

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 1558 : 2009

(JBIA)

**Rolling bearings — Insert bearings
and eccentric locking collars**

ICS 21.100.20

Reference number : JIS B 1558 : 2009 (E)

PROTECTED BY COPYRIGHT

B 1558 : 2009

Date of Establishment: 1965-03-01

Data of Revision: 2009-03-20

Date of Public Notice in Official Gazette: 2009-03-23

Investigated by: Japanese Industrial Standards Committee

Standards Board

Technical Committee on Machine Elements

JIS B 1558 : 2009, First English edition published in 2010-01

Translated and published by: Japanese Standards Association

4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

KA/HN
 **Documents**
Document Sharing Hub

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Quantity symbols	3
5 Characteristics	6
5.1 General	6
5.2 Bore diameter	6
5.3 Outside diameter	6
5.4 Width of inner ring and locking device	7
5.5 Width of outer ring	7
5.6 Relubrication	7
6 Types	7
7 Designation	8
8 Dimensions	8
9 Tolerances and permissible values	8
10 Radial internal clearance	8
11 Material of bearing rings and eccentric locking collars and hardness of raceway	9
12 Rolling elements	9
13 Measuring method	9
14 Inspection	9
15 Packaging	10
16 Marking	10
16.1 Marking on products	10
16.2 Marking on packaging	10
Annex JA (informative) Insert bearings of diameter series X	23
Annex JB (informative) Comparison table between JIS and corresponding International Standard	27

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal of revision of Japanese Industrial Standard submitted by the Japan Bearing Industrial Association (JBIA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 1558:1995** is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Rolling bearings

— Insert bearings and eccentric locking collars

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 9628** published in 2006 by incorporating the parts corresponding to this Standard (characteristics, dimensions, tolerances, permissible values and items related to radial internal clearances) without any modification of the technical contents, but also adding some **JIS** specification contents that are not given in the said corresponding International Standard.

The portions given sidelines or dotted underlines and Annex JA are not contained in the corresponding International Standard. A list of modifications and their explanations is given in Annex JB.

1 Scope

This Standard specifies insert bearings (hereafter referred to as “bearings”) and eccentric locking collars.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows :

ISO 9628 : 2006 *Rolling bearings — Insert bearings and eccentric locking collars — Boundary dimensions and tolerances* (MOD)

The symbols which denote the degree of correspondence in the contents in the corresponding International Standard and **JIS** are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0104 *Rolling bearings — Vocabulary*

NOTE : Corresponding International Standard : **ISO 5593** :1984 *Rolling bearings — Vocabulary* (MOD)

JIS B 0124 *Rolling bearings — Symbols for quantities*

NOTE : Corresponding International Standard : **ISO 15241** : 2001 *Rolling bearings — Symbols for quantities* (MOD)

JIS B 1511 *Rolling bearings — General code*

JIS B 1512 *Rolling bearings — Boundary dimensions*

NOTE : Corresponding International Standard : ISO 15 :1998 *Rolling bearings — Radial bearings — Boundary dimensions, general plan* (MOD)

JIS B 1514-1 *Rolling bearings — Tolerances of bearings — Part 1 : Radial bearings*

JIS B 1515-1 *Rolling bearings — Tolerances — Part 1 : Terms and definitions*

NOTE : Corresponding International Standard : ISO 1132-1 : 2000 *Rolling bearings — Tolerances — Part 1 : Terms and definitions* (IDT)

JIS B 1515-2 *Rolling bearings — Tolerances — Part 2 : Measuring and gauging principles and methods*

JIS B 1517 *Packaging of rolling bearings*

JIS B 1520 *Rolling bearings — Radial internal clearance*

JIS B 1552 *Rolling bearings — Adapter assemblies, Adapter sleeves and Withdrawal sleeves*

JIS B 1559 *Rolling bearings — Cast and pressed housings for insert bearings*

JIS G 4051 *Carbon steels for machine structural use*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS B 0104 and JIS B 1515-1 and the following apply.

3.1 insert bearing

radial rolling bearing with a spherical outside surface and an extended inner ring with a locking device

NOTE : The insert bearings generally used are radial rolling bearings and the locking device, used for fixing the inner ring to the shaft, may be an eccentric locking collar, concentric locking collar, set screws directly attached to the inner ring or adapters.

3.2 bearing with set screw

the cylindrical bore bearing which fixes the inner ring to the axis with the set screw attached to the inner ring

3.3 bearing with eccentric locking collar

the cylindrical bore bearing which fixes the inner ring to the axis with the eccentric locking collar attached to the inner ring

3.4 bearing with concentric locking collar

the cylindrical bore bearing which fixes the inner ring to the axis with the concentric locking collar attached to the inner ring

3.5 eccentric surface

the eccentrically inclined face to the centre axis being provided to the outside diameter of inner ring end part and the bore diameter of eccentric locking collar end part

3.6 lubrication zone

the zone on which the lubrication hole and lubrication groove in outer ring are capable of being provided

4 Quantity symbols

For the purpose of this Standard, the quantity symbols given in JIS B 0124 and the following apply.

The symbols shown in the following, except those for tolerances or items related to tolerances, denote nominal dimensions unless otherwise specified.

A	: width of eccentric surface of inner ring
A_1	: width of eccentric surface of eccentric locking collar
B	: width of inner ring
B_1	: overall width of inner ring including eccentric locking collar
B_2	: width of eccentric locking collar
C	: width of outer ring
C_1	: distance from centre of outer ring width to centre of lubrication zone
C_2	: width of lubrication zone
D	: outer ring outside diameter (diameter of spherical outside surface)
d	: bore diameter of inner ring and eccentric locking collar
d_1	: outside diameter of eccentric locking collar
d_2	: small end diameter (theoretical) of eccentric surface of eccentric locking collar
d_3	: large end diameter (theoretical) of inner ring eccentric surface
H	: eccentricity of eccentric surface of inner ring and eccentric locking collar
H_s	: <u>single dimension of eccentricity of eccentric surface of inner ring and eccentric locking collar</u>
K_{ia}	: <u>radial runout of inner ring</u>
K_{ea}	: <u>radial runout of outer ring</u>
r_1	: chamfer dimension of eccentric surface of inner ring
$r_{1s \min}$	: smallest single chamfer dimension of eccentric surface of inner ring
r_2	: fillet radius at corner of eccentric surface of inner ring

- $r_{2s \max}$: largest single fillet radius at corner of eccentric surface of inner ring
 r_3 : fillet radius at corner of eccentric surface of eccentric locking collar
 $r_{3s \max}$: largest single fillet radius at corner of eccentric surface of eccentric locking collar
 r_4 : chamfer dimension of eccentric surface of eccentric locking collar
 $r_{4s \min}$: smallest single chamfer dimension of eccentric surface of eccentric locking collar
 S : distance from raceway centre to inner ring side face on side opposite the locking device
 S_1 : distance from raceway centre to inner ring side face of locking device side or eccentric locking collar side
 V_{dsp} : variation of bore diameter in a single plane of inner ring
 Δ_{A1s} : deviation of width of eccentric surface of eccentric locking collar
 Δ_{B_s} : deviation of a single inner ring width
 Δ_{B2s} : deviation of a single width of eccentric locking collar
 Δ_{Dm} : deviation of mean outside diameter of outer ring (deviation of mean diameter of spherical outside surface)
 Δ_{dm_p} : deviation of mean bore diameter in plane of inner ring
 Δ_{ds} : deviation of a single bore diameter of eccentric locking collar
 Δ_{d2s} : deviation of a single small end diameter of eccentric surface of eccentric locking collar
 Δ_{Hs} : deviation of eccentricity of eccentric surface of inner ring and eccentric locking collar in a single plane

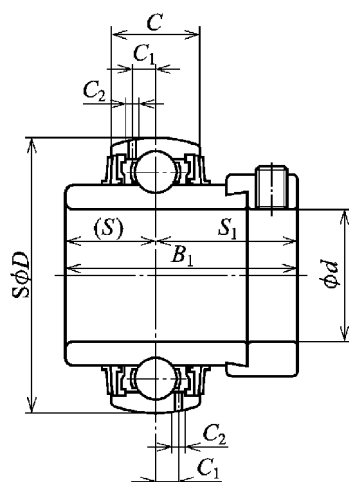


Figure 1 Wide overall width bearing with eccentric locking collar (Type UWE)

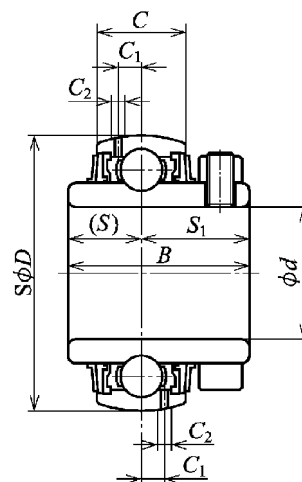


Figure 2 Bearing with concentric locking collar (Type UM)

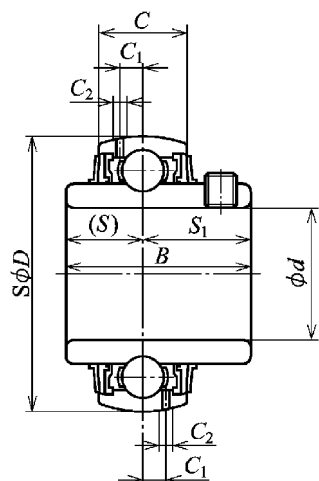


Figure 3 Bearing with set screw (Type UC)

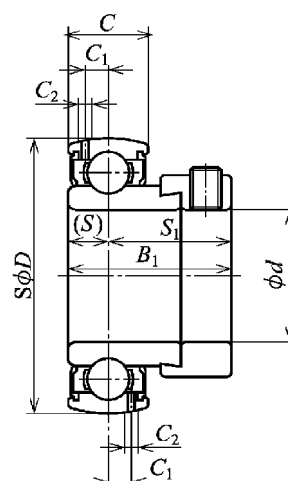


Figure 4 Narrow overall width bearing with eccentric locking collar (Type UNE)

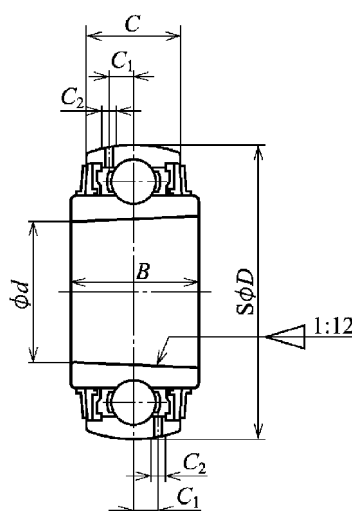


Figure 5 Tapered bore bearing (Type UK)

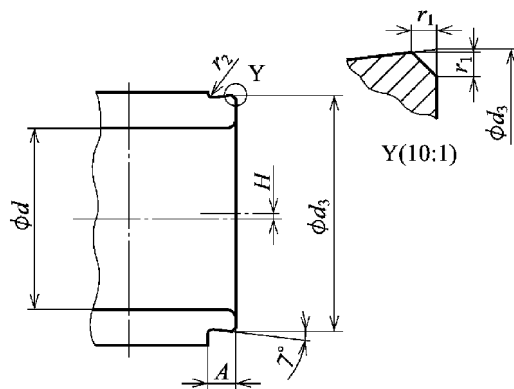


Figure 6 Inner ring eccentric surface of bearing with eccentric locking collar

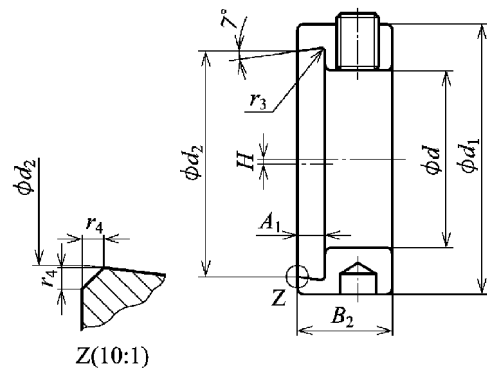


Figure 7 Eccentric locking collar

NOTE 1 Figures 1 to 5 are examples.

NOTE 2 In figure 7, the relative angular position of the plain and tapped holes to each other and to the eccentricity is optional.

5 Characteristics

5.1 General

The outer ring has a spherical outside surface so that the bearing can be mounted in a housing as specified in JIS B 1559 (hereafter referred to as “ housings”) with a matching spherical seating to accommodate permanent angular misalignment.

The bore surface of the bearing inner ring and the eccentric locking collar may be plated or treated with surface treatment to reduce corrosion during operation.

The bearing shall be prelubricated, and seal or shield and fringer, as required, shall be attached.

5.2 Bore diameter

The bore diameter of bearing may be cylindrical bore or tapered bore.

The size of the eccentric feature on the inner ring and the locking collar is generally common for one metric and several inch inner ring bore sizes. (For the inner cylindrical bore bearings and eccentric locking collars, there are meter inner ring bore sizes and inch sizes). The non-preferred inch bore sizes, which are given as designation in parentheses in tables 2, 3.1 and 4 should be avoided whenever possible.

The inner ring bore diameter tolerance is on the plus side of the nominal bore diameter, in order that the bearing and collar can be slipped over standard size shafting.

5.3 Outside diameter

The outside diameter of the bearing corresponds to the diameter series 2 and diameter series 3 of JIS B 1512.

Snap ring may be provided on the outside diameter, if necessary.

5.4 Width of inner ring and locking device

The inner ring width does not conform to the requirements of dimension series 02 or dimension series 03 of JIS B 1512. It is determined by the requirements of spacer for sealing and locking devices and by the axial extension of the shaft support considered suitable for various applications.

There are wide width and narrow width for the overall width (B_1) of inner ring of bearing with eccentric locking collar. The distance (S_1) from the raceway centre to the locking device-side of inner ring side surface or eccentric locking collar side surface are important dimensions for the fixing and therefore specified in this Standard.

The locking devices of cylindrical bore bearing are eccentric locking collar attached to the side face of inner ring, circular concentric locking collar attached to the outside diameter side of inner ring and set screw attached to the inner ring. The locking device of tapered bore bearing is an adapter.

Figures 1 to 4 are examples, and detailed designs of set screws and concentric locking collars are optional.

5.5 Width of outer ring

In this Standard, for the width of outer ring, minimum and maximum dimensions are specified so that assembly slots in the housing can be properly dimensioned. The minimum dimension conforms to dimension series 02 and dimension series 03 in JIS B 1512 and the maximum dimension is set so that sufficient space is provided for various seals and relubrication holes.

5.6 Relubrication

Depending on the application, these bearings are supplied with or without means for relubrication, for example, one or more small radial holes drilled through the outer ring. The exact design and location of such means are not specified in this Standard. However, the width and location of a zone are given in which any relubrication means, provided on one or both sides of the outer ring, should intersect such that lubricant will satisfactorily feed into the bearing from the housing bore groove covering the zone.

6 Types

Types of bearings are shown in table 1.

Table 1 Types of bearings

Types of bearings		Shape figure	Dimension table	
Name of type	Type symbol		Diameter series 2	Diameter series 3
Wide width bearing with eccentric locking collar	<u>UWE</u>	Figures 1, 6, 7	Tables 2, 5, 6	—
Bearing with concentric locking collar	<u>UM</u>	Figure 2	Table 3.1	—
Bearing with set screw	<u>UC</u>	Figure 3	Table 3.1	Table 3.2
Narrow width bearing with eccentric locking collar	<u>UNE</u>	Figures 4, 6, 7	Tables 4, 5, 6	—
<u>Tapered bore bearing</u>	<u>UK</u>	<u>Figure 5</u>	Table 7.1	Table 7.2

7 Designation

The bearings and eccentric locking collars shall be designated by the type symbol of bearing or eccentric locking collar, diameter series symbol and bore number, in this order, as shown in tables 2 to 7.2.

There are two types, namely, those conforming with **ISO 9628** and those not conforming, to bearings of bore number 01 to 03 and bore number 13 of bearings with set screws of diameter series 2, and those bearings conforming with **ISO 9628** shall be marked with the letter “X”.

Other designations may be applied for bearings with inch bore sizes, wide overall width bearings with eccentric locking collars (Type UWE bearings), and narrow overall width bearings with eccentric locking collars (Type UNE bearings).

The designation may additionally have an auxiliary number ¹⁾ if necessary.

Note ¹⁾ It expresses the radial internal clearance, lubricant, type of seal or other matters, and shall be as agreed between the purchaser and the supplier.

8 Dimensions

The dimensions of bearings and eccentric locking collars shall be in accordance with tables 2 to 7.2.

9 Tolerances and permissible values

The tolerances and permissible values of bearings and eccentric locking collars shall be in accordance with tables 8 to 10. However, the tolerances and permissible values of tapered hole shall be in accordance with JIS B 1514-1.

10 Radial internal clearance

The radial internal clearance, for diameter series 2 bearings, shall be in accordance with table 11 or JIS B 1520, and for diameter series 3 bearings, shall be in accordance