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**Cranes — Training of drivers —**

**Part 3:  
Tower cranes**

*Appareils de levage à charge suspendue — Formation des  
conducteurs —*

*Partie 3: Grues à tour*

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Published in Switzerland

## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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

ISO 9926-3 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 7, *Tower cranes*.

ISO 9926 consists of the following parts, under the general title *Cranes — Training of drivers*:

- *Part 1: General*
- *Part 3: Tower cranes*

The following parts are under preparation:

- *Part 2: Mobile cranes*
- *Part 4: Jib cranes*

## Introduction

ISO 9926-1 specifies the minimum training to be given to trainee drivers of lifting appliances with a suspended load in order to develop the person's operational basic skill in driving and to impart the knowledge required for the correct use of these appliances.

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# Cranes — Training of drivers —

## Part 3: Tower cranes

### 1 Scope

This part of ISO 9926 covers the specific subjects considered necessary for training tower crane drivers.

### 2 Normative references

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.

ISO 9926-1, *Cranes — Training of drivers — Part 1: General*

ISO 4302, *Cranes — Wind load assessment*

### 3 Content of training according to tower crane type

Practical or theoretical training shall take into account the following characteristics, according to tower crane type:

- a) positioning of loads;
- b) types of hoist controls, e.g. stepless contact, speed;
- c) type of jibs, e.g. horizontal jib, luffing jib, gooseneck jib, extending jib, jack knife boom or folding jib;
- d) type of erection/dismantling, e.g. cranes assembled from component parts, self-erecting tower cranes, travelling or stationary cranes, cranes climbing inside or outside the building (theoretical procedure);
- e) special operating precautions when more than one driver is used on one crane, e.g. the last crane user has to make sure that the crane is put out of service correctly;
- f) procedures for taking the crane out of service, including putting the jib to free slewing, applying rail clamps or any special procedure describing to in the manufacturer's instructions;
- g) making the crane ready for road transport, where applicable (theoretical procedure);
- h) the role and responsibilities of the crane driver;
- i) maintaining a safe distance from electrical power lines;
- j) operational interferences and proximity hazards;

- k) different pulley system configurations;
- l) purpose and operation of safety devices;
- m) checking of all motion limiters;
- n) forbidden operations;
- o) tests and periodic checks;
- p) regulation applicable to the country;
- q) detection and recording malfunctions — notifying a designated person.

#### **4 Illiteracy and language problems**

Wherever practicable, pictograms or other visual means, rather than text, should be used.

Part of the training shall familiarize the trainee with the pictograms and other visual means used.

#### **5 Communication systems**

Drivers should be trained in the use of communication systems.

For tower cranes, the following hand signals shall be defined, taking into account the national usage and standards, identifying the following controls:

- a) start of command;
- b) stop;
- c) deceleration;
- d) hoisting the load;
- e) lowering the load;
- f) direction of the load;
- g) crane travelling;
- h) emergency stop.

NOTE Annex A illustrates and gives examples of different signals in usage (Tables A.1, A.2, A.3).

Radios and hard-wired voice communication systems may be used.

#### **6 Load curves**

The load curves and the characteristics of the cranes shall be taught, including the manufacturer's information given on the rating plate fixed to the control panel.

## 7 Operating wind speed limits

### 7.1 General

Drivers should familiarize themselves with the crane and should consult the instruction manual for the limiting wind speed.

When starting the shift, a crane driver shall establish the maximum wind speed in service.

### 7.2 Operating limits

The manufacturer has determined a maximum wind speed in service according to ISO 4302, set by considering the suspended load surface (in general  $1 \text{ m}^2/\text{t}$ ). If this surface is exceeded, operating the tower crane shall be limited with a reduced maximum wind speed.

Larger loads shall be secured against swinging.

Generally, every tower crane or site is equipped with an anemometer. The trainee shall learn to use it. If there is no anemometer, the wind speeds may be estimated by sight.

The training shall make the driver aware of the dangers associated with operating tower cranes and of the different sources of information that may be available.

### 7.3 Putting out-of-service

When the wind speed in service according to ISO 4302 is reached, the crane shall be put into the out-of-service conditions specified by the manufacturer. The necessary weathervaning operations shall be carried out and, if necessary, the tightening of the rail clamps.

## 8 Use with or without radio control

If driving by means of a radio control is required, the driver shall

- a) ensure that he/she is able to see the instructions on the rating plates,
- b) keep visual contact with the load or ensure adequate assistance, and
- c) know the procedure to take/transfer the control of the crane (in case of several radio control sets).

**Annex A**  
(informative)

**Control hand signals**

Table A.1 — Control hand signals used in Europe

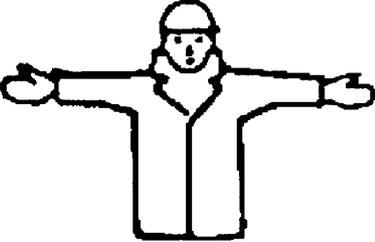
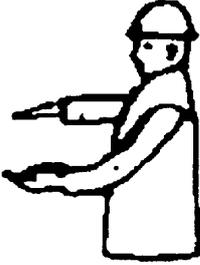
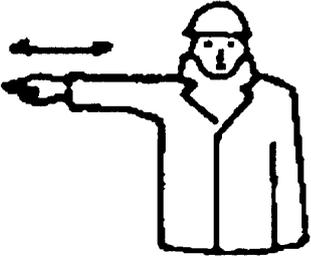
 <p>Start of command</p>	 <p>Stop (Normal/Emergency/Control stop)</p>	 <p>End of operation (all movements)</p>
 <p>Load hoisting</p>	 <p>Load lowering</p>	 <p>Vertical distance</p>
 <p>Move forwards</p>	 <p>Move backwards</p>	 <p>Right of the signalman</p>
 <p>Left of the signalman</p>	 <p>Horizontal distance</p>	

Table A.2 — Control hand signals used in Australia

Motion	Hand signal	Whistle, bell or buzzer signal	Motion	Hand signal	Whistle, bell or buzzer signal
Hoisting raise		2 short ..	Hoisting lower		1 long —
Luffing boom up		3 short ...	Luffing boom down		4 short ....
Through to the direction indicated		1 long, 2 short — ..	Through to the direction indicated		1 long, 1 short — .
Jib-trolley out; telescoping boom extend		1 long, 3 short — ...	Jib-trolley in; telescoping boom retract		1 long, 4 short — ....
Travel and traverse		N/A	STOP		1 short .

Creep speed: appropriate hand signal for motion with hand opening and closing.