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**Road vehicles — M14 × 1,25 spark-plugs  
with conical seating and their cylinder  
head housings**

*Véhicules routiers — Bougies d'allumage M14 × 1,25 à siège conique et  
leurs logements dans la culasse*

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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.

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 2344 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 1, *Ignition equipment*.

This seventh edition cancels and replaces the sixth edition (ISO 2344:1992), which has been technically revised.

Annex A forms an integral part of this International Standard.

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# Road vehicles — M14 × 1,25 spark-plugs with conical seating and their cylinder head housings

## 1 Scope

This International Standard specifies the main characteristics of M14 × 1,25 spark-plugs with conical seating with normal reach, long reach and extra long reach and their cylinder head housings, for use with spark-ignition engines.

## 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 listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 68-1:—<sup>1)</sup>, *ISO general purpose screw threads — Basic profile — Part 1: Metric screw threads.*

ISO 261:—<sup>2)</sup>, *ISO general purpose metric screw threads — General plan.*

ISO 965-1:—<sup>3)</sup>, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data.*

ISO 965-3:—<sup>4)</sup>, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional threads.*

ISO 14508:1997, *Road vehicles — Spark-plugs — Terminals.*

## 3 Requirements

### 3.1 Terminals

The spark-plug terminal may be either the solid post or the threaded type as specified in ISO 14508.

A spark-plug with threaded terminal on which a nut is applied shall respect the dimensions specified for spark-plugs with solid post terminals (see figure 1).

### 3.2 Dimensions and threads

See figures 1 and 2.

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<sup>1)</sup> To be published. (Revision of ISO 68:1973)

<sup>2)</sup> To be published. (Revision of ISO 261:1973)

<sup>3)</sup> To be published. (Revision of ISO 965-1:1980)

<sup>4)</sup> To be published. (Revision of ISO 965-3:1980)

### 3.2.1 Length dimensions

The length dimensions are measured from a gauging plane defined by diameter 14,8 mm on the seating.

### 3.2.2 Spark-plug reach

Spark-plug reach shall be in accordance with table 1.

**Table 1**

Dimensions in millimetres

Type of reach	A ± 0,3	B max.	Y ± 0,3
Normal reach	11,2	19	10,2
Long reach	17,5	25	16,5
Extra long reach	25	32,5	24

### 3.2.3 Threads for spark-plugs and cylinder heads

The threads of M14 × 1,25 spark-plugs and the corresponding tapped holes in the cylinder head shall conform to ISO 68, ISO 261, ISO 965-1 and ISO 965-3. Their limiting dimensions and their tolerance classes are specified in 3.2.3.1 and 3.2.3.2 respectively.

#### 3.2.3.1 Limiting dimensions

The limiting dimensions shall be as given in table 2.

**Table 2**

Dimensions in millimetres

Dimension		Plug thread (on finished plug)	Tapped hole in cylinder head
Major diameter	max.	13,937	not specified
	min.	13,725	14,000
Pitch diameter	max.	13,125	13,368
	min.	12,993	13,188
Minor diameter	max.	12,404	12,912
	min.	12,181 <sup>1)</sup>	12,647

1) With a root radius  $\geq 0,125$  mm (0,1 P)

#### 3.2.3.2 Tolerance classes

The thread tolerance classes of finished M14 × 1,25 spark-plugs and of the corresponding tapped holes in the cylinder head shall be as follows:

- 6e for spark-plugs (see note 1);
- 6H for tapped holes in the cylinder head.

## NOTES

1 In order that spark-plugs complying with this International Standard can be fitted in existing cylinder heads also in extreme cases, the value for the maximum truncation of the minor diameter of the spark-plug base has been slightly reduced with respect to the ISO value.

This maximum value of the minor diameter is calculated from a distance of  $H/6$  for the maximum truncation instead of the value given by the formula in ISO 965-1:—, clause 11, according to the formula given below:

$$\begin{aligned} \text{Minor diameter, maximum} &= d_1 - e_s - 2(H/4 - H/6) \\ &= 12,647 - 0,063 - 0,180 \\ &= 12,647 - 0,243 = 12,404 \end{aligned}$$

The value for the *basic profile* remains the same as for the ISO thread ( $12,647 - 0,063 = 12,584$ ).

2 The initial clearance  $e = 0,063$  mm between the pitch diameters of the thread and of the tapped hole is intended to prevent the possibility of seizure, as a result of combustion deposits on the bare threads, when removing the spark-plugs.

This clearance is also intended to enable spark-plugs with threads in accordance with this International Standard to be fitted in existing tapped holes.

### 3.3 Other dimensions of spark-plugs and their cylinder head housings

The other dimensions shall be in accordance with figures 1 and 2.

An alternative cylinder head housing which allows both conical seat and flat seat spark-plugs is possible (see annex A).

The contour of the insulator is optional; however, between the reference planes defined for spark-plugs with solid post terminals by the dimensions 29 mm and 33 mm, and for spark-plugs with threaded terminals by the dimensions 26 mm and 30 mm, its largest diameter shall be  $10,5 \text{ mm} \pm 0,3 \text{ mm}$ .

The length dimensions  $Z$  and 5,5 mm max. or  $Z'$  and 3 mm max. in the cylinder head (see figure 2 and figure A.1, respectively) are measured from a gauging plane defined by diameter 14,8 mm on the seating.

The  $Z$  and  $Z'$  length of the spark-plug housing in the cylinder head shall be sufficient to ensure that the end of the spark-plug thread does not project into the combustion chamber at any point when the spark-plug is tightened to its maximum specified torque.

Details not specified are left to the manufacturer's choice.

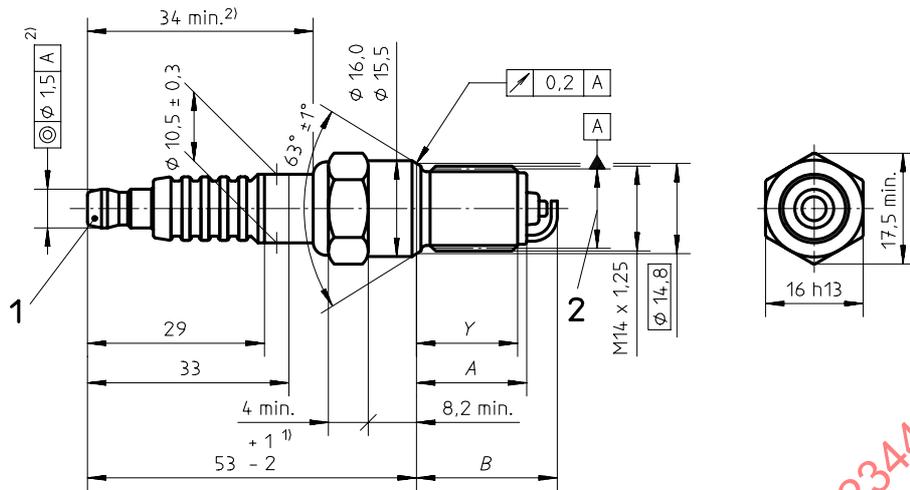
### 3.4 Installation tightening torque

The installation torque values apply to new spark-plugs without lubricant on the threads. If threads are lubricated, the torque value shall be reduced by approximately one-third to avoid overstressing.

Spark-plugs shall be tightened with a torque of 10 N·m to 20 N·m in aluminium and cast iron cylinder heads.

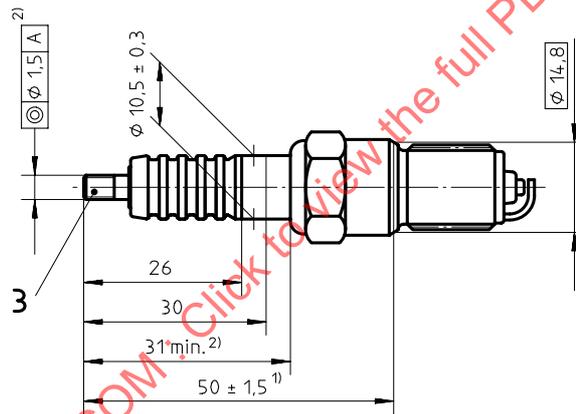
NOTE — Engine manufacturers may specify a different torque for the first spark-plug installation.

Dimensions in millimetres



a) with solid post terminal

Dimensions in millimetres



b) with threaded terminal<sup>3)</sup>

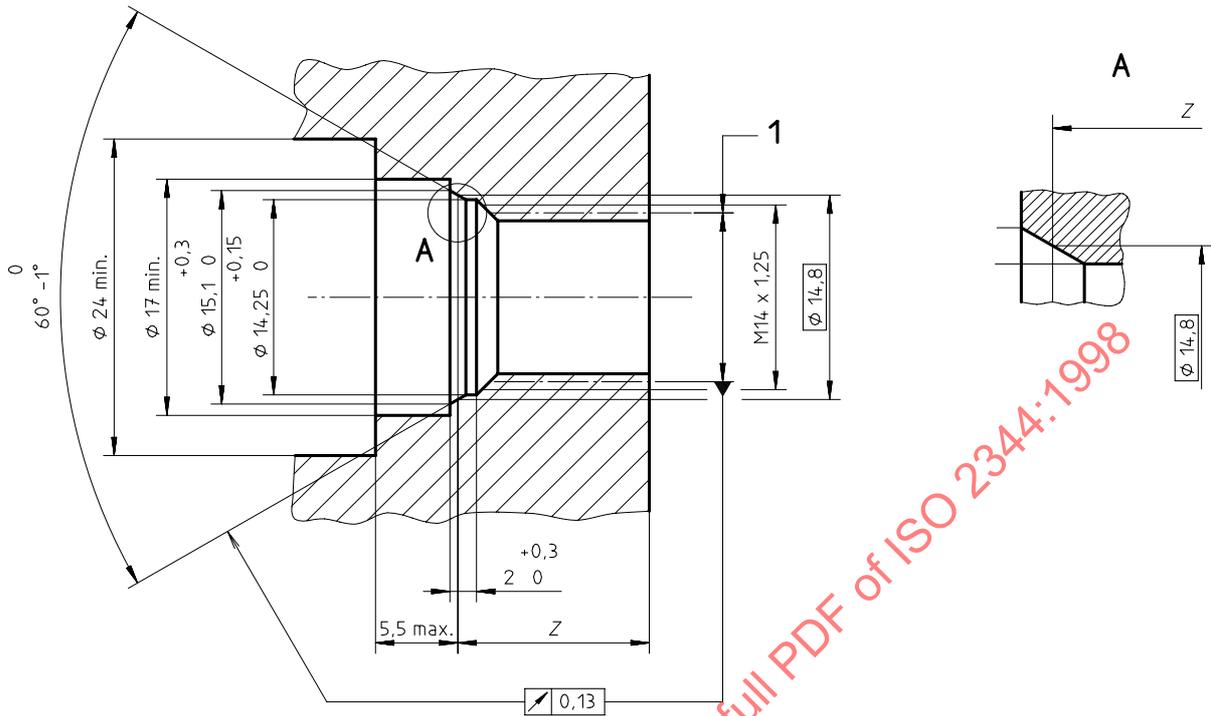
**Key**

- 1 ISO 14508 solid post terminal
- 2 Pitch diameter
- 3 ISO 14508 threaded terminal

- 1) For normal reach spark-plugs the following maximum heights are allowed:  
63 mm for spark-plugs with solid post terminal;  
60 mm for spark-plugs with threaded terminal.
- 2) For normal reach spark-plugs the coaxiality tolerance and the dimensions 31 mm min. for spark-plugs with threaded terminal and 34 mm min. for spark-plugs with solid post terminal do not apply.
- 3) For other dimensions not shown, see figure 1a).

**Figure 1 — M14 × 1,25 spark-plugs with conical seating**

Dimensions in millimetres



**Key**

- 1 Pitch diameter

**Figure 2 — Housing of the spark-plug in the cylinder head**

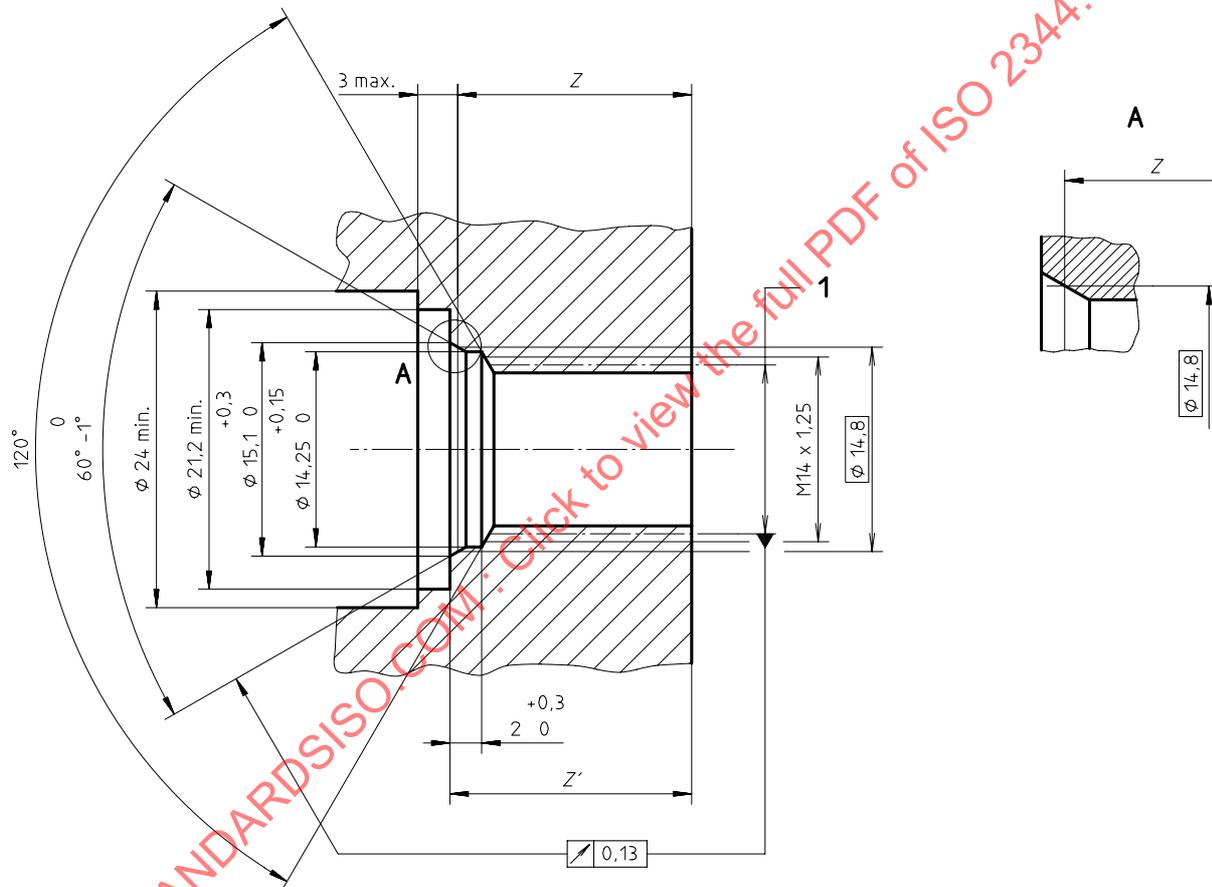
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## Annex A (normative)

### Alternative cylinder head housing

The  $Z$  and  $Z'$  length of the spark-plug housing in the cylinder head shall be sufficient to ensure that the end of the spark-plug thread does not project into the combustion chamber at any point when the spark-plug is tightened to its maximum specified torque.

Dimensions in millimetres



**Key**

- 1 Pitch diameter

**Figure A.1 — Counterbore combination for M14 × 1,25 spark-plugs with conical seating and for M14 × 1,25 spark-plugs with flat seating and 16 mm hexagon**