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Forestry machinery — Portable chain-saws — Kickback test

Matériel forestier — Scies à chaîne portatives — Essai de rebond



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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.

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 9518 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*.

This second edition cancels and replaces the first edition (ISO 9518:1992), which has been technically revised, mainly to extend it to include chain-saws with an engine capacity of 80 cm³.

Annex A forms an integral part of this International Standard. Annex B is for information only.

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Introduction

The movement of a chain-saw during kickback can be simulated by a mathematical model. Through application of engineering principles, vertical, horizontal and rotational components of the chain-saw's movement are predicted. The model is presented in this International Standard in the form of a computer program which predicts the peak position of the chain-saw, upward and backward towards the user. This is called the "computed kickback angle" and is illustrated in figure 1.

The computer program uses standard engineering force-motion equations to predict the path of the saw based on kickback energy, physical characteristics of the chain-saw and simulated operator reaction forces. User reaction forces were determined through analysis of high-speed motion pictures of actual hand-held kickbacks.¹⁾

Input data for the computer program is obtained from physical measurements and from kickback energy tests performed on a completely assembled chain-saw including powerhead, guide bar and saw chain.

Kickback energy of a chain-saw is measured on a apparatus (called the kickback machine) developed specifically for this purpose. Kickbacks are generated by delivering the flat surface of a fibreboard test specimen into contact with the bar tip under controlled conditions. This apparatus and standardized specimen have been found to yield a realistic measurement of kickback energy of any specific saw/bar/chain combination.

The test procedure requires testing over a range of conditions to ensure that peak kickback energy for the particular saw/bar/chain combination on test is determined.

When the rotating parts of a chain-saw are stopped by a chain brake, a moment is generated that tends to reduce the kickback angle. The procedure accounts for this effect.

Annex A is a flow diagram of the computer program used to determine the computed kickback angle. Annex B contains a BASIC language program (complete with examples) to make these computations

¹⁾ For additional details see *Overview of the KICKBACK Computer Program — Contents and Development*, available from the Portable Power Equipment Manufacturer's Association, 4720 Montgomery Lane, Suite 514, Bethesda, MD 20814, USA.