



**SLOVENSKI STANDARD**  
**SIST EN 13157:2004+A1:2009**  
**01-november-2009**

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Cranes - Safety - Hand powered cranes

Krane - Sicherheit - Handbetriebene Krane

Appareils de levage à charge suspendue - Sécurité - Appareils de levage à bras

**Ta slovenski standard je istoveten z: EN 13157:2004+A1:2009**

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**ICS:**

53.020.20      Dvigala      Cranes

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EUROPEAN STANDARD

**EN 13157:2004+A1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2009

ICS 53.020.20

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English Version

**Cranes - Safety - Hand powered cranes**Appareils de levage à charge suspendue - Sécurité -  
Appareils de levage à bras

Krane - Sicherheit - Handbetriebene Krane

This European Standard was approved by CEN on 22 October 2003 and includes Corrigendum 1 issued by CEN on 8 October 2008 and Amendment 1 approved by CEN on 16 July 2009.

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 CEN Management Centre 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 CEN 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

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## Foreword

This document (EN 13157:2004+A1:2009) has been prepared by Technical Committee CEN/TC 147 "Cranes - Safety", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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.

This document includes Amendment 1, approved by CEN on 2009-07-16 and Corrigendum 1, issued by CEN on 2008-10-08.

This document supersedes EN 13157:2004.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags  $\boxed{AC}$   $\boxed{AC}$ .

This document 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).

Annex A is normative. [SIST EN 13157:2004+A1:2009  
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$\boxed{A_1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\boxed{A_1}$

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

**EN 13157:2004+A1:2009 (E)****Introduction**

This European Standard has been prepared to be a harmonised standard to provide one means for hand powered lifting equipment to conform to the essential health and safety requirements of the Machinery Directive, as amended.

This European Standard is a type C standard as stated in **EN ISO 12100-2**.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for lever blocks which have been designed and built according to the provisions of this type C standard.

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## 1 Scope

This European Standard specifies requirements for the following hand powered lifting equipment defined in clause 3:

- Hand chain blocks;
- Lever hoists;
- Jaw winches;
- Hand powered trolleys supporting lifting machines;
- Drum winches;
- Pulley blocks and deflection pulley.

The significant hazards covered by this European Standard are identified in clause 4.

This European Standard does not cover hazards related to the lifting of persons.

This standard does not specify the additional requirements for:

- use in ambient temperature outside the range of - 10°C to + 50°C,
- hand powered lifting equipment in direct contact with food stuffs or pharmaceuticals requiring a high level of cleanliness for hygiene reasons;
- hazards resulting from handling specific hazardous materials (e.g. explosives, hot molten masses, radiating materials);
- hazards caused by operation in an explosive atmosphere.

This European Standard is applicable to hand powered lifting equipment, which are manufactured after the date of approval by CEN of this standard.

## 2 Normative references

**[A1]** 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. **[A1]**

**[A1]** *deleted text* **[A1]**

**[A1]** EN 818-7:2002 **[A1]**, *Short link chain for lifting purposes — Safety — Part 7: Fine tolerance hoist chain, Grades T (Types T, DAT and DT)*

EN 1005-3, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

**[A1]** *deleted text* **[A1]**

EN 12385-1, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-4, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications*

EN 13411-1, *Terminations for steel wire ropes — Safety — Part 1: Thimbles for steel wire rope slings*

EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire rope slings*

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EN 13411-3, *Terminations for steel wire ropes — Safety — Part 3: Ferrules and ferrule-securing*

EN 13411-4, *Terminations for steel wire ropes — Safety — Part 4: Metal and resin socketing*

EN 13411-6, *Terminations for steel wire ropes — Safety — Part 6: Asymmetric wedge socket*

EN 13411-7, *Terminations for steel wire ropes — Safety — Part 7: Symmetric wedge socket*

EN ISO 12100-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

ISO 606, *Short-pitch transmission precision roller and bush chains, attachments and associated chain sprockets*

ISO 4309, *Cranes — Wires ropes — Care, maintenance, installation and discard*

**3 Terms and definitions**

For the purposes of this standard, the definitions given in EN ISO 12100-2:2003 apply, together with the following:

**3.1 General definitions**

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**3.1.1****coefficient of utilisation (safety coefficient)**

the arithmetic ratio between the maximum load held by the lifting equipment and its rated capacity

**3.1.2****combined unit**

combination of a trolley and a hoist which are connected (see figure 1)

**3.1.3****dynamic tests**

testing of lifting equipment by executing operating motions under a specified test load exceeding the rated capacity

**3.1.4****lifting**

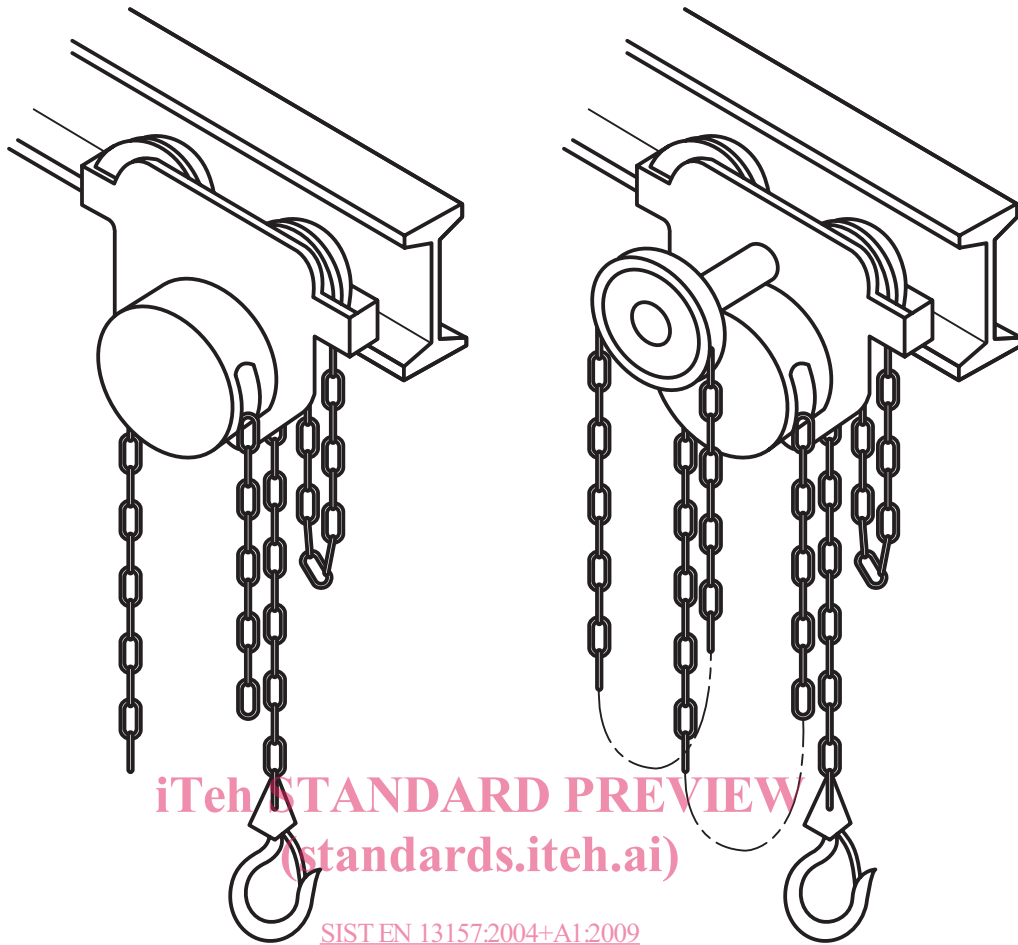
change in level during the movement

NOTE Lifting incorporates the vertical or the vertical and horizontal movement of the load or all combinations

**3.1.5****rated capacity**

load that the lifting equipment is designed to lift for a given operating condition (e.g. configuration, position of the load)





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**Figure 1 — Example of combined units**

### 3.1.6

#### static tests

testing of lifting equipment by applying a specified static load, exceeding the rated capacity

### 3.1.7

#### test coefficient

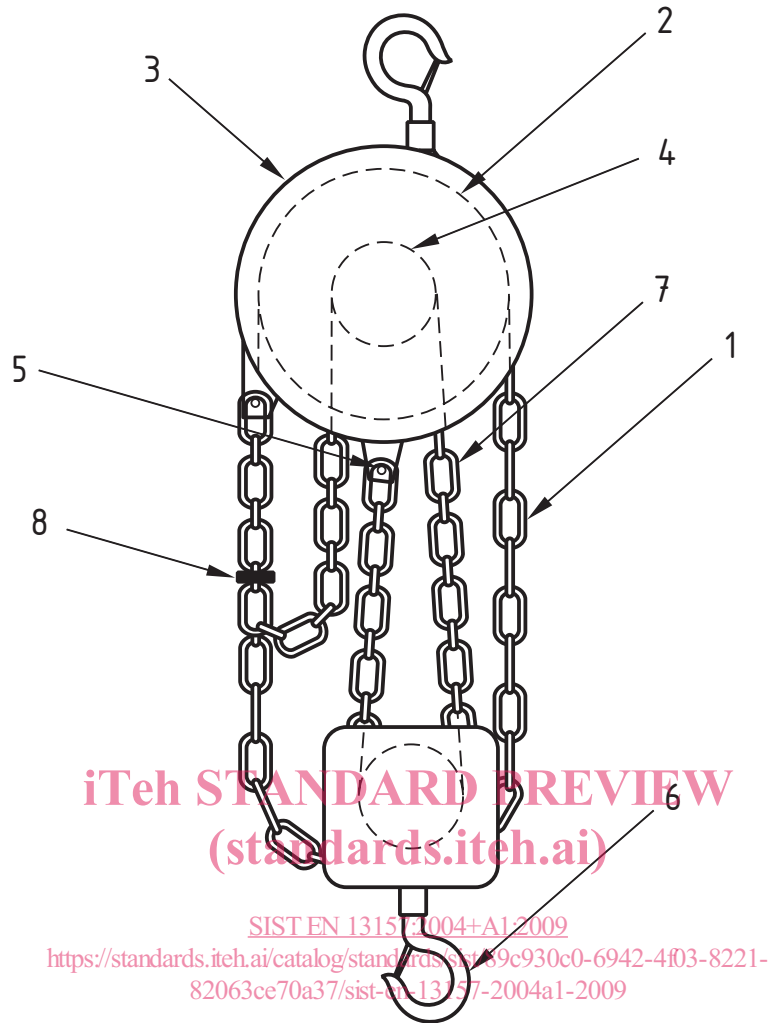
the ratio between the load used for static and dynamic tests and the rated capacity

## 3.2 Definitions for hand chain blocks

### 3.2.1

#### hand chain block

device for lifting and lowering a load suspended from one chain (the load chain) by means of human effort applied to another chain (the hand chain) and for holding this load (see figure 2)



- |                     |                                |
|---------------------|--------------------------------|
| 1. Hand chain       | 5. Anchorage of the load chain |
| 2. Hand chain wheel | 6. Load hook                   |
| 3. Cover            | 7. Load Chain                  |
| 4. Load chain wheel | 8. Chain end stop              |
|                     | 9. Top hook                    |

Figure 2 — Example of a hand chain block

### 3.3 Definitions for lever hoists

#### 3.3.1

##### **D/d ratio**

the ratio of the minimum pitch circle diameter of the first rope layer of the drum or sheave to the calculated minimum diameter of the rope

#### 3.3.2

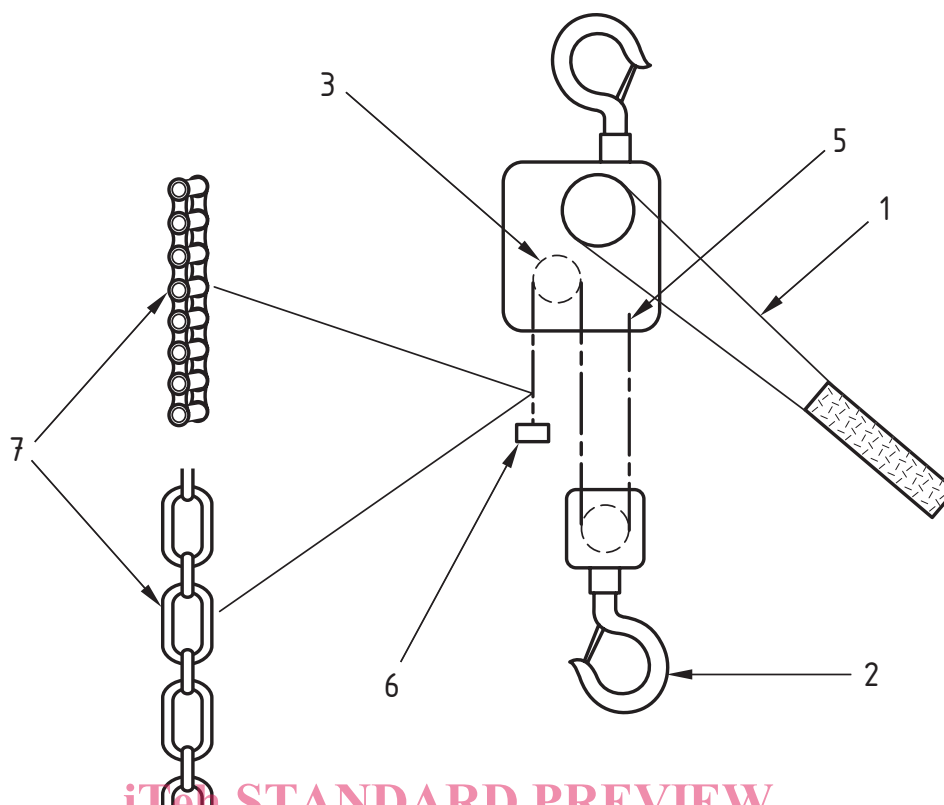
##### **lever hoist**

device for lifting and lowering a load suspended from a lifting medium by means of human effort applied to a lever and to hold it by means of a braking devices(see figure 3)

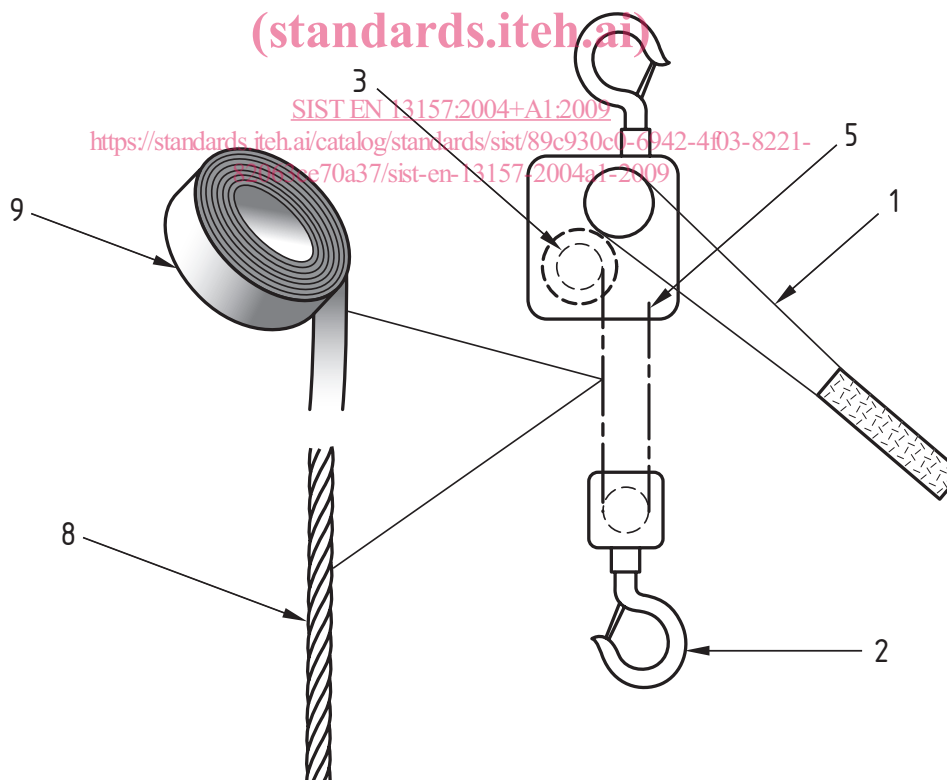
#### 3.3.3

##### **pitch circle diameter**

twice the distance between the drum or the sheave axle and the middle of the rope or webbing in direct contact with the drum or sheaves (first layer on drum)



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- |                                    |                   |
|------------------------------------|-------------------|
| 1. Lever                           | 6. Chain end stop |
| 2. Hook                            | 7. Load Chain     |
| 3. Drum                            | 8. Rope           |
| 4. Load chain wheel                | 9. Webbing        |
| 5. Anchorage of the lifting medium |                   |

Figure 3 — Example of lever hoists

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## 3.4 Definitions for jaw winches

## 3.4.1

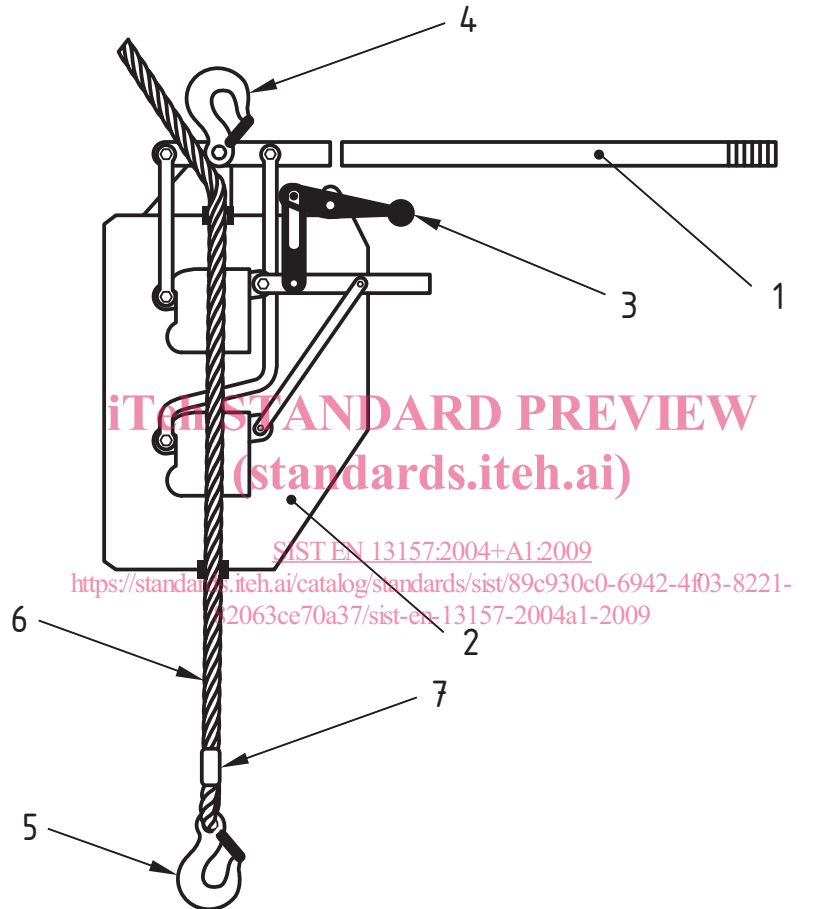
**jaw winches**

device for lifting, lowering and holding a load by means of a rope, where the rope is gripped or moved by jaws using human effort on a lever or levers (see figure 4)

## 3.4.2

**operation cycle (for test purpose only)**

a lifting movement plus a lowering movement over the minimum vertical distance defined by the rope length corresponding to its passing over all concerned jaw winch parts



- |   |                     |
|---|---------------------|
| 1. Removable lever                                | 5. Hook             |
| 2. Guard case of the jaw and actuating mechanisms | 6. Rope             |
| 3. Declutching lever                              | 7. Rope termination |
| 4. Anchorage                                      |                     |

Figure 4 — Example of a jaw winch

## 3.5 Definitions for hand powered trolleys supporting lifting machines

## 3.5.1

**hand powered trolleys supporting lifting machines**

equipment fitted with wheels which are designed for the hand powered travelling of a hooked or combined lifting machine along a monorail

**3.5.2****geared travel trolley**

hand powered trolley permitting horizontal travel, driven by a hand wheel which is operated by an operating chain (see figure 5)

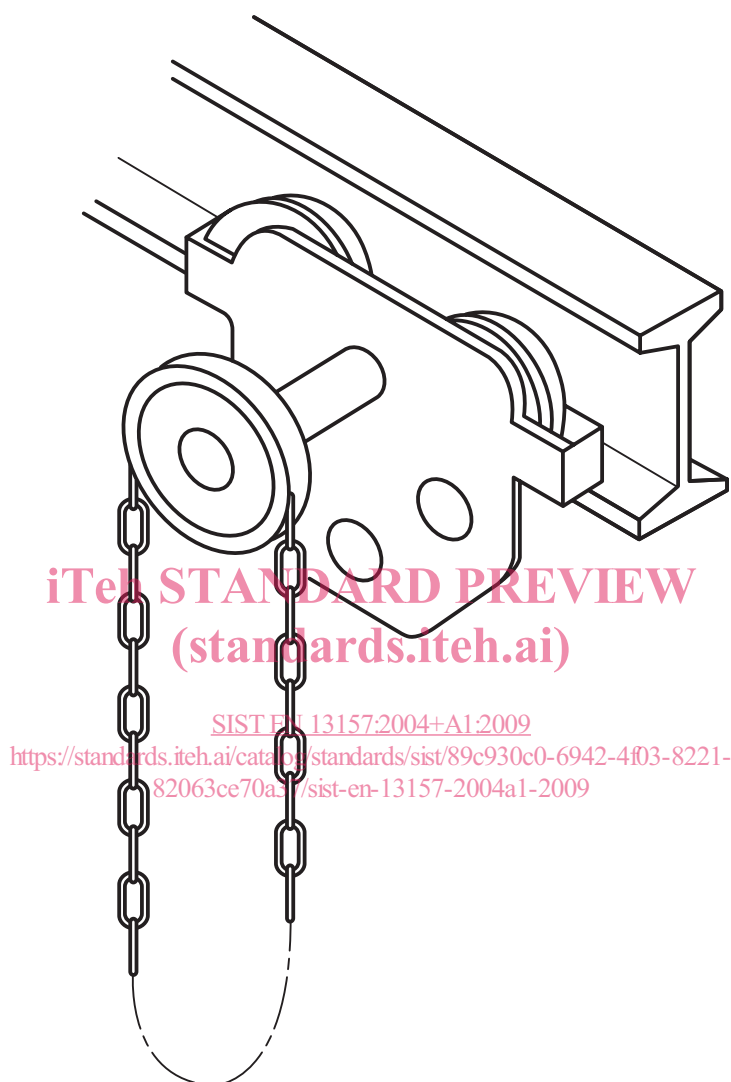


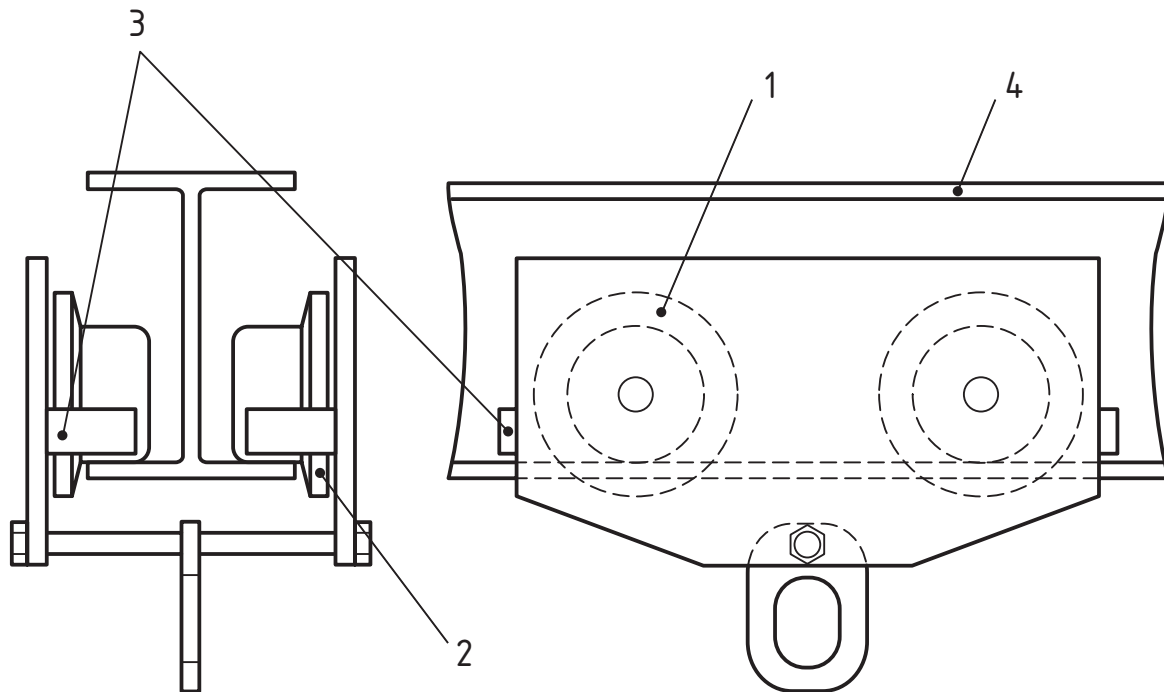
Figure 5 — Example of geared travel trolley

**3.5.3****monorail**

equipment comprising an overhead beam or section along which suspended loads can be moved with a trolley. This equipment can also have curves, points, turntables etc.

**3.5.4****push travel trolley**

hand powered trolleys permitting horizontal travel by pushing or pulling manually on the load (see figure 6)



1. Wheel
2. Wheels flange
3. Buffer
4. Monorail

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**Figure 6 — Example of a push travel trolley**

### 3.6 Definitions for drum winches

#### 3.6.1

##### **AC** drum winch **AC**

device for lifting, lowering and holding a load connected to a rope or webbing wound onto a drum by means of (a) crank handle(s) or operating wheel(s) activated by human effort (see figure 7)

#### 3.6.2

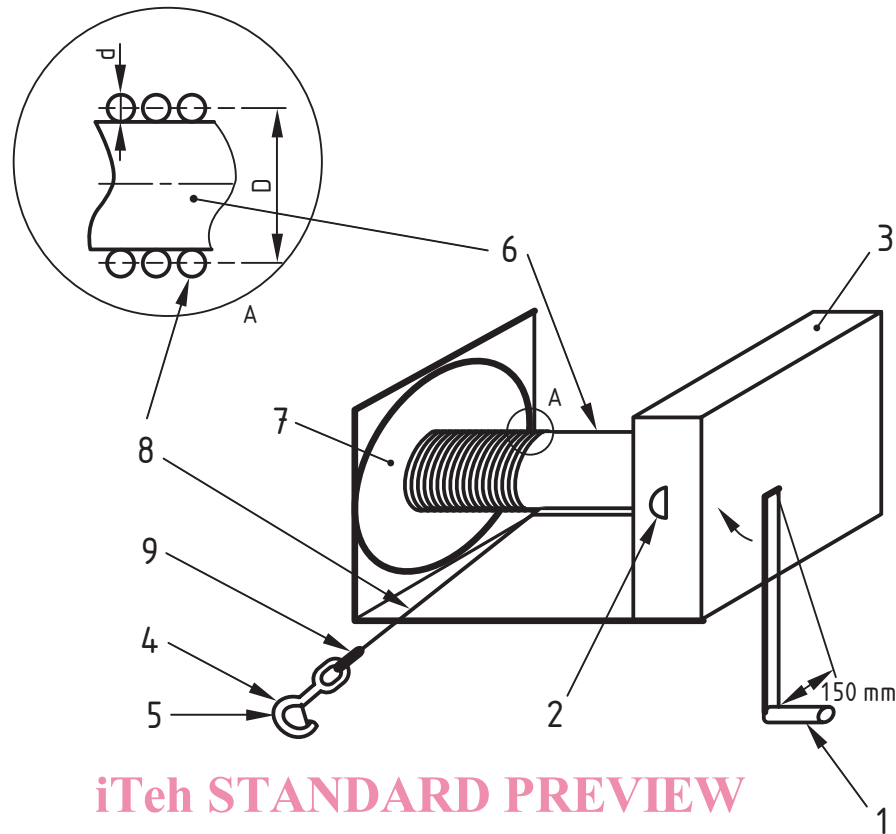
##### **D/d ratio**

the ratio of the pitch circle diameter of the first rope or webbing layer on the drum or sheave to the diameter of the rope or the thickness of the webbing.

#### 3.6.3

##### **drum pitch circle diameter**

twice the distance between the drum or the sheave axle and the middle of the rope or webbing in direct contact with the drum or sheaves (first layer on drum).



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1	Crank handle or operating wheel	7	Drum flange
2	Disengagement – de clutching device	8	Wire rope
3	Guarding – cover	9	Termination
4	Hook	D	Drum pitch diameter
5	Latch	d	Minimum calculated rope diameter
6	Drum		

**Figure 7 — Example of a drum winch**

### 3.7 Definitions for pulley blocks and deflection pulley

#### 3.7.1

##### **deflection pulley**

equipment used to change the direction of a rope with a sheave freely rotating on an axle to be used with drum winches and jaw winches

#### 3.7.2

##### **pulley block**

an assembly of one or more sheaves, rotating freely on one or more shafts used to change the direction of a wire rope or a rope to be used with drum winches and jaw winches (see figure 8)

#### 3.7.3

##### **pitch diameter**

twice the distance between the drum or the sheave axle and the middle of the rope or webbing in direct contact with the drum or sheaves (first layer on drum)

#### 3.7.4

##### **sheave**

wheel with a groove supporting a wire rope or a fibre rope