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:

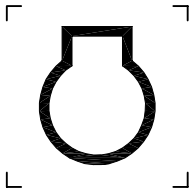
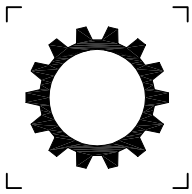
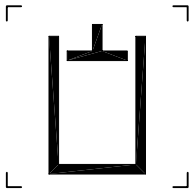
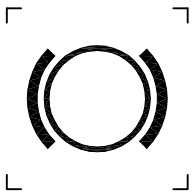
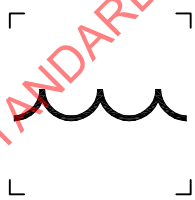
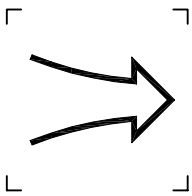
— blue: “high beam; main beam” display (see 13.1);

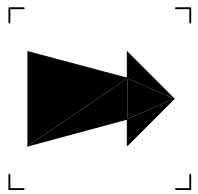
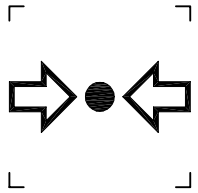
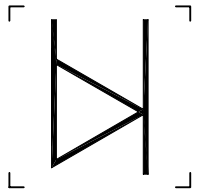
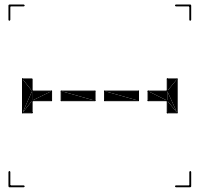
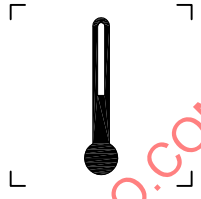
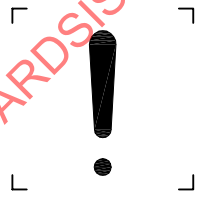
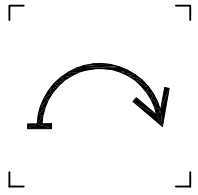
— red: “hazard warning” display (see 13.6);

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

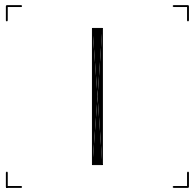
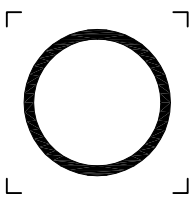
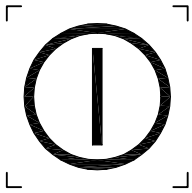
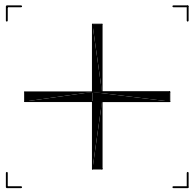
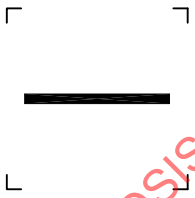
5.3 If colour is used on symbols for heating and/or cooling systems, the colour red shall be used to indicate hot, and the colour blue shall be used to indicate cold.

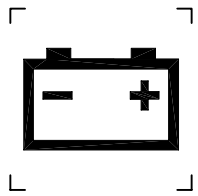
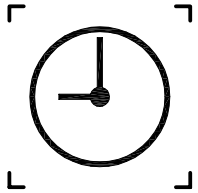
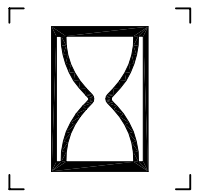
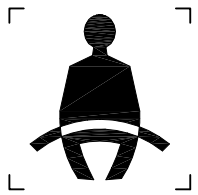
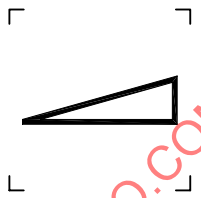
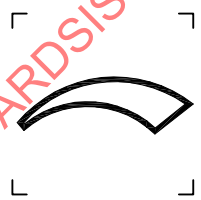
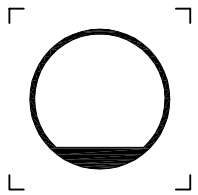
6 Base symbols

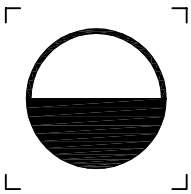
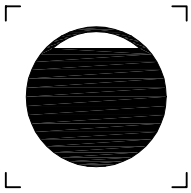
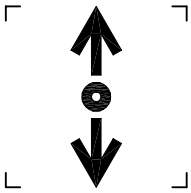
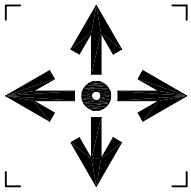
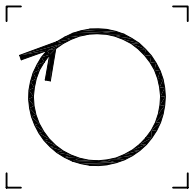
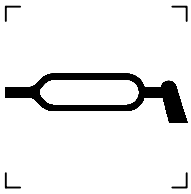
Symbol number	Symbol	Description/application	ISO/IEC registration number
6.1		Engine; reciprocating internal combustion engine	ISO 7000-1156
6.2		Transmission	ISO 7000-1166-A
6.3		Hydraulic system	ISO 7000-1409
6.4		Brake system	ISO 7000-1399
6.5		Oil; fluid	ISO 7000-1056
6.6		Water; fluid; coolant	ISO 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

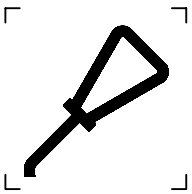
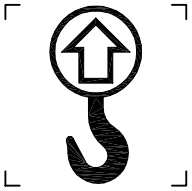
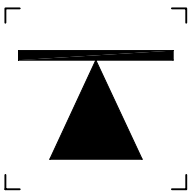
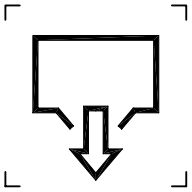
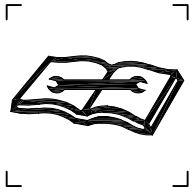
Symbol number	Symbol	Description/application	ISO/IEC registration number
6.8		Exhaust gas It shall be used only as a symbol element in combination with other symbols (e.g. engine), and shall be filled in for all applications.	ISO 7000-1605
6.9		Pressure	ISO 7000-1701
6.10		Level indicator	Application 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

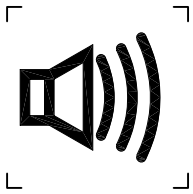
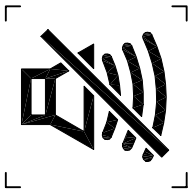
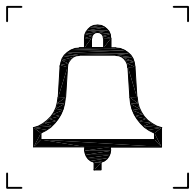
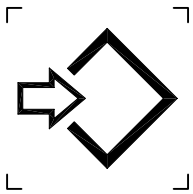
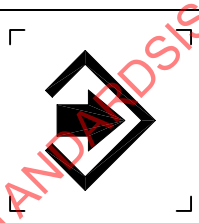
7 General symbols

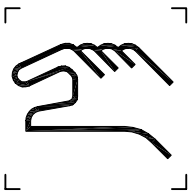
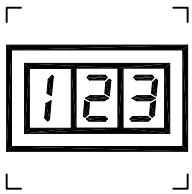
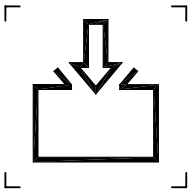
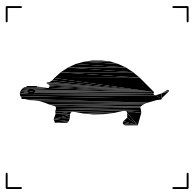
Symbol number	Symbol	Description/application	ISO/IEC registration number
7.1		On; start	Application of IEC 60417-5007
7.2		Off; stop	Application of IEC 60417-5008
7.3		On and off	Application of IEC 60417-5010
7.4		Plus; increase; positive polarity	Application of IEC 60417-5005
7.5		Minus; decrease; negative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

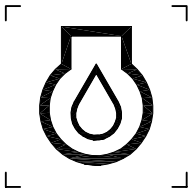
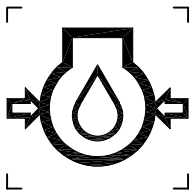
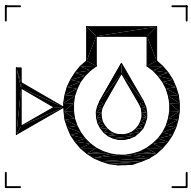
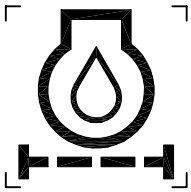
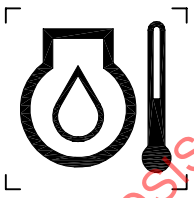
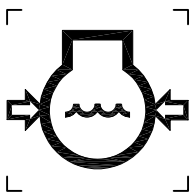
Symbol number	Symbol	Description/application	ISO/IEC registration number
7.15		Volume, half-full	ISO 7000-1564
7.16		Volume, full	ISO 7000-1565
7.17		Control lever operating direction, dual-direction Place appropriate symbols at extremes of directional arrows.	ISO 7000-1436
7.18		Control lever operating 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

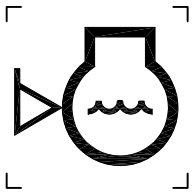
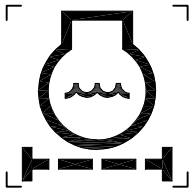
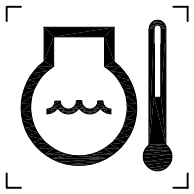
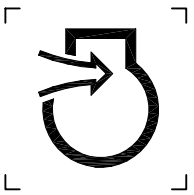
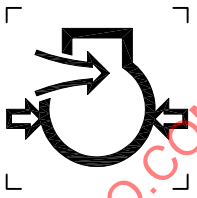
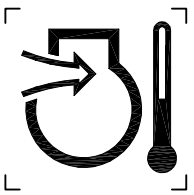
Symbol number	Symbol	Description/application	ISO/IEC registration number
7.22		Oil lubrication point; lubricate with oil; lubricating oil	Application of ISO 7000-0391
7.23		Lift point	ISO 7000-1368
7.24		Jack support point; central support	ISO 7000-0542
7.25		Draining; emptying	ISO 7000-0029
7.26		Read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

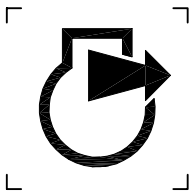
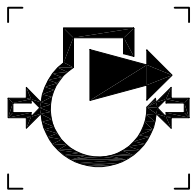
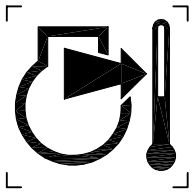
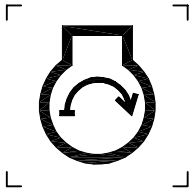
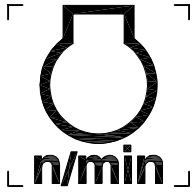
Symbol number	Symbol	Description/application	ISO/IEC registration number
7.29		Moving machine alarm; rearward moving vehicle alarm	ISO 7000-2104
7.30		Rearward moving vehicle alarm, cancel	ISO 7000-2240
7.31		Radar sensor	ISO 7000-2241
7.32		Urgent alert indicator Use as a universal alert calling attention to another (already existing) symbol.	ISO 7000-2301
7.33		Enter data Use to identify the *Enter data* control on electronic performance monitor.	Application of ISO 7000-1025
7.34		Save entered data Use to identify the *save previously entered data* control on electronic performance monitor.	ISO 7000-2167
7.35		Cancel entered data Use to identify the *cancel previously entered data* control on electronic performance monitor.	Application of ISO 7000-1028

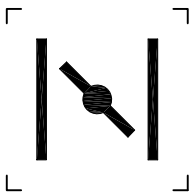
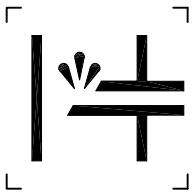
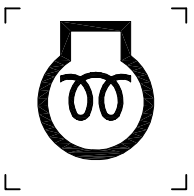
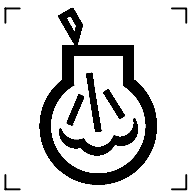
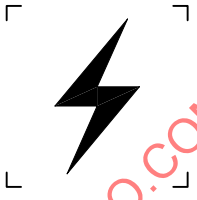
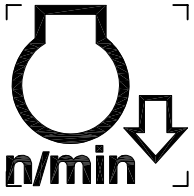
Symbol number	Symbol	Description/application	ISO/IEC registration number
7.36		Manual control; manual operation; manual start	ISO 7000-0096
7.37		Digital counter	ISO 7000-2168
7.38		Filling	ISO 7000-0028
7.39		Roadway travel mode Use to indicate that the machine is set up for travel on public highways.	ISO 7000-2310
7.40		Battery disconnect; battery shut-off	ISO 7000-2063
7.41		Fast	For information, symbol not registered
7.42		Slow	For information, symbol not registered

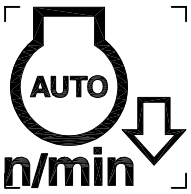
8 Engine symbols

Symbol number	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.	ISO 7000-1372
8.2		Engine lubricating oil pressure	ISO 7000-1374
8.3		Engine lubricating oil level	ISO 7000-1373
8.4		Engine lubricating oil filter	ISO 7000-1376
8.5		Engine lubricating oil temperature	ISO 7000-1375
8.6		Engine coolant If *engine coolant level* alone is to be displayed, this symbol may be used to indicate level.	ISO 7000-1377
8.7		Engine coolant pressure	ISO 7000-1379

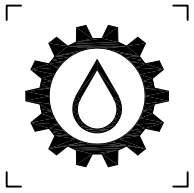
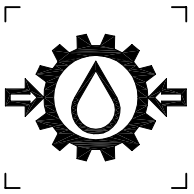
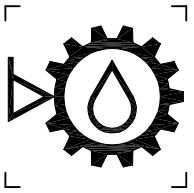
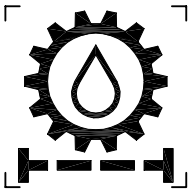
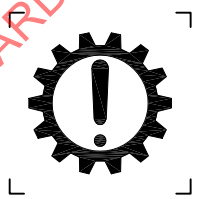
Symbol number	Symbol	Description/application	ISO/IEC registration number
8.8		Engine coolant level	ISO 7000-1378
8.9		Engine coolant filter	ISO 7000-1562
8.10		Engine coolant temperature	ISO 7000-1380
8.11		Engine intake; combustion air	ISO 7000-1381
8.12		Engine intake pressure; combustion air pressure	ISO 7000-1382
8.13		Engine intake air filter; combustion air filter	ISO 7000-1170
8.14		Engine intake air temperature; combustion air temperature	ISO 7000-1383

Symbol number	Symbol	Description/application	ISO/IEC registration number
8.15		Engine exhaust gas	ISO 7000-1384
8.16		Engine exhaust gas pressure	ISO 7000-1385
8.17		Engine exhaust gas temperature	ISO 7000-1386
8.18		Engine start	ISO 7000-1387
8.19		Engine stop	ISO 7000-1388
8.20		Engine failure; engine malfunction	ISO 7000-1371
8.21		Engine rotational speed (revolutions per minute)	Application of ISO 7000-1389

Symbol number	Symbol	Description/application	ISO/IEC registration number
8.22		Choke; cold starting aid	ISO 7000-0243
8.23		Engine start aid, primer	ISO 7000-1370
8.24		Engine, electrical preheat (low temperature start aid)	ISO 7000-1704
8.25		Engine start aid, gas injection	ISO 7000-1547
8.26		Electrical power, accessories Normally used to identify a key switch position on the starter control, it may also be used to denote the electrical system.	ISO 7000-2302
8.27		Engine run Normally used to identify a key switch position on the starter control.	Application of ISO 7000-2303
8.28		Engine rotational speed, instantaneous decrease	Application of ISO 7000-2308

Symbol number	Symbol	Description/application	ISO/IEC registration number
8.29		Engine rotational speed, automatic decrease	Application of ISO 7000-2309

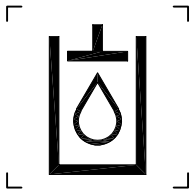
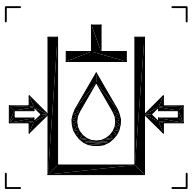
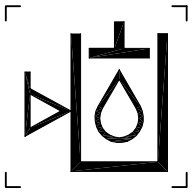
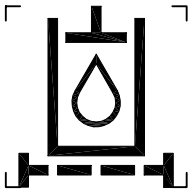
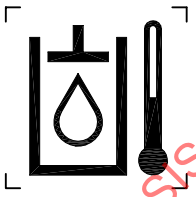
9 Transmission symbols

Symbol number	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.	ISO 7000-1397
9.2		Transmission oil pressure	ISO 7000-1167-A
9.3		Transmission oil level	ISO 7000-1398-A
9.4		Transmission oil filter	ISO 7000-1169
9.5		Transmission oil temperature	ISO 7000-1168-A
9.6		Transmission failure; transmission malfunction	ISO 7000-1396-A
9.7		Clutch	ISO 7000-1308

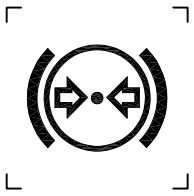
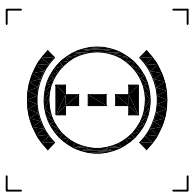
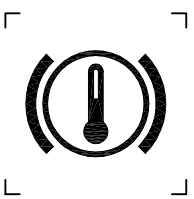
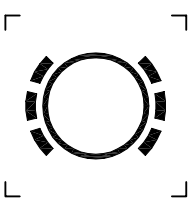
Symbol number	Symbol	Description/application	ISO/IEC registration number
9.8	N	Neutral	Letters used as symbols are not registered.
9.9	H	High	Letters used as symbols are not registered.
9.10	L	Low	Letters used as symbols are not registered.
9.11	F	Forward	Letters used as symbols are not registered.
9.12	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	Numerals used as symbols are not registered.

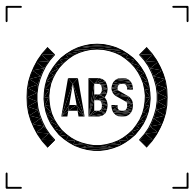
Symbol number	Symbol	Description/application	ISO/IEC registration number
9.15	2	Second gear	Numerals used as symbols are not registered.
9.16	3	Third gear Additional successive numerals may be used until the maximum number of forward gears is reached.	Numerals used as symbols are not registered.
9.17	R1	Reverse first gear Additional successive numerals may be used until the maximum number of reverse gears is reached.	Letters and numerals used as symbols are not registered.
9.18		Transmission creeper gear	For information, symbol not registered
9.19		Worn clutch	ISO 7000-2169

10 Hydraulic system symbols

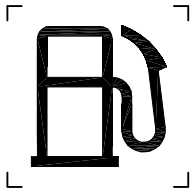
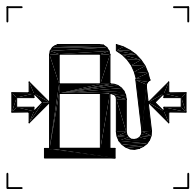
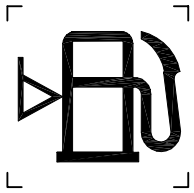
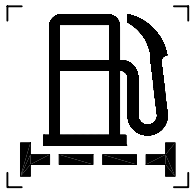
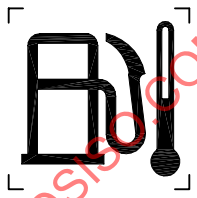
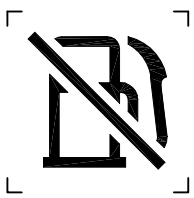
Symbol number	Symbol	Description/application	ISO/IEC registration number
10.1		Hydraulic oil If *hydraulic oil level* alone is to be displayed, this symbol may be used to indicate level.	ISO 7000-1411
10.2		Hydraulic oil pressure	ISO 7000-1413
10.3		Hydraulic oil level	ISO 7000-1412
10.4		Hydraulic oil filter	ISO 7000-1415
10.5		Hydraulic oil temperature	ISO 7000-1414
10.6		Hydraulic system failure/malfunction	ISO 7000-1410

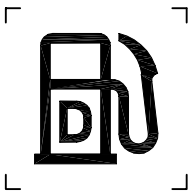
11 Brake symbols

Symbol number	Symbol	Description/application	ISO/IEC registration number
11.1		Brake oil/fluid	ISO 7000-1400
11.2		Brake system pressure	ISO 7000-1402
11.3		Brake system filter	ISO 7000-1404
11.4		Brake system temperature	ISO 7000-1403-A
11.5		Brake failure; brake system malfunction The symbol may also be used to indicate that the machine is operating with a secondary braking system.	Application of ISO 7000-0239
11.6		Parking brake	Application of ISO 7000-0238
11.7		Worn brake linings	ISO 7000-1408

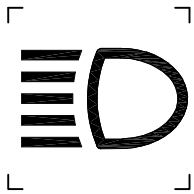
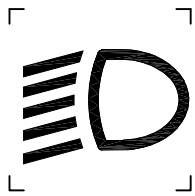
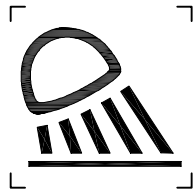
Symbol number	Symbol	Description/application	ISO/IEC registration number
11.8		Anti-lock brake system, failure	ISO 7000-1407

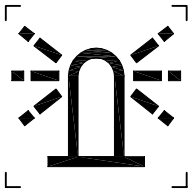
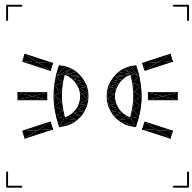
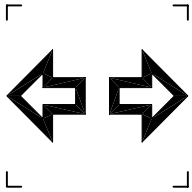
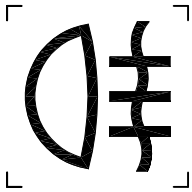
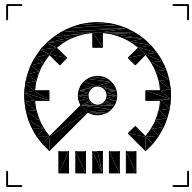
12 Fuel symbols

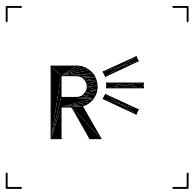
Symbol number	Symbol	Description/application	ISO/IEC registration number
12.1		Fuel If *fuel level* alone is to be displayed, this symbol may be used to indicate level. The type of fuel may be indicated inside or below the symbol.	ISO 7000-0245
12.2		Fuel pressure	ISO 7000-1392
12.3		Fuel level	ISO 7000-1551
12.4		Fuel filter	ISO 7000-1393
12.5		Fuel temperature	ISO 7000-1394
12.6		Fuel system failure/malfunction	ISO 7000-1391
12.7		Fuel shut-off It shall not be used as an *engine stop* symbol.	ISO 7000-1395-B

Symbol number	Symbol	Description/application	ISO/IEC registration number
12.8		Diesel (compression ignition) fuel	ISO 7000-1541

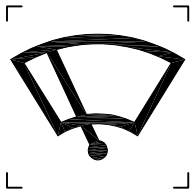
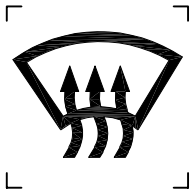
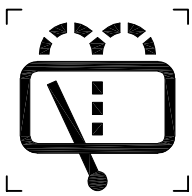
13 Lighting symbols

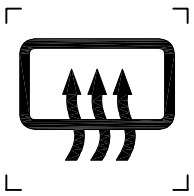
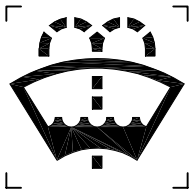
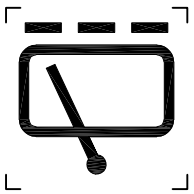
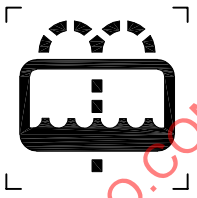
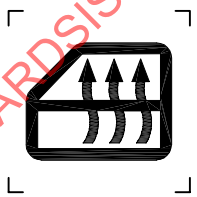
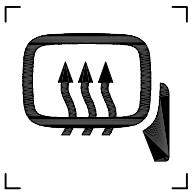
Symbol number	Symbol	Description/application	ISO/IEC registration number
13.1		High beam; main beam	ISO 7000-0082
13.2		Low beam; dipped beam	ISO 7000-0083
13.3		Working light If a single control is used for both front and rear working lights, the symbol designated *working light* shall be used.	Application of ISO 7000-1204
13.4		Rear working light If a single control is used for both front and rear working lights, the symbol designated *working light* shall be used.	Application of ISO 7000-1204
13.5		Parking lights	ISO 7000-0240
13.6		Hazard warning	ISO 7000-0085
13.7		Interior compartment illumination; interior (dome) light	ISO 7000-1421-A

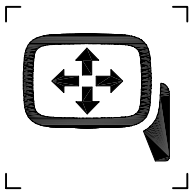
Symbol number	Symbol	Description/application	ISO/IEC registration number
13.8		Identification light; beacon	ISO 7000-1141-B
13.9		Position lights; side lights	ISO 7000-0456
13.10		Turn signals	ISO 7000-0084
13.11		Front fog lights If a single control is used for both front and rear fog lights, the symbol designated *front fog lights* shall be used.	ISO 7000-0633
13.12		Rear fog lights If a single control is used for both front and rear fog lights, the symbol designated *front fog lights* shall be used.	ISO 7000-0634
13.13		Master lighting switch	Application of IEC 60417-5012
13.14		Instrument illumination	ISO 7000-1556

Symbol number	Symbol	Description/application	ISO/IEC registration number
13.15		Reverse/back-up lights	Application of ISO 7000-2304

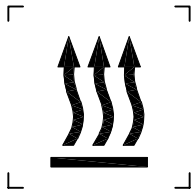
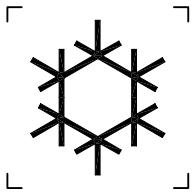
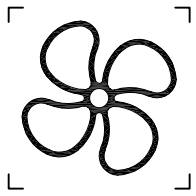
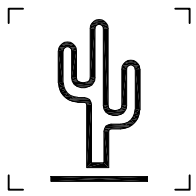
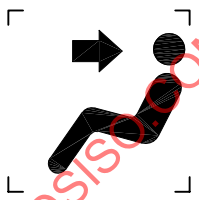
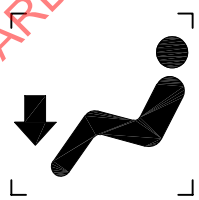
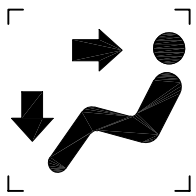
14 Window and visibility symbols

Symbol number	Symbol	Description/application	ISO/IEC registration number
14.1		Windscreen (US: windshield) wiper	ISO 7000-0086
14.2		Windscreen (US: windshield) washer	ISO 7000-0088
14.3		Windscreen (US: windshield) washer and wiper	ISO 7000-0087
14.4		Windscreen (US: windshield) demisting and defrosting	ISO 7000-0635-A
14.5		Rear window wiper	ISO 7000-0097
14.6		Rear window washer	ISO 7000-0099
14.7		Rear window washer and wiper	ISO 7000-0098

Symbol number	Symbol	Description/application	ISO/IEC registration number
14.8		Rear window demisting and defrosting	ISO 7000-0636-A
14.9		Windscreen wiper (US: windshield), intermittent	ISO 7000-0647
14.10		Windscreen (US: windshield) washer fluid	ISO 7000-1422
14.11		Rear window wiper, intermittent	ISO 7000-1424
14.12		Rear window washer fluid	ISO 7000-1423
14.13		Side (lateral) window, demisting and defrosting	ISO 7000-1425
14.14		Exterior rear view mirror heating, horizontal type	ISO 7000-1426

Symbol number	Symbol	Description/application	ISO/IEC registration number
14.15		Exterior rear view mirror adjustment, horizontal type	ISO 7000-1427

15 Climate control symbols

Symbol number	Symbol	Description/application	ISO/IEC registration number
15.1		Interior heating; heater	ISO 7000-0637-A
15.2		Cooling; air conditioning	ISO 7000-0027
15.3		Ventilating fan; air circulating fan	ISO 7000-0089
15.4		Dehumidifier	ISO 7000-2068
15.5		Ventilation air flow, upper air outlet	ISO 7000-1865
15.6		Ventilation air flow, lower air outlet	ISO 7000-1866
15.7		Ventilation air flow, upper and lower air outlets	ISO 7000-1867