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Rolling bearings — Vocabulary

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*.

This fourth edition cancels and replaces the third edition (ISO 5593:2019), which has been technically revised. The main changes compared to the previous edition are as follows:

— Definitions, figures and notes have been modified.

Introduction

0.1 General

This document establishes a vocabulary of terms, with their definitions, applied in the field of rolling bearings and their technology. Only terms which are particular to the pertinent field, or which in this field are defined in a particular way, are included. Specialized terms are found only in the rolling bearing standard for which they have been created.

0.2 Organization of the vocabulary

This vocabulary contains the following:

— terms, with their definition, in mixed order and grouped by topic;

— figures with index numbers of relevant terms;

— alphabetical listings of the terms, with their index numbers.

0.3 Organization of the figures

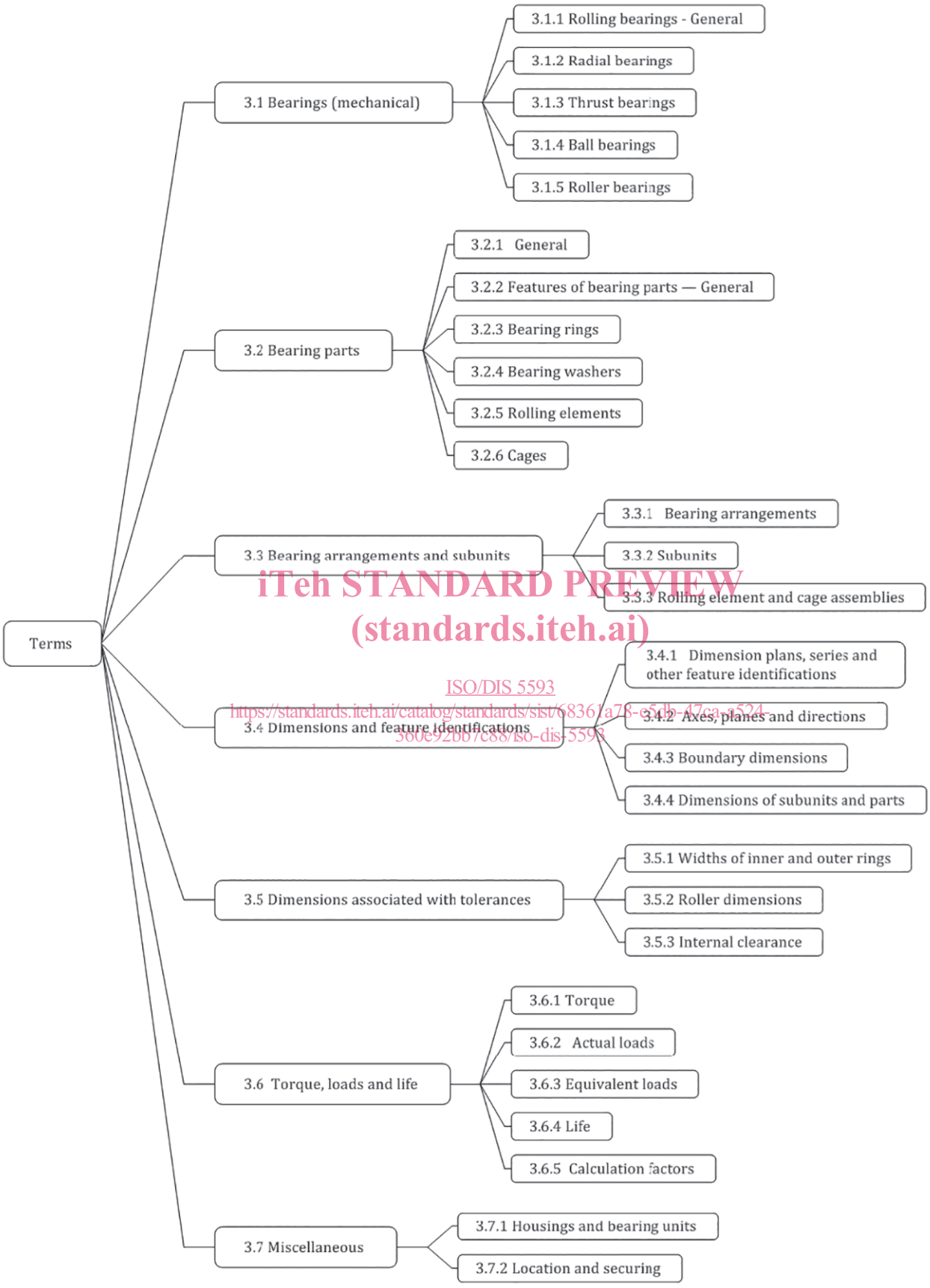
The figures are principally arranged in the same order as the terms they illustrate.

Each figure gives the index numbers of relevant terms. A figure usually shows only one example of several existing forms of a bearing or part. In most cases, the figures are simplified and leave out unnecessary details.

0.4 Organization of the alphabetical indexes

The alphabetical indexes include all terms. Multiple word terms appear in alphabetical order both by natural order of words and by their keywords.

The alphabetical index refers to the index number of the entry.



Rolling bearings — Vocabulary

1 Scope

This document establishes a vocabulary of terms, with their definitions, applied in the field of rolling bearings and their technology under ISO Technical Committee TC 4 management.

It includes terms related to all types of rolling bearings wherein the principal degree of freedom is continuous rotation about an axis enabled by an ordered set of rolling elements between two circular raceways such that loads can be transmitted between them in a particular range of radial and/or axial directions. Also included are accessories to these products.

The following types of terms are not included:

— terms specified in ISO 76, ISO 281 and ISO 1132-1;

— terms which are narrowly applied in only one specialised rolling bearing International Standard.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 Bearings (mechanical)

3.1.1 Rolling bearings — General

3.1.1.1
bearing
mechanical component by means of which a moving part in relative motion is supported and/or guided with respect to other parts of a mechanism

3.1.1.2
rolling bearing
bearing operating with rolling (rather than sliding) motion between the parts supporting load and moving in relation to each other

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 and 33.

Note 2 to entry: It comprises raceway members and rolling elements with or without means for their spacing and/or guiding.

Note 3 to entry: It may be designed to support radial load, axial load or combined radial and axial load.

3.1.1.3
single-row bearing
single-row rolling bearing
rolling bearing with one row of rolling elements

Note 1 to entry: See Figures 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 21, 22, 23, 24, 27, 28, 29, 30, 31 and 158.

3.1.1.4
double-row bearing
double-row rolling bearing
rolling bearing with two rows of rolling elements

Note 1 to entry: See Figures 5, 7, 16, 20, 25 and 26.

3.1.1.5
multi-row bearing
multi-row rolling bearing
rolling bearing with more than two rows of rolling elements supporting load in the same direction

Note 1 to entry: Figure 19.

Note 2 to entry: It is preferable to specify the number of rows and type of bearing, for example “four-row (radial) cylindrical roller bearing”.

3.1.1.6
insert bearing
insert ball bearing
radial ball bearing with a spherical outside surface and an extended inner ring with a locking device

Note 1 to entry: Figure 8.

Note 2 to entry: It is technically possible to have insert bearings with rollers as rolling elements. Such bearings are however so rare that, for practical use in the bearing industry, the terms “insert bearing” and “insert ball bearing” are to be considered to be synonymous.

3.1.1.7
full complement bearing
full complement rolling bearing
rolling bearing in which the sum of the clearances between the rolling elements in each row is less than the diameter of the rolling elements

Note 1 to entry: See Figures 14, 22, 23 and 157.

Note 2 to entry: Full complement bearings are without a cage or separators usually.

Note 3 to entry: The sum of the clearances between the rolling elements in each row is small enough to give satisfactory function of the bearing.

3.1.1.8
angular contact bearing
angular contact rolling bearing
rolling bearing designed to support a combination of radial and axial load

Note 1 to entry: See Figures 4, 5, 7, 9, 10, 12, 16, 17, 20, 21, 27, 29 and 31.

3.1.1.9
rigid bearing
rigid rolling bearing
rolling bearing which resists misalignment between the axes of its raceways

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 30.

3.1.1.10
self-aligning bearing
self-aligning rolling bearing
rolling bearing which can accommodate angular misalignment and angular motion between the axes of its rings or washers due to one raceway being spherical

Note 1 to entry: See Figures 7, 15, 16, 31 and 158.

3.1.1.11
external-aligning bearing
external-aligning rolling bearing
rolling bearing which can accommodate angular misalignment between its axis and the axis of its housing by means of a spherical form on one ring or washer surface, which mates with a complementary seat surface in an aligning housing ring, in an aligning seat washer or in the housing

Note 1 to entry: See Figures 8, 58 and 120.

3.1.1.12
separable bearing
separable rolling bearing
rolling bearing with separable subunits

Note 1 to entry: See Figures 6, 9, 10, 11, 12, 13, 14, 19, 21, 24, 25, 26, 28, 29, 30, 31, 35, 36, 39, 40 and 41.

3.1.1.13
non-separable bearing
non-separable rolling bearing
rolling bearing from which, after final manufacturing assembly, neither bearing ring can be freely separated

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 7, 8, 15, 16, 17, 20, 22, 23 and 27.

3.1.1.14
split bearing
split rolling bearing
rolling bearing with rings and the cage, when used, divided into two semicircular pieces to facilitate mounting

Note 1 to entry: See Figure 18.

3.1.1.15
metric bearing
metric rolling bearing
rolling bearing originally designed with boundary dimensions and tolerances primarily in round metric units

3.1.1.16
metric series bearing
metric series rolling bearing
rolling bearing which conforms to a metric series of an ISO dimension plan

3.1.1.17
inch bearing
inch rolling bearing
rolling bearing originally designed with boundary dimensions and tolerances in inches

3.1.1.18
inch series bearing
inch series rolling bearing
rolling bearing which conforms to an inch series dimension plan

3.1.1.19
open bearing
open rolling bearing
rolling bearing with neither seals nor shields

Note 1 to entry: See Figures 1, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 28, 29, 30 and 31.

3.1.1.20
sealed bearing
sealed rolling bearing
rolling bearing which is fitted with a seal on one or both sides

Note 1 to entry: See Figures 2, 8 and 20.

3.1.1.21
shielded bearing
shielded rolling bearing
rolling bearing which is fitted with a shield on one or both sides

Note 1 to entry: See Figure 3.

3.1.1.22
capped bearing
capped rolling bearing
rolling bearing which is fitted with one or two seals, one or two shields or with one seal and one shield

Note 1 to entry: See Figures 2, 3, 8 and 20.

3.1.1.23
prelubricated bearing
prelubricated rolling bearing
rolling bearing which has been charged with lubricant by the manufacturer

3.1.1.24
airframe bearing
airframe rolling bearing
rolling bearing which, by reason of design or execution, is intended for use in the general structure of an aircraft, including its control systems

3.1.1.25
instrument precision bearing
instrument precision rolling bearing
rolling bearing which, by reason of design or execution, is intended for use in instruments

3.1.1.26
railway axlebox bearing
railway axlebox rolling bearing
rolling bearing which, by reason of design or execution, is intended for use in railway axleboxes

Note 1 to entry: See Figure 20.

Note 2 to entry: The most common type is a radial roller bearing.

3.1.1.27
matched bearing
matched rolling bearing
one of the rolling bearings in a matched pair or a matched stack

3.1.1.28
coated bearing
coated rolling bearing
rolling bearing with one or more bearing rings or bearing washers and/or the rolling elements fully or partly covered (coated) by means of a specifically defined surface coating method

Note 1 to entry: See Figures 114 and 115.

Note 2 to entry: The coating may also be applied to additional integral bearing parts such as cages and shields but, if only the additional integral bearing parts are coated, the term "coated bearing" should not be used.

3.1.1.29
insulated bearing
insulated rolling bearing
rolling bearing which prevents the passage of electric current and/or the equalization of different voltage potentials in a given insulation class

Note 1 to entry: See Figures 114, 115, 116 and 117.

Note 2 to entry: Commonly, either the bearing outside surface, faces and chamfers of the outer ring or the bearing bore, faces and chamfers of the inner ring are provided with an insulating layer of, for example, oxide ceramics or polymer resins.

Note 3 to entry: The insulation can, alternatively, be provided by means of the rolling elements if they are all made of a non-conductive material, for example as in some types of hybrid bearings.

3.1.1.30
hybrid bearing
hybrid rolling bearing
rolling bearing in which the rolling elements are made of ceramic material and at least one bearing ring or bearing washer is made of bearing steel

Note 1 to entry: See Figure 116.

Note 2 to entry: Hybrid bearings for some special applications have a limited number of their rolling elements made of ceramic material with the remainder being made of bearing steel.

3.1.1.31
ceramic bearing
ceramic rolling bearing
rolling bearing in which the bearing rings or bearing washers and the rolling elements are made of ceramic material

Note 1 to entry: See Figure 117.

3.1.1.32
sensor bearing
sensor rolling bearing
sensorized bearing
sensorized rolling bearing
rolling bearing with one or more integrated sensors which consist of electromechanical and/or electronic components

Note 1 to entry: See Figure 118.

Note 2 to entry: Temperature, speed, displacement, vibration and forces are typical items that may be monitored.

Note 3 to entry: Signal transfer to evaluation equipment is generally via cable, but may be by wireless connection.

3.1.1.33
heat stabilized bearing
heat stabilized rolling bearing
rolling bearing with components tempered in such a way for the bearing to withstand specified exposure temperatures and maintain dimensional stability

3.1.1.34
combined bearing
combined rolling bearing
rolling bearing which has two sets of rolling elements in a bearing individually supporting radial load and axial load respectively

Note 1 to entry: See Figure 119.

3.1.1.35
duplex bearing
duplex rolling bearing
stack of two rolling bearings selected or manufactured to have predetermined characteristics when mounted together

Note 1 to entry: See Figures 77, 78 and 79.

3.1.1.36
face-to-face duplex bearing
face-to-face duplex rolling bearing
duplex bearing matched in X-arrangement
stack of two matched bearings mounted with the front faces of their outer rings in contact with each other

Note 1 to entry: See Figure 78.

Note 2 to entry: See 3.3.1.4.

3.1.1.37
tandem duplex bearing
tandem duplex rolling bearing
stack of two matched bearings mounted with the back face of the outer ring of one bearing in contact with the front face of the outer ring of the next bearing

Note 1 to entry: See Figure 79.

Note 2 to entry: See 3.3.1.5.

3.1.1.38
back-to-back duplex bearing
back-to-back duplex rolling bearing
duplex bearing matched in O-arrangement
stack of two matched bearings mounted with the back faces of their outer rings in contact with each other

Note 1 to entry: See Figure 77.

Note 2 to entry: See 3.3.1.3.

3.1.1.39
bearing with interchangeable subunit
rolling bearing with interchangeable subunit
rolling bearing designed and manufactured so that its function is kept properly when any subunit from the same group of separable (rolling) bearings is assembled with it

Note 1 to entry: Refer to *interchangeable subunit* (3.3.2.2).

3.1.1.40
bearing with non-interchangeable subunit
rolling bearing with non-interchangeable subunit
rolling bearing having a subunit with which it is uniquely paired and not designed and manufactured to keep its function when assembled with a subunit from any other of the same group of the separable rolling bearings

Note 1 to entry: Refer to *non-interchangeable subunit* (3.3.2.3).

3.1.2 Radial bearings

3.1.2.1
radial bearing
radial rolling bearing
rolling bearing designed to support primarily radial load

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23.

Note 2 to entry: Some radial rolling bearings are designed to support a pure radial or axial load as well as a combination of radial and axial loads.

Note 3 to entry: Note 3 to entry: Its principal parts are inner ring, outer ring and rolling elements with or without a cage.

3.1.2.2
radial contact bearing
radial contact rolling bearing
rolling bearing designed to support primarily a radial load, having a nominal contact angle of 0°

Note 1 to entry: See Figures 1, 2, 3, 8, 11, 13, 14, 15, 18, 19, 22 and 23.

3.1.2.3
angular contact radial bearing
angular contact radial rolling bearing
rolling bearing designed to support primarily a combined radial and axial load

Note 1 to entry: See Figures 4, 5, 7, 9, 10, 12, 16, 17, 20 and 21.

3.1.2.4
tapered bore bearing
tapered bore rolling bearing
radial rolling bearing having an inner ring with tapered bore

Note 1 to entry: See Figures 7 and 19.

3.1.2.5
flanged bearing
flanged rolling bearing
radial rolling bearing with an external radial flange on one of its rings, usually the outer ring

Note 1 to entry: See Figure 21.

3.1.2.6
track roller
track roller rolling bearing
radial rolling bearing with a heavy section outer ring, intended for use as a roller to roll on a track

Note 1 to entry: See Figures 22 and 23.

Note 2 to entry: It is intended for use as a roller to roll on a cam track.

3.1.2.7
yoke-type track roller
yoke-type track roller rolling bearing
track roller rolling bearing intended for mounting in a yoke

Note 1 to entry: See Figure 22.

3.1.2.8
stud-type track roller
stud-type track roller rolling bearing
track roller rolling bearing in which the inner member is extended on one side in the form of a shaft for cantilever mounting of the bearing

Note 1 to entry: See Figure 23.

3.1.2.9
universal matching bearing
universal matching rolling bearing
radial rolling bearing which, when used together with one or more similar bearing(s), selected at random, yields predetermined characteristics in a paired or stack mounting

3.1.2.10
bearing with cylindrical bore
rolling bearing with cylindrical bore
radial rolling bearing having an inner ring with cylindrical bore

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21 and 22.

3.1.2.11
bearing with cylindrical outside surface
rolling bearing with cylindrical outside surface
radial rolling bearing with an outer ring with cylindrical outside surface

Note 1 to entry: See Figures 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17,19 and 20.

3.1.2.12
bearing with spherical outside surface
rolling bearing with spherical outside surface
radial rolling bearing with an outer ring with spherical outside surface

Note 1 to entry: See Figures 8, 46 and 58.

3.1.2.13
bearing with locating snap ring groove
rolling bearing with locating snap ring groove
rolling bearing having a snap ring groove in the outer ring outside surface

Note 1 to entry: See Figure 97.

3.1.2.14
bearing with locating snap ring
rolling bearing with locating snap ring
rolling bearing having a locating snap ring fitted in a groove on the outer ring outside surface

Note 1 to entry: See Figure 34.

3.1.2.15
bearing with adapter sleeve assembly
rolling bearing with adapter sleeve assembly
rolling bearing combined with an adapter sleeve assembly

Note 1 to entry: See Figure 154.

3.1.2.16
radial bearing with aligning housing ring
radial rolling bearing with aligning housing ring
radial rolling bearing combined with an aligning housing ring

Note 1 to entry: See Figure 58.

3.1.3 Thrust bearings

3.1.3.1
thrust bearing
thrust rolling bearing
rolling bearing designed to support primarily axial load

Note 1 to entry: See Figures 24, 25, 26, 27, 28, 29, 30 and 31.

Note 2 to entry: Some thrust rolling bearings are designed to support a combination of axial and radial loads.

Note 3 to entry: Its principal parts are shaft washer, housing washer and rolling elements with or without a cage.

3.1.3.2
axial contact bearing
axial contact rolling bearing
rolling bearing designed to support an axial load

Note 1 to entry: See Figures 24, 25, 26, 28 and 30.

3.1.3.3
angular contact thrust bearing
angular contact thrust rolling bearing
rolling bearing designed to support a combination of axial and radial loads

Note 1 to entry: See Figures 27, 29 and 31.

3.1.3.4
single-direction thrust bearing
single-direction thrust rolling bearing
thrust rolling bearing intended to support axial load in one direction only

Note 1 to entry: See Figures 24, 26, 28, 29, 30 and 31.

3.1.3.5
double-direction thrust bearing
double-direction thrust rolling bearing
thrust rolling bearing intended to support axial load in both directions

Note 1 to entry: See Figures 25 and 27.

3.1.3.6
double-row double-direction thrust bearing
double-row double-direction thrust rolling bearing
double-direction thrust rolling bearing having two rows of rolling elements, each supporting axial load in one direction only

Note 1 to entry: See Figure 25.

3.1.3.7
thrust bearing with flat back faces
thrust rolling bearing with flat back faces
thrust rolling bearing in which the back faces of the housing and shaft washers are flat

Note 1 to entry: See Figures 24, 25, 26, 28, 29, 30 and 31.