

BS 7121-2-4:2025



BSI Standards Publication

Safe use of cranes

Part 2-4: Inspection, maintenance and thorough examination of loader cranes – Code of practice

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Foreword

Publishing information

This part of [BS 7121-2](#) is published by BSI Standards Limited, under license from the British Standards Institution, and came into effect on 31 July 2025. It was prepared by Subcommittee MHE/3/11, *Crane safety and testing*, under the authority of Technical Committee MHE/3, *Cranes and derricks*. A list of organizations represented on these committees can be obtained on request to the committee manager.

Supersession

This part of [BS 7121-2](#) supersedes [BS 7121-2-4:2013](#), which is withdrawn.

Relationship with other publications

[BS 7121](#) is published in the following parts:

- Part 1: General
- Part 2-1: Inspection, maintenance and thorough examination – General
- Part 2-3: Inspection, maintenance and thorough examination – Mobile cranes
- Part 2-4: Inspection, maintenance and thorough examination of loader cranes
- Part 2-5: Inspection, maintenance and thorough examination – Tower cranes
- Part 2-7: Inspection, maintenance and thorough examination – Bridge and gantry cranes, including light crane systems
- Part 2-9: Inspection, maintenance and thorough examination – Cargo handling and container cranes
- Part 3: Mobile cranes
- Part 4: Lorry loaders
- Part 5: Tower cranes
- Part 7: Bridge and gantry cranes, including light crane systems
- Part 11: Offshore cranes
- Part 12: Recovery vehicles and equipment
- Part 13: Hydraulic gantry lifting systems
- Part 14: Side boom pipelayers

This part of [BS 7121-2](#) is intended to be used in conjunction with [BS 7121-2-1](#).

Information about this document

This is a full revision of the document, and introduces the following principal changes:

- alignment with [BS 7121-1:2016](#);
- alignment with the content and format of other parts of [BS 7121-2](#);
- the scope has been updated and clarified;
- references have been updated throughout;
- definitions have been expanded and improved, such as including timber handling and recycling cranes;
- [Table 1](#) has been added to aid understanding of the recommendations for periodic testing of lorry loaders;

- provisions have been added covering facilities, services and test site conditions for thorough examinations;
- provisions have been added regarding what to do if no machine history is available prior to thorough examination;
- provisions have been added regarding what to do if safety systems are found deliberately overridden prior to thorough examination;
- provisions have been added regarding the thorough examination of attachments;
- recommended checks have been added to include the inspection and thorough examination of hydraulic rotating stabilizers throughout;
- a clause has been added on running in;
- a clause has been added on the functional test;
- a clause has been added on the performance test;
- an explanatory reason has been added for the purpose of each test clause;
- the term “static” has been removed from “static overload” for improved clarity;
- recommendations have been added for what to do upon the completion of testing and thorough examination;
- recommendations have been added covering air suspension and lift axles during thorough examination;
- clarification has been provided that non-destructive testing (NDT) decisions can also be based on data logger information, not just crane age;
- [Annex A](#) now recommends that pre-use checklists include height warning/boom not stowed and stabilizer not stowed warnings; and
- addition of recommendations from Association of Lorry Loader Manufacturers and Importers’ (ALLMI) *GN010: Thorough examination and testing of loader cranes* [1].

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at knowledge.bsigroup.com, or by contacting the Customer Services team.

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Hazard warnings

WARNING. This part of [BS 7121-2](#) calls for the use of procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

As a code of practice, this part of [BS 7121-2](#) takes the form of guidance and recommendations. It is not to be quoted as if it were a specification. Users are expected to ensure that claims of compliance are not misleading.

Users may substitute any of the recommendations in this part of [BS 7121-2](#) with practices of equivalent or better outcome. Any user claiming compliance with this part of [BS 7121-2](#) is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this document are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

The word “should” is used to express recommendations of this document. The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word “can” is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this document. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

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Compliance with a British Standard cannot confer immunity from legal obligations.

Particular attention is drawn to the following specific Acts and regulations:

- Health and Safety at Work etc. Act 1974 [2];
- Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 [3];
- Provision and Use of Work Equipment Regulations (PUWER) 1998 [4];
- Supply of Machinery (Safety) Regulations 2008 (as amended) [5];
- Road Vehicles (Construction and Use) Regulations 1986 (as amended) [6];
- Road Traffic Act 1991 [7];
- Work at Height Regulations 2005 (as amended) [8].

NOTE Details of LOLER 1998 [3] and PUWER 1998 [4] are provided in the HSE publications Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved code of practice [9] and Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved code of practice and guidance [10].

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Introduction

Loader cranes have traditionally been used to load and unload vehicles on which they are mounted and these vehicles, complete with the crane, are referred to as “lorry loaders”.

Loader cranes can be installed in a static location (e.g. on a quay, in a factory or on the roof of a building).

1 Scope

This part of [BS 7121-2](#) gives recommendations for the pre-use checks, in-service inspection, maintenance, thorough examination (in service and following exceptional circumstances) and supplementary testing of loader cranes.

This part of [BS 7121-2](#) also covers loader cranes fitted with attachments and interchangeable equipment that can be used in conjunction with loader cranes, such as brick grabs, muck grabs, augers, clamshells, pallet forks, wire rope hoists, fly jibs and manipulators. It does not cover detailed guidance on the pre-use checks, in-service inspection, maintenance, thorough examination of such attachments or interchangeable equipment.

This part of [BS 7121-2](#) does not cover the stability testing and certification immediately following installation of loader cranes on vehicles or in static locations.

NOTE Stability testing and certification immediately following installation of loader cranes on vehicles or in static locations is covered in [BS EN 12999](#).

This part of [BS 7121-2](#) is applicable both to lorry loaders and to loader cranes used in other situations, such as static locations.

This part of [BS 7121-2](#) is not applicable to lorry loaders working from, or loader cranes mounted on, marine and other water-borne vessels.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 7121-1:2016](#), *Code of practice for safe use of cranes – General*

[BS 7121-2-1:2012](#), *Code of practice for the safe use of cranes – Part 2-1: Inspection, maintenance and thorough examination – General*

[BS EN 12999](#), *Cranes – Loader cranes*

[BS ISO 4309](#), *Cranes – Wire ropes – Care and maintenance, inspection and discard*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in [BS 7121-2-1:2012](#) and the following apply.

3.1 chassis

underpart of a motor vehicle on which the body/sub frame is mounted

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

3.2 design life

estimation of the allowable service life of a crane based on its original design specifications and taking into account the stress cycles and stress collectives (design constraints) before a special assessment and general overhaul are required

3.3 in-service

condition where the loader crane is handling loads not exceeding the rated capacities within permissible wind speeds and other conditions, as specified by the manufacturer

3.4 lift axle

auxiliary unpowered axle that can be raised so that its tyres are not touching the road surface when the crane is not needed, installed in conjunction with the rear axle(s) of a vehicle chassis

3.5 loader crane

powered driven crane comprising a column which slews about a base, and a boom system attached onto the top of the column

3.6 lorry loader

commercial vehicle or trailer fitted with a loader crane, which typically has a load-carrying capability

3.7 out-of-service condition

condition where the lorry loader is either not required for use or is out of use, without a load and in conditions as specified by the manufacturer

3.8 pre-use checks

checks undertaken by the loader crane operator at the start of each shift to confirm that the lorry loader has not suffered any damage or failure, and is safe to go to work

3.9 recycling crane

loader crane specifically designed, manufactured and equipped with a grapple for loading/unloading of recycling materials

NOTE 1 An example of recycling materials is scrap metal.

NOTE 2 Recycling cranes are designed to operate at higher speeds and with higher dynamic loads than other types of loader crane.

3.10 stability testing

testing to verify the stability of the loader crane mounted on the unloaded vehicle

3.11 sub frame (helper frame)

frame constructed and secured to the vehicle frame so that it can withstand the imposed loads and conform to the requirements for the chassis strength specified by the vehicle manufacturer

3.12 timber handling crane

loader crane specifically designed, manufactured and equipped with a grapple for the loading/unloading of unprepared timber in a forestry environment

NOTE 1 Unprepared timber is, for example, tree trunks or branches.

NOTE 2 The operator controls the crane from a high seat or from a cabin.

3.13 trailer

unpowered vehicle designed to be coupled to a trailer towing vehicle and to impose a substantial part of its total weight on the towing vehicle

4 General

Regular pre-use checking, in-service inspection, maintenance and thorough examination of cranes should be undertaken if cranes are to function safely and reliably, as follows.

- a) Visual pre-use checks should be undertaken in conjunction with functional checks to confirm there are no obvious defects and verify that the crane has not suffered damage or failure, and is safe to use.
 - b) In-service inspections and maintenance should be undertaken to verify that components are repaired or replaced before they deteriorate to a point at which they would become unsafe.
 - c) Thorough examinations should be undertaken at specified intervals, after major alteration or repair, or after the occurrence of exceptional circumstances which could jeopardize the safety of the crane.
 - d) Supplementary testing should be undertaken in support of thorough examination and the extent and nature of any testing should be as specified by the competent person carrying out the thorough examination.
-

5 Personnel carrying out pre-use checks, in-service inspections, maintenance and thorough examinations

Attributes, competencies, competency assessment, training plans and training records of personnel should conform to [BS 7121-2-1:2012](#), Clause 5.

6 Pre-use checks and in-service inspections

6.1 General

NOTE 1 Attention is drawn to Section 2(2)(a) of the Health and Safety at Work etc. Act 1974 [2] and Regulation 9(3)(b) in LOLER 1998 [3] in respect of pre-use checks and in-service inspections of cranes.

Pre-use checks and in-service inspections should only be undertaken by personnel who have been adequately trained and assessed as competent to carry out the required tasks (see [Clause 5](#)).

NOTE 2 Attention is drawn to LOLER 1998 [3] in respect of the requirement for the results of in-service inspections to be recorded in writing. It is good practice for the results of all pre-use checks also to be recorded in writing.

The crane user should allow time for pre-use checks to be carried before the crane starts work. The user should also verify that a safe system of work is in place to prevent the person who is carrying out the checks/inspections from being exposed to danger.

Personnel carrying out pre-use checks, in-service inspections, maintenance and thorough examinations should be suitably trained on the avoidance of hand contact with any hydraulic components when checking for leaks.

NOTE 3 Attention is drawn to the risk of hydraulic injection injury.

If a pre-use check identifies any safety systems having been deliberately overridden, the loader crane should not be used and the issue should be reported to management. The loader crane should only be put back into service when all safety systems have been checked and reinstated.

6.2 Pre-use checks

Pre-use checks should be undertaken at the start of each shift during which the crane is to be used and at each change of operator. Pre-use checks should be undertaken from a position of safety.

NOTE 1 These pre-use checks are to test the functionality of the crane and visually check for any obvious defects.

NOTE 2 An example of a checklist for pre-use checking of a loader crane and of a lorry loader is given in [Annex A](#).

6.3 In-service inspection

A regular in-service inspection should be made to identify any defects not detected by the pre-use checks. In-service inspections should be undertaken at intervals such that any deterioration is identified before there is a risk of failure of the crane or injury to persons.

NOTE 1 It might be convenient to schedule the inspections concurrently with planned preventive maintenance (see [BS 7121-2-1:2012](#), [7.2.2](#) and [7.2.3](#)).

NOTE 2 Attention is drawn to HSE document L113 [\[9\]](#).

For loader cranes, two types of in-service inspection should be undertaken. The first, which is in addition to the pre-use checks, should be undertaken at intervals of between one week and one month, depending on the application and level of use of the crane.

NOTE 3 An example of a checklist for this type of in-service inspection is given in [Annex B](#).

The second type of in-service inspection should be undertaken at intervals of between three months and six months.

NOTE 4 An example of a checklist for this type of inspection is given in [Annex C](#).

NOTE 5 An example of an in-service inspection checklist for an attachment is given in [Annex D](#).

NOTE 6 Steel structures suffer from fatigue, a process which can create cracks that propagate over time. If left unattended, cracks can cause serious failure of the crane structure.

The in-service inspection regime should include measures to detect cracks in steel structures before the safety of the crane is affected. Therefore, in-service inspections should include a structural inspection of highly stressed areas of the crane.

NOTE 7 Details of these areas are given in [Annex E](#).

NOTE 8 The majority of these areas are adjacent to greasing points so a close inspection can be made while the structure is being lubricated.

NOTE 9 Paint can hide cracks, particularly if the area has been resprayed and might need to be removed to permit inspection.

If there are indications of cracking or excessive wear in pins, bearings or structural components, the crane should be taken out of use and a thorough examination performed in accordance with [Clause 8](#), with NDT, if deemed necessary by the competent person.

The period and extent of the inspections required depends on the potential risk from the lifting equipment, including operational factors, and the period between inspections should be decided based on a risk assessment taking account of, for example, manufacturer's guidance, duty of the crane, age of the crane and the environmental conditions. The period should be kept under review and adjusted according to the results of the inspections.

6.4 Reporting of defects

Personnel carrying out pre-use checks or in-service inspections should submit written reports or observations of defects as soon as they are identified.

NOTE Attention is drawn to LOLER 1998 [3] which requires that defects be reported immediately when they are identified.

Reporting of defects should be in addition to the normal verbal reporting that should routinely take place between crane operator and crane owner/site manager. The written report should be to a predefined format (e.g. a pro-forma or a section on the daily time sheet), which requests details of the defect or observation and supporting information, such as date, time, crane identification, error codes and circumstances. The operator should also fill in a written report when there are no defects or observations to report (a “nil report”) and these should be submitted at least weekly.

Defect reports, including the “nil reports”, should be forwarded to the crane owner (or the crane owner’s delegated representative), who should arrange for any necessary action to be taken based on the report. A copy of the original report should be retained by the crane user.

Once a defect/observation has been dealt with and cleared, this should be recorded with supporting information on the original defect report.

The “cleared” reports should be securely lodged in the crane owning organization’s maintenance management system and should be made available on demand to the users of the crane as well as other authorized bodies.

6.5 Records of pre-use checks and in-service inspections

6.5.1 General

Written records of all pre-use checks and in-service inspections should be retained.

6.5.2 Pre-use checks

The record of a pre-use check should include at least the following information:

- a) identity of the crane;
- b) date of pre-use check;
- c) result of the check, i.e. whether or not the crane passed; and
- d) name and signature of person carrying out the check.

NOTE 1 This can be recorded, for example, in a standard pro-forma record.

NOTE 2 An example of a pre-use checklist for a loader crane and for a lorry loader is given in [Annex A](#).

6.5.3 In-service inspections

The record of an in-service inspection should include at least the following information:

- a) date and location of the inspection;
- b) description and unique identification number of the equipment inspected;
- c) nature and extent of the inspection;
- d) results of the inspection, including details of the condition of critical components which should be monitored (e.g. a wire rope showing signs of wear); and
- e) name and signature of the person carrying out the inspection.

The record should be related to the crane’s historical records and made available to the competent person responsible for the thorough examination (see [Clause 8](#)).

6.6 Inspection of second-hand loader cranes

When purchasing second-hand loader cranes, their condition should be inspected and assessed.

NOTE 1 Second-hand cranes might also have been imported into the UK without being modified to meet UK legislation, so-called “Grey imports”. The assessment of a second-hand crane includes a review of maintenance records and previous reports of thorough examination, together with consultation with the manufacturer to obtain details of any major repairs, etc.

The contents of any data logger should be downloaded and reviewed. Once the crane’s condition has been fully assessed, any necessary repairs should be undertaken and appropriate inspection and maintenance intervals established.

NOTE 2 The assessment might require the removal of access covers or strip down of major assemblies to reveal parts that could not ordinarily be seen.

6.7 Checks when the loader crane is not in regular use

If the lorry loader is held in out-of-service conditions and not in regular use, a special programme of checks should be undertaken before it is used.

NOTE The extent and thoroughness of this programme is based not only on the length of the period for which the lorry loader has been out of use, but also on the location of the lorry loader during this period. A lorry loader standing under cover or inside a workshop might require very little in addition to the checks recommended in 6.2 and 6.3, but a lorry loader that has been out of use in the open, and therefore exposed to the weather and atmospheric pollution, etc., is likely to require an extensive appraisal to determine its fitness for work.

The appraisal should include at least the following procedures:

- a) checks recommended by the lorry loader manufacturer;
- b) where fitted, examine ropes for signs of corrosion and damage, and checks for thorough lubrication;
- c) examine control linkages for evidence of seizure or partial seizure, and checked for correct lubrication;
- d) test every lorry loader motion for several minutes without load, each motion individually at first, then with two or more motions simultaneously, as appropriate. The test should be repeated with a load up to rated capacity on the lorry loader;
- e) undertake a full functional check;
- f) check seals or other components for evidence of deterioration; and
- g) undertake checks recommended by the attachment manufacturer.

Before the lorry loader is returned to service, the results of the tests in the programme should be documented in the records (see 7.5), along with details of any corrective action taken.

7 Maintenance of loader cranes

7.1 General

An effective maintenance management system should be set up in accordance with BS 7121-2-1:2012, 7.1, so that cranes are maintained in efficient working order and good repair.

NOTE Attention is drawn to the Provision and Use of Work Equipment Regulations (PUWER) 1998 [4].