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**Rolling bearings — Locknuts and locking
devices**

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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 for 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 1554:2005** is replaced with this Standard.

However, **JIS B 1554:2005** may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until October 19, 2016.

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

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Rolling bearings — Locknuts and locking devices

Introduction

This Japanese Industrial Standard has been prepared based on the third edition of **ISO 2982-2** published in 2013 with some modifications of the technical contents, for example by adding specifications not given in the corresponding International Standard.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies locknut for rolling bearing (hereafter referred to as “locknut”), lockwasher for rolling bearing (hereafter referred to as “lockwasher”) and locking clip for rolling bearing (hereafter referred to as “locking clip”), to be used mainly for adapter sleeve and withdrawal sleeve for rolling bearing specified in **JIS B 1552**.

- The locknuts are used for locating adapter sleeves, withdrawal sleeves, and bearing inner rings on shafts.
- The lockwashers are used with 4-slot locknuts.

NOTE 1 Lockwashers are classified into those with straight inner tab, and those with bent inner tab (see Annex A).

- The locking clips are used with 8-slot locknuts.

NOTE 2 The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 2982-2 : 2013 *Rolling bearings — Accessories — Part 2 : Dimensions for locknuts and locking devices* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

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 *Rolling bearings — Vocabulary* (MOD)

JIS B 0124 *Rolling bearings — Symbols for quantities*

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

JIS B 0205-1 *ISO general purpose metric screw threads — Part 1 : Basic profile*

JIS B 0205-4 *ISO general purpose metric screw threads — Part 4 : Basic dimensions*

JIS B 0209-3 *ISO general purpose metric screw threads — Tolerances — Part 3 : Deviations for constructional screw threads*

JIS B 0216-1 *ISO metric trapezoidal screw threads — Part 1 : Basic profiles and maximum material profiles*

JIS B 0216-3 *ISO metric trapezoidal screw threads — Basic dimensions*

JIS B 0217-2 *ISO metric trapezoidal screw threads — Tolerances — Part 2 : Limits of sizes for external and internal screw thread*

JIS B 1552 *Rolling bearings — Adapter assemblies and withdrawal sleeves*

JIS G 3101 *Rolled steels for general structure*

JIS G 3141 *Cold-reduced carbon steel sheet and strip*

JIS G 4051 *Carbon steels for machine structural use*

JIS G 4804 *Free-cutting steels*

3 Terms and definitions

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

3.1 locknut with 4-slots

locknut having four slots in the axial direction along the circumference (see Figure 1), normally used with a lockwasher (see Figures 2 and A.1)

3.2 locknut with 8-slots

locknut having eight slots in the axial direction along the circumference, and eight threaded holes on the end face (see Figure 3), normally used with a locking clip and applicable bolt (see Figure 4)

4 Symbols

4.1 General

For the purposes of this Standard, the symbols given in JIS B 0124 and the following listed in 4.2 to 4.5 apply.

The symbols shown in Figures 1 to 4 and the values given in Tables 1 to 8 denote nominal dimensions, unless specified otherwise.

4.2 Locknuts with 4 slots

The symbols of locknuts with 4 slots shall be as follows (see Figure 1, Tables 1, 2 and 9).

- B : locknut width
 A_{Bs} : dimensional tolerance in locknut width
 b : width of slot in locknut
 A_{bs} : dimensional tolerance in width of slot in locknut
 D_2 : effective diameter of screw thread of locknut
 d : nominal diameter of locknut
 d_1 : outside diameter of clamp face of locknut
 A_{d1s} : dimensional tolerance in outside diameter of clamp face of locknut
 d_2 : outside diameter of locknut
 A_{d2s} : dimensional tolerance in outside diameter of locknut
 d_6 : bore diameter of clamp face of locknut
 G : designation of screw thread
 g : length between slots in locknut
 A_{gs} : dimensional tolerance in length between slots in locknut
 h : depth of slot in locknut
 r_1 : fillet radius of slot in locknut
 S : runout of locknut clamp face with respect to effective diameter of screw thread

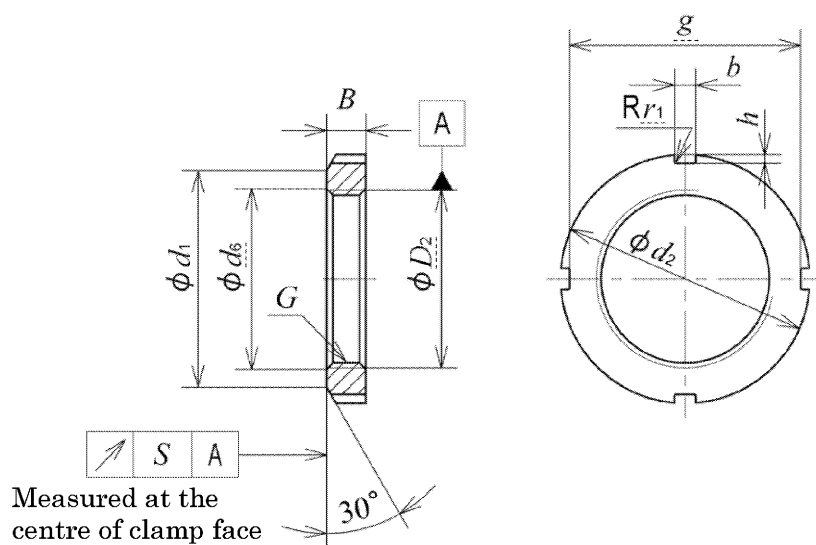


Figure 1 Locknut with 4-slots (for adapter sleeves and withdrawal sleeves using lockwasher)

4.3 Lockwasher with straight inner tab

The symbols of lockwasher with straight inner tab shall be as follows (see Figure 2, Tables 3, 4 and 10).

- B_7 : material thickness of lockwasher
 d_3 : bore diameter of lockwasher
 Δ_{d3s} : dimensional tolerance in bore diameter of lockwasher
 d_4 : root diameter of outer tab of lockwasher
 Δ_{d4s} : dimensional tolerance in root diameter of outer tab of lockwasher
 d_5 : outside diameter of lockwasher
 f : width of outer tab of lockwasher
 Δ_{fs} : dimensional tolerance in width of outer tab of lockwasher
 f_1 : width of inner tab of lockwasher
 Δ_{f1s} : dimensional tolerance in width of inner tab of lockwasher
 M : distance between inner tab and bore
 Δ_{Ms} : dimensional tolerance in distance between inner tab and bore
 N : minimum number of outer tabs of lockwasher

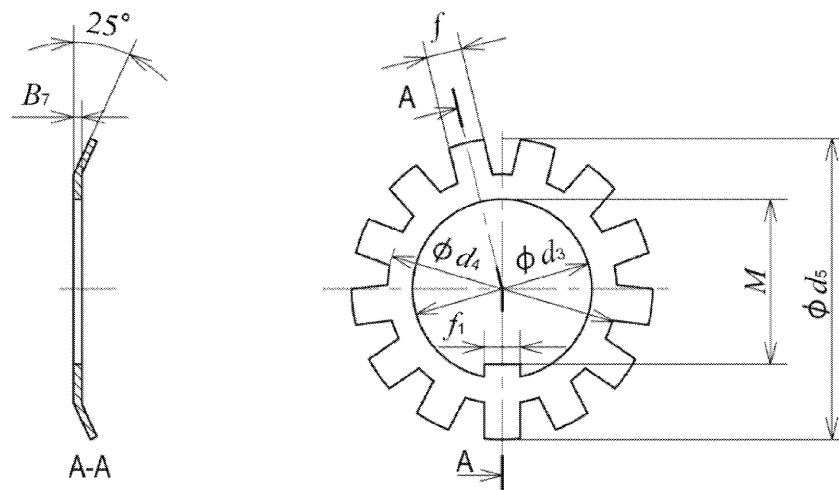


Figure 2 Lockwasher with straight inner tab

4.4 Locknuts with 8 slots

The symbols of locknuts with 8 slots shall be as follows (see Figure 3, Tables 5, 6 and 9).

- B : locknut width
 Δ_{Bs} : dimensional tolerance in locknut width
 b : width of slot in locknut

- A_{bs} : dimensional tolerance in width of slot in locknut
- D_2 : effective diameter of screw thread of locknut
- d : nominal diameter of locknut
- d_p : pitch diameter of threaded hole for locking clip of locknut
- d_1 : outside diameter of clamp face of locknut
- A_{d1s} : dimensional tolerance in outside diameter of clamp face of locknut
- d_2 : outside diameter of locknut
- A_{d2s} : dimensional tolerance in outside diameter of locknut
- d_6 : bore diameter of clamp face of locknut
- G_1 : designation of screw thread of the locknut bore
- G_2 : designation of screw thread in threaded hole for locking clip of locknut
- g : length between slots in locknut
- A_{gs} : dimensional tolerance in length between slots in locknut
- h : depth of slot in locknut
- l_G : depth of threaded hole for locking clip of locknut
- r_1 : fillet radius of slot in locknut
- S : runout of locknut clamp face with respect to effective diameter of screw thread

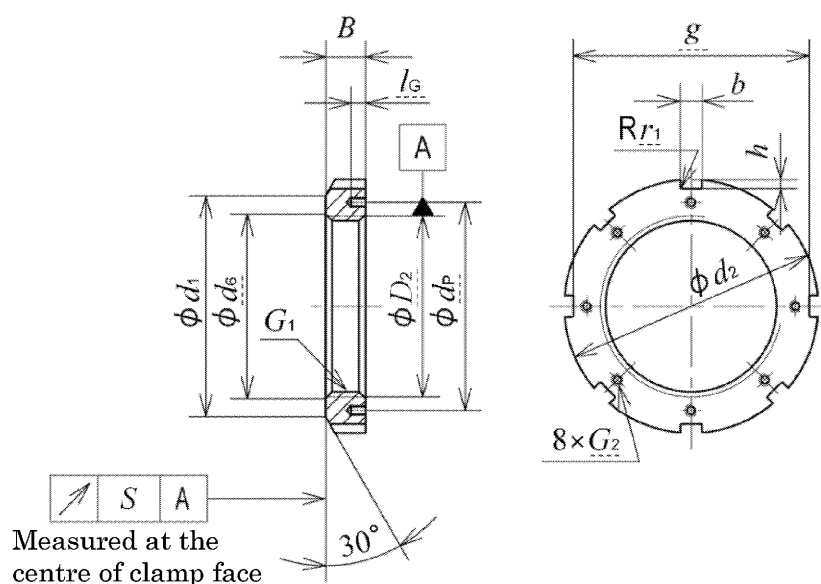


Figure 3 Locknut with 8 slots (for adapter sleeve using locking clip)

4.5 Locking clip and applicable bolt

The symbols of locking clip and applicable bolt shall be as follows (see Figure 4, Tables 7, 8 and 11).

b_1 : width of locking clip

Δ_{b1s} : dimensional tolerance in width of locking clip

d_6 : diameter of hole in locking clip

e : inner width of locking clip

G_2 : designation of screw thread

h_1 : height of locking clip

Δ_{h1s} : dimensional tolerance in height of locking clip

L_3 : length of locking clip

l : nominal length of bolt

s : material thickness of locking clip

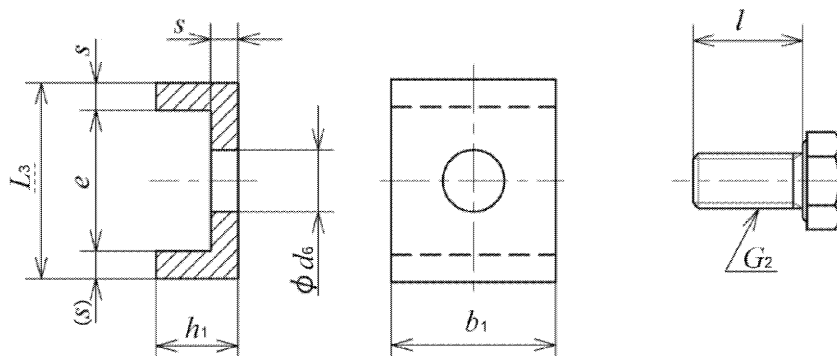


Figure 4 Locking clip and applicable bolt

NOTE : The bolt may or may not be secured to prevent loosening.

5 Designation and dimensions

5.1 Locknuts with 4 slots

The designation and dimensions of locknuts with 4 slots are given in Tables 1 and 2.

Symbols for locknuts with 4-slots series shall be AN, ANL, HN and HNL.

Basic profiles and dimensions of screw threads given in the dimension tables shall be as given in JIS B 0205-1 and JIS B 0205-4 for general purpose metric screw threads; or as given in JIS B 0216-1 and JIS B 0216-3 for metric trapezoidal screw threads. If JIS B 0216-3 does not specify appropriate basic dimensions, obtain the dimensions by using a formula given in JIS B 0216-3.

NOTE : HN and HNL series are locknuts with 4-slots used mainly for withdrawal sleeves for rolling bearing specified in **JIS B 1552**.

5.2 Lockwasher with straight inner tab

The designation and dimensions of lockwasher with straight inner tab are given in Tables 3 and 4.

Symbols for lockwasher series with straight inner tab shall be AW and AWL.

5.3 Locknuts with 8 slots

The designation and dimensions of locknuts with 8 slots are given in Tables 5 and 6.

Symbols for locknuts with 8-slots series shall be AN and ANL.

Basic profiles and dimensions of screw threads given in the dimension tables shall be as given in **JIS B 0205-1** and **JIS B 0205-4** for general purpose metric screw threads; or as given in **JIS B 0216-1** and **JIS B 0216-3** for metric trapezoidal screw threads. If **JIS B 0216-3** does not specify appropriate basic dimensions, obtain the dimensions by using a formula given in **JIS B 0216-3**.

5.4 Locking clip and applicable bolt

The designation and dimensions of locking clip, and the dimensions of applicable bolt are given in Tables 7 and 8.

Symbols for locking clip series shall be AL and ALL.

6 Tolerance and allowable value

6.1 Locknut

The tolerance and allowable values of locknut shall be as given in Table 9.

6.2 Lockwasher with straight inner tab

The tolerance of lockwasher with straight inner tab shall be as given in Table 10.

6.3 Locking clip

The tolerance of locking clip shall be as given in Table 11.

Symbols U and L given in Tables 9 to 11 shall be as follows.

U : upper tolerance

L : lower tolerance

7 Materials

7.1 Locknut

Materials for locknut shall be steel products specified in **JIS G 3101**, **JIS G 4051**, **JIS G 4804** or at least equivalent.

7.2 Lockwasher

Materials for lockwasher shall be steel products specified in **JIS G 3101** and **JIS G**

3141 or at least equivalent.

7.3 Locking clip

Materials for locking clip shall be steel products specified in JIS G 3101, JIS G 4051 or at least equivalent.

8 Measurement

8.1 Locknut

The dimensions and runout, S , of locknut shall be measured by using proper instruments, respectively.

Measurement of run-out, S , of locknut clamp face with respect to effective diameter of screw thread shall be carried out by turning the locknut and the tapered arbor together by one rotation, after screwing the locknut on the threaded taper arbor until it is secured. Bring the dial gauge probe into contact with the locknut at the centre of the clamp face, and observe the difference between the maximum and minimum readings of the dial gauge (total displacement of the needle in the dial gauge) (see Figure 5).

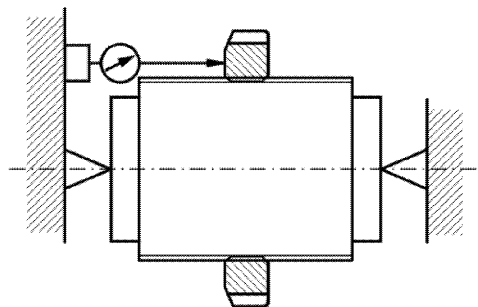


Figure 5 Measurement of locknut (example)

8.2 Lockwasher and locking clip

The dimensions of lockwasher and locking clip shall be measured by using proper instruments, respectively.

9 Inspection

Locknut, lockwasher, and locking clip having conformed to all specifications in this Standard shall be inspected for the dimensions and run-outs, S , and shall satisfy the requirements in clauses 5 and 6.

10 Packaging

Locknut, lockwasher and locking clip having conformed to all requirements in this Standard shall be packaged, after applying oil/grease or others for corrosion resistance.

11 Marking

11.1 Marking on products

Locknut, lockwasher and locking clip shall be marked on each product with the following items. The marking may be omitted if impracticable.

- Designation
- Manufacturer's name or its abbreviation

11.2 Marking on package

Locknut, lockwasher and locking clip shall be marked with the following items on package. The item of quantity may be omitted for package containing a single product.

- Designation
- Quantity
- Manufacturer's name or its abbreviation
- Year and month of manufacture or their abbreviation