



<b>SURFACE VEHICLE STANDARD</b>	<b>J2305™</b>	<b>NOV2024</b>
	Issued 2002-01 Reaffirmed 2011-08 Revised 2024-11	
Superseding J2305 JAN2017		
Hazard Reduction for Horizontal Earthboring Machines		

### RATIONALE

With recent document publications at the ISO and CEN level, and in an effort to align requirements where possible, this document has been updated accordingly. It was up for Five-Year Review in 2022.

#### 1. SCOPE

This SAE Standard applies to horizontal earthboring machines found in SAE J2022 of the following types:

- a. Auger boring machines
- b. Rod pushers
- c. Rotary rod machines
- d. Impact machines

This document does not apply to horizontal directional drilling (HDD) machines as defined in ISO 21467, mining machinery covered in SAE J1116, Table 1, nor does it apply to conveyors, tunnel boring machines, pipe jacking systems, micro tunnelers, or well drilling machines.

#### 1.1 Purpose

This document is a guide for reducing hazards for the operators and other personnel on the worksite during normal operation and maintenance of the horizontal earthboring machines listed above.

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## 2. REFERENCES

### 2.1 Applicable Documents

The following publications form part of this specification to the extent specified herein. Unless otherwise specified, the latest version of SAE publications shall apply.

#### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

- SAE J1116 Categories of Off-Road Self-Propelled Work Machines
- SAE J1362 Graphical Symbols for Operator Controls and Displays on Off-Road Self-Propelled Work Machines
- SAE J2022 Classification, Nomenclature, and Specification Definitions for Horizontal Earthboring Machines

#### 2.1.2 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

- ISO 2867 Earth-Moving Machinery – Access Systems
- ISO 3450 Earth-Moving Machinery – Wheeled or High-Speed Rubber-Tracked Machines – Performance Requirements and Test Procedures for Brake Systems
- ISO 3457 Earth-Moving Machinery – Guards – Definitions and Requirements
- ISO 3471 Earth-Moving Machinery – Roll-Over Protective Structures – Laboratory Tests and Performance Requirements
- ISO 7000 Graphical Symbols for Use on Equipment – Registered Symbols at: [iso.org/obp/ui](http://iso.org/obp/ui)
- ISO 9244 Earth-Moving Machinery – Machine Safety Labels – General Principles
- ISO 10265 Earth-Moving Machinery – Crawler Machines – Performance Requirements and Test Procedures for Braking Systems
- ISO 13766-1 Earth-Moving and Building Construction Machinery - Electromagnetic Compatibility (EMC) of Machines With Internal Electrical Power Supply – Part 1: General EMC Requirements Under Typical Electromagnetic Environmental Conditions
- ISO 13766-2 Earth-Moving and Building Construction Machinery – Electromagnetic Compatibility (EMC) of Machines With Internal Electrical Power Supply – Part 2: Additional EMC Requirements for Functional Safety
- ISO 15818 Earth-Moving Machinery – Lifting and Tying Down Attachment Points – Performance Requirements
- ISO 17063 Earth-Moving Machinery – Braking Systems of Pedestrian-Controlled Machines – Performance Requirements and Test Procedures
- ISO 21467 Drilling and Foundation Machinery – Horizontal Directional Drilling (HDD) Machines – Commercial Specifications

### 3. DEFINITIONS

All definitions contained in SAE J2022 are included herein by reference.

#### 3.1 NORMAL OPERATION

Normal operation is the reasonable use of a horizontal earthboring machine by a trained person using equipment and procedures specified by the manufacturer.

#### 3.2 ELECTRIC JOB SITE

A job site which has been properly investigated for underground utilities and where an energized underground electric line has been determined to be within 3 m of the intended bore path.

### 4. GUARDS

Guards shall conform to ISO 3457, except as specified in Section 12.

### 5. INFORMATION FOR USE

5.1 Safety instructions shall be supplied with the machine.

#### 5.1.1 Operator's Manual

5.1.1.1 The operator's manual shall provide safety instructions for normal operation and maintenance.

5.1.1.2 The operator's manual shall illustrate safety labels used on the machine. If symbols or pictorials are used instead of text in the safety labels, the operator's manual shall contain meaning of the safety label.

5.1.1.3 The operator's manual shall contain instructions regarding proper movement of non-self-propelled machines to and from the bore site.

5.1.1.4 The operator's manual shall include the following specific precautions and those specified in Section 12.

- Identification and avoidance of potential hazards resulting from contact with underground utilities
- Wearing of personal protective equipment
- Identification and avoidance of potential hazards resulting from excavation wall collapse, if applicable

#### 5.1.2 Safety Labels

5.1.2.1 Safety labels shall conform to ISO 9244.

5.1.2.2 One or more safety labels on the machine shall provide information regarding identification and avoidance of potential hazards resulting from contacting underground utilities.

#### 5.1.3 Other Labels

5.1.3.1 Symbols used on labels for the marking of lifting and tying down points shall be consistent with ISO 7000.

Symbols or pictorials used on labels for the marking of controls shall be consistent with SAE J1362 or ISO 7000, unless their meaning is clearly defined in the operator's manual.

## 6. CONTROLS

- 6.1 Where confusion can result from the motion of the control, the effect from movement of the control shall be clearly identified.
- 6.2 Control design shall be based on the principle that a given direction of movement of any control produces a consistent and expected effect.

## 7. ACCESS

Access systems of machines shall comply with ISO 2867.

## 8. ELECTRIC SHOCK PRECAUTIONS

8.1 Machines used on electric job sites shall have the following provisions:

- A means to determine tool head position while boring
- A means of helping to protect personnel from electrical shock

## 9. BRAKES

- 9.1 Ride-on crawler track machines shall be equipped with brakes conforming to ISO 10265.
- 9.2 Ride-on rubber tired machines shall be equipped with brakes conforming to ISO 3450.
- 9.3 Self-propelled, walk-along machines shall be equipped with brakes conforming to ISO 17063.
- 9.4 Machines which are not self-propelled do not require brakes.

## 10. ROLLOVER PROTECTIVE STRUCTURE (ROPS)

Self-propelled machines with machine travel controls at a riding operator's station shall be equipped with a rollover protective structure (ROPS) conforming to ISO 3471.

## 11. ELECTROMAGNETIC COMPATIBILITY

Electromagnetic compatibility for horizontal earthboring machines shall conform to ISO 13766-1 and ISO 13766-2 in regard to functional safety.

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