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**Forestry machinery — Portable chain-  
saw front hand-guard — Dimensions  
and clearances**

*Machines forestières — Protecteur de la main tenant la poignée avant  
des scies à chaîne portatives — Dimensions et dégagements*

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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6533 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*.

This fourth edition cancels and replaces the third edition (ISO 6533:2001), which has been technically revised primarily concerning the determination of reference point  $X_0$ .

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# Forestry machinery — Portable chain-saw front hand-guard — Dimensions and clearances

## 1 Scope

This International Standard specifies the dimensions and clearances for front hand-guards and their openings on portable hand-held chain-saws. These dimensions and clearances ensure the necessary safety provided by the hand-guard, which serves as both a shield between the operator's hand and the saw chain and as an actuator for manually operated chain brakes. For chain-saws with wrap around handles, this International Standard is not applicable to the portion of the front handle to the right (when viewed from the rear) of the top brace.

## 2 Normative reference

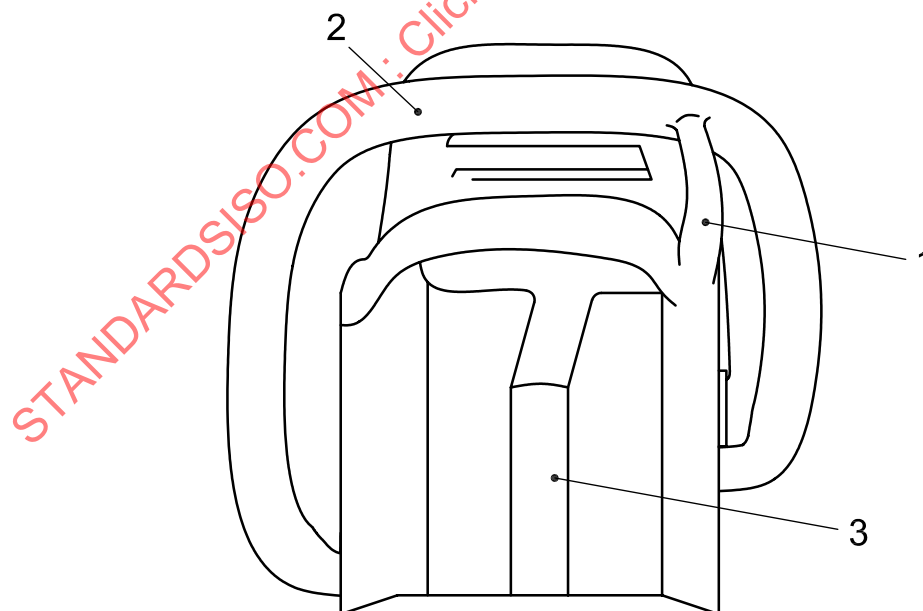
The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6531, *Machinery for forestry — Portable hand-held chain-saws — Vocabulary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6531 apply.

NOTE Figure 1 provides an example of a chain-saw rear view.



### Key

- 1 top brace
- 2 front handle
- 3 rear handle

**Figure 1 — Example of a chain saw with a wrap around handle — Rear view**

## 4 General

The dimensions of the front hand-guard and the clearances shall be in relation to the intended position of the left hand on the front handle during vertical cutting (bucking), determined using defined gauges (see Clause 5).

Unless otherwise specified, the following is applicable when determining the dimensions and clearances.

- a) The chain-saw shall be kept in the upright position; and the total forces applied to the guards (force on gauge plus gauge gravity force in probing direction) shall be  $10 \text{ N } \begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$  N.
- b) If the front hand-guard also activates the chain brake, the measurements shall be made
  - 1) with the front hand guard in the position for non-activated chain brake, and
  - 2) with a force of  $10 \text{ N } \begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$  N applied at the top edge of the guard, at  $45^\circ$  in a forward and downward direction relative to the guidebar centreline and 50 mm to the left of the reference point  $X_0$  (see Clause 6), when viewed from the rear.

## 5 Gauge dimensions

Rigid gauges of the types and sizes specified in Table 1 shall be used to determine the dimensions and clearances.

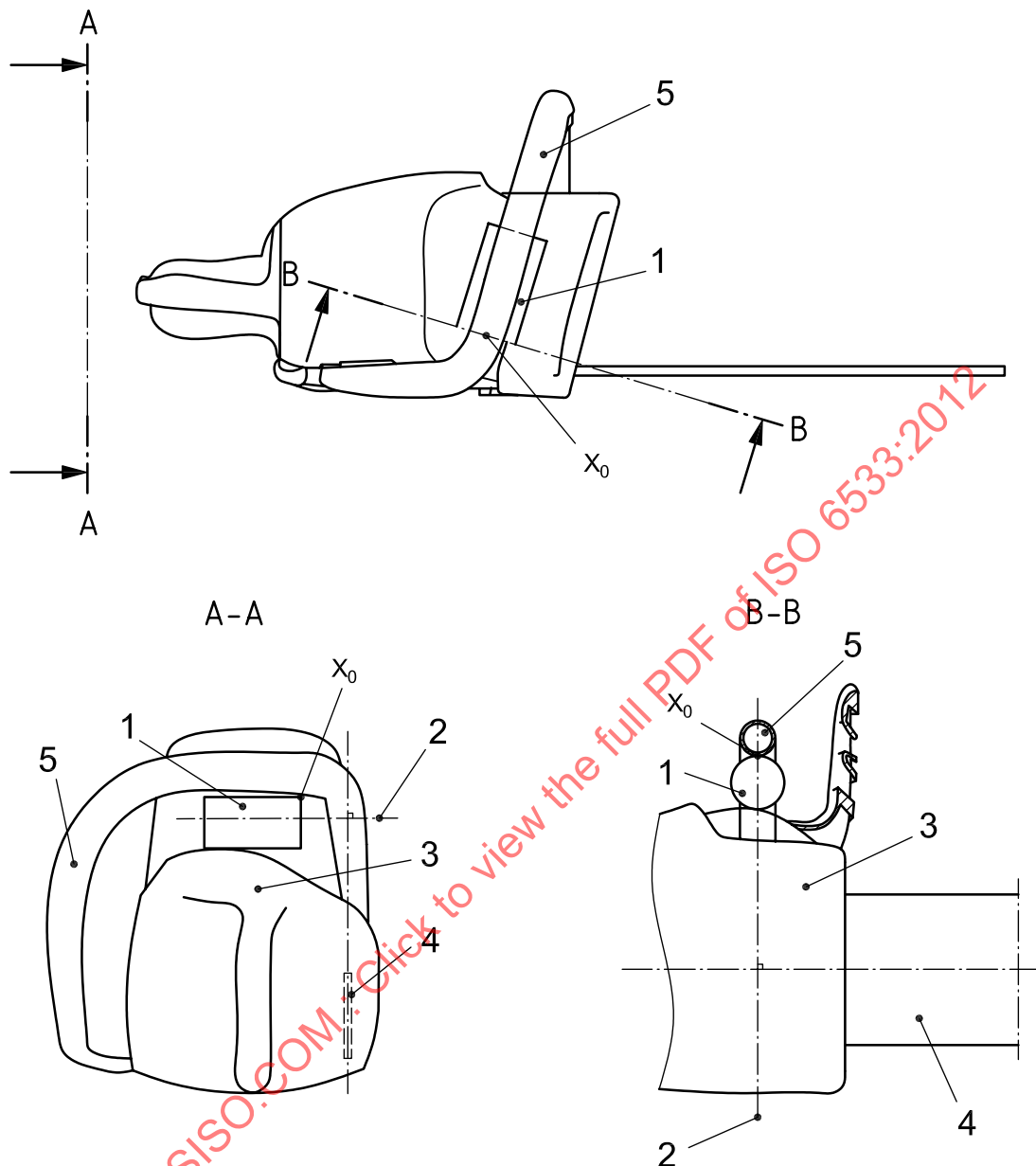
**Table 1 — Gauge dimensions**

Dimensions in millimetres

Gauge type	Diameter $D \pm 0,1 \text{ mm}$	Length $L \pm 0,1 \text{ mm}$	Corner radius $r \begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$
A	35	100	5
B	70	100	0,5
C	56	82	0,5

## 6 Determination of reference point $X_0$

**6.1** The reference point  $X_0$  shall be determined, when viewed from the rear, using a type A gauge kept furthest to the right side of the front handle, directly below and in line with the centreline of the front handle as specified in Figure 2.



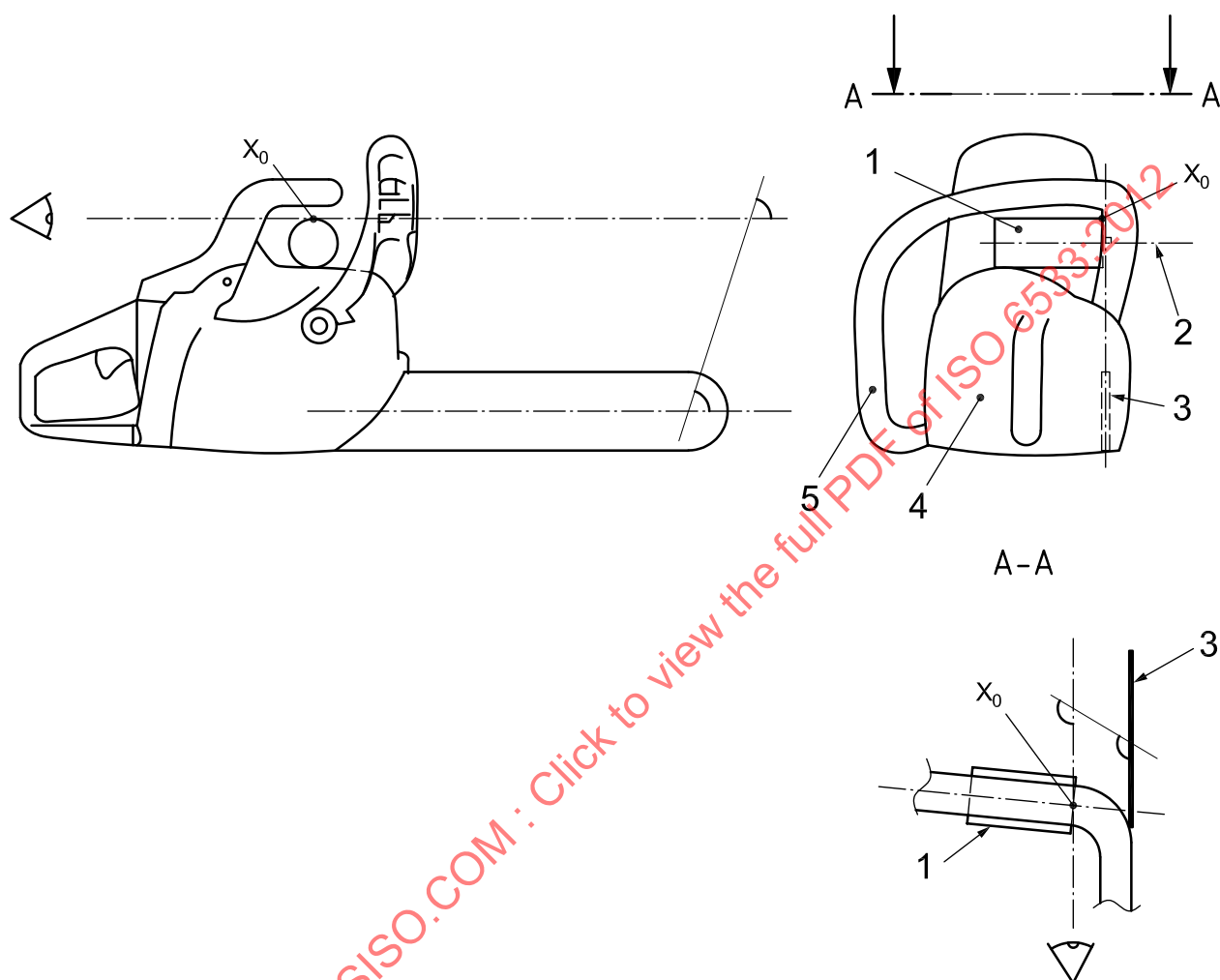
#### Key

- 1 type A gauge
- 2 type A gauge centreline
- 3 chain saw body
- 4 guide bar
- 5 front handle

**Figure 2 — Definition of reference point  $X_0$  when there is gauge contact between the housing and the front handle**

**6.2** When the machine is designed in such a way that a type A gauge of 100 mm length cannot be inserted between the handle and the housing, and  $X_0$  cannot be determined using such a gauge, the gauge length can be shortened (though no more than necessary). Using this modified gauge,  $X_0$  shall be determined according to all other requirements of 6.1.

6.3 If no contact between the gauge, the housing and the front handle can be achieved, then  $X_0$  shall be determined as the intersection point, transposed to the front handle along the line of sight, between the upper right edge of the type A gauge and a virtual surface that is created by a line of sight, parallel to the guide bar centre line, following the right inner surface contour of the front handle (see Figure 3)



**Key**

- 1 type A gauge
- 2 type A gauge centreline
- 3 guide bar
- 4 chain saw body
- 5 front handle

**Figure 3 — Definition of reference point  $X_0$  when there is no contact between the gauge and the front handle**



## 7 Front hand-guard dimensions

### 7.1 Front hand-guard width, $W_1$

The front hand-guard width,  $W_1$ , is the distance from  $X_0$ , left, to the point at which the requirement for the front hand-guard height over the front handle,  $H_1$  and  $H_{1A}$ , respectively (see 7.2), is not fulfilled. See Figure 4.

The front hand-guard width,  $W_1$ , shall in both cases ( $H_1$  and  $H_{1A}$ ) be at least 100 mm.

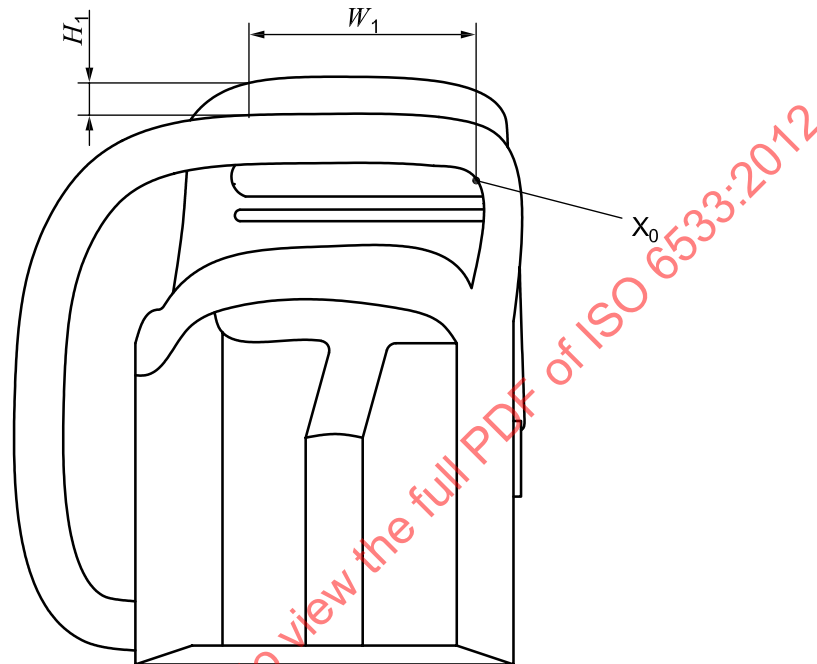


Figure 4 — Front hand-guard width,  $W_1$ , from the rear view of the machine

### 7.2 Front hand-guard height over front handle, $H_1$ and $H_{1A}$

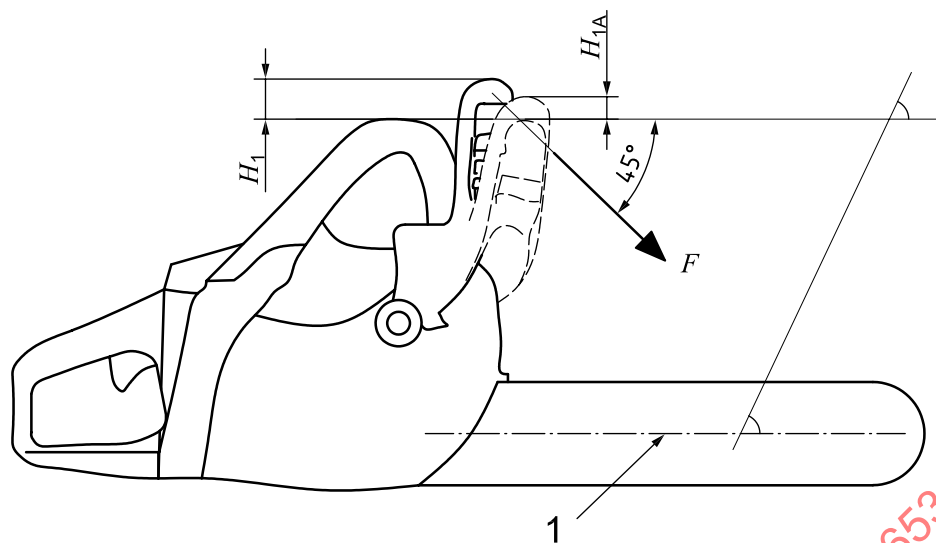
The measurement of the vertical height  $H_1$  and  $H_{1A}$  shall be made in a plane parallel to the guide bar plane and perpendicular to the guide bar centreline (see Figure 5).

Any free play in the guide bar fixing shall be taken up by tightening the guide bar to the saw body in its uppermost position.

The height,  $H_1$ , above top of front handle shall be at least 20 mm.

When the front hand-guard also activates the chain brake, this height shall be at least

- 20 mm with disengaged chain brake ( $H_1$ ), and
- 0 mm for engaged chain brake ( $H_{1A}$ ).



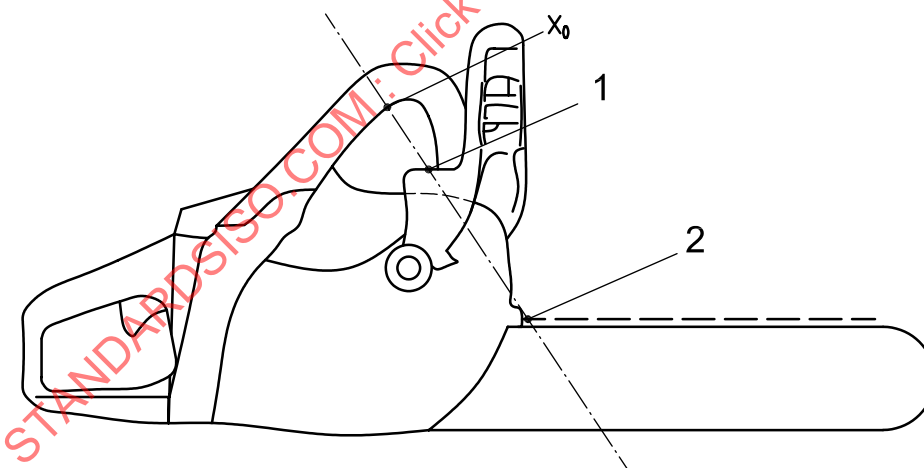
**Key**

1 centreline of guide bar

**Figure 5 — Front hand-guard height over front handle ( $H_1$  and  $H_{1A}$ ) — Machine viewed from the right side**

### 7.3 Line between $X_0$ and the rearmost part of unprotected saw chain

A line drawn from  $X_0$  to the rearmost upper unprotected part of the saw chain on the guide bar (see Figure 6) shall be intersected by a surface determined by the outer contour of the front hand-guard and/or the housing. Any opening in this surface shall fulfil the requirements in 7.4 and Clause 8.



**Key**

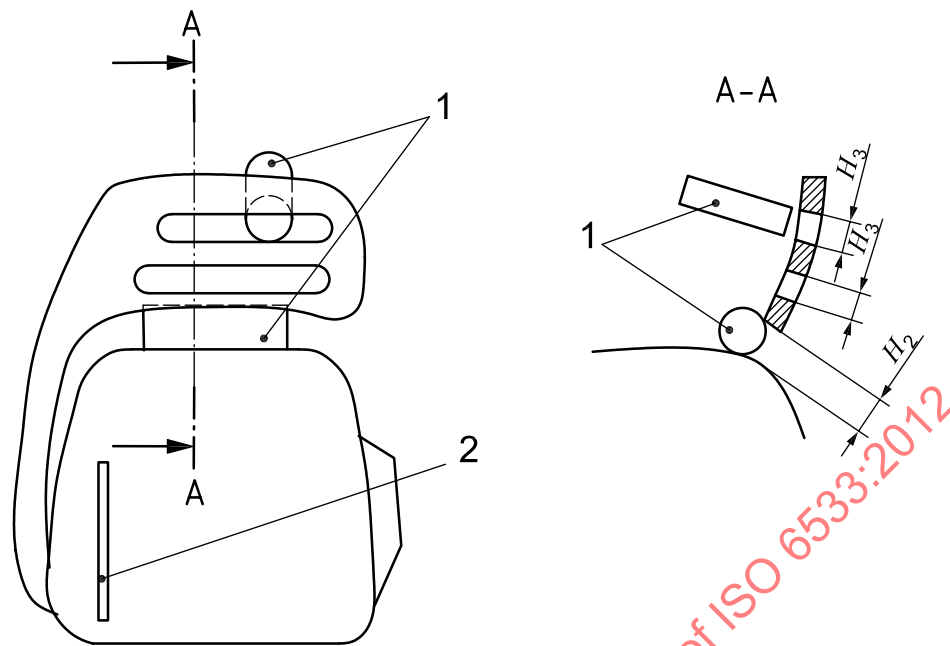
1 intersection point

2 unprotected part of saw chain

**Figure 6 — Line between  $X_0$  and rearmost part of unprotected saw chain**

### 7.4 Front hand-guard openings, $H_3$

The front hand-guard may have openings. Such openings shall be limited so that a type C gauge, applied in any direction and from either front or rear, cannot pass through when pushed perpendicularly toward the opening. See Figure 7.

**Key**

- 1 type C gauge
- 2 guide bar

**Figure 7 — Front hand-guard openings,  $H_3$ , and clearance,  $H_2$ , between hand-guard and chain saw body — Machine front view**

## 8 Clearance between the hand-guard and the chain saw body, $H_2$

The clearance,  $H_2$ , between the lower edge of the front hand-guard and any component of the chain saw body shall be limited so that a type C gauge, held at point  $X_0$  (see Figure 3) and held parallel to the front hand-guard, cannot pass through (see Figure 6).

If necessary, the gauge can be applied from the front, in which case additional means could be necessary for holding the hand-guard in position.

## 9 Clearances between the hand-guard and the front handle

There shall be a clearance between any part of the front hand-guard and the front handle, starting from  $X_0$  to the left when viewed from behind, such that

- a type A gauge can pass the clearance without coming into contact with the hand-guard [see Figure 8 a)], and
- a type B gauge cannot pass the clearance and any part of the gauge centreline will not come lower than any part of the centreline of the front handle [see Figure 8 b)].