SAE International	SURFACE VEHICLE STANDARD	SAE J1177 JAN2012
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Hydraulic Excavator Operator Controls

RATIONALE

J1177 has been reaffirmed to comply with the SAE 5-Year Review Policy.

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Foreword

This document is revised to include international symbols in the control arrangement figures, add references to other documents, and grammatical changes.

1. Scope

This standard covers mobile hydraulic excavator controls and the specific arrangement and direction of motion for the primary controls.

This standard applies to mobile hydraulic excavators as described in ISO 7135—Earthmoving machinery—Hydraulic excavators—Terminology and commercial specifications, and ISO 6165—Earthmoving machinery—Basic types—Vocabulary.

1.1 Purpose

This SAE Standard is intended as a guide for designing uniform two lever type operating controls for mobile hydraulic excavators, either wheel mounted or crawler mounted on independently reversible tracks.

1.2 Rationale

SAE J1177 has been upgraded from a Recommended Practice to a Standard due to its long standing position and acceptance in the earthmoving industry. It has been reformatted to the latest SAE criteria, references have been updated throughout the document and Figure 1 has been redrawn to include the use of ISO symbols. Figure 3 has been redrawn to show the more common and industry accepted foot pedal configuration for travel controls although the mode of operation remains unchanged. In paragraph 5.3 the direction of movement of the functions has been changed from “as specified by the manufacturer” to “idlers to the front and sprockets to the rear for crawler mounted machines and primary steering axle to the front for wheel mounted machines” which is the industry accepted definition.

2. References

2.1 Applicable Publications

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

2.1.1 SAE PUBLICATIONS

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

SAE J1362—Graphical Symbols for Operator Controls and Displays on Off-Road Self-Propelled Work Machines

2.1.2 INTERNATIONAL ORGANIZATION FOR STANDARDS PUBLICATIONS

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 6405—Earth-moving machinery—Symbols for operator controls and other displays
ISO 7135—Earth-moving machinery—Hydraulic excavators—Terminology and commercial specifications
ISO 6165—Earth-moving machinery—Basic types—Vocabulary
ISO 10968—Earth-moving machinery—Operator's controls

3. Definitions

3.1 Working Equipment Controls

Those controls that actuate the functions that dig, elevate, swing and dump material.

3.1.1 PRIMARY CONTROLS

Those controls that actuate the following basic functions common to all hydraulic excavators; boom, arm or telescoping boom, swing, and bucket or clam.

3.1.2 SECONDARY CONTROLS

Those controls that actuate other equipment functions (if provided) such as bucket tilt, bucket rotate, extendible arm, adjustable boom, combination bucket, etc.

3.2 Machine Travel Controls

Those controls that actuate any functions that influence machine movement or travel.

3.2.1 WHEEL MOUNTED MACHINE

3.2.1.1 Primary Controls

Those controls that actuate the following basic travel functions; speed, steering, travel direction, service brake and clutch (if provided).

3.2.1.2 Secondary Controls

Those controls that actuate other travel functions (if provided) such as transmissions selector, emergency brake, parking brake, turn signals, etc.

3.2.2 CRAWLER MOUNTED MACHINE

3.2.2.1 Primary Controls

Those controls that actuate the following basic travel functions; speed, steering, and travel direction.

3.2.2.2 Secondary Controls

Those controls that actuate other travel functions (if provided) such as transmission selector, parking brake, etc.

3.3 Auxiliary Controls

Those controls that actuate all other functions that pertain to overall machine performance such as outriggers, engine speed, engine start and stop, swing brake, horn, digging brake, and steering selector.

4. General

4.1 The function of all controls (except as noted in Section 4.1.1) shall be clearly identified on permanently affixed labels or diagrams (Ref. SAE J1362—Graphical Symbols for Operator Controls and Displays on Off-Road Self-Propelled Work Machines, and ISO 6405—Earth-moving machinery—Symbols for operator controls and other displays). Primary and secondary control movement shall additionally be identified such that the operator can determine equipment movement without trial and error or reference to a manual.

4.1.1 The functions of controls obviously self-defined by standard practice such as steering wheel, turn signal, horn or by mounting location such as heater switch or door handle when located on the unit are exempt. Movement of foot operated controls need not be identified if they operate with a push motion.

4.2 All primary working equipment and machine travel controls (except steering wheel, travel direction, and clutch controls) shall return to their neutral position automatically when released and power for movement shall disengage.

4.3 The type and style of control levers, buttons, or pedals are left to the option of the manufacturer.

4.4 Where possible, the movement of all controls from their neutral position shall be in the same direction as the movement of the functions that they control.

5. Recommendations

5.1 The control arrangements shown in Figures 1 to 3 are for the primary controls only, and shall be located within the optimum zones as set forth in ISO 10968—Earth-moving machinery—Operator's controls.

5.2 The location and direction of movement of the Primary Working Equipment Controls and their functions are illustrated in Figure 1. The direction of movement of the functions are controlled (right, left, etc.) are relative to the operator when he is seated in the operating position.

5.3 The locations and directions of movement of the Primary Machine Travel Controls for Wheel Mounted Machines and Crawler Mounted Machines are illustrated and described in Figures 2 and 3 respectively. The direction of movement for functions that are controlled (forward, reverse, etc.) are relative to the machine in its normal travel mode; idlers to the front and sprockets to the rear for crawler mounted machines and primary steering axle to the front for wheel mounted machines.

5.4 The arrangements of secondary and auxiliary controls are not shown, but left to the discretion of the manufacturer and shall be so located as not to interfere with the operation of the primary controls.

5.5 When more than one control location is offered for a function or functions, one location should conform to the recommended practice. Other control locations and arrangements shall be at the discretion of the manufacturer.

TWO LEVER CONTROL ARRANGEMENT AS VIEWED FROM OPERATORS SEAT

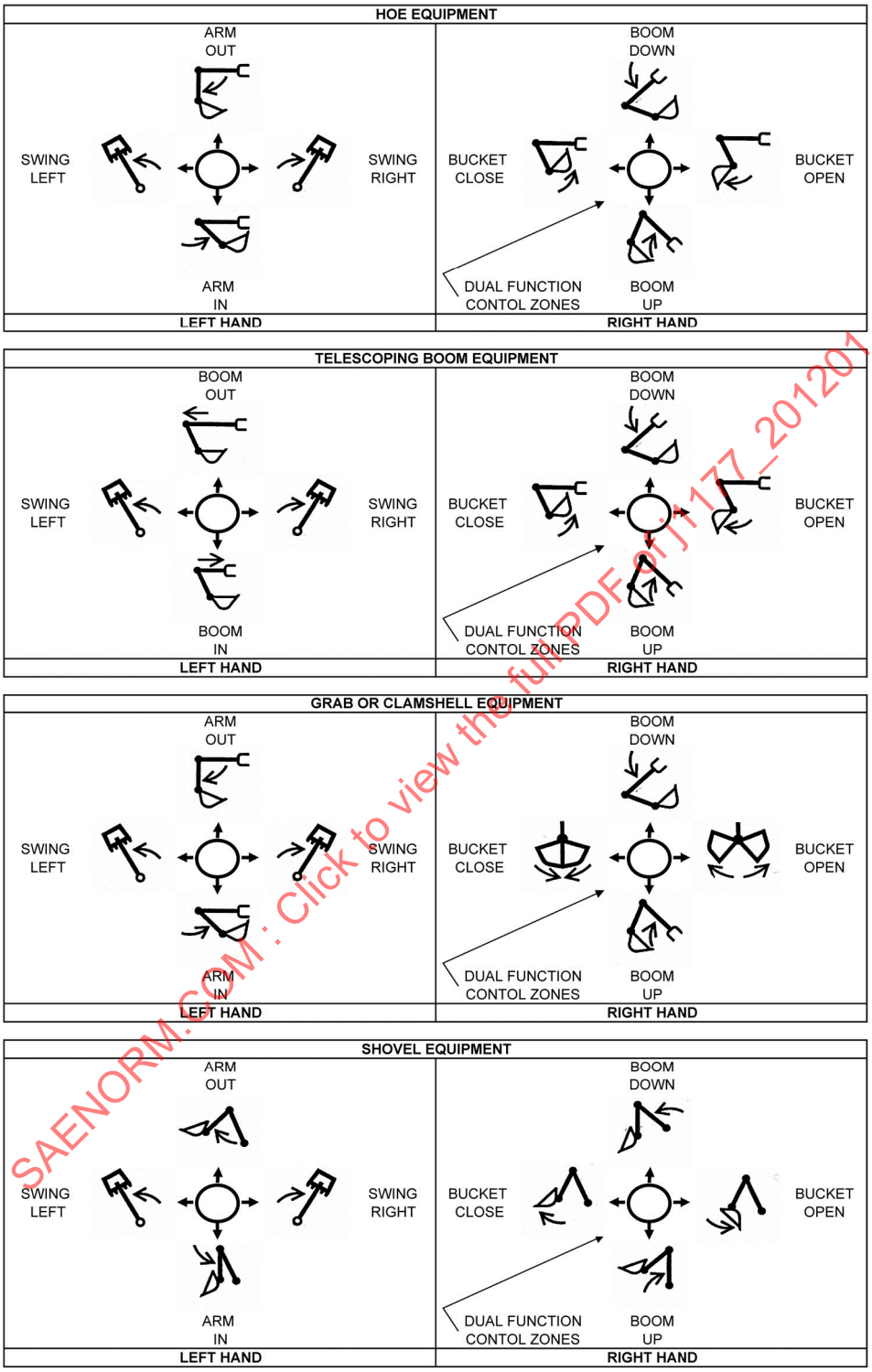

FIGURE 1—PRIMARY WORKING EQUIPMENT CONTROLS AND FUNCTIONS