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Earth-moving machinery — Wheeled loader coupler for attachments

Engins de terrassement — Accouplement pour accessoires de chargeuse à roues

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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 23727 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 3, *Machine characteristics, electrical and electronic systems, operation and maintenance*.

Introduction

This International Standard provides for the interchangeability of attachments on wheeled loaders by establishing dimensional and clearance limits for the attachment interface. It is not intended to limit the use of other coupler configurations, but does define a common coupler configuration that will permit broad interchangeability of attachments.

The design of the attachment bracket locking system is not restricted by this International Standard and is left to the discretion of the manufacturer.

Earth-moving machinery — Wheeled loader coupler for attachments

1 Scope

This International Standard provides for the interchangeability of attachments on wheeled loaders by establishing common dimensions and clearances for a coupler. It is applicable to wheeled loaders as defined in ISO 6165 with an operating mass of between 8 000 kg and 17 500 kg. Alternative coupler designs and dimensions are permitted, but might not provide broad interchangeability of attachments.

This International Standard is not intended for, but may be applicable to, other wheeled loaders, skid steer loaders or backhoe loaders if interchangeability of common attachments is desired. It does not require the fitting of a coupler and attachments can be directly mounted to the lifting linkage without the use of one.

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

3 Terms and definitions

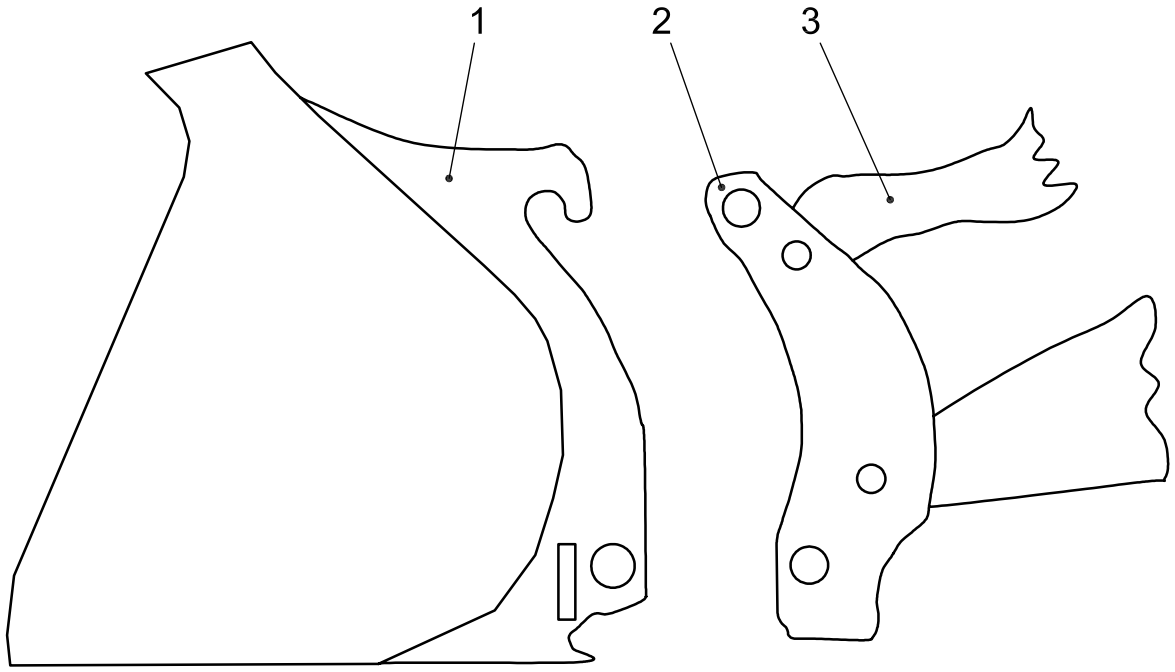
For the purposes of this document, the following terms and definitions apply.

3.1
attachment
assembly of components (bucket, fork, etc.) that can be mounted onto the lifting linkage coupler of a wheeled loader

See Figure 1.

3.2
coupler
equipment installed at the end of the lifting linkage for mounting various attachments using a common interface

See Figure 1.



Key

1 attachment
2 coupler
3 lifting linkage

Figure 1 — Wheeled loader lifting linkage with coupler and attachment

3.3
lifting linkage
equipment on the front of a wheeled loader consisting of lifting arms and bucket linkage arms

See Figure 1.

3.4
operating mass
OM
mass of the base machine, with equipment and empty attachment in the most usual configuration as specified by the manufacturer, and with the operator (75 kg), full fuel tank and all fluid systems (i.e. hydraulic oil, transmission oil, engine oil, engine coolant) at the levels specified by the manufacturer and, when applicable, with sprinkler water tank(s) half full

NOTE 1 The mass of an operator is not included for non-riding machines.

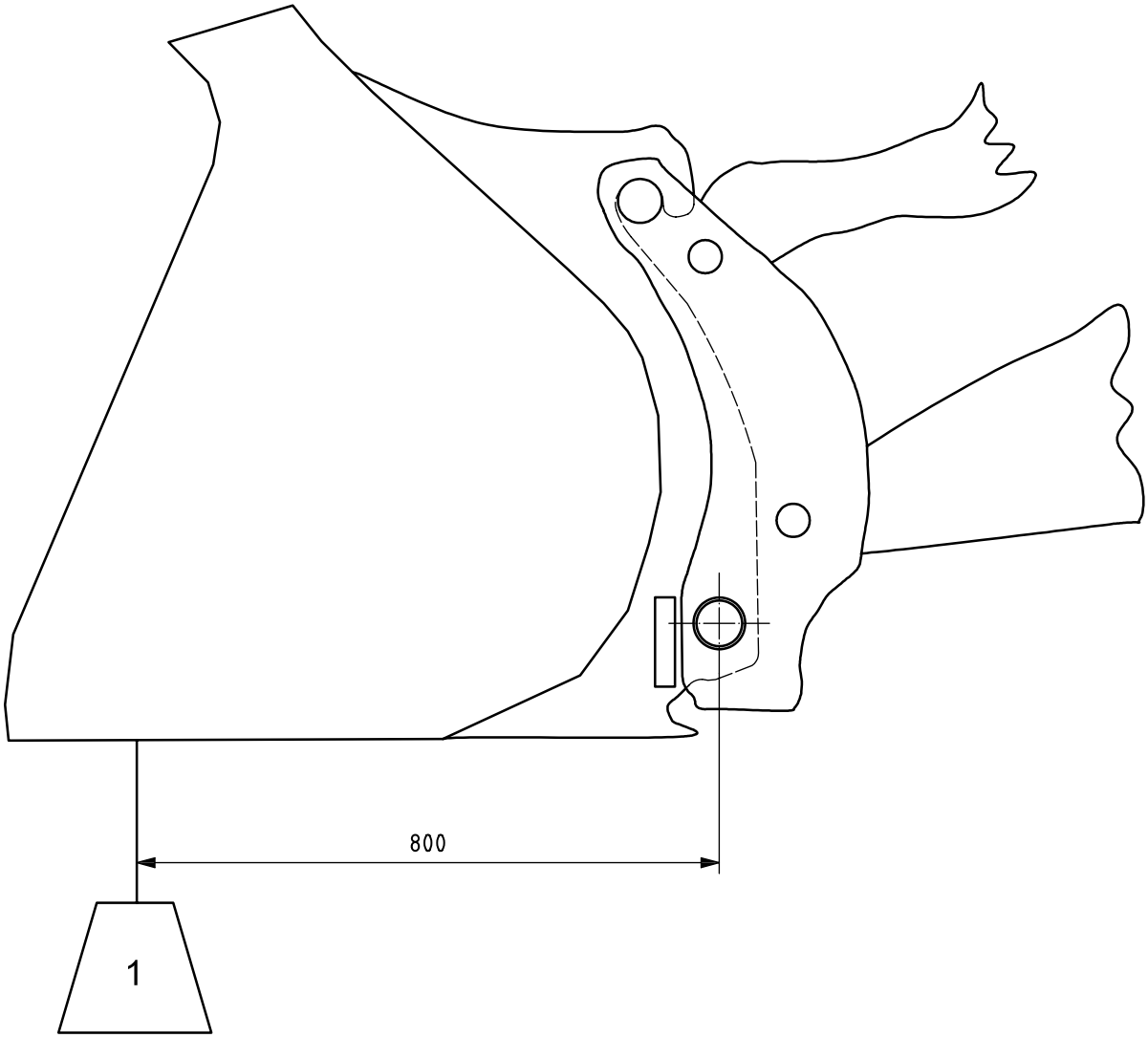
NOTE 2 Ballast mass included at delivery can be included if specified by the manufacturer.

[ISO 6016:2008]

3.5
coupler maximum load rating
maximum vertical lift capacity generated at a point 800 mm horizontal in front of the locking pin of the coupler, used to define the coupler rating by the coupler manufacturer for the selection of compatible attachments

See Figure 2.

Dimensions in millimetres



Key

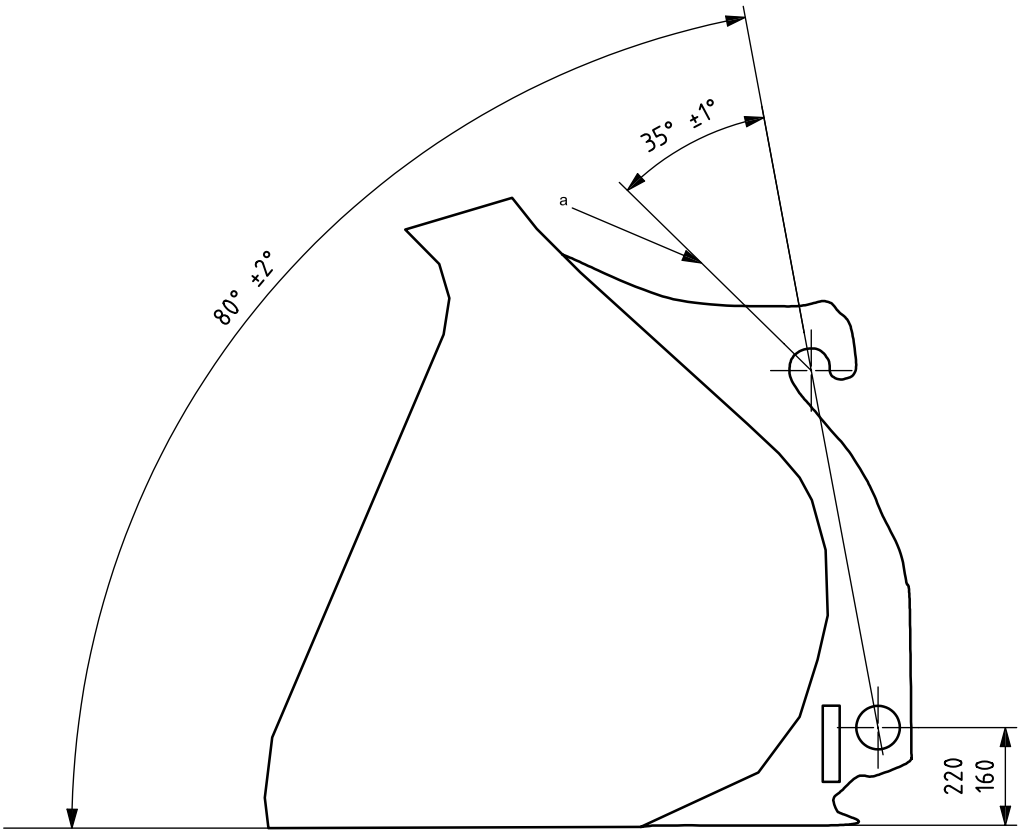
1 coupler load

Figure 2 — Coupler maximum load rating

3.6
linkage clearance angle
angle from the centre of the lower coupler pin that defines the clearance between the coupler members and the loader linkages to permit operating clearances

See Figure 3.

Dimensions in millimetres



a Linkage clearance line.

Figure 3 — Dimensional ranges and clearances

4 Coupler dimensions

4.1 General

Figures 3 to 8 provide dimensions permitting exchangeable coupling arrangements with attachments for wheeled loaders within the scope of this International Standard.

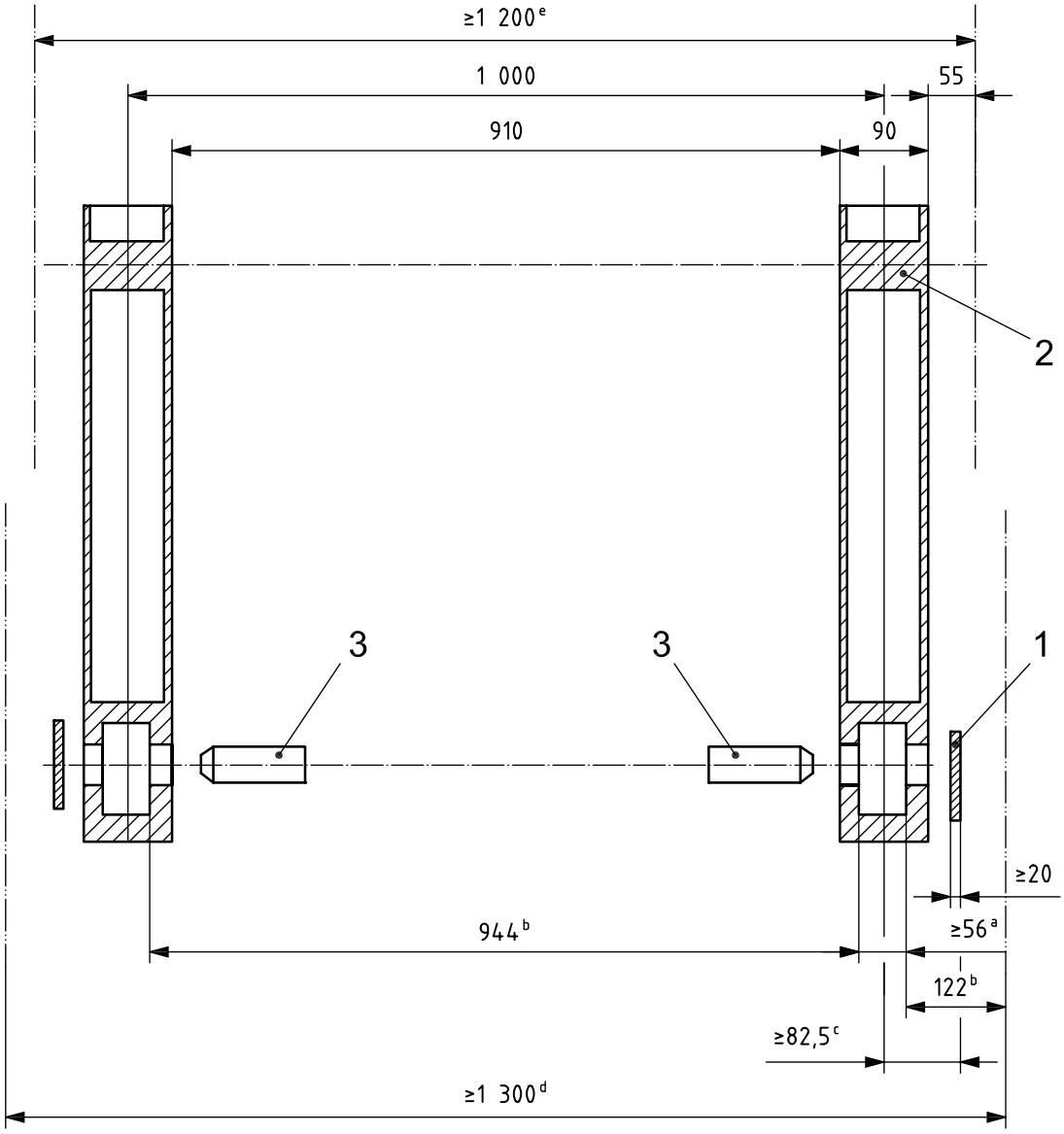
NOTE Figures 3 to 8 show a bucket as an example of a typical attachment. It is not intended to exclude any other attachment.

4.2 Clearances

Provisions should be made to permit clearance at the back of the attachment with the coupler. See Figure 3. Clearance information on the required crowd or dump angles shall be provided in the coupler's instructions for defining the requirements for interchangeable attachments.

Zones A, B, and C as shown in Figures 5, 6, and 7 provide the maximum coupler dimensions between the coupler and the attachment.

Dimensions in millimetres



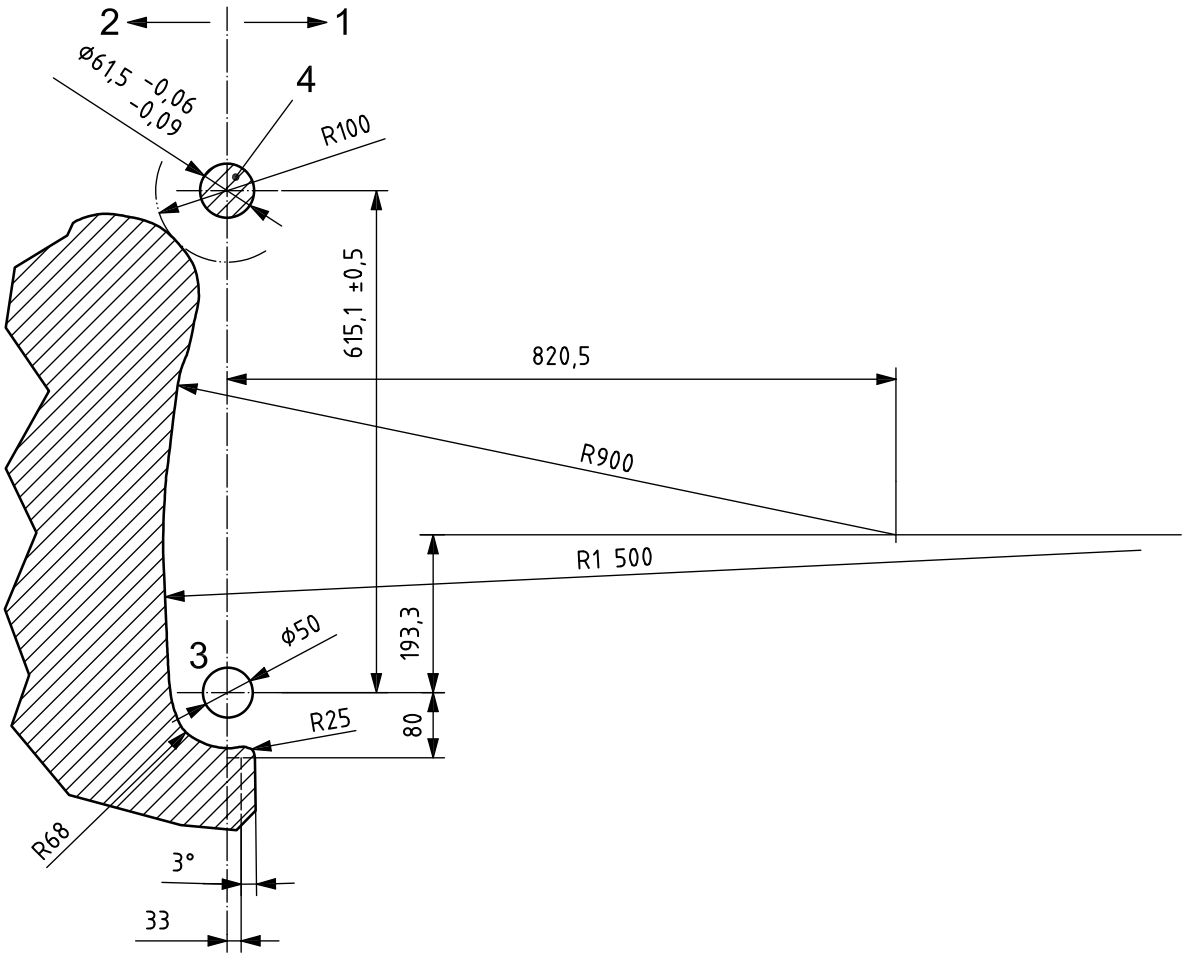
Key

1 attachment stop
2 coupler pin
3 locking pin

a Zone A.
b Zone B.
c Zone C.
d Attachment bottom.
e Attachment top.

Figure 4 — Section view of coupler dimensions

Dimensions in millimetres

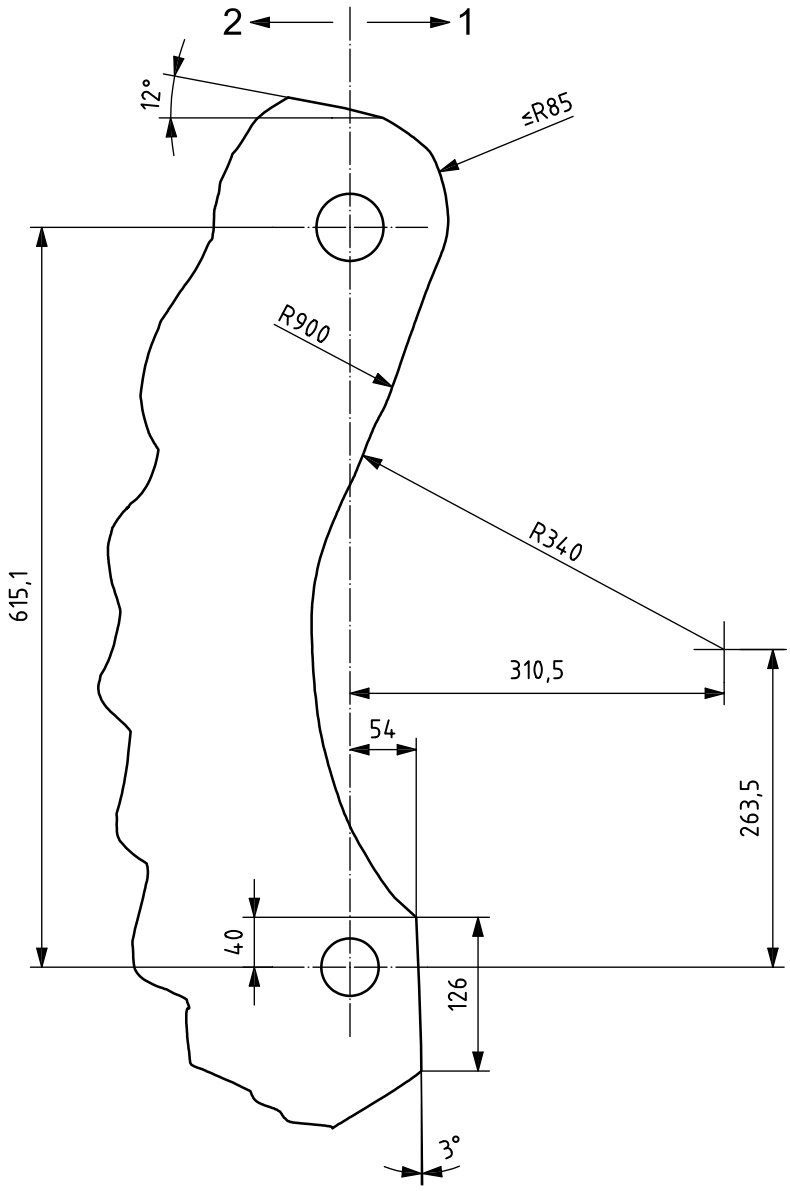


Key

1 attachment side
2 coupler side
3 coupler hole
4 coupler pin

Figure 5 — Section view of zone A — Maximum coupler clearance dimensions

Dimensions in millimetres

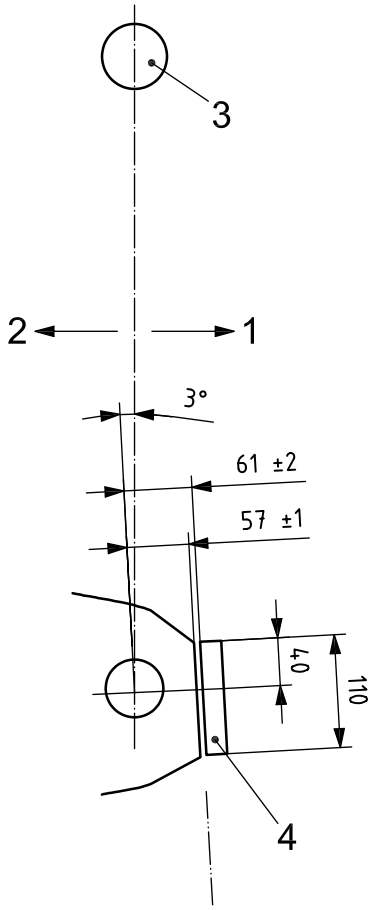


Key

1 attachment side
2 coupler side

Figure 6 — View of zone B — Maximum coupler dimensions

Dimensions in millimetres



Key

1 attachment side
2 coupler side
3 coupler pin
4 attachment stop

Figure 7 — Zone C — Coupler dimensions at hard attachment stop

4.3 Locking pin

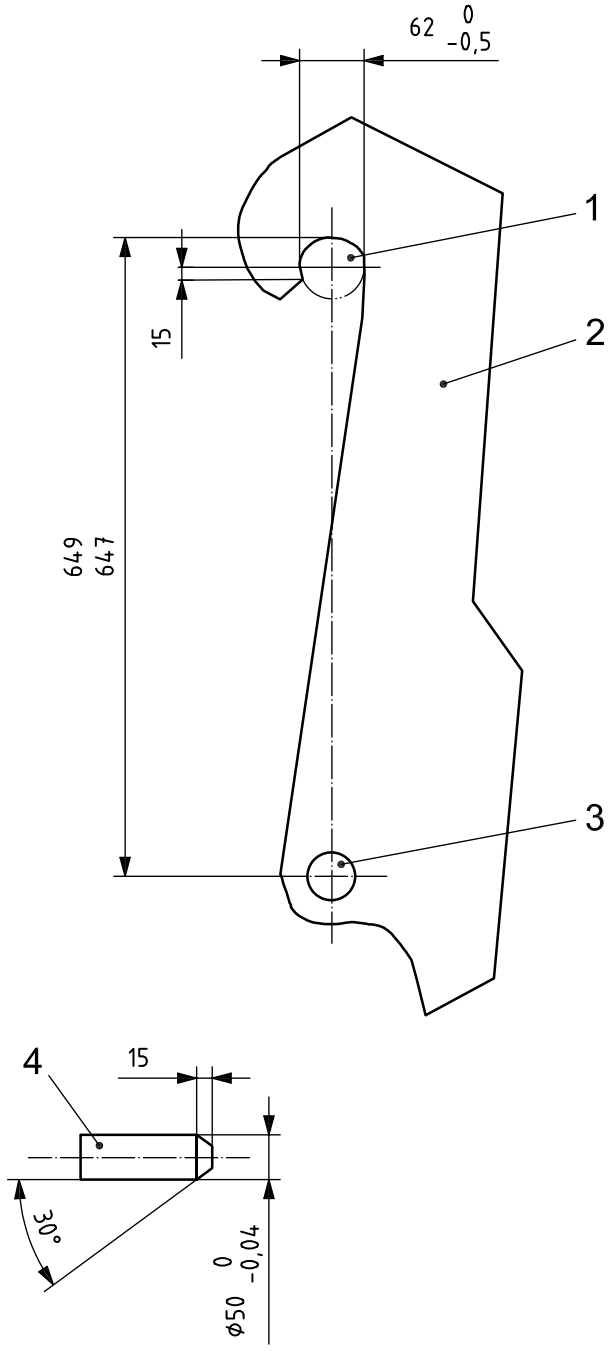
The locking pin shown in Figure 8 may be placed either inside or outside of the frame.

Mechanical “hard” stops on the attachment used to locate the position of the attachment relative to the lower locking pins during the locking process (see Figure 4) should not come into contact with the locking pins when the pins are engaged. These attachment stops should provide clearance to the locking pins when the pins are engaged. A pin clearance from the stops of at least 3 mm is suggested but not required.

4.4 Mounting height of eyelet to an attachment

The attachment’s recommended distance between the base surface and the centre of the eyelet is in the range of 160 mm to 220 mm. See Figure 3.

Dimensions in millimetres



Key

1 coupler pin
2 attachment
3 locking pin hole
4 locking pin

Figure 8 — Detail dimensions of locking pin and attachment

5 General requirements [1)]

5.1 Identification

When the coupler is not manufactured or labelled by the machine manufacturer, the coupler shall be permanently marked with the following information:

— manufacturer's name and address;

— model or part number.

The coupler may be permanently marked with the following information, or the information shall be provided with the coupler instructions:

— mass of the coupler, expressed in kilograms (kg);

— coupler maximum load rating, in kilograms (kg), as defined in this International Standard.

5.2 Instructions

The machine and/or coupler operating manual shall include the following instructions:

— precautions for correctly matching the coupler, having the appropriate coupler maximum load ratings, with the machine if the machine configuration permits the fitting of a coupler;

— precautions for selecting a coupler with a coupler maximum load rating exceeding the machine manufacturer’s specified rated operating capacity and/or lift capacity to maximum height;

— precautions for verifying compatibility between any attachment and the coupler for proper fit and connection;

— information on the required crowd or dump angles, provided in the operator’s instructions, for understanding the clearance requirements for interchangeability of attachments.

1) General requirements for attachments and couplers mandatory in the European Union are given in EN 474-1:2006, 5.21, as indicated in ISO/TS 20474-14.

Bibliography

[1] ISO 6016, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

[2] ISO 20474-1:2008, *Earth-moving machinery — Safety — Part 1: General requirements*

[3] ISO/TS 20474-14:2008, *Earth-moving machinery — Safety — Part 14: Information on national and regional provisions*

[4] EN 474-1:2006, *Earth-moving machinery — Safety — Part 1: General requirements*

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