# SLOVENSKI STANDARD
# SIST EN 15436-2:2015

**01-september-2015**

**Nadomešča:**
**SIST EN 15436-2:2008**

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**Oprema za vzdrževanje cest - 2. del: Ocenjevanje delovanja**

Road service area maintenance equipment - Part 2: Performance assessment

Straßenbetriebsdienstausstattung - Teil 2: Leistungsbewertung



Matériel d'entretien des dépendances routières - Partie 2: Evaluation des performances



**Ta slovenski standard je istoveten z: EN 15436-2:2015**



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**ICS:**

43.160 Vozila za posebne namene Special purpose vehicles

**SIST EN 15436-2:2015** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 15436-2

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English Version

# Road service area maintenance equipment - Part 2: Performance assessment

Matériel d'entretien des dépendances routières - Partie 2: Evaluation des performances

Straßenbetriebsdienstausstattung - Teil 2: Leistungsbewertung

This European Standard was approved by CEN on 14 May 2015.

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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 CEN-CENELEC Management Centre has the same status as the official versions.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 15436-2:2015 E

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# Foreword

This document (EN 15436-2:2015) has been prepared by Technical Committee CEN/TC 337 “Road operation equipment and products”, the secretariat of which is held by AFNOR.

This document supersedes EN 15436-2:2008.

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of an identical text or by endorsement, at the latest by January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

Compared to the previous version, this new standard includes few editorial corrections, wording improvements and technical precisions (e.g. accuracy of some measurements) and a new Annex D dealing with the test protocol for the measurement of power at the tool.

EN 15436, *Road service area maintenance equipment*, is composed with the following parts:

— *Part 1: Terminology*;

— *Part 2: Performance assessment* [the present document];

— *Part 3: Classification*;

— *Part 4: Delivery acceptance of the machines by the users*.



According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

# Introduction

Road service area grass-cutting, brush-cutting and mechanical plant-cutting operations require special equipment that meets clearly defined technical criteria. This European Standard defines and describes the test methods used to monitor, assess and measure the technical performance of new equipment (head of series) in its working configuration with the production-run requirements tool.

The accuracies indicated in this European Standard apply only to the measurements taken to assess the performance of the machines away from the plants.

# 1 Scope

This European Standard specifies the accuracy of the performance measurement system of road service area maintenance equipment described in the scope of CEN/TC 337 and used for:

— grass-cutting and brush-cutting;

— mechanical plant-cutting.

This equipment is mounted on self-propelled carrying vehicles and is designed to cut and shred grass, brushwood, trees, saplings and bushes in road service areas.

This European Standard does not cover the collection and transportation of shredded grass.

# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15436-1:2008, *Road service area maintenance equipment - Part 1: Terminology*

# 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15436-1:2008 apply.



# 4 Cutting specifications check

## 4.1 Articulated-arm grass cutter – brushcutter



### 4.1.1 Cutting width (w)

Cutting width is defined according to EN 15436-1:2008, 6.25.

It is measured with an accuracy of ± 0,01 m and expressed in metres (m).

### 4.1.2 Cutting height (h)

Cutting height is defined according to EN 15436-1:2008, 6.26.

It is measured with an accuracy of ± 0,005 m and expressed in metres (m).

In the case of continuous adjustment, the minimum and maximum heights should be measured. In the case of intermittent adjustment, the various possible heights allowed by the cutting tool should be measured.

### 4.1.3 Cutting rotor stop time

The cutting rotor stop time is measured automatically, from the time the stop command is sent to the moment when the rotation speed is measured as being equal to 0.

The cutting rotor stop time is measured with an accuracy of ± 0,1 s and expressed in seconds (s).

A distinction is made between the value of the stop times for open hydraulic circuits and for closed hydraulic circuits.

## 4.2 In-line flail mower

### 4.2.1 Cutting width (w)

The cutting width is measured with an accuracy of ± 0,01 m and expressed in metres (m).

### 4.2.2 Cutting height (h)

The cutting height is measured with an accuracy of ± 0,005 m and expressed in metres (m).

In the case of continuous adjustment, the minimum and maximum heights should be measured. In the case of intermittent adjustment, the various possible heights allowed by the cutting tool should be measured.

### 4.2.3 Cutting tool stop time

The cutting rotor stop time is measured automatically, from the time the stop command is sent to the moment when the rotation speed is measured as being equal to 0.

The cutting rotor stop time is measured with an accuracy of ± 0,1 s and expressed in seconds (s).

A distinction is made between the value of the stop times for open hydraulic circuits and for closed hydraulic circuits.

## 4.3 Mechanical plant cutting



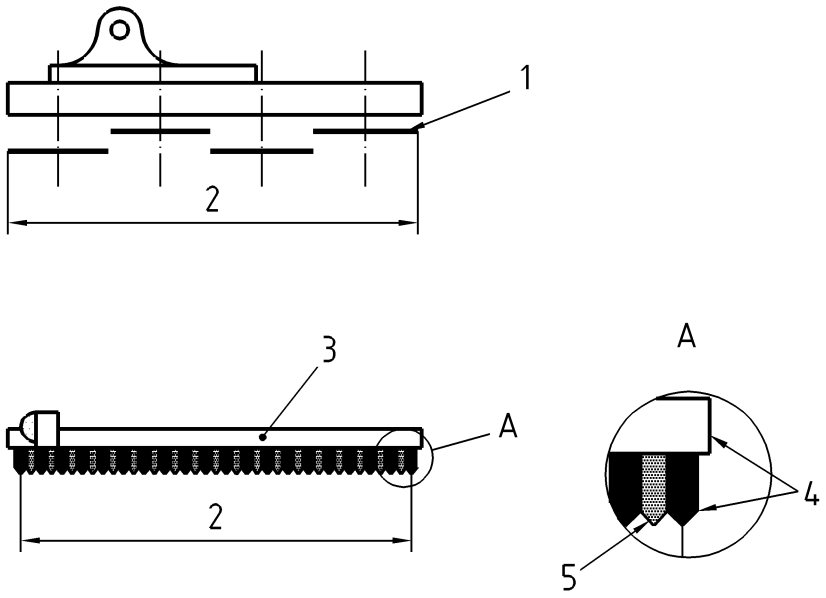
### 4.3.1 Cutting width (w)

The cutting width is measured with the engine off.



The cutting width is the distance measured between the active ends of the fingers of the bars, with the cutters of the blades or saws in the furthest possible position (Figure 1).

The cutting width is measured with an accuracy of ± 0,01 m and expressed in metres (m).




**Key**

1 saw blade
2 cutting width w
3 reciprocating cutter bar
4 fixed
5 mobile



**Figure 1 — Cutting width (w)**

#### 4.3.2 Cutting tool stop time

The cutting tool stop time is measured automatically, from the time the stop command is sent to the moment when the rotation speed is measured as being equal to 0.

The cutting rotor stop time is measured with an accuracy of ± 0,5 s and expressed in seconds (s).

A distinction is made between the value of the stop times for open hydraulic circuits and for closed hydraulic circuits.

## 5 Kinematic properties check

### 5.1 General

In their design structure, all these machines have the same constituent elements, i.e. a frame, articulated arms and a tool. Whatever the shape and size of the components and any accessories that may be used, there is always an articulation between the frame and the primary arm. The articulation which is very close to the frame is used to define three reference planes for the machine.

The kinematic properties of the different machines are then defined with respect to these reference planes.

See the definitions according to EN 15436-1:2008, 5.1 to 5.6.

Given that the height, in relation to the ground plane of the primary arm–frame articulation changes the geometry of certain operating positions significantly, the horizontal reference plane of the machine is positioned at a height **ZP** from the ground specified by the manufacturer. This height can vary.

See the definitions according to of EN 15436-1:2008, Clause 4.

## 5.2 Articulated-arm grass cutters - brushcutters

### 5.2.1 General

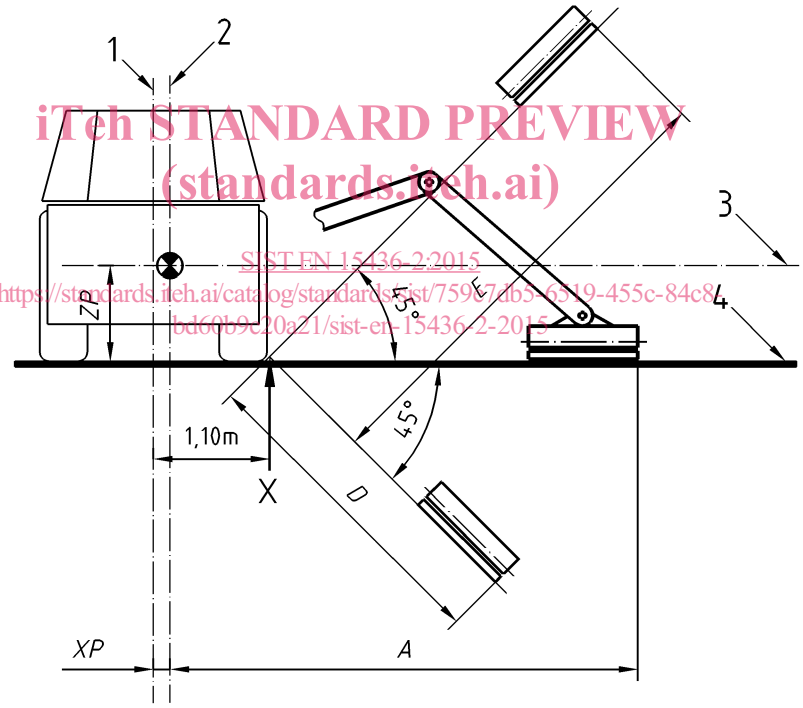
The kinematic properties defining the operating positions are shown in the diagram in Figure 2. They are described in the subclauses below.

Point **X** is defined at a distance of 1,10 m from the mid-plane.

Dimension **XP**, defined in EN 15436-1:2008, 4.2 is specified by the manufacturer with an accuracy of ± 0,01 m.

Dimension **ZP**, defined in EN 15436-1:2008, 4.4 is specified by the manufacturer with an accuracy of ± 0,02 m.

Dimension **YP**, defined in EN 15436-1:2008, 4.3 is specified by the manufacturer with an accuracy of ± 0,01 m.






**Key**

1 mid-plane
2 lvrp
3 hrp
4 ground plane

**Figure 2 — Kinematic properties**

### 5.2.2 Horizontal range (A)

Horizontal range is defined in EN 15436-1:2008, 6.21.

The measurement system accuracy of the horizontal distance **A** is ± 0,01 m.

### 5.2.3 Embankment range (E)

Embankment range is defined in EN 15436-1:2008, 6.22.

The measurement system accuracy of the embankment range **E** is ± 0,02 m.

The embankment range **E** is measured on the 45° inclined plane on which the cutting head rests. The inclined plane is positioned at **X** on the ground plane. The angle of 45° is measured with an inclinometer and the measurement system accuracy of the inclination is ± 1°. The inclined plane allows the range **E** to be measured directly.

### 5.2.4 Ditch range ($D_1$)

Ditch range is defined in EN 15436-1:2008, 6.23.

The measurement system accuracy of the ditch range $\mathbf{D_1}$ is ± 0,02 m.

The ditch range $\mathbf{D_1}$ can be measured on the 45° inclined plane on which the cutting head rests. The inclined plane is positioned at **X** with respect to the ground plane. The angle of 45° is measured with an inclinometer and the measurement system accuracy of the inclination is ± 1°. The inclined plane allows the range $\mathbf{D_1}$ to be measured directly.



### 5.2.5 Ditch range with slide rail ($D_2$)



#### 5.2.5.1 General

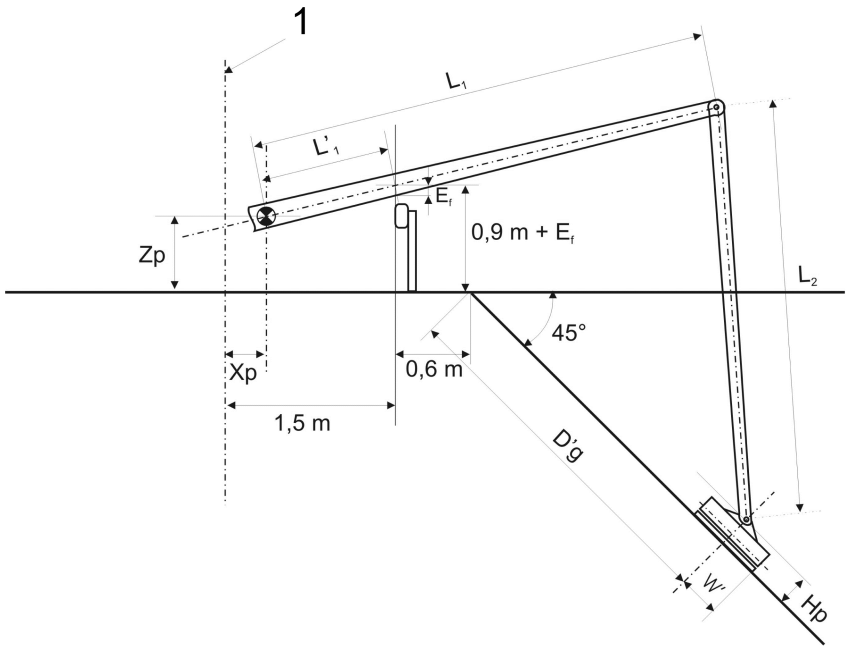
Ditch range with slide rail is defined in EN 15436-1:2008, 6.24.

The measurement system accuracy of the ditch range $\mathbf{D_2}$ is ± 0,02 m.

The ditch range with slide rail $\mathbf{D_2}$ can be measured on a 45° inclined plane 2,1 m from the mid-plane. The angle of 45° is measured with an inclinometer and the measurement system accuracy of the inclination is ± 1°. The inclined plane allows the range $\mathbf{D_2}$ to be measured directly.

#### 5.2.5.2 Method of measurement

When $Z$p ≤ 0,9 m:



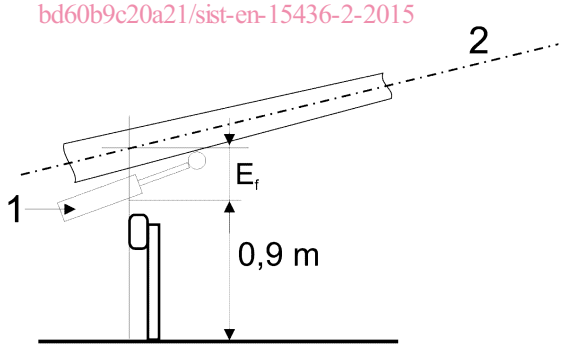



**Key**

1 mid-plane

**Figure 3 — Method of measurement when $Z_p$ ≤ 0,9 m**






**Key**

1 cylinder

2 primary arm axis

$E_f$ overall dimensions given by the manufacturer or measured on the machine, including the 1/2 width of the primary arm + possibly the width of the cylinder, etc. (See Figure 3.)

**Figure 4 — Method of measurement when $Z_p$ ≤ 0,9 m**