| PROJECT | CUSTOMER | VEHICLE |
|---|---|---|
| **Xtrapolis-PRASA** | **PRASA** | **226 – M3 – VFT** |

# RTR Vehicle Functional Static Testing TS226 M3 Report

## GIB0000006532


| | CREATED | VERIFIED | APPROVED | DISTRIBUTION |
|---|---|---|---|---|
| **Name** | Tshegofatso SETSHOGWE | Sifiso LUKHELE | Kgomotso NKOANA | Confidentiality Category<br>*Restricted* ☐ *Project* ☐ *Normal* ☑ |
| **Date** | 06/06/2024 | 06/06/2024 | 06/06/2024 | Control Category<br>*Controlled* ☑ *Not Controlled* ☐ |
| **Signature** | | | | Language<br>**EN** |

**This report has been automatically generated from TES version 1**

## Table of modifications

| Rev | Date | Modifications Content | Writer |
|---|---|---|---|
| A0 | 06/06/2024 | Creation | Tshegofatso SETSHOGWE |

## Internal validations

| | Name | Function | Date | Signature |
|---|---|---|---|---|
| **Creator** | Tshegofatso SETSHOGWE | EPU Manager | 06/06/2024 | X<br>Tshegofatso SETSHOGWE<br>EPU Manager |
| **Verifier** | Sifiso LUKHELE | Serial Test Manager | 06/06/2024 | X<br>Sifiso LUKHELE<br>Serial Test Manager |
| **Approver** | Kgomotso NKOANA | Test Expert | 06/06/2024 | X<br>Kgomotso NKOANA<br>Test Expert |

## Execution Plan

| | |
|---|---|
| **Start Date** | 31/05/2024 |
| **End Date** | 31/05/2024 |

## Contents

## Section 1 – Purpose / Objectives

## Section 2 – Energy Distribution

### 2.3 Instructions list

### 2.3.1 015_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial Conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | All the Circuit Breakers should be OPEN | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | I | Test bench should be connected but with no power supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | NO 400Vac should be connected to the car | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Close Circuit Breaker 15Q3 (Normal Line) | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | I | Voltage Isolation 110Vdc | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | I | 230Vac and 400Vac Circuit breaker | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Close Circuit Breaker 13Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Close the circuit breaker 13Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | I | Normal and Permanent Power Supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | I | 110Vdc Permanent Train Line<br>Apply 110Vdc on -93XT304_1 pin 4 to simulate Permanent Train Line | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Apply 110Vdc on the Normal Line using the external power supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | A | Measure 110Vdc between 90XR50.X1/1 (+) and 90XR50.X2/1 (-) (intercar connector).<br>[Normal line] | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | I | Permanent Line Circuit Breaker | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | A | Close Circuit Breaker 15Q4 for battery voltage above 80Vdc and close it(permanent Line) | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | I | 230Vac Circuit Breaker | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | A | Close Circuit Breaker 13Q2 | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10019 | A | Close Circuit Breaker 13Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | I | 230Vac and 400Vac Voltage Supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | A | Apply 400Vac to the Vehicle, either on End1 or End2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | A | Perform a phase rotation measurement on Connector 90XR62 between phases U(X3),V(X2),W(X1) and ensure the rotation is in the correct direction. | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | R | Phase rotation between U,V,W is correct | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | A | Perform a phase rotation measurement on Connector 90XR52 between phases U(X1),V(X2),W(X3) and ensure the rotation is in the correct direction | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | R | Phase rotation between U,V,W is correct | | OK | | Walter Sigudla - 486333 | M3 |
| 10026 | A | Check 230Vac between points L and N of socket -13XT1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10027 | R | 230Vac present | | OK | | Walter Sigudla - 486333 | M3 |
| 10028 | A | Check 230Vac between points L and N of socket -13XT2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10029 | R | 230Vac present | | OK | | Walter Sigudla - 486333 | M3 |
| 10030 | A | Remove connector 57XP1_10 | | OK | | Walter Sigudla - 486333 | M3 |
| 10031 | A | Remove connector 93XP150 | | OK | | Walter Sigudla - 486333 | M3 |
| 10032 | A | Close circuit breaker 34Q1 and 57Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10033 | A | Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 57XP1_10 (10.b1,10a2,10a1) | | OK | | Walter Sigudla - 486333 | M3 |
| 10034 | R | 400Vac +- 5% tolerance is measured between all three phases of 57XP1_10 | | OK | | Walter Sigudla - 486333 | M3 |
| 10035 | A | Check 400Vac +-5% tolerance between Phases (W,V,U) on connector 93XP150 (E2,E3,E1) | | OK | | Walter Sigudla - 486333 | M3 |
| 10036 | R | 400Vac +- 5% tolerance is measured between all three phases on connector 93XP150 | | OK | | Walter Sigudla - 486333 | M3 |
| 10037 | A | Put back connector 57XP1_10 | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10038 | A | Put back connector 93XP150 | | OK | | Walter Sigudla - 486333 | M3 |
| 10039 | A | Switch off the 400Vac power supply from the socket | | OK | | Walter Sigudla - 486333 | M3 |
| 10040 | I | Auxiliary Converters Command | | OK | | Walter Sigudla - 486333 | M3 |
| 10041 | A | Battery Connection Train Lines<br>Measure continuity between<br>END 1 90XR14 pin 30<br>END 2 90XP24 pin 30 | | OK | | Walter Sigudla - 486333 | M3 |
| 10042 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10043 | A | Battery Disconnection Train Lines<br>Measure continuity between<br>END 1 90XR14 pin 31<br>END 2 90XP24 pin 31 | | OK | | Walter Sigudla - 486333 | M3 |
| 10044 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10045 | A | IES StatusTrain Lines<br>Measure continuity between<br>END 1 90XR15 pin 61<br>END 2 90XP25 pin 61 and<br>END 1 90XR15 pin 62<br>END 2 90XP25 pin 62 | | OK | | Walter Sigudla - 486333 | M3 |
| 10046 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |

# Section 3 – TCMS Network

## 3.3 Instructions list

### 3.3.1 025_NET-TCMS Network

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

| N° | Type | Instruction | File | Result status | Result value | Operator | Vehicle |
|---|---|---|---|---|---|---|---|
| 10001 | I | TCMS Network (SPP=25) | | OK | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | Vehicle test bench should be configured as TC1:<br>1. TC1 Dataplugs<br>2. MCE switch set to TC1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | A | 110Vdc supply to the Normal Train line is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | Power Supply to the Router Switches | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | I | Power supply to the 25A10 SWITCH ETHERNET (CRS1) | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | A | Close Circuit Breaker 25Q10 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | R | CRS1 25A10 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | I | Power supply to the 25A11 SWITCH ETHERNET (CRS2) | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Close Circuit Breaker 25Q11 | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | CRS2 25A11 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | I | Power supply to the 25A14 ETHERNET REPEATER (TBR) | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Close Circuit Breaker 25Q14 | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | R | TBR 25A14 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | A | Close Circuit Breaker 25Q6 | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10016 | A | Close Circuit Breaker 25Q7 | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | I | Ethernet Loop | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | A | For each CRS, check that the Ethernet Loop LEDs are flashing | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | R | CRS1 has LEDs on ports X3 and X4 flashing | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | R | CRS2 has ONLY LED on port X4 flashing | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | R | Check on the Test Bench DDU that all Router Switches are available on the network | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | I | Power Supply to the BRIOMS | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | I | Power supply to the 25A6 BRIOM 40/10 ETH 6 | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | R | BRIOM 25A6 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | A | Check visually that ground braid is connected to BRIOM. | | OK | | Walter Sigudla - 486333 | M3 |
| 10026 | I | Power supply to the 25A7 BRIOM 40/10 ETH 7 | | OK | | Walter Sigudla - 486333 | M3 |
| 10027 | R | BRIOM 25A7 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10028 | A | Check visually that ground braid is connected to BRIOM | | OK | | Walter Sigudla - 486333 | M3 |

# Section 4 – Cabin Control

## 4.3 Instructions list

### 4.3.1 020_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Train Lines | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Cab Selected On Train - Train Lines<br><br>Measure continuity between<br>END1 90XR14 pin 3<br>END2 90XP24 pin 3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | Cab Active TC1 Train Lines<br><br>Measure continuity between<br>END1 90XR14 pin 4<br>END2 90XP24 pin 4 | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | R | Both pins are continuous. | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | A | Cab Active TC2 Train Lines<br><br>Measure continuity between<br>END1 90XR14 pin 5<br>END2 90XP24 pin 5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Master Key TC1 Train Lines<br><br>Measure continuity between<br>END1 90XR14 pin 17<br>END2 90XP24 pin 17 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |

# Section 5 – Internal Lighting

## 5.3 Instructions list

### 5.3.1 052_LGT-Internal Lighting

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

| N° | Type | Instruction | File | Result status | Result value | Operator | Vehicle |
|---|---|---|---|---|---|---|---|
| 10001 | I | Internal Lighting (SPP=52) | | OK | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial Conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | 110Vdc Normal line is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | I | Cleaning Light Command | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | 110Vdc Permanent Train Line<br><br>Apply 110V on 93XT304_1 pin 4 to simulate permanent supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Close Circuit Breaker 52Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | A | Close Circuit Breaker 52Q4 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Close Circuit Breaker 52Q5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | R | All saloon emergency lights (low intensity) are OFF on all light modules (Left + Right) | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Turn Cleaning Light Switch 52S6 to ON position. | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | All saloon emergency lights (low intensity) are (ON) on all light modules (Left + Right) | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | A | Reset Circuit Breaker 52Q5 (Open and Close) | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Close Circuit Breaker 52Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | A | Close Circuit Breaker 52Q2 | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10015 | R | All saloon emergency lights (low intensity) are ON (on) all light modules (Left + Right) | | OK | | Walter Sigudla - 486333 | M3 |

## Section 6 – PACIS System

### 6.3 Instructions list

### 6.3.1 054_PIS-PACIS System

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

| N° | Type | Instruction | File | Result status | Result value | Operator | Vehicle |
|---|---|---|---|---|---|---|---|
| 10001 | I | PACIS System IO (SPP=054) | | OK | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | 110Vdc Normal line is connected and ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | I | Circuit Breakers | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | Close Circuit Breaker 54Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Close Circuit Breaker 54Q2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | A | Close Circuit Breaker 54Q10 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Close Circuit Breaker 54Q11 | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Close Circuit Breaker 55Q2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Close Circuit Breaker 55Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | All 'Pacis System' circuit breakers are closed | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | I | Power Supply of Router Switches | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | I | Ethernet Switch CRS1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | R | CRS1 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | I | Ethernet Switch CRS2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | R | CRS2 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | I | DPAI-1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | R | DPAI-1 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | I | DPAI-2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | R | DPAI-2 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | I | Lateral Display 'LAT1' | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10022 | R | The PWR (power) LED is ON on the Lateral Display 'LAT1' | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | I | Lateral Display 'LAT2' | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | R | The PWR (power) LED is ON on the Lateral Display 'LAT2' | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | I | Interior Display 'INT1' | | OK | | Walter Sigudla - 486333 | M3 |
| 10026 | R | The PWR (power) LED is ON on the Interior Display 'INT1' | | OK | | Walter Sigudla - 486333 | M3 |
| 10027 | I | Interior Display 'INT2' | | OK | | Walter Sigudla - 486333 | M3 |
| 10028 | R | The PWR (power) LED is ON on the Interior Display 'INT2' is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10029 | I | Impedance of Loudspeaker | | OK | | Walter Sigudla - 486333 | M3 |
| 10030 | I | Saloon Speakers Commanded by DPAI-1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10031 | A | Measure the impedance connector '54XP1_X4' between pins:z32(+) and z30 (-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10032 | R | Impedance<br>Result Max : x <= 32.00 (Ohm) | | OK | 30.9 | Walter Sigudla - 486333 | M3 |
| 10033 | I | Saloon Speakers Commanded by DPAI-2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10034 | A | Measure the impedance connector '54XP2_X4' between pins:z32(+) and z30 (-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10035 | R | Impedance<br>Result Max : x <= 32.00 (Ohm) | | OK | 30.7 | Walter Sigudla - 486333 | M3 |

# Section 7 – Train Ground Communication

## 7.3 Instructions list

### 7.3.1 062_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | A | ERTMS Bypass Train Lines<br><br>Check continuity between<br>END1 90XR14 pin 11<br>END2 90XP24 pin 11 | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | A | Emergency Brake ERTMS 1 Train Lines<br><br>Check continuity between<br>END1 90XR14 pin 18<br>END2 90XP24 pin 18 | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | I | Emergency Brake ERTMS 2 Train Lines<br><br>Check continuity between<br>END1 90XR14 pin 20<br>END2 90XP24 pin 20 | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | R | Both pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | I | Eurobalise Antenna Cable | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Check continuity between [Intercar(LOCAL: +END1; Connector - 90XR10) and Intercar (LOCAL:+END2; connector -90XP20)] according to the image below |  | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10010 | R | Eurobalise Antenna cable is correctly configured | | OK | | Walter Sigudla - 486333 | M3 |

# Section 8 – Rescue Mode and Emergency Disconnection

## 8.3 Instructions list

### 8.3.1 027_ERM-Rescue Mode and Emergency Disconnection

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

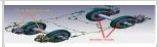
| N° | Type | Instruction | File | Result status | Result value | Operator | Vehicle |
|---|---|---|---|---|---|---|---|
| 10001 | I | Rescue Mode and Emergency Disconnection (SPP=027) | | OK | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Backup Mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Backup Mode Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 23<br>END2 90XP25 pin 23 and<br>27K1 A1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | R | All points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | Check continuity between 27K1 A2 and Ground | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | R | The points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | I | Emergency Disconnection | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Emergency Disconnection Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 24<br>END2 90XP25 pin 24 | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | R | All points are continuous | | OK | | Walter Sigudla - 486333 | M3 |

# Section 9 – Emergency Brake

## 9.3 Instructions list

### 9.3.1 044_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial Conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | No PEAs are activated | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | I | 110Vdc Normal power supply should be connected to the vehicle and ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | Visual Inspection | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Physically and visually inspect all the Disk Break Units (DBU) and brake pads, to ensure they are securely fitted |  | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | R | All the brake DBUs are correctly installed and all the brake pads are correctly installed and locked | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Check the pipe installation | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | R | All the pipes are installed on the vehicle | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Check all the Passenger Emergency Alarm handles, and ensure they are connected to their respective connectors | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | All the PEAs are installed and connected | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | I | Train Lines | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Emergency Brake Loop Train Lines<br><br>Check continuity between<br>END1 90XR24 pin 8<br>END2 90XP34 pin 8 | | OK | | Walter Sigudla - 486333 | M3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10014 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | A | Emergency Brake Loop Override Train Lines<br><br>Check continuity between<br>END1 90XR24 pin 9<br>END2 90XP34 pin 9 | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | I | Emergency Brake Train Line<br><br>Check continuity between<br>END1 90XR25 pin 67<br>END2 90XP35 pin 67 | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | A | PEA Loop OTDR Train Lines<br><br>Check continuity between<br>END1 90XR24 pin 10<br>END2 90XP34 pin 10 | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | A | PEA Loop Train Lines<br><br>Check continuity between<br>END1 90XR25 pin 95<br>END2 90XP35 pin95 | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | A | PEA Reset<br>Check continuity on Timer Relay 44D1 between points A1 and B1.<br><br>Check continuity on Timer Relay 44D1 between points A4, B3 and C4 | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | R | The Points are continuous. | | OK | | Walter Sigudla - 486333 | M3 |

# Section 10 – Service Brake

## 10.3 Instructions list

### 10.3.1 040_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial Conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | I | No air supply to the vehicle | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | I | All brake panel cocks are in normal position (not isolated) | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | 110Vdc Normal power supply should be connected to the vehicle and ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | I | Follow the procedure in the document below to upload software onto the TBCU electronic | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | I | Power Supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Remove the connector 10XR12_XCB2 from the propulsion box | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Close Circuit Breaker 33Q1, 33Q3 and 33Q5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Check the voltage on connector 10XR12_XCB2 between pins 4 (+) and 69 (-) ; 4(+) and 67(-); and 5(+) and 68(-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | Battery Voltage (above 80Vdc) is measured on connector 10XR12_XCB2 between pins 4 (+) and 69 (-) ; 4(+) and 67(-); and 5(+) and 68(-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | A | Open Circuit Breaker 33Q1 and 33Q3, Replace connector 10XR12_XCB2 on the propulsion box, and Close Circuit breaker 33Q1 and 33Q3 | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| 10013 | A | Remove the connector -40XP2__C2__16 from pneumatic brake panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | A | Close Circuit Breaker 40Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | A | Check the voltage on connector 40XP2__C2__16 between pins 13 (+) and 31 (-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | R | Battery Voltage (above 80Vdc) is measured on connector 40XP2__C2__16 between pins 13 (+) and 31 (-) | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | A | Open Circuit Breaker 40Q1, Replace connector -40XP2__C2__16 on the pneumatic brake panel, and Close Circuit breaker -40Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | R | The pneumatic brake panel 40A2 is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | I | Train Lines | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | A | EB Reduced Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 60<br>END2 90XP25 pin 60 | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | A | Brake Applied Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 50<br>END2 90XP25 pin 50 | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | A | Remote Isolation Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 59<br>END2 90XP25 pin 59 | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |

## Section 11 – Holding and Parking Brake

### 11.3 Instructions list

### 11.3.1 045_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Initial Conditions | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Using the tools list on the side of your screen, record the serial number of the manometer that will be used during this test | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | A | Check that the pressure on Test point C2.11/1 is >5bar | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | Visual Inspection | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Check the installation of the manual parking brake release components (lever + cable) | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | R | The lever is securely fixed (tight) and the cable is correctly attached to the bogie (there is no excess cable and all clamps are installed) | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | I | Circuit Breaker | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Close Circuit Breaker 33Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | Close Circuit Breaker 33Q5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | I | Parking Brake Pressure Switch | | OK | | Mlungisi Madela - 529927 | M3 |
| 10012 | R | Read Defined Variable [TT] (TBCU3)LI_PARK_BR_RELEASE = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10013 | R | Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10014 | R | Read Defined Variable [TT] (MPU1)tbcu3_parkbrakerelease = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10015 | R | Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10016 | A | Parking Brake Applied Train Lines<br><br>Check continuity between END1 90XR15 pin 77 | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| | | END2 90XP25 pin 77 | | | | | |
| 10017 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | A | Remote Parking Command Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 68<br>END2 90XP25 pin 68 | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | I | Parking Brake Applied | | OK | | Mlungisi Madela - 529927 | M3 |
| 10021 | I | For this section of the test, ensure that the pressure on test point C2.11/1 is ALWAYS BELOW 4.8 Bar. if it goes above, turn the Isolation cock C2.3.2 to CLOSE position to drain the air | | OK | | Mlungisi Madela - 529927 | M3 |
| 10022 | A | Position the Isolation cock C2.3.2 in CLOSE position. Allow the parking brake air pressure to drain to below 4.5 Bar. Use the test point C2.11/1 to verify the air pressure <4.5 Bar | | OK | | Mlungisi Madela - 529927 | M3 |
| 10023 | R | Pressure at test point C2.11/1 <4.5 Bar | | OK | | Mlungisi Madela - 529927 | M3 |
| 10024 | R | Read Defined Variable [TT] (TBCU3)LI_PARK_BR_RELEASE = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10025 | R | Read Defined Variable [TT] (MPU1)tbcu3_parkbrakerelease = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10026 | A | Return the Isolation cock C2.3.2 to OPEN position | | OK | | Mlungisi Madela - 529927 | M3 |
| 10027 | R | Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10028 | R | Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10029 | R | Read Defined Variable [TT] (TBCU3)LI_PARK_BR_DC = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10030 | R | Read Defined Variable [TT] (MPU1)tbcu3_parkbrakeisoldc = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10031 | R | Read Defined Variable [TT] (MPU1)li_pbk_m3parkbrakeisol = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10032 | A | Position the Isolation cock C2.3.2 in CLOSE position | | OK | | Mlungisi Madela - 529927 | M3 |

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|---|---|---|---|---|---|---|---|
| 10033 | R | Read Defined Variable [TT] (MPU1)li_pbk_m3parkbrakeisol = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10034 | R | Read Defined Variable [TT] (TBCU3)LI_BRAKE_STAT = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10035 | R | Read Defined Variable [TT] (MPU1)tbcu3_li_pbrake_stat = 0.0 | | OK | 0 | Mlungisi Madela - 529927 | M3 |
| 10036 | R | Read Defined Variable [TT] (TBCU3)LI_PARK_BR_DC = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10037 | R | Read Defined Variable [TT] (MPU1)tbcu3_parkbrakeisoldc = 1.0 | | OK | 1 | Mlungisi Madela - 529927 | M3 |
| 10038 | A | Return the Isolation cock C2.3.2 to OPEN position | | OK | | Mlungisi Madela - 529927 | M3 |

## Section 12 – Air Condition

### 12.3 Instructions list

### 12.3.1 057_HVA-HVAC Air Condition

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) | | OK | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Power Supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Close Circuit Breaker 57Q2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | A | Remove Connector 57XP1_5 from HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | Force [TT] (MPU1)lo_hva_m3hvacinhibr1___1 = 0.00 | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | A | Force [TT] (MPU1)lo_hva_m3hvacinhibr2___1 = 0.00 | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | R | Check battery voltage (above 80Vdc) between points 11 and 9 of the connector 57XP1_5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Force [TT] (MPU1)lo_hva_m3hvacinhibr2___1 = 1.00 | | OK | | Sicelo Mtolo - 525130 | M3 |
| 10009 | R | Check 0Vdc between points 11 and 9 of the connector 57XP1_5 | | OK | | Sicelo Mtolo - 525130 | M3 |
| 10010 | A | Force [TT] (MPU1)lo_hva_m3hvacinhibr1___1 = 1.00 | | OK | | Walter Sigudla - 486333 | M3 |
| 10011 | R | Check 0Vdc between points 11 and 9 of the connector 57XP1_5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10012 | R | Check 0Vdc between points 10 and 9 of the connector 57XP1_5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Force [TT] (MPU1)lo_hva_m3hvacinhibr2___1 = 0.00 | | OK | | Walter Sigudla - 486333 | M3 |
| 10014 | A | Force [TT] (MPU1)lo_hva_m3emergventil___1 = 1.00 | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| 10015 | R | Check 0Vdc between points 11 and 9 of the connector 57XP1_5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | R | Check battery voltage (above 80Vdc) between points 10 and 9 of the connector 57XP1_5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | A | Release [TT] (MPU1)Io_hva_m3emergventil___1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | A | Release [TT] (MPU1)Io_hva_m3hvacinhibr1___1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | A | Release [TT] (MPU1)Io_hva_m3hvacinhibr2___1 | | OK | | Sicelo Mtolo - 525130 | M3 |
| 10020 | A | Put back the connector 57XP1_5 on the HVAC panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | I | HVAC Electronic Power Supply | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | A | Close Circuit Breaker F1 on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | A | Turn the control switch to AUTO position on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | R | The HVAC electronic is ON | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | A | Open Circuit Breaker F1 on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10026 | R | The HVAC electronic is OFF | | OK | | Walter Sigudla - 486333 | M3 |
| 10027 | A | Close Circuit Breaker F1 on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10028 | I | Software Upload | | OK | | Walter Sigudla - 486333 | M3 |
| 10029 | I | Follow the procedure in the document below to upload software onto the HVAC electronic |  | OK | | Walter Sigudla - 486333 | M3 |
| 10030 | A | |  | OK | | Walter Sigudla - 486333 | M3 |
| 10031 | I | Sensor Grade | | OK | | Walter Sigudla - 486333 | M3 |
| 10032 | I | Each temperature sensor has calibrated grade information. The sensor must be setup with this information. | | OK | | Walter Sigudla - 486333 | M3 |
| 10033 | A | The label with sensor grade information is found inside the HVAC frame, near the filter. Inside the train, open the ceiling | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| | | filter access, rotate a damper and read the label. | | | | | |
| 10034 | R | Sensor grade for HVAC Return Air (RAS) is : | | OK | 4 | Walter Sigudla - 486333 | M3 |
| 10035 | R | Sensor grade for HVAC Duct Air (DAS) is : | | OK | 4 | Walter Sigudla - 486333 | M3 |
| 10036 | R | Sensor grade for HVAC Fresh Air (FAS) is : | | OK | 4 | Sicelo Mtolo - 525130 | M3 |
| 10037 | R | Sensor grade for HVAC Duct Air 2 (DAS2) is : | | OK | 3 | Sicelo Mtolo - 525130 | M3 |
| 10038 | A | In the maintenance software, select the "Application settings" page and click the "Sensors" tab | | OK | | Walter Sigudla - 486333 | M3 |
| 10039 | A | Enter the data found on the label for each grade. Then, click "Save settings" |  | OK | | Walter Sigudla - 486333 | M3 |
| 10040 | A | Open Circuit Breaker F1 on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10041 | I | Checking 400Vac | | OK | | Walter Sigudla - 486333 | M3 |
| 10042 | A | Ensure that the 400Vac Shore Supply is connected to the vehicle, else connect it | | OK | | Walter Sigudla - 486333 | M3 |
| 10043 | A | Close Circuit Breaker 57Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10044 | A | Measure 400Vac (+-5%) in the Terminal Block next to the connector '57XP1_10.A / '57XP1_10.B' on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10045 | R | 400Vac (+-5%) measured | | OK | | Walter Sigudla - 486333 | M3 |
| 10046 | A | On the HVAC Panel check 400Vac (+-5%) between points L1- Phase R, L2- Phase S, L3- Phase T | | OK | | Walter Sigudla - 486333 | M3 |
| 10047 | A | On the HVAC Panel, with a phasemeter, check the correct Phase Rotation between points L1- Phase R, L2- Phase S and L3- Phase T. | | OK | | Walter Sigudla - 486333 | M3 |
| 10048 | R | 400Vac (+-5%) is measured between each of the phases | | OK | | Walter Sigudla - 486333 | M3 |
| 10049 | R | The phase rotation is correct between all three phases | | OK | | Walter Sigudla - 486333 | M3 |
| 10050 | I | Using the tools list on the side of your screen, log the details of the phasemeter | | OK | | Walter Sigudla - 486333 | M3 |

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| | | used | | | | | |
| 10051 | I | Saloon HVAC | | OK | | Walter Sigudla - 486333 | M3 |
| 10052 | A | To force any mode on HVAC, please follow the manual to open the communication channel with the HVAC. Connection should be through the HVAC Electronic Device in the HC cubicle | | OK | | Walter Sigudla - 486333 | M3 |
| 10053 | A | Close Circuit Breaker F1 on the HVAC Panel | | OK | | Walter Sigudla - 486333 | M3 |
| 10054 | R | HVAC unit turns ON and starts to work | | OK | | Walter Sigudla - 486333 | M3 |
| 10055 | I | Reconnect the laptop to the HVAC maintenance software using HCU Finder | | OK | | Walter Sigudla - 486333 | M3 |
| 10056 | R | The Exhaust fans are Turned Off (Confirm on Forced tab that Actual exhauster speed is OFF) |  | OK | | Walter Sigudla - 486333 | M3 |
| 10057 | I | Forced Mode (Saloon HVAC) | | OK | | Walter Sigudla - 486333 | M3 |
| 10058 | I | For the next sections, walk through the whole car and physically check (feel) that the HVAC is functioning as desired | | OK | | Walter Sigudla - 486333 | M3 |
| 10059 | I | In the maintenance software, select the 'Forced' tab, and use the "Required working mode" drop down box to force the following modes: | | OK | | Walter Sigudla - 486333 | M3 |
| 10060 | I | Ventilation Mode |  | OK | | Walter Sigudla - 486333 | M3 |
| 10061 | A | Force Ventilation mode on the Saloon HVAC | | OK | | Walter Sigudla - 486333 | M3 |
| 10062 | R | All saloon HVAC units work in Ventilation mode. Not heating/cooling | | OK | | Walter Sigudla - 486333 | M3 |
| 10063 | R | The Exhaust fans are Turned OFF | | OK | | Walter Sigudla - 486333 | M3 |
| 10064 | I | Cooling Mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10065 | A | Force Cooling mode on the Saloon HVAC | | OK | | Walter Sigudla - 486333 | M3 |
| 10066 | R | All saloon HVAC units work in Cooling mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10067 | R | The Exhaust fans are Turned OFF | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| 10068 | I | Heating Mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10069 | A | Force Heating mode on the Saloon HVAC | | OK | | Walter Sigudla - 486333 | M3 |
| 10070 | R | All saloon HVAC units work in Heating mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10071 | R | The Exhaust fans are Turned OFF | | OK | | Walter Sigudla - 486333 | M3 |
| 10072 | I | Automatic Mode | | OK | | Walter Sigudla - 486333 | M3 |
| 10073 | A | Force Self-Test on the Saloon HVAC | | OK | | Walter Sigudla - 486333 | M3 |
| 10074 | R | All saloon HVAC units work according to the mode described in the "Actual working mode" | | OK | | Walter Sigudla - 486333 | M3 |
| 10075 | R | The Exhaust fans are Turned OFF | | OK | | Walter Sigudla - 486333 | M3 |
| 10076 | I | HVAC Faults | | OK | | Walter Sigudla - 486333 | M3 |
| 10077 | A | Open Circuit Breaker 57Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10078 | R | All saloon HVAC units STOP working | | OK | | Walter Sigudla - 486333 | M3 |
| 10079 | A | Close Circuit Breaker 57Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10080 | R | All saloon HVAC units START working | | OK | | Walter Sigudla - 486333 | M3 |
| 10081 | A | In the maintenance software, select the "Alarms / Warnings" tab |  | OK | | Walter Sigudla - 486333 | M3 |
| 10082 | A | Ensure there are no active faults on the HVAC | | OK | | Sicelo Mtolo - 525130 | M3 |
| 10083 | R | No active faults identified on the HVAC unit | | OK | | Sicelo Mtolo - 525130 | M3 |

# Section 13 – Fire Protection

## 13.3 Instructions list

### 13.3.1 067_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Fire Detection Train Lines | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Fire Detection Train Lines<br><br>Check continuity between<br>END1 90XR14 pin 21<br>END2 90XP24 pin 21 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | I | Continuity Test | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | I | The following steps are continuity tests between the two points described in each step. Use a multimeter for this test. | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | A | From : [(local: +END1 -90XR13.B (pin 4))] to: [ -Inter-connector (local: +END2 -90XP23.b pin 4)] | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | From : [(local: +END1 -90XR13.B (pin 5))] to: [ -Inter-connector (local: +END2 -90XP23.b pin 5)] | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | From : [(local: +END1 -90XR13.A (pin 7))] to: [ -Inter-connector (local: +END2 -90XP23.a pin 7)] | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | A | From : [(local: +END1 -90XR13.A (pin 8))] to: [ -Inter-connector (local: +END2 -90XP23.a pin 8)] | | OK | | Walter Sigudla - 486333 | M3 |

# Section 14 – Traction and Electric Brake

## 14.3 Instructions list

### 14.3.1 033_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 | | Walter Sigudla - 486333 | M3 |
| 10002 | I | Circuit Breakers and Configuration | | OK | | Walter Sigudla - 486333 | M3 |
| 10003 | A | Close Circuit Breaker 33Q2 | | OK | | Walter Sigudla - 486333 | M3 |
| 10004 | A | Close Circuit Breaker 33Q4 | | OK | | Walter Sigudla - 486333 | M3 |
| 10005 | A | Close Circuit Breaker 33Q5 | | OK | | Walter Sigudla - 486333 | M3 |
| 10006 | I | Circuit Breaker 33Q1 and 33Q3 must be Opened | | OK | | Walter Sigudla - 486333 | M3 |
| 10007 | I | 110Vdc Normal Traction EL Train Line<br><br>Apply bridge piece between<br>END2 90XP25 pin 14 and pin 42 | | OK | | Walter Sigudla - 486333 | M3 |
| 10008 | A | Close Circuit Breaker 33Q1 | | OK | | Walter Sigudla - 486333 | M3 |
| 10009 | A | Close Circuit Breaker 33Q3 | | OK | | Walter Sigudla - 486333 | M3 |
| 10010 | R | Read Defined Variable [TT]<br>(TBCU3)LI_CAR_ID3 = 1.00 | | OK | 1 | Mphato Mphahlele - 480716 | M3 |
| 10011 | I | The TBCU should appear on TCMS network on DDU screen | | OK | | Mlungisi Madela - 529927 | M3 |
| 10012 | I | Train Lines | | OK | | Walter Sigudla - 486333 | M3 |
| 10013 | A | Forward Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 25<br>END2 90XP25 pin 25 | | OK | | Walter Sigudla - 486333 | M3 |

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|---|---|---|---|---|---|---|---|
| 10014 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10015 | A | Reverse Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 30<br>END2 90XP25 pin 30 | | OK | | Walter Sigudla - 486333 | M3 |
| 10016 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10017 | A | Traction Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 31<br>END2 90XP25 pin 31 | | OK | | Walter Sigudla - 486333 | M3 |
| 10018 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10019 | A | No Brake Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 32<br>END2 90XP25 pin 32 | | OK | | Walter Sigudla - 486333 | M3 |
| 10020 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10021 | A | Traction Interlock Bypass Train Lines<br><br>Check continuity between<br>END1 90XR14 pin 6<br>END2 90XP24 pin 6 | | OK | | Walter Sigudla - 486333 | M3 |
| 10022 | R | Both points are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10023 | A | Traction Interlock Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 41<br>END2 90XP25 pin 41 and<br>-10XP12_XCB2 pin 8 | | OK | | Walter Sigudla - 486333 | M3 |
| 10024 | R | All pins are continuous | | OK | | Walter Sigudla - 486333 | M3 |
| 10025 | I | 110Vdc Normal Traction EL Train Line<br><br>Remove bridge peice on<br>END2 90XP25 pin 49 and pin 42 | | OK | | Walter Sigudla - 486333 | M3 |
| 10026 | I | Coolant Liquid | | OK | | Walter Sigudla - 486333 | M3 |
| 10027 | A | Check that the coolant level is atleast 1/2 of the sight glass level indicator | ☒ | OK | | Walter Sigudla - 486333 | M3 |
| 10028 | R | Coolant Liquid Level is OK | | OK | | Walter Sigudla - 486333 | M3 |

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| 10029 | I | End of Test | | OK | | Walter Sigudla - 486333 | M3 |

## Section 15 – Passenger Doors

### 15.3 Instructions list

### 15.3.1 050_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 | | Philemon Milani - 484650 | M3 |
| 10002 | I | Initial conditions | | OK | | Philemon Milani - 484650 | M3 |
| 10003 | I | 110Vdc Normal power supply is connected to the vehicle and ON | | OK | | Philemon Milani - 484650 | M3 |
| 10004 | I | Circuit Breaker | | OK | | Philemon Milani - 484650 | M3 |
| 10005 | A | Close Circuit Breaker 50Q1 | | OK | | Philemon Milani - 484650 | M3 |
| 10006 | R | DCU 1 is powered ON | | OK | | Philemon Milani - 484650 | M3 |
| 10007 | R | Check on the DDU that DCU1 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10008 | A | Close Circuit Breaker 50Q2 | | OK | | Philemon Milani - 484650 | M3 |
| 10009 | R | DCU 2 is powered ON | | OK | | Philemon Milani - 484650 | M3 |
| 10010 | R | Check on the DDU that DCU2 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10011 | A | Close Circuit Breaker 50Q3 | | OK | | Philemon Milani - 484650 | M3 |
| 10012 | R | DCU 3 is powered ON | | OK | | Philemon Milani - 484650 | M3 |
| 10013 | R | Check on the DDU that DCU3 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10014 | A | Close Circuit Breaker 50Q4 | | OK | | Philemon Milani - 484650 | M3 |
| 10015 | R | DCU 4 is powered ON | | OK | | Philemon Milani - 484650 | M3 |
| 10016 | R | Check on the DDU that DCU4 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10017 | A | Close Circuit Breaker 50Q5 | | OK | | Philemon Milani - 484650 | M3 |
| 10018 | R | DCU 5 is powered ON | | OK | | Philemon Milani - 484650 | M3 |
| 10019 | R | Check on the DDU that DCU5 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10020 | A | Close Circuit Breaker 50Q6 | | OK | | Philemon Milani - 484650 | M3 |
| 10021 | R | DCU 6 is powered ON | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| 10022 | R | Check on the DDU that DCU6 is online | | OK | | Philemon Milani - 484650 | M3 |
| 10023 | A | Close Circuit Breaker 50Q7 | | OK | | Philemon Milani - 484650 | M3 |
| 10024 | I | Car ID Code | | OK | | Philemon Milani - 484650 | M3 |
| 10025 | A | Using the DDU on the test bench, check that all the doors on M4 are available - as in the picture below |  | OK | | Philemon Milani - 484650 | M3 |
| 10026 | R | All doors are available | | OK | | Philemon Milani - 484650 | M3 |
| 10027 | I | Train Lines and Safety Loop | | OK | | Philemon Milani - 484650 | M3 |
| 10028 | A | ERTMS Auth Left Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 44<br>END2 90XP25 pin 44 | | OK | | Philemon Milani - 484650 | M3 |
| 10029 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10030 | A | ERTMS Auth Right Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 47<br>END2 90XP25 pin 47 | | OK | | Philemon Milani - 484650 | M3 |
| 10031 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10032 | A | Doors Open Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 66<br>END2 90XP25 pin 66 | | OK | | Philemon Milani - 484650 | M3 |
| 10033 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10034 | A | Door Close Right Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 78<br>END2 90XP25 pin 78 | | OK | | Philemon Milani - 484650 | M3 |
| 10035 | A | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10036 | A | Door Close Left Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 79<br>END2 90XP25 pin 79 | | OK | | Philemon Milani - 484650 | M3 |
| 10037 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| 10038 | A | Door Auth Left Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 85<br>END2 90XP25 pin 85 | | OK | | Philemon Milani - 484650 | M3 |
| 10039 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10040 | A | Door Auth Right Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 84<br>END2 90XP25 pin 84 | | OK | | Philemon Milani - 484650 | M3 |
| 10041 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10042 | A | V<3km/h Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 29<br>END2 90XP25 pin 29 | | OK | | Philemon Milani - 484650 | M3 |
| 10043 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10044 | A | Door Auth Left Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 85<br>END2 90XP25 pin 85 | | OK | | Philemon Milani - 484650 | M3 |
| 10045 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10046 | A | Door Auth Right Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 84<br>END2 90XP25 pin 84 | | OK | | Philemon Milani - 484650 | M3 |
| 10047 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10048 | A | Safety Doors Loop Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 96<br>END2 90XP25 pin 96 | | OK | | Philemon Milani - 484650 | M3 |
| 10049 | R | Both points are continuous | | OK | | Philemon Milani - 484650 | M3 |
| 10050 | I | Left Side Doors | | OK | | Philemon Milani - 484650 | M3 |
| 10051 | I | Door 1 | | OK | | Philemon Milani - 484650 | M3 |
| 10052 | I | Use bridge pieces to apply voltage on the passenger door mechanism to simulate the following signals:<br>- Door Auth Left | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| | | - Door Open Left<br>- V<3km/h | | | | | |
| 10053 | A | Apply bridge pieces on 50XP1_X11 between slot 2,3,4 and 15 | | OK | | Philemon Milani - 484650 | M3 |
| 10054 | A | Force [TT] (MPU1)lo_dor_m3opendoorleft = 1.00 | | OK | | Philemon Milani - 484650 | M3 |
| 10055 | R | Check that the door opens in 3 sec (+1/-0) | | OK | | Philemon Milani - 484650 | M3 |
| 10056 | R | Check that the GREEN LED on both sides of the door blink while the door opens [Safety Request: Prasa8-05] | | OK | | Philemon Milani - 484650 | M3 |
| 10057 | I | Door Opening Gap | | OK | | Philemon Milani - 484650 | M3 |
| 10058 | A | Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10059 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1395 | Philemon Milani - 484650 | M3 |
| 10060 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10061 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1406 | Philemon Milani - 484650 | M3 |
| 10062 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10063 | R | Door 1 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1400 | Philemon Milani - 484650 | M3 |
| 10064 | I | Door 3 | | OK | | Philemon Milani - 484650 | M3 |
| 10065 | A | Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10066 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1396 | Philemon Milani - 484650 | M3 |
| 10067 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10068 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1407 | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| 10069 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10070 | R | Door 3 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1401 | Philemon Milani - 484650 | M3 |
| 10071 | I | Door 5 | | OK | | Philemon Milani - 484650 | M3 |
| 10072 | I | Door Opening Gap | | OK | | Philemon Milani - 484650 | M3 |
| 10073 | A | Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10074 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1393 | Philemon Milani - 484650 | M3 |
| 10075 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10076 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1405 | Philemon Milani - 484650 | M3 |
| 10077 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10078 | R | Door 5 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1399 | Philemon Milani - 484650 | M3 |
| 10079 | I | Right Side Doors | | OK | | Philemon Milani - 484650 | M3 |
| 10080 | I | Door 2 | | OK | | Philemon Milani - 484650 | M3 |
| 10081 | A | Use bridge pieces to apply voltage on the passenger door mechanism to simulate the following signals:<br>- Door Auth Right<br>- Door Open Right<br>- V<3km/h | | OK | | Philemon Milani - 484650 | M3 |
| 10082 | A | Apply bridge pieces on 50XP2_X11 between slot 2,3,4 and 15 | | OK | | Philemon Milani - 484650 | M3 |
| 10083 | A | Force [TT] (MPU1)lo_dor_m3opendoorright = 1.00 | | OK | | Philemon Milani - 484650 | M3 |
| 10084 | R | Check that the door opens in 3 sec (+1/-0) | | OK | | Philemon Milani - 484650 | M3 |
| 10085 | R | Check that the GREEN LED on both sides of the door blink while the door opens. [Safety Request: Prasa8-05] | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| 10086 | I | Door Opening Gap | | OK | | Philemon Milani - 484650 | M3 |
| 10087 | A | Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door). | | OK | | Philemon Milani - 484650 | M3 |
| 10088 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1396 | Philemon Milani - 484650 | M3 |
| 10089 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10090 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1407 | Philemon Milani - 484650 | M3 |
| 10091 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10092 | R | Door 2 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1401 | Philemon Milani - 484650 | M3 |
| 10093 | I | Door 4 | | OK | | Philemon Milani - 484650 | M3 |
| 10094 | I | Door Opening Gap | | OK | | Philemon Milani - 484650 | M3 |
| 10095 | A | Measure the opening gap of the door. (This measurement must be done at the BOTTOM of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10096 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1394 | Philemon Milani - 484650 | M3 |
| 10097 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10098 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1406 | Philemon Milani - 484650 | M3 |
| 10099 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10100 | R | Door 4 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1400 | Philemon Milani - 484650 | M3 |
| 10101 | I | Door 6 | | OK | | Philemon Milani - 484650 | M3 |
| 10102 | I | Door Opening Gap | | OK | | Philemon Milani - 484650 | M3 |
| 10103 | A | Measure the opening gap of the door. (This measurement must be done at the | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| | | BOTTOM of the door) | | | | | |
| 10104 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1394 | Philemon Milani - 484650 | M3 |
| 10105 | A | Measure the opening gap of the door. (This measurement must be done at the top of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10106 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1405 | Philemon Milani - 484650 | M3 |
| 10107 | A | Measure the opening gap of the door. (This measurement must be done in the middle of the door) | | OK | | Philemon Milani - 484650 | M3 |
| 10108 | R | Door 6 gap<br>Result Min/Max : 1390<= x <= 1410 (mm) | | OK | 1400 | Philemon Milani - 484650 | M3 |
| 10109 | I | Obstacle Detection | | OK | | Philemon Milani - 484650 | M3 |
| 10110 | A | Position an obstacle on the floor in the centre of the door closing line for all the doors | | OK | | Philemon Milani - 484650 | M3 |
| 10111 | A | Remove the bridge piece on 50XP1_X11 pin 2 | | OK | | Philemon Milani - 484650 | M3 |
| 10112 | A | Remove the bridge piece on 50XP2_X11 pin 2 | | OK | | Philemon Milani - 484650 | M3 |
| 10113 | R | The doors will hit the obstacle, reopen and try to close again 3 times.<br>On the third attempt it will stop and stand ajar - free to be opened manually | | OK | | Philemon Milani - 484650 | M3 |
| 10114 | A | Safety Doors Loop Train Lines<br><br>Check continuity between<br>END1 90XR15 pin 96<br>END2 90XP25 pin 96 | | OK | | Philemon Milani - 484650 | M3 |
| 10115 | R | There is no continuity between the two points | | OK | | Philemon Milani - 484650 | M3 |
| 10116 | A | Put back the bridge piece on 50XP1_X11 pin 2 | | OK | | Philemon Milani - 484650 | M3 |
| 10117 | A | Put back the bridge piece on 50XP2_X11 pin 2 | | OK | | Philemon Milani - 484650 | M3 |
| 10118 | R | The door opens fully | | OK | | Philemon Milani - 484650 | M3 |
| 10119 | A | Remove the obstacle | | OK | | Philemon Milani - 484650 | M3 |

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|---|---|---|---|---|---|---|---|
| 10120 | A | Release [TT] (MPU1)lo_dor_m3opendoorleft | | OK | | Philemon Milani - 484650 | M3 |
| 10121 | A | Release [TT] (MPU1)lo_dor_m3opendoorright | | OK | | Philemon Milani - 484650 | M3 |
| 10122 | A | Remove the bridge pieces on connector 50XP1_X11 | | OK | | Philemon Milani - 484650 | M3 |
| 10123 | A | Remove the bridge pieces on connector 50XP2_X11 | | OK | | Philemon Milani - 484650 | M3 |

# Section 16 – Vehicle Normalization

## 16.3 Instructions list

### 16.3.1 093_NORM-Vehicle Normalization

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

| N° | Type | Instruction | File | Result status | Result value | Operator | Vehicle |
|---|---|---|---|---|---|---|---|
| 10001 | R | On LV3 all Connectors are tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10002 | I | Initial Conditions | | OK | | Mlungisi Madela - 529927 | M3 |
| 10003 | I | This inspection must be performed by the EPU/Acting EPU Manager on shift | | OK | | Mlungisi Madela - 529927 | M3 |
| 10004 | I | The VFT procedures are all completed | | OK | | Mlungisi Madela - 529927 | M3 |
| 10005 | I | Vehicle Normalization Check | | OK | | Mlungisi Madela - 529927 | M3 |
| 10006 | R | On LV3 all Circuit Breakers are installed and secured | | OK | | Mlungisi Madela - 529927 | M3 |
| 10007 | R | On LV3 all Dataplugs are installed, tightened and earth braids are fastened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10008 | R | On LV3 there are no missing components, device, wiring or connectors. | | OK | | Mlungisi Madela - 529927 | M3 |
| 10009 | R | On LV6 all Dataplugs are installed, tightened and earth braids are fastened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10010 | R | On LV6 all Connectors are tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10011 | R | On LV6 there are no missing components, device, wiring or connectors. | | OK | | Mlungisi Madela - 529927 | M3 |
| 10012 | R | On HC Cubicle the Controller is installed and properly tightened and its connectors are tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10013 | R | All DCUs are properly installed and secured | | OK | | Mlungisi Madela - 529927 | M3 |

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|---|---|---|---|---|---|---|---|
| 10014 | R | All Internal Displays are properly installed and secured | | OK | | Mlungisi Madela - 529927 | M3 |
| 10015 | R | All Light Covers are properly installed | | OK | | Mlungisi Madela - 529927 | M3 |
| 10016 | R | All Saloon Fire Detectors are properly installed and secured | | OK | | Mlungisi Madela - 529927 | M3 |
| 10017 | R | All covers are normalised inside the car | | OK | | Mlungisi Madela - 529927 | M3 |
| 10018 | R | On the Underframe, TBCU Agate is installed and properly tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10019 | R | On the Underframe, Speed Sensors are installed and properly tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10020 | R | On the LVB, all Circuit Breakers are installed and properly tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10021 | R | On the LVB, all Relays and Timers are installed and properly tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10022 | R | On the LVB, BRIOMs are installed and properly tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10023 | R | On the LVB there are no missing components, device, wiring or connectors. | | OK | | Mlungisi Madela - 529927 | M3 |
| 10024 | R | On the Underframe, all Connectors are tightened | | OK | | Mlungisi Madela - 529927 | M3 |
| 10025 | R | All underframe covers are normalised | | OK | | Mlungisi Madela - 529927 | M3 |
| 10026 | R | On END1 the Octopus cables are disconnected from the car and properly stored. | | OK | | Mlungisi Madela - 529927 | M3 |
| 10027 | R | On END2 the Octopus cables are disconnected from the car and properly stored. | | OK | | Mlungisi Madela - 529927 | M3 |
| 10028 | R | The Test Bench is switched OFF and the Octopus cables are disconnected and properly stored | | OK | | Mlungisi Madela - 529927 | M3 |
| 10029 | R | ALL P.Os of this car are closed | | OK | | Alleta Sekgololo - 417407 | M3 |
| 10030 | I | End Of Test | | OK | | Alleta Sekgololo - 417407 | M3 |

# Section 17 – Report summaries

## 17.2 Results status

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

## 17.3 Tools used

| Function | Tool name | Tool number | Next Calibration date |
|---|---|---|---|
| 015_NRG | Phasemeter | Phasemeter | 8/25/2024 |
| 054_PIS | Multimeter | Multimeter 2 | 8/23/2024 |
| 062_ETS | Multimeter | Multimeter 2 | 8/23/2024 |
| 067_FSD | Multimeter | Multimeter 2 | 8/23/2024 |

| Vehicle | Equipment | Expected version | Version loaded |
|---|---|---|---|
| M3 | | | |