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

Ensemble ski/fixation/chaussure (SFC) pour skis alpins — Montage, réglage et contrôle

Reference number
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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 on 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 the following URL: 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 sixth edition cancels and replaces the fifth edition (ISO 11088:2015), which has been technically revised. The main changes are:

— the content of the test report has been extended to include specifications of the ski, the binding and the boot;

— accepted deviation for the adjustment has been aligned to other relevant standards;

— in Annex A, other figures and characters have been given as an informative option for the indication of skier type;

— the tibia method has been removed from Figure C.1;

— release preference instead of skier types;

— normative references have been updated;

— a new Clause 4 has been added.

Introduction

International Standards exist for the components of the alpine ski/binding/boot (S-B-B) system, mainly intended for the component manufacturers. An International Standard (ISO 8061) also exists for the selection of release moments.

This document is intended primarily for retailers. However, its aim is to include, in one text, the different phases of the choice of components, their assembly, adjustment and inspection in the form of practical procedures, and to provide tolerances for inspection and adjustment.

The inspection procedures and tolerances described in this document apply to the condition of the S-B-B system before it leaves the ski shop to judge the condition of the equipment once it is put into use and for periodic verification of used equipment.

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

1 Scope

This document specifies assembly, adjustment and inspection procedures for the binding mechanisms of skis, integrating, in a practical way, the requirements of those International Standards which are related to skis, bindings and boots.

It is intended for all individuals and institutions concerned with those procedures, and especially for sports retailers.

It is applicable to a ski-binding-boot system (S-B-B) for alpine skiing, of which at least one component is owned by the user.

This document is applicable for complete and incomplete alpine ski-binding-boot systems which are owned by the user or rented for 15 days or more.

NOTE ISO 13993 gives a method of measurement for equipment which is rented for less than 15 days.

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 5355, *Alpine ski-boots — Requirements and test methods*

ISO 8061:2015, *Alpine ski-bindings — Selection of release torque values*

ISO 8364, *Alpine skis and bindings — Binding mounting area — Requirements and test methods*

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

ISO 9523, *Touring ski-boots for adults — Interface with touring ski-bindings — Requirements and test methods*

ISO 11087, *Alpine ski-bindings — Retention devices — Requirements and test methods*

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

ISO 13992, *Alpine touring ski-bindings — Requirements and test methods*

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:

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

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
fitting adjustment
procedure required to obtain geometric compatibility and correct functioning of different components

3.2
indicator setting
***Z*-mark**
release indicator value marked on the binding in accordance with ISO 9462

3.3
skier type
release adjustment (3.7) criteria pertaining to the type of skiing to be undertaken, as assessed by the skier in accordance with Table A.1 or Table A.2

Note 1 to entry: If the skier desires a setting outside the tolerances of this document, he or she can select such a setting at his or her own discretion. Ski-binding manufacturers should provide guidelines to shops and skiers regarding the recommended magnitude of such changes. Skiers should be clearly informed when these changes result in release values above the upper limit or below the lower limit defined in ISO 8061.

3.4
initial indicator position
release indicator position of the binding corresponding with the instructions given in Annex B

3.5 Release moment (values) M_Z and M_Y

3.5.1
selected individual release moment
reference moment
⟨for a given skier⟩ release moment determined in accordance with ISO 8061

3.5.2
measured release moment
⟨for a given S-B-B system⟩ value for which the binding releases

Note 1 to entry: It is expressed in newton metres.

Note 2 to entry: The procedure is given in 6.7.

3.6
accepted inspection tolerance
maximum difference between the *measured release moment* (3.5.2) and the *selected individual release moment* (3.5.1), limited for M_Z and M_Y to the release moments stated in Table B.1 one line above/below the reference moments

Note 1 to entry: The theoretical limits for M_Z with ±15 % or ±3 Nm (whichever is higher) and M_Y with ±15 % or ±10 Nm (whichever is higher) are the base for Table B.1. Long experience shows that using the table values avoids many errors and is easier to explain to customers.

3.7
release adjustment
procedure for making the measured M_Z and M_Y values coincide with the selected individual M_Z and M_Y values within the limits stated in Table B.1

3.8
trouble-shooting procedures
additional procedures recommended by the equipment manufacturer

3.9
accepted re-adjustment tolerance
maximum difference between the *measured release moment* (3.5.2) at the *initial indicator position* (3.4) and the *selected individual release moment* (3.5.1), limited for M_Z and M_Y to the release moments stated in Table B.1 two lines above/below the reference moments

Note 1 to entry: The theoretical limits for M_Z with ±30 % or ±6 Nm (whichever is higher) and M_Y with ±30 % or ±20 Nm (whichever is higher) are the base for Table B.1. Long experience shows that using the table values avoids many errors and is easier to explain to customers.

4 Principle

Follow the procedure shown in Annex C.

5 Skier's parameters

5.1 General

The individual release moment values are given in ISO 8061. The following procedure, using discrete values, may be considered an acceptable approximation of the basic functions of ISO 8061.

5.2 Weight method

5.2.1 Determine the skier's parameters:

a) mass (weight);

b) height;

c) type (according to Annex A);

d) age;

e) sole length if necessary.

5.2.2 Using Table B.1, choose the individual release values of M_Z and M_Y.

6 Equipment parameters

6.1 Choice of new equipment

The components shall be in accordance with the following documents:

a) ISO 8364 for skis;

b) ISO 5355 and ISO 9523 for boots;

c) ISO 9462 and ISO 13992 for bindings;

d) ISO 11087 for brakes.

The skier should receive specific recommendations concerning the selection of boot, binding and ski, if they are provided by the manufacturer.

6.2 Visual inspection and preparation of used equipment

If any of the components of the S-B-B system have been used, the installer shall carry out a visual check according to the criteria below. In addition, older equipment may require special attention as defined by the manufacturer.

a) The edges and base of the ski shall be properly prepared according to the recommendations of the ski manufacturer. Unused mounting holes, if any, shall be carefully filled in, according to the manufacturer's specifications.

b) The condition of the boot sole shall meet the binding manufacturer's requirements. All buckles, fasteners and support areas shall be in good condition.

In cases where release is independent of the boot (e.g. some plate bindings), the inspection of the sole may be less exacting.

c) The condition of the binding components shall meet the binding manufacturer's requirements (i.e. no broken, deformed, missing or worn-out parts).

Component guides or rotation points shall be free-moving, free of obvious rust, corrosion and dirt, etc.

The manufacturer's inspection and maintenance instructions shall be observed (including lubrication).

The brake shall not be deformed. Suspect components shall be repaired or exchanged.

6.3 Assembly

When assembling the system, comply with the instructions of the binding and ski manufacturers and use the proper tools.

The use of a drill according to Annex E is recommended. Once the holes are drilled, it is recommended that they be tapped and glue applied if this is required by the ski manufacturer. New holes shall not be drilled less than 10 mm from old holes (measured from centre of hole to centre of hole), even when they are filled in, unless otherwise specified by the ski or binding manufacturer.

When inserting the screws, take care not to damage the threads. A maximum tightening moment of 4 Nm shall fulfil this requirement, unless otherwise specified by the ski manufacturer.

6.4 Binding-to-boot fitting adjustments

Follow the binding manufacturer's instructions.

6.5 Initial indicator adjustment

The binding manufacturer shall provide a table similar to Table B.1 for his/her products.

Using Table B.1, adjust the bindings to the appropriate initial indicator position.

6.6 Functional check (inspection of functions)

Check visually that everything is according to the binding manufacturer's instructions and operates correctly.

Check if the boot returns quickly to its initial position within less than 2 mm after a sideward displacement of approximately 10 mm.

6.7 Measurement of release moment

Precondition the binding by releasing each unit as required by the binding manufacturer.

Using a test device in accordance with ISO 11110, proceed as follows.

a) Follow the test device manufacturer's instructions and check the calibration of the test device according to the manufacturer's procedures.

b) Perform a measurement for $+M_Z$, $-M_Z$ and $+M_Y$ each.

c) Check that the measured $+M_Z$, $-M_Z$ and $+M_Y$ values are within the limits of the accepted inspection tolerance as defined in 3.6. If so, no further actions are required; proceed according to e). If the release measurements do not fall within the accepted inspection tolerance but within the accepted

re-adjustment tolerance, proceed according to d). If the release measurements do not fall within the accepted inspection tolerance and do not fall within the accepted re-adjustment tolerance, proceed according to f).

d) The equipment manufacturers' instructions for trouble shooting shall be followed. Re-adjustment of the binding shall be undertaken. These re-adjustments shall achieve measured values as close as practical to the selected individual release moment, within the accepted inspection tolerance. If so, no further actions are required; proceed according to e).

e) If the measured $+M_Z$ and $-M_Z$ values fall near opposite limits of the accepted inspection tolerance range, the manufacturer's procedure for evaluation of non-symmetrical release shall be implemented.

f) If the release values are out of the accepted re-adjustment tolerance (see 3.9), the equipment manufacturers' instructions for trouble shooting shall be followed before proceeding. If no instructions are provided, the person mounting the bindings should conduct a clean versus lubricated diagnostic test in accordance with Annex D.

6.8 Report

An adjustment report is established by the ski shop and delivered to the user. It shall contain at least the following information:

a) skier's parameters (age, mass, height);

b) indicator setting;

c) measured values of M_Z and M_Y, or pass/fail result of the system test;

d) binding manufacturer with binding type;

e) boot manufacturer with boot model, sole length and specific sole configuration (if applicable);

f) ski manufacturer with ski length;

g) warning that the equipment cannot provide full protection from injury if an accident occurs;

h) indication which component is owned by the skier, if applicable;

i) skier type and release preference requested by the skier;

j) further modifications requested by the skier.

Annex A
(normative)

Definition of skier type

NOTE Based on ISO 8061:2015, Annex A.

A.1 Skier types

A.1.1 It is the responsibility of the skier to determine his or her skier-type classification into one of three types (1, 2 and 3)[1)], in accordance with Table A.1 or Table A.2.

A.1.2 These designations, 1, 2 and 3, should not be used by equipment manufacturers to categorize their products.

A.1.3 The information given in Table A.1 and Table A.2 is an example of the kind of layout which may be used to assist the skier in determining his or her skier type.

A.1.4 The information given in A.1.3 can be used to assist the skier in determining the appropriate skier-type classification and to make him aware of the risks related to each classification.

A.2 Discretionary settings

A.2.1 Skiers 10 years of age and older who desire a higher or lower setting than the setting of their skier type according to ISO 8061:2015, 4.3.4 a), 4.3.4 b), 4.3.4 c) or 4.3.4 d), may designate their preference with a + or − sign next to their skier type designation.

A.2.2 The use of these classifications in determining the release setting may be inappropriate for some types of competition skiing.

1) Other characters and figures may be used to be consistent with national standards or customs, such as "I" for type 1, "II" for type 2 and "III" for type 3, which is the required use in North America.

Table A.1 — Determination of skier type (example 1)

Type	1	2	3[a]
Speed	Slow to moderate	Skiers that do not meet all the descriptions of either 1 or 3	Fast
Terrain	Gentle to moderate		Steep
Style	Cautious (or smooth)		Aggressive
[a] Type 3 settings should not be used by skiers of 22 kg or less.			

Table A.2 — Determination of skier type[a] (example 2)

Type	1	2	3
Explanation	Entry-level skiers preferring lower release settings	Skiers preferring release settings suitable for most skiers	Skiers preferring higher release settings
Description	Skiers who designate themselves as type 1 receive lower than average release settings. This corresponds to an increased risk of inadvertent binding release to have releasability in a fall. This type also applies to entry-level skiers uncertain of their classification.	Skiers who designate themselves as type 2 receive average release settings suitable for most recreational skiers.	Skiers who designate themselves as type 3 receive higher than average release settings. This corresponds to decreased releasability in a fall to have a decreased risk of inadvertent binding release. This classification is not recommended for skiers of 22 kg or less.
[a] The term "release preference" can be used instead of "skier type" for this example.			

Annex B
(normative)

Method of setting

B.1 Locate the skier's mass (weight) and height in the appropriate column in Table B.1. If mass (weight) and height are not on the same line, select the line closest to the top of the table.

B.2 Consider the skier type[2)] (see Annex A):

a) for a type 1 skier, stay on the line and use the reference moment (M_Z and M_Y) on that line;

b) for a type 2 skier, move down one line and use the reference moment (M_Z and M_Y) on that line;

c) for a type 3 skier, move down two lines and use the reference moment (M_Z and M_Y) on that line.

B.3 Consider the skier's age. For skiers who are 50 years of age and older (≥ 50 years), or 9 years of age and under (<10 years), move up one line.

B.4 The setting obtained after having considered skier type and age may additionally be lowered or raised in the following cases:

a) Skiers who have satisfactory experience with lower settings regarding the manufacturer's recommendations may request settings based on their experience.

b) Skiers who have skiing experience without inadvertent releases may request a setting that corresponds to one line up in Table B.1.

c) Skiers having certain characteristics like a neutral skiing technique, defensive attitude, high degree of control, etc. may request a setting that corresponds to one line up in Table B.1.

d) Skiers who have experienced inadvertent releases may request a setting that corresponds to one line down in Table B.1.

B.5 Skiers may request settings that are different for twist and forward lean.

B.6 Using the boot sole length, determine the initial indicator value.

B.7 The accepted inspection tolerance (see 3.6) is equivalent, in Table B.1, to the difference between the value located one line above and the value located one line below the selected individual release moment (reference moment, see 3.5.1).

2) Other characters and figures may be used to be consistent with national standards or customs, such as "I" for type 1, "II" for type 2 and "III" for type 3, which is the required use in North America.

B.8 The accepted re-adjustment tolerance (see 3.9) is equivalent, in Table B.1, to the difference between the value located two lines above and the value located two lines below the selected individual release moment (reference moment, see 3.5.1).

Table B.1 — Release value selection using skier's mass (weight)

Mandatory release values					**Examples for initial indicator position**							
Skier's parameters			**Inspection parameters**		These are only the starting point in the binding setting process and may need to be modified in order to achieve the correct measured release value. **Z (pre-setting) depending on boot sole length**							
Skier's mass	Skier's height	Skier code	Twist	For-ward-lean	≤230 mm	231 mm to 250 mm	251 mm to 270 mm	271 mm to 290 mm	291 mm to 310 mm	311 mm to 330 mm	331 mm to 350 mm	≥ 351 mm
			M_Z	M_Y								
kg	m		Nm	Nm	mm	mm	mm	mm	mm	mm	mm	mm
—	—	—	5[a]	18[a]	—	—	—	—	—	—	—	—
10 to 13	—	A	8	29	0,75	0,75	0,75	—	—	—	—	—
14 to 17	—	B	11	40	1,00	0,75	0,75	0,75	—	—	—	—
18 to 21	—	C	14	52	1,50	1,25	1,25	1,0	—	—	—	—
22 to 25	—	D	17	64	2,00	1,75	1,50	1,5	1,25	—	—	—
26 to 30	—	E	20	75	2,50	2,25	2,00	1,75	1,50	1,50	—	—
31 to 35	—	F	23	87	3,00	2,75	2,50	2,25	2,00	1,75	1,75	—
36 to 41	—	G	27	102	—	3,50	3,00	2,75	2,50	2,25	2,00	—
42 to 48	≤1,48	H	31	120	—	—	3,50	3,0	3,00	2,75	2,50	—
49 to 57	1,49 to 1,57	I	37	141	—	—	4,50	4,0	3,50	3,50	3,0	—
58 to 66	1,58 to 1,66	J	43	165	—	—	5,50	5,0	4,50	4,00	3,50	3,00
67 to 78	1,67 to 1,78	K	50	194	—	—	6,50	6,0	5,50	5,00	4,50	4,00
79 to 94	1,79 to 1,94	L	58	229	—	—	7,50	7,0	6,50	6,00	5,50	5,00
≥95	≥1,95	M	67	271	—	—	—	8,50	8,00	7,00	6,50	6,00
—	—	N	78	320	—	—	—	10,00	9,50	8,50	8,00	7,50
—	—	O	91	380	—	—	—	11,50	11,00	10,00	9,50	9,00
—	—	—	105	452	—	—	—	—	—	12,00	11,00	10,50
—	—	—	121	520	—	—	—	—	—	—	—	—
—	—	—	137[b]	588[b]	—	—	—	—	—	—	—	—

NOTE 1 For skiers of 13 kg and under, no further correction is appropriate.

NOTE 2 For skiers of 17 kg and under, skier type –1 (see A.2.1) is inappropriate.

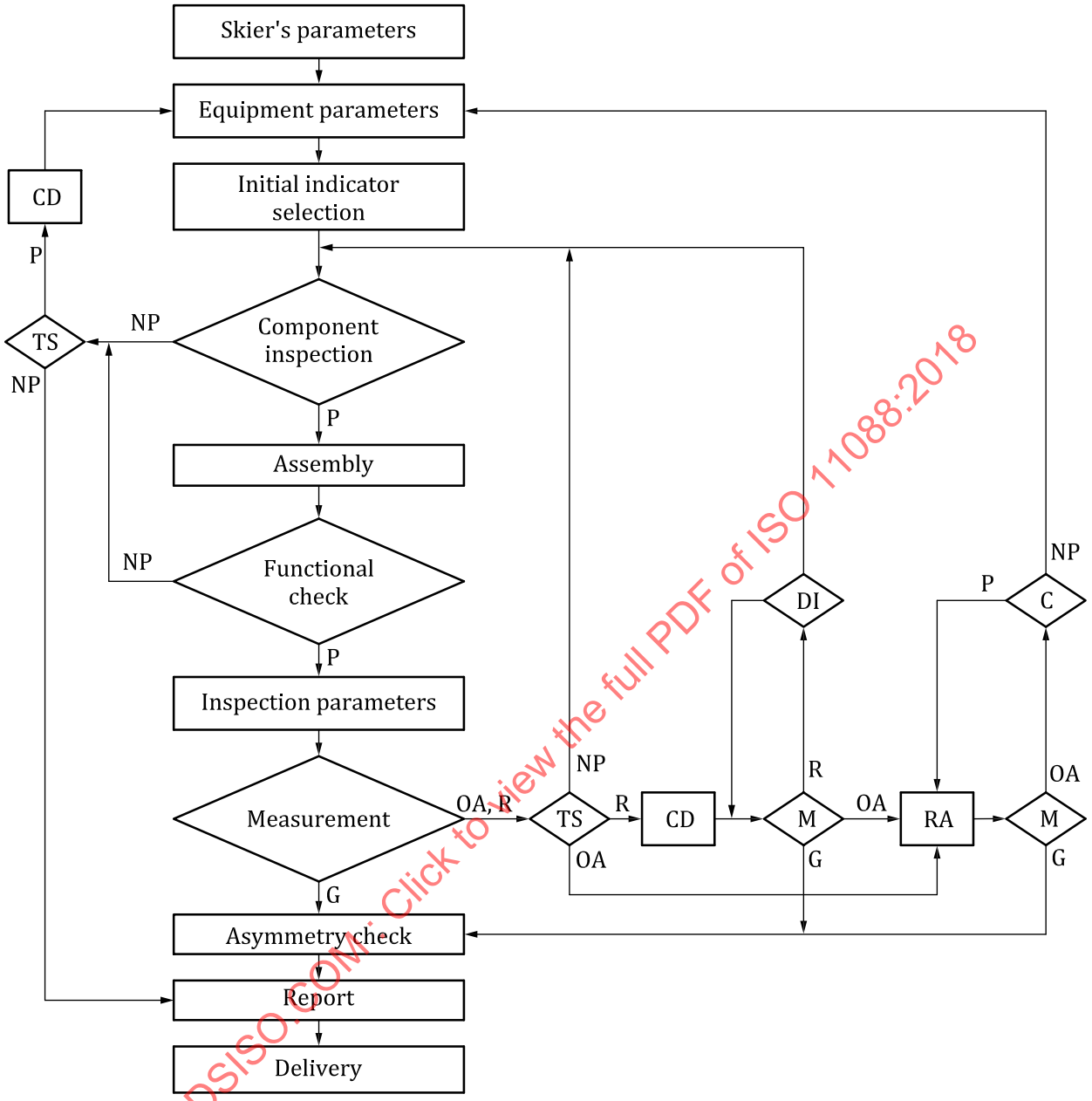
[a] Lowermost tolerance limit.

[b] Uppermost tolerance limit.

Annex C
(normative)

Flow chart

See Figure C.1.



Key

P	pass	G	within accepted inspection tolerance	R	outside accepted re-adjustment tolerance
TS	trouble shoot	M	re-measure	DI	diagnostic inspection
NP	not pass	RA	readjust	OA	outside accepted inspection tolerance, within accepted re-adjustment tolerance
CD	correct defect	C	check indicator run		

Figure C.1 — Flow chart