

Specification for

Graphical symbols for reciprocating internal combustion engines

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Machinery and Components Standards Policy Committee (MCE/-) to Technical Committee MCE/14, upon which the following bodies were represented:

- Association of Consulting Engineers
- British Railways Board
- Ministry of Defence
- Society of Motor Manufacturers and Traders Ltd.

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Agricultural Engineers' Association
- Association of Manufacturers of Power Generating Systems and Association of British Generating Set Manufacturers
- British Industrial Truck Association
- Department of Transport
- Health and Safety Executive
- Marine Engine and Equipment Manufacturers' Association

This British Standard, having been prepared under the direction of the Machinery and Components Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 October 1993

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The following BSI references relate to the work on this standard:
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National foreword

This British Standard has been prepared under the direction of the Machinery and Components Standards Policy Committee and is identical with ISO 8999:1993 *Reciprocating internal combustion engines — Graphical symbols*, published by the International Organization for Standardization (ISO).

Cross-references

International standard	Corresponding British Standard
ISO 3461-1:1988	BS 7477:1991 <i>Guide for general principles for the creation of graphical symbols for use on equipment</i> (Identical)

The Technical Committee has reviewed the provisions of ISO 3864:1984 and IEC 73:1991 to which normative reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This International Standard specifies graphical symbols for operator controls, gauges, tell-tale indicators and instructions for reciprocating internal combustion (RIC) engines to provide necessary information on their use and operation.

It is applicable to RIC engines for land, rail traction and marine use, excluding engines used to propel road vehicles and aircraft.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 3461-1:1988, *General principles for the creation of graphical symbols — Part 1: Graphical symbols for use on equipment*.

ISO 3864:1984, *Safety colours and safety signs*.

IEC 73:1991, *Coding of indicating devices and actuators by colours and supplementary means*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1

basic graphical symbol

symbol used individually or in combination to make a composite symbol

3.2

composite symbol

symbol made from combinations of symbol elements

4 General

4.1 Symbols shall be as shown in clauses 5 to 7 of this International Standard. In general, symbols are shown in outline form. Where necessary for legibility when reduced to a small size, enclosed areas within symbols or symbol elements may be filled in.

4.2 The symbols included in clause 5 are basic symbols which may be used for general application as well as to create composite symbols.

4.3 The composite symbols included in clauses 6 and 7 are developed using basic symbols from clause 5 as elements where applicable to provide families of symbols associated with functions and systems.

4.4 As required, additional composite symbols may be developed using the basic symbols from clause 5, provided that the characteristics specified in ISO 3461-1 are maintained.

4.5 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 easily discernible by the operator.

4.6 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 perceptual characteristics of the symbol are maintained. See ISO 3461-1:1988, **10.2**.

4.7 For actual use, all symbols shall be reproduced large enough to be easily discernible by the operator. See ISO 3461-1 for guidelines for proper sizing of symbols. Symbols shall be used in the orientations shown in this International Standard unless otherwise noted for individual symbols.

4.8 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, black to white and vice versa) it shall be done for the entire symbol.

4.9 When using symbols with multifunction controls, understanding is improved and the presentation simplified where symbols are combined to the least extent possible. The example shown in Figure 1 is for a typical engine operation key switch, having separate positions for Off, On and Start.

4.10 The fonts shown in this International Standard are not intended to be restrictive: other fonts may be substituted, but care shall be taken that legibility is maintained.

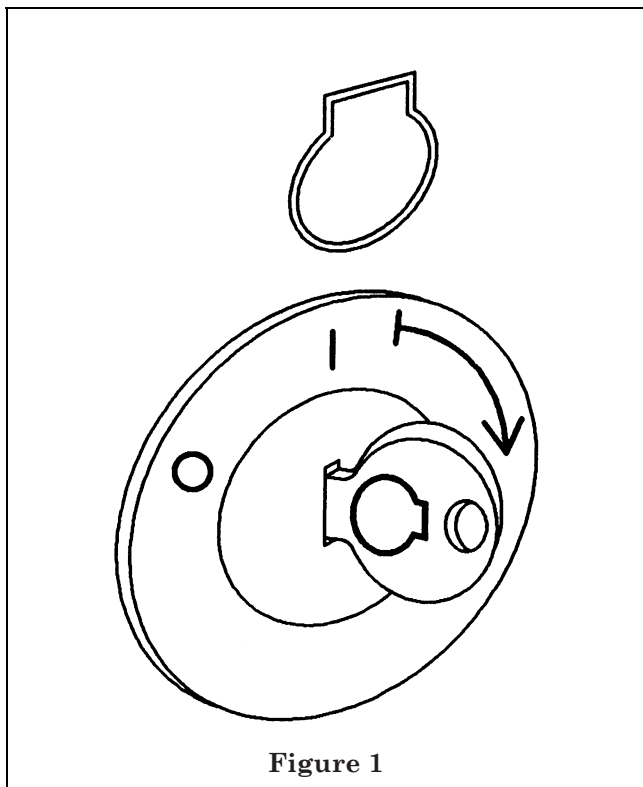
4.11 Symbols in this International Standard are presented 32 % of original size. The grid marks “L” denote the corners of the 75 mm square of the graphic grid presented. The grid marks are not part of the symbol but are provided to ensure consistent presentation of all symbol graphics.

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

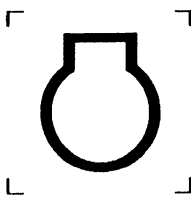
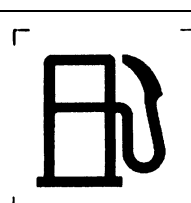
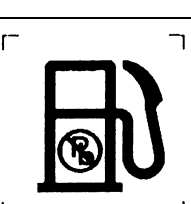
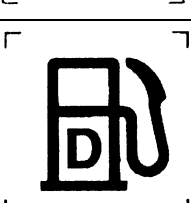
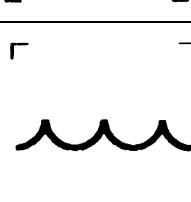
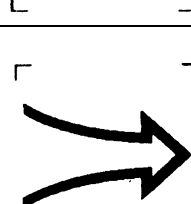
4.13 When used on optical indicators or tell-tales, the following colours have the meanings indicated:

- red: danger, unsafe or malfunction
- yellow or amber: caution
- green: safe or normal

NOTE 1 Where practical, the indicators should be banded such that red are positioned above yellow/amber which are positioned above green.



5 Basic symbols

No.	Symbol	Description	Application	ISO/IEC Registration No.
5.1		Engine	To signify functions associated with the engine.	ISO 7000:1156
5.2		Malfunction	To indicate a possible malfunction. A red colour indicator with a basic symbol may be used alternatively to indicate a malfunction.	ISO 7000:1603
5.3		Fuel	To signify the fuel quantity indicator. To signify functions associated with fuel. At the fuel fill to indicate a gasoline-type fuel.	ISO 7000:0245 B
5.4		Unleaded gasoline fuel	To signify functions associated with fuel. At the fuel fill to indicate unleaded gasoline fuel.	Variant of ISO 7000:0237
5.5		Diesel fuel	To signify functions associated with fuel. At the fuel fill to indicate diesel fuel.	ISO 7000:1541
5.6		Liquid coolant	To signify functions associated with liquid-type coolant.	ISO 7000:0536
5.7		Intake air	To signify functions associated with intake air.	ISO 7000:1604