SAE International™

400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1611

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An American National Standard

(R) Operator Controls—Horizontal Earthboring Machines

1. ***Scope***—This SAE Standard applies to horizontal earthboring machines of the following types:

a. Auger Machines
b. Pipe Pushers
c. Rotary Rod Machines
d. Impact Machines
e. Directional Boring/Drilling Machines

Additional information on machines of this type may be found in SAE J2022 and SAE J2023. This document does not apply to specialized mining machinery such as conveyors, tunnel-boring machines, pipe-jacking systems, and microtunnelers.

1.1 **Purpose**—The purpose of this document is to encourage common terminology of machine control names, types, and definitions for horizontal earthboring machines.

2. ***References***

2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1362—Graphical Symbols for Operator Controls and Displays on Off-Road Self-Propelled Work Machines
SAE J1814—Operator Controls—Off-Road Machines
SAE J2022—Classification, Nomenclature, and Specification Definitions for Horizontal Earthboring Machines

2.2 **Related Publication**—The following publication is provided for information purposes only and is not a required part of this document.

2.2.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J2023—Operating Precautions for Horizontal Earthboring Machines

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3. Definitions

3.1 Thrust/Travel Controls—Those controls that control the advance and retraction of the tool.

3.2 Rotation Controls—Those controls that control the direction and/or the rotation of the tool.

3.3 Speed Controls—Those controls that control the speed of the engine, rotation of the tool, travel of the tool, and forward or lateral movement of the machine.

3.4 Drilling Fluid Controls—Those controls that control the flow and volume of drilling fluid.

3.5 Air Controls—Those controls that regulate the flow of air.

3.6 Stop Controls—Those controls that stop power to machine or components.

3.7 Auxiliary Controls—Those controls that actuate other functions such as winch, anchoring, and setup.

3.8 Horizontal Earthboring Machine—A machine used to bore horizontally through the earth by means of a rotating tool, or non-rotating pushing or piercing tool (SAE J2022).

4. Control Identification and Definition

4.1 Auger Machine—A machine used to drill earth horizontally by means of a cutting head and auger or other functionally similar device. The machine may be cradle or track type (SAE J2022).

4.1.1 THRUST—See 3.1.

4.1.2 ROTATION—See 3.2.

4.1.3 SPEED—See 3.3.

4.1.3.1 *Throttle*—Changes power speed.

4.1.3.2 *Thrust*—Changes thrust speed.

4.1.3.3 *Rotation*—Changes the rotation speed of the auger.

4.1.4 PUSH BAR—Unlatches the push bar so it can be repositioned.

4.1.5 BRAKE—Applies brake.

4.1.6 STOP—See 3.6.

4.1.7 AUXILIARY—See 3.7.

4.1.7.1 *Rock Drill*—Starts, stops, and/or regulates power to rock drill mechanism.

4.1.7.2 *Drilling Fluid*—See 3.4.

4.1.7.3 *Hammer*—Starts, stops, and/or regulates power to hammer.

4.1.7.4 *Winch*—Starts and stops winch.

4.1.7.5 *Power*—Connects transmission of power to auger drive.

4.2 Pipe Pusher—A machine that pushes or pulls a rod or pipe to produce a bore by means of compaction (SAE J2022).

4.2.1 TRAVEL—See 3.1.

4.2.2 GRIP—Applies travel to rod or pipe.

4.2.3 SPEED—See 3.3.

4.2.3.1 *Throttle*—Changes power speed.

4.2.3.2 *Travel*—Changes travel speed.

4.2.4 STOP—See 3.6.

4.2.5 AUXILIARY—See 3.7.

4.3 Rotary Rod Machine—A machine used to drill earth horizontally by means of a compaction bit or a cutting head attached to a rotating rod (not an auger). Such drilling may include fluid injected to the cutting head through a hollow rod (SAE J2022).

4.3.1 TRAVEL—See 3.1.

4.3.2 ROTATION—See 3.2.

4.3.3 SPEED—3.3.

4.3.3.1 *Throttle*—Changes power speed.

4.3.3.2 *Thrust Speed*—Changes speed of advance and retraction of the tool.

4.3.3.3 *Rotation Speed*—Changes the speed at which the rod turns.

4.3.4 DRILLING FLUID—See 3.4.

4.3.4.1 *Flow*—Turns drilling fluid on.

4.3.4.2 *Volume*—Changes the drilling fluid flow rate.

4.3.4.3 *Pressure*—Changes the drilling fluid pressure.

4.3.5 AIR—Controls air which may be used to drill and/or flush bore.

4.3.5.1 *Flow*—Turns air on.

4.3.5.2 *Oiler*—Changes amount of lubricating oil injected in supply air.

4.3.6 STOP—See 3.6.

4.3.7 AUXILIARY—See 3.7.

4.3.7.1 *Breakout*—Controls the joint make and/or break mechanism.

4.3.7.2 *Grip*—Applies travel to rod or pipe.

4.4 Impact machine—A type of machine that pierces the earth (piercing tool) or rams an object to produce a bore (ramming machine) (SAE J2022).

4.4.1 AIR—Controls air supply.

4.4.1.1 Flow—Turns air on.

4.4.1.2 Oiler—Changes amount of lubricating oil injected in supply air.

4.4.2 HYDRAULIC—Controls hydraulic oil supply.

4.4.3 DIRECTION—Changes direction of travel.

4.4.4 AUXILIARY—See 3.7.

4.5 Directional Boring/Drilling Machine—A machine which can launch a steerable cutting head attached to the end of a rotating drill pipe string used for boring through the earth in a horizontal direction. Boring most generally includes fluid injection to the cutting head through the drill pipe and also generally includes enlarging the bore with a back reamer (SAE J2022). See SAE J1362 for typical control symbols.

4.5.1 CARRIAGE TRAVEL—See 3.1.

4.5.2 DRILL HEAD ROTATION—See 3.2.

4.5.3 SPEED—See 3.3.

4.5.3.1 Throttle—Changes engine speed.

4.5.3.2 Thrust—Changes speed of advance and retraction of the drill pipe.

4.5.3.3 Rotation—Changes the speed at which the drill pipe turns.

4.5.4 DRILLING FLUID—See 3.4

4.5.4.1 Flow—Turns drilling fluid on/off.

4.5.4.2 Volume—Changes the drilling fluid flow rate.

4.5.4.3 Pressure—Changes the drilling fluid pressure.

4.5.5 AUXILIARY—See 3.7.

4.5.5.1 Clamp/Wrench—Applies holding force to resist joint make/break torque.

4.5.5.2 Rotating Clamp/Wrench—Applies the joint make/break-torque mechanism.

4.5.5.3 Anchor—Actuates devices for resisting machine movement from thrust forces.

4.5.5.4 Entry Angle—Adjusts the entry angle of the drill pipe with the earth surface.