping at overheight detection till it reaches housed position |                                                                                   |    |      | 27.02.2025                               |    |
| 10100 | A | Use the rope to hook the pantograph and place the marked ruler perpendicular to the roof of the car. See the picture attached.                                                                                                                   |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10101 | A | Force [TT]<br>(MPU1)lo_pnt_m1raiseantor1 = 1.0                                                                                                                                                                                                   |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10102 | A | Whilst holding the end of the rope, allow the pressure to rise, and the pantograph to rise until it reaches the maximum height marked on the ruler.                                                                                              |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10103 | R | Rising time<br>Result Max : x <= 10 (S)                                                                                                                                                                                                          |                                                                                   | OK | 3.45 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10104 | A | By adjusting the rope, ensure that the Pantograph Panhead is aligned with the marking on the ruler.                                                                                                                                              |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10105 | A | Adjust the Over-height valve such that when the panto goes above the marking on the ruler, the overheight must be detected.                                                                                                                      |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10106 | R | The over-height valve is adjusted correctly.                                                                                                                                                                                                     |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10107 | A | Release [TT]<br>(MPU1)lo_pnt_m1raiseantor1                                                                                                                                                                                                       |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10108 | R | Pantograph is lowered                                                                                                                                                                                                                            |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10109 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr1 = 0.0                                                                                                                                                                                  |                                                                                   | OK | 0    | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10110 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr2 = 0.0                                                                                                                                                                                  |                                                                                   | OK | 0    | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10111 | A | Force [TT]<br>(MPU1)lo_pnt_m1raiseantor1 = 1.0                                                                                                                                                                                                   |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10112 | A | Allow the pantograph to rise freely until it reaches overheight.                                                                                                                                                                                 |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10113 | R | Overheight is detected immediately after passing the marked area on the ruler and                                                                                                                                                                |                                                                                   | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |

|       |   |                                                                                                                                                          |  |    |      |                                          |    |
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|       |   | pantograph begins to drop                                                                                                                                |  |    |      |                                          |    |
| 10114 | R | Lowering time<br>Result Max : $x \leq 7$ (S)                                                                                                             |  | OK | 6.36 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10115 | A | Release [TT]<br>(MPU1)lo_pnt_m1raisepantor1                                                                                                              |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10116 | A | Reset over-height valve (PT2) on the roof                                                                                                                |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10117 | R | Equipment normalized. (Only after resetting the PT2 valve, can the pantograph be raised)                                                                 |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10118 | I | Control Force Test                                                                                                                                       |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10119 | I | The purpose of this test is to ensure that the pantograph maintains an acceptable force against the catenary wire over all operating heights             |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10120 | A | Attach the dynamometer to the pantograph's head collector                                                                                                |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10121 | A | Raise the pantograph and measure the static force when the pantograph begins to rise after pulling the dynamometer up (lifting force on housed position) |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10122 | A | Force [TT]<br>(MPU1)lo_pnt_m1raisepantor1 = 1.0                                                                                                          |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10123 | I | Allow the pressure to rise, and the pantograph to raise                                                                                                  |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10124 | R | The pantograph is raised                                                                                                                                 |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10125 | R | $F > 150N$                                                                                                                                               |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10126 | A | Attach the 8.5kg (one 7.5kg and one 1kg) dead weight to the pantohead to apply a 85N force whilst the panto is in the raised position.                   |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10127 | R | The pantographs should remain in the neutral position                                                                                                    |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10128 | A | Check that the centre of the pantograph head corresponds with the track centreline on maximum raised position                                            |  | OK |      | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |

|       |   |                                                                                                       |  |    |   |                                          |    |
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| 10129 | R | Pantograph aligned with the track centreline in maximum raised position (Use marked ruler to compare) |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10130 | A | Remove 1kg dead weight                                                                                |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10131 | R | Pantograph continues to rise to over height condition                                                 |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10132 | A | Remove the dynamometer and dead weights from the pantograph's head-collector                          |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10133 | A | Release [TT]<br>(MPU1)lo_pnt_m1raisepantor1                                                           |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10134 | R | Pantograph is lowered                                                                                 |  | OK |   | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10135 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr1 = 0.0                                       |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |
| 10136 | R | Read Defined Variable [TT]<br>(MPU1)li_pnt_m1pantorisedr2 = 0.0                                       |  | OK | 0 | Mphato Mphahlele<br>480716<br>27.02.2025 | M1 |



Serial Tests Report  
TS271– M1 – VFT  
RTR Vehicle Functional Static Testing Report

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Emission date  
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## 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            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10002 | I    | Initial Conditions                                                                     |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10003 | I    | 110Vdc Normal power supply is connected to the vehicle, and switched ON                |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10004 | I    | Backup Mode Train Lines<br>Dev1/29 = END1 90XR15 pin23<br>Dev5/33 = END2 90XP25 pin 23 |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10005 | A    | Force [NI] Dev1/29 = 1.0                                                               |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10006 | R    | Read Defined Variable [NI] Dev5/33 = 1.0                                               |      | OK            | 1            | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10007 | R    | Relay 27K1 is Energised                                                                |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10008 | R    | Relay 27K2 is De-energised                                                             |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10009 | A    | Timer 30.0 S                                                                           |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10010 | R    | Relay 27K2 is De-energised                                                             |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10011 | A    | Timer 30.0 S                                                                           |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |
| 10012 | R    | Relay 27K2 is energised                                                                |      | OK            |              | Carol Gumedede<br>425280<br>27.02.2025 | M1      |



|       |   |                                                                                                    |  |    |   |                                        |    |
|-------|---|----------------------------------------------------------------------------------------------------|--|----|---|----------------------------------------|----|
| 10013 | I | Backup Mode Train Lines<br>Dev1/29 = END1 90XR25 pin23<br>Dev5/33 = END2 90XP35 pin 23             |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10014 | A | Force [NI] Dev1/29 = 0.0                                                                           |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10015 | R | Read Defined Variable [NI] Dev5/33 = 0.0                                                           |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10016 | R | Relay 27K1 is De-energised                                                                         |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10017 | R | Relay 27K2 is De-energised                                                                         |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10018 | I | Emergency Disconnection                                                                            |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10019 | I | Emergency Disconnection Train Lines<br>Dev1/30 = END1 90XR25 pin24<br>Dev5/34 = END2 90XP35 pin 24 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10020 | A | Force [NI] Dev1/30 = 1.0                                                                           |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10021 | R | Read Defined Variable [NI] Dev5/34 = 1.0                                                           |  | OK | 1 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10022 | R | Relay 27K5 is Energised                                                                            |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10023 | I | Emergency Disconnection Train Lines<br>Dev1/30 = END1 90XR25 pin24<br>Dev5/34 = END2 90XP35 pin 24 |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10024 | A | Force [NI] Dev1/30 = 0.0                                                                           |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [NI] Dev5/34 = 0.0                                                           |  | OK | 0 | Carol Gumedede<br>425280<br>27.02.2025 | M1 |
| 10026 | R | Relay 27K5 is De-energised                                                                         |  | OK |   | Carol Gumedede<br>425280<br>27.02.2025 | M1 |

## Section 9 – Emergency Brake

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### 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            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10002 | I    | Initial Conditions                                                                                                |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10003 | I    | No PEAs are activated                                                                                             |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10004 | I    | 110Vdc Normal power supply should be connected to the vehicle and ON                                              |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10005 | I    | Visual Inspection                                                                                                 |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10006 | A    | Physically and visually inspect all the Disk Break Units (DBU) and brake pads, to ensure they are securely fitted |  | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10007 | R    | All the brake DBUs are correctly installed and all the brake pads are correctly installed and locked              |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10008 | A    | Check the piping installation                                                                                     |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10009 | R    | All the pipes are installed on the vehicle                                                                        |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10010 | A    | Check all the Passenger Emergency Alarm handles, and ensure they are connected to their respective connectors     |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10011 | R    | All the PEAs are installed and connected                                                                          |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10012 | I    | Train Lines                                                                                                       |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10013 | I    | Emergency Brake Loop Train Lines<br>Dev1/5 = END1 90XR24 pin 8<br>Dev5/5 = END2 90XP34 pin 8                      |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10014 | A    | Force [NI] Dev1/5 = 1.0                                                                                           |                                                                                    | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10015 | R    | Read Defined Variable [NI] Dev5/5 = 1.0                                                                           |                                                                                    | OK            | 1            | Mvelo Mthembu<br>425564               | M1      |

|       |   |                                                                                                        |  |    |   |                                       |    |
|-------|---|--------------------------------------------------------------------------------------------------------|--|----|---|---------------------------------------|----|
|       |   |                                                                                                        |  |    |   | 27.02.2025                            |    |
| 10016 | A | Force [NI] Dev1/5 = 0.0                                                                                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10017 | R | Read Defined Variable [NI] Dev5/5 = 0.0                                                                |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10018 | I | Emergency Brake Loop Override Train Lines<br>Dev1/6 = END1 90XR24 pin 9<br>Dev5/6 = END2 90XP34 pin 9  |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10019 | A | Force [NI] Dev1/6 = 1.0                                                                                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10020 | R | Read Defined Variable [NI] Dev5/6 = 1.0                                                                |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10021 | A | Force [NI] Dev1/6 = 0.0                                                                                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10022 | R | Read Defined Variable [NI] Dev5/6 = 0.0                                                                |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10023 | I | Emergency Brake Train Line Train Lines<br>Dev1/50 = END1 90XR25 pin 67<br>Dev5/61 = END2 90XP35 pin 67 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10024 | A | Force [NI] Dev1/50 = 1.0                                                                               |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [NI] Dev5/61 = 1.0                                                               |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10026 | A | Force [NI] Dev1/50 = 0.0                                                                               |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10027 | R | Read Defined Variable [NI] Dev5/61 = 0.0                                                               |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10028 | I | PEA Loop OTDR Train Lines<br>Dev1/7 = END1 90XR24 pin 10<br>Dev5/7 = END2 90XP34 pin 10                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10029 | A | Force [NI] Dev1/7 = 1.0                                                                                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10030 | R | Read Defined Variable [NI] Dev5/7 = 1.0                                                                |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10031 | A | Force [NI] Dev1/7 = 0.0                                                                                |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10032 | R | Read Defined Variable [NI] Dev5/7 = 0.0                                                                |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |

|       |   |                                                                                      |  |    |   |                                       |    |
|-------|---|--------------------------------------------------------------------------------------|--|----|---|---------------------------------------|----|
| 10033 | I | PEA Reset                                                                            |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10034 | A | Check continuity on Timer Relay 44D1 between points A1 and B1                        |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10035 | R | The points are continuous                                                            |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10036 | A | Check continuity on Timer Relay 44D1 between points A4, B3 and C4                    |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10037 | R | All three points are continuous                                                      |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10038 | A | Close Circuit Breaker 44Q1                                                           |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10039 | I | PEA Loop Train Lines<br>Dev1/58 = END1 90XR25 pin 95<br>Dev5/62 = END2 90XP35 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10040 | A | Force [NI] Dev1/58 = 1.0                                                             |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10041 | R | Read Defined Variable [NI] Dev5/62 = 1.0                                             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10042 | A | Force [NI] Dev1/58 = 0.0                                                             |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10043 | R | Read Defined Variable [NI] Dev5/62 = 0.0                                             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10044 | A | Force [NI] Dev1/58 = 1.0                                                             |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10045 | A | Activate the PEA on door 5 (44S15)                                                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10046 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95                                 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10047 | R | Read Defined Variable [NI] Dev5/62 = 0.0                                             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10048 | A | Reset the PEA using square key                                                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10049 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95                                 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10050 | R | Read Defined Variable [NI] Dev5/62 = 1.0                                             |  | OK | 1 | Mvelo Mthembu<br>425564               | M1 |

|       |   |                                                      |  |    |   |                                       |    |
|-------|---|------------------------------------------------------|--|----|---|---------------------------------------|----|
|       |   |                                                      |  |    |   | 27.02.2025                            |    |
| 10051 | A | Activate the PEA on door 3 (44S13)                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10052 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10053 | R | Read Defined Variable [NI] Dev5/62 = 0.0             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10054 | A | Reset the PEA using square key                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10055 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10056 | R | Read Defined Variable [NI] Dev5/62 = 1.0             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10057 | A | Activate the PEA on door 1 (44S11)                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10058 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10059 | R | Read Defined Variable [NI] Dev5/62 = 0.0             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10060 | A | Reset the PEA using square key                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10061 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10062 | R | Read Defined Variable [NI] Dev5/62 = 1.0             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10063 | A | Activate the PEA on door 2 (44S12)                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10064 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10065 | R | Read Defined Variable [NI] Dev5/62 = 0.0             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10066 | A | Reset the PEA using square key                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10067 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564               | M1 |

|       |   |                                                      |  |    |   |                                       |    |
|-------|---|------------------------------------------------------|--|----|---|---------------------------------------|----|
|       |   |                                                      |  |    |   | 27.02.2025                            |    |
| 10068 | R | Read Defined Variable [NI] Dev5/62 = 1.0             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10069 | A | Activate the PEA on door 4 (44S14)                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10070 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10071 | R | Read Defined Variable [NI] Dev5/62 = 0.0             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10072 | A | Reset the PEA using square key                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10073 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10074 | R | Read Defined Variable [NI] Dev5/62 = 1.0             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10075 | A | Activate the PEA on door 6 (44S16)                   |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10076 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10077 | R | Read Defined Variable [NI] Dev5/62 = 0.0             |  | OK | 0 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10078 | A | Reset the PEA using square key                       |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10079 | I | PEA Loop Train Lines<br>Dev5/62 = END2 90XP25 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10080 | R | Read Defined Variable [NI] Dev5/62 = 1.0             |  | OK | 1 | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10081 | I | PEA Loop Train Lines<br>Dev1/58 = END1 90XR15 pin 95 |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10082 | A | Force [NI] Dev1/58 = 0.0                             |  | OK |   | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |



Serial Tests Report  
TS271– M1 – VFT  
RTR Vehicle Functional Static Testing Report

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Serial Tests Report  
TS271– M1 – VFT  
RTR Vehicle Functional Static Testing Report

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Emission date  
07/03/2025

## Section 10 – Service Brake

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### 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            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10002 | I    | Initial Conditions                                                                                                                                   |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10003 | I    | No air supply to the vehicle                                                                                                                         |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10004 | I    | All BPM cocks are in normal position (not isolated)                                                                                                  |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10005 | I    | 110Vdc Normal power supply should be connected to the vehicle and ON                                                                                 |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10006 | I    | Follow the procedure in the document below to upload software onto the TBCU electronic<br><a href="#">[11-40-49-281074_TBCU Software Upload.pdf]</a> |  | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10007 | I    | Power Supply                                                                                                                                         |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10008 | A    | Remove the connector 10XR12_XCB2 from the propulsion box                                                                                             |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10009 | A    | Close Circuit Breaker 33Q1, 33Q3 and 33Q5                                                                                                            |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10010 | A    | Check the voltage on connector 10XR12_XCB2 between pins 4 (+) and 69 (-) ; 4(+) and 67(-); and 5(+) and 68(-)                                        |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 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            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10012 | A    | Open Circuit Breaker 33Q1 and 33Q3, Replace connector 10XR12_XCB2 on the propulsion box, and Close Circuit breaker 33Q1 and 33Q3                     |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10013 | A    | Remove the connector -40XP2_C2_16 from pneumatic BPM                                                                                                 |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10014 | A    | Close Circuit Breaker 40Q1                                                                                                                           |                                                                                    | OK            |              | Sizwe Sibanyoni<br>484647               | M1      |

|       |   |                                                                                                                 |  |    |   |                                         |    |
|-------|---|-----------------------------------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   |                                                                                                                 |  |    |   | 27.02.2025                              |    |
| 10015 | A | Check the voltage on connector 40XP2_C2_16 between pins 13 (+) and 31 (-)                                       |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10016 | R | Battery voltage (above 80Vdc) is measured on connector 40XP2_C2_16 between pins 13 (+) and 31 (-)               |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10017 | A | Open Circuit Breaker 40Q1, Replace connector -40XP2_C2_16 on the pneumatic BPM, and Close Circuit breaker -40Q1 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10018 | R | The pneumatic BPM 40A2 is ON                                                                                    |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10019 | I | Brake Air Supply and Brake Application                                                                          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10020 | I | EB Reduced Train Lines<br>Dev2/85 = END1 90XR25 pin 60<br>Dev5/51 = END2 90XP35 pin 60                          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10021 | R | Read Defined Variable [NI] Dev2/85 = 1.0                                                                        |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10022 | R | Read Defined Variable [NI] Dev5/51 = 1.0                                                                        |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10023 | I | Brake Applied Train Lines<br>Dev2/83 = END1 90XR25 pin 50<br>Dev5/49 = END2 90XP35 pin 50                       |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10024 | R | Read Defined Variable [NI] Dev2/83 = 0.0                                                                        |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [NI] Dev5/49 = 0.0                                                                        |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10026 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1brakeairsuppokr1 = 0.0                                             |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10027 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1brakeairsuppokr2 = 0.0                                             |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10028 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRPS_NOK = 1.0                                                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10029 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_NOT_APPLIED = 1.0                                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10030 | A | Close/Isolate the Isolation cock F2.1/3                                                                         |  | OK |   | Sizwe Sibanyoni<br>484647               | M1 |

|       |   |                                                                                                       |  |    |   |                                         |    |
|-------|---|-------------------------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   |                                                                                                       |  |    |   | 27.02.2025                              |    |
| 10031 | A | Open the Isolation cock F2.2/3                                                                        |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10032 | A | Connect the air supply to the vehicle main pipe coupling flexible hose F3/5, and switch the supply ON |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10033 | I | Take note of any air leaks in the pipes or valves                                                     |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10034 | A | Allow the pressure to go above 6 bar. The pressure can be checked at the BRTP test point              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10035 | R | BRTP pressure is measured $\geq 6$ Bar                                                                |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10036 | I | Brake Applied Train Lines<br>Dev2/83 = END1 90XR25 pin 50<br>Dev5/49 = END2 90XP35 pin 50             |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10037 | R | Read Defined Variable [NI] Dev2/83 = 1.0                                                              |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10038 | R | Read Defined Variable [NI] Dev5/49 = 1.0                                                              |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10039 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1brakeairsuppokr1 = 1.0                                   |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10040 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1brakeairsuppokr2 = 1.0                                   |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10041 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRPS_NOK = 0.0                                                |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10042 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_NOT_APPLIED = 0.0                                       |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10043 | I | Remote Isolation                                                                                      |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10044 | I | Remote Isolation Train Lines<br>Dev1/84 = END1 90XR25 pin 59<br>Dev5/50 = END2 90XP35 pin 59          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10045 | A | Force [NI] Dev1/84 = 1.0                                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10046 | R | Read Defined Variable [NI] Dev5/50 = 1.0                                                              |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |

|       |   |                                                                                        |    |   |                                         |    |
|-------|---|----------------------------------------------------------------------------------------|----|---|-----------------------------------------|----|
| 10047 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_ISO = 1.0                                | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10048 | A | Force [TT] (MPU1)lo_sbk_m1isobrake = 1.0                                               | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10049 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_ISO = 0.0                                | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10050 | I | Remote Isolation Train Lines<br>Dev5/50 = END2 90XP35 pin 59                           | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10051 | R | Read Defined Variable [NI] Dev5/50 = 0.0                                               | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10052 | A | Release [TT] (MPU1)lo_sbk_m1isobrake                                                   | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10053 | R | Read Defined Variable [NI] Dev5/50 = 1.0                                               | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10054 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_ISO = 1.0                                | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10055 | I | Remote Isolation Train Lines<br>Dev1/84 = END1 90XR25 pin 59                           | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10056 | A | Force [NI] Dev1/84 = 0.0                                                               | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10057 | I | Manual Isolation                                                                       | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10058 | I | EB Reduced Train Lines<br>Dev2/85 = END1 90XR25 pin 60<br>Dev5/51 = END2 90XP35 pin 60 | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10059 | R | Read Defined Variable [NI] Dev2/85 = 0.0                                               | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10060 | R | Read Defined Variable [NI] Dev5/51 = 0.0                                               | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10061 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1servicebrakedc = 0.0                      | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10062 | R | Read Defined Variable [TT]<br>(TBCU1)Li_ServiceBrakeDC = 0.0                           | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10063 | A | Close the Isolation cock C2.3.1                                                        | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10064 | I | EB Reduced Train Lines<br>Dev2/85 = END1 90XR25 pin 60                                 | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |

|       |   |                                                                   |  |    |   |                                         |    |
|-------|---|-------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   | Dev5/51 = END2 90XP35 pin 60                                      |  |    |   |                                         |    |
| 10065 | R | Read Defined Variable [NI] Dev2/85 = 1.0                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10066 | R | Read Defined Variable [NI] Dev5/51 = 1.0                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10067 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1servicebrakedc = 1.0 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10068 | R | Read Defined Variable [TT]<br>(TBCU1)Li_ServiceBrakeDC = 1.0      |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10069 | A | Re-open the Isolation cock C2.3.1                                 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10070 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1servicebrakedc = 0.0 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10071 | I | Switch OFF 400V before reading the<br>bcufault variable           |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10072 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1bcufault = 0.0       |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10073 | A | Force [TT] (TBCU1)LO_BRK_FLT = 1.0                                |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10074 | R | Read Defined Variable [TT]<br>(MPU1)li_sbk_m1bcufault = 1.0       |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10075 | A | Release [TT] (TBCU1)LO_BRK_FLT                                    |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |



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## Section 11 – Holding and Parking Brake

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### 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            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10002 | I    | Initial Conditions                                                                                                                           |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10003 | I    | Using the tools list on the side of your screen, record the serial number of the manometer that will be used in this test                    |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10004 | I    | Check that the pressure on Test point C2.11/1 is >5bar                                                                                       |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10005 | I    | Visual Inspection                                                                                                                            |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10006 | A    | Check the installation of the manual parking brake release components (lever + cable)                                                        |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 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            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10008 | I    | Circuit Breakers                                                                                                                             |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10009 | I    | Circuit Breaker 33Q3 and 33Q5 should be closed                                                                                               |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10010 | I    | Parking Brake Pressure Switch                                                                                                                |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10011 | R    | Read Defined Variable [TT]<br>(TBCU1)LI_PARK_BR_RELEASE = 1.0                                                                                |      | OK            | 1            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10012 | R    | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_STAT = 0.0                                                                                     |      | OK            | 0            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10013 | R    | Read Defined Variable [TT]<br>(MPU1)TBCU1_parkbrakerelease = 1.0                                                                             |      | OK            | 1            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10014 | R    | Read Defined Variable [TT]<br>(MPU1)tbcu1_li_pbrake_stat = 0.0                                                                               |      | OK            | 0            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10015 | I    | Parking Brake Applied Train Lines<br>Dev2/52 = END1 90XR25 pin 77                                                                            |      | OK            |              | Sizwe Sibanyoni<br>484647               | M1      |

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|       |   |                                                                                                                                                                                           |  |    |   |                                         |    |
|-------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   | Dev5/58 = END2 90XP35 pin 77                                                                                                                                                              |  |    |   | 27.02.2025                              |    |
| 10016 | R | Read Defined Variable [NI] Dev2/52 = 0.0                                                                                                                                                  |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10017 | R | Read Defined Variable [NI] Dev5/58 = 0.0                                                                                                                                                  |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10018 | I | Parking Brake Applied                                                                                                                                                                     |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10019 | 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 |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10020 | 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 |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10021 | R | Pressure at test point C2.11/1 <4.5 Bar                                                                                                                                                   |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10022 | R | Read Defined Variable [TT]<br>(TBCU1)LI_PARK_BR_RELEASE = 0.0                                                                                                                             |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10023 | R | Read Defined Variable [TT]<br>(MPU1)TBCU1_parkbrakerelease = 0.0                                                                                                                          |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10024 | A | Return the Isolation cock C2.3.2 to OPEN position                                                                                                                                         |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_STAT = 1.0                                                                                                                                  |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10026 | R | Read Defined Variable [TT]<br>(MPU1)tbcu1_li_pbrake_stat = 1.0                                                                                                                            |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10027 | R | Read Defined Variable [TT]<br>(TBCU1)LI_PARK_BR_DC = 0.0                                                                                                                                  |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10028 | R | Read Defined Variable [TT]<br>(MPU1)TBCU1_parkbrakeisoldc = 0.0                                                                                                                           |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10029 | R | Read Defined Variable [TT]<br>(MPU1)li_pbk_m1parkbrakeisol = 0.0                                                                                                                          |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10030 | I | Parking Brake Applied Train Lines<br>Dev2/52 = END1 90XR25 pin 77<br>Dev5/58 = END2 90XP35 pin 77                                                                                         |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10031 | R | Read Defined Variable [NI] Dev2/52 = 1.0                                                                                                                                                  |  | OK | 1 | Sizwe Sibanyoni<br>484647               | M1 |

|       |   |                                                                                                          |  |    |   |                                         |    |
|-------|---|----------------------------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   |                                                                                                          |  |    |   | 27.02.2025                              |    |
| 10032 | R | Read Defined Variable [NI] Dev5/58 = 1.0                                                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10033 | A | Position the Isolation cock C2.3.2 in CLOSE position                                                     |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10034 | R | Read Defined Variable [TT]<br>(MPU1)li_pbk_m1parkbrakeisol = 1.0                                         |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10035 | R | Read Defined Variable [TT]<br>(TBCU1)LI_BRAKE_STAT = 0.0                                                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10036 | R | Read Defined Variable [TT]<br>(MPU1)tbcu1_li_pbrake_stat = 0.0                                           |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10037 | R | Read Defined Variable [TT]<br>(TBCU1)LI_PARK_BR_DC = 1.0                                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10038 | R | Read Defined Variable [TT]<br>(MPU1)TBCU1_parkbrakeisoldc = 1.0                                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10039 | I | Parking Brake Applied Train Lines<br>Dev2/52 = END1 90XR25 pin 77<br>Dev5/58 = END2 90XP35 pin 77        |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10040 | R | Read Defined Variable [NI] Dev2/52 = 0.0                                                                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10041 | R | Read Defined Variable [NI] Dev5/58 = 0.0                                                                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10042 | A | Return the Isolation cock C2.3.2 to OPEN position                                                        |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10043 | I | Remote Parking Brake Command                                                                             |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10044 | I | Remote Parking Brake Command Train Lines<br>Dev1/51 = END1 90XR25 pin 68<br>Dev5/57 = END2 90XP35 pin 68 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10045 | A | Force [NI] Dev1/51 = 1.0                                                                                 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10046 | R | Read Defined Variable [NI] Dev5/57 = 1.0                                                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10047 | R | Confirm that the parking brake is applied, and air is released from electro valve C2.5                   |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10048 | I | Remote Parking Brake Command Train Lines<br>Dev1/51 = END1 90XR25 pin 68                                 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |

|       |   |                                                          |  |    |   |                                         |    |
|-------|---|----------------------------------------------------------|--|----|---|-----------------------------------------|----|
|       |   | Dev5/57 = END2 90XP35 pin 68                             |  |    |   |                                         |    |
| 10049 | A | Force [NI] Dev1/51 = 0.0                                 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10050 | R | Read Defined Variable [NI] Dev5/57 = 0.0                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10051 | R | Confirm that electro valve C2.5 has stopped emitting air |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |



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## Section 12 – Passenger Doors

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### 12.1 Instructions list

### 12.1.1 050\_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            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10002 | I    | Initial conditions                                            |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10003 | I    | 110Vdc Normal power supply is connected to the vehicle and ON |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10004 | I    | Ensure that the TCMS network is functional                    |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10005 | I    | Circuit Breakers                                              |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10006 | A    | Close Circuit Breaker 50Q1                                    |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10007 | R    | DCU 1 is powered ON                                           |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10008 | R    | Check on the DDU that DCU1 is online                          |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10009 | A    | Close Circuit Breaker 50Q2                                    |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10010 | R    | DCU 2 is powered ON                                           |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10011 | R    | Check on the DDU that DCU2 is online                          |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10012 | A    | Close Circuit Breaker 50Q3                                    |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10013 | R    | DCU 3 is powered ON                                           |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10014 | R    | Check on the DDU that DCU3 is online                          |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10015 | A    | Close Circuit Breaker 50Q4                                    |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |
| 10016 | R    | DCU 4 is powered ON                                           |      | OK            |              | Anthonia Mabowa<br>494131<br>27.02.2025 | M1      |

|       |   |                                                                                                             |                                                                                     |    |   |                                         |    |
|-------|---|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|---|-----------------------------------------|----|
| 10017 | R | Check on the DDU that DCU4 is online                                                                        |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10018 | A | Close Circuit Breaker 50Q5                                                                                  |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10019 | R | DCU 5 is powered ON                                                                                         |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10020 | R | Check on the DDU that DCU5 is online                                                                        |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10021 | A | Close Circuit Breaker 50Q6                                                                                  |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10022 | R | DCU 6 is powered ON                                                                                         |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10023 | R | Check on the DDU that DCU6 is online                                                                        |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10024 | A | Close Circuit Breaker 50Q7                                                                                  |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10025 | I | Car ID Code                                                                                                 |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10026 | A | Using the DDU on the test bench, check that all the doors on M1 are available - as in the picture attached. |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10027 | R | All doors are available                                                                                     |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10028 | I | Door Open and Close - Safety Loop                                                                           |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10029 | I | ERTMS Auth Left Train Lines<br>Dev1/81 = END1 90XR25 pin 44<br>Dev5/86 = END2 90XP35 pin 44                 |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10030 | A | Force [NI] Dev1/81 = 1.0                                                                                    |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10031 | R | Read Defined Variable [NI] Dev5/86 = 1.0                                                                    |                                                                                     | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10032 | A | Force [NI] Dev1/81 = 0.0                                                                                    |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10033 | R | Read Defined Variable [NI] Dev5/86 = 0.0                                                                    |                                                                                     | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10034 | I | ERTMS Auth RightTrain Lines<br>Dev1/82 = END1 90XR25 pin 47                                                 |                                                                                     | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |



|       |   |                                                                                              |  |    |   |                                         |    |
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|       |   | Dev5/87 = END2 90XP35 pin 47                                                                 |  |    |   |                                         |    |
| 10035 | A | Force [NI] Dev1/82 = 1.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10036 | R | Read Defined Variable [NI] Dev5/87 = 1.0                                                     |  | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10037 | A | Force [NI] Dev1/82 = 0.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10038 | R | Read Defined Variable [NI] Dev5/87 = 0.0                                                     |  | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10039 | I | Doors Open Train Lines<br>Dev1/49 = END1 90XR25 pin 66<br>Dev5/55 = END2 90XP35 pin 66       |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10040 | A | Force [NI] Dev1/49 = 1.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10041 | R | Read Defined Variable [NI] Dev5/55 = 1.0                                                     |  | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10042 | A | Force [NI] Dev1/49 = 0.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10043 | R | Read Defined Variable [NI] Dev5/55 = 0.0                                                     |  | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10044 | I | Door Close Right Train Lines<br>Dev1/53 = END1 90XR25 pin 78<br>Dev5/59 = END2 90XP35 pin 78 |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10045 | A | Force [NI] Dev1/53 = 1.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10046 | R | Read Defined Variable [NI] Dev5/59 = 1.0                                                     |  | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10047 | A | Force [NI] Dev1/53 = 0.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10048 | R | Read Defined Variable [NI] Dev5/59 = 0.0                                                     |  | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10049 | I | Door Close Left Train Lines<br>Dev1/54 = END1 90XR25 pin 79<br>Dev5/60 = END2 90XP35 pin 79  |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10050 | A | Force [NI] Dev1/54 = 1.0                                                                     |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |
| 10051 | R | Read Defined Variable [NI] Dev5/60 = 1.0                                                     |  | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025 | M1 |

|       |   |                                                                                             |  |    |   |                                              |    |
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| 10052 | A | Force [NI] Dev1/54 = 0.0                                                                    |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10053 | R | Read Defined Variable [NI] Dev5/60 = 0.0                                                    |  | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10054 | I | Door Auth Left Train Lines<br>Dev1/56 = END1 90XR25 pin 85<br>Dev5/64 = END2 90XP35 pin 85  |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10055 | A | Force [NI] Dev1/56 = 1.0                                                                    |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10056 | R | Read Defined Variable [NI] Dev5/64 = 1.0                                                    |  | OK | 1 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10057 | I | Door Auth Right Train Lines<br>Dev1/55 = END1 90XR25 pin 84<br>Dev5/61 = END2 90XP35 pin 84 |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10058 | A | Force [NI] Dev1/64 = 1.0                                                                    |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10059 | R | Read Defined Variable [NI] Dev5/56 = 1.0                                                    |  | OK | 1 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10060 | I | V<3km/h Train Lines<br>Dev1/35 = END1 90XR25 pin 29<br>Dev5/39 = END2 90XP35 pin 29         |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10061 | A | Force [NI] Dev1/35 = 1.0                                                                    |  | OK |   | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10062 | R | Read Defined Variable [NI] Dev5/39 = 1.0                                                    |  | OK | 1 | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10063 | A | Force [TT]<br>(MPU1)lo_dor_m1opendoorleft = 1.0                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10064 | A | Force [TT]<br>(MPU1)lo_dor_m1opendoorright = 1.0                                            |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10065 | R | Check that ALL doors are OPEN                                                               |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10066 | I | Door Auth Left Train Lines<br>Dev1/56 = END1 90XR25 pin 85<br>Dev5/64 = END2 90XP35 pin 85  |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10067 | A | Force [NI] Dev1/56 = 0.0                                                                    |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10068 | R | Read Defined Variable [NI] Dev5/64 = 0.0                                                    |  | OK | 0 | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |

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| 10069 | I | Door Auth Right Train Lines<br>Dev1/64 = END1 90XR25 pin 84<br>Dev5/56 = END2 90XP35 pin 84                      |  | OK |      | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10070 | A | Force [NI] Dev1/64 = 0.0                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10071 | R | Read Defined Variable [NI] Dev5/56 = 0.0                                                                         |  | OK | 0    | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10072 | R | Check that ALL doors are CLOSED                                                                                  |  | OK |      | Anthonia Mabowa<br>494131<br>27.02.2025      | M1 |
| 10073 | I | Safety Doors Loop Train Lines<br>Dev1/59 = END1 90XR25 pin 96<br>Dev5/89 = END2 90XP35 pin 96                    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10074 | A | Force [NI] Dev1/59 = 1.0                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10075 | R | Read Defined Variable [NI] Dev5/89 = 1.0                                                                         |  | OK | 1    | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10076 | I | Left Side Doors                                                                                                  |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10077 | I | Door 1                                                                                                           |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10078 | I | Door Auth Left Train Lines<br>Dev1/56 = END1 90XR25 pin 85                                                       |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10079 | A | Force [NI] Dev1/56 = 1.0                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10080 | R | Check if ALL Left doors opens in 3 sec<br>(+1/-0)                                                                |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10081 | R | Check that the GREEN leds on both sides<br>of the door blink while the door opens<br>[Safety Request: Prasa8-05] |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10082 | I | Door Opening Gap                                                                                                 |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10083 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>BOTTOM of the door)             |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10084 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                                          |  | OK | 1397 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10085 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>top of the door)                |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |

|       |   |                                                                                                      |  |    |      |                                              |    |
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| 10086 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1404 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10087 | A | Measure the opening gap of the door.<br>(This measurement must be done in the<br>middle of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10088 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1401 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10089 | I | Door 3                                                                                               |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10090 | I | Door Opening Gap                                                                                     |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10091 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>BOTTOM of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10092 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1398 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10093 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>top of the door)    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10094 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1404 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10095 | A | Measure the opening gap of the door.<br>(This measurement must be done in the<br>middle of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10096 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1402 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10097 | I | Door 5                                                                                               |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10098 | I | Door Opening Gap                                                                                     |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10099 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>BOTTOM of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10100 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1399 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10101 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>top of the door)    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |

|       |   |                                                                                                               |  |    |      |                                              |    |
|-------|---|---------------------------------------------------------------------------------------------------------------|--|----|------|----------------------------------------------|----|
| 10102 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410 (mm)                                                          |  | OK | 1405 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10103 | A | Measure the opening gap of the door.<br>(This measurement must be done in the middle of the door).            |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10104 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410 (mm)                                                          |  | OK | 1403 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10105 | I | Door Auth Left Train Lines<br>Dev1/56 = END1 90XR15 pin 85                                                    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10106 | A | Force [NI] Dev1/56 = 0.0                                                                                      |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10107 | R | Check if ALL Left doors closes in 3 sec<br>(+1/-0)                                                            |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10108 | R | Check that the RED leds on both sides of the door blink while the door closes<br>[Safety Request: Prasa8-05]  |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10109 | I | Safety Doors Loop Train Lines<br>Dev5/89 = END2 90XP35 pin 96                                                 |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10110 | R | Read Defined Variable [NI] Dev5/89 = 1.0                                                                      |  | OK | 1    | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10111 | I | Right Side Doors                                                                                              |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10112 | I | Door 2                                                                                                        |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10113 | I | Door Auth Right Train Lines<br>Dev1/64 = END1 90XR25 pin 84                                                   |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10114 | A | Force [NI] Dev1/64 = 1.0                                                                                      |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10115 | R | Check if ALL Left doors opens in 3 sec<br>(+1/-0)                                                             |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10116 | R | Check that the GREEN leds on both sides of the door blink while the door opens<br>[Safety Request: Prasa8-05] |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10117 | I | Door Opening Gap                                                                                              |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10118 | A | Measure the opening gap of the door.<br>(This measurement must be done at the BOTTOM of the door)             |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |

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|-------|---|------------------------------------------------------------------------------------------------------|--|----|------|----------------------------------------------|----|
| 10119 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1398 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10120 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>top of the door)    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10121 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1406 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10122 | A | Measure the opening gap of the door.<br>(This measurement must be done in the<br>middle of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10123 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1402 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10124 | I | Door 4                                                                                               |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10125 | I | Door Opening Gap                                                                                     |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10126 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>BOTTOM of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10127 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1398 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10128 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>top of the door)    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10129 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1405 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10130 | A | Measure the opening gap of the door.<br>(This measurement must be done in the<br>middle of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10131 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410<br>(mm)                                              |  | OK | 1401 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10132 | I | Door 6                                                                                               |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10133 | I | Door Opening Gap                                                                                     |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10134 | A | Measure the opening gap of the door.<br>(This measurement must be done at the<br>BOTTOM of the door) |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |

|       |   |                                                                                                                                                                  |  |    |      |                                              |    |
|-------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|------|----------------------------------------------|----|
| 10135 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm)                                                                                                             |  | OK | 1394 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10136 | A | Measure the opening gap of the door.<br>(This measurement must be done at the top of the door)                                                                   |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10137 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm)                                                                                                             |  | OK | 1405 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10138 | A | Measure the opening gap of the door.<br>(This measurement must be done in the middle of the door)                                                                |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10139 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm)                                                                                                             |  | OK | 1401 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10140 | I | Obstacle Detection                                                                                                                                               |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10141 | I | Door Auth Left Train Lines<br>Dev1/56 = END1 90XR25 pin 85                                                                                                       |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10142 | A | Force [NI] Dev1/56 = 1.0                                                                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10143 | R | Check if ALL Left doors opens in 3 sec<br>(+1/-0)                                                                                                                |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10144 | R | Position an obstacle on the floor in the centre of each and every door closing line                                                                              |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10145 | I | Door Auth Train Lines<br>Dev1/64 = END1 90XR25 pin 84 (Right)<br>Dev1/56 = END1 90XR25 pin 85 (Left)                                                             |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10146 | A | Force [NI] Dev1/64 = 0.0                                                                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10147 | A | Force [NI] Dev1/56 = 0.0                                                                                                                                         |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10148 | R | All doors will hit the obstacles, reopen and try to close again 3 times.<br>On the third attempt ALL doors will stop and stand ajar - free to be opened manually |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10149 | I | Safety Doors Loop Train Lines<br>Dev5/89 = END2 90XP35 pin 96                                                                                                    |  | OK |      | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10150 | R | Read Defined Variable [NI] Dev5/89 = 0.0                                                                                                                         |  | OK | 0    | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10151 | I | Door Auth Train Lines<br>Dev1/64 = END1 90XR25 pin 84 (Right)                                                                                                    |  | OK |      | Paseka Ditlhakanyane<br>491468               | M1 |

|       |   |                                                                                                              |  |    |   |                                              |    |
|-------|---|--------------------------------------------------------------------------------------------------------------|--|----|---|----------------------------------------------|----|
|       |   | Dev1/56 = END1 90XR25 pin 85 (Left)                                                                          |  |    |   | 28.02.2025                                   |    |
| 10152 | A | Force [NI] Dev1/64 = 1.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10153 | A | Force [NI] Dev1/56 = 1.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10154 | R | ALL doors opens fully                                                                                        |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10155 | A | Remove the obstacles                                                                                         |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10156 | I | Door Auth Train Lines<br>Dev1/64 = END1 90XR25 pin 84 (Right)<br>Dev1/56 = END1 90XR25 pin 85 (Left)         |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10157 | A | Force [NI] Dev1/64 = 0.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10158 | A | Force [NI] Dev1/56 = 0.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10159 | R | Check that ALL doors closes in 3 sec (+1/-0)                                                                 |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10160 | R | Check that the RED leds on both sides of the door blink while the door closes<br>[Safety Request: Prasa8-05] |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10161 | I | Safety Doors Loop Train Lines<br>Dev5/89 = END2 90XP35 pin 96                                                |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10162 | R | Read Defined Variable [NI] Dev5/89 = 1.0                                                                     |  | OK | 1 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10163 | I | Speed Detection                                                                                              |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10164 | I | Door Auth Train Lines<br>Dev1/64 = END1 90XR25 pin 84 (Right)<br>Dev1/56 = END1 90XR25 pin 85 (Left)         |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10165 | A | Force [NI] Dev1/64 = 1.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10166 | A | Force [NI] Dev1/56 = 1.0                                                                                     |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10167 | R | All doors open                                                                                               |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10168 | I | V>5km/h Train Lines<br>Dev1/34 = END1 90XR25 pin 28                                                          |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |



|       |   |                                                                                                      |  |    |   |                                              |    |
|-------|---|------------------------------------------------------------------------------------------------------|--|----|---|----------------------------------------------|----|
|       |   | Dev5/38 = END2 90XP35 pin 28                                                                         |  |    |   |                                              |    |
| 10169 | A | Force [NI] Dev1/34 = 1.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10170 | R | Read Defined Variable [NI] Dev5/38 = 1.0                                                             |  | OK | 1 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10171 | R | All doors close due to the invalid state of the DCU                                                  |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10172 | A | Release [TT]<br>(MPU1)lo_dor_m1opendoorleft                                                          |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10173 | A | Release [TT]<br>(MPU1)lo_dor_m1opendoorright                                                         |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10174 | I | V>5km/h Train Lines<br>Dev1/34 = END1 90XR25 pin 28<br>Dev5/38 = END2 90XP35 pin 28                  |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10175 | A | Force [NI] Dev1/34 = 0.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10176 | R | Read Defined Variable [NI] Dev5/38 = 0.0                                                             |  | OK | 0 | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10177 | I | V<3km/h Train Lines<br>Dev1/35 = END1 90XR25 pin 29                                                  |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10178 | A | Force [NI] Dev1/35 = 0.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10179 | I | Door Auth Train Lines<br>Dev1/64 = END1 90XR25 pin 84 (Right)<br>Dev1/56 = END1 90XR25 pin 85 (Left) |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10180 | A | Force [NI] Dev1/64 = 0.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10181 | A | Force [NI] Dev1/56 = 0.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10182 | I | Safety Doors Loop Train Lines<br>Dev1/59 = END1 90XR25 pin 96                                        |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |
| 10183 | A | Force [NI] Dev1/59 = 0.0                                                                             |  | OK |   | Paseka Ditlhakanyane<br>491468<br>28.02.2025 | M1 |



Serial Tests Report  
TS271– M1 – VFT  
RTR Vehicle Functional Static Testing Report

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RTR Vehicle Functional Static Testing Report

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## Section 13 – HVAC Air Conditioning

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### 13.1 Instructions list

### 13.1.1 057\_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            |              |          | M1      |
| 10002 | I    | Initial conditions                                                                     |                                                                                     | NE            |              |          | M1      |
| 10003 | A    | Car Should be Prepared                                                                 |                                                                                     | NE            |              |          | M1      |
| 10004 | I    | Power Supply                                                                           |                                                                                     | NE            |              |          | M1      |
| 10005 | A    | Close Circuit Breaker 57Q1                                                             |                                                                                     | NE            |              |          | M1      |
| 10006 | A    | Close Circuit Breaker 57Q2                                                             |                                                                                     | NE            |              |          | M1      |
| 10007 | I    | HVAC Electronic Power Supply                                                           |                                                                                     | NE            |              |          | M1      |
| 10008 | A    | Close Circuit Breaker F1 on the HVAC Panel                                             |                                                                                     | NE            |              |          | M1      |
| 10009 | I    | The HVAC electronic is ON                                                              |                                                                                     | NE            |              |          | M1      |
| 10010 | A    | Turn the control switch to AUTO position on the HVAC Panel                             |                                                                                     | NE            |              |          | M1      |
| 10011 | I    | Software Upload                                                                        |                                                                                     | NE            |              |          | M1      |
| 10012 | I    | Follow the procedure in the document below to upload software onto the HVAC electronic |                                                                                     | NE            |              |          | M1      |
| 10013 | A    |                                                                                        |  | NE            |              |          | M1      |
| 10014 | I    | Checking 400Vac                                                                        |                                                                                     | NE            |              |          | M1      |
| 10015 | A    | Ensure that the 400Vac Shore Supply is connected to the vehicle, else connect it       |                                                                                     | NE            |              |          | M1      |

|       |   |                                                                                                                                        |                                                                                     |    |  |  |    |
|-------|---|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|--|--|----|
| 10016 | A | Disconnect connector 57XP4_X5 and use a multimeter to measure 400Vac between phases a1, a2 and b1                                      |                                                                                     | NE |  |  | M1 |
| 10017 | R | 400Vac (+/-5%) measured                                                                                                                |                                                                                     | NE |  |  | M1 |
| 10018 | A | On the same connector, with a phasemeter, check the correct Phase Rotation between points L1- Phase a1, L2- Phase a2 and L3- Phase b1. |                                                                                     | NE |  |  | M1 |
| 10019 | R | The phase rotation is correct between all three phases                                                                                 |                                                                                     | NE |  |  | M1 |
| 10020 | A | Normalize connector 57XP4_X5                                                                                                           |                                                                                     | NE |  |  | M1 |
| 10021 | I | HVAC 50% restriction                                                                                                                   |                                                                                     | NE |  |  | M1 |
| 10022 | A | Force [TT] NRG_HvacM150Cmd = 0                                                                                                         |                                                                                     | NE |  |  | M1 |
| 10023 | I | HVAC inhib                                                                                                                             |                                                                                     | NE |  |  | M1 |
| 10024 | A | Force [TT]<br>(MPU1)lo_hva_m1hvacinhibr1__1 = 1                                                                                        |                                                                                     | NE |  |  | M1 |
| 10025 | A | Force [TT]<br>(MPU1)lo_hva_m1hvacinhibr2__1 = 1                                                                                        |                                                                                     | NE |  |  | M1 |
| 10026 | R | HVAC unit turns ON and starts to work                                                                                                  |                                                                                     | NE |  |  | M1 |
| 10027 | I | Emergency Ventilation                                                                                                                  |                                                                                     | NE |  |  | M1 |
| 10028 | A | Force [TT]<br>(MPU1)lo_hva_m1emergventil__1 = 1                                                                                        |                                                                                     | NE |  |  | M1 |
| 10029 | I | All saloon HVAC units work in Ventilation mode. Not heating/cooling                                                                    |                                                                                     | NE |  |  | M1 |
| 10030 | A | Connect the laptop to the HVAC maintenance software using HCU Finder and check the actual working mode of HVAC                         |  | NE |  |  | M1 |
| 10031 | R | Release [TT]<br>(MPU1)lo_hva_m1emergventil__1                                                                                          |                                                                                     | NE |  |  | M1 |
| 10032 | I | Forced Mode (Saloon HVAC)                                                                                                              |                                                                                     | NE |  |  | M1 |

|       |   |                                                                                                                                       |                                                                                   |    |  |  |    |
|-------|---|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----|--|--|----|
|       |   |                                                                                                                                       |                                                                                   |    |  |  |    |
| 10033 | I | In the maintenance software, select the 'Forced' tab, and use the "Required working mode" drop down box to force the following modes: |                                                                                   | NE |  |  | M1 |
| 10034 | I | For the next sections, walk through the whole car and physically check (feel) that the HVAC is functioning as desired                 |                                                                                   | NE |  |  | M1 |
| 10035 | A | Force Ventilation mode on the Saloon HVAC                                                                                             |                                                                                   | NE |  |  | M1 |
| 10036 | I | Ventilation Mode                                                                                                                      |  | NE |  |  | M1 |
| 10037 | R | All saloon HVAC units work in Ventilation mode. Not heating/cooling                                                                   |                                                                                   | NE |  |  | M1 |
| 10038 | I | Cooling Mode                                                                                                                          |                                                                                   | NE |  |  | M1 |
| 10039 | A | Force Cooling mode on the Saloon HVAC                                                                                                 |                                                                                   | NE |  |  | M1 |
| 10040 | R | All saloon HVAC units work in Cooling mode                                                                                            |                                                                                   | NE |  |  | M1 |
| 10041 | I | Heating Mode                                                                                                                          |                                                                                   | NE |  |  | M1 |
| 10042 | A | Force Heating mode on the Saloon HVAC                                                                                                 |                                                                                   | NE |  |  | M1 |
| 10043 | R | All saloon HVAC units work in Heating mode                                                                                            |                                                                                   | NE |  |  | M1 |
| 10044 | I | Self-Test                                                                                                                             |                                                                                   | NE |  |  | M1 |
| 10045 | A | Force Self-Test on the Saloon HVAC                                                                                                    |                                                                                   | NE |  |  | M1 |
| 10046 | R | All saloon HVAC units work according to the mode described in the "Actual working mode"                                               |                                                                                   | NE |  |  | M1 |
| 10047 | R | The Exhaust fans are Turned OFF                                                                                                       |                                                                                   | NE |  |  | M1 |
| 10048 | I | HVAC Faults                                                                                                                           |                                                                                   | NE |  |  | M1 |

|       |   |                                                                 |                                                                                   |    |  |  |    |
|-------|---|-----------------------------------------------------------------|-----------------------------------------------------------------------------------|----|--|--|----|
| 10049 | A | In the maintenance software, select the "Alarms / Warnings" tab |  | NE |  |  | M1 |
| 10050 | A | Ensure there are no active faults on the HVAC                   |                                                                                   | NE |  |  | M1 |
| 10051 | R | No active faults identified on the HVAC unit                    |                                                                                   | NE |  |  | M1 |
| 10052 | A | Release [TT]<br>(MPU1)lo_hva_m1hvacinhibr1__1                   |                                                                                   | NE |  |  | M1 |
| 10053 | A | Release [TT]<br>(MPU1)lo_hva_m1hvacinhibr2__1                   |                                                                                   | NE |  |  | M1 |
| 10054 | A | Release [TT] NRG_HvacM150Cmd                                    |                                                                                   | NE |  |  | M1 |
| 10055 | I | End of Test                                                     |                                                                                   | NE |  |  | M1 |

### 13.1.2 057\_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            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10002 | I    | Initial conditions                                                                                                                                |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10003 | A    | Car Should be Prepared with CVS running and 400V ac available in the car                                                                          |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10004 | I    | HVAC AC Power Supply                                                                                                                              |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10005 | A    | Close Circuit Breaker 13Q1 and 13Q5                                                                                                               |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10006 | A    | Check on the DDU if the HVAC is offline                                                                                                           |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10007 | I    | Checking 400Vac                                                                                                                                   |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10008 | A    | Close Circuit Breaker 57Q1                                                                                                                        |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10009 | A    | Disconnect connector 57XP4_X5 and use a multimeter to check 400Vac between each phases a1, a2 and b1                                              |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10010 | R    | 400Vac measured between all phases                                                                                                                |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10011 | A    | On the same connector 57XP4_X5, with a phasemeter, check the phase rotation of all 3 phases which are a1- phase L1, a2- Phase L2 and b1- phase L3 |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10012 | R    | The phase rotation is correct between all three phases                                                                                            |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10013 | A    | Normalize connector 57XP4_X5.                                                                                                                     |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10014 | I    | HVAC controller power supply                                                                                                                      |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |
| 10015 | A    | Close Circuit Breaker 57Q2                                                                                                                        |      | OK            |              | Celiwe Sokhela<br>491462<br>27.02.2025 | M1      |

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|       |   |                                                                                                                                                                                                             |                                                                                     |    |  |                                        |    |
|-------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|--|----------------------------------------|----|
| 10016 | A | Allow the HVAC to initialize and check on the DDU if the HVAC is online                                                                                                                                     |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10017 | R | HVAC unit turns ON and starts to work                                                                                                                                                                       |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10018 | I | HVAC inhib                                                                                                                                                                                                  |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10019 | A | Force [TT]<br>(MPU1)lo_hva_m1hvacinhibr1__1 = 1                                                                                                                                                             |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10020 | A | Force [TT]<br>(MPU1)lo_hva_m1hvacinhibr2__1 = 1                                                                                                                                                             |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10021 | I | 50% HVAC restriction                                                                                                                                                                                        |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10022 | A | Force [TT] NRG_HvacM150Cmd = 0                                                                                                                                                                              |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10023 | I | saloon HVAC                                                                                                                                                                                                 |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10024 | I | HVAC web portal                                                                                                                                                                                             |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10025 | I | The attached document is a procedure on how to navigate around the maintenance software                                                                                                                     |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10026 | I | Connect the laptop to the HVAC maintenance software using web browser. Enter the following IP address on the web browser 10.136.xxx30<br>xxx represents the train number<br>Login: maint<br>Password: maint |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10027 | I | Full "Self test" saloon                                                                                                                                                                                     |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10028 | R | On status tab, Active mode is off for both cab and saloon                                                                                                                                                   |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10029 | A | Go to Alarms tab and clear all the alarms for saloon and cabin                                                                                                                                              |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10030 | I | For the following tests make sure on the webHMI tab you change controller to be controlled by webHMI and not MPU                                                                                            |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10031 | A | Before running the full test, please click on reset test to reset the previous results.                                                                                                                     |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |

|       |   |                                                                                                                                         |                                                                                     |    |  |                                        |    |
|-------|---|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|--|----------------------------------------|----|
| 10032 | A | Select Full-Test on the Saloon HVAC                                                                                                     |    | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10033 | R | All saloon HVAC units work according to the mode described in the "ACTIVE MODE" on the status tab                                       |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10034 | 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 |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10035 | I | Forced Mode (Saloon HVAC)                                                                                                               |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10036 | I | During all tests Walk through the whole car and physically check (feel) that the HVAC is functioning as desired                         |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10037 | I | Go to maintenance tab to force the following modes                                                                                      |    | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10038 | I | Cooling Mode                                                                                                                            |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10039 | A | Select forced Cooling mode on the Saloon HVAC and let it run for 5 mins                                                                 |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10040 | R | All HVAC units are cooling                                                                                                              |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10041 | I | Heating Mode                                                                                                                            |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10042 | A | Select forced Heating mode on the Saloon HVAC and let it run for 5 mins                                                                 |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10043 | R | All HVAC units are heating                                                                                                              |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10044 | I | HVAC Faults                                                                                                                             |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10045 | A | In the maintenance software, select the "Alarms" tab                                                                                    |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10046 | A | Ensure there are no active faults on the HVAC for Cabin and Saloon. Use the highlighted drop down to navigate between saloon and cabin. |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10047 | R | No active faults identified on the HVAC unit                                                                                            |                                                                                     | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |

|       |   |                                               |  |    |  |                                        |    |
|-------|---|-----------------------------------------------|--|----|--|----------------------------------------|----|
| 10048 | A | Release [TT]<br>(MPU1)lo_hva_m1hvacinhibr1__1 |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10049 | A | Release [TT]<br>(MPU1)lo_hva_m1hvacinhibr2__1 |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10050 | A | Release [TT] NRG_HvacM150Cmd                  |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10051 | R | Cabin HVAC turned OFF                         |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |
| 10052 | I | End of test                                   |  | OK |  | Celiwe Sokhela<br>491462<br>27.02.2025 | M1 |



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## Section 14 – Fire protection

### 14.1 Instructions list

#### 14.1.1 067\_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            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10002 | I    | Fire Detection Train Lines                                                                                              |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10003 | I    | Fire Detection Train Lines<br>Dev1/76 = END1 90XR24 pin 21<br>Dev5/76 = END2 90XP34 pin 21                              |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10004 | A    | Force [NI] Dev1/76 = 1.0                                                                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10005 | R    | Read Defined Variable [NI] Dev5/76 = 1.0                                                                                |      | OK            | 1            | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10006 | A    | Force [NI] Dev1/76 = 0.0                                                                                                |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10007 | R    | Read Defined Variable [NI] Dev5/76 = 0.0                                                                                |      | OK            | 0            | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10008 | I    | Continuity Test                                                                                                         |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10009 | I    | The following steps are continuity tests between the two points described in each step. Use a multimeter for this test. |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10010 | A    | From : [(local: +END1 -90XR23.B (pin 4))] to: [ -Inter-connector (local: +END2 - 90XP33.a pin 7)]                       |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |
| 10011 | A    | From : [(local: +END1 -90XR23.B (pin 5))] to: [ -Inter-connector (local: +END2 - 90XP33.a pin 8)]                       |      | OK            |              | Mvelo Mthembu<br>425564<br>27.02.2025 | M1      |

|       |   |                                                                                                  |  |    |  |                                       |    |
|-------|---|--------------------------------------------------------------------------------------------------|--|----|--|---------------------------------------|----|
|       |   |                                                                                                  |  |    |  |                                       |    |
| 10012 | A | From : [(local: +END1 -90XR23.A (pin 7))] to: [ -Inter-connector (local: +END2 -90XP33.b pin 4)] |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |
| 10013 | A | From : [(local: +END1 -90XR23.A (pin 8))] to: [ -Inter-connector (local: +END2 -90XP33.b pin 5)] |  | OK |  | Mvelo Mthembu<br>425564<br>27.02.2025 | M1 |



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## Section 15 – Traction and Electric Brake

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### 15.1 Instructions list

### 15.1.1 033\_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            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10002 | I    | Circuit Breakers and Configuration                                                                      |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10003 | A    | Close Circuit Breaker 33Q1                                                                              |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10004 | A    | Close Circuit Breaker 33Q2                                                                              |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10005 | A    | Close Circuit Breaker 33Q3                                                                              |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10006 | A    | Close Circuit Breaker 33Q4                                                                              |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10007 | A    | Close Circuit Breaker 33Q5                                                                              |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10008 | R    | Read Defined Variable [TT]<br>(TBCU1)LI_CAR_ID1 = 1.0                                                   |      | OK            | 1            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10009 | I    | Train Lines                                                                                             |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10010 | I    | 110Vdc Normal Traction EL Train Lines<br>Dev 1/66 = END1 90XP25 pin 49<br>Dev 2/65 = END1 90XP35 pin 42 |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10011 | A    | Force [NI] Dev1/66 = 1.0                                                                                |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10012 | R    | Read Defined Variable [NI] Dev2/65 = 1.0                                                                |      | OK            | 1            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10013 | A    | Force [NI] Dev1/66 = 0.0                                                                                |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10014 | R    | Read Defined Variable [NI] Dev2/65 = 0.0                                                                |      | OK            | 0            | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |
| 10015 | I    | Forward Train Lines:<br>Dev1/31 : END1 90XR25 pin 25<br>Dev5/78 : END2 90XP35 pin 30                    |      | OK            |              | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1      |



|       |   |                                                                                       |  |    |   |                                         |    |
|-------|---|---------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
| 10016 | A | Force [NI] Dev1/31 = 1.0                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10017 | R | Read Defined Variable [TT]<br>(TBCU1)LI_FORWARD = 1.0                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10018 | R | Read Defined Variable [NI] Dev5/78 = 1.0                                              |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10019 | I | Forward Train Lines:<br>Dev1/31 : END1 90XR25 pin 25<br>Dev5/78 : END2 90XP35 pin 30  |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10020 | A | Force [NI] Dev1/31 = 0.0                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10021 | R | Read Defined Variable [TT]<br>(TBCU1)LI_FORWARD = 0.0                                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10022 | R | Read Defined Variable [NI] Dev5/78 = 0.0                                              |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10023 | I | Reverse Train Lines:<br>Dev1/36 : END1 90XR25 pin 30<br>Dev5/35 : END2 90XP35 pin 25  |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10024 | A | Force [NI] Dev1/36 = 1.0                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10025 | R | Read Defined Variable [TT]<br>(TBCU1)LI_REVERSE = 1.0                                 |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10026 | R | Read Defined Variable [NI] Dev5/35 = 1.0                                              |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10027 | I | Reverse Train Lines:<br>Dev1/36 : END1 90XR25 pin 30<br>Dev5/35 : END2 90XP35 pin 25  |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10028 | A | Force [NI] Dev1/36 = 0.0                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10029 | R | Read Defined Variable [TT]<br>(TBCU1)LI_REVERSE = 0.0                                 |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10030 | R | Read Defined Variable [NI] Dev5/35 = 0.0                                              |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10031 | I | Traction Train Lines:<br>Dev1/37 : END1 90XR25 pin 31<br>Dev5/81 : END2 90XP35 pin 31 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10032 | A | Force [NI] Dev1/37 = 1.0                                                              |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |

|       |   |                                                                                                   |  |    |   |                                         |    |
|-------|---|---------------------------------------------------------------------------------------------------|--|----|---|-----------------------------------------|----|
| 10033 | R | Read Defined Variable [TT]<br>(TBCU1)LI_TRACTION = 1.0                                            |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10034 | R | Read Defined Variable [NI] Dev5/81 = 1.0                                                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10035 | I | Traction Train Lines:<br>Dev1/37 : END1 90XR25 pin 31<br>Dev5/81 : END2 90XP35 pin 31             |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10036 | A | Force [NI] Dev1/37 = 0.0                                                                          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10037 | R | Read Defined Variable [TT]<br>(TBCU1)LI_TRACTION = 0.0                                            |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10038 | R | Read Defined Variable [NI] Dev5/81 = 0.0                                                          |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10039 | I | No Brake Train Lines:<br>Dev1/38 : END1 90XR25 pin 32<br>Dev5/82 : END2 90XP35 pin 32             |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10040 | A | Force [NI] Dev1/38 = 1.0                                                                          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10041 | R | Read Defined Variable [TT]<br>(TBCU1)LI_NOBRAKE = 1.0                                             |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10042 | R | Read Defined Variable [NI] Dev5/82 = 1.0                                                          |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10043 | I | No Brake Train Lines:<br>Dev1/38 : END1 90XR25 pin 32<br>Dev5/82 : END2 90XP35 pin 32             |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10044 | A | Force [NI] Dev1/38 = 0.0                                                                          |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10045 | R | Read Defined Variable [TT]<br>(TBCU1)LI_NOBRAKE = 0.0                                             |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10046 | R | Read Defined Variable [NI] Dev5/82 = 0.0                                                          |  | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10047 | I | Traction Interlock Bypass Train Lines<br>Dev1/4 : END1 90XR24 pin 6<br>Dev5/4 : END2 90XP34 pin 6 |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10048 | A | Force [NI] Dev1/4 = 1.0                                                                           |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10049 | R | Read Defined Variable [NI] Dev5/4 = 1.0                                                           |  | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |

|       |   |                                                                                                                                                   |                                                                                     |    |   |                                         |    |
|-------|---|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|---|-----------------------------------------|----|
| 10050 | A | Force [NI] Dev1/4 = 0.0                                                                                                                           |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10051 | R | Read Defined Variable [NI] Dev5/4 = 0.0                                                                                                           |                                                                                     | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10052 | I | Traction Interlock Train Lines<br>Dev1/39 : END1 90XR25 pin 41<br>Dev5/83 : END2 90XP35 pin 41                                                    |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10053 | A | Force [NI] Dev1/39 = 1.0                                                                                                                          |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10054 | R | Read Defined Variable [TT]<br>(TBCU1)LI_NOT_INHIB = 1.0                                                                                           |                                                                                     | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10055 | R | Read Defined Variable [NI] Dev5/83 = 1.0                                                                                                          |                                                                                     | OK | 1 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10056 | I | Traction Interlock Train Lines<br>Dev1/39 : END1 90XR25 pin 41<br>Dev5/83 : END2 90XP35 pin 41                                                    |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10057 | A | Force [NI] Dev1/39 = 0.0                                                                                                                          |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10058 | R | Read Defined Variable [TT]<br>(TBCU1)LI_NOT_INHIB = 0.0                                                                                           |                                                                                     | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10059 | R | Read Defined Variable [NI] Dev5/83 = 0.0                                                                                                          |                                                                                     | OK | 0 | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10060 | I | Coolant Liquid                                                                                                                                    |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10061 | A | Check that the coolant level is atleast 1/2<br>of the sight glass level indicator<br><a href="#">[9-30-44-281075_Coolant Level<br/>Check.pdf]</a> |  | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10062 | R | Coolant Liquid Level is OK                                                                                                                        |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |
| 10063 | I | End of Test                                                                                                                                       |                                                                                     | OK |   | Sizwe Sibanyoni<br>484647<br>27.02.2025 | M1 |



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## Section 16 – Vehicle Normalization

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### 16.1 Instructions list

### 16.1.1 NORM-Vehicle Normalization

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

| N°    | Type | Instruction                                                                                       | File                                                                                | Result status | Result value | Operator                             | Vehicle |
|-------|------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|--------------|--------------------------------------|---------|
| 10001 | I    | Initial Conditions                                                                                |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10002 | I    | The VFT procedures are all completed                                                              |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10003 | I    | Vehicle Normalization Check                                                                       |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10004 | R    | On LV3 all Circuit Breakers are installed and secured                                             |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10005 | R    | On LV3 all Dataplugs are installed, tightened and earth braids are fastened                       |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10006 | R    | On LV3 all Connectors are tightened                                                               |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10007 | R    | On LV3 there are no missing components, device, wiring or connectors.                             |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10008 | A    | ON LV3, make sure that both bolts on 93XT300 terminal 4 are tightened and torque marked.          |  | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10009 | R    | On LV6 all Dataplugs are installed, tightened and earth braids are fastened                       |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10010 | R    | On LV6 all Connectors are tightened                                                               |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10011 | R    | On LV6 there are no missing components, device, wiring or connectors.                             |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10012 | R    | On HC Cubicle the Controller is installed and properly tightened and its connectors are tightened |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10013 | R    | All DCUs are properly installed and secured                                                       |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10014 | R    | All Internal Displays are properly installed and secured                                          |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |
| 10015 | R    | All Light Covers are properly installed                                                           |                                                                                     | OK            |              | Sicelo Mtolo<br>525130<br>28.02.2025 | M1      |

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|       |   |                                                                                            |  |    |  |                                         |    |
|-------|---|--------------------------------------------------------------------------------------------|--|----|--|-----------------------------------------|----|
| 10016 | R | All Saloon Fire Detectors are properly installed and secured                               |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10017 | R | All covers are normalised inside the car                                                   |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10018 | R | On the Underframe, TBCU Agate is installed and properly tightened                          |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10019 | R | On the Underframe, Auxiliary Compressor cover is normalized                                |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10020 | R | On the Underframe, Panto panel cover is normalized                                         |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10021 | R | On the Underframe, Speed Sensors are installed and properly tightened                      |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10022 | R | On the LVB, all Circuit Breakers are installed and properly tightened                      |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10023 | R | On the LVB, all Relays and Timers are installed and properly tightened                     |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10024 | R | On the LVB, BRIOMs are installed and properly tightened                                    |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10025 | R | On the LVB there are no missing components, device, wiring or connectors.                  |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10026 | R | On the Underframe, all Connectors are tightened                                            |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10027 | R | All underframe covers are normalised                                                       |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10028 | R | On END1 the Octopus cables are disconnected from the car and properly stored.              |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10029 | R | On END2 the Octopus cables are disconnected from the car and properly stored.              |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10030 | R | On the roof, there is no Strap connected to the Pantograph                                 |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10031 | R | The Test Bench is switched OFF and the Octopus cables are disconnected and properly stored |  | OK |  | Sicelo Mtolo<br>525130<br>28.02.2025    | M1 |
| 10032 | R | ALL P.Os of this car are closed                                                            |  | OK |  | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |



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## Section 17 – PACIS Network

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### 17.1 Instructions list

### 17.1.1 054\_PIS-PACIS Network

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

| N°    | Type | Instruction                                    | File | Result status | Result value | Operator                             | Vehicle |
|-------|------|------------------------------------------------|------|---------------|--------------|--------------------------------------|---------|
| 10001 | I    | PACIS System (SPP=054)                         |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10002 | I    | Initial conditions                             |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10003 | I    | 110Vdc Normal line is connected and ON         |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10004 | I    | Circuit Breakers                               |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10005 | A    | Close Circuit Breaker 54Q1                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10006 | A    | Close Circuit Breaker 54Q2                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10007 | A    | Close Circuit Breaker 54Q10                    |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10008 | A    | Close Circuit Breaker 54Q11                    |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10009 | A    | Close Circuit Breaker 55Q2                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10010 | A    | Close Circuit Breaker 55Q3                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10011 | R    | All 'Pacis System' circuit breakers are closed |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10012 | I    | Power Supply of Router Switches                |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10013 | I    | Ethernet Switch CRS1                           |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10014 | R    | CRS1 is ON                                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10015 | I    | Ethernet Switch CRS2                           |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |
| 10016 | R    | CRS2 is ON                                     |      | OK            |              | Carol Gumede<br>425280<br>27.02.2025 | M1      |

|       |   |                                                                            |  |    |      |                                         |    |
|-------|---|----------------------------------------------------------------------------|--|----|------|-----------------------------------------|----|
| 10017 | I | DPAI-1                                                                     |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10018 | R | DPAI-1 is ON                                                               |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10019 | I | DPAI-2                                                                     |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10020 | R | DPAI-2 is ON                                                               |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10021 | I | Lateral Display 'LAT1'                                                     |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10022 | R | The PWR (power) LED is ON on the Lateral Display 'LAT1'                    |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10023 | I | Lateral Display 'LAT2'                                                     |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10024 | R | The PWR (power) LED is ON on the Lateral Display 'LAT2'                    |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10025 | I | Interior Display 'INT1'                                                    |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10026 | R | The PWR (power) LED is ON on the Interior Display 'INT1'                   |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10027 | I | Interior Display 'INT2'                                                    |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10028 | R | The PWR (power) LED is ON on the Interior Display 'INT2'                   |  | OK |      | Carol Gumede<br>425280<br>27.02.2025    | M1 |
| 10029 | I | Impedance of Loudspeaker                                                   |  | OK |      | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
| 10030 | I | Saloon Speakers Commanded by DPAI-1                                        |  | OK |      | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
| 10031 | A | Measure the impedance connector '54XP1_X4' between pins:z32(+) and z30 (-) |  | OK |      | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
| 10032 | R | Impedance Result Max : $x \leq 32$ (Ohm)                                   |  | OK | 30.4 | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
| 10033 | I | Saloon Speakers Commanded by DPAI-2                                        |  | OK |      | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
| 10034 | A | Measure the impedance connector '54XP2_X4' between pins:z32(+) and z30 (-) |  | OK |      | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |



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|-------|---|---------------------------------------------|--|----|------|-----------------------------------------|----|
| 10035 | R | Impedance<br>Result Max : $x \leq 32$ (Ohm) |  | OK | 30.2 | Nokuzola Mdluli<br>491469<br>05.03.2025 | M1 |
|-------|---|---------------------------------------------|--|----|------|-----------------------------------------|----|



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## Section 18 – Report summaries

### 18.1 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         |            |               |
| Pantograph                              | X         |            |               |
| PACIS Network                           | X         |            |               |
| Internal Lighting                       | X         |            |               |
| HVAC Air Conditioning                   | X         |            |               |
| Holding and Parking Brake               | X         |            |               |
| Fire protection                         | X         |            |               |
| Energy Distribution                     | X         |            |               |
| Emergency Brake                         | X         |            |               |
| Cabin Control                           | X         |            |               |

### 18.2 Tools used

| Function    | Tool name   | Tool number | Next Calibration date |
|-------------|-------------|-------------|-----------------------|
| 015_NRG     | NPhasemètre | Phasemeter  | 30/09/2025            |
| 021_PNT     | Manometro   | Manometer   | 30/08/2025            |
| 040_SBK     | Manometro   | Manometer   | 30/08/2025            |
| 045_PBK     | Manometro   | Manometer   | 30/08/2025            |
| 057_HVA_SME | NPhasemètre | Phasemeter  | 30/09/2025            |
| 062_ETS     | Multimetro  | Meter 1     | 31/08/2025            |



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|         |   |                |            |
|---------|---|----------------|------------|
| 064_COM | N | Radio Analyser | 10/11/2025 |
|---------|---|----------------|------------|

| Vehicle | Equipment | Expected version | Version loaded |
|---------|-----------|------------------|----------------|
| M1      |           |                  |                |