

INTERNATIONAL
STANDARD

ISO
7296-2

First edition
1996-12-15

Cranes — Graphical symbols —

Part 2:
Mobile cranes

Appareils de levage à charge suspendue — Symboles graphiques —

Partie 2: Grues mobiles



Reference number
ISO 7296-2:1996(E)

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.

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.

International Standard ISO 7296-2 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 6, *Mobile cranes*.

ISO 7296 will consist of the following parts, under the general title *Cranes* — *Graphical symbols*:

- *Part 1: General*
- *Part 2: Mobile cranes*
- *Part 3: Tower cranes*
- *Part 4: Jib cranes*
- *Part 5: Overhead travelling and portal bridge cranes*

Annex A of this part of ISO 7296 is for information only.

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Cranes — Graphical symbols —

Part 2: Mobile cranes

1 Scope

This part of ISO 7296 establishes graphical symbols for use on operator controls and other displays on mobile cranes as defined in ISO 4306-2.

NOTES

1 Any ambiguity between the graphical symbols in this part of ISO 7296 and those in ISO 7296-1 will be resolved in the next revision of ISO 7296-1.

2 The foreword lists other parts of ISO 7296 where graphical symbols for specific forms of machinery and equipment may be found.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7296. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7296 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3461:1988, *General principles for the creation of graphical symbols — Part 1: Graphical symbols for use on equipment*.

ISO 4196:1984, *Graphical symbols — Use of arrows*.

ISO 4306-2:1985, *Lifting appliances — Vocabulary — Part 2: Mobile cranes*.

3 Definition

For the purposes of this part of ISO 7296, the following definition applies.

3.1 graphical symbol: Visually perceptible figure used to transmit information independently of language, produced by drawing, printing, or other means.

NOTE 3 The term symbol is used in the text in place of “graphical symbol” for simplicity.

4 General

4.1 Symbols shall be as shown in succeeding clauses of this part of ISO 7296. However, symbols which are shown in outline form may be filled, when actually used, for enhanced 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 may 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 the graphical symbol is applied, it may be necessary to change the line thickness or to round the corners of a symbol. The graphical designer is normally free to make such changes, provided that the essential perceptual characteristics of the symbol are maintained. See ISO 3461-1:1988, 10.2.

4.4 For actual use, all symbols shall be reproduced large enough to be easily discernible by the operator. See ISO 3461-1 for guidelines on the proper sizing of symbols. Symbols shall be used in the orientations shown in this part of ISO 7296 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.

4.6 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 grid area shall be assumed. If a symbol shows a machine or parts of a machine from an overhead (top) view, a machine moving from bottom to top across the symbol grid area shall be assumed.

4.7 Symbols on controls and displays shall have good contrast to their background. A light symbol on a dark background is preferred for most controls. Displays may use either a light symbol on a dark background or a dark symbol on a light 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 and vice versa), it 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 4196. ISO 3461-1 shall be consulted for the general principles of creating symbols.

4.10 ISO/IEC registration numbers are shown for symbols in this part of ISO 7296. Registration numbers below 5000 refer to ISO 7000. Registration numbers above 5000 refer to IEC 417.

4.11 Letters and numerals may be used as symbols, but are not registered by ISO/TC 145 or published in ISO 7000. In certain clauses, letters and numerals have the meaning indicated when used in association with transmission gear controls and displays on mobile cranes. The founts shown in this part of ISO 7296 are not intended to be restrictive: other founts may be substituted, but care shall be taken to ensure that legibility is maintained.

4.12 Symbols in this part of ISO 7296 are presented at 32% of original size. The grid marks "L" denote the corners of the 75 mm square graphics grid from ISO 3461-1. The grid marks are not part of the symbol, but are provided to ensure consistent presentation of all symbol graphics.

4.13 Microfiches of the symbols are available from the ISO/TC 145 Secretariat.

5 Colour

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

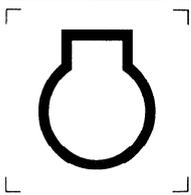
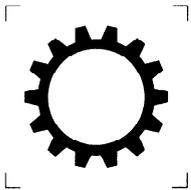
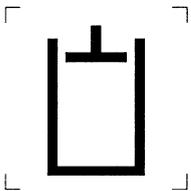
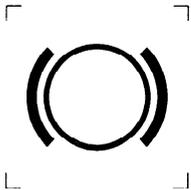
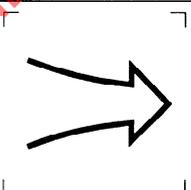
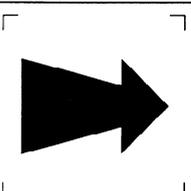
- red: failure, serious malfunction, or dangerous operating condition that requires immediate attention;
- yellow or amber: approaching a dangerous operating condition;
- green: normal operating condition.

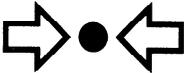
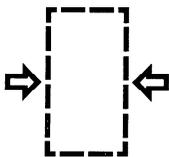
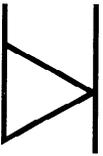
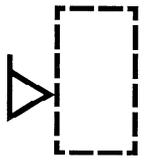
5.2 In addition, certain colours are used for specific functions;

- blue: headlight main/high beam display;
- red: hazard warning display;
- green: turn signal display.

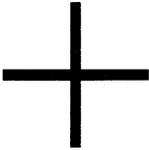
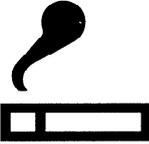
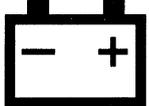
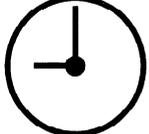
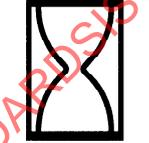
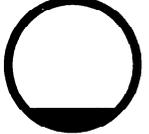
5.3 If colour is used on symbols for heating and/or cooling systems, the colour red shall be used to indicate hot and the colour blue shall be used to indicate cold.

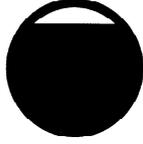
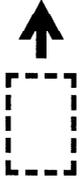
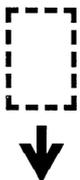
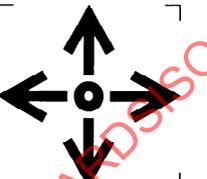
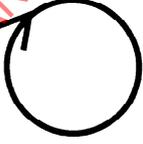
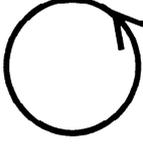
6 Basic symbol shapes

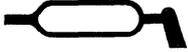
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6.1		Engine	1156
6.2		Transmission	1166
6.3		Hydraulic system	1409
6.4		Brake system	1399
6.5		Oil	1056
6.6		Coolant (water)	0536
6.7		Intake air [To be used as symbol element only in combination with other symbols (e.g., engine). Shall be an outline in all applications.]	1604
6.8		Exhaust gas [To be used as symbol element only in combination with other symbols (e.g., engine). Shall be filled in all applications.]	1605

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
6.9		Pressure (To be used as an independent symbol where the medium under pressure is not specified.)	1701
6.10		Pressure (For the creation of a combined symbol where the medium under pressure is specified, replace the dashed rectangle with a symbol for the medium.)	Application examples are not registered
6.11		Level indicator	Application of 0159
6.12		Liquid level (For the creation of a combined symbol where the fluid being measured is specified, replace the dashed rectangle with a symbol for the fluid.)	Application examples are not registered
6.13		Filter	1369
6.14		Failure/malfunction	1603
6.15		Temperature	0034
6.16		Start switch/mechanism	1365

7 General symbols

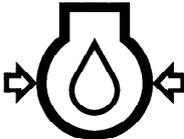
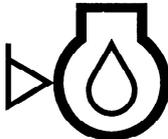
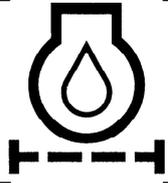
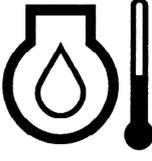
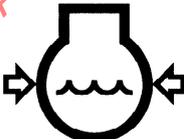
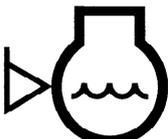
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
7.1		Plus/increase/positive polarity	5005
7.2		Minus/decrease/negative polarity	5006
7.3		Lighter	0620
7.4		Battery	0247
7.5		Clock/time switch/timer	5184
7.6		Hourmeter/elapsed operating hours	1366
7.7		Seatbelt — Lap belt only	1702
7.8		Volume — Empty	1563

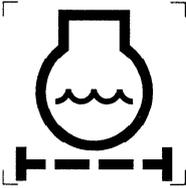
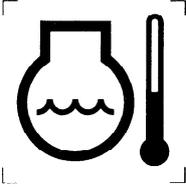
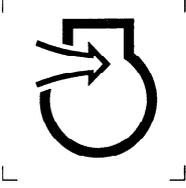
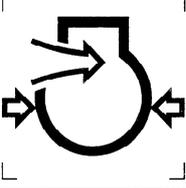
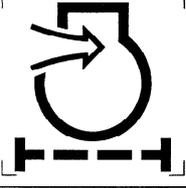
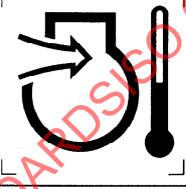
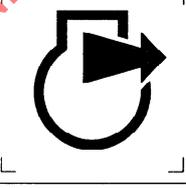
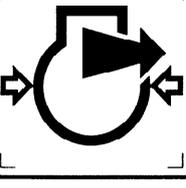
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
7.9		Volume — Half-full	1564
7.10		Volume — Full	1565
7.11		Machine travel direction — Forwards (Replace dashed rectangle with appropriate symbol. May be rotated 90° counter-clockwise for side view of forward travel direction.)	Application examples are not registered
7.12		Machine travel direction — Backwards (Replace dashed rectangle with appropriate symbol. May be rotated 90° counter-clockwise for side view of backwards travel direction.)	Application examples are not registered
7.13		Control lever operating direction — Dual direction (Place appropriate symbols at extremes of directional arrows.)	1436
7.14		Control lever operating direction — Multiple direction (Place appropriate symbols at extremes of directional arrows.)	1703
7.15		Clockwise rotation	0258
7.16		Counter-clockwise rotation	0937

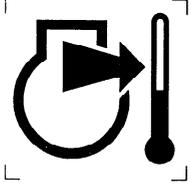
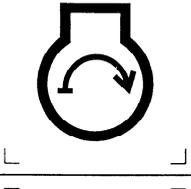
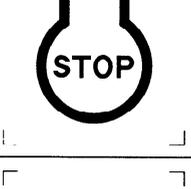
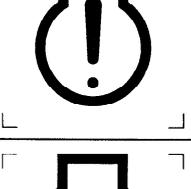
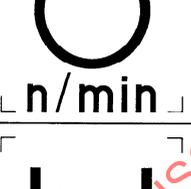
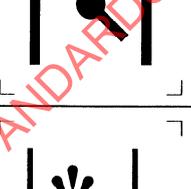
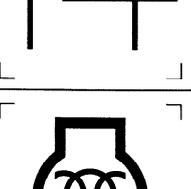
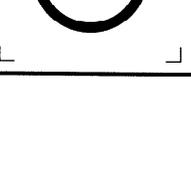
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
7.17		Grease lubrication point	0787
7.18		Oil lubrication point	0391
7.19		Lift point	1368
7.20		Jack or support point	0542
7.21		Read operator's manual	0790
7.22		Lock	1656

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8 Engine symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
8.1		Engine lubricating oil (If engine lubricating oil level alone is to be displayed, this symbol may be used to indicate level.)	1372
8.2		Engine lubricating oil — Pressure	1374
8.3		Engine lubricating oil — Level	1373
8.4		Engine lubricating oil — Filter	1376
8.5		Engine lubricating oil — Temperature	1375
8.6		Engine coolant (If engine coolant level alone is to be displayed, this symbol may be used to indicate level.)	1377
8.7		Engine coolant — Pressure	1379
8.8		Engine coolant — Level	1378

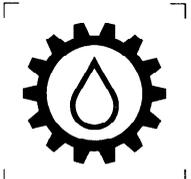
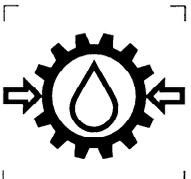
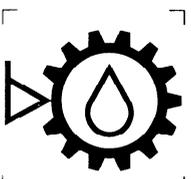
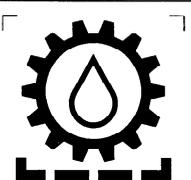
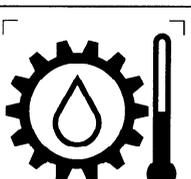
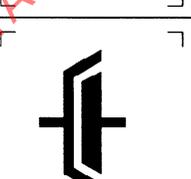
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
8.9		Engine coolant — Filter	1562
8.10		Engine coolant — Temperature	1380
8.11		Engine intake/combustion air	1381
8.12		Engine intake/combustion air — Pressure	1382
8.13		Engine intake/combustion air — Filter	1170
8.14		Engine intake/combustion air — Temperature	1383
8.15		Engine exhaust gas	1384
8.16		Engine exhaust gas — Pressure	1385

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
8.17		Engine exhaust gas — Temperature	1386
8.18		Engine — Start	1387
8.19		Engine — Stop	1388
8.20		Engine — Failure/malfunction	1371
8.21		Engine — Rotational speed/frequency	1389
8.22		Choke	0243
8.23		Primer (start aid)	1370
8.24		Electrical preheat (low temperature start aid)	1704

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
8.25		Gas injection (low temperature start aid)	1547

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9 Transmission symbols

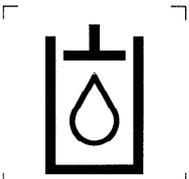
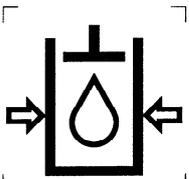
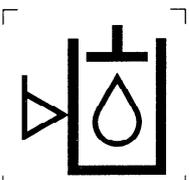
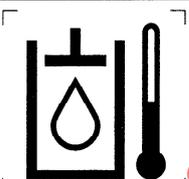
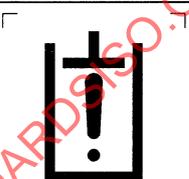
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
9.1		Transmission oil (If transmission oil level alone is to be displayed, this symbol may be used to indicate level.)	1397
9.2		Transmission oil — Pressure	1167
9.3		Transmission oil — Level	1398
9.4		Transmission oil — Filter	1169
9.5		Transmission oil — Temperature	1168
9.6		Transmission oil — Failure/malfunction	1396
9.7		Clutch	1308

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
9.8	┌ ┐ N └ ┘	Neutral	Letters used as symbols are not registered
9.9	┌ ┐ H └ ┘	High	Letters used as symbols are not registered
9.10	┌ ┐ L └ ┘	Low	Letters used as symbols are not registered
9.11	┌ ┐ F └ ┘	Forward	Letters used as symbols are not registered
9.12	┌ ┐ R └ ┘	Reverse	Letters used as symbols are not registered
9.13	┌ ┐ P └ ┘	Park	Letters used as symbols are not registered
9.14	┌ ┐ 1 └ ┘	First gear	Numbers used as symbols are not registered
9.15	┌ ┐ 2 └ ┘	Second gear	Numbers used as symbols are not registered

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
9.16	┌ ┐ 3 └ ┘	Third gear (Use sequential numbers as needed for additional forward gears: 4 for fourth gear, etc.)	Numbers used as symbols are not registered
9.17	┌ ┐ R1 └ ┘	Reverse first gear (Use sequential numbers as needed for additional reverse gears: R2 for reverse second gear, etc.)	Letters and numbers used as symbols are not registered

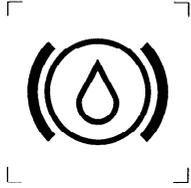
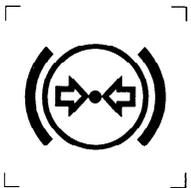
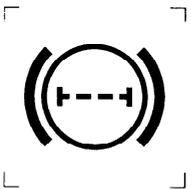
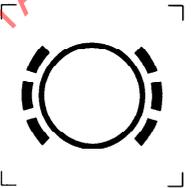
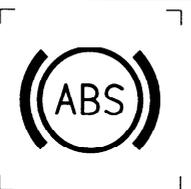
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10 Hydraulic system symbols

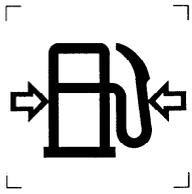
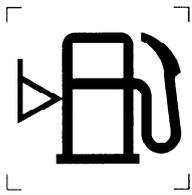
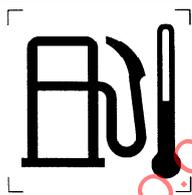
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
10.1		Hydraulic oil (If hydraulic oil level alone is to be displayed, this symbol may be used to indicate level.)	1411
10.2		Hydraulic oil — Pressure	1413
10.3		Hydraulic oil — Level	1412
10.4		Hydraulic oil — Filter	1415
10.5		Hydraulic oil — Temperature	1414
10.6		Hydraulic system — Failure/malfunction	1410

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11 Brake system symbols

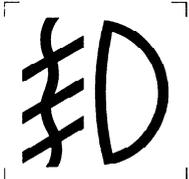
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
11.1		Brake oil/fluid (If brake oil/fluid level alone is to be displayed, this symbol may be used to indicate level.)	1400
11.2		Brake system — Pressure	1402
11.3		Brake system — Filter	1404
11.4		Brake system — Temperature	1403
11.5		Brake system — Failure/malfunction	0239
11.6		Parking brake	0238
11.7		Worn brake linings	1408
11.8		Anti-lock brake system — Failure/malfunction	1407

12 Fuel symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
12.1		Fuel (If fuel level alone is to be displayed, this symbol may be used to indicate level. The type of fuel may be indicated inside the symbol.)	0245
12.2		Fuel — Pressure	1392
12.3		Fuel — Level	1551
12.4		Fuel — Filter	1393
12.5		Fuel — Temperature	1394
12.6		Fuel system — Failure/malfunction	1391
12.7		Fuel shut-off (Not to be used as engine stop symbol)	1395 (second version)
12.8		Diesel (compressor-ignition) fuel	1541

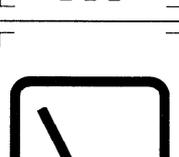
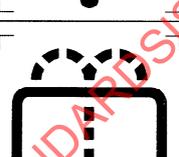
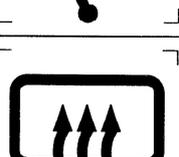
13 Lighting symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
13.1		Headlights — Main/high beam	0082
13.2		Headlights — Dipped/low beam	0083
13.3		Worklight; floodlight	1204
13.4		Parking light	0240
13.5		Hazard warning lights	0085
13.6		Beacon	1141 (second version)
13.7		Clearance/position lights	0456
13.8		Turn signals	0084

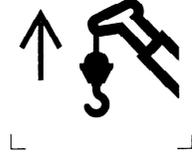
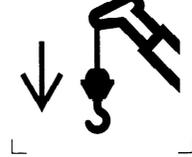
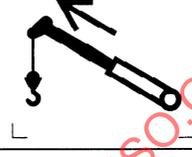
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
13.9		Front fog-lights (If one control is used for both front and rear fog-lights, the symbol designated front fog-lights shall be used.)	0633
13.10		Rear fog-lights (If one control is used for both front and rear fog-lights, the symbol designated front fog-lights shall be used.)	0634

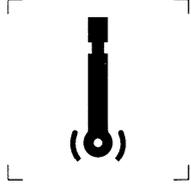
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14 Window symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
14.1		Windscreen/windshield wiper	0086
14.2		Windscreen/windshield washer	0088
14.3		Windscreen/windshield washer and wiper	0087
14.4		Windscreen/windshield demister/defroster	0635
14.5		Rear window wiper	0097
14.6		Rear window washer	0099
14.7		Rear window washer and wiper	0098
14.8		Rear window demister/defroster	0636

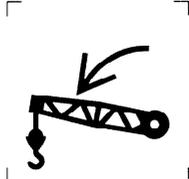
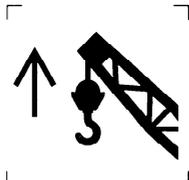
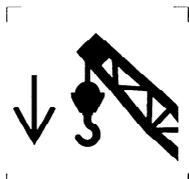
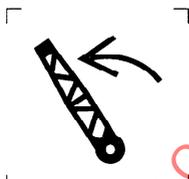
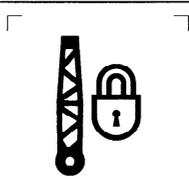
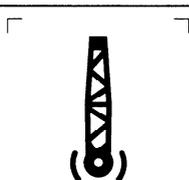
15 Telescoping jib (boom) crane symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
15.1		Jib (boom) — Luffing up (raise)	2220
15.2		Jib (boom) — Luffing down (lower)	2221
15.3		Load — Hoist	2222
15.4		Load — Lower	2223
15.5		Telescope — Extend	2224
15.6		Telescope — Retract	2225
15.7		Jib (boom) — Slew left	2226

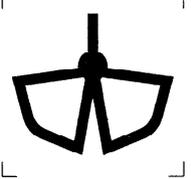
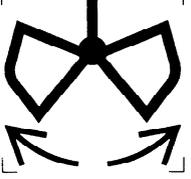
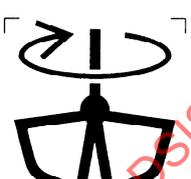
Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
15.8		Jib (boom) — Slew right	2227
15.9		Jib (boom) — Slew lock	2228
15.10		Jib (boom) — Slew brake	2229

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16 Fixed length jib (boom) crane symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
16.1		Jib (boom) — Luffing up (raise)	2230
16.2		Jib (boom) — Luffing down (lower)	2231
16.3		Load — Hoist	2232
16.4		Load — Lower	2233
16.5		Jib (boom) — Slew left	2234
16.6		Jib (boom) — Slew right	2235
16.7		Jib (boom) — Slew lock	2236
16.8		Jib (boom) — Slew brake	2237

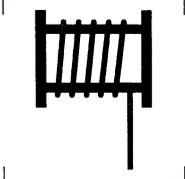
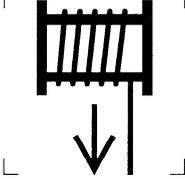
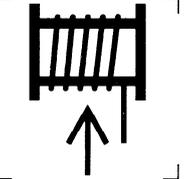
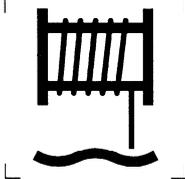
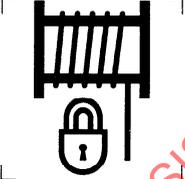
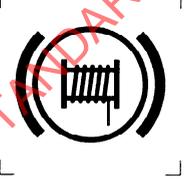
17 Clamshell bucket symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
17.1	 A clamshell bucket symbol consisting of a central vertical stem with a horizontal line at the top, and two curved, bowl-like shapes extending downwards and outwards from the stem. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Basic symbol	1494
17.2	 A clamshell bucket symbol with two curved arrows pointing outwards from the bottom of the bucket, indicating an open state. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Open	1495
17.3	 A clamshell bucket symbol with two curved arrows pointing inwards towards the bottom of the bucket, indicating a closing state. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Close	1496
17.4	 A clamshell bucket symbol with a horizontal line above the stem and two curved arrows pointing outwards from the ends of this line, indicating a rotation. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Rotate	2082
17.5	 A clamshell bucket symbol with a horizontal line above the stem and a single curved arrow pointing clockwise from the left end of the line, indicating a clockwise rotation. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Rotate clockwise	1497
17.6	 A clamshell bucket symbol with a horizontal line above the stem and a single curved arrow pointing counter-clockwise from the right end of the line, indicating a counter-clockwise rotation. The symbol is enclosed in a square frame with corner brackets.	Clamshell bucket — Rotate counter-clockwise	1498

18 Grapple symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
18.1		Grapple — Basic symbol	1499
18.2		Grapple — Open	1500
18.3		Grapple — Close	1501
18.4		Grapple — Rotate	1502
18.5		Grapple — Rotate clockwise	2083
18.6		Grapple — Rotate counter-clockwise	2084

19 Winch symbols

Symbol number	Symbol form/shape	Symbol description/application	ISO/IEC registration number
19.1		Winch — Basic symbol	1176
19.2		Winch — Spool out	1539
19.3		Winch — Spool in	1538
19.4		Winch — Free spool	1540
19.5		Winch — Lock	2070
19.6		Winch — Brake	2071