User Manual

Lifting Shackles



730 | 732 | 735 | 750 | 755 | 830(DP) | 831 | 834 | 835 | 850(DP) | 851 | 854 |855 | 856 | 858 | 860 | 861 | 863 | 1577 | 1619

Gunnebo Industries
Stinavägen 1, Växjö, Sweden
www.kitocrosby.com

Part number: KCG-UM-022-A -
Version 2026 September

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1 Introduction and EC declaration

This manual is an original instruction in accordance with:

Directive 2006/42/EC on machinery, section 1.7.4 Instructions and Annex II Declarations.

It also meets the requirements in:

Standard EN 13889:2003+A1:2008, Forged steel shackles for general lifting purposes.

This manual is valid for the following products:

Gunnebo lifting shackles type 730, 732, 735, 755, 830(DP), 831, 834, 835, 850(DP), 851, 854, 855, 856, 858, 860, 861, 863, 1577, 1619

For more information about specific lifting schakles see the product specific user manual. All manuals are continuously updated and are only valid in their latest version, which can be downloaded from www.kitocrosby.com.

1.1 EC declaration of conformity

The Quality Manager is the authorized person to sign this declaration.

The main use of the product is to be incorporated as part of a CE-marked lifting assembly but must not be put into service until the final lifting assembly has been declared to be in conformity with the provisions of the Directive 2006/42/EC.

Our quality management system complies with ISO 9001:2015 and is certified by LRQA Sverige AB for and on behalf of Lloyd's Register Quality Assurance Limited (certificate identity number: 10140613).

Information about harmonized and national standards/technical specifications that apply, and the valid version of this user instruction are available at www.kitocrosby.com.

If the products are modified without approval from Gunnebo Industries, this declaration becomes invalid.

We declare that the CE-marked products described in this user manual fulfil all the relevant provisions of the Directive 2006/42/EC. The numbers in parenthesis refers to the list of requirements detailed in Directive 2006/42/EC on machinery, Annex II.1.A.

Business name and full address of the manufacturer (1):

Gunnebo-Anja Industrier AS, NO-5282 Lonevaag, Norway.
E-mail: sales.norway@kitocrosby.com
Web: www.kitocrosby.com

Name and address of the person authorised to compile the technical file (2):

Cf. (1) and (10).

Description and identification of the machinery (3):

Gunnebo lifting shackles type 730, 732, 735, 750, 755, 830(DP), 831, 834, 835, 850(DP), 851, 854, 855, 856, 858, 860, 861, 863, 1577, 1619 (cf. manufacturer’s website for drawings og tables of dimensions).

Declaration (4):

It is hereby declared that Gunnebo lifting shackles as specified above (3) fulfills all the relevant provisions of Directive 2006/42/EC on machinery.

Name, address and identification number of the notified body which carried out the EC type-examination (6):

Nemko AS, Gaustadalléen 30, NO-0373 Oslo, Norway. Identification number: Norsk Akkreditering MSYS 001.

Standards and specifications used (7+8):

EN 13889:2003+A1:2008; US Fed. Spec. RR-C-271; SMS 1577; SMS 1619; DNV 2-7.1.

Place and date of the declaration (9):

Lonevaag, Norway, 17. September 2027

Identity and signature of the person empowered to draw up the declaration on behalf of the manufacturer (10):



Henrik Vestheim

Plant Manager / Technical Manager

Gunnebo-Anja Industrier AS

1.2 Certifications

Shackles can be used for lifting only when the user has a valid certificate. Gunnebo lifting shackles are supplied with a manufacturer's certificate acc. to EN 13889:2003 and a 3.1 material certificate acc. to EN 10204:2004. Authorised resellers may provide their own documentation, but will be able to provide the original certificates upon request.

1.3 Abbreviations

EC	European Commission
LRQA	Lloyd's Register Quality Assurance
ROV	Remotely Operated Vehicle
SWL	Safe Working Load. Older shackles may carry the designation SWL instead of WLL.
WLL	Working Load Limit The maximum working load a lifting accessory or lifting assembly can be subjected to. For shackles the stated WLL is valid when the shackle is loaded in a straight direction. Shackles that are not marked with WLL (or SWL) must not be used for lifting.

Table 1: Abbreviations

2 Safety precautions

The rigger is responsible for the lifting operation, and for following all related safety regulations. The rigger must understand the limitations of the equipment.

The rigger is a competent person, with the knowledge to select correctly dimensioned lifting equipment, and to ensure its safe condition.

2.1 Warnings, cautions and notes

Carefully read the instructions before using the lifting equipment.

The following signs are used in the instructions, to alert about potential dangers and safety related issues.

Warning!

A warning alerts about a situation which, if not avoided, could result in injury, or death.

Caution!

A caution alerts about a situation which, if not avoided, could result in minor or moderate injury, or damage to the equipment or other property.

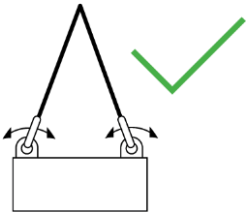
Note!

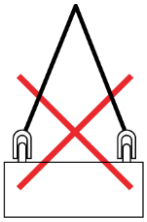
Notes are added to give more information.

2.2 Lifting precautions

Warning!

Avoid side loading. Fit the lifting shackle to the load in a manner that allows the shackle body to take the load in a true line along its centerline to avoid undue bending stresses that will reduce the load capacity of the shackle.





Warning!

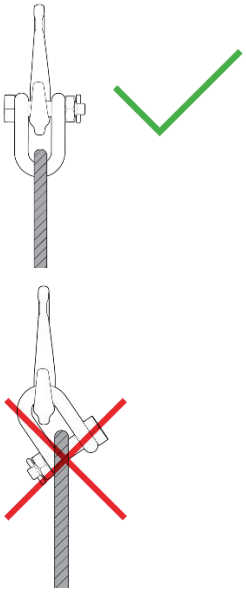
Avoid rotation of the lifting shackle bolt. Avoid applications where, due to load movement, the shackle bolt can rotate and possibly unscrew.

Warning!

If two lifting shackles are fitted together, it is recommended to connect the bows.

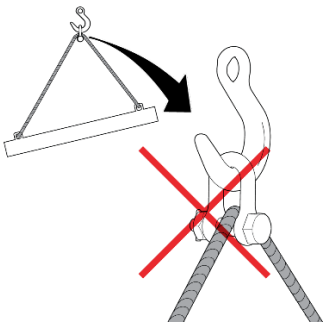
Warning!

Avoid eccentric load distribution. It is recommended to distribute the load evenly across the total length of the lifting shackle bolt. Loose distance spacers may be used on both ends of the bolt.
Do not force together the opening. Do not weld parts onto the bolt to facilitate centering of the load. This will negatively impact the mechanical properties of the lifting shackle.



Warning!

Avoid unstable loads.

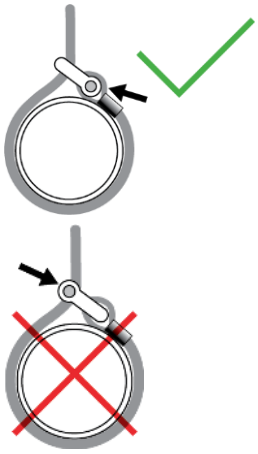


Warning!

Avoid contact with sharp edges that could damage the lifting shackle.

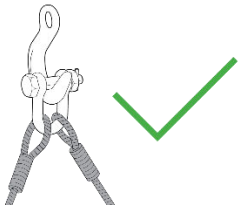
Warning!

When securing the load, put the bow of the lifting shackle into the running side of a choke.



Warning!

Multiple sling legs can be attached to the lifting shackle body. Consider the effect of the angle between the sling legs. The stated WLL is valid for leg angles up to 120°. Do not have larger leg angles.



Warning!

When fitting shackles together with fiber and textile lifting slings, ensure that the contact diameter matches the sling manufacturer's recommendations. If necessary, use a bushing on the shackle bolt to achieve the necessary contact diameter.

Warning!

When a shackle is used to secure the top block of a set of rope blocks, the load on this shackle is increased by the value of the hoisting effect.

Caution!

Do not use the shackle if there is incorrect seating of a pin. Incorrect seating of a pin may be due to a bent pin, damage threads or misalignment of the holes. Refer the matter to a competent person (i.e. dealer, manufacturer).

Caution!
Shackles should be fitted to the load in a manner that allows the shackle body to take the load in a true line along its centerline to avoid undue bending stresses, which will reduce the load capacity of the shackle.

Caution!
Never try to reduce the inside with of a shackle by pressing on the shackle eyes or welding washers / spacers to the inside of the eyes – such action makes the Test Certificate invalid

Note!
The user is required to keep a valid Test Certificate for any shackle being used in a lifting operation.

3 General description

This user's manual is valid for all CE-marked shackles manufactured by Gunnebo Industries. Gunnebo Sweden, GB,GBO, Gunnebo or GL is stamped on the shackle bow.

All measurements and technical data for a specific product can be found on the website www.kitocrosby.com.

3.1 Marking

Lifting shackles conforming to EN 13889 and/or US Fed. Spec. RR-C-271 have the following marking:

On the bow:

- WLL in metric Tonnes,
- material grade (6 or 8),
- manufacturer identification (GUNNEBO or GL),
- CE mark,
- batch/traceability code,
- bow dimension in inches.

On the bolt:

- Country of origin code (NOR),
- manufacturer identification (GL),
- material grade (6 or 8),
- batch/traceability code.

Shackles with WLL < 2T are only marked with material grade on the bolt (in acc. with EN 13889).

3.1.1 Example of marking, shackle type 855, WLL 12T, batch XXX-XXX

Bow: WLL 12,0T – 6 GUNNEBO CE XXX 1 1/4	Bolt: NOR GL-6 XXX
	

Serial numbers / unique ID marking

Gunnebo lifting shackles can be delivered from the factory with serial numbers / unique ID marking. The marking is engraved into the shackle bow, usually as an ascending digit series.

Color coding

Some of Gunnebo's lifting shackles are color coded on the bow for ease of identification. Type 856 Arctic has red-brown color on the lower part of the bow, and type 858 Super has red-brown color on the upper part of the bow. ROV shackles (type 860, 861, and 863) have orange high-visibility color at the top of the bow (as well as the bolt grip).

856 Arctic	858 Super	860 ROV
		

4 Intended use and restrictions

4.1 Intended use

Gunnebo lifting shackles are intended for use in controlled lifting operations, performed and supervised by qualified and competent personnel. Shackles can also be used as a connecting component in different constructions, provided that the necessary technical calculations have been taken, with regards to load and environmental factors. The instructions herein primarily covers use of shackles for lifting.

4.2 Asymmetrical loading

Shackles are designed to carry the load at the center/bottom of the bow, and evenly distributed on the shackle bolt. Asymmetrical loading or side loading will reduce the shackle's load capacity. Cf. illustration below.

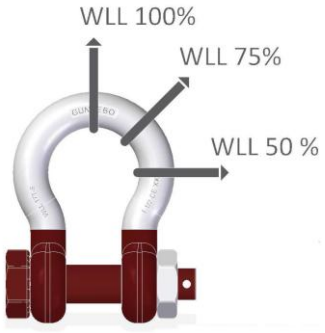


Figure 1: Load capacity

4.3 Deformation

A poor-fitting shackle bow-bolt assembly may be due to misalignment or deformations. Any such shackle should be presented to a competent authority (i.e. dealer, manufacturer).

4.4 Chemicals

Shackles must not be exposed to acids, acid fumes or other corrosive chemicals.

4.5 Modifications

Modifications of a shackle that may affect its material or load bearing properties are not permitted.

4.6 Load distribution

It is generally recommended that the load be distributed evenly across the length of the shackle bolt.

Should point-loading be unavoidable, it should be centered on the bolt to avoid eccentric loading. However, under no circumstances should the opening be forced together, or parts be welded onto the bolt to facilitate centering of the load.

4.7 Wear

Shackles with more than 10% wear of the bow or bolt diameter should be discarded. Original diameter is listed in dimension tables in the manufacturer's product catalogue and on the manufacturer's website.

4.8 Extreme temperature/ WLL reduction at elevated temperatures

Shackles must not be heat treated (e.g. through welding). The general service temperature is -20° til +200° Celcius (some shackle types are approved for use in temperatures down to -40°, contact the manufacturer or dealer for information). For temperatures higher than +200° C, the following apply:

Service temperature	New load capacity in % of original WLL
200-300° C	90%
300-400° C	75%
> 400° C	not allowed

Table 2: WLL reduction at elevated temperatures

4.9 Unstable load, shock load

Lifting operations wherein the load is unstable should be avoided. In particular, shackles should not be subjected to shock loads.

4.10 Fatigue

It is important to realize that fatigue failure can occur even if the shackle's WLL has not been exceeded. Scenarios in which the shackle is subjected to variable load over a prolonged period of time, will carry the risk of inducing fatigue. Consider this when choosing shackle type/dimension, and deciding service intervals.

4.11 Replacing a lost or damaged shackle bolt

Generally, it is recommended to use only the original bow-bolt combination. In most cases, if a shackle bolt fails to meet the approval criteria, the whole shackle should be discarded. The manufacturer will not issue a certificate on a non-original combination of bow and bolt.

If end-user needs bolt to be replaced, Gunnebo Industrier technical support needs to be contacted prior to replacement.

5 Instructions prior to use

5.1 Inspection prior to use

Prior to use, the shackle must be thoroughly inspected to verify that:

- all markings on the body and the pin of the shackle are readable and in compliance with the relevant Test Certificate,
- the shackle pin is of the correct type,
- the body and pin shall not be distorted or unduly worn, and
- the body and pin are free from nicks, cracks, grooves and corrosion.

If there is any doubt with regards to the above criteria being met, the shackle should not be used for a lifting operation.

5.2 Use of shackles with multi-leg slings

When using shackles in conjunction with multi-leg slings, due consideration should be given to the effect of the angle between the sling legs. The stated WLL is valid for leg angles up to 120°. Larger leg angles should be avoided.

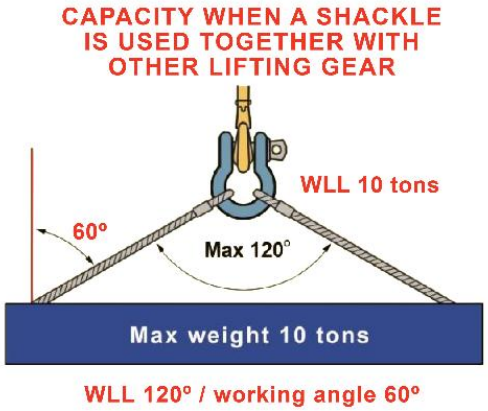


Figure 2: From the book Sikker bruk av løfteredskap (Safe Use of Lifting Equipment) and used with the publisher's permission (www.Lsi-bok.no).

When the shackle is fitted to a lifting lug, ensure that the shackle can rotate freely around the axis of the shackle bolt – see illustration below.

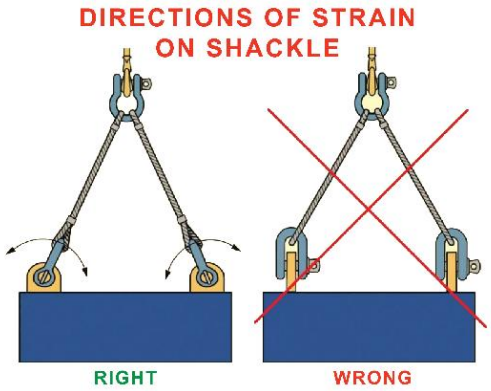


Figure 3: From the book Sikker bruk av løfteredskap (Safe Use of Lifting Equipment) and used with the publisher's permission (www.Lsi-bok.no).

When fitting shackles together with polyester lifting slings, ensure that the contact diameter is according to the sling manufacturer's recommendations. If necessary, one should use a bushing on the shackle bolt to achieve the necessary contact diameter.

If two shackles are fitted together, it is generally recommended to connect the bows.

For further recommendations regarding safe use of lifting shackles, the user may refer to EN 13889, Annex A.

6 Assembly

It is important to ensure that the pin is safely locked after assembly. For repeated lifting between inspection of the gear, it is recommended to use a safety bolt type shackle with nut and split-pin – the user must than make sure that the split-pin ensure appropriate safely against unscrewing the nut.

6.1 Shackles with safety bolt

Shackles with safety bolt (e.g. type 855) should not be tightened in a way that prevents the bolt from rotating freely. In most cases, hand-tightening will be sufficient.

The picture below shows an 855 shackle with rotating safety bolt with cotter pin.



Figure 4: Shackles with safety bolt (e.g. type 855)

6.2 Screw pin shackles

Screw pin shackles (e.g. type 854) should be assembled so that the collar is flush with the shackle body, and the threads are fully engaged. A suitable tool (such as a wrench, pin punch or screwdriver) can be used to achieve sufficient force.

The picture below shows an 854 shackle with screw pin and pin punch as tightening tool..



Figure 5: Screw pin shackles (e.g. type 854)

6.3 Shackles designed for ROV operations

Shackles designed for ROV operations (i.e., type 860, 861 and 863) come with special bolts. There is a separate set of instructions for shackle type 863 ROV Release.

7 Maintenance

When performing maintenance or inspection, always read and follow the Safety Precautions.

7.1 Inspection

During service, lifting equipment are subjected to conditions which affect their safety. Therefore ensure that the equipment is safe for continued use. See Safety Precautions.

Withdraw the Lifting Shackle from service and refer the product to a competent person for thorough examination if any of the following is observed:

- The lifting shackle markings are illegible.
- More than 10% reduction of dimension at any point.
- Incomplete bolt engagement.
- Cuts, nicks, gouges, cracks, excessive pitting or corrosion, heat discoloration, bends, distortion, or other defects.
- The threads of the bolt, or the shackle body is damaged.

7.2 Examination

A competent person should thoroughly examine the Lifting Shackle at intervals not exceeding 12 months. The inspection should be carried out more frequently if deemed necessary, taking into consideration the following points.

- Local, national, or branch-specific regulation.
- The service condition of the Lifting Shackle.
- Use in demanding environments (such as corrosive or extreme temperature).
- Use where the Lifting Shackle is subjected to repeated loads that may induce metal fatigue.
- When the shackle has not been in use for the last 6 months or longer,
- When a shackle is used in demanding (e.g. corrosive or extreme temperature) environments.
- When the shackle is subjected to repeated loads that may induce metal fatigue.

Maintain records of examinations. Before examination, clean the Lifting Shackle so it is free from oil, dirt, and rust.

Any cleaning method which does not damage the parent metal is acceptable. Methods to avoid are those using acids, overheating, removal of metal or movement of metal which may cover cracks or surface defects.

See also Safety Precautions.

7.3 Repair

A competent person with relevant knowledge and technical skills must do the repairs. The product shall only be returned to service after approval by a designated person.

Maintain records of repairs.

Any replacement component or part of the shackle should be in accordance with the appropriate European Standard for that component or part. Use only original Gunnebo spare parts.

Discard or replace components that are cracked, visibly distorted or twisted, severely corroded or have deposits which cannot be removed.

Remove minor damage such as nicks and gouges by careful grinding or filing. The surface should blend smoothly into the adjacent material without abrupt change of section. The complete removal of the damage should not reduce the thickness of the section at that point to lesser than the manufacturer's specified minimum dimensions or by more than 10% of nominal thickness of the section.

7.4 End of use/Disposal

Recycle as general steel scrap.