INTERNATIONAL STANDARD

ISO 20474-10

Second edition
2017-07

Earth-moving machinery — Safety —

Part 10: Requirements for trenchers

Engins de terrassement — Sécurité —

Partie 10: Exigences applicables aux trancheuses

Reference number
ISO 20474-10:2017(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html

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

This second edition cancels and replaces the first edition (ISO 20474-10:2008), which has been technically revised with the following changes:

— normative references have been updated;

— references to national and regional provisions in the withdrawn ISO/TS 20474-14 have been deleted;

— new safety requirements and protective measures have been added, and the illustrations of Annex A updated.

It is intended to be used in conjunction with ISO 20474-1.

A list of all parts in the ISO 20474 series, published under the general title, *Earth-moving machinery — Safety,* can be found on the ISO website.

Introduction

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

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

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

ISO 20474 provides acceptable safety requirements for earth-moving machinery. This standard does not necessarily provide requirements to meet all national and regional regulatory provisions, e.g. Japan does not allow object handling with earth-moving machinery.

Earth-moving machinery — Safety —

Part 10: Requirements for trenchers

1 Scope

This document gives the safety requirements specific to trenchers as defined in ISO 6165. It is intended to be used in conjunction with ISO 20474-1, which specifies general safety requirements common to two or more earth-moving machine families. The specific requirements given in this document take precedence over the general requirements of ISO 20474-1.

This document deals with all significant hazards, hazardous situations and events relevant to the earth-moving machinery within its scope (see ISO 20474-1:2017, Annex A) when used as intended or under conditions of misuse reasonably foreseeable by the manufacturer. It specifies the appropriate technical measures for eliminating or reducing risks arising from relevant hazards, hazardous situations or events during commissioning, operation and maintenance.

This document is not applicable to machines manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

ISO 6682, *Earth-moving machinery — Zones of comfort and reach for controls*

ISO 6393, *Earth-moving machinery — Determination of sound power level — Stationary test conditions*

ISO 6394, *Earth-moving machinery — Determination of emission sound pressure level at operator's position — Stationary test conditions*

ISO 12509, *Earth-moving machinery — Lighting, signalling and marking lights, and reflex-reflector devices*

ISO 13539:1998, *Earth-moving machinery — Trenchers — Definitions and commercial specifications*

ISO 20474-1:2017, *Earth-moving machinery — Safety — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20474-1, ISO 13539, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
trencher
self-propelled crawler or wheeled machine, having rear- and front-mounted equipment or attachment, primarily designed to produce a trench in a continuous operation, through motion of the machine

Note 1 to entry: The attachment can be a digging chain, wheel, disk, plough blade or similar.

Note 2 to entry: See Annex A for illustrations.

[SOURCE: ISO 6165:2012, 4.5, modified — By adding Note 2.]

3.2
restraint bar
structure generally above and parallel to the digging chain which provides a degree of protection from contact with the digging element

Note 1 to entry: See Annex A for illustrations.

3.3
trench
narrow horizontal excavation for which, in general, the depth is greater than the width

4 Safety requirements and protective measures

4.1 General

Trenchers shall comply with the safety requirements and protective measures of ISO 20474-1, in as far as those are not modified by the specific requirements of this clause.

4.2 Restraint bar

ISO 20474-1:2017, 4.14.3, shall apply, with the addition that a restraint bar shall be fitted and shall extend as far as practical over the length of the digging chain. A restraint bar or trench cleaner bar as shown in ISO 13539:1998, Figure 5, satisfies this requirement.

4.3 Ride-on operated trenchers

4.3.1 Operator's seat

4.3.1.1 General

ISO 20474-1:2017, 4.4.1.2, shall apply, with the exceptions given in 4.3.1.2 and 4.3.1.3 below.

4.3.1.2 Seat with transversal position

Fore and aft seat adjustment is not required.

4.3.1.3 Additional or separate operator station

If a separate operator station is required for control of a special attachment, the following exceptions shall apply:

— a separate cab is not required (ISO 20474-1:2017, 4.3.1, does not apply);

— a roll-over protective structure is not required (ISO 20474-1:2017, 4.3.3, does not apply);

— falling object protective structures (FOPS) are not required (ISO 20474-1:2017, 4.3.4, does not apply).

4.3.2 Operator's controls

4.3.2.1 General

ISO 20474-1:2017, 4.5.1, shall apply, with the additions given in 4.3.2.2 and 4.3.2.3 below.

4.3.2.2 Engine stop

If a separate seat for a special attachment is provided (e.g. backhoe equipment) and if the normal stopping device is not within the zone of reach according to ISO 6682 from that separate seat, an additional engine stopping device shall be fitted.

4.3.2.3 Control deactivation

ISO 20474-1:2017, 4.5.3, shall apply, with the addition that the machine travel and attachment movement shall stop when the operator leaves the operator's station.

4.4 Non-riding trenchers

4.4.1 Controls

ISO 20474-1:2017, 4.5, shall apply, with the following additions:

— non-riding trenchers shall be equipped with one or more systems to stop machine travel and hazardous tool movement when the operator releases the operator's controls;

— design of the controls shall take into account the hazards from inadvertent movement of the machine towards the operator.

4.4.2 Lighting

ISO 20474-1:2017, 4.8.2, shall not apply to non-riding trenchers. If provided with lighting, the machine's signalling and marking lights shall be in accordance with the appropriate clauses of ISO 12509.

4.4.3 Warning devices and safety signs

ISO 20474-1:2017, 4.9 a) does not apply to pedestrian-controlled trenchers.

4.5 Noise

4.5.1 Sound power level

The sound power level shall be measured in accordance with ISO 6393.

4.5.2 Sound pressure level at operator's station

The emission sound pressure level at the operator's station shall be measured in accordance with ISO 6394. See also ISO 20474-1:2017, 4.13.2.2.

5 Information for use

ISO 20474-1:2017, 6.2, shall apply, with the following additions:

— an instruction to wear hearing protection if the A-weighted sound pressure exceeds 85 dB;

— instructions regarding the deactivating device;

— safety rules for the use of the restraint bar;

— instructions and safety precautions relating to the operation of pedestrian-controlled trenchers (e.g. automatic stop, speed limit, brake systems).

Annex A
(informative)

Illustrations

See Figures A.1 to A.5.

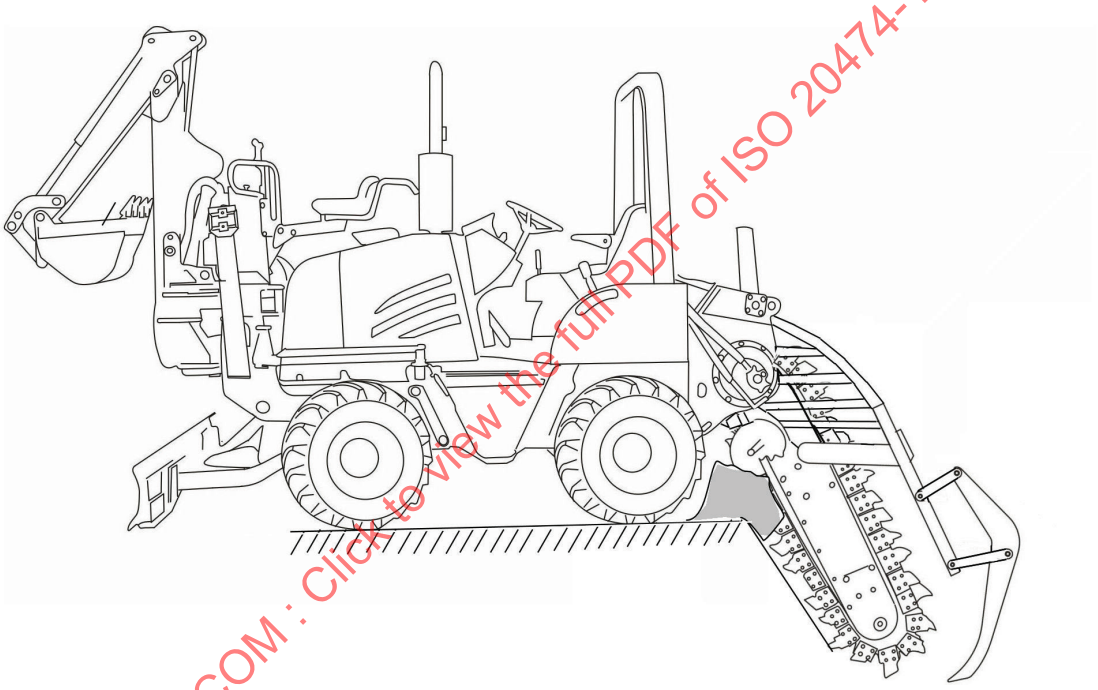

Figure A.1 — Wheeled trencher — Ride-on

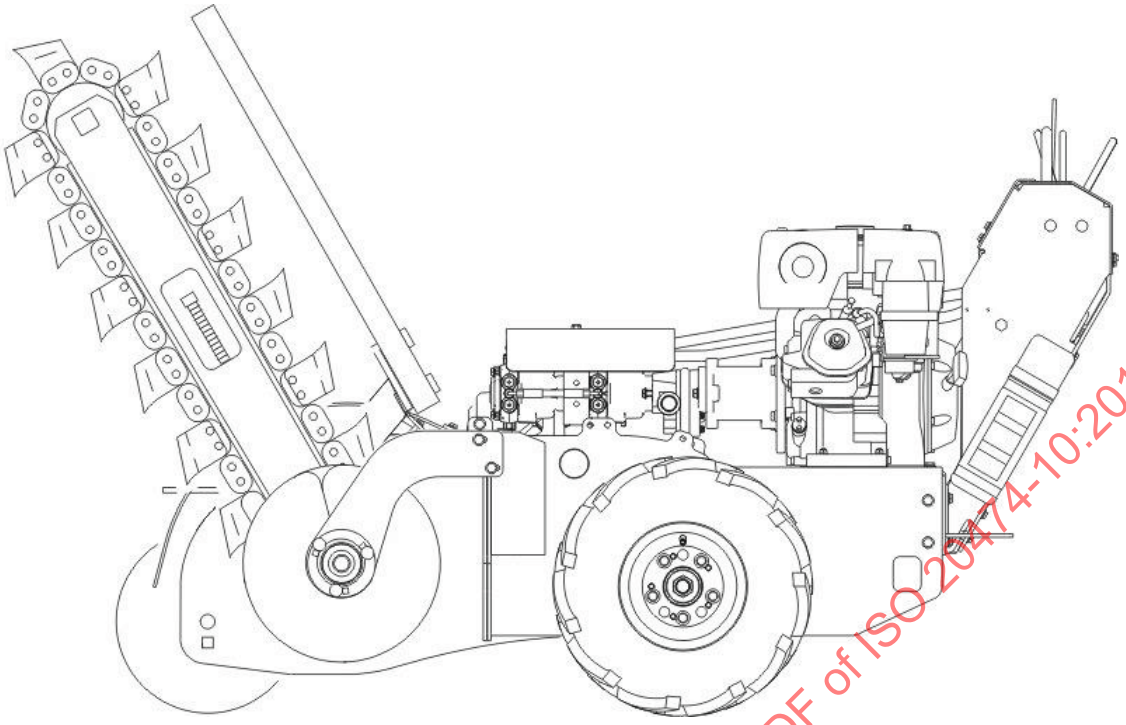

Figure A.2 — Wheeled trencher — Pedestrian-controlled

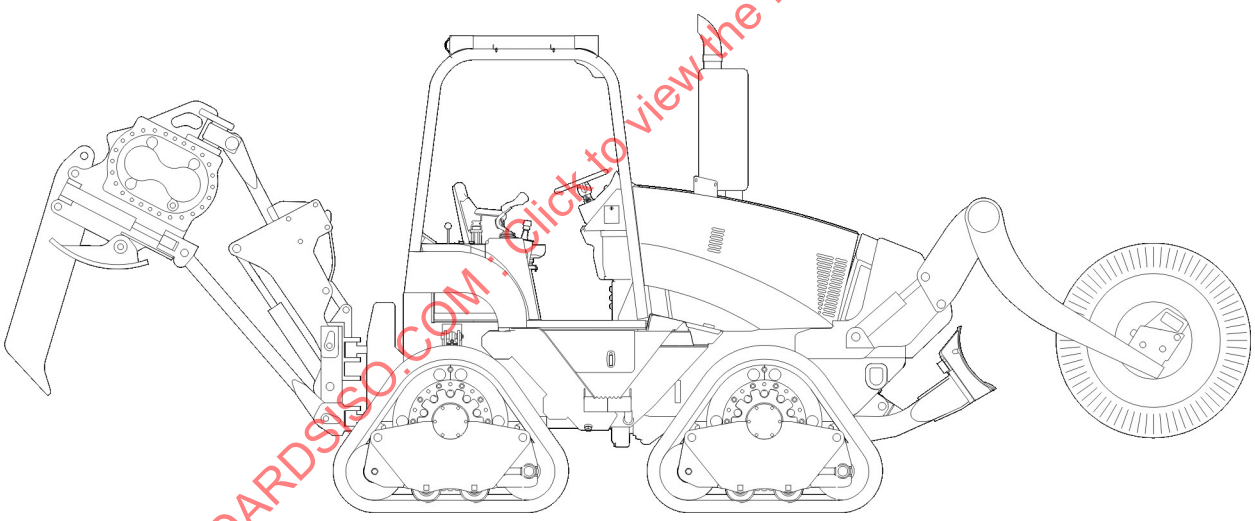

Figure A.3 — Crawler trencher — Ride-on