भारतीय मानक

Indian Standard

IS 16764 : 2024
ISO 8061 : 2019

अल्पाइन स्की बाइंडिंग — रिलीज टॉर्क मान का चयन

(पहला पुनरीक्षण)

Alpine Ski-Bindings — Selection of Release Torque Values

(First Revision)

ICS 97.220.20

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June 2024 **Price Group 5**

Mountaineering and Adventure Sports Sectional Committee, PGD 27

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical to ISO 8061 : 2019 ‘Alpine ski-bindings — Selection of release torque values’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Mountaineering Sectional Committee and approval of the Production and General Engineering Division Council.

Alpine bindings are traditional downhill bindings, made for alpine boots and general resort skiing. The different models depend on ski style. There are different categories that include freeride, race, all mountain, sport, and junior.

This standard was first published in 2015. The first revision has been undertaken to align it with ISO 8061.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’; and
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current-practice is to use a point (.) as the decimal marker.

The technical Committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 11088 : 2023	Alpine ski/binding/boot (S-B-B) system — Assembly, adjustment and inspection
ISO 11110 : 2015	Winter-sports equipment — Test devices for the setting of the functional unit ski/boot/binding — Requirements and tests

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

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Introduction

This document is part of a family of International Standards, along with ISO 9462 and ISO 9465, dealing with the safety of ski bindings.

National standards might be more extensive regarding, for example, the following:—

combined loading;

— deflexion of the ski.

Indian Standard

ALPINE SKI-BINDINGS — SELECTION OF RELEASE TORQUE VALUES

(First Revision)

1 Scope

This document specifies methods for the selection of the release torques for alpine ski-bindings. It gives information necessary to determine the release torques recommended for use by ski-binding manufacturers in their instructions for installation and use, and by ski shops for the adjustment of ski-bindings already mounted.

It is applicable to state-of-the-art alpine ski bindings.

It might be inappropriate for non-mechanical bindings or bindings used with boots which reach more than half-way up the lower leg.

This document describes a specified method for the selection of the recommended release torques considering three types of skiers.

The method applies to moment-measuring binding test machines, according to ISO 11110.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 11088, *Alpine ski/binding/boot (S-B-B) system — Assembly, adjustment and inspection*

ISO 11110, *Winter-sports equipment — Test devices for the setting of the functional unit ski/boot/binding — Requirements and tests*

3 Terms and definitions

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

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

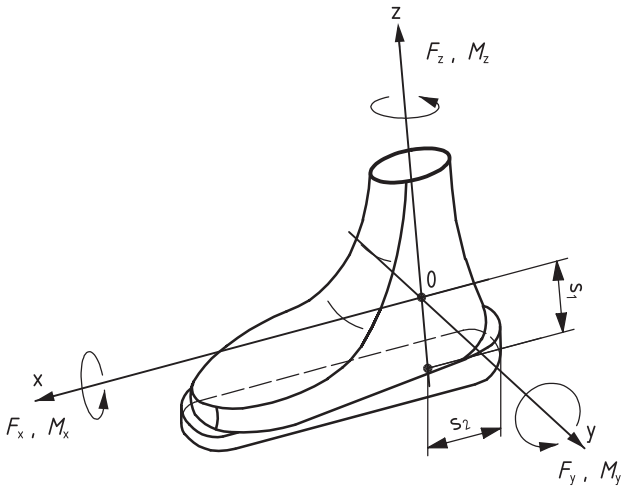
— IEC Electropedia: available at http://www.electropedia.org/

3.1 Release torque
load pattern which leads to a release and which is generated by force(s) acting with a lever arm about a specific axis and with the force sum not being equal to 0

Note 1 to entry: The release moment is defined as the load pattern which leads to a release and which is generated by a force-couple (same magnitude but opposite direction) thus resulting in the force sum being equal to 0. The moment can have x, y and z components.

4 Symbols, notations and coordinates

See Figure 1 and Table 1.



Key

F force

M moment of rotation

NOTE The origin of the system of coordinates 0 is defined by s_1 and s_2 in Table 1.

Figure 1 — Definition of the loads and moments

Table 1 — Coordinates of reference point 0

Dimensions in millimetres

Coordinates	Type of binding		
	C	CA	A
s_1	85	100	100
s_2	70	80	80
NOTE The definitions of type C, CA and A bindings are given in ISO 9462.			

All imaginable loads on the ski boot can be referred to as the force, *F*, acting along the X, Y, or Z axes of a system of coordinates, and a moment of rotation, *M*, about that axis.

The moments and forces shown in Figure 1 are positive. Moments and forces in the opposite directions are negative.

5 Release force

The release force, F_r, in newtons, is given by Formula (1):

$$F_r = \frac{M}{l} \tag{1}$$

where

M is the release torque, in newton metres;

l is the lever arm, in metres (i.e. the distance from the point of force application by the test machine to the point about which the boot or plate pivots).

The value of *l* should be determined empirically by measuring F_r for several values of *M*.

6 Weight method

6.1 Calculation of release torques

6.1.1 A range of release torques based on the mass of the skier can be calculated from the formulae given in 6.1.2 to 6.1.4 for both twist release, M_z, and forward lean release, M_y.

Ski-binding manufacturers shall not recommend release torques higher than the upper limit of this range; they may recommend moments below the lower limit. Manufacturers may provide additional information to guide the fitter and user in the selection of such values.

6.1.2 The upper limit for M_z, in newton metres, is given by Formula (2) and Formula (3):

a) if the mass of the skier is less than 70 kg:

$$M_z = 0{,}84 \cdot m_s + 4 \tag{2}$$

b) if the mass of the skier is equal to or greater than 70 kg:

$$M_z = 0{,}69 \cdot m_s + 15 \tag{3}$$

where m_s is the mass of the skier, in kilograms.

Coefficients 0,84 and 0,69 are expressed in m^2/s^2, constants 4 and 15 are expressed in Nm.

6.1.3 The lower value for M_z, in newton metres, is given by Formula (4) and Formula (5):

a) if the mass of the skier is less than 75 kg:

$$M_z = 0{,}71 \cdot m_s \tag{4}$$

b) if the mass of the skier is equal to or greater than 75 kg:

$$M_z = 0{,}59 \cdot m_s + 9 \tag{5}$$

where m_s is the mass of the skier, in kilograms.

Coefficients 0,71 and 0,59 are expressed in m^2/s^2, constant 9 is expressed in Nm.

6.1.4 The release torque M_y, in newton metres, is given by Formula (6):

$$M_y = M_z \left(3{,}6 + 0{,}006\,5\, M_z\right) \tag{6}$$

Coefficients are expressed in Nm^{-1}.

6.2 Release torques corresponding to user's maximum recommended mass

If the actual mass of the skier is greater than the maximum recommended mass for the height, h, then the release torque values shall be calculated using the maximum recommended mass, $m_{T,\,max}$, which is given by Formula (7):

$$m_{T,\,max} = 100(h-1) \tag{7}$$

for $h \geq 1{,}50$ m, where h is the height of the skier, in metres.

NOTE This formula is used to calculate the upper value of the weight classes, see ISO 11088:2018, Table B.1.

6.3 Correction of the release torque

6.3.1 The recommended release torque values shall be corrected for skier-type, according to ISO 11088 and age (see 6.3.2 and 6.3.3, respectively).

The result may be eventually lowered or raised upon request of the skier (see 6.3.4 and 6.3.5).

6.3.2 The skier-type correction factor should be as follows:

— for skier type 1: –15 % for M_z and M_y;

— for skier type 2: 0;

— for skier type 3: +15 % for M_z and M_y.

NOTE Other characters and figures can be used depending on national legislation. Some national standards might have skier type 2 as the starting point for correction of the release torques.

6.3.3 The age correction is determined as follows:

— skiers of 9 years of age and under (<10 years): –15 % for M_z and M_y;

— skiers who are 50 years or older (≥50 years): –15 % for M_z and M_y.

6.3.4 Release torque values other than recommended above may be used in the following cases.

a) Skiers who have satisfactory experience with lower settings regarding these recommendations may request settings based on their experience.

b) Skiers who have skiing experience without inadvertent releases may request a setting up to 15 % lower than recommended above.

c) Skiers having certain characteristics like neutral skiing technique, defensive attitude, high degree of control, etc. may request a setting up to 15 % lower than recommended above.

d) Skiers who have experienced inadvertent releases may request a setting up to 15 % higher than recommended above.

6.3.5 Skiers may request settings that are different for twist and forward lean.

6.3.6 If the skier's style requires greater corrections than indicated above, the skier may change the setting at his own risk.

Bibliography

[1] ISO 9462, *Alpine ski-bindings — Requirements and test methods*

[2] ISO 9465, *Alpine ski-bindings — Lateral release under impact loading — Test method*

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: PGD 27 (23218).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi