

INTERNATIONAL
STANDARD

ISO
9927-1

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Cranes — Inspections —

Part 1:
General

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Appareils de levage à charge suspendue — Vérifications —

Partie 1: Généralités

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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 9927-1 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 5, *Use, operation and maintenance*.

ISO 9927 consists of the following parts, under the general title *Cranes — Inspections*:

— *Part 1: General*

The following parts are planned for future publication:

— *Part 2: Mobile cranes*

— *Part 3: Tower cranes*

— *Part 4: Jib cranes*

— *Part 5: Overhead travelling and portal bridge cranes*

Annex A of this part of ISO 9927 is for information only.

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Cranes — Inspections —

Part 1: General

1 Scope

This part of ISO 9927 specifies the regular inspections to be carried out on cranes as defined in ISO 4306-1, ISO 4306-2 and ISO 4306-3.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9927. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9927 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4306-1:1990, *Cranes — Vocabulary — Part 1: General*.

ISO 4306-2:1994, *Cranes — Vocabulary — Part 2: Mobile cranes*.

ISO 4306-3:1991, *Cranes — Vocabulary — Part 3: Tower cranes*.

3 General

In order to ensure safe operation of cranes, their proper working and operational condition shall be maintained. Therefore all cranes need to undergo regular inspections. This ensures that deviations from safe conditions are detected and can be rectified. The inspections shall be arranged by the user.

4 Inspection prior to operation

Prior to operation, the crane shall be checked by the crane driver.

In general, the inspection prior to operation is a functional test of the safety equipment carried out in accordance with the operating instructions, and a visual inspection for obvious defects.

5 Regular inspections

5.1 Inspection intervals

Depending on the duration of operation and the operating and factory conditions, cranes shall be inspected by an experienced technician (5.2.1) or an expert engineer (5.2.2) as and when necessary, but at least once a year.

5.2 Inspecting personnel

5.2.1 Experienced technicians are persons who, due to their vocational background and experience, have sufficient knowledge in the field of cranes and are sufficiently familiar with the relevant regulations to determine deviations from the proper conditions (i.e. specially trained personnel).

5.2.2 Expert engineers are engineers experienced in the design, construction or maintenance of cranes, with sufficient knowledge of the relevant regulations and standards, who have equipment necessary for carrying out the inspection and are in a position to judge the safe condition of the crane and to decide which measures shall be taken in order to ensure further safe operation.

5.3 Type of inspection

In general, a regular inspection consists of the visual examination and verification of function and effectiveness. Unless stipulated by other regulations or by the manufacturer, it is not normally necessary for the experienced technician to disassemble any parts. Inspections by expert engineers, however, may involve disassembling parts so that the safe condition of the crane may be assessed.

The inspections shall be carried out in the following order:

- verification of the identification of the crane, including the labelling;
- verification of the condition of components and equipment with reference to damage, wear, corrosion or any other change;
- functional test of mechanisms;
- verification of the state and efficiency of safety equipment and brakes under nominal load.

An example of a check-list for the inspection of various types of cranes is given in annex A.

5.4 Results of the inspection

The results of the regular inspection shall be recorded by the personnel carrying out the inspection.

Reports by experienced technicians shall detail all observations. Reports by expert engineers shall contain the conclusions drawn from the observations.

Reports shall include the following:

- the scope of the inspection;
- any partial inspection still to be carried out;
- the defects that have been found;
- assessment as to whether or not there is any cause for concern regarding the further operation of the crane.

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Annex A (informative)

Example of a check-list for regular inspections of cranes

Check-list

The details to be checked are given below.

Element	Verification to be made
1 Components and mechanical equipment	
1.1 Crane runway structure Pillars, girders, bars, connections	Condition (cracks, deformation, wear, corrosion)
1.2 Access ladders and walkways Steps, rungs, beams, covering of walkways, platforms, etc. Protective guarding (railing, intermediate bars, hoop guard, toe guards) Information labels and boards marking hazardous areas	Installation, condition
1.3 Crane and trolley tracks Travel rails, runway stops Locking and latching devices	Installation and condition, track gauge, span, deformation Condition, function
1.4 Crane structure (bridge, portal mast, jib, tower) Girders, bars, connections, buffers, end stops, bracings	Cracks, deformation, wear, fastening elements, condition, alignment
1.5 Trolley structure (structure, jib) Girders, bars, connections, slewing rims	Condition
1.6 Assemblies Travel wheels, shafts, couplings, drums, sheaves, compensating sheaves with pins Gear wheels, worm gears Screws, nuts, wedges Hydraulic and pneumatic components Mechanical warning devices, limit stop devices, overload protection	Fitting and securing of removable parts, condition Function Support Protection of assembly Condition, function
1.7 Brakes Discs, shoes, belts, levers, release units, weights, pins, springs	Condition, function, brake test with load (test load in the capacity range)
1.8 Lubrication Lubrication systems and lubrication points	Sufficient filling, accessibility, identification
1.9 Clearances	Compliance, also with regard to subsequently added elements
1.10 Foundations, anchorages	Condition and installation

Element	Verification to be made
<p>2 Electrical equipment</p> <p>2.1 Switches and actuating devices Mains connection switch, isolating switch, crane switch, control gear, contactors, overcurrent protection, limit switches, overload protection</p> <p>2.2 Supply lines Mobile connecting lines, busbar lines, insulators, current collectors, permanently laid lines</p> <p>2.3 Current consumers Motors, brake release units, resistors, heaters, lighting, warning and signalling systems, load-lifting magnets and other energy-consuming lifting attachments</p> <p>2.4 Protection</p>	<p>Accessibility, condition, function, identification</p> <p>Installation, polarity, condition</p> <p>Condition, polarity, function</p> <p>Protection against direct and indirect contact, insertion of polyethylene conductors and of insulators in control systems</p>
<p>3 Handling accessories (ropes, chains, belts, etc.)¹⁾</p> <p>3.1 Cables</p> <p>3.2 Chains</p> <p>3.3 Load hooks, grabs, tongs and other load-handling accessories</p>	<p>The nature and number of broken wires, wear due to friction, corrosion pits, pinches, loosening of the outer wire layer and other changes in cable construction</p> <p>Protection preventing the cable from leaving its track</p> <p>Condition of the cable anchorage</p> <p>Shielding against heat radiation when transporting molten metal</p> <p>Deformation</p> <p>Elongation, wear, cracks, securing of pins by means of rivets or rings, etc., correct running on sprockets, chain protection bracket (installed and working)</p> <p>Deformation, deformation and pinches in the mouth of the hook, cracks, wear, corrosion, securing of hook nut, securing devices for preventing load from falling off (if specified)</p>
<p>1) For correct assessment of handling accessories, it may be necessary to disassemble parts. During the inspection, handling accessories shall be inspected over their entire length, including hidden parts, e.g. contact surfaces on compensating sheaves, pressure points under cable clips and cable anchorages.</p>	

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