SLOVENSKI STANDARD
SIST EN 1679-1:2000

01-april-2000

Reciprocating internal combustion engines - Safety - Part 1: Compression ignition engines

Reciprocating internal combustion engines - Safety - Part 1: Compression ignition engines

Hubkolben-Verbrennungsmotoren - Sicherheit - Teil 1: Dieselmotoren

Moteurs alternatifs a combustion interne - Sécurité - Partie 1: Moteurs a allumage par compression

Ta slovenski standard je istoveten z: **EN 1679-1:1998**

ICS:

27.020	Motorji z notranjim zgorevanjem	Internal combustion engines

SIST EN 1679-1:2000 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1679-1

February 1998

ICS 27.020

Descriptors: internal combustion engines, reciprocating engines, diesel engines, safety, accident prevention, hazards, safety measures, control devices, safety devices, protection, marking

English version

Reciprocating internal combustion engines - Safety - Part 1: Compression ignition engines

Moteurs alternatifs à combustion interne - Sécurité - Partie 1: Moteurs à allumage par compression

Hubkolben-Verbrennungsmotoren - Sicherheit - Teil 1: Dieselmotoren

This European Standard was approved by CEN on 12 January 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1679-1:1998 E

Contents

FOREWORD

This European Standard has been prepared by Technical Committee CEN/TC 270 "Internal combustion engines", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

O Introduction

This European Standard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association, and supports essential requirements of the EC Machinery Directive (89/392/EEC) and the associated EFTA regulations.

The extent to which hazards are covered is indicated in the scope of this standard. In addition, machinery shall comply as appropriate with EN 292-1: 1991 and EN 292-2: 1991 for hazards which are not covered by this standard.

The requirements of this standard concern the designers, manufacturers, suppliers, importers and installers of reciprocating internal combustion engines.

This standard also gives the information which the manufacturer shall provide to the user.

1 Scope

This standard specifies the safety requirements for compression ignition engines and their *essential auxiliaries* used in all applications on land, underground and water, except engines used to propel road vehicles and aircraft. The special requirements needed to cover operation in potentially explosive atmospheres are not covered in this standard.

The engine in terms of this standard is understood as the prime mover up to its driving extremitie(s) for power take off(s).

The hazards relevant to compression ignition engines are identified in Annex A.

This standard specifies the special safety requirements for compression ignition engines based on the general requirements laid down in EN 292-1: 1991 and EN 292-2: 1991.

This standard *should* be referred to in other standards wherever compression ignition engines are used.

2 Normative References

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN Standards

prEN 286-1: 1995	Simple unfired pressure vessels designed to contain air or nitrogen Part 1: Design, manufacture and testing
EN 292-1: 1991	Safety of machinery - Basic concepts, general principles for design Part 1: Basic technology, methodology
EN 292-2: 1991	Safety of machinery - Basic concepts, general principles for design Part 2: Technical principles and specifications
EN 294: 1992	Safety of machinery - Safety distances to prevent danger zones being reached
EN 418: 1992	Safety of machinery - Emergency stop equipment
EN 547-2: 1996	Safety of machinery - Human body dimensions Part 2: Principles for determining the dimensions required for access openings

EN 563: 1994	Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit values for hot surfaces
prEN 811: 1992	Safety of machinery - Safety distances to prevent danger zone being reachedby the lower limbs
EN 953: 1997	*Safety of machinery - General requirements for the design and construction of guards (fixed, movable)*
EN 983: 1996	Safety of machinery - Safety requirements for fluid power systems and componants - Pneumatices
prEN 1175-1: 1993	Safety of industrial trucks - Electrical equipment Part 1: Battery powered trucks
prEN 1175-2: 1993	Safety of industrial trucks - Electrical equipment Part 2: General requirements for IC engine powered trucks
prEN 1175-3: 1993	Safety of industrial trucks - Electrical equipment Part 3: Specific requirements for the electric power transmission systems of IC engine powered trucks
prEN 1834-1: 1995	Safety requirements for the design and construction of IC engines for use in potentially explosive atmospheres - Part 1: Group II engines for use in flammable gas and vapour atmospheres
prEN 1834-2: 1996	Safety requirements for the design and construction of IC engines for use in potentially explosive atmospheres - Part 2: Group I engines for use in underground workings including mines susceptible to firedamp and/or combustible dust
prEN 1834-3: 1996	Safety requirements for the design and construction of IC engines for use in potentially explosive atmospheres - Part 3: Group II engines for use in flammable dust atmospheres
EN ISO 8178-1: 1996	Reciprocating internal combustion engines - Exhaust emission measurement Part 1: Test bed measurement of gaseous and particulate emissions
EN ISO 8178-2: 1996	Reciprocating internal combustion engines - Exhaust emission measurement Part 2: Measurement of gaseous and particulate emissions at site
EN ISO 8178-4: 1996	Reciprocating internal combustion engines - Exhaust emission measurement Part 4: Test cycles for different engine applications

prEN ISO 8178-5: 1995	Reciprocating internal combustion engines - Exhaust emission measurement Part 5: Specification of test fuels
prEN ISO 8178-6: 1995	Reciprocating internal combustion engines - Exhaust emission measurement - Part 6: Report on measurement results and test reports
EN ISO 11102-1: 1997	R.I.C. engines - Crank handle starting equipment - Part 1: Safety requirements
EN ISO 11102-2: 1997	R.I.C. engines - Crank handle starting equipment - Part 2: Method of testing the angle of disengagement
EN 23411: 1988	Earth-moving machinery - Human physical dimensions of operators and minimum operator space envelope
prEN 61310-1: 1995	Safety of machinery - Indicating, marking and actuating principles Part 1: Visual, audible and tactile signals
prEN 61310-2: 1994	Safety of machinery - Indicating, marking and actuating principles Part 2: Marking principles

ISO Standards

ISO 2261: 1994	Reciprocating internal combustion engines - Hand operated control devices - Standard direction of motion
ISO 2710: 1978	Reciprocating internal combustion engines - Vocabulary
ISO 2867: 1994	Earth-moving machinery - Access systems
ISO 3046-1: 1995	Reciprocating internal combustion engines - Performance - Part 1: Standard reference conditions and declerations of power, fuel consumption and lubricating oil consumption and test methods
ISO 6798: 1996	Acoustics - Test code for the measurement of airborne noise emitted by reciprocating internal combustion engines - Engineering method and survey method
ISO 6826: 1997	Reciprocating internal combustion engines - Fire protection
ISO 7967-1: 1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 1: Structure and external covers
ISO 7967-2: 1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 2: Main running gear

ISO 7967-3: 1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 3: Valves, camshaft drive and actuating mechanisms
ISO 7967-4: 1988	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 4: Pressure charging and air/exhaust gas ducting systems
ISO 7967-8: 1994	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 8: Starting systems
ISO 7967-9: 1996	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 9: Control and monitoring systems
ISO 8178-7: 1996	Reciprocating internal combustion engines - Exhaust emission measurement - Part 7:Engine family determination
ISO 8178-8: 1996	Reciprocating internal combustion engines - Exhaust emission measurement - Part 8: Engine group determination
ISO 8999: 1993	Reciprocating internal combustion engines - Graphic symbols
ISO/CD 14314: 1996	Internal combustion engines - Recoil starting equipment - Safety requirements and tests

IEC Standards

IEC 34-5: 1983	Rotating electrical machines - Part 5: Degrees of protection by enclosures for rotating machinery
IEC 73: 1991	Colours of indicator lights and push-buttons
IEC 331: 1970	Fire-resisting characteristics of electric cables
IEC 332-2: 1989	Tests on electric cables under fire condition - Part 2: Test on a single small vertical insulated copper wire or cable

3 Definitions

For the purposes of this standard, definitions as specified in ISO 2710: 1978, ISO 3046-1: 1995, ISO 7967-1: 1987, *ISO 7967-2: 1987, ISO 7967-3: 1987, ISO 7967-4: 1988, ISO 7967-8: 1994 and ISO 7967-9: 1996 and the following apply.*

3.1 Essential auxiliary
Item of enquipment which is essential for the continued or repeated operation of the engine (e. g. engine driven fuel-feed pump, engine driven water pump).

4 General

Since engines are only power sources and always part of a specific application, the desired degree of compliance with these safety requirements depends on the application and shall be subject to agreement between the engine manufacturer and the engine installer. In particular when it is possible to deal with specific hazards either on the engine itself or on the complete application the installer shall be responsible for choosing the most appropriate solution.

The engine manufacturer shall ensure that the equipment he is supplying meets the requirements laid down in this standard. The extent of these requirements depends on the engine installation.

The safety requirements given in clause 6 apply to both, the engine manufacturer and the engine installer depending on the application.

5 List of hazards

The hazards relevant to compression ignition engines that have to be considered in order to prevent personal injury are listed in Annex A.

6 Safety Requirements and/or measures

6.1 Starting systems

Starting systems can be triggered manually or automatically.

Electrical starting sytems normally operate at voltages of 24 V or below and therefore do not present a hazard. *E*lectrical starting systems above 24 V *are not dealt with in this standard and* the installer of the engine has to ensure safe operation after connecting *the* engine to the driven machinery.

For engines with compressed air starting, the starting pneumatic system shall comply with the requirements of EN 983: *1996*

Crank handle starting systems shall meet the requirements specified in EN ISO 11102-1: *1997* and EN ISO 11102-2: *1997*. Additionally the following requirements apply:

- Starting handles shall have sufficient clearance from the mounting surfaces to ensure safe turning.

- Diesel engines with a manual starter shall have a decompression facility which does not require to be hand-held during cranking.

The only permissable hand starting systems are crank handle (as defined above) and recoil starting devices as described in ISO/CD 14314: 1996.

6.2 Normal stopping

All engines shall have a normal stopping device which can be manually or automatically controlled. This shall operate by cutting off the fuel supply.

6.3 Emergency stopping

The installer and the engine manufacturer shall consider whether an emergency stopping system should be provided in order to avoid the engine getting into an unsafe mode of operation. Depending on the application, other means of stopping may be used such as a combustion air shut-off device. The emergency stopping system may be manually or automatically controlled.

6.3.1 Manually controlled

Manually controlled emergency stopping systems shall meet the requirements of EN 418: 1992, category 0

6.3.2 Automatically controlled

The engine installer shall consider whether an automatically controlled emergency stopping system shall be provided.

The main signals that might be used to trigger an automatically controlled stopping system are:

- overspeed
- low lubricating oil pressure
- high coolant temperature
- low coolant level

Which of these measures or other measures should be used depends on the application.

6.4 Controls

6.4.1 General

Hand controls shall be designed to withstand 1,2 times the maximum actuating forces given in table 1.

Controls shall act positively and *smoothly* and without *delay or* unexpected action. ISO 2261:1994 should be used as a reference.