DRAFT INTERNATIONAL STANDARD

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Earth-moving machinery — Quick couplers — Safety

Engins de terrassement — Attache rapide — Sécurité

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Foreword

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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 13031 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety, ergonomics and general requirements*.

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

Introduction

The development of this International Standard was initiated in response to accidents which had occurred in various countries in connection with the use of some types of quick couplers. It became clear that some of the risks related to quick coupler operation could be overcome by design measures and that therefore there was a benefit in obtaining international consensus on those measures. Amongst other measures the standard specifies design criteria related to ensuring that an attachment is located in the right position on the quick coupler and that the engagement system is fully activated. While preparing the standard it was considered to what extent the state of the art allowed the further reduction of risks related to engagement procedures not being fully completed. In particular, it was considered carefully whether the use of sensors and associated control systems could be normatively required in order to ensure that those procedures were correctly completed. It was determined that the current state of the art did not allow such a mandatory requirement to be made. However, due to the continuing development of technology this possibility will be reviewed by ISO TC 127 periodically so that a revision to this standard can be initiated at the appropriate time. Nothing in this standard should be taken as discouraging the development of new technologies and new technical measures to reduce or remove risk.

This document is a type C standard as defined in ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

Earth-moving machinery — Quick couplers — Safety

1 Scope

This International Standard specifies safety requirements for quick couplers used on earth-moving machinery 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 12100 *Safety of machinery — General principles for design — Risk assessment and risk reduction*

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

ISO 6750, *Earth-moving machinery — Operator's manual — Content and format*

ISO 9244, *Earth-moving machinery — Safety signs and hazard pictorials — General principles*.

ISO 20474-1:2008*, Earth-moving machinery — Safety — General requirements*

3 Terms and definitions

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

3.1
quick coupler
device mounted on an earth-moving machine to allow the quick interchange of attachments

NOTE Quick couplers are also commonly referred to under many different names, including but not limited to, “quick hitch” or “attachment bracket”. For the purpose of this standard only the term “quick coupler" is used.

3.1.1
powered quick coupler
quick coupler where the movement of any part of the engagement and locking system is actuated by a power source (e.g. a hydraulic system or an electric motor)

3.1.2
manual quick coupler
quick coupler where the movement of the engagement and locking systems is actuated by human effort at the quick coupler itself

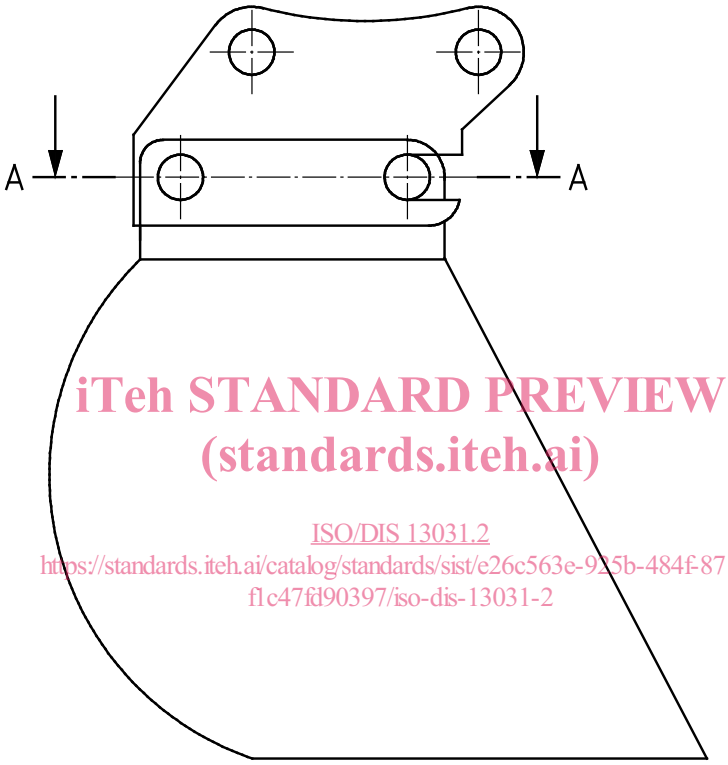
NOTE Locking can be automatic as part of the manual process of engagement.

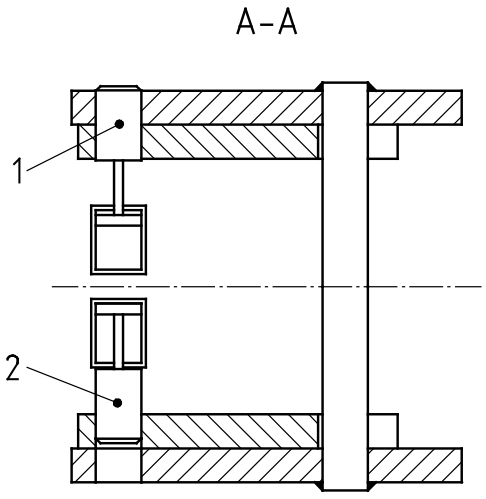
3.1.3
mixed quick coupler
quick coupler where engagement and locking is carried out from the operator's station but disengagement is carried out by human effort at the quick coupler itself

3.2
engagement system
mechanical system of the quick coupler which engages with the attachment and retains the attachment in its working position

3.2.1
form-locked engagement system
engagement system which retains the attachment in the normal working position by a system of at least two components that engage each other perpendicular to the working forces such that the working forces do not tend to cause disengagement

EXAMPLE Pin in shear (see Figure 1).





Key

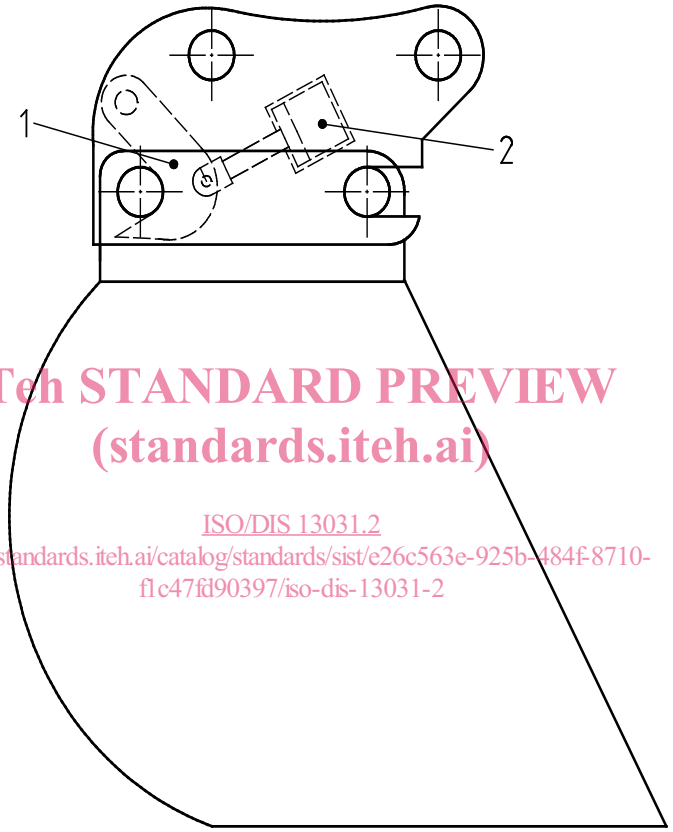
1 engagement system in engaged position

2 engagement system in disengaged position

Figure 1 — Example of form-locked engagement system

3.2.2
force-locked engagement system
engagement system whereby continued engagement is dependent on the continuous application of the engagement force as the working forces act in a direction to cause disengagement

See Figure 2 for an example.



Key

1 engagement system

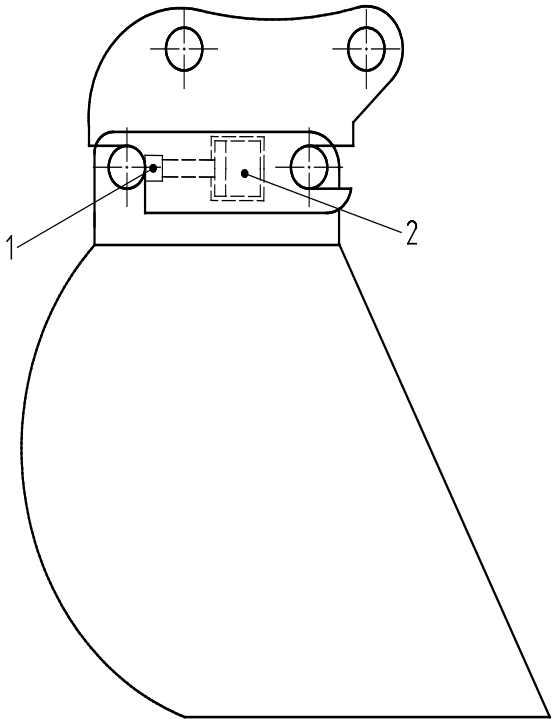
2 engagement force device

Figure 2 — Example of force-locked engagement system

3.2.3
friction system
engagement system whereby engagement is dependent on a force generated only by friction

NOTE 1 Friction systems are not permitted [see 4.1.2 paragraph 2]

NOTE 2 See Figure 3 for an example.



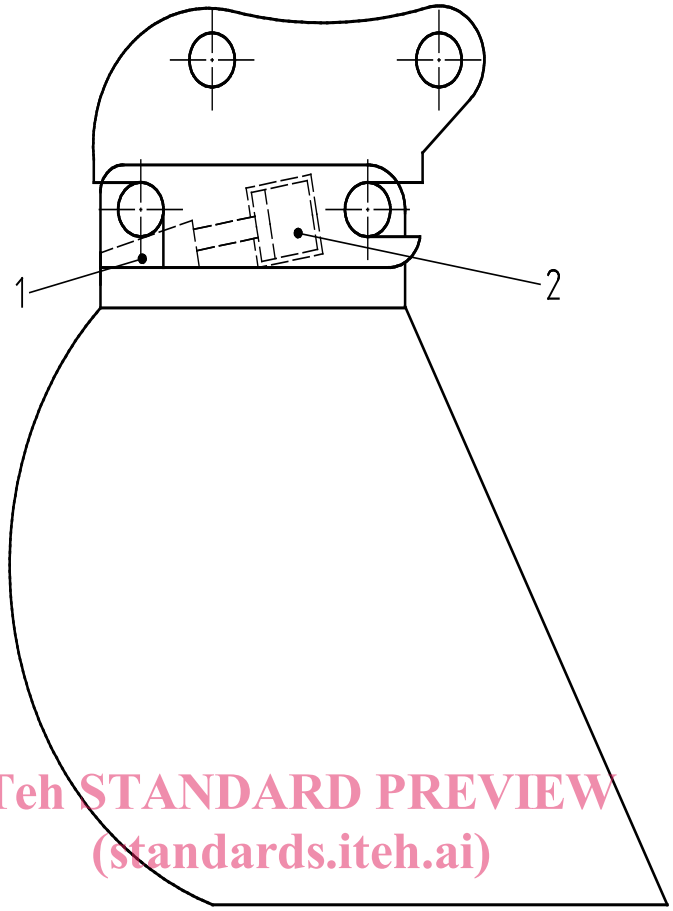
Key

1 engagement system
2 engagement force device

Figure 3 — Example of friction engagement system

3.2.4
wedge-type engagement system
engagement system of at least two interconnecting parts which engage with one another in a wedge action whereby the combination of the wedge angle and the friction coefficient counteract the tendency of the working forces to cause disengagement

NOTE See Figures 4 and 5.



Key

1 engagement system (wedge)

2 engagement force device

Figure 4 — Example of wedge-type engagement system