



SLOVENSKI STANDARD

SIST EN 15313:2010

01-september-2010

Železniške naprave - Zahteve za vzdrževanje kolesnih dvojic - Vzdrževanje kolesnih dvojic med obratovanjem in vzdrževanje demontiranih kolesnih dvojic

Railway applications - In-service wheelset operation requirements - In-service and off-vehicle wheelset maintenance

Bahnanwendungen - Radsätze und Drehgestelle - Radsatzinstandhaltung

Application ferroviaires - Exploitation des essieux en service - Maintenance des essieux en exploitation ou déposés

iTeh STANDARD PREVIEW

(standards.iteh.ai)

[SIST EN 15313:2010](https://standards.iteh.ai/catalog/standards/sist/623348c-450b-4861-832e-4609812d6f5a/sist-en-15313-2010)

Ta slovenski standard je istoveten z: **EN 15313:2010**

<https://standards.iteh.ai/catalog/standards/sist/623348c-450b-4861-832e-4609812d6f5a/sist-en-15313-2010>

ICS:

45.040 Materiali in deli za železniško Materials and components
tehniko for railway engineering

SIST EN 15313:2010

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 15313:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

EUROPEAN STANDARD

EN 15313

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2010

ICS 45.040

English Version

Railway applications - In-service wheelset operation requirements - In-service and off-vehicle wheelset maintenance

Applications ferroviaires - Exploitation des essieux en service - Maintenance des essieux en exploitation ou déposés

Bahnanwendungen - Radsätze und Drehgestelle - Radsatzinstandhaltung

This European Standard was approved by CEN on 30 January 2010.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, 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.

[SIST EN 15313:2010](https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

| | |
|---|----|
| Foreword..... | 5 |
| 1 Scope | 6 |
| 2 Normative references | 7 |
| 3 Terms and definitions | 7 |
| 4 Maintenance | 8 |
| 4.1 General..... | 8 |
| 4.2 Maintenance organization..... | 8 |
| 4.2.1 Maintenance plan..... | 8 |
| 4.2.2 Service experience | 8 |
| 4.2.3 Traceability – storage – transportation | 9 |
| 4.3 Qualification of equipment and systems | 10 |
| 4.3.1 General principle..... | 10 |
| 4.3.2 Qualification file for equipment and systems..... | 10 |
| 4.4 Staff certification and competence | 10 |
| 4.5 Maintenance organization plan | 11 |
| 4.6 Qualification of an undertaking for the maintenance of in-service or off-vehicle wheelsets | 11 |
| 5 Definition and illustrations of a wheelset, its associated components and defects | 13 |
| 5.1 Definition and illustrations of a wheelset..... | 13 |
| 5.1.1 Wheelset | 13 |
| 5.1.2 Axle | 14 |
| 5.1.3 Wheel | 15 |
| 5.1.4 Axle box | 16 |
| 5.2 Functional references of the rail-wheel interface..... | 17 |
| 5.2.1 General..... | 17 |
| 5.2.2 Wheelset functional references..... | 17 |
| 5.2.3 Wheel functional references..... | 17 |
| 5.3 Definition and illustrations of defects | 18 |
| 5.3.1 General..... | 18 |
| 5.3.2 Defects for all types of wheel | 18 |
| 5.3.3 Defects specific to monobloc wheels..... | 27 |
| 5.3.4 Axle defects | 28 |
| 5.3.5 Axle box defects | 30 |
| 5.3.6 Wheelset defects..... | 31 |
| 6 Mandatory requirements and operations..... | 33 |
| 6.1 General..... | 33 |
| 6.2 Mandatory requirements..... | 34 |
| 6.2.1 In-service limit dimensions and positions | 34 |
| 6.2.2 Maintenance decision criteria for in-service wheels..... | 38 |
| 6.2.3 Marking of wheelsets with wheels according to EN 13979-1 | 41 |
| 6.2.4 Electrical resistance of wheelsets after overhaul | 41 |
| 6.2.5 Tyred wheels | 41 |
| 6.2.6 Operational limit values for axle bodies..... | 41 |
| 6.3 Reprofilng operation | 42 |
| 6.4 Dimensions after reprofiling..... | 42 |
| 6.4.1 Front-to-front dimension "a ₂ " | 42 |
| 6.4.2 Diameter difference between wheels on the same axle..... | 42 |
| 6.4.3 Limit values of radial run-out as a function of the maximum operating speed authorized for the vehicle..... | 42 |

| | | |
|---------|---|----|
| 6.4.4 | Wheel axial run-out as a function of the maximum operating speed authorized for the vehicle..... | 42 |
| 6.5 | Mandatory operations | 43 |
| 6.5.1 | Detection of thermal damage on the wheel rim or tyre | 43 |
| 6.5.2 | Verification of brake disc integrity | 43 |
| 6.5.3 | Detection of circularity defects (e.g. flats, metal build-up, cavity, etc.) | 43 |
| 6.5.4 | Verification of rim integrity – Detection of deep sub-surface tread defects | 43 |
| 6.5.5 | Verification of web integrity | 43 |
| 6.5.6 | Verification of axle integrity | 44 |
| 6.5.7 | Non-destructive testing | 44 |
| 6.5.8 | Verification of residual magnetism..... | 44 |
| 6.5.9 | Lubrication operation..... | 44 |
| 6.5.10 | Checking for axle box defects | 44 |
| 6.5.11 | Verification of wheelset electrical resistance after overhauls..... | 45 |
| 6.6 | Requirements to be met by wheelset maintenance equipment..... | 45 |
| 7 | In-service wheelset maintenance | 45 |
| 7.1 | General | 45 |
| 7.2 | Maintenance plan | 45 |
| 7.3 | Wheelset protection during body and bogie cleaning | 46 |
| 8 | Off-vehicle wheelset maintenance..... | 46 |
| 8.1 | General | 46 |
| 8.2 | Maintenance plan | 46 |
| 8.3 | Key operations for off-vehicle wheelset maintenance | 46 |
| 8.4 | Off-vehicle wheelset cleaning | 47 |
| 9 | Action to be taken on any wheelset after an incident in service or when not covered by the maintenance plan..... | 48 |
| 9.1 | Wheelset bearings subject to water ingress | 48 |
| 9.2 | Wheelsets having been subjected to a short circuit current (e.g. from falling overhead line equipment, etc.)..... | 48 |
| 9.3 | Detection by a trackside facility of a wheel circularity defect..... | 48 |
| 9.4 | Wheelsets loaded over the allowed limit | 48 |
| 9.5 | Hot axle box detection | 48 |
| 9.5.1 | General | 48 |
| 9.5.2 | Technical procedure | 48 |
| 9.5.3 | Treatment of the wheelsets with hot axle box in commercial or other service | 49 |
| 9.6 | Derailment | 49 |
| 9.7 | Head-on collision..... | 49 |
| 9.8 | Grease leakage or loss | 49 |
| 9.9 | Brake incident (detection of seized brake or discoloration)..... | 49 |
| 9.10 | Reporting after detection of a wheelset irregularity outside the maintenance plan | 49 |
| 10 | Domestic or bilateral traffic | 49 |
| 11 | Summary table of requirements | 49 |
| Annex A | (normative) Freight stock | 51 |
| Annex B | (informative) Rim width without roll-over for vehicle for domestic use | 52 |
| Annex C | (informative) Position of wear groove and reverse slope | 53 |
| Annex D | (informative) Tyred wheels | 54 |
| D.1 | Marking of tyred wheels..... | 54 |
| D.2 | Tyre thicknesses | 55 |
| D.3 | Defects specific to tyred wheels..... | 56 |
| D.4 | Specific requirements for tyred wheels | 56 |
| D.5 | Incidents arising outside the maintenance plan: loose tyre..... | 57 |
| D.6 | Verification of the electrical resistance during overhauls | 57 |
| D.7 | Verification of the electrical resistance during removal | 57 |
| Annex E | (informative) Characteristics of metric gauge wheelsets..... | 58 |

EN 15313:2010 (E)

| | |
|--|-----------|
| Annex F (informative) Characteristics of Spanish and Portuguese gauge wheelsets | 59 |
| Annex G (informative) Characteristics of Finnish and Baltic country gauge wheelsets | 60 |
| Annex H (informative) Plain bearing regeneration | 61 |
| Annex I (informative) Permissible circularity defects | 62 |
| Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC | 63 |
| Bibliography | 66 |

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 15313:2010](https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

Foreword

This document (EN 15313:2010) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

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 October 2010, and conflicting national standards shall be withdrawn at the latest by October 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 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 2008/57/EC](#).

For relationship with Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

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 the United Kingdom.

[SIST EN 15313:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

EN 15313:2010 (E)**1 Scope**

To ensure safety and interoperability, this European Standard gives:

- the mandatory limits for in-service and off-vehicle wheelsets;
- the mandatory operations to be carried out for which the specific values (and/or criteria) remain to be defined in the maintenance plan.

This document applies to wheelsets complying with the following European Standards:

- EN 12080, EN 12081, EN 12082;
- EN 13103, EN 13104;
- EN 13260, EN 13261, EN 13262;
- EN 13979-1;
- EN 13715,

that comprise:

- the axle with wheel diameters greater than or equal to 330 mm;
- axle boxes with bearings and grease.

This document is also applicable to wheelsets:

- fitted with brake discs, final drive, transmission or noise-damping systems, as appropriate;
- not complying with the above European Standards, but complying with the international requirements in force before the approval of these standards;
- with tyred wheels whose characteristics are given in Annex D.

For bilateral and domestic traffic, this document may be applied, noting that different values may be used.

All the dimensions of this document are in millimetres (mm).

NOTE The requirements to be met by components other than axles, wheels, axle boxes, bearings and grease (e.g. brake disc, final drive, transmission, noise-damping systems, etc.) shall be defined in a specific document.

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.

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

EN 473, *Non-destructive testing — Qualification and certification of NDT personnel — General principles*

EN 13260, *Railway applications — Wheelsets and bogies — Wheelsets — Product requirements*

EN 13261, *Railway applications — Wheelsets and bogies — Axles — Product requirements*

EN 13262, *Railway applications — Wheelsets and bogies — Wheels — Product requirements*

EN 13715, *Railway applications — Wheelsets and bogies — Wheels — Tread profile*

EN 13979-1, *Railway applications — Wheelsets and bogies — Monobloc wheels — Technical approval procedure — Part 1: Forged and rolled wheels*

EN ISO 9934-1, *Non-destructive testing — Magnetic particle testing — Part 1: General principles (ISO 9934-1:2001)*

EN ISO 9934-2, *Non-destructive testing — Magnetic particle testing — Part 2: Detection media (ISO 9934-2:2002)*

EN ISO 9934-3, *Non-destructive testing — Magnetic particle testing — Part 3: Equipment. (ISO 9934-3:2002)*

[SIST EN 15313:2010](https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

3 Terms and definitions

For the purposes of this document, **the following terms and definitions apply.**

3.1

operation

everday use of wheelsets in service on the track or during routine planned maintenance.

NOTE This term also includes any in-service problems and their treatment.

3.2

competent technical department

department having experience in the wheelset maintenance field having already written the rules

NOTE Departments of the former "networks" come into this category.

3.3

technical expert

person recognized and designated as such by the railway undertaking

3.4

former networks

historical networks existing before the publication of the European Directives and which had specified the requirements for the wheelsets registered in their respective country

EN 15313:2010 (E)**4 Maintenance****4.1 General**

Maintenance involves:

- maintenance of in-service wheelsets;
- maintenance of off-vehicle wheelsets;
- overhaul after in-service incidents (e.g. overloads, hot axle box detection, wheelset bearings subject to water ingress, etc.).

An in-service wheelset shall be maintained by a maintenance undertaking qualified for this type of wheelset.

For maintenance of wheelsets, as a minimum, the following shall be utilized:

- a maintenance plan;
- service experience;
- an organization for component and production management;
- specific qualified wheelset tools;
- qualified staff for non-destructive testing and welding.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4.2 Maintenance organization

SIST EN 15313:2010

4.2.1 Maintenance plan <https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

For wheelset maintenance, it is necessary to have a maintenance plan for the wheelsets when in-service and off-vehicle.

The maintenance plan shall specify:

- the actions to the requirements and mandatory operations listed in this standard;
- the maintenance intervals;
- any specific measures to be implemented.

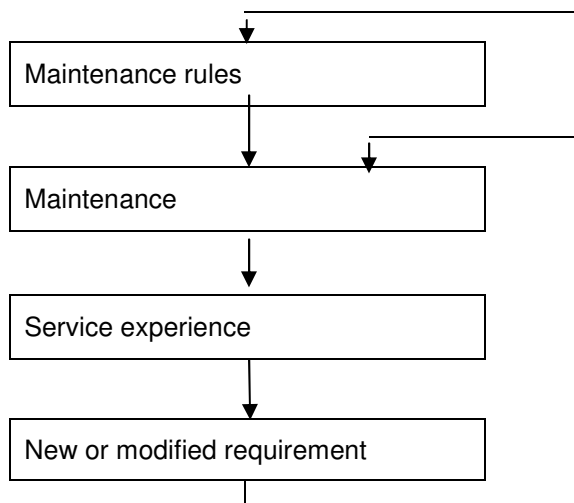
This maintenance plan shall be written by a competent technical department in the railway field and approved by the technical expert of the owner undertaking.

4.2.2 Service experience

The maintenance plan shall be reviewed to include:

- a) the service experience based on the performance of parts in service;
- b) the corrective actions necessary for dealing with defects:
 - 1) detected outside the maintenance plan;
 - 2) established on the track using specific devices.

The general principle of service experience is shown in Figure 1:



iTeh STANDARD PREVIEW

(standard.itih.ai)

Figure 1 — Service experience

4.2.3 Traceability – storage – transportation

SIST EN 15313:2010

[https://standards.itih.ai/catalog/standards/sist/62334f8c-450b-4861-832e-](https://standards.itih.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

4.2.3.1 Wheelset identification [46098f2d6f5a/sist-en-15313-2010](https://standards.itih.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

In order to ensure traceability, in-service wheelsets shall have marks complying with the requirements of EN 13260, EN 13261 and EN 13262.

It is recommended having:

- the owner's mark on the wheel (e.g. on the hub, with the same requirement as for the other marks, as specified in EN 13262; painted on the web, etc.);
- external identification on wheelset with axle boxes mounted (e.g. tag or metal plate on the axle box, collar on the axle, etc.).

None of the external identification marks shall adversely affect the axle or its components.

All the identification marks shall be described in a specific document to support the management of the wheelsets during their service lives.

The markings are applied to the wheelsets when the latter are being overhauled.

NOTE It is recommended, where possible, for these markings to be applied retrospectively, even when the wheelset components were not manufactured in accordance with EN 13261 or EN 13262.

4.2.3.2 Traceability of operations and transfers

The traceability shall be ensured throughout the life of the in-service wheelset by recording the various operations and transfers.

EN 15313:2010 (E)

The traceability shall be recorded in a database (e.g. paper, electronic, etc.) and shall be validated.

The traceability shall be secured.

The contents of the database and process for capturing information shall be described in a specific procedure.

In the case of a computerized database, the consistency of the recordings shall be checked on a regular basis.

4.2.3.3 Grease storage

Grease storage areas shall be protected from direct sunlight.

4.2.3.4 Component storage

Component parts of the wheelsets shall be protected against damage and corrosion.

It is recommended storing the components in dry conditions with free air circulation.

4.2.3.5 Handling and transportation conditions for new or overhauled wheelsets

A procedure shall be written for safe handling and transporting new or overhauled wheelsets or their components.

4.3 Qualification of equipment and systems**4.3.1 General principle**

All railway-specific tools, gauges and systems for wheelset maintenance (e.g. checking for circularity defect, stresses in the wheel rim, non-destructive testing, etc.) shall be qualified to ensure that requirements of this standard are met.

A qualification file shall be created for all railway-specific equipment in order to ensure that it meets the specifications.

4.3.2 Qualification file for equipment and systems

This file shall indicate that the equipment or railway-specific system has the appropriate levels of sensitivity and repeatability in line with the desired objective. Performance sustainability shall be demonstrated by means of calibrated reference equipment.

In addition, when new methods are used, it shall be ensured that the results achieved with the new equipment or system are at least equivalent to those obtained with the former (e.g. differentiation between parts with or without defects, etc.).

4.4 Staff certification and competence

Certification is necessary for staff carrying out:

a) non-destructive testing:

the staff shall be qualified according to EN 473 or equivalent and authorized to work on specific processes;

b) welding operations:

the staff shall be qualified according to EN 287-1 or equivalent for components where welding is authorized.

4.5 Maintenance organization plan

The general maintenance of the wheelsets is organized as shown in Figure 2.

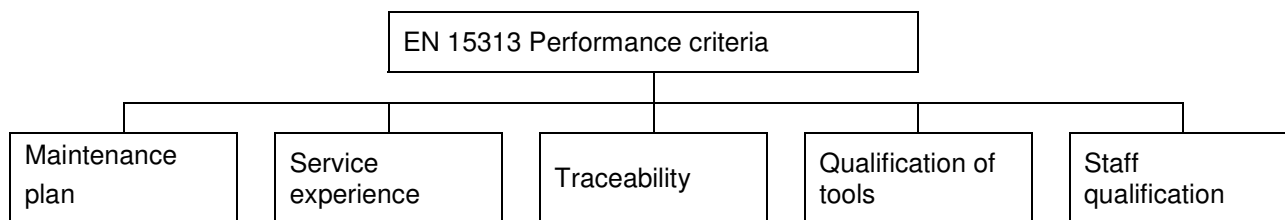


Figure 2 — General maintenance organization

4.6 Qualification of an undertaking for the maintenance of in-service or off-vehicle wheelsets

The qualification principle shown in Figure 3 applies to each of the following activities:

- maintenance of in-service wheelsets;
- maintenance of off-vehicle wheelsets;
- maintenance activity component (example: reprofiling).

The qualification shall be reviewed before its extension to a new wheelset.

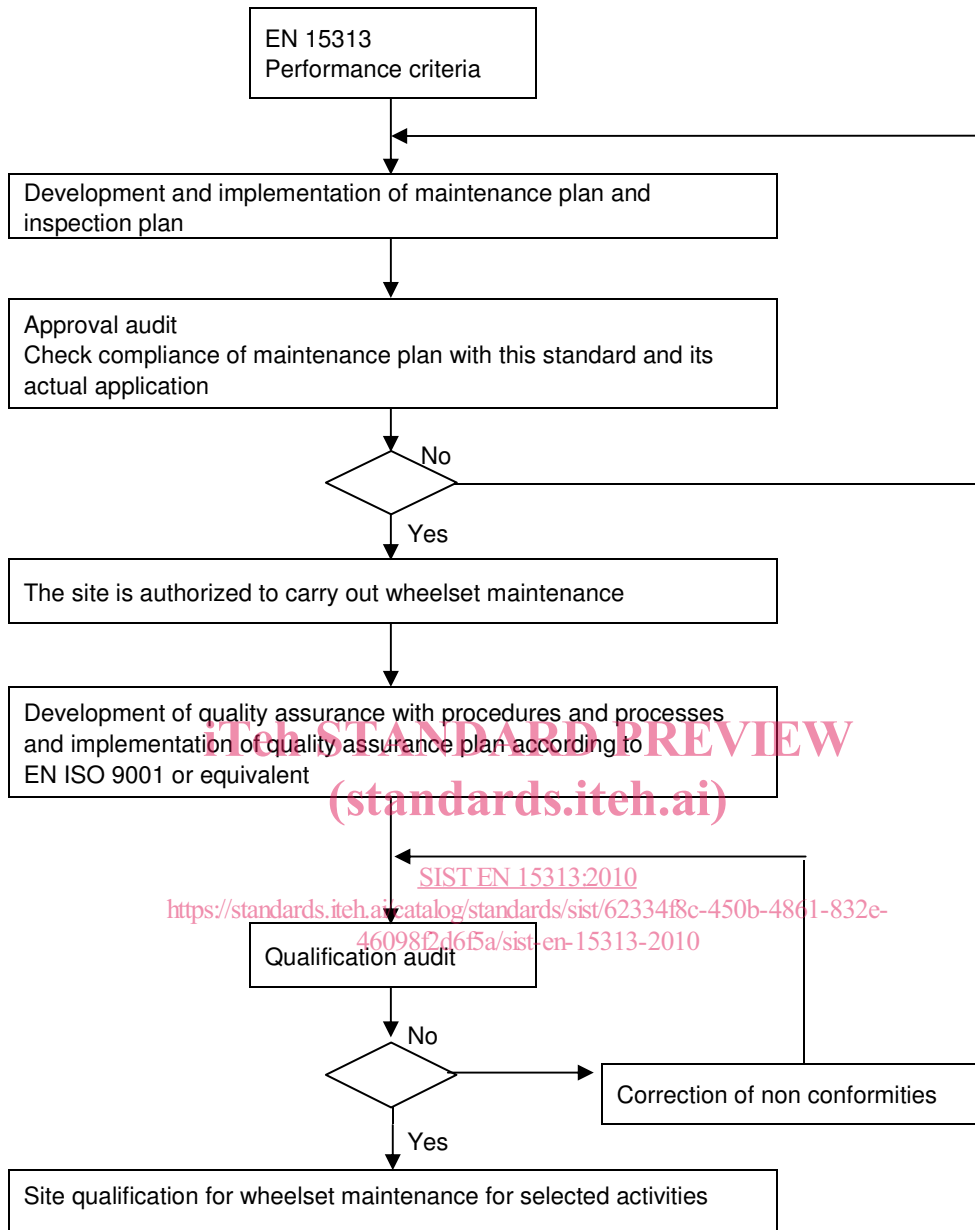


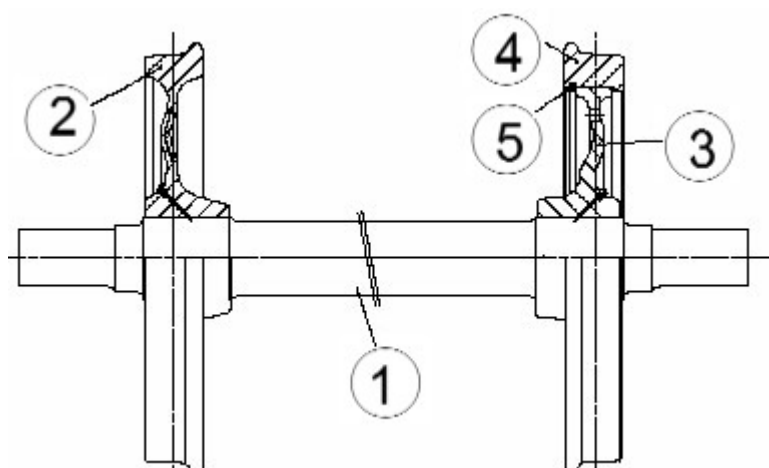
Figure 3 — Flow chart for qualification of an undertaking

5 Definition and illustrations of a wheelset, its associated components and defects

5.1 Definition and illustrations of a wheelset

5.1.1 Wheelset

The various components of a wheelset are shown in Figures 4a) and 4b).



iTeh STANDARD PREVIEW
(standards.iteh.ai)

Key

- 1 axle
- 2 monobloc wheel
- 3 wheel centre
- 4 tyre
- 5 retaining ring

[SIST EN 15313:2010](https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010)

<https://standards.iteh.ai/catalog/standards/sist/62334f8c-450b-4861-832e-46098f2d6f5a/sist-en-15313-2010>

a) — Wheelset — Principal components