

Contents

| | |
|---------|---|
| | Foreword |
| | Introduction |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms and definitions |
| 4 | Safety requirements and/or protective/risk reduction measures |
| 4.1 | General requirements |
| 4.1.1 | General |
| 4.1.2 | Moving parts |
| 4.1.3 | Equipment carrier restraints |
| 4.1.4 | Starting system |
| 4.1.5 | Unintended movement |
| 4.2 | Lifting and transportation |
| 4.3 | Towing and retrieval |
| 4.4 | Fluid power systems |
| 4.4.1 | Hydraulic systems |
| 4.4.1.1 | General |
| 4.4.1.2 | Fluid tanks |
| 4.4.1.3 | Tank filling |
| 4.4.1.4 | Tank drainage |
| 4.4.1.5 | Relief valves |
| 4.4.1.6 | Pressure lines |
| 4.4.1.7 | Tank level indicator |
| 4.4.1.8 | Fluid temperature |
| 4.4.1.9 | Manufacturer's instructions |
| 4.4.2 | Pneumatic systems |
| 4.5 | Electrical equipment |
| 4.5.1 | General |
| 4.5.2 | Electromagnetic compatibility (EMC) |
| 4.5.3 | Batteries |
| 4.6 | Machines powered by diesel engine |
| 4.6.1 | Fuel and exhaust |
| 4.6.2 | Exhaust pipes |
| 4.6.3 | Engine cooling system |
| 4.7 | Fuel systems |
| 4.7.1 | Fuel tanks |
| 4.7.2 | Fuel tank filler inlet |
| 4.7.3 | Fuel tank vent system |
| 4.7.4 | Fuel tank drainage device |
| 4.7.5 | Fuel shut-off system |
| 4.7.6 | Fuel lines |
| 4.8 | Light intensity and quantity |
| 4.8.1 | General |
| 4.8.2 | Head lights |
| 4.8.3 | Tail lights |
| 4.8.4 | Reversing lights |
| 4.8.5 | Stop lamps |
| 4.8.6 | Both direction lights |
| 4.8.7 | Protective systems |
| 4.9 | Warning devices and safety signs |

- 4.10 Braking
 - 4.10.1 General requirements
 - 4.10.1.1 Retarder
 - 4.10.1.2 Wheel chocks
 - 4.11 Control systems and devices
 - 4.11.1 General
 - 4.11.2 Control devices
 - 4.11.3 Steering systems
 - 4.11.4 Displays
 - 4.11.4.1 Display information
 - 4.11.4.2 Additional information
 - 4.11.4.3 Multiple positions
 - 4.12 Operator and passenger's position
 - 4.12.1 Protection
 - 4.12.2 Access systems
 - 4.12.3 Visibility
 - 4.12.4 Interior space, dimensions, and seats
 - 4.13 Fire protection
 - 4.14 Noise
 - 4.14.1 Noise reduction at source at the design stage
 - 4.14.2 Information on noise emission
 - 4.14.2.1 A-weighted sound power level
 - 4.14.2.2 A-weighted emission sound pressure level at the operator's position
 - 4.15 Vibrations
 - 4.16 Radiation health risks
 - 4.17 Tyres and rims
 - 4.18 Stability
 - 4.19 Load haul dump capacity
 - 4.20 Maintenance
 - 4.20.1 General
 - 4.20.2 Frequent maintenance
 - 4.20.3 Support devices
 - 4.20.4 Tilttable cab support device
 - 4.21 Quick coupler systems
- 5 Verification of safety requirements and/or protective/risk reduction measures
- 6 Information for use
 - 6.1 Operator's manual
 - 6.1.1 General
 - 6.1.2 Information on noise emission
 - 6.1.3 Information concerning hand-arm and whole-body vibration emission
 - 6.1.3.1 General
 - 6.1.3.2 Whole-body
 - 6.2 Marking
 - 6.2.1 General
 - 6.2.2 Attachment points
 - 6.2.3 Section or sub-assemblies
 - 6.3 Training manuals

Annex A (normative) Brake requirements for rubber tyred underground mining machines

- A.1 General
- A.2 Normative references
- A.3 Terms and definitions
- A.4 General requirements
 - A.4.1 Required brake systems
 - A.4.2 Common components
 - A.4.3 Brake control system
 - A.4.4 Service brake systems
 - A.4.5 Secondary brake systems
 - A.4.6 Parking brake systems
 - A.4.7 Hydrostatic brake systems
 - A.4.8 Systems with combined brake and steer function
 - A.4.9 Performance and warning devices for stored energy sources

- A.4.10 Brake systems with electronic MCS
- A.4.11 Machines designed to tow trailers
- A.4.12 Machine instructions and labels
- A.4.13 Estimating brake slope capability
- A.5 Test conditions
 - A.5.1 Overall test parameters
 - A.5.2 General test conditions
 - A.5.3 Test course
 - A.5.4 Machine test configuration
- A.6 Performance tests
 - A.6.1 General
 - A.6.2 Brake system controls
 - A.6.3 Stored energy sources
 - A.6.3.1 Service brake system recovery capacity
 - A.6.3.2 Secondary brake system capacity
 - A.6.3.3 Test performance
 - A.6.4 Holding performance
 - A.6.4.1 General
 - A.6.4.2 Service and parking brakes
 - A.6.4.3 Brake holding performance tests
 - A.6.4.4 Durability test of parking brake when used as a secondary brake
 - A.6.5 Stopping performance
 - A.6.5.1 General
 - A.6.5.2 Service brake systems
 - A.6.5.3 Secondary brake systems
 - A.6.5.4 Heat fade test
- A.6.6 General exceptions from ISO 3450:2011
- A.7 Test report

Annex B (informative) List of significant hazards, hazardous situations and hazardous events

Annex C (normative) Verification table

Annex D (informative) Examples of performance levels for safety-related functions

Page count: 43