Technical Software Specifications - SPS TestManager

Automotive software package 12V - 24V v1.2

The software package includes tests for electrical and electronic components in motor vehicles.
TestManager version SPS TestManager v2.19 or higher is required.
The required hardware can also be seen in the hardware matrix.
(Not all tests from each standard are supported)

List of standards and tests supported by the SPS TestManager software:

BMW GS 95003-2

2010-01

- 5.2.1.1 Testing for immunity to 18 V transient
- 5.2.1.2b Component immunity to ripple on power supply leads
- 5.2.1.3 Decreasing / increasing of operating voltage
- 5.2.1.4 Ground offset
- 5.2.1.5 Cranking profile
- 5.2.1.6 Very brief voltage dip
- 5.2.1.7 Brief voltage dip
- 5.2.1.7.1 Brief off / on for bus nodes
- 5.2.1.9 Voltage impulse due to switch-off of loads
- 5.3.1 Quick chargers / jump start
- 5.3.2 Load dump impulses
- 5.3.3 Protection against polarity reversal
- 5.3.5 Short-circuit strength

BMW GS 95024-2

- 2021-03
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow decrease and increase of the supply voltage
  - E-08 Slow decrease, quick increase of the supply voltage
  - E-09 Reset
  - E-10 Short interruptions
  - E-11 Start pulses
  - E-12 Voltage curve with electric system control
  - E-13 Pin interruption
  - E-14 Connector interruption
  - E-15 Reverse polarity
  - E-16 Ground offset
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Closed-circuit current
  - E-21 Backfeeds
  - E-23 Equalizing current of multiple supply voltages
  - E-40 Very brief voltage drop
  - E-41 Brief off on for bus nodes
  - E-42a Negative voltage impulse on switched supply voltage
  - E-42b Low-resistance voltage impulse on charge wire
- 2024-03
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage (18 V, 400 ms)
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow lowering and raising of the supply voltage
  - E-08 Slow lowering, fast raising of the supply voltage
  - E-09 Reset
  - E-10 Short-term open circuit (10 µs bis 2 s)
  - E-11 Start pulses
  - E-12 Voltage curve during onboard electrical system control
  - E-13 Pin open circuit
  - E-14 Connector open circuit
  - E-15 Reverse polarity
  - E-16 Ground offset
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Quiescent current and standby current
  - E-21 Back-feed (decoupling)
  - E-23 Compensating currents of multiple supply voltages
  - E-40 Very brief voltage drop
  - E-41 Short off/on for bus participant
  - E-42 Voltage pulses due to consumer deactivation

BMW GS 95024-2-2

2011-02

- E-01 Long-term overvoltage
- E-02 Transient overvoltage (18 V pulse)
- E-03 Transient undervoltage
- E-04 Jump start
- E-05 Load dump
- E-06 Superimposed alternating voltage
- E-07 Slow decrease and increase of the supply voltage
- E-08 Slow decrease, quick increase of the supply voltage
- E-09 Reset behavior
- E-10 Short interruptions
- E-11 Start pulses
- E-12 Voltage curve with electric system control
- E-13 Pin interruption
- E-14 Connector interruption
- E-15 Reverse polarity
- E-16 Ground offset
- E-17 Short circuit in signal circuit and load circuits
- E-19 Closed-circuit current
- E-21 Backfeeds
- E-40 Very brief voltage drop
- E-41 Brief off on for bus nodes
- E-42a Negative voltage impulse on switched supply voltage
- E-42b Low-resistance voltage impulse on charge wire

FCA CS.00054

2018-01

- 5.2 Electrical System Operating Requirement
  - 5.2.1 Supply Voltage Range
  - 5.2.2 Ignition Off Draw (IOD)
  - 5.2.3 Supply Voltage Ripple
- 5.3 Supply Voltage Variations
  - 5.3.1 Sneak Path
  - 5.3.2 Supply Voltage Drop Out
  - 5.3.3 Power Supply Disconnection
  - 5.3.4. Reset behaviour at voltage drop
  - 5.3.5 Supply Voltage Dips
  - 5.3.6 Engine Cranking Low Voltage - Resembling Cold Cranking
  - 5.3.7 Engine Cranking Low Voltage - Warm Cranking / Stop- Start
  - 5.3.8 Slow decrease and increase of supply voltage
- 5.4 Supply Over Voltage and Reverse Voltage
  - 5.4.1 Defective Regulation
  - 5.4.2 Reverse Supply Voltage
- 5.5 Electronical System Compatibility Requirements
  - 5.5.1 Immunity to Short Circuits in the Supply Voltage Input and Load Outputs Lines
  - 5.5.2 Immunity to Short Circuits in I/O Signal Lines
- 5.7 Conducted Transient Emissions
  - Fast pulse without internal switch
  - Fast pulse with internal switch
- 5.9 Transient Immunity
  - 5.9.1 Transient Immunity of Supply Lines
  - 5.9.2 Transient Immunity of I/O or Sensor Lines (CCC)
  - 5.9.3 Transient Immunity of I/O or Sensor Lines (DCC)
  - 5.9.4 Transient Immunity of LED Lighting Power Lines

Fiat 9.90111-01

2012-06

- 4.1 Electrical System operating Environment
  - 4.1.1 Supply Voltage Range
  - 4.1.2 Ignition Off Current Draw (IOD)
  - 4.1.3 Supply Voltage Ripple
- 4.2 Supply Voltage Variations
  - 4.2.1 Sneak Path
  - 4.2.2 Supply Voltage Drop Out
  - 4.2.3 Power Supply Disconnection
  - 4.2.4. Reset behaviour at voltage drop
  - 4.2.5 Supply Voltage Dips
  - 4.2.6 Engine Cranking Low Voltage - Resembling Cold Cranking
  - 4.2.7 Engine Cranking Low Voltage - Warm Cranking / Stop- Start
  - 4.2.8 Slow decrease and increase of supply voltage
- 4.3 Supply Over Voltage and Reverse Voltage
  - 4.3.1 Defective Regulation
  - 4.3.2 Reverse Supply Voltage
- 4.4 Electronical System Compatibility Requirements
  - 4.4.1 Immunity to Short Circuits in the Supply Voltage Input and Load Outputs Lines
  - 4.4.2 Immunity to Short Circuits in I/O Signal Lines
- 5.4 Conducted Transient Emissions
  - Fast pulse without internal switch
  - Fast pulse with internal switch
- 6.4 Transient Immunity
  - 6.4.1 Transient Immunity of Supply Lines
  - 6.4.2 Transient Immunity of I/O or Sensor Lines (CCC)
  - 6.4.3 Transient Immunity of I/O or Sensor Lines (DCC)
  - 6.4.4 Transient Immunity of LED Lighting Power Lines

GMW 3172

2015-06

- 8. Development
- 9. Design Validation (DV)

Honda 1901Z-XP7F-V010

- 2010
  - 6.1 Overvoltage application test
    - Case 1
    - Case 2
  - 6.2 Reverse voltage application test
  - 6.7 Immunity transient surge tests (Power supply line pulse 1)
  - 6.8 Immunity transient surge tests (Power supply line pulse 2a)
  - 6.9 Immunity transient surge tests (Power supply line pulse 3a)
  - 6.10 Immunity transient surge tests (Power supply line pulse 3b)
  - 6.13 Immunity transient surge tests (Signal line ISO Fast pulse a)
    - DCC method
    - CCC method
  - 6.14 Immunity transient surge tests (Signal line ISO Fast pulse b)
    - DCC method
    - CCC method
  - 6.16 Immunity transient surge tests (ICC method)
    - Positive pulse
    - Negative pulse
  - 6.17 (+) Surrge application test
  - 6.20 Power supply fluctuation test
    - Pattern A1
    - Pattern A2
    - Pattern A3
    - Pattern B
    - Pattern C
    - Pattern D1
    - Pattern D2
    - Pattern D3
    - Pattern D4
    - Pattern D5
    - Pattern E
    - Pattern E (+B Buck Up/ACC line 0V)
    - Pattern A (+B Buck Up/ACC line 0V)
    - Pattern D (+B Buck Up/ACC line 0V)
    - Pattern E (1 Push Start application model added)
    - Pattern B1 (1 Push Start application model added)
    - Pattern B2 (1 Push Start application model added)
    - Pattern D (1 Push Start application model added)

2010-10
- 6.1 Overvoltage application test
- 6.2 Reverse voltage application test
- 6.7 Immunity transient surge tests (Power supply line pulse 1)
- 6.8 Immunity transient surge tests (Power supply line pulse 2a)
- 6.9 Immunity transient surge tests (Power supply line pulse 3a)
- 6.10 Immunity transient surge tests (Power supply line pulse 3b)
- 6.13 Immunity transient surge tests (Signal line ISO Fast pulse a)
- 6.14 Immunity transient surge tests (Signal line ISO Fast pulse b)
- 6.16 Immunity transient surge tests (ICC method)
- 6.17 (+) Surrge application test
- 6.20 Power supply fluctuation test

ISO 16750-2

2012-11
- 4.2. Direct current supply voltage
- 4.3. Overvoltage
- 4.4. Superimposed alternating voltage
- 4.5. Slow decrease and increase of supply voltage
- 4.6. Discontinuities in supply voltage
- 4.7. Reversed voltage
- 4.8. Ground reference and supply offset
- 4.9. Open circuit test
- 4.10. Short circuit protection

2023-07
- 4.2. Direct current (DC) supply voltage
- 4.3. Overvoltage
- 4.4. Superimposed alternating voltage
- 4.5. Slow decrease and increase of supply voltage
- 4.6. Discontinuities in supply voltage
- 4.7. Reversed voltage
- 4.8. Ground reference and supply offset
- 4.9. Open circuit test
- 4.10 Short circuit/overload protection

LV 124

2013-06

- E-01 Long-term overvoltage
- E-02 Transient overvoltage
- E-03 Transient undervoltage
- E-04 Jump start
- E-05 Load dump
- E-06 Superimposed alternating voltage
- E-07 Slow decrease and increase of the supply voltage
- E-08 Slow decrease, quick increase of the supply voltage
- E-09 Reset behavior
- E-10 Short interruptions
- E-11 Start pulses
- E-12 Voltage curve with electric system control
- E-13 Pin interruptions
- E-14 Connector interruption
- E-15 Reverse polarity
- E-16 Ground offset
- E-17 Short circuit in signal circuit and load circuits
- E-19 Closed-circuit current
- E-21 Backfeeds

MBN 10567

2018-03

- 7.1 Operating voltage range test
- 7.2 Long term overvoltage test
- 7.3 Transient overvoltage test
- 7.4 Transient undervoltage test
- 7.5 Jump start
- 7.6 Load dump test
- 7.7 Superimposed alternating voltage
  - Test case 1
  - Test case 2
  - Test case 3
  - Test case 4
- 7.8 Slow decrease and increase of the supply voltage
  - Test case 1
  - Test case 2
- 7.9 Start pulses test
  - Cold start
  - Hot start
- 7.10 Reset behavior
- 7.11 Short interruptions test
  - Sequence 1: t1 from 10 µs to 100 µs with 10 µs steps
  - Sequence 2: t1 from 100 µs to 1 ms with 100 µs steps
  - Sequence 3: t1 from 1 ms to 10 ms with 1 ms steps
  - Sequence 4: t1 from 10 ms to 100 ms with 10 ms steps
  - Sequence 5: t1 from 100 ms to 2 s with 100 ms steps
- 7.12 Pin interruption test
  - Test case 1
  - Test case 2
- 7.13 Connector interruption
- 7.14 Reverse polarity
  - Static polarity reversal
  - Dynamic polarity reversal
- 7.15 Ground offset test
  - DUT-current ≤ 2 A
  - DUT-current > 2 A
- 7.16 Quiescent current test
- 7.17 Feedback test
  - Test case 1
  - Test case 2
- 7.19 Equalizing current test for components with several supply voltages

2024-01
- 7.1 Operating voltage range test
- 7.2 Long term overvoltage test
- 7.3 Transient overvoltage test
- 7.4 Transient undervoltage test
- 7.5 Jump start
- 7.6 Load dump test
- 7.7 Superimposed alternating voltage
- 7.8 Slow decrease and increase of the supply voltage
- 7.9 Start pulses test
- 7.10 Reset behavior
- 7.11 Short interruptions test
- 7.12 Pin interruption test
- 7.13 Connector interruption
- 7.14 Reverse polarity
- 7.15 Ground offset test
- 7.16 Quiescent current test
- 7.17 Feedback test
- 7.19 Equalizing current test for components with several supply voltages

MBN 50569

2023-04
- 7.1 Operating voltage range test
- 7.2 Long-term overvoltage test
- 7.3 Transient overvoltage test
- 7.4 Transient undervoltage test
- 7.5 Jump start test
- 7.6 Superimposed alternating voltage
- 7.7 Slow supply voltage decrease and increase test
- 7.8 Reset behavior test
- 7.9 Short interruptions test
- 7.10 Pin interruption test
- 7.11 Connector interruption
- 7.12 Polarity reversal test
- 7.13 Ground offset test
- 7.14 Quiescent current test
- 7.15 Feedback test
- 7.17 Equalizing current test for components with several supply voltages

MBN LV 124-1

- 2011-03
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow decrease and increase of the supply voltage
  - E-08 Slow decrease, quick increase of the supply voltage
  - E-09 Reset behavior
  - E-10 Short interruptions
  - E-11 Start pulses
  - E-12 Voltage curve with electric system control
  - E-13 Pin interruptions
  - E-14 Connector interruption
  - E-15 Reverse polarity
  - E-16 Ground offset
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Closed-circuit current
  - E-21 Backfeeds
- 2013-03
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow decrease and increase of the supply voltage
  - E-08 Slow decrease, quick increase of the supply voltage
  - E-09 Reset behavior
  - E-10 Short interruptions
  - E-11 Start pulses
  - E-12 Voltage curve with electric system control
  - E-13 Pin interruptions
  - E-14 Connector interruption
  - E-15 Reverse polarity
  - E-16 Ground offset
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Closed-circuit current
  - E-21 Backfeeds

Mitsubishi ES-X82115

2009-03

- 6. Electrical system operating environment
  - 6.1 Supply voltage range
  - 6.2 Ignition off draw (IOD)
  - 6.3 Supply voltage ripple
- 7. Supply voltage variations
  - 7.2 Supply voltage drop out
  - 7.3 Supply voltage dips
  - 7.4 Engine cranking low voltage
  - 7.6 Slow decrease and increase of supply voltage
- 8. Supply over voltage and reverse voltage
  - 8.1 Defective regulation (full-field alternator)
  - 8.2 Jump start
  - 8.3 Load dump
  - 8.4 Reverse supply voltage
- 9. Electrical system compatibility requirements
  - 9.1 Immunity to short circuits in the supply voltage input and load output lines
  - 9.2 Immunity to short circuits in I/O signal lines
  - 9.4 Supply voltage offset
  - 9.5 Ground reference offset
- 10. Specific requirements for motors and inductive devices
  - 10.1 Operating and voltage stress
  - 10.2 Stall

Nissan 28401NDS02

2002-04

- 6.1. Resistance to electrical disturbances tests
  - 6.1.1. EQ/TE 01: Resistance to power supply voltages
  - 6.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
  - 6.1.3. EQ/TE 03: Re-initialization test
  - 6.1.4. EQ/TE 04: Resistance to non usual power supply voltages
  - 6.1.5. EQ/TE 05: Resistance to ground and positive supply voltages short circuit
  - 6.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis and 2a
  - 6.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
  - 6.1.8. EQ/IC 10: Resistance of inductive load connected circuits
  - 6.1.9 EQ/IC 03: Resistance to pulses 5a and/or 5b
  - 6.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
  - 6.1.11. EQ/IC 05: Resistance to starting profile
  - 6.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples
- 6.2. Immunity to conducted disturbance tests
  - 6.2.1. EQ/IC 07: Immunity to signal line transients

2016-03

6.1. Resistance to electrical disturbances tests

6.1.1. EQ/TE 01: Resistance to power supply voltages
6.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
6.1.3. EQ/TE 03: Re-initialization test
6.1.4. EQ/TE 04: Resistance to non usual power supply voltages
6.1.5. EQ/TE 05: Resistance to ground and positive supply voltages short circuit
6.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis, 2a and 2b
6.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
6.1.8. EQ/IC 10: Resistance of inductive load connected circuits
6.1.9. EQ/IC 03: Resistance to pulse 5b and 5c
6.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
6.1.11. EQ/IC 05: Resistance to starting profile
6.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples

6.2. Immunity to conducted disturbance tests

6.2.1. EQ/IC 07: Immunity to signal line transients

PSA B21 7110

2012-07

7.1. Low voltage network (12 V)

7.1.1. EQ/TE 01: Resistance to usual power supply voltages
7.1.2. EQ/TE 08: Resistance to the variations of supply voltage in the usual "volt control" range
7.1.3. EQ/TE 07: Resistance to exceptional supply voltage
7.1.4. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
7.1.5. EQ/TE 03: Re-initialization test
7.1.6. EQ/TE 04: Resistance to unusual power supply voltages
7.1.7. EQ/TE 05: Resistance to grounding and to the positive terminal of the network
7.1.9. EQ/IC 01: Resistance to the pulses 1 and 2a
7.1.10. EQ/IC 10: Resistance to pulses on the outputs switching inductive loads
7.1.11. EQ/IC 02: Resistance to pulses 3a and 3b
7.1.12. EQ/IC 03: Resistance to 5b pulses
7.1.13. EQ/IC 04: Resistance to short interruption of the power supply
7.1.14. EQ/IC 05: Resistance to pulses 4 bis
7.1.15. EQ/IC 12: Resistance to re-start pulse
7.1.16. EQ/IC 13: Resistance to "volt control" voltage pulse
7.1.17. EQ/IC 06: Resistance to voltage ripples

7.3. EMC immunity tests (general case)

7.3.1. EQ/IC 07: Immunity to the transients on the signal lines

7.4. EMC emission tests (general case)

7.4.1. EQ/MC 01: Measurement of switching noises

2019-04

7.1. Electrical resistance tests

7.1.1. EQ/TE 01: Resistance to usual power supply voltages
7.1.2. EQ/TE 08: Resistance to the variations of supply voltage in the usual "volt control" range
7.1.3. EQ/TE 07: Resistance to exceptional supply voltage
7.1.4. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
7.1.5. EQ/TE 03: Re-initialization test
7.1.6. EQ/TE 04: Resistance to unusual power supply voltages
7.1.7. EQ/TE 05: Resistance to ground and to the positive supply voltage short circuit
7.1.9. EQ/IC 01: Resistance to the pulses 1 and 2a
7.1.10. EQ/IC 10: Resistance to pulses on the inputs/outputs connected to ground through their loads
7.1.11. EQ/IC 02: Resistance to pulses 3a and 3b
7.1.12. EQ/IC 03: Resistance to load dump
7.1.13. EQ/IC 04: Resistance to short interruption of the power supply and/or ground
7.1.14. EQ/IC 05: Resistance to pulses 4 bis
7.1.15. EQ/IC 12: Resistance to re-start pulse
7.1.16. EQ/IC 13: Resistance to "volt control" voltage pulse
7.1.17. EQ/IC 06: Resistance to voltage ripples

7.2. EMC immunity tests

7.2.1. EQ/IC 07: Immunity to the transients on the signal lines
7.2.3. EQ/IC 14: Immunity to transients with wire to wire coupling

7.3. EMC emission tests (general case)

7.3.1. EQ/MC 01: Measurement of switching noises

RNDS-C-00517

2018-06

9.1. Resistance to electrical disturbances tests

9.1.1. EQ/TE 01: Resistance to power supply voltages
9.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
9.1.3. EQ/TE 03: Re-initialization test
9.1.4. EQ/TE 04: Resistance to non usual power supply voltages
9.1.5. EQ/TE 05: Resistance to ground and postitive supply voltage short circuit
9.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis, 2a and 2b
9.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
9.1.8. EQ/IC 10: Resistance of inductive load connected circuits
9.1.9. EQ/IC 03: Resistance to pulse 5b and 5c
9.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
9.1.11. EQ/IC 05: Resistance to starting profile
9.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples

9.2. Resistance to electrical disturbances tests

9.2.1. EQ/IC 07: Resistance to pulses 3a and 3b

2022-10
- 9.1. Resistance to electrical disturbances tests
  - 9.1.1. EQ/TE 01: Resistance to power supply voltages
  - 9.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
  - 9.1.3. EQ/TE 03: Re-initialization test
  - 9.1.4. EQ/TE 04: Resistance to non usual power supply voltages
  - 9.1.5. EQ/TE 05: Resistance to ground and postitive supply voltage short circuit
  - 9.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis, 2a and 2b
  - 9.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
  - 9.1.8. EQ/IC 10: Resistance of inductive load connected circuits
  - 9.1.9. EQ/IC 03: Resistance to pulse 5b and 5c
  - 9.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
  - 9.1.11. EQ/IC 05: Resistance to starting profile
  - 9.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples
- 9.2. Resistance to electrical disturbances tests
  - 9.2.1. EQ/IC 07: Resistance to pulses 3a and 3b

Renault 36-00-808

2012-07
- 6.1. Resistance to electrical disturbances tests
  - 6.1.1. EQ/TE 01: Resistance to power supply voltages
  - 6.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
  - 6.1.3. EQ/TE 03: Re-initialization test
  - 6.1.4. EQ/TE 04: Resistance to non usual power supply voltages
  - 6.1.5. EQ/TE 05: Resistance to ground and positive supply voltages short circuit
  - 6.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis and 2a
  - 6.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
  - 6.1.8. EQ/IC 10: Resistance of inductive load connected circuits
  - 6.1.9. EQ/IC 03: Resistance to pulse 5b
  - 6.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
  - 6.1.11. EQ/IC 05: Resistance to starting profile
  - 6.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples
- 6.2. Immunity to conducted disturbance tests
  - 6.2.1. EQ/IC 07: Immunity to signal line transients

2016-03
- 6.1. Resistance to electrical disturbances tests
  - 6.1.1. EQ/TE 01: Resistance to power supply voltages
  - 6.1.2. EQ/TE 02: Resistance to slow decrease and increase of supply voltages
  - 6.1.3. EQ/TE 03: Re-initialization test
  - 6.1.4. EQ/TE 04: Resistance to non usual power supply voltages
  - 6.1.5. EQ/TE 05: Resistance to ground and postitive supply voltage short circuit
  - 6.1.6. EQ/IC 01: Resistance to pulses 1, 1 bis, 2a and 2b
  - 6.1.7. EQ/IC 02: Resistance to pulses 3a and 3b
  - 6.1.8. EQ/IC 10: Resistance of inductive load connected circuits
  - 6.1.9. EQ/IC 03: Resistance to pulse 5b and 5c
  - 6.1.10. EQ/IC 04: Resistance to power supply micro-interruptions
  - 6.1.11. EQ/IC 05: Resistance to starting profile
  - 6.1.12. EQ/IC 06: Resistance to on-board power system voltage ripples
- 6.2. Immunity to conducted disturbance tests
  - 6.2.1. EQ/IC 07: Immunity to signal line transients

VW 80000

- 2013-06
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow decrease and increase of the supply voltage
  - E-08 Slow decrease, quick increase of the supply voltage
  - E-09 Reset behavior
  - E-10 Short interruptions
  - E-11 Start pulses
  - E-12 Voltage curve with electric system control
  - E-13 Pin interruptions
  - E-14 Connector interruption
  - E-15 Reverse polarity
  - E-16 Ground offset
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Closed-circuit current
  - E-21 Backfeeds
- 2017-10
  - E-01 Long-term overvoltage
  - E-02 Transient overvoltage
  - E-03 Transient undervoltage
  - E-04 Jump start
  - E-05 Load dump
  - E-06 Superimposed alternating voltage
  - E-07 Slow decrease and increase of the supply voltage
  - E-08 Slow decrease, quick increase of the supply voltage
  - E-09 Reset behavior
  - E-10 Brief interruptions
  - E-11 Start pulses
  - E-12 Voltage curve with electric system control
  - E-13 Pin interruptions
  - E-14 Connector interruption
  - E-15 Reverse polarity
  - E-16 Ground potential difference
  - E-17 Short circuit in signal circuit and load circuits
  - E-19 Quiescent current
  - E-21 Backfeeds
  - E-23 Equalizing current of multiple supply voltages

2020-12
- E-01 Long-term overvoltage
- E-02 Transient overvoltage
- E-03 Transient undervoltage
- E-04 Jump start
- E-05 Load dump
- E-06 Superimposed alternating voltage
- E-07 Slow decrease and increase of the supply voltage
- E-08 Slow decrease, quick increase of the supply voltage
- E-09 Reset behavior
- E-10 Brief interruptions
- E-11 Start pulses
- E-12 Voltage curve with electric system control
- E-13 Pin interruptions
- E-14 Connector interruption
- E-15 Reverse polarity
- E-16 Ground potential difference
- E-17 Short circuit in signal circuit and load circuits
- E-19 Quiescent current
- E-21 Backfeeds
- E-23 Equalizing current of multiple supply voltages

2021-07
- E-01 Long-term overvoltage
- E-02 Transient overvoltage
- E-03 Transient undervoltage
- E-04 Jump start
- E-05 Load dump
- E-06 Superimposed alternating voltage
- E-07 Slow decrease and increase of the supply voltage
- E-08 Slow decrease, quick increase of the supply voltage
- E-09 Reset behavior
- E-10 Brief interruptions
- E-11 Start pulses
- E-12 Voltage curve with electric system control
- E-13 Pin interruptions
- E-14 Connector interruption
- E-15 Reverse polarity
- E-16 Ground potential difference
- E-17 Short circuit in signal circuit and load circuits
- E-19 Quiescent current
- E-21 Backfeeds
- E-23 Equalizing current of multiple supply voltages

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- E-01 Long-term overvoltage
- E-02 Transient overvoltage
- E-03 Transient undervoltage
- E-04 Jump start
- E-05 Load dump
- E-06 Superimposed alternating voltage
- E-07 Slow decrease and increase of the supply voltage
- E-08 Slow decrease, quick increase of the supply voltage
- E-09 Reset behavior
- E-10 Brief interruptions
- E-11 Start pulses
- E-12 Voltage curve with electric system control
- E-13 Pin interruptions
- E-14 Connector interruption
- E-15 Reverse polarity
- E-16 Ground potential difference
- E-17 Short circuit in signal circuit and load circuits
- E-19 Quiescent current
- E-21 Backfeeds
- E-23 Equalizing current of multiple supply voltages

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- 4.2. Direct current supply voltage
- 4.3. Overvoltage
- 4.4. Superimposed alternating voltage
- 4.5. Slow decrease and increase of supply voltage
- 4.6. Discontinuities in supply voltage
- 4.7. Reversed voltage
- 4.10. Short circuit protection