

SVENSK STANDARD

SS-ISO 15818:2017

Fastställt/Approved: 2017-04-28
Publicerad/Published: 2017-05-04
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 53.100

Anläggningsmaskiner – Lyft- och fästanordningar – Prestandakrav (ISO 15818:2017, IDT)

Earth-moving machinery – Lifting and tying-down attachment points – Performance requirements (ISO 15818:2017, IDT)



Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Den internationella standarden ISO 15818:2017 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 15818:2017.

The International Standard ISO 15818:2017 has the status of a Swedish Standard. This document contains the official version of ISO 15818:2017.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Uppllysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Anläggningsmaskiner, SIS/TK 225.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Lifting attachment points	4
4.1 Location and number.....	4
4.2 Strength.....	4
5 Tying-down attachment points	6
5.1 Location and number.....	6
5.2 Acceleration coefficient.....	6
5.3 Strength.....	7
6 Attachment points — Common requirements	9
6.1 Common locational requirements.....	9
6.2 Material requirements.....	10
6.3 Pull-pin type devices.....	10
6.4 Common devices.....	10
7 Identification	10
8 Lifting and tying-down instructions	11
9 Verification	12
Annex A (normative) Lifting and tying-down information for disassembled machines	13
Annex B (informative) Lifting, loading, tying down and transporting earth-moving machinery — Methods and recommendations	14
Annex C (informative) Method for calculation of forces on tying-down attachment points in diagonal lashing disposition	19
Bibliography	20

SS-ISO 15818:2017 (E)**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.

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 3, *Machine characteristics, electrical and electronic systems, operation and maintenance*.

Introduction

This document has been developed to define the performance requirements of lifting and tying-down attachment points fitted on, or incorporated into, earth-moving machinery for the purposes of its effective and safe transportation.

Although manufacturers of machines do not have direct responsibility for such transportation, the method and precautions necessary for lifting, tying down and disassembling for transportation are described in informative annexes which can be used by the manufacturer as guidance when preparing the operator's manual.

The tying-down requirements and recommendations given in this document are intended to match with widely applied practices such as those described in IMO/ILO/UNECE guidelines. However, where this is not the case, another or other supplemental methods for securing the machine can be provided in the operator's manual.

Earth-moving machinery — Lifting and tying-down attachment points — Performance requirements

1 Scope

This document specifies the performance requirements for the lifting and tying-down attachment points of earth-moving machinery as defined in ISO 6165.

This document also applies to components and subassemblies of earth-moving machinery which the manufacturer intends to be lifted or tied down separately by using lifting or tying-down attachment points.

NOTE 1 Some components (e.g. tyres, tyres with wheels, track shoe assemblies, hydraulic cylinders) can be securely tied down without specific tying-down attachment points.

This document applies to the following modes of transport:

- lifting with cranes (e.g. mobile cranes, gantry cranes);
- road transport (e.g. truck, trailer);
- rail transport, including combined transport (e.g. wagons with containers, swap-bodies, semi-trailers, trucks);
- sea transport.

It is not applicable to

- airlift or transport by air, or
- rail transport of machines on wagons subject to shunting.

NOTE 2 National or local regulations can be more stringent.

This document does not include requirements for attaching the machine to a platform of the rail car, boat, etc., from which the machine is intended to work.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2867, *Earth-moving machinery — Access systems*

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

ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6165 and the following apply.

SS-ISO 15818:2017 (E)

3.1
lifting attachment point
device fitted on, or incorporated into, an earth-moving machine, used for lifting the machine or disassembled unit

Note 1 to entry: The attachment point can be a hole, a lifting eye or any specific part of the machine as specified by the manufacturer.

3.2
lifting accessory
combination of materials (e.g. shackles, wire ropes, slings, chains) used for lifting the machine or disassembled unit

3.3
tying-down attachment point
device fitted on, or incorporated into, an earth-moving machine, used for tying down when transporting the machine or disassembled unit

Note 1 to entry: The attachment point can be a hole, a tying-down eye or any specific part of the machine as specified by the manufacturer.

3.4
tying-down accessory
combination of materials (e.g. chains, wire ropes, shackles, bracing, wheel chocks) used for tying down and fastening when transporting a machine or disassembled unit

3.5
sling
assembly of slinging components, such as chains, wire ropes or textile material joined to upper or lower terminals, suitable for attaching to a *lifting attachment point* ([3.1](#))

3.6
machine lifting configuration
manufacturer's recommended position of the machine for lifting

3.7
machine tying-down configuration
manufacturer's recommended position of the machine for transport

3.8 Masses for calculation

3.8.1
mass of each disassembled unit
mass of each unit of a machine (e.g. component, subassembly, base machine) that is disassembled for transport

Note 1 to entry: It is used for calculating forces exerted on *lifting attachment points* ([3.1](#)) or *tying-down attachment points* ([3.3](#)) of the unit.

3.8.2
whole machine mass for calculation
mass of the machine, including the heaviest combination of cab, canopy, operator-protective structures, if any, with all their components and mountings, and any combination of equipment and attachment approved by the manufacturer of the machine, including full-liquid systems excluding payloads

Note 1 to entry: It is used for calculating forces exerted on *lifting attachment points* ([3.1](#)) or *tying-down attachment points* ([3.3](#)) of the whole machine.

3.9**distributed lifting force**

force applied onto each *lifting attachment point* (3.1) from lifting equipment through *lifting accessories* (3.2) during lifting

Note 1 to entry: The distributed lifting force magnitude and direction can be different for each lifting attachment point due to unequal distribution of loads and non-vertical lifting accessories.

3.10**distributed tying-down force
restraining force**

force potentially applied onto each *tying-down attachment point* (3.3) from transport vehicle through *tying-down accessories* (3.4) during transport

3.11**working load limit****WLL**

maximum load (mass) that the *lifting accessory* (3.2) is designed to lift under the conditions specified by the manufacturer

3.12**lashing capacity****LC**

maximum allowable direct force that a *tying-down accessory* (3.4) can sustain in use

3.13**transport vehicle**

vehicle to which the earth-moving machine is tied down for transportation purposes

3.14**proof force**

calculated force including proof factor for *distributed lifting force* (3.9) or *distributed tying-down force* (3.10)

3.15**breaking force**

calculated force including safety factor for *distributed lifting force* (3.9) or *distributed tying-down force* (3.10)

3.16**number of effective tying-down attachment points**

n

number of *tying-down attachment points* (3.3) used simultaneously in the same direction of force

3.17**number of effective lifting attachment points**

n

number of *lifting attachment points* (3.1) used simultaneously

3.18**lashing**

restraining (as cargo) of earth-moving machine movement in relation to the *transport vehicle* (3.13) against forces applied on the machine during transport by means of the appropriate use of *tying-down accessories* (3.4)

3.19**resultant force**

F_{Rx}, F_{Ry}

force acting on the *tying-down attachment point* (3.3) due to the direction of force relative to the *transport vehicle* (3.13) actuated on the load in either the x- or y- direction during transport