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Alpine ski-bindings — Selection of release torques values

Fixations de skis alpins — Sélection des valeurs du couple de déclenchement

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Foreword

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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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 83 *Sports and other recreational facilities and equipment*, Subcommittee SC 4, *Snowsports equipment*.

This fifth edition cancels and replaces the fourth edition (ISO 8061:2015), which has been technically revised. The main changes compared to the previous edition are as follows:

— 6.3.2 has been aligned to ISO 11088;

— Annex A has been deleted.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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.

Alpine ski-bindings — Selection of release torques values

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

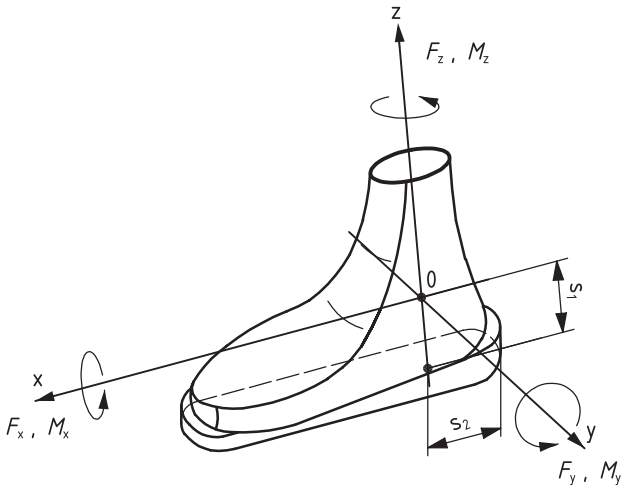
— IEC Electropedia: available at http://www.electropedia.org/

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}.