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Earth-moving machinery — Symbols for operator controls and other displays —

Part 2: Symbols for specific machines, equipment and accessories

Engins de terrassement — Symboles pour les commandes de l'opérateur et autres indications —

Partie 2: Symboles spécifiques aux engins, équipements et accessoires

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 3, *Machine characteristics, electrical and electronic systems, operation and maintenance*.

This second edition cancels and replaces the first edition (ISO 6405-2:1993), which has been technically revised with many new symbols added. It also incorporates the Amendments ISO 6405-2:1993/Amd 1:1997 and ISO 6405-2:1993/Amd 2:2004.

A list of all parts in the ISO 6405 series can be found on the ISO website.

Earth-moving machinery — Symbols for operator controls and other displays —

Part 2:
Symbols for specific machines, equipment and accessories

1 Scope

This document standardizes symbols for use on operator controls and other displays on specific types of earth-moving machinery as defined in ISO 6165.

NOTE 1 ISO 6405-1 covers common symbols that apply to multiple types of earth-moving machinery.

NOTE 2 ISO 7000 and IEC 60417 can be consulted for additional internationally standardized symbols of potential relevance to earth-moving machinery.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 6405-1:2017, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

IEC 80416-1, *Basic principles for graphical symbols for use on equipment — Part 1: Creation of graphical symbols for registration*

ISO 80416-2, *Basic principles for graphical symbols for use on equipment — Part 2: Form and use of arrows*

IEC 80416-3, *Basic principles for graphical symbols for use on equipment — Part 3: Guidelines for the application of graphical symbols*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at www.iso.org/obp

— IEC Electropedia: available at www.electropedia.org

3.1
symbol
graphical symbol
visually perceptible figure used to transmit information independent of language

Note 1 to entry: It may be produced by drawing, printing, or other means. Letters, numerals, and mathematical symbols may be used as symbols or symbol elements. For some specific applications, groups of letters (for example, AUTO, STOP) are used as symbols or symbol elements.

Note 2 to entry: Letters and numerals are not registered by ISO/TC 145/SC 3 or published in ISO 7000 unless they are symbol elements embedded in graphical symbols.

3.2
icon
digital display icon
digitized (pixelated) representation of a graphical symbol, usually used on a reconfigurable electronic display screen or graphical user interface (GUI)

Note 1 to entry: A single symbol can be represented by multiple icons, each of a different size, pixel count, or colourization.

4 General

4.1 Except as indicated in subsequent clauses, symbols shall be used as shown in this document.

4.2 Selected symbols, which are shown in outline form in this document, may be filled in actual use for enhanced clarity of reproduction and improved visual perception by the operator, except as otherwise specified for individual symbols, and in accordance with IEC 80416-3.

4.3 Limitations inherent in some reproduction and display technologies can require increased line width or other minor modifications of symbols. Such modifications are allowed, provided that the symbol remains conceptually unchanged in its basic graphical elements and is easily discernible by the operator.

4.4 To improve the appearance and perceptibility of a graphical symbol, or to coordinate with the design of the equipment to which it is applied, it can be necessary to modify the symbol as indicated in IEC 80416-3 (for example, to change the line width or to round the corners of the symbol). Such modifications are allowed, provided that the essential perceptible characteristics of the symbol are maintained.

4.5 For actual use, all symbols shall be reproduced large enough to be easily discernible by the operator. Follow IEC 80416-3 for the proper sizing of symbols. Symbols grouped together in a display or on a set of controls should be scaled to the same degree relative to the corner marks of the symbol original as shown in this document in order to maintain the correct visual relationship among the symbols. Symbols shall be used in the orientation shown in this document, unless rotation or mirror imaging is specifically allowed for individual symbols.

4.6 Most symbols are constructed using a building block approach in which various symbols and symbol elements are combined in a logical manner to produce a new symbol.

4.7 In some cases, symbols may be used in conjunction, without being combined into a composite symbol, to convey the same meaning as the composite symbol.

4.8 Symbols are generally intended to replace a word or words with a graphical image that has the same meaning for all operators, regardless of their native language. However, the use of a graphical symbol to identify a control or display does not preclude the use of words in conjunction with that control or display.

4.9 If a symbol shows a machine or parts of a machine from a side view, a machine moving from right to left across the symbol area shall be assumed. If a symbol shows a machine or parts of a machine from an overhead view, a machine moving from bottom to top across the symbol area shall be assumed.

4.10 Symbols on controls and displays shall have a good contrast to their background. A white or light-coloured symbol on a black or dark-coloured background is preferred for most controls. Displays may use either a white or light-coloured symbol on a black or dark-coloured background or a black or dark-

coloured symbol on a white or light-coloured background, depending upon which alternative provides the best visual perception. When a symbol image is reversed (for example, from black-on-white to white-on-black or vice versa) this reversal shall be done for the entire symbol.

4.11 If symbols are cast, moulded, embossed, or stamped into a surface, the symbols shall be visually distinct from that surface without dependence on colour.

4.12 Symbols shall be located on or adjacent to the control or display that is being identified. Where more than one symbol is required for a control, the symbols shall be located in relation to the control such that movement of the control towards the symbols shall effect the function depicted by that symbol.

4.13 Arrows used in symbols shall conform to the requirements of ISO 80416-2. IEC 80416-1 shall be consulted for the general principles for creating symbol originals. IEC 80416-3 should be consulted for guidelines for the application of symbols.

4.14 ISO/IEC registration numbers are shown for symbols which are registered in ISO 7000 or IEC 60417.

NOTE Symbol originals are approved and registered either by ISO/TC 145/SC 3 and published in ISO 7000 or by IEC/SC 3C and published in IEC 60417. In some cases, modified or application symbols, rather than the registered symbol originals, are standardized in this document.

4.15 When letters or numerals are used in a symbol, the font shown shall not be considered definitive. Other fonts may be used so long as the letters and numerals remain legible.

4.16 Symbols in this document are shown within marks that delimit the corners of the 75 mm square basic pattern from IEC 80416-1. Corner marks are not part of the symbol, but are provided to ensure consistent presentation of all symbol graphics.

5 Colour

When used on illuminated displays, the following colours shall have the meanings indicated:

— red denotes a failure, serious malfunction, or operating condition that requires immediate attention;

— yellow or amber denotes a condition outside normal operating limits;

— green denotes a normal operating condition.

6 Development of new symbols

6.1 Prior to developing a new symbol, a search should be conducted for previously standardized symbols with the same or similar meaning to what is needed. ISO 7000 and IEC 60417 (both available in database form) are compilations of internationally standardized symbols which can be useful both for finding appropriate symbols that do not appear in ISO 6405 and for generating concepts that can be used in the development of new symbols.

6.2 New symbols shall be developed in accordance with the principles of ISO 6405-1:2017, Annex A. IEC 80416-1 should be consulted for general principles for the creation of symbols. Arrows shall be in accordance with ISO 80416-2. Different arrow forms have different meanings according to ISO 80416-2. Care should be taken to use the correct arrow form. Following the guidelines of ISO 6405-1:2017, Annex A makes possible the development of symbols appropriate in graphical form and content for international standardization and ISO 7000 registration.

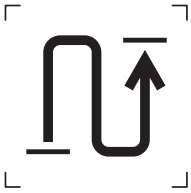
6.3 Symbols proposed for standardization in this document shall include a short explanation of the function or expected use of the symbol.

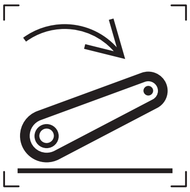
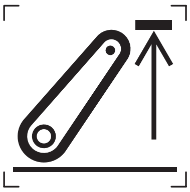
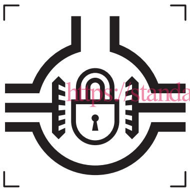
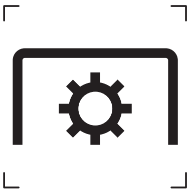
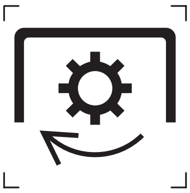
NOTE IEC 80416–1 uses the term “description” for this type of information and provides guidelines for writing descriptions for symbols intended for standardization in ISO 7000 or IEC 60417. The descriptions for symbols standardized in this document can serve as examples.

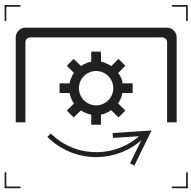
7 Adaptation of symbols as digital display icons

Symbols can be adapted for use as digital display icons on visual display units, reconfigurable displays, or other electronic displays. Such adaptations should follow the principles of ISO 80416-4. Special care should be taken to ensure that digital display icons preserve the visual impression of the symbol from which the icon is adapted. The same principles regarding use of colour with symbols apply to the use of colour with digital display icons.

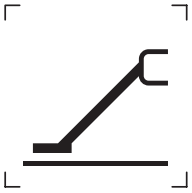
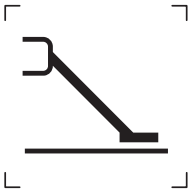
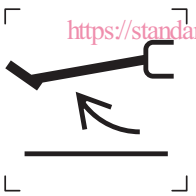
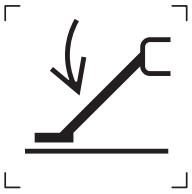
8 General machine and equipment symbols

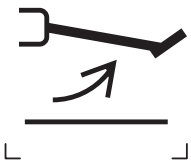
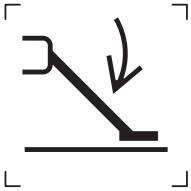
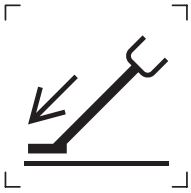
	Graphical symbol	Symbol title and description	ISO/IEC registration number
8.1		**Area worked** To indicate the area that has been worked by a machine. To identify the control for specifying an area.	ISO 7000-1657
8.2		**Area worked per hour** To indicate the area that has been worked by a machine per hour of operation.	ISO 7000-1658
8.3		**Work distance travelled** To indicate the distance that has been travelled by a machine during work.	ISO 7000-2177
8.4		**Rockshaft** To identify the control for the rockshaft of a machine; the rockshaft raises or lowers the implement or equipment attached to it. To indicate the operational status of the rockshaft. The horizontal ground line may be deleted if in context, the symbol meaning remains clear.	ISO 7000-1566
8.5		**Rockshaft, up; rockshaft, raise** To identify the control that raises the rockshaft. To indicate that the rockshaft is being raised or is in the raised (up) position. The horizontal ground line may be deleted if in context, the symbol meaning remains clear.	ISO 7000-1567

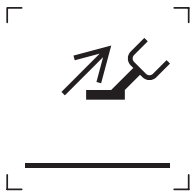
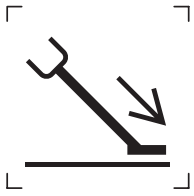
	Graphical symbol	Symbol title and description	ISO/IEC registration number
8.6		**Rockshaft, down; rockshaft, lower** To identify the control that lowers the rockshaft. To indicate that the rockshaft is being lowered or is in the lowered (down) position. The horizontal ground line may be deleted if in context, the symbol meaning remains clear.	ISO 7000-1568
8.7		**Rockshaft, float** To identify the control that allows the rockshaft to move up and down with the contour of the ground over which or through which the implement or equipment attached to the rockshaft moves. To indicate that the rockshaft is in the float condition.	ISO 7000-1660
8.8		**Rockshaft, upper limit** To identify the control that sets the maximum height to which an implement can be raised by the rockshaft. To indicate that the rockshaft is raised to its maximum height. A machine symbol may be placed to the left of this symbol. The horizontal ground line may be deleted if in context, the symbol meaning remains clear.	ISO 7000-2178
8.9		**Differential lock** To identify the control for the differential lock, which forces both wheels on an axle to rotate at the same speed regardless of the traction available to either wheel individually while still allowing the wheels to rotate at different speeds when negotiating a turn. To indicate the operational status of the differential lock.	ISO 7000-1662
8.10		**PTO; power take-off** To identify the control for the power take-off (PTO) system. To indicate the operational status of the PTO. Symbol may be used with a numerical indicator of rated PTO rotational speed.	ISO 7000-1572
8.11		**Power take-off (PTO), direction of rotation, clockwise** To indicate that the PTO shaft rotates clockwise. For anti-clockwise rotation, use the mirror image (see 8.12). Direction of rotation is from the perspective of a person looking at the end of the PTO shaft.	ISO 7000-1664

	Graphical symbol	Symbol title and description	ISO/IEC registration number
8.12		**Power take-off (PTO), direction of rotation, anti-clockwise** To indicate that the PTO shaft rotates anti-clockwise. For clockwise rotation, use ISO 7000-1664 (see 8.11). Direction of rotation is from the perspective of a person looking at the end of the PTO shaft.	Mirror image of ISO 7000–1664
8.13		**Power take-off (PTO), rotational speed** To identify the control that sets or adjusts the rotational speed of the power take-off (PTO) To indicate the rotational speed of the PTO. Symbol element “n/min” may be replaced by a numerical indicator of PTO rated rotational speed.	ISO 7000–3194
8.14		**Machine immobilizer** To identify the control that immobilizes the machine to prevent its unintended or unauthorized movement. To indicate that the machine is in the immobilized condition.	ISO7000–3037

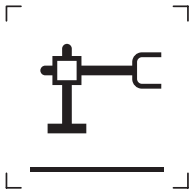
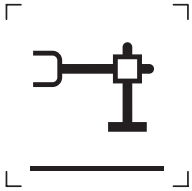
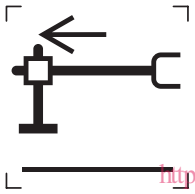
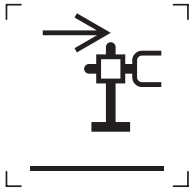
9 Stabilizer symbols

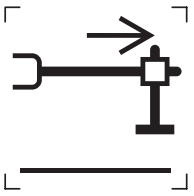
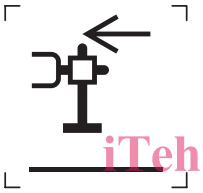
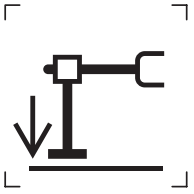
	Graphical symbol	Symbol title and description	ISO/IEC registration number
9.1		**Left stabilizer** To identify the equipment used to stabilize the machine to prevent movement of the machine during operation. To identify the control for operation of the left stabilizer. If one control operates both the left and right stabilizers, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Mirror image of ISO 7000–2072
9.2		**Right stabilizer** To identify the equipment used to stabilize the machine to prevent movement of the machine during operation. To identify the control for operation of the right stabilizer. If one control operates both the left and right stabilizers, use symbol in 9.1. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	ISO 7000–2072
9.3		**Left stabilizer, up; left stabilizer, raise** To identify the control that raises the left stabilizer. To indicate that the left stabilizer is being raised or is in the raised (up) position. If one control raises both the left and right stabilizers, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	ISO 7000–2073
9.4		**Left stabilizer, down; left stabilizer, lower** To identify the control that raises the right stabilizer. To indicate that the right stabilizer is being lowered or is in the lowered (down) position. If one control lowers both the left and right stabilizers, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	ISO 7000–2074

	Graphical symbol	Symbol title and description	ISO/IEC registration number
9.5		**Right stabilizer, up; right stabilizer raise** To identify the control that lowers the right stabilizer. To indicate that the right stabilizer is being raised or is in the raised (up) position. If one control raises both the left and right stabilizers, use ISO 7000–2073 (see 9.3). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	ISO 7000–1292
9.6		**Right stabilizer, down; right stabilizer, lower** To identify the control that raises the right stabilizer. To indicate that the right stabilizer is being lowered or is in the lowered (down) position. If one control lowers both the left and right stabilizers, use ISO 7000–2074 (see 9.4). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	ISO 7000–1291
9.7		**Left stabilizer, extend** To identify the control that extends the left stabilizer to provide a wider stance of the machine for greater stability during operation. To indicate that the left stabilizer is being extended or is in the extended position. If one control extends both the left and right stabilizers, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2075

	Graphical symbol	Symbol title and description	ISO/IEC registration number
9.8		**Left stabilizer, retract** To identify the control that retracts the left stabilizer. To indicate that the left stabilizer is being retracted or is in the retracted position. If one control retracts both the left and right stabilizers, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2076
9.9		**Right stabilizer, extend** To identify the control that extends the right stabilizer to provide a wider stance of the machine for greater stability during operation. To indicate that the right stabilizer is being extended or is in the extended position. If one control extends both the left and right stabilizers, use application of ISO 7000–2075 (see 9.7). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–1536
9.10		**Right stabilizer, retract** To identify the control that retracts the right stabilizer. To indicate that the right stabilizer is being retracted or is in the retracted position. If one control retracts both the left and right stabilizers, use application of ISO 7000–2076 (see 9.8). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–1537

10 Outrigger symbols

	Graphical symbol	Symbol title and description	ISO/IEC registration number
10.1		**Left outrigger** To identify the control for the left outrigger. If one control operates both the left and right outriggers, use this symbol Use as the base symbol for developing left outrigger symbols. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Mirror image application of ISO7000–2077
10.2		**Right outrigger** To identify the control for the right outrigger. If one control operates both the left and right outriggers, use symbol in 10.1. Use as the base symbol for developing right outrigger symbols. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2077
10.3		**Outrigger, left beam out, horizontal extension only** To identify the control that extends the left beam away from the machine. To indicate that the left beam is extending horizontally away from the machine or has reached its extension limit. To indicate the operational status of the left beam horizontal extension function. If one control extends both left and right beams, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2078
10.4		**Outrigger, left beam in, horizontal retraction only** To identify the control that retracts the left beam toward the machine. To indicate that the left beam is retracting horizontally toward the machine or has reached its retraction limit. To indicate the operational status of the left beam horizontal retraction function. If one control retracts both left and right beams, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2079

	Graphical symbol	Symbol title and description	ISO/IEC registration number
10.5		**Outrigger, right beam out, horizontal extension only** To identify the control that extends the right beam away from the machine. To indicate that the right beam is extending horizontally away from the machine or has reached its extension limit. To indicate the operational status of the right beam horizontal extension function. If one control extends both left and right beams, use application of ISO 7000–2078 (see 10.3). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–0746A
10.6		**Outrigger, right beam in, horizontal retraction only** To identify the control that retracts the right beam toward the machine. To indicate that the right beam is retracting horizontally toward the machine or has reached its retraction limit. To indicate the operational status of the right beam horizontal retraction function. If one control retracts both left and right beams, use application of ISO 7000–2079 (see 10.4). This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–0747A
10.7		**Outrigger, left jack down, vertical extension only** To identify the control that extends the left jack down toward the ground. To indicate that the left jack is extending vertically down toward the ground or has reached its extension limit. To indicate the operational status of the left jack vertical extension function. If one control extends both left and right jacks, use this symbol. This symbol is viewed from the perspective of a person looking forward along the longitudinal axis of the machine.	Application of ISO 7000–2080