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Alpine ski-bindings — Selection of release torque 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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 83, *Sports and other recreational facilities and equipment*, Subcommittee SC 4, *Snowsports equipment*.

This fourth edition cancels and replaces the third edition (ISO 8061:2004), which has been technically revised to remove Annex B. It also incorporates the Amendment ISO 8061:2004/Amd 1:2006.

Introduction

This International Standard is one of a series of International Standards dealing with the safety of ski bindings; the other International Standards of this series are ISO 9462 and ISO 9465.

National standards, complying with legal regulations, may be more extensive regarding, for example, the following:

— combined loading;

— deflexion of the ski.

International Standards covering these aspects are being prepared.

To verify the safety of ski-bindings, it is necessary to use all three International Standards of the series and also national standards covering aspects which are not yet standardized internationally.

Alpine ski-bindings — Selection of release torque values

1 Scope

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

It applies to alpine ski-bindings in current use.

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

Manufacturers may use either of the two specified methods, or a combination of the two, as the basis for their recommended release torques.

The methods apply to torque-measuring binding test machines. If force-measuring test machines are used, it is necessary to report the release force, calculated as shown in Clause 3.

In recommending the release torques, it is necessary to take into account the abilities of the skier concerned by applying skier-type correction factors. For this purpose, three types of skier are defined, as described in Annex A.

2 Symbols

See Figure 1.

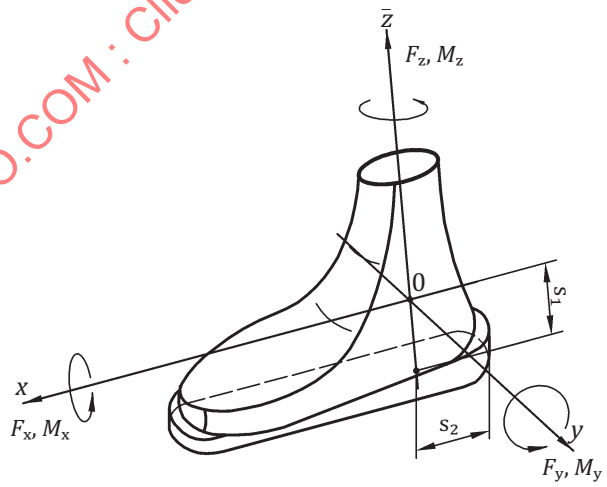

Figure 1 — Symbols

All imaginable loads on the ski boot can be referred to as 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 origin of the system of coordinates is fixed at approximately the bottom of the boot sole.

The torques and forces shown in Figure 1 are positive. Torques and forces in the opposite directions are negative.

3 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.

4 Weight method

4.1 Calculation of release torques

4.1.1 A range of release torques based on the mass of the skier can be calculated from the formulae given in 4.1.2 to 4.1.4 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 torques below the lower limit. Manufacturers may provide additional information to guide the fitter and user in the selection of such values.

4.1.2 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:

$$M_z = 0{,}84 \frac{\mathrm{m}^2}{s^2} \cdot m_s + 4\ \mathrm{Nm} \tag{2}$$

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

$$M_z = 0{,}69 \frac{\mathrm{m}^2}{s^2} \cdot m_s + 15\ \mathrm{Nm} \tag{3}$$

where

m_s is the mass of the skier, in kilograms.

4.1.3 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:

$$M_z = 0{,}71 \frac{\mathrm{m}^2}{s^2} \cdot m_s \tag{4}$$

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

$$M_z = 0{,}59 \frac{\mathrm{m}^2}{s^2} \cdot m_s + 9 \text{ Nm} \quad (5)$$

where

m_s is the mass of the skier, in kilograms.

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

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

4.2 Release torques corresponding to user's maximum recommended mass

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

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

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

4.3 Correction of the release torque

4.3.1 The recommended release torque values shall be corrected for skier-type (see Annex A) and age (see 4.3.2 and 4.3.3, respectively).

The result may be eventually lowered or raised upon request of the skier (see 4.3.4 and 4.3.5).

4.3.2 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.

4.3.3 The age correction is determined as follows:

— skiers under 10 years: –15 % for M_z and M_y;

— skiers in the age of 50 years and older: –15 % for M_z and M_y.

4.3.4 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.