

INTERNATIONAL STANDARD

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Assembly, adjustment and inspection of an alpine ski-binding-boot (S-B-B) system

*Montage, réglage et contrôle d'un ensemble ski-fixation-chaussure (SFC)
pour skis alpins*



Reference number
ISO 11088:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11088 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Sub-Committee SC 3, *Ski bindings*.

Annexes A, B, C, D and E form an integral part of this International Standard.

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Introduction

International Standards exist for the components of the alpine ski-binding-boot system (S-B-B) and they are mainly intended for the component manufacturers. An International Standard (ISO 8061) also exists for the selection of release moments. However, the aim of this International Standard 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 International Standard apply to the condition of the S-B-B system before it leaves the ski shop and should not be used to judge the condition of the equipment once it is put into use.

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Assembly, adjustment and inspection of an alpine ski-binding-boot (S-B-B) system

1 Scope

This International Standard specifies assembly, adjustment and inspection procedures for the binding mechanism, integrating in a practical way the requirements of the International Standards used for reference (see clause 2).

This International Standard is intended for all individuals and institutions which are concerned with the above-mentioned procedures, and especially sport retailers.

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

NOTE 1 For the other case, in which both components (SB and B) are rented, another International Standard being prepared which will propose a method of measurement by sampling as an alternative to systematic measurement before delivery to the end user.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5355:1991, *Alpine ski-boots — Safety requirements and test methods*.

ISO 8061:1991, *Alpine ski-bindings — Selection of release torque values*.

ISO 8364:1991, *Alpine skis and bindings — Binding mounting area — Requirements and test methods*.

ISO 9462:1993, *Alpine ski-bindings — Safety requirements and test methods*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 fitting adjustment: Procedures required to obtain geometric compatibility and correct functioning of different components.

3.2 indicator value (Z-mark): The release indicator value marked on the binding in accordance with ISO 9462.

3.3 skier type 1, 2 or 3: A release adjustment criteria pertaining to the type of skiing to be undertaken, as assessed by the skier in accordance with table A.1.

NOTES

2 The designations L, A, S which were used in the first edition of ISO 8061:1984 have been replaced by types 1, 2 and 3 respectively, as in the second edition of ISO 8061:1991.

3 If the skier desires a setting outside the tolerances of this International Standard, he or she may 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: The binding's release indicator position corresponding with the instructions given in table B.1 or B.2.

3.5 release moment (values) M_Z and M_Y : There are two contexts in which the release moment, expressed in newton metres, may be used:

3.5.1 selected individual release moment (reference moment) for a given skier: According to ISO 8061.

3.5.2 measured release moment for a given S-B-B system: The mean value of three consecutive release measurements in the same direction on the same unit.

3.6 release moment range: The accepted tolerance for the measured release moment, with respect to the selected individual moment. This is $\pm 15\%$ or $3\text{ N}\cdot\text{m}$, whichever is greater, for M_Z and $\pm 15\%$ or $10\text{ N}\cdot\text{m}$, whichever is greater, for M_Y .

3.7 release adjustment: The purpose of this procedure is to make 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 or B.2.

3.8 trouble shooting procedures: Additional procedures recommended by the equipment manufacturer.

3.9 limit for readjustment: 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). This difference, which may be corrected by readjustment, is approximately $\pm 30\%$ or $\pm$ two lines in the selected individual moment column in table B.1, whichever is greater. The difference in table B.2 is $\pm 30\%$.

4 Skier's parameters

4.1 General

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

4.2 Weight method

4.2.1 Determine the following skier's parameters:

- weight,
- height,
- type (according to annex A),
- age,
- sole length if necessary.

4.2.2 Using table B.1, choose the individual release values of M_Z and M_Y .

4.3 Tibial width method

4.3.1 Determine the following skier's parameters:

- tibial width,
- sex,
- type,
- age,
- sole length if necessary.

4.3.2 Using table B.2, choose the individual release values of M_Z and M_Y .

5 Equipment parameters

5.1 Choice of new equipment

The components shall conform to the following International Standards:

- ski — ISO 8364,
- boot — ISO 5355,
- binding — ISO 9462,
- brake — ISO 11087¹⁾.

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

5.2 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 following criteria. In addition to this, older equipment may require special attention as defined by the manufacturer.

- a) The edges and sole 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.

NOTE 4 In cases where release is independent of the boot (e.g. some plate bindings), the inspection of the sole can be less exacting.

1) ISO 11087:—, *Skis — Retention devices — Safety requirements and test methods*. (To be published.)

- 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, 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.

5.3 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 they are drilled, the holes shall be tapped and glue applied if required by the ski manufacturer. New holes shall not be drilled less than 10 mm (measured from centre of hole to centre of hole) from old holes, even when they are filled in, unless otherwise specified by the ski or binding manufacturer.

When putting the screws in, take care not to damage the threads. A maximum tightening moment of 4 N·m shall fulfil this requirement, unless otherwise specified by the ski manufacturer.

5.4 Binding-to-boot fitting adjustments

Follow the binding manufacturer's instructions.

5.5 Initial indicator adjustment

The binding manufacturer shall provide a table similar to table B.1 or B.2 for his products.

Using this table, adjust the bindings to the appropriate initial indicator position.

5.6 Functional check (inspection of functions)

Check visually that everything conforms 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.

5.7 Measurement of release moment

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

Using a test device 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) Check that the measured $\pm M_Z$ and M_Y values are within the limits stated in table B.1 or B.2 and, if required, correct the release adjustment.
- c) If the measured $\pm M_Z$ values fall near opposite limits of the inspection tolerance range, the manufacturer's procedure for evaluation of non-symmetrical release shall be implemented.
- d) If the correction exceeds the limit for readjustment (3.9), check the binding manufacturer's most recent instructions before proceeding. If no instructions are provided, the person mounting the bindings should conduct a clean versus lubricated diagnostic test as defined in annex D.
- e) If the measured $\pm M_Z$ and M_Y values are outside the $\pm 15\%$ inspection tolerance, consult the manufacturer's troubleshooting instructions. After completing the troubleshooting procedures, if the measured values fall within the $\pm 30\%$ limit for readjustment tolerance, readjustment of the binding may be undertaken. These readjustments shall achieve measured values as close as practical to the selected individual release moment, within the $\pm 15\%$ tolerance.

Readjustment of bindings which, after troubleshooting, still release outside the $\pm 30\%$ limit for readjustment tolerance shall not be made, unless specifically permitted by the binding manufacturer.

NOTE 5 If a test device is not available, the procedure described in 5.1 to 5.6 should be used and the skier informed that a test device was not used to inspect the system.

5.8 Report

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

- skier's parameters,
- indicator value,
- measured values of M_Z and M_Y , or pass/fail result of the system test.

NOTE 6 The exact content of the report and its delivery conditions are defined by the national standard organizations.

Annex A (normative)

Definition of skier type

[adapted from annex A of ISO 8061:1991]

A.1 It is the responsibility of the skier to determine his skier-type classification as used in table A.1.

A.2 Skiers are classified by type of skiing into three categories, 1, 2 and 3. The definitions are as follows:

- Type 1: cautious skiing on smooth slopes of gentle to moderate pitch. This type also applies to entry-level skiers uncertain of their classification.
- Type 2: skiers not classified in type 1 or 3.
- Type 3: fast, aggressive skiing on slopes of moderate to steep pitch.

NOTE 7 These new designations, 1, 2 and 3 should not be used by equipment manufacturers to categorize their products.

A.3 The information given in A.3.1 and A.3.2 can be used to assist the skier in determining the appropriate skier-type classification.

A.3.1 Skiers who designate themselves as type 1 receive lower than average release/retention settings. This corresponds to an increased risk of inadvertent binding release, in order to gain increased capacity for release in a fall.

A.3.2 Skiers who designate themselves as type 3 receive higher than average release/retention settings. This corresponds to decreased capacity for release in a fall, in order to gain a decreased risk of inadvertent binding release.

NOTE 8 The designations L, A, S which were used in the first edition of ISO 8061:1984 are currently used to refer to definition types 1, 2 and 3 respectively.

The new designations 1, 2 and 3 will now be reserved, in this International Standard, for the purpose of setting the bindings.

A.4 The information given in table A.1 is an example of the kind of layout which may be used to assist the skier in determining his skier-type classification.

A.5 The use of these definitions in determining the release setting may be inappropriate for some types of competition skiing.

Table A.1

Type	1	2	3
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 undetermined)		Aggressive

Annex B (normative)

Setting methods

B.1 Weight method (see table B.1)

B.1.1 Locate the skier's weight (mass) and height in the appropriate column. If weight and height are not on the same line, select the line closest to the top of the table.

B.1.2 Consider the skier type (see annex A):

- for a type 1, stay on the line and use the reference moment (M_Z and M_Y) on that line;
- for a type 2, move down one line and use the reference moment (M_Z and M_Y) on that line;
- for a type 3, move down two lines and use the reference moment (M_Z and M_Y) on that line.

B.1.3 Consider the skier's age.

For skiers who are 50 years old or more, move up one line.

B.1.4 Using the boot sole length, determine the initial indicator value.

B.1.5 The inspection tolerance is defined as the range from one line above to one line below the selected individual release moment.

B.1.6 The limit for readjustment is defined as the range from two lines above to two lines below the selected individual release moment.

B.2 Tibial width method (see table B.2)

B.2.1 Skier's parameters

To determine the individual release moments, in decanewton metres, the maximum width of the tibial head is measured by pressing a caliper square onto an uncovered, right angled lower leg of a sitting skier. Corrections shall be made for the age and type of skier.

B.2.2 Parameters for checking

See 5.7 for requirements.

B.2.3 Presetting of the binding depending on the boot sole length

Modification of the initial indicator position depending on the boot sole length.

Table B.1 — Release value selection using the skier's weight

Skier's parameters			Initial indicator value, Z, depending on boot sole length, in millimetres						Inspection parameters	
Skier's mass kg	Skier's height m	Skier code	≤ 250	251 to 270	271 to 290	291 to 310	311 to 330	≥ 331	Twist M_z N·m	Forward lean M_y N·m
10 to 13		A	(0,75)	(0,75)					5 8	18 29
14 to 17		B	(1,25)	(1,0)					11	40
18 to 21		C	(1,5)	(1,25)	(1,0)				14	52
22 to 25		D	(1,75)	(1,5)	(1,5)	(1,25)			17	64
26 to 30		E	(2,25)	(2,0)	(1,75)	(1,5)			20	75
31 to 35		F	(2,75)	(2,5)	(2,25)	(2,0)			23	87
36 to 41		G	(3,5)	(3,0)	(2,75)	(2,5)	(2,5)		27	102
42 to 48	≤ 1,48	H		(4,0)	(3,5)	(3,0)	(2,75)		31	120
49 to 57	1,49 to 1,57	I		(5,0)	(4,5)	(4,0)	(3,0)	(3,0)	37	141
58 to 66	1,58 to 1,66	J		(5,5)	(5,0)	(4,5)	(4,0)	(4,0)	43	165
67 to 78	1,67 to 1,78	K		(6,5)	(6,0)	(5,5)	(5,0)	(4,5)	50	194
79 to 94	1,79 to 1,94	L		(7,5)	(7,0)	(6,5)	(6,0)	(5,5)	58	229
≥ 95	≥ 1,95	M			(8,5)	(8,0)	(7,5)	(7,0)	67	271
		N			(9,5)	(9,0)	(8,5)	(8,0)	78	320
		O				(10,0)	(10,0)	(9,5)	91	380
		P							105	452
										540

The part of the table which is enclosed in bold lines is the minimum field to be filled in by the binding manufacturer. If this is not the case, the values in parentheses shall be used.

Table B.2 — Release value selection using the skier's tibial width

B.2.1 Skier's parameters			
Tibia diameter measured with a tibiameter mm			Initial indi- cator value Z
Children up to age 15	Woman	Men	
up to 52			0,5
53 up to 61			1,0
62 up to 68			1,5
69 up to 73			2,0
74 up to 77			2,5
78 up to 81	up to 73		3,0
82 up to 85	74 up to 78		3,5
86 up to 88	79 up to 83	up to 76	4,0
89 up to 91	84 up to 87	77 up to 79	4,5
92 and above	88 up to 90	80 up to 82	5,0
	91 up to 94	83 up to 85	5,5
	95 and above	86 up to 88	6,0
		89 up to 91	6,5
		92 up to 94	7,0
		95 up to 96	7,5
		97 up to 99	8,0
		100 up to 101	8,5
		102 and above	9,0
			9,5
			10,0

Correction value in Z			
Age years	For skier type		
	1	2	3
up to 15	-0,5	0	+0,5
16 and 17	-1,5	-0,5	+0,5
18 up to 50	-1	0	+1
51 up to 60	-1,5	-0,5	+0,5
61 and above	-2	-1	0

Skier type	1	2	3
Speed	Slow to moderate	Skiers that do not meet the descriptions of either 1 or 3	Fast
Terrain	Gentle to moderate		Steep
Style	Cautious (or undetermined)		Agressive

Table B.2 — (continued)

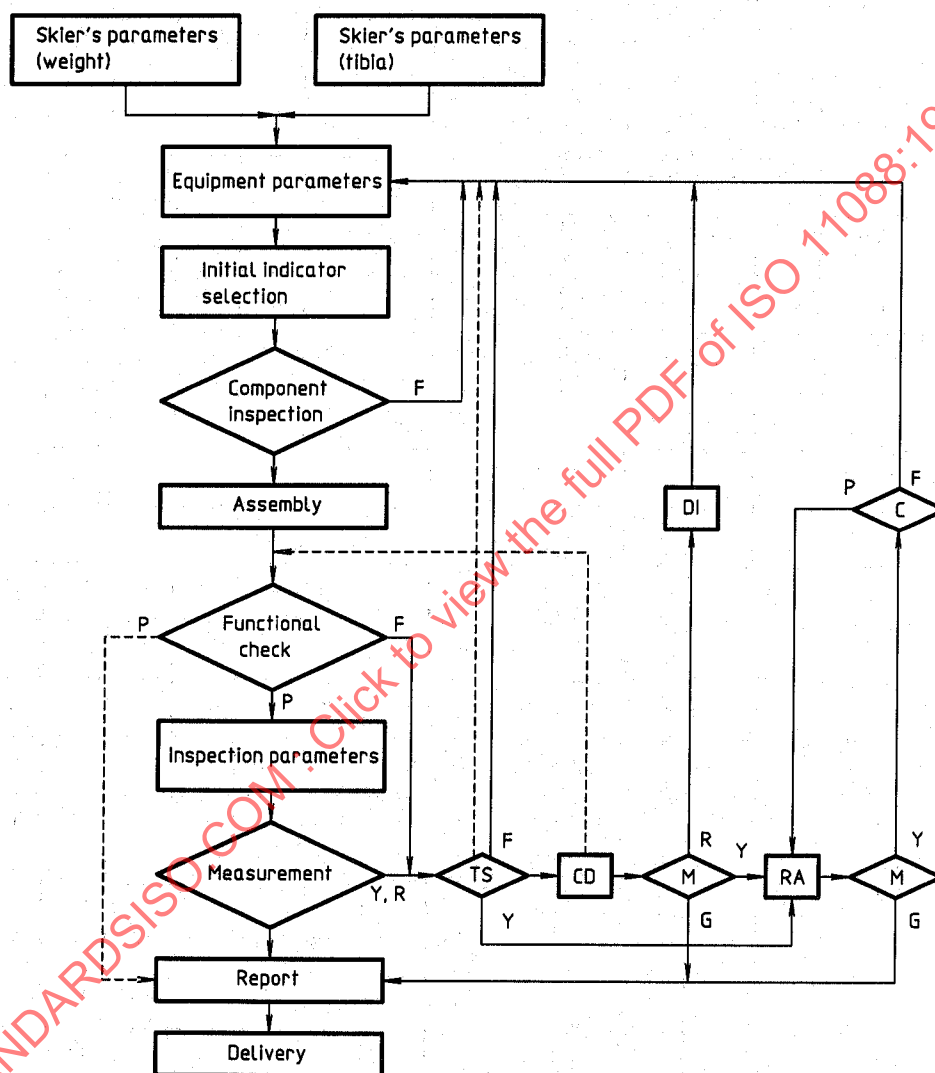
B.2.2 Inspection parameters	
Twist M_z N·m	Forward lean M_y N·m
5	18
10	37
15	55
20	75
25	94
30	114
35	134
40	154
45	175
50	196
55	218
60	239
65	261
70	284
75	307
80	330
85	353
90	377
95	401
100	425

Table B.2 — (concluded)

B.2.3 Preset of binding scale related to boot sole length																				
Corrected indicator value Z	Boot sole length																			
	mm																			
	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	
0,5	0,5	0,5	0,5	0,5	0,5	0,5														
1,0	1,25	1,0	1,0	1,0	1,0	0,75														
1,5			1,75	1,75	1,5	1,5	1,25	1,25	1,25	1,25	1,0									
2,0			2,5	2,25	2,25	2,0	2,0	1,75	1,75	1,75	1,5									
2,5			3,5	3,0	3,0	2,75	2,75	2,5	2,25	2,25	2,25	2,0								
3,0			4,5	4,0	4,0	3,5	3,5	3,0	3,0	2,75	2,75	2,5	2,5	2,25						
3,5				5,0	4,5	4,0	4,0	4,0	3,5	3,5	3,5	3,0	3,0	3,0	2,75					
4,0				6,0	5,5	5,0	5,0	4,5	4,5	4,0	4,0	4,0	3,5	3,5	3,5	3,0				
4,5				7,0	6,5	6,0	5,5	5,5	5,0	5,0	4,5	4,5	4,0	4,0	4,0	3,5				
5,0					7,5	7,0	6,5	6,0	6,0	5,5	5,5	5,0	5,0	4,5	4,5	4,5	4,0			
5,5						8,0	7,5	7,0	6,5	6,5	6,0	6,0	5,5	5,5	5,0	5,0	4,5			
6,0							8,5	8,0	7,5	7,0	7,0	6,5	6,0	6,0	5,5	5,5	5,0			
6,5							9,5	9,0	8,5	8,0	7,5	7,0	7,0	6,5	6,5	6,0	6,0	5,5		
7,0							10,5	10,0	9,5	9,0	8,5	8,0	7,5	7,5	7,0	6,5	6,5	6,0		
7,5							11,0	10,5	10,0	9,5	9,0	9,0	8,5	8,0	7,5	7,5	7,0	7,0	6,5	
8,0							12,0	11,5	11,0	10,5	10,0	9,5	9,0	9,0	8,5	8,0	7,5	7,5	7,5	
8,5									11,5	11,0	10,5	10,5	10,0	9,5	9,0	8,5	8,5	8,0	7,5	
9,0									12,0	11,5	11,5	11,0	10,5	10,0	10,0	9,5	9,0	8,5	8,5	
9,5									13,0	12,5	12,0	11,5	11,0	10,5	10,5	10,0	9,5	9,5	9,0	
10,0										13,0	12,5	12,0	11,5	11,5	11,0	10,5	10,5	10,0	9,5	

Annex C (normative)

Flow chart



P Pass
 F Fail
 G Within $\pm 15\%$
 Y Greater than $\pm 15\%$, not greater than $\pm 30\%$
 R Greater than $\pm 30\%$
 D Defect identified
 -- No test device

TS Trouble shoot
 CD Correct defect
 M Remeasure
 RA Readjust
 DI Diagnostic inspection
 C Check indicator run

Annex D

(normative)

Clean versus lubricated diagnostic test for boot/binding compatibility

Determine the measured release value in the S-B-B system in a clean state according to the binding manufacturer's instructions.

Determine the measured release value in the S-B-B system after lubricating all contact points between boot and binding with a lubricant specified by the

binding manufacturer, or, if not specified, use a soap and water solution.

Determine the relationship between lubricated and clean tests by dividing the lubricated result by the clean result.

If the quotient is greater than 1,2 or less than 0,8, the system should be considered incompatible.

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Annex E
(normative)

Drill

Figure E.1 illustrates a drill which is suitable for drilling holes for screws used for connecting the binding to the ski.

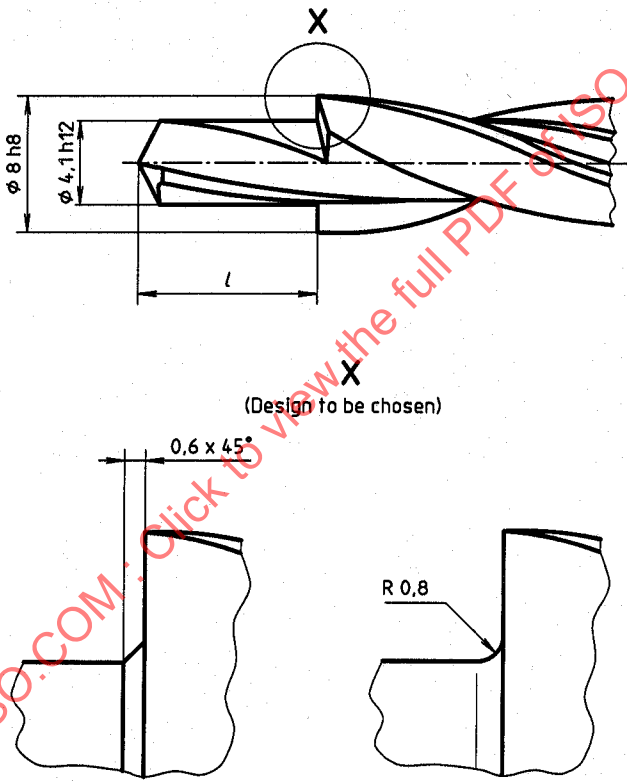


Figure E.1 — Drill