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Portable chain-saws — Chain brake performance

Scies à chaîne portatives — Performance du frein de chaîne

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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 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 6535:2008), which has been technically revised.

Portable chain-saws — Chain brake performance

1 Scope

This International Standard specifies methods for measuring the braking time and release force of manually operated chain brakes on portable hand-held chain-saws.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 chain-saws — Vocabulary*

ISO 6533:2012, *Forestry machinery —Portable chain-saw front hand-guard —Dimensions and clearances*

3 Terms and definitions

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

3.1
braking time
interval from the instant the pendulum hits the guard to when the saw chain is considered to have stopped

4 Test objects

The measurements shall be carried out on three different new production saws of the same model, equipped with guide bar and saw chain with the largest diameter drive sprocket as recommended by the manufacturer.

5 Apparatus

5.1 Rotational speed indicator, with a rotating speed reading accuracy of ±2,5 % of the indicated value.

5.2 Time recording device, including pick-ups, having an accuracy of ±2,5 ms.

5.3 Pick-up device, for registering the brake arm activation.

5.4 Pick-up device, for registering the saw chain motion.

5.5 Force gauge, having an accuracy of ±1 N.

5.6 Pendulum, having a head with a flat strike face of 50 mm ± 1 mm diameter and an arm with a length giving 700 mm ± 5 mm distance between the swivel point and the centre of the head (see Figure 1). The arm shall be as light as possible. The pendulum shall cause an impact energy of 1,4 J ± 0,2 J from a drop height (see Figure 1) of 200 mm ± 5 mm. Sharp edges on the pendulum shall be chamfered.

6 Chain-saw preparation

The engine shall have been run in and warmed up for 3 min at maximum power speed before the test and the carburettor and ignition (if applicable) adjusted according to the manufacturer's instructions.

The chain-saw and saw chain tension shall be adjusted for best cutting performance in accordance with the manufacturer's recommendations. If nothing else is stated, the saw chain tension shall be adjusted so that, when a 0,9 kg mass is hanging from the centre of the usable cutting length along the lower portion of the saw chain, the gap between the saw chain side link and the bar is a maximum of 0,017 mm per millimetre of bar cutting length. The saw chain should move freely on the bar by applying moderate hand pressure.

If applicable, the chain oil pump shall be adjusted to its maximum setting according to the manufacturer's recommendations. The type of chain lubrication oil used shall be noted in the test report.

7 Procedure

7.1 Release force (static test)

The engine shall not be run during this test.

Measure the force needed to activate the brake on the top of the front hand-guard (see Figure 2) at the midpoint of the effective guard width W1 as described in ISO 6533:2012, 7.1. The force shall be applied at a uniform rate. Repeat this measurement twice for a total of three measurements.

For each chain-saw, the release force shall be measured before and after the measurement of chain braking time (see 7.2) and the results of both series of measurements shall be reported.

7.2 Braking time

7.2.1 General

Keep the throttle in a fixed position during the braking. This position shall correspond to the racing speed defined as the manufacturer's rated speed for maximum power plus 33 % or full throttle, whichever is the lesser. When the saw chain has stopped after braking, adjust the throttle to idling immediately and reset the brake. All tests in which the speed exceeds or is below the racing speed tolerances shall be omitted and repeated.

The saw chain has ceased to move, after activation of the chain brake, when the time taken for two successive chain drive links or sprocket teeth to pass the measuring point exceeds 5 ms

No brake adjustment of any kind and no cleaning shall be carried out during the test.

The saw shall be rigidly mounted by the handles during the test.

The brake shall be released with a blow from the pendulum (5.6), which shall strike the front hand-guard at the midpoint of the effective guard width W1 as described in ISO 6533:2012, 7.1 and from the drop height causing an impact energy of 1,4 J ± 0,2 J and along a line of action forming an angle of 45° ± 5° with the axis of the guide-bar (see Figure 1).

Carry out the test according to steps 7.2.2 to 7.2.6.

To avoid overheating, the time interval between each actuation of the chain brake shall be at least 30 s and the throttle trigger shall always be deactivated immediately after the chain has stopped after braking.

7.2.2 First measurement of braking times (in new condition)

Run the engine at racing speed ±5 r/s (±300 rpm) and carry out five actuations of the brake. Record the braking times.

7.2.3 Preliminary running

7.2.3.1 Perform 300 actuations of the chain brake at an engine speed between maximum power speed and racing speed. Braking times will not be recorded.

7.2.3.2 Cut softwood for the time it takes to use one tankful of fuel at approximately maximum power speed. The chain brake shall not be activated during this cutting. No cleaning of the chain saw is permitted during and after this cutting sequence. Check chain tension and adjust if necessary according to Clause 6.

7.2.4 Second measurement of braking times

Run the engine at racing speed ±5 r/s (±300 rpm) and carry out five actuations of the brake. Record the braking times.

7.2.5 Interim actuations

Run the engine at racing speed ±5 r/s (±300 rpm) and carry out 15 actuations of the brake. Braking times will not be recorded.

7.2.6 Third measurement of braking times

Run the engine at racing speed ±5 r/s (±300 rpm) and carry out five actuations of the brake. Record the braking times.

8 Report

8.1 Braking time

Report all recorded braking times and determine the average value of the 10 measurements of 7.2.4 and 7.2.6 in milliseconds.

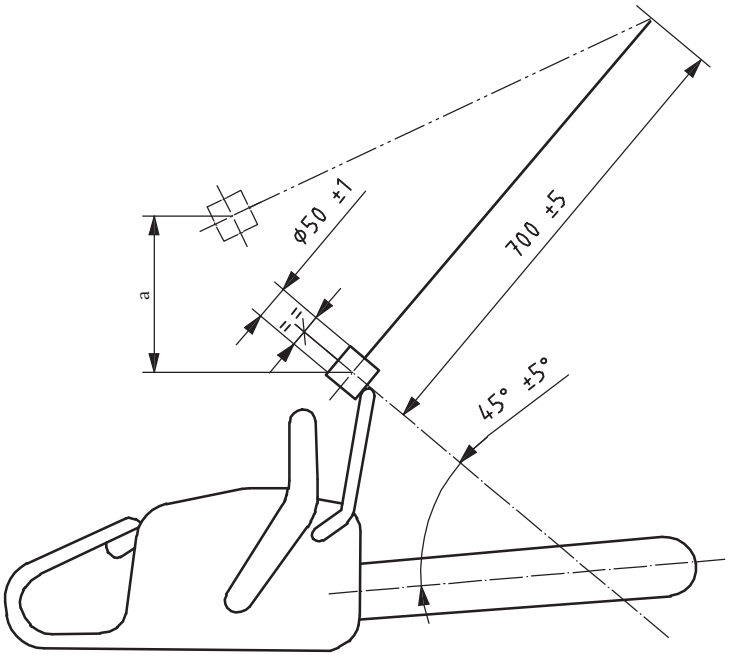
8.2 Release force

Report the six recorded release forces in Newtons.

8.3 Chain lubrication oil

Report the type of chain lubrication oil used during the tests.

Dimensions in millimetres



[a] Pendulum drop height.

Figure 1 — Impact direction and pendulum

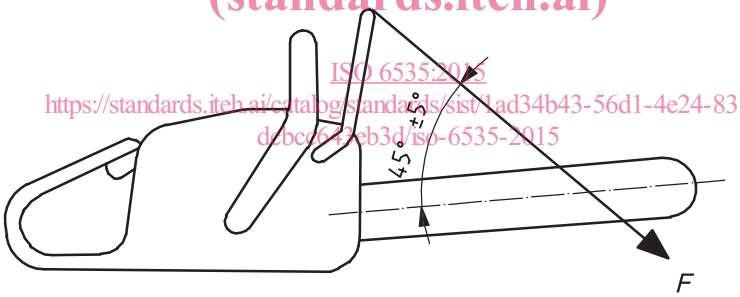


Figure 2 — Measuring direction for release force, *F*