INTERNATIONAL STANDARD

ISO 6405-1

Second edition
2004-11-01

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

Part 1: Common symbols

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

Partie 1: Symboles communs

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6405-1 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 3, *Operation and maintenance*.

This second edition cancels and replaces the first edition (ISO 6405-1:1991), which has been technically revised.

ISO 6405 consists of the following parts, under the general title *Earth-moving machinery — Symbols for operator controls and other displays*:

— *Part 1: Common symbols*

— *Part 2: Specific symbols for machines, equipment and accessories*

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

Part 1:
Common symbols

1 Scope

This part of ISO 6405 establishes the common symbols for use on operator controls and other displays on earth-moving machinery as defined in ISO 6165. It is also applicable to other types of self-propelled work machines designed to operate off public roads.

2 Normative references

The following referenced documents are indispensable for the application 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 — Vocabulary*

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

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

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.

3.1
symbol
visually perceptible figure with a particular meaning, used to transmit information independently of language, produced by drawing, printing or other means

4 General

4.1 Symbols shall be as shown in succeeding clauses of this part of ISO 6405. However, selected symbols which are shown in outline form in this part of ISO 6405 may be filled in actual use for clarity of reproduction and improved visual perception by the operator, except as otherwise noted for individual symbols.

4.2 Limitations inherent in some reproduction and display technologies could require increased line thickness or other minor modifications of symbols. Such modifications are acceptable, provided the symbol remains unchanged in its basic graphical elements and is easily discernible by the operator.

4.3 Additionally, 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 may be necessary to change the line thickness or to round off the corners of the symbol. The graphical designer is normally free to make such changes, provided that the essential perceptible characteristics of the symbol are maintained. See IEC 80416-1 and IEC 80416-3.

4.4 For actual use, all symbols shall be reproduced large enough to be easily discernible by the operator. See IEC 80416-3 for guidelines on the proper sizing of symbols. Symbols shall be used in the orientations shown in this part of ISO 6405, unless otherwise noted for individual symbols.

4.5 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.

EXAMPLE Symbol 8.4 (engine lubricating oil filter) is a composite of Symbols 6.1 (engine), 6.5 (oil) and 6.11 (filter).

4.6 If a symbol shows a machine or parts of a machine in a side view, a machine moving from left to right in the symbol area shall be assumed. If a symbol shows a machine or parts of a machine in a top (overhead) view, a machine moving from bottom to top in the symbol area shall be assumed.

4.7 Symbols on controls and displays shall have a good contrast to their background. A light-coloured symbol on a dark-coloured background is preferred for most controls. Displays may use either a light-coloured symbol on a dark-coloured background or a dark-coloured symbol on a light-coloured background, depending upon which alternative provides the best visual perception. When a symbol image is reversed (for example black to white or vice versa), this shall be done for the entire symbol.

4.8 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 symbol shall effect the function depicted by that symbol.

4.9 Arrows used in symbols shall conform to the requirements of ISO 80416-2, while 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.

4.10 ISO/IEC registration numbers are shown for symbols in this part of ISO 6405. Registration numbers below 5000 refer to ISO 7000. Registration numbers above 5000 refer to IEC 60417.

NOTE Symbol originals are approved and registered by ISO/TC 145/SC 3 and published in ISO 7000. In some cases, modified or application symbols, rather than the original symbols, are standardized in this part of ISO 6405.

4.11 Letters and numerals may be used as symbols. In 9.8 to 9.17, letters and numerals have the meaning indicated when used in association with transmission gear controls and displays on earth-moving machinery. The fonts shown in this part of ISO 6405 are not intended to be restrictive: other fonts may be substituted, but care shall be taken that legibility is maintained.

NOTE Letters and numerals are not registered by ISO/TC 145/SC 3 or published in ISO 7000.

4.12 Symbols in this part of ISO 6405 are presented at 32 % of symbol original size. The grid marks "∟" denote the corners of the 75 mm square of the graphics grid from IEC 80416-1. The grid marks are not part of the symbol, but are provided to ensure consistent presentation of all symbol graphics.

5 Colour

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

— red: failure or serious malfunction, requires immediate attention;

— yellow or amber: outside normal operating limits;

— green: normal operating condition.

5.2 In addition, certain colours shall be used for specific functions:

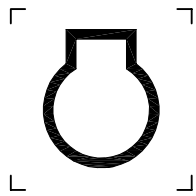
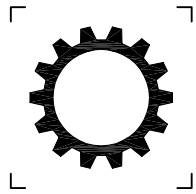
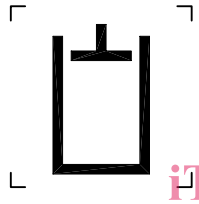
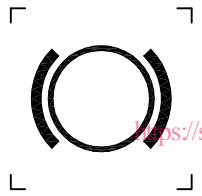
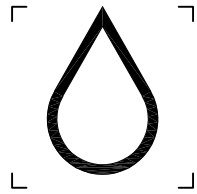
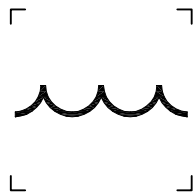
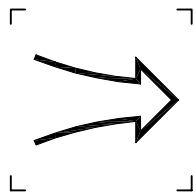
— blue: “high beam; main beam” display (see 13.1);

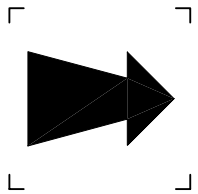
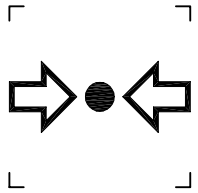
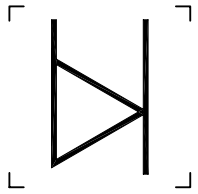
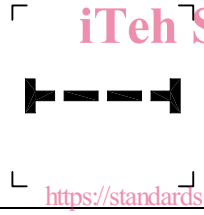
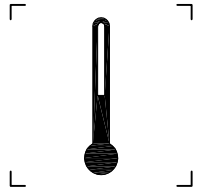
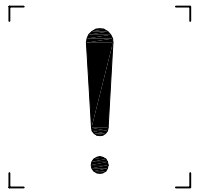
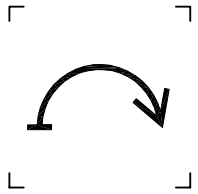
— red: “hazard warning” display (see 13.6);

— green: “turn signal” display (see 13.10).

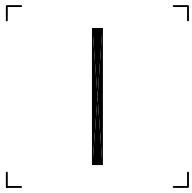
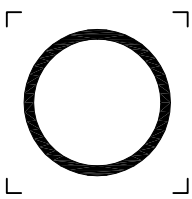
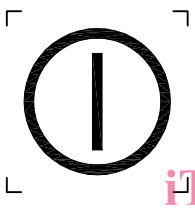
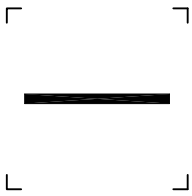
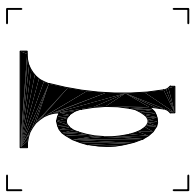
5.3 If colour is used on symbols for heating and/or cooling systems, the colour red shall be used to indicate hot, and the colour blue shall be used to indicate cold.

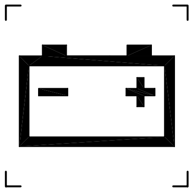
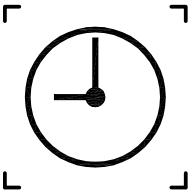
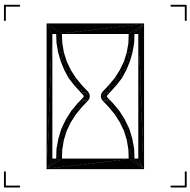
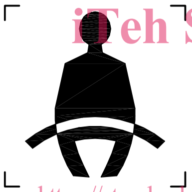
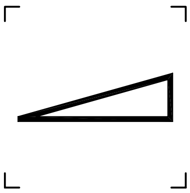
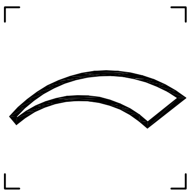
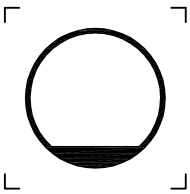
6 Base symbols

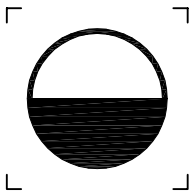
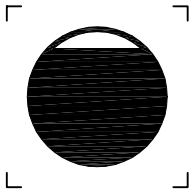
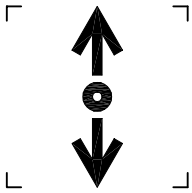
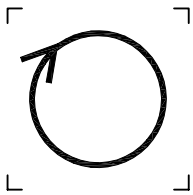
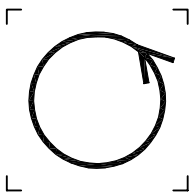
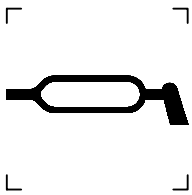
Symbol number	Symbol	Description/application	ISO/IEC registration number
6.1		Engine; reciprocating internal combustion engine	ISO 7000-1156
6.2		Transmission	ISO 7000-1166-A
6.3		Hydraulic system	ISO 7000-1409
6.4		Brake system	ISO 7000-1399
6.5		Oil; fluid	ISO 7000-1056
6.6		Water; fluid; coolant	ISO 7000-0536
6.7		Intake air It shall be used only as a symbol element in combination with other symbols (e.g. engine), and shall be in outline for all applications.	ISO 7000-1604

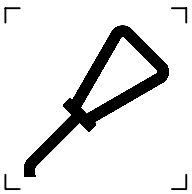
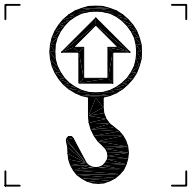
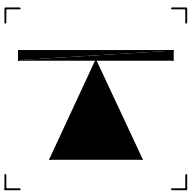
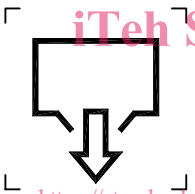
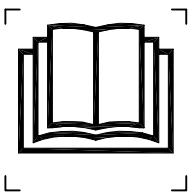
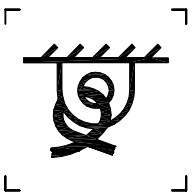
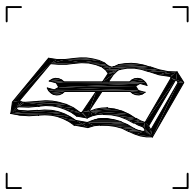
Symbol number	Symbol	Description/application	ISO/IEC registration number
6.8		Exhaust gas It shall be used only as a symbol element in combination with other symbols (e.g. engine), and shall be filled in for all applications.	ISO 7000-1605
6.9		Pressure	ISO 7000-1701
6.10		Level indicator	Application of ISO 7000-0159
6.11		Filter	ISO 7000-1369
6.12		Temperature	ISO 7000-0034
6.13		Malfunction, general; failure	ISO 7000-1603-B
6.14		Start/crank Normally used on the engine start switch.	ISO 7000-1365

7 General symbols

Symbol number	Symbol	Description/application	ISO/IEC registration number
7.1		On; start	Application of IEC 60417-5007
7.2		Off; stop	Application of IEC 60417-5008
7.3		On and off	Application of IEC 60417-5010
7.4		Plus; increase; positive polarity	Application of IEC 60417-5005
7.5		Minus; decrease; negative polarity	Application of IEC 60417-5006
7.6		Horn	ISO 7000-0244
7.7		Lighter	ISO 7000-0620

Symbol number	Symbol	Description/application	ISO/IEC registration number
7.8		Battery charging condition	ISO 7000-0247
7.9		Clock; time switch; timer	IEC 60417-5184
7.10		Hourmeter; elapsed operating hours	ISO 7000-1366
7.11		Seatbelt, lap belt only	ISO 7000-1702
7.12		Variability, linear adjustment	IEC 60417-5004
7.13		Variability, rotational adjustment	ISO 7000-1364
7.14		Volume, empty	ISO 7000-1563

Symbol number	Symbol	Description/application	ISO/IEC registration number
7.15		Volume, half-full	ISO 7000-1564
7.16		Volume, full	ISO 7000-1565
7.17		Control lever operating direction, dual-direction Place appropriate symbols at extremes of directional arrows.	ISO 7000-1436
7.18		Control lever operating direction, multiple-direction Place appropriate symbols at extremes of directional arrows.	ISO 7000-1703
7.19		Clockwise rotation	ISO 7000-0258
7.20		Anti-clockwise rotation	ISO 7000-0937
7.21		Grease lubrication point; lubricate with grease; grease lubrication	ISO 7000-0787

Symbol number	Symbol	Description/application	ISO/IEC registration number
7.22		Oil lubrication point; lubricate with oil; lubricating oil	Application of ISO 7000-0391
7.23		Lift point	ISO 7000-1368
7.24		Jack support point; central support	ISO 7000-0542
7.25		Draining; emptying	ISO 7000-0029
7.26		Read operator's manual	ISO 7000-0790
7.27		Tie down point	ISO 7000-2069
7.28		Service indicator; read technical manual	ISO 7000-1659