AS ISO 6015:2021
ISO 6015:2006

Australian STANDARD®

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Earth-moving machinery — Hydraulic excavators and backhoe loaders — Methods of determining tool forces



AS ISO 6015:2021

This Australian Standard® was prepared by ME-063, Earthmoving Equipment. It was approved on behalf of the Council of Standards Australia on 22 March 2021.

This Standard was published on 1 April 2021.

The following are represented on Committee ME-063:

Australian Industry Group
Better Regulation Division — SafeWork NSW
Construction and Mining Equipment Industry Group
Department of Natural Resources, Mines and Energy, Qld
Department of Regional NSW
Engineers Australia
Institute of Instrumentation, Control and Automation Australia
Minerals Council of Australia
Mining Electrical and Mining Mechanical Engineering Society
University of Queensland

This Standard was issued in draft form for comment as DR AS ISO 6015:2020.

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ISBN 978 1 76113 255 1

Earth-moving machinery — Hydraulic excavators and backhoe loaders — Methods of determining tool forces

First published as AS ISO 6015:2021.

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Preface

This Standard was prepared by the Standards Australia Committee ME-063, Earthmoving Equipment.

The objective of this document is to specify methods for measuring and calculating the tool forces of earth-moving attachments fitted to hydraulic excavators and the hoe equipment of backhoe loaders. It is applicable to hydraulic excavators and backhoe loaders as defined in ISO 6165.

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Foreword

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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 6015 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 1, *Test methods relating to machine performance*.

This second edition cancels and replaces the first edition (ISO 6015:1989), which has been technically revised.

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Australian Standard®

Earth-moving machinery — Hydraulic excavators and backhoe loaders — Methods of determining tool forces

1 Scope

This International Standard specifies methods for measuring and calculating the tool forces of earth-moving attachments fitted to hydraulic excavators and the hoe equipment of backhoe loaders. It is applicable to hydraulic excavators and backhoe loaders as defined in ISO 6165.

2 Normative references

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 6016:1998, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

ISO 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 6746-1:2003, *Earth-moving machinery — Definitions of dimensions and codes — Part 1: Base machine*

ISO 7135:1993, *Earth-moving machinery — Hydraulic excavators — Terminology and commercial specifications*

ISO 7451:1997, *Earth-moving machinery — Volumetric ratings for hydraulic excavator buckets and backhoe loader buckets*

ISO 7546:1983, *Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings*

ISO 9248:1992, *Earth-moving machinery — Units for dimensions, performance and capacities, and their measurement accuracies*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
tool force
force generated at the bucket lip or cutting edge, but not at the tips of the teeth, when operating the bucket or arm cylinders independently

3.2
arm cylinder tool force
force generated at the bucket lip with the arm cylinder positioned to provide a rotating moment around the arm pivot

Note 1 to entry: The bucket lip moves towards the base machine when hoe equipment is used.

3.3
arm cylinder tool force at level crowd
⟨shovel equipment⟩ horizontal arm cylinder tool force generated by the arm cylinder at the bucket lip when the bucket"s attitude is level and maintained parallel to the ground line and the lip is at the ground line

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