

Operation Instructions

Original Operation Instructions

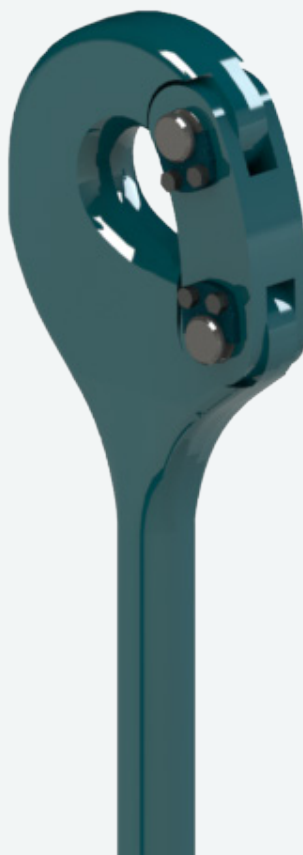
Elevator Link Extension - LE



Elevator Link



Elevator Link Extension - LE2



Elevator Link Connector



Revision history

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Document Approval

Version	Author	Eng. Check	Approval Check
09	FORUM Handling Tools St.S 05-2018	FORUM Handling Tools FS 06-2018	FORUM Handling Tools as per Rev. 07

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DESCRIPTION

SAFETY

TRANSPORT

COMMISSIONING /
OPERATION

SERVICE

INSPECTION /
MAINTENANCE

STORAGE

APPENDIX

A. General

I Basic Information

This operating manual provides information of the FORUM Handling Tools Elevator Links, Elevator Link Extensions - LE and LE2 and the FORUM Handling Tools Elevator Link Connectors. Permissible loads, as well as specific characteristics can be found in the technical data („1.2 Technical Data“ on page 15). This operating manual is for the operator of the above mentioned devices. It is intended to ensure safe operation and must therefore be carefully read and kept where it is accessible to everyone at all times. This operating manual contains all information for safe and proper use. In addition, all applicable national and local regulations must be observed, such as accident prevention regulations, environmental regulations, as well as company-specific internal safety regulations. For installation, maintenance and repair work and proper training of the operating personnel, Forum recommends requesting service from FORUM Handling Tools itself.

II Intended Use

The FORUM Handling Tools Elevator Links, Elevator Link Extensions - LE and LE2 and the FORUM Handling Tools Elevator Link Connectors serve as a connection between the Top-Drive and the Elevator, or as an extension/ connection of two Elevator Links and are designed only for vertical holding and lifting operations. The load capacity is only limited vertically and is not valid unrestrictedly for angles of inclination $> 0^\circ$. The load capacity has to be recalculated in cases of any changes regarding to the link length and the inclination (recalculation on request). The devices may only be used for their intended purpose. Insofar as no load capacity has been specified for a certain angle of inclination, working with an inclination angle $> 0^\circ$ is not permitted. Failures due to non-compliance can lead to dangerous situations. In addition, the intended use also includes compliance with and observance of all procedures and safety instructions in this operating manual, as well as the execution of all necessary maintenance work at the specified intervals.

INFO



In this documentation the abbreviation **t** and the word **tons** are used to describe short tons. If the metric ton is referred it will explicit be named in the text or the abbreviation ton.

1 sh ton = 2000 lb = 907,19 kg

1 metric ton = 2204,62 lb = 1000 kg

III Improper Use

INFO



Improper use of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors releases FORUM Handling Tools from any liability for personal injury or property damage resulting therefrom.

Only the intended use of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors is allowed. The following is prohibited:

- Increasing the load capacity.
- Every use which is not intended.

Moreover, operations of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are prohibited under the following conditions:

- Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors or parts thereof are damaged or not installed properly.
- Protective or safety equipment is damaged, unusable, improperly installed or not present.
- The Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are not operating properly.
- Humans or foreign objects are located in the hazard area of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors.
- Conversions or modifications have been performed without previous, written approval by FORUM Handling Tools.
- When tools not approved by FORUM Handling Tools are used.
- Prescribed maintenance intervals have been exceeded.
- When replacement parts not approved by FORUM Handling Tools are used.
- When repair or service work has been performed on the machine by companies not authorized by FORUM Handling Tools.

Observe also the chapter “Guarantee and Liability”.

IV Potential Misuse

This manual contains information and warnings on procedures that address hazardous conditions and could cause personal injury but cannot reflect all fashions in which hazardous consequences may occur due to service and/or operation. All personnel using this equipment or service procedures contained within this manual must be completely satisfied that personal and/or equipment safety will not be compromised.

Common methods of MISUSE include but are not limited to:

1. Use without ALL warning and identification labels present. Personnel may misunderstand the areas of the equipment that can cause serious injury.
2. Use with insufficient and/or worn assemblies and parts. This can cause failure causing a suspended hazard which can result in serious injury or death.
3. Use of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors in methods not intended.

V Warranty and Liability

Liability

The technical information, data and instructions for operation contained in this operating manual correspond to the status at the time of print and are provided according to the best of our knowledge in consideration of our previous experience and know-how.

We reserve all rights to make technical modifications within the scope of technical development of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors treated in this operating manual. Claims or entitlements cannot be deduced or derived from information, illustrations and /or descriptions in this operating manual.

FORUM Handling Tools is liable for all warranty obligations made within the scope of the contract for any faults or omissions on our part, excluding further claims. Claims for damages suffered are excluded regardless of the legal grounds.

Translations are complete according to best knowledge. We cannot assume any liability for translation errors, even when the translation was performed at our order. Only the original text is binding. The original text language for FORUM Handling Tools documents and manual is English.

The descriptions and illustrations do not necessarily reflect the scope of delivery or any parts orders. The drawings and illustrations are not to scale.

Warranty

FORUM Handling Tools general terms of purchase and delivery apply. Purchasers recognize these conditions on the day the contract is signed, at the latest.

The terms and duration of FORUM Handling Tools warranty are specified in the sales documents as well as the order confirmation. These will be submitted to the operating company as information at the time the contract is signed, at the latest.

The manufacturer assumes no warranty whatsoever for damage or interruptions in operation resulting from failure to observe the operating instructions.

The operating manual is to be supplemented by the operating company with operating instructions based on existing national regulations on accident and environmental protection, including information on supervisory and reporting obligations taking into consideration operating peculiarities, e.g. in regard to work organization.

Warranty claims/complaints within the scope of the guarantee and liability for personal injury and property damage are excluded, when such result from any of the following causes:

- Any use other than intended;
- Improper installation, operation, maintenance or repair;
- Operation with defective, improperly attached or non-operational safety and/or protective equipment;
- Failure to observe the instructions in the operating manual regarding safe conduct;
- Impermissible structural and/or functional modifications;
- Use of replacement parts not approved by FORUM Handling Tools;
- Normal wear or insufficient inspection of components subject to wear;
- External effects or force majeure;
- Lubricating the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors with lubricants other than those recommended by FORUM Handling Tools.

INFO



Any structural or functional modification to the equipment by the operating company requires previous written approval by FORUM Handling Tools. Failure to obtain such approval voids the warranty as well as the declaration of conformity and releases FORUM Handling Tools from any product liability. Following modifications or installation of optional equipment, all safety equipment must be reinstalled and checked by the operator for proper function.

VI Obligations of the Operating Company

Planning and Checking Safety Measures

The obligation of the operating company due to diligence, includes planning safety measures and supervising their observance.

All personnel performing work on and with the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors must be trained by the operating company for the work performed on and with the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors

All personnel must have read and understood the operating manual.

Minimizing Risk of Injury

The following principles apply to minimize the risk of injury:

- Ensure that work on and with the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors is performed only by qualified personnel.
- The personnel must be authorized for such work by the operating company.
- The personnel must wear the prescribed protective equipment.
- Procedures, competencies and responsibilities must be clearly defined and established. Proper behavior in the event of a malfunction must be clear for everyone. The personnel must be given regular training.

Trouble-free Operation

The following principles apply for trouble-free operation:

- Keep the complete operating manual accessibly for everyone and in an easily legible condition.
- Use the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors exclusively for its intended purpose.
- Use the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors only a perfect operating state.
- Before starting work, check to ensure that Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are in a safe operating state and functioning properly.

Requirements for Operator

Basic knowledge of safe handling and use of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors includes knowledge of the general safety precautions also.

Ensure that the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are operated only in compliance with the general safety precautions and other instructions in this manual.

Training

The operating company is obligated to organize and hold regular training to ensure that all personnel involved with transporting, installing, operating and/or servicing the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are familiar with the required procedures and safety precautions.

Minimum Qualifications

All work on the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors requires special knowledge and qualifications on the part of the operating personnel.

All personnel working on Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors must have the following qualifications:

- Personal suitability for the work performed.
- Suitable qualifications for the work performed.
- Familiarity with the safety equipment and its function.
- Familiarity with this operating manual – particularly the safety precautions – and all sections relevant for the work to be performed.
- Familiarity with the elementary instructions on operating safety and accident prevention.

In general, all employees must have one of the following minimum qualifications:

- Technical training for independent work on the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors.
- Sufficient qualifications for working on the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors under supervision and at the instructions of a trained specialist.

VII User Groups

This operating manual is subdivided into the following user groups:

Personnel	Qualifications
Operating personnel	<p>Sufficiently trained in:</p> <ul style="list-style-type: none"> • Functional procedures on the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. • Operating procedures. <p>Knowledge:</p> <ul style="list-style-type: none"> • Competency and responsibility in regard to the work to be performed. • Behavior in emergencies.
Service personnel	<p>Basic knowledge in mechanics.</p> <p>Authorizations (according to standards of safety engineering):</p> <ul style="list-style-type: none"> • Starting up Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. • Grounding Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. • Marking of Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. • Basic knowledge of installation and operation of the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors.

Special Technical Knowledge

The following work should be performed only by specially trained personnel:

Work Performed	Qualifications
Work on mechanical parts	<p>Personnel qualified or trained in industrial mechanics; work is to be performed only under supervision and on instructions of a person qualified in accordance with generally accepted codes of practice in industrial mechanics.</p>

VIII Safety Symbols

The safety precautions in this document contain standardized depictions and symbols. Three hazard classes are distinguished depending on the probability of occurrence and severity of the consequences. Selection of the WARNING category depends on the probability of occurrence and the possible extent of damage.



⚠ CAUTION

Indication of recognizable hazard for humans or possible property damage.

Failure to observe can lead to reversible injuries or property damage!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.



⚠ WARNING

Indication of recognizable hazard for humans.

Failure to observe can lead to irreversible injuries!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.



⚠ DANGER

Indication of imminent hazard for humans.

Failure to observe can lead to irreversible or lethal injuries!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.

Preliminary Safety Precautions

Safety precautions are given in the preceding form at the beginning of complete sections or sections. They apply for the entire section or the entire subsequent section.

Safety Precautions Relevant for Action

If a safety precaution applies only for one single action or a short series of actions, it is integrated into the text preceding the possible hazard point.

For example:

1. Attach hoisting gear to eye bolts in cover.

⚠ CAUTION of pinching/crushing hands! The cover can fall shut when the retainer is not engaged. Never open the cover by hand.

2. Open the cover with a crane and suitable hoisting gear.
3. Unscrew the M10 bolts with a 17 mm box wrench.

Instructions for Safe Procedure

Special work steps to ensure Safe Procedure are depicted as follows (example):

Safe Procedure

1. Shut off Equipment.
2. Disconnect supply lines.
3. Attach Equipment to crane.
4. ...

Linguistic Conventions

This documentation uses terms and symbols intended to help you find information more easily, perform work steps more effectively and recognize dangerous situations more quickly. These symbols and terms are explained below:

All important text sections are printed in bold face.

- Lists without any necessary sequence are marked with a dash (-) at the left side of the column.
- Individual activities to be performed are indicated by a dot (•) to the left of the column.

Relevant consequences of an action or work step are marked with an arrow (») in the left margin.

Enumerations in a certain sequence (e.g. a series of work steps) are indicated by sequential numbers (1, 2, 3, ..) in the left margin.

For example:

1. Unscrew nuts on Equipment feet.
2. Lift Equipment.

For greater clarity the illustrations are located in the right column with the text opposite or directly below the associated text section. Larger illustrations extending over the entire width of the page are located before the explanatory text. The illustrations are provided with captions in telegraph style.

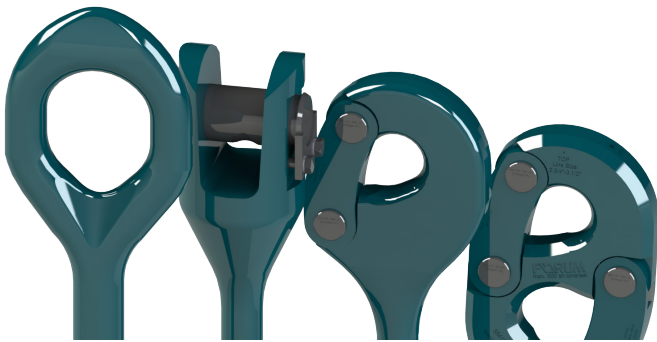


Fig. 1: Illustration Example

INFO



Additional information and relationships requiring special attention are distinguished in this manner.

IX Personal Protective Equipment (PPE)

The following symbols located at appropriate points in the operating manual indicate that it is mandatory to wear personal protective equipment:



WEAR PROTECTIVE GLOVES!



WEAR EYE PROTECTION!



WEAR SAFETY SHOES!



WEAR PROTECTIVE HELMET!



WEAR EAR PROTECTION!

X Conformity

The Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors satisfy all requirements in applicable directives and standards. A sample of the EC Declaration of Conformity is given in the appendix.

INFO



This operating manual is a part of the technical documentation for the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. The EC Declaration of Conformity is delivered together with the Link. Keep these instructions and the associated documents for later use.

XI Contact FORUM Handling Tools worldwide

In the event of problems that cannot be solved with the aid of this manual, please contact one of the following addresses.

FORUM B + V Oil Tools GmbH FORUM Handling Tools

Hermann-Blohm-Straße 2
 20457 Hamburg
 Germany
 Tel: + 49.40.37022.6855
 Fax: + 49.40.37022.6899

1023 FORUM Drive
 Broussard, LA 70518 USA
 Tel: +1.337.373.1800
 Fax: +1.337.369.6893

E-Mail: oiltools@f-e-t.com
 web: www.f-e-t.com
www.blohmvooss-oiltools.com

FORUM ENERGY TECHNOLOGIES Drilling-Service-Standorte

Email: ForumDP.Sales@f-e-t.com

Canada	Mexico	Scotland
Nr. 106, 3903 - 75 Ave Leduc, Alberta T9E 0K3 Tel: + 1 780.980.0345 Fax: + 1 780.986.3278	Avenida Avante Monterrey N 300 Parqu Industrialxico Tel: + 52.81.8245.6800	Peregrine Road, Westhill Aberdeenshire, AB32 6JL Tel: + 44,1224.744000
United Arab Emirates	Singapore	
Oilfields Supply Center Building B-45 Jebel Ali Free Zone Dubai UAE Tel: + 971.4.883.5266	No 51 Benoi Road #06-00 Liang Huat Industrial Complex 629908 Tel: + 65.6465.4850 Fax: + 65.6465.4851 Out of hours: Tel: + 65.913.898.12	

XII Information on the FORUM Handling Tools homepage

INFO



For further and actual information you can also visit our homepage in the internet.

A digital version of the operation instructions for this product as well as the operation instructions, safety- and update notes for other FORUM Handling Tools products can be reached via the blohmvooss-oiltools homepage. To join our Internet Technical Documentation service with the latest updates on new technical documentation in a free and easy way, you must register to our service with your email-address and name in the customer-login area ❶ on www.blohmvooss-oiltools.com.




EXHIBITIONS

Sep.08 – Sep.11, 2015 Offshore Europe / Aberdeen, UK

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Quality
Engineering
Service
Sales

Products
Links
Elevators
Elevator / Spiders

Slip Lifter
Floorhand
Pipe Spinner
Power Slips
Manual Tongs

Bushings
Manual Slips
Safety Clamps
Dual Elevator System
Spare Parts

Company
Jobs
Contact
Imprint

Fig. 2: Illustration Service - Homepage

XIII Information via Extranet

INFO



For further and actual information you can also visit our Extranet homepage .

A digital version of the operation instructions for this product as well as the operation instructions, safety – and update notes for other FORUM Handling Tools products can be reached via the Extranet.

To join our Internet Technical Documentation service with the latest updates on new technical documentation in a free and easy way, you must register to our service with your email-address and name in the customer-login area ❶ on <https://www.accessoiltools.com/fx/> .



Technical Documentations
Safety Notes and Product Updates



Fig. 3: Illustration Service–Extranet

DESCRIPTION

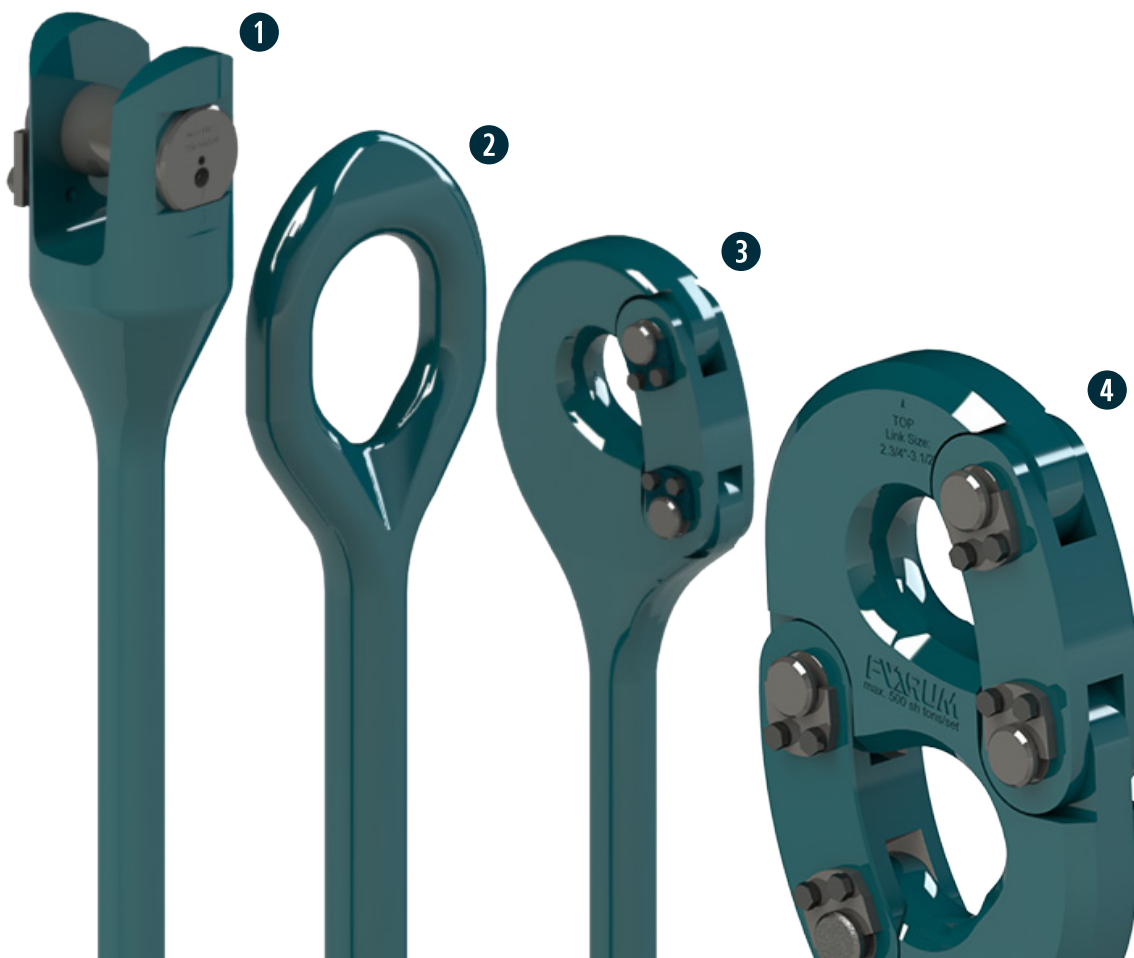
DESCRIPTION

1 Description

The FORUM Handling Tools Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors are manufactured in pairs from high-quality, heat-treated and tested steel. The safety factor and test procedure are in compliance with the API Spec 8C. A load test with 1.5 x the nominal load capacity was carried out. The FORUM Handling Tools Elevator Links, Elevator Link Extensions - LE and LE2 and the FORUM Handling Tools Elevator Link Connectors serve as a connection between the Top-Drive and the Elevator, or as an extension/ connection of two Elevator Links and are designed for vertical holding and lifting operations.

1.1 Operation manual content

This operation manual is valid for the below described FORUM Handling Tools equipment. An overview of all models, types and load capacities can be found in the following chapters. Corresponding parts lists and technical drawings can be found in the chapter „5 Service“ on page 42.



Pos.	Name	Pos.	Name
1	Elevator Link Extension - LE	3	Elevator Link Extension - LE2
2	Solid Elevator Link	4	Elevator Link Connector

1.2 Technical Data

Environmental conditions

Temperature range* -20 °C to +80 °C
(-4 °F to +176 °F)

* Unless not stated otherwise in the data book.

1.2.1 Elevator Links

P/N	Size	Load rating (tons)	Weight per set kg [lbs]
134048-Y	1.¾" x 48"	150	154 [340]
	12" increases	150	18 [40]
134144-Y	1.¾" x 144"	150	298 [657]
214048-Y	2.¼" x 48"	250	178 [392]
	12" increases	250	23 [51]
214180-Y	2.¼" x 180"	250	428 [944]
214240-Y	2.¼" x 240" (20 ft)	250	544 [1200]
214360-Y	2.¼" x 360" (30 ft)	250	772 [1702]
214480-Y	2.¼" x 480" (40 ft)	250	1000 [2205]
234048-Y	2.¾" x 48"	350	270 [595]
	12" increases	350	33 [73]
234216-Y	2.¾" x 216"	350	726 [1601]
234240-Y	2.¾" x 240" (25 ft)	350	790 [1742]
N/A	60" (5 ft) increases	350	163 [359]
234600-Y	2.¾" x 600" (50 ft)	350	1766 [3894]
234720-Y	2.¾" x 720" (60 ft)	350	2090 [4608]
312072-Y	3.½" x 72"	500	480 [1058]
	12" increases	500	44 [97]
312216-Y	3.½" x 216"	500	1098 [2421]
312240-Y	3.½" x 240" (20 ft)	500	1200 [2646]
	60" (5 ft) increases	500	271 [598]
312660-Y	3.½" x 660" (55 ft)	500	3100 [6836]
312720-Y	3.½" x 720" (60 ft)	500	3300 [7277]
434108-Y	4.¾" x 108"	750	1028 [2267]
	12" increases	750	76 [168]
434216-Y	4.¾" x 216"	750	1710 [3771]
434240-Y	4.¾" x 240" (20 ft)	750	1862 [4106]
	60" (5 ft) increases	750	379 [836]
434660-Y	4.¾" x 660" (55 ft)	750	4514 [9953]
512180-Y	5.½" x 180"	1000	2630 [5799]
512180-Z-1250	5.½" x 180"	1250	2630 [5799]
512192-Z-1250	5.½" x 192"	1250	2714 [5984]
512200-Z-1250	5.½" x 200"	1250	2770 [6108]
512216-Z-1250	5.½" x 216"	1250	2882 [6355]
512240-Z-1250	5.½" x 240"	1250	3050 [6725]
612240-Z-1500	6.½" x 240"	1500	3213 [7084]

Technical data can be provided for FORUM Handling Tools Links of the size 1000 t and 1250 t, as well as for other sizes, on request.

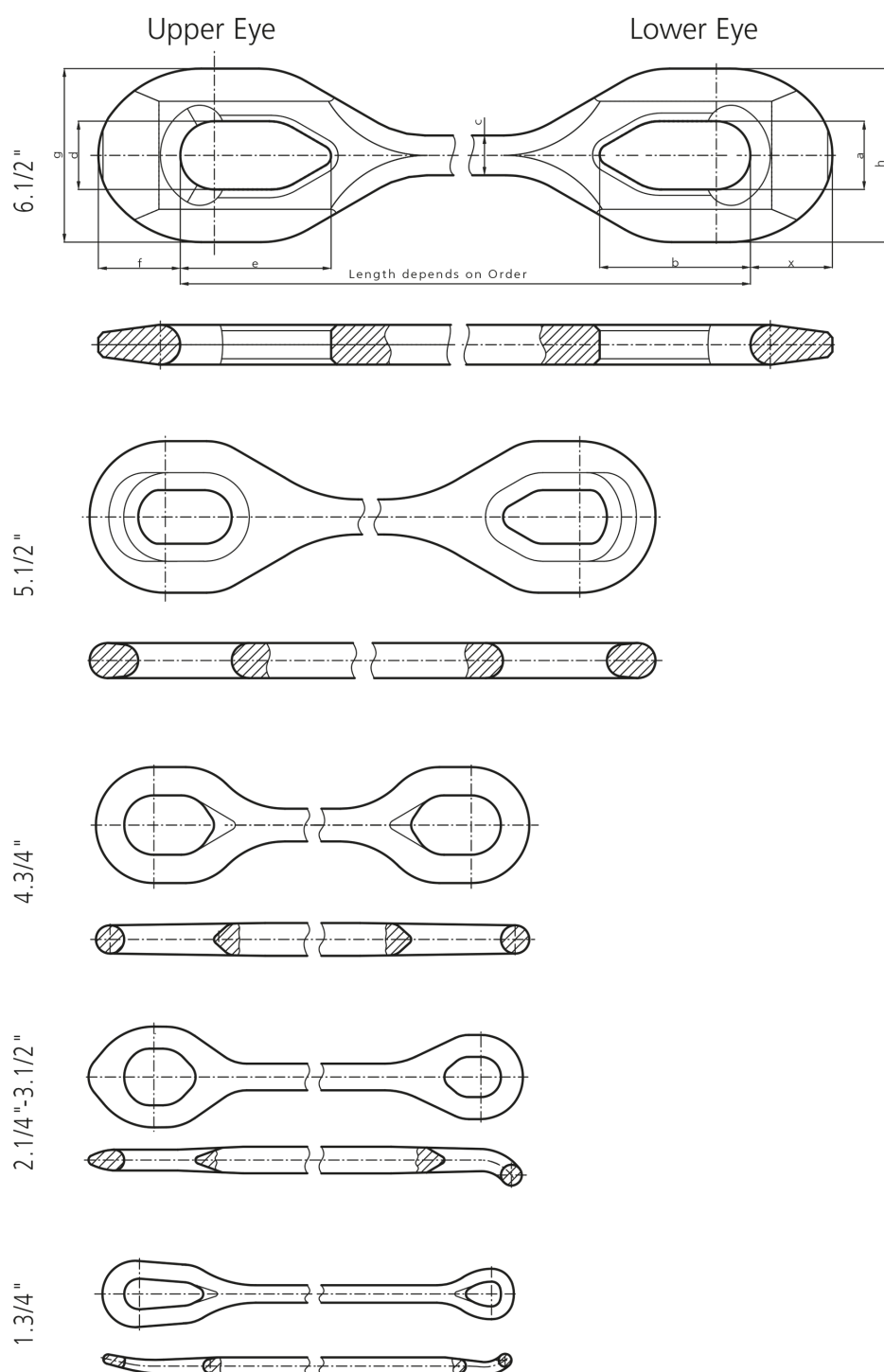


Fig. 4: Elevator Links Measures

sh tons	Measure	x	a	b	c	d	e	f	g	h
150	1.3/4"	2.1/4"	4.3/16"	5.1/2"	3"	5.1/4"	13"	3.3/4"	11.3/8"	8.1/2"
250	2.1/4"	2.2/5"	5.1/2"	8"	3"	8"	10.1/4"	5"	14.1/8"	10.1/4"
350	2.3/4"	2.7/8"	5.53/64"	8"	3.2/3"	9.1/4"	11.3/4"	5.3/8"	15.3/4"	11.13/16"
500	3.1/2"	3.1/2"	6.3/4"	10.1/4"	4.1/2"	9.1/2"	12"	6.1/16"	17.3/8"	14"
750	4.3/4"	4.3/4"	10"	15"	5.1/2"	10"	15"	4.3/4"	19.1/2"	19.1/2"
1000	5.1/2"	8.3/16"	12.1/2"	17.1/2"	5.1/2"	12.3/4"	17.1/2"	8.3/16"	25.1/2"	25.1/2"
1250	5.1/2"	8.3/16"	12.1/2"	17.1/2"	5.1/2"	12.1/2"	17.1/2"	8.3/16"	25.1/2"	25.1/2"
1500	6.1/2"	6.1/2"	12.1/2"	17"	6.45/64"	12.1/2"	17"	6.1/2"	25.1/2"	25.1/2"

Elevator Link are marked as a pair with an identical serial number.

1.2.2 Elevator Link Extension - LE

P/N*	Size	Load rating (tons)*	Weight (kg / lbs)**
234120-Y-LE	2.¾" x 120"	350 sh tons	296 / 652.6
234096-Y-LE	2.¾" x 96"	350 sh tons	262 / 577.6

* For a pair of Elevator Link Extensions.

** For each Elevator Link Extensions.

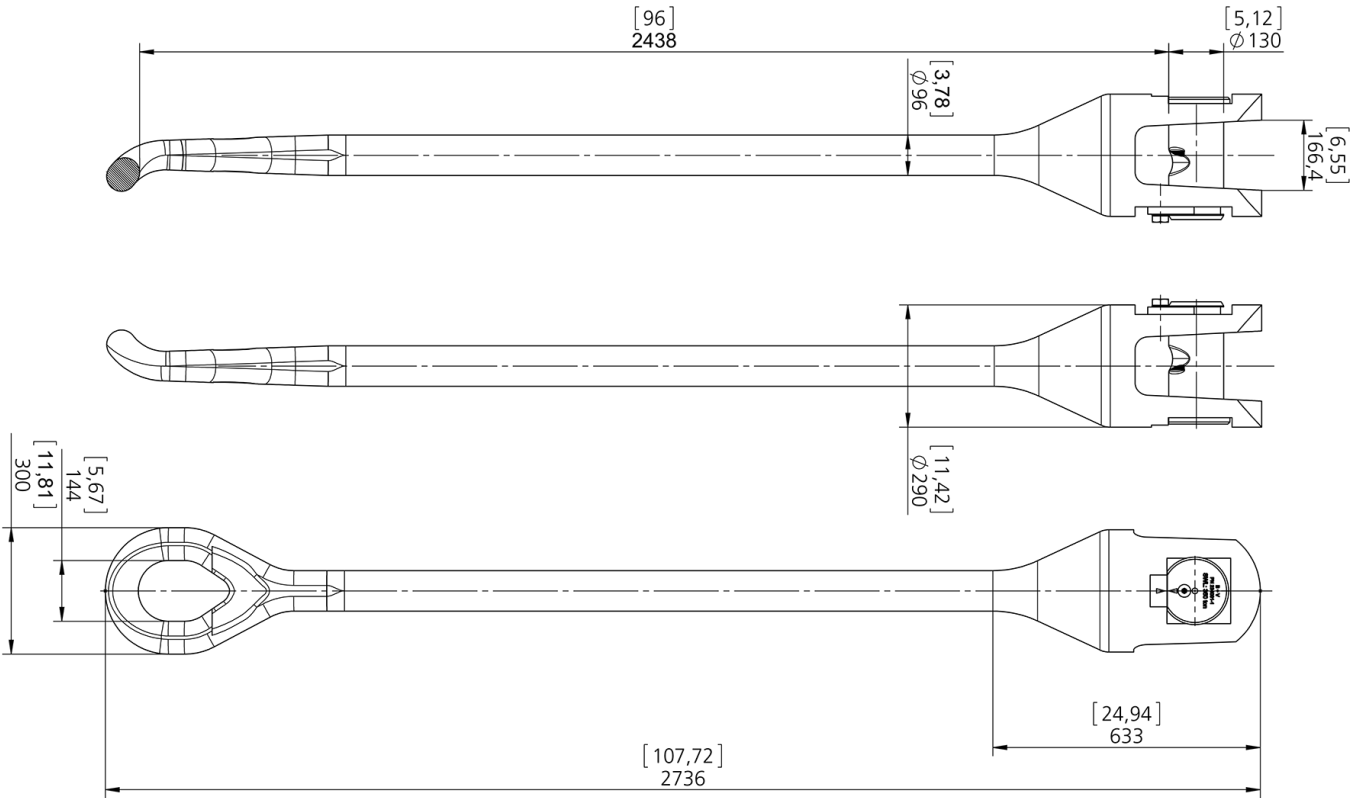


Fig. 5: Elevator Link Extension Measures - 234096-Y-LE

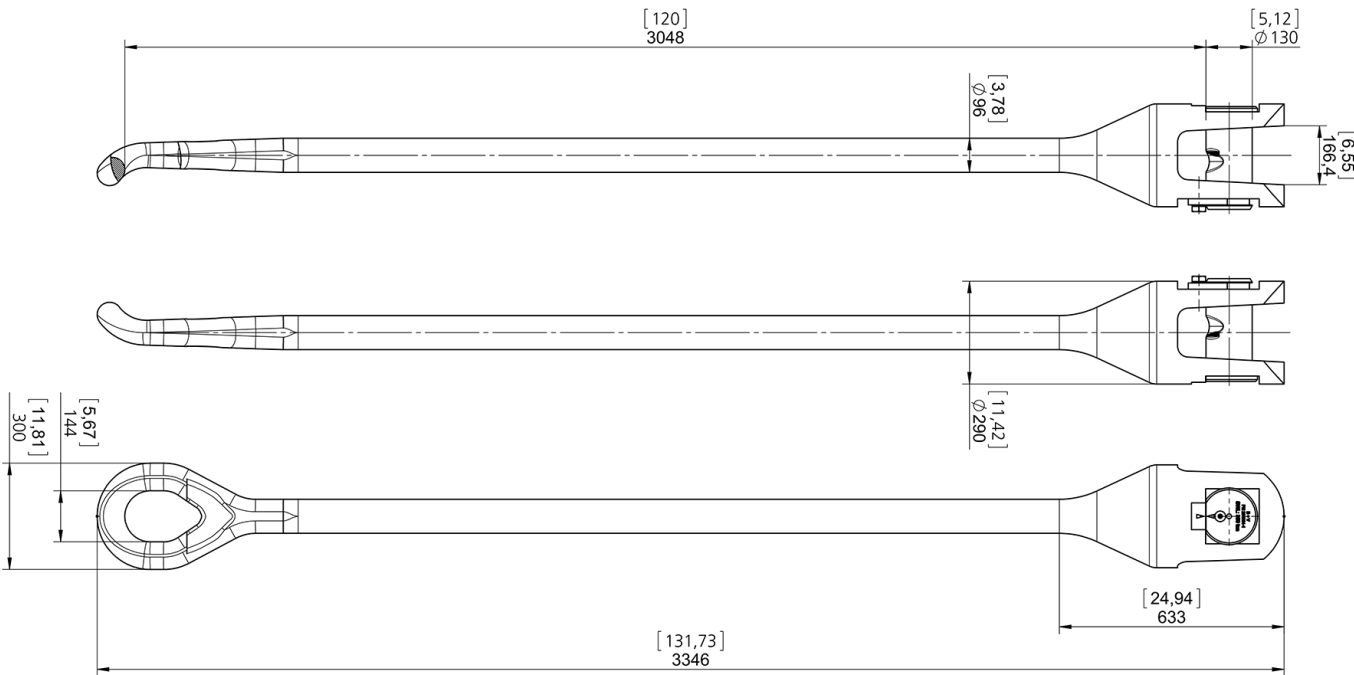


Fig. 6: Elevator Link Extension Measures - 234120-Y-LE

Elevator Link Extensions are always marked as a pair with an identical serial number.

DESCRIPTION

1.2.3 Elevator Link Extension - LE2

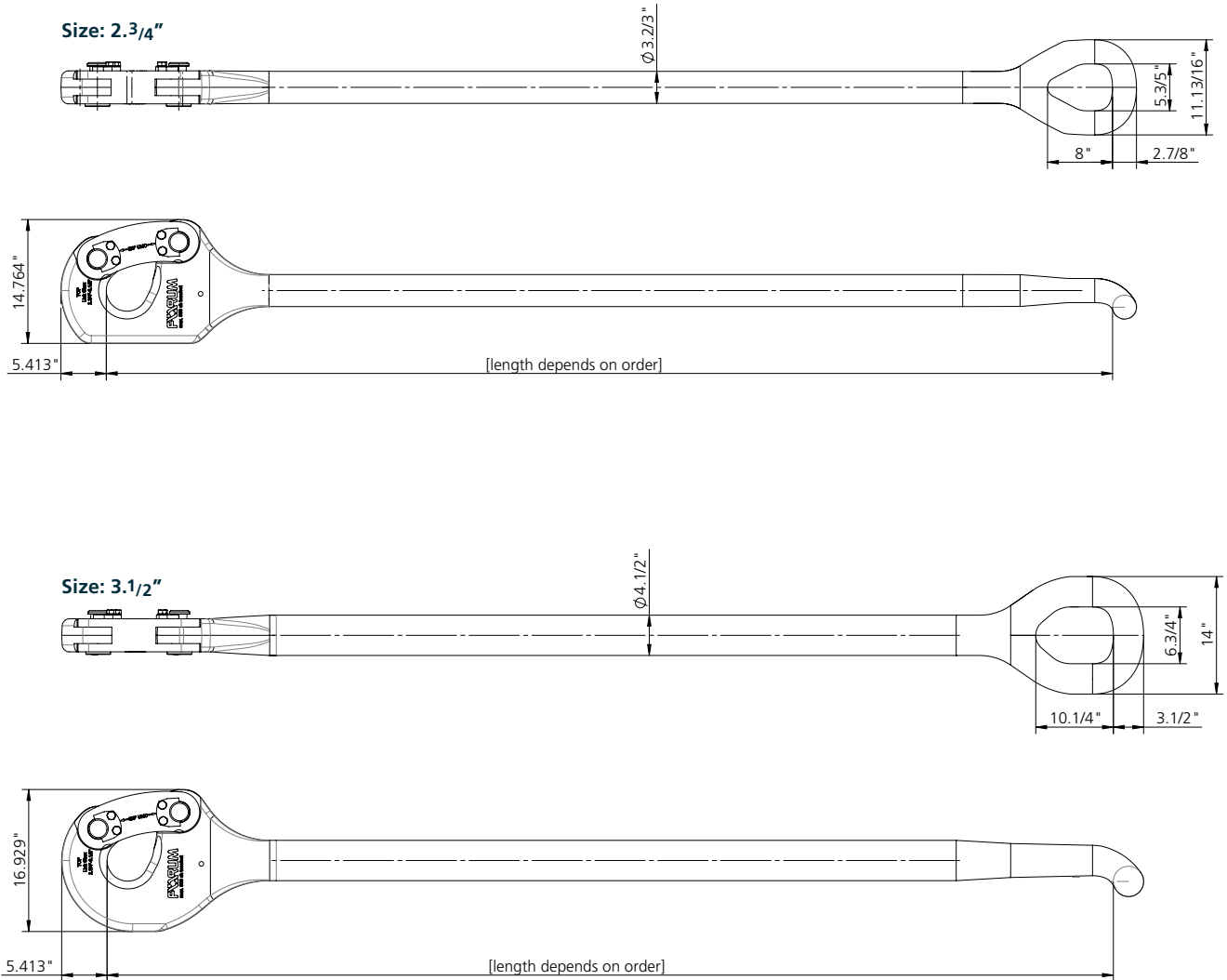


Fig. 7: Elevator Link Extension Measures

Elevator Link Extensions are always marked as a pair with an identical serial number.

2.3/4" Link Extension 2.0 [Metric Version]

P/N	Size	Weight (kg / lbs)
234048-Y-LE2	2.3/4" x 48"	350.23 (772.12)
234072-Y-LE2	2.3/4" x 72"	420.97 (928.08)
234096-Y-LE2	2.3/4" x 96"	491.71 (1084.03)
234108-Y-LE2	2.3/4" x 108"	527.08 (1162.01)
234120-Y-LE2	2.3/4" x 120"	562.07 (1239.15)
234132-Y-LE2	2.3/4" x 132"	597.81 (1317.94)
234144-Y-LE2	2.3/4" x 144"	633.19 (1395.94)
234160-Y-LE2	2.3/4" x 160"	680.34 (1499.89)
234168-Y-LE2	2.3/4" x 168"	703.92 (1551.88)
234170-Y-LE2	2.3/4" x 170"	709.81 (1564.86)
234180-Y-LE2	2.3/4" x 180"	739.29 (1629.85)
234184-Y-LE2	2.3/4" x 184"	751.08 (1655.85)
234192-Y-LE2	2.3/4" x 192"	774.66 (1707.83)
234216-Y-LE2	2.3/4" x 216"	845.39 (1863.76)
234240-Y-LE2	2.3/4" x 240"	916.13 (2019.72)
234264-Y-LE2	2.3/4" x 264"	986.86 (2175.65)
234360-Y-LE2	2.3/4" x 360"	1269.81 (2799.45)
234900-Y-LE2	2.3/4" x 900"	2861.38 (6308.26)

2.3/4" Link Extension 2.0 [Imperial Version]

P/N	Size	Weight (kg / lbs)
234048-Y-LE2_IM	2.3/4" x 48"	350.31 (772.3)
234072-Y-LE2_IM	2.3/4" x 72"	421.05 (928.26)
234096-Y-LE2_IM	2.3/4" x 96"	491.79 (1084.21)
234108-Y-LE2_IM	2.3/4" x 108"	527.16 (1162.19)
234120-Y-LE2_IM	2.3/4" x 120"	562.52 (1240.14)
234132-Y-LE2_IM	2.3/4" x 132"	597.89 (1318.12)
234144-Y-LE2_IM	2.3/4" x 144"	633.27 (1396.12)
234160-Y-LE2_IM	2.3/4" x 160"	680.42 (1500.07)
234168-Y-LE2_IM	2.3/4" x 168"	704.00 (1552.05)
234170-Y-LE2_IM	2.3/4" x 170"	709.89 (1565.04)
234180-Y-LE2_IM	2.3/4" x 180"	739.37 (1630.03)
234184-Y-LE2_IM	2.3/4" x 184"	751.16 (1656.02)
234192-Y-LE2_IM	2.3/4" x 192"	774.74 (1708.01)
234216-Y-LE2_IM	2.3/4" x 216"	845.48 (1863.96)
234240-Y-LE2_IM	2.3/4" x 240"	916.21 (2019.89)
234264-Y-LE2_IM	2.3/4" x 264"	986.95 (2175.85)
234360-Y-LE2_IM	2.3/4" x 360"	1269.90 (2799.65)
234900-Y-LE2_IM	2.3/4" x 900"	2861.46 (6308.43)

3.1/2" Link Extension 2.0 [Metric Version]

P/N	Size	Weight (kg / lbs)
312048-Y-LE2	3.1/2" x 48"	449.73 (991.48)
312072-Y-LE2	3.1/2" x 72"	561.67 (1238.27)
312096-Y-LE2	3.1/2" x 96"	673.61 (1485.05)
312108-Y-LE2	3.1/2" x 108"	729.61 (1608.51)
312120-Y-LE2	3.1/2" x 120"	785.56 (1731.86)
312132-Y-LE2	3.1/2" x 132"	841.51 (1855.21)
312144-Y-LE2	3.1/2" x 144"	897.46 (1978.56)
312160-Y-LE2	3.1/2" x 160"	972.06 (2143.02)
312168-Y-LE2	3.1/2" x 168"	1009.36 (2225.26)
312170-Y-LE2	3.1/2" x 170"	1018.69 (2245.82)
312180-Y-LE2	3.1/2" x 180"	1065.31 (2348.60)
312184-Y-LE2	3.1/2" x 184"	1083.96 (2389.72)
312192-Y-LE2	3.1/2" x 192"	1121.26 (2471.95)
312216-Y-LE2	3.1/2" x 216"	1233.15 (2718.63)
312240-Y-LE2	3.1/2" x 240"	1345.05 (2965.32)
312264-Y-LE2	3.1/2" x 264"	1456.95 (3212.02)
312360-Y-LE2	3.1/2" x 360"	1904.53 (4198.76)
312900-Y-LE2	3.1/2" x 900"	4422.26 (9749.40)

3.1/2" Link Extension 2.0 [Imperial Version]

P/N	Size	Weight (kg / lbs)
312048-Y-LE2_IM	3.1/2" x 48"	449.81 (991.66)
312072-Y-LE2_IM	3.1/2" x 72"	561.76 (1238.47)
312096-Y-LE2_IM	3.1/2" x 96"	673.70 (1485.25)
312108-Y-LE2_IM	3.1/2" x 108"	729.69 (1608.69)
312120-Y-LE2_IM	3.1/2" x 120"	785.64 (1732.04)
312132-Y-LE2_IM	3.1/2" x 132"	841.59 (1855.39)
312144-Y-LE2_IM	3.1/2" x 144"	897.54 (1978.73)
312160-Y-LE2_IM	3.1/2" x 160"	972.14 (2143.2)
312168-Y-LE2_IM	3.1/2" x 168"	1009.44 (2225.43)
312170-Y-LE2_IM	3.1/2" x 170"	1018.77 (2246)
312180-Y-LE2_IM	3.1/2" x 180"	1065.39 (2348.78)
312184-Y-LE2_IM	3.1/2" x 184"	1084.04 (2389.9)
312192-Y-LE2_IM	3.1/2" x 192"	1121.34 (2472.13)
312216-Y-LE2_IM	3.1/2" x 216"	1233.23 (2718.8)
312240-Y-LE2_IM	3.1/2" x 240"	1345.13 (2965.5)
312264-Y-LE2_IM	3.1/2" x 264"	1457.03 (3212.2)
312360-Y-LE2_IM	3.1/2" x 360"	1904.61 (4198.94)
312900-Y-LE2_IM	3.1/2" x 900"	4422.34 (9749.58)

1.2.4 Elevator Link Connector

P/N	Size	Load rating (tons)	Weight (pair) (kg / lbs)
554150	2.¾" - 3.½"	350 - 500 sh tons	313 / 690.6

Measures inch[mm]	A	B	C	D	E
554150	27.3 [695]	16.54[420]	16.93[430]	3.94[100]	5.24[133]

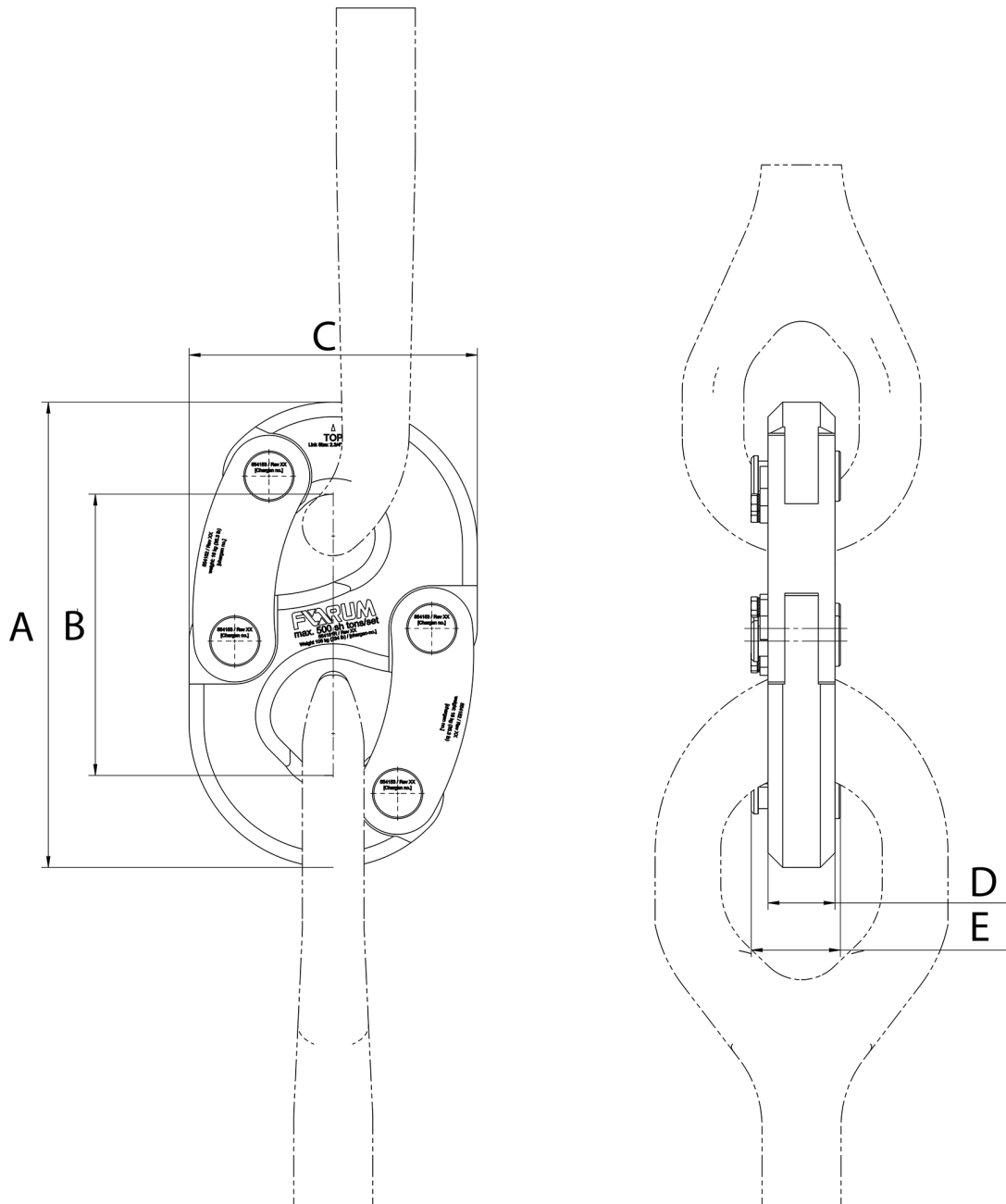


Fig. 8: Elevator Link Connector Measures

Elevator Link Connectors are marked as a pair with an identical serial number. For differentiation the suffixes A and B are added to the serial number.

1.3 Recommended Lubricants

FORUM Handling Tools recommends use of the following lubricants for effective lubrication under various ambient conditions:

Brand	Name	Temperature range	Remarks
Finke	Aviaticon XRF Low-Viscosity Grease	- 20°C to + 29°C (- 4°F to 84.2°F)	NLGI 0
Fuchs	NESSOS SFO EP grease for non-oil tight gear trains	- 20°C to 29°C (- 4°F to 84.2°F)	NLGI 0 DIN 51826 GPOF-25 DIN 51502 GPOF-25

* For temperatures above +30 °C (+86 °F)

FORUM Handling Tools recommends using lubricants in consistency class NLGI 2.

INFO



The specified lubricants can be obtained through FORUM Handling Tools. Contact your local representative.

1.4 Operational Environment

The FORUM Handling Tools Elevator Links, Elevator Link Extensions - LE and LE2 and the Elevator Link Connectors are designed and constructed for use in the drilling industry on ships and platforms. The equipment is approved for operation in explosion hazard areas. The corresponding ATEX certificates are present in the Data book. The Classification according to CE (with reference to the ATEX guideline) is as followed:

CE II 2G IIB T6 for manual equipment

Explanation

CE	CE- marking (with reference to the ATEX guideline)
	Marking of the equipment for the Ex- range
II	Equipment Group (II)
2	Equipment Category
G	For explosive mixtures of air and combustible gases, mists or vapors (G)
IIB	Category for Gases
T6	Temperature class

1.5 Machine Markings

The markings are generally used for traceability and provide general information about components/ the device. All markings are in compliance to the latest API Spec. 8C and at least include the following information:

- Manufacturer.
- Size.
- Serial number (Link pair).
- ATEX classification.

Always keep this information at hand for maintenance and repair work.



Fig. 9: Example of Machine marking



Fig. 10: Support data sticker on device

The email address of the manufacturer is given on the support sticker if service is required.

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SAFETY

SAFETY

2 Safety

The Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors were designed and produced according to the state-of-the-art and in consideration of all required safety precautions. Failure to observe the safety precautions and operating instructions specified in the present operating manual, can lead to hazardous situations when operating the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. Notwithstanding the fact that it is not possible to completely exclude hazardous situations during operation. Use the machine only for the intended purpose when it is in a technical safe state. Rectify all faults immediately which could have a negative effect on the machine safety.

2.1 General Safety Precautions

Ensure that work on, or with Elevator Links, Elevator Link Extensions - LE und LE2 and Elevator Link Connectors, particularly installation, maintenance and repair work, is performed only by personnel with the necessary qualifications and who are familiar with the associated risks (see Chapter „VI Obligations of the Operating Company“ on page 6). For the safe and efficient operation of the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors, it is essential that all personnel working on, or with them observe the safety instructions in this operation manual. Before working with, or on Elevator Links, Elevator Link Extensions - LE, LE2 and Link Connectors, ensure that no one can be put into a dangerous situation. Elevator Links, Elevator Link Extensions - LE, LE2 and Link Connectors are subject to wear. After longer periods of operation, safety can be reduced due to wear. Service the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors regularly in compliance with the maintenance chart to ensure that all safety requirements are always fulfilled. Wear limits have to be checked regularly. Worn or defective Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors, or parts thereof must be replaced immediately by new ones. Do not use this equipment if safe operation can no longer be guaranteed. Always advise the responsible service organization and FORUM Handling Tools. Rectify every fault which affects the safety immediately



⚠ Warning

Reuse of safety components can cause accidents.

- » Replace such components with new safety parts.

The operating company is responsible for ensuring safe and correct use of the equipment within the sense of the hazard and risk analysis. The operating company is also obligated to issue and supervise observance of operating instructions on safe use as well as to observe the instructions in this operating manual.

Never remove the safety equipment or replace it with equipment not approved by FORUM Handling Tools. Failure to observe these instructions can lead to hazardous situations for which FORUM Handling Tools cannot be held responsible. Always keep all safety equipment in working condition and check regularly.

2.2 Operating Manual and Machine

The safety precautions in this operating manual are indicated using standardized depictions and symbols. Chapter 1 describes general depiction of safety precautions. Concrete examples of the symbols and terms used in this manual are explained below. These are used in the form shown wherever possible hazards are present.



⚠ DANGER

Suspended load!

This indicates injury risks from transporting heavy components.



⚠ DANGER

Tipping hazard for components!

This indicates injury risks from tipping components.



⚠ WARNING

Danger of pinching/crushing hands!

This indicates injury risks from moving parts, which pose a hazard of pinching or crushing hands.



⚠ WARNING

Danger of pinching/crushing feet!

This indicates injury risks from moving parts, which pose a hazard of pinching or crushing feet.



⚠ Caution

Risk of stumbling/tripping!

This symbol warns of tripping hazards, which can lead to stumbling resulting in injuries.



⚠ WARNING

Health hazards from service products!

This symbol warns of health hazards resulting from contact of service products (e.g. lubricants) with the skin, mucous membranes, eyes and respiratory paths.

2.3 Organizational Measures

The operating company is responsible for ensuring that all legally and officially prescribed approvals for operation of the machine are present in compliance with national laws and regulations. The required personal protective equipment (see Chapter „IX Personal Protective Equipment (PPE)“ on page 9) must be provided by the company when operating the Elevator Links, Elevator Link Extensions - LE and LE2, Elevator Link Connectors. All safety features present must be checked regularly in compliance with national and local requirements. The operating instructions must be kept so that they are available to those operating the machine at all times.

Personal Protective Equipment

The required Personal Protective Equipment (PPE) must be used when operating the machine. This is to be provided by the operating company.

The following PPE is recommended:

- Oil resistant protective clothing,
- Protective gloves,
- Eye protection,
- Safety shoes,
- Protective helmet.

All parts of the protective equipment must be checked regularly for damage in compliance with the specific national regulations and replaced as required.

2.4 Safety Precaution against Remaining Hazards

Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors are designed and produced according to the state-of-the-art in consideration of the safety precautions specified in EC Directive 2006/42/EC on Machinery.

Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors may be used only for:

- The intended purpose.
- In a technically safe state.

Nevertheless it is not possible to completely exclude all hazardous situations which could arise when the machine is used. Reference is made to these remaining risks at the beginning of each chapter and at the corresponding points in the description and measures for avoiding these risks are explained.

WARNING

Mechanically generated sparks.

Metal tools (e.g. hammers) can generate sparks, if used.

- » The use of metal tools in explosive areas has to be prohibited by the operating company.
- » Only tools approved for use in potentially explosive atmospheres may be used.



INFO



The operating company is responsible for ensuring that all personnel working on the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors are familiar with the remaining risks and observing the appropriate safety precautions.

2.5 Human Error

Ignorance of hazards, inattentiveness and limited reactions can lead to hazard situations while working with the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors.

Safe Work

1. All personnel working on and with Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors are responsible for paying attention to their colleagues.
2. Consumption of alcohol and drugs is prohibited.
3. Work on and with Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors is not permissible after taking medication which reduces reactions.
4. AT LEAST visual contact must exist between all personnel to allow communication via hand signals.
5. The personal protective equipment must always be kept and used in perfect condition.
6. All personnel must be aware of and observe the safety instructions in this operation maintenance manual.
7. The instructions for handling and maintenance intervals specified in this operation maintenance manual must be observed.
8. Keep a copy of this operation maintenance manual accessible at all times.

2.6 Accidents, Fire

Basic rules in event of accidents or fire

1. Move accident victims out of hazard area and switch off machines immediately.
2. Administer first-aid.
3. Alarm rescue services and fire department immediately and inform supervisor.

In addition all national, local and internal plant regulations for fire fighting in explosion hazard areas apply.

TRANSPORT/ INSTALLATION

TRANSPORT/
INSTALLATION

3 Transport and Lifting Techniques



Ensure that setup and installation work are accomplished only by sufficiently qualified and trained personnel.



Read these instructions carefully before setting up the Elevator Links, Elevator Link Extensions - LE, LE2 or the Elevator Link Connectors.

3.1 Delivery

Elevator Links, Elevator Link Extensions - LE und LE2 und Elevator Link Connectoren und alle Zubehörteile werden auf Transportpaletten und/oder Transportgestellen angeliefert. Alle Objekte sind mit Transportriemen gegen Kippen und Rutschen gesichert.

- Transport instructions are provided for safe transport on Packaging.
- Transport is only allowed in compliance with these instructions.

3.1.1 Scope of Delivery

INFO



The contract documents and shipment papers specify the precise scope of delivery. Check these documents carefully on delivery. In the event of any discrepancies please contact FORUM Handling Tools or representatives specified immediately („Contact worldwide“ on page 10).

The scope of delivery includes all components required for the intended operation.

3.1.2 Unpacking and Disposal of Packing Material

Entfernen Sie die Transportverpackung und die Transporthilfsmittel vor dem Anheben der Elevator Links, Elevator Link Extensions - LE und LE2 und Elevator Link Connectoren.

INFO



- Do not remove transport retainers.
- The transport retainers should be removed only at the installation site just before startup.

Check scope of delivery

1. Are any transport damages visible?
2. Is the shipment complete?
Compare the scope of delivery with the specifications in the shipping documents.

If the Elevator Link, Elevator Link Extensions - LE, LE2 or the Elevator Link Connectors has been damaged during transport or the shipment is incomplete, please contact FORUM Handling Tools immediately (see Chapter „XI Contact worldwide“).

Dispose of the packaging material ecologically in compliance with all applicable regulations.

Intermediate Storage

- Leave the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectoren in its transport packaging. This provides sufficient protection against external influences.
- Secure Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectoren against slipping or falling due to motion.



Fig. 11: Transport packaging for a pair of Elevator Links

3.2 Transport



⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

- NEVER stand beneath or in the swing area of lifted loads or loads suspended from a crane.



WEAR PROTECTIVE HELMET!



WEAR PROTECTIVE GLOVES!

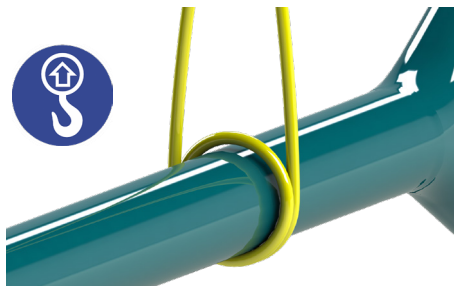


WEAR SAFETY SHOES!

Weights

- Detailed information about weights are given in chapter „Technical Data“ on page 15.

INFO



Always make sure that correct and valid lifting techniques are in use!

- » Always rewrap the link.

Principles for transport

1. The transport routes must be adequately dimensioned and marked.
 - » Make sure that people are aware that transport is taking place.
2. All longer transports must be carried out with surrounded transport pallets or transport frames (support blocks).
3. The total weight may not exceed the carrying capacity of the ground.
4. These tasks may only be carried out by adequately qualified persons
5. There must be visual and speech contact between the crane operator and the deck personnel.
6. Secure the area against unauthorized entry.
 - » If necessary, mark the area with information signs to draw attention to maintenance and repair work.
7. Only use approved, valid and tested lifting equipment. If necessary, use ropes and cables for guiding.
 - » Observe specific load limits.
8. Secure the Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors against slipping.
 - » Observe the respective specific total weight and center of gravity.
9. NEVER stand beneath or in the swing area of lifted loads or loads suspended from a crane.
10. Always transport loads carefully and near to the ground.
 - » Avoid sudden stops.
11. Ensure that all lifting procedures are in compliance with industry practices and standards.
12. Always attach Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors only at the attachment points shown in this operation maintenance manual.
13. Always ensure that the used hoisting equipment is mounted straight and kink-free.

3.3 Attachment Points, Lifting and Intermediate Storage Techniques

3.3.1 Attachment Points



Always ensure the center of gravity when lifting Elevator Links, Elevator Link Extensions - LE, LE2 or Elevator Link Connectors.

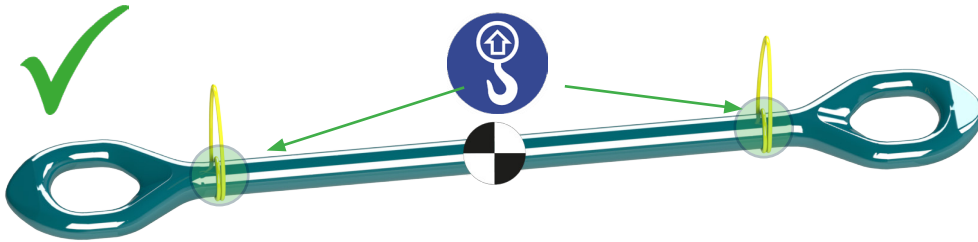


Fig. 14: Elevator Link attached correctly

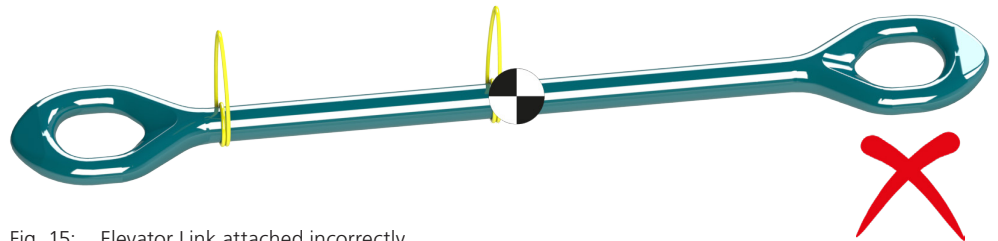


Fig. 15: Elevator Link attached incorrectly

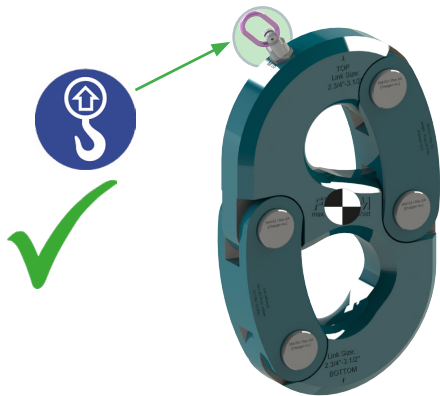


Fig. 16: Elevator Link Connector attached correctly

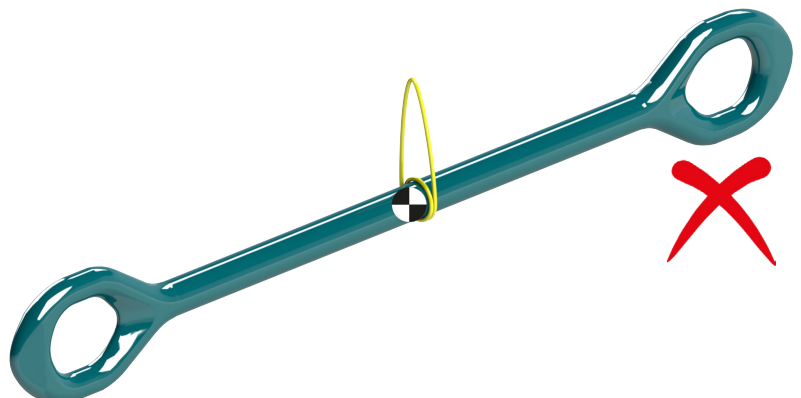


Fig. 17: Elevator Link attached incorretcly

INFO



- The shown attachment points are also valid for the Elevator Link Extensions - LE und LE2.

3.3.2 Lifting and Intermediate Storage Techniques



Do not place single Links or a pair of Links on the ground. Always use support blocks or other valid equipment.



To increase safety, the FORUM Handling Tools Elevator Links are connected to each other by additional transport cables. These may only be removed if the Elevator Links have been placed safely.

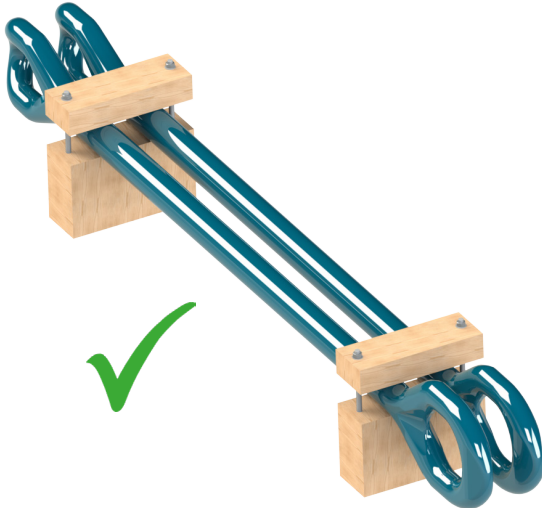


Fig. 12: Elevator Links placed safely and correctly

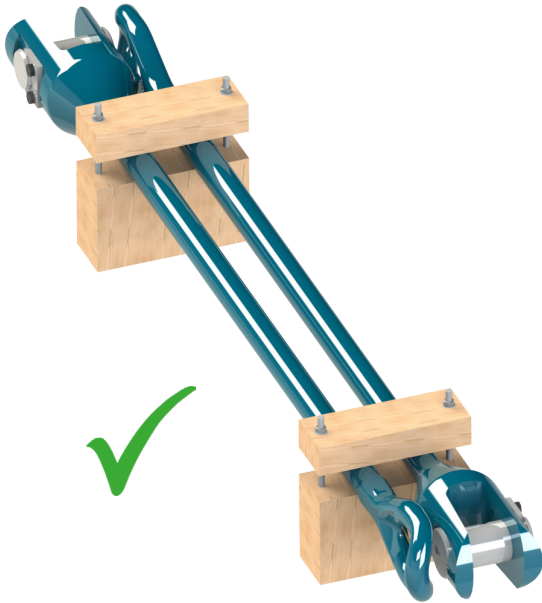


Fig. 13: Elevator Link Extensions placed safely and correctly



Fig. 18: Elevator Links placed unsafe and incorrectly



Fig. 19: Unsafe separation of transport security

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COMMISSIONING / OPERATION

COMMISSIONING
OPERATION

4 Commissioning and Operation



Ensure that the the Elevator Link, Elevator Link Extensions - LE, LE2 or the Elevator Link Connectors operated only by personnel trained for this work and familiar with the risks involved in operating the machine.



Read these instructions carefully before setting up the machine and putting it into service.

4.1 Commissioning



⚠ WARNING

Danger of pinching/crushing feet!

Transporting and setting down heavy components.

- » NEVER stand below or under moving components.

⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

- » NEVER stand under suspended loads and in the swing area of suspended loads.

⚠ WARNING

Danger of pinching/crushing body!

- » NEVER stand below or under moving components.

⚠ WARNING

Danger of pinching/crushing hands!

- » DO NOT reach between moving components.
- » Do not guide Elevator Link, Elevator Link Extensions - LE, LE2 or Elevator Link Connectors manually. Use ropes or cables therefore.



WEAR PROTECTIVE HELMET!



WEAR PROTECTIVE GLOVES!



WEAR SAFETY SHOES!

4.1.1 Mounting Elevator Link to the Top Drive System (Hook)

1. Position the Elevator Links in a appropriate mounting position using lifting equipment and ropes. Place or attach the Elevator Links therefore as shown in chapter 3.
 2. Move down the Top Drive System ①.
 3. Mount the Elevator Links by mounting the upper eyes to the top drive hooks ②. Secure the Elevator Links.
 4. Move the Top Drive System slowly upwards. Use ropes to stabilize the Elevator Links.
- » The Elevator Links are now mounted to the hooks. An elevator can now be installed to the Elevator Links.

INFO

i Mounting an elevator to Elevator Links is part of the operation manual of the respective elevator. Please refer to the operation manual of the elevator/spider in order to mount the elevator/spider.

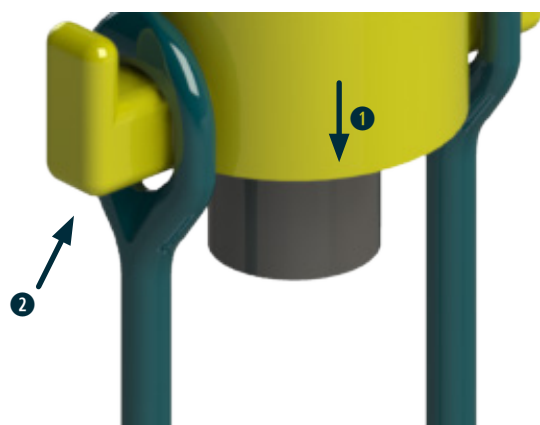


Fig. 20: Elevator Links Hook and elevator connection

4.1.2 Elevator Link Extension Installation

Elevator Link Extension - LE



⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

- » NEVER stand under suspended loads and in the swing area of suspended loads.



⚠ WARNING

Danger of pinching/crushing hands!

- » DO NOT reach between moving components.
- » Do not guide Elevator Link, Elevator Link Extensions - LE, LE2 or Elevator Link Connectors manually. Use ropes or cables therefore.



WEAR PROTECTIVE HELMET!



WEAR PROTECTIVE GLOVES!



WEAR SAFETY SHOES!

1. Lower the Top Drive System with Elevator Links until the lower eyes of the Elevator Links are at the Elevator Link Extension level ①.

⚠ CAUTION Stabilize and guide the Elevator Links with ropes during the lowering process.

2. Position the lower eye of the Elevator Link ② in the fork opening of the Elevator Link Extension.
3. Insert the bolt.
4. Tighten and secure the bolt with the securing plate and screws.

⚠ CAUTION Make sure that the securing plate is positioned in the bearing.

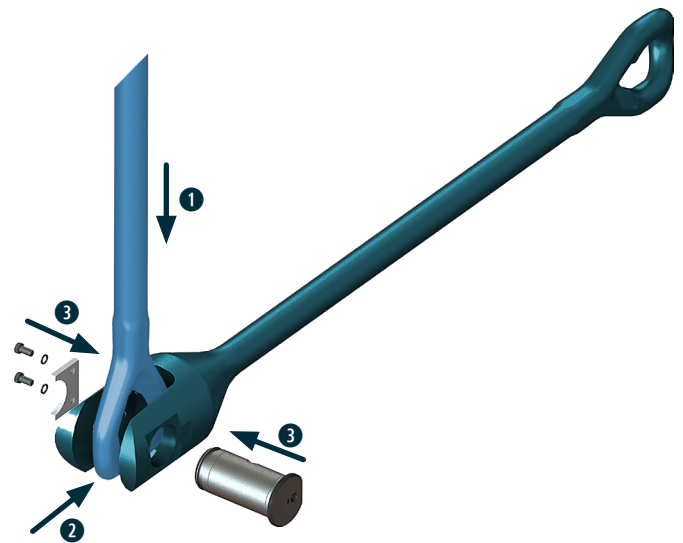


Fig. 21: Mounting the Elevator Link Extension to the Elevator Link

5. Repeat Steps 2 - 4 on the remaining Elevator Link.
 - » The Elevator Links Extensions are now mounted to the Elevator Links. An Elevator/Spider can now be mounted to the Elevator Link Extensions.

Elevator Link Extension - LE2

1. Open the Elevator Link Extension - LE2 by removing the upper securing plate, screws and the upper hinge pin ❶. Fold back the Link Block ❷.

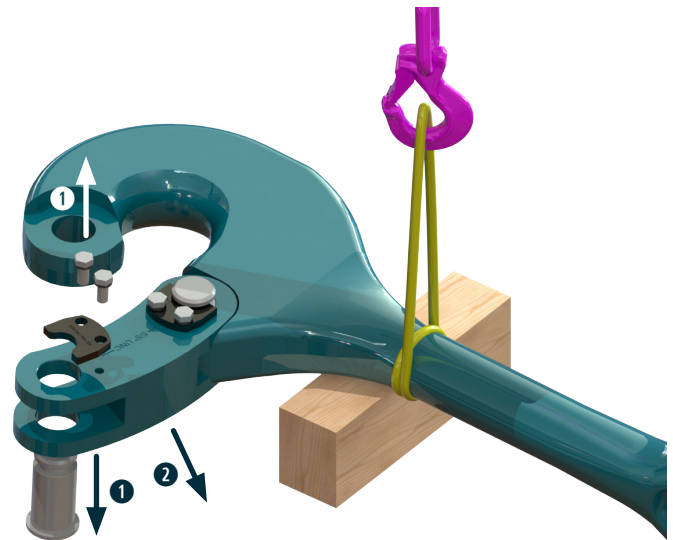


Fig. 22: Mounting the LE2 to the Elevator Link, Step I

2. Lower the Top Drive System with Elevator Links until the lower eyes of the Elevator Links are at the Elevator Link Extension level ❸.

CAUTION Stabilize and guide the Elevator Links with ropes during the lowering process.

3. Place the lower eye of the Elevator Link in the fork opening of the Elevator Link Extension ❹.

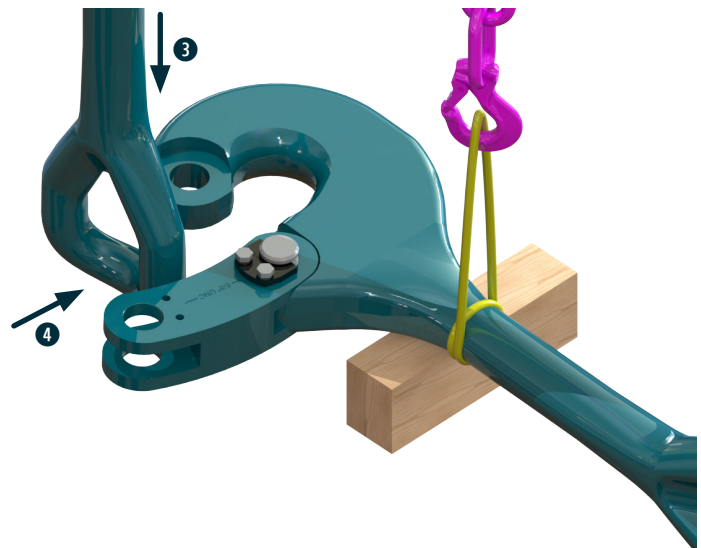


Fig. 23: Mounting the LE2 to the Elevator Link, Step II

4. Fold back the Link Block and place the bolt ❹.
5. Tighten and secure the bolt with the securing plate and the screws ❺. Fasten the screws with a torque of 210 Nm.

CAUTION Make sure that the securing plate is positioned in the bearing.

6. Repeat Steps 3 - 5 on the remaining Elevator Link.
 - » The Elevator Links Extensions are installed and can be used with an Elevator/Spider .

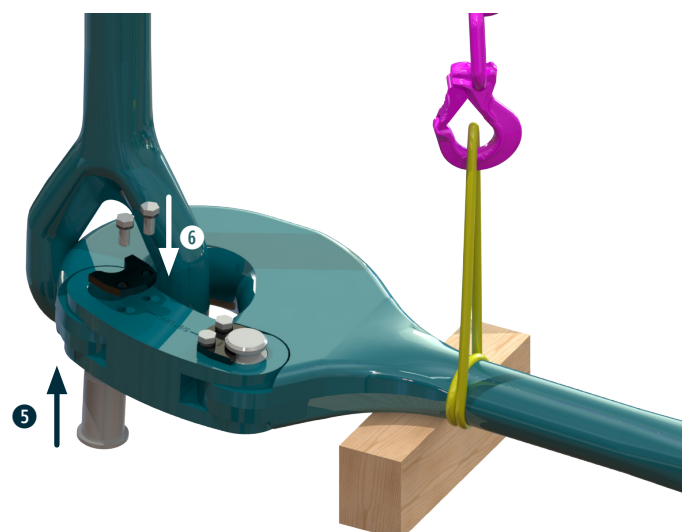


Fig. 24: Mounting the LE2 to the Elevator Link, Step III

4.1.3 Mounting the Elevator Link Connectors to the Elevator Link



⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

- » NEVER stand under suspended loads and in the swing area of suspended loads.

⚠ WARNING

Danger of pinching/crushing hands!

- » DO NOT reach between moving components.
- » DO NOT guide Elevator Link, Elevator Link Extensions - LE, LE2 or Elevator Link Connectors manually. Use ropes or cables therefore.



WEAR PROTECTIVE HELMET!



WEAR PROTECTIVE GLOVES!



WEAR SAFETY SHOES!

Installation tasks

1. Screw a suitable ring bolt ❶ into the intended thread hole on top of the Elevator Link Connector and attach the Elevator Link Connector to the crane afterwards.
2. Loosen and remove the screws and the securing plate ❷ and pull the bolt out of the Link Block and the Elevator Link Connector ❸.
3. Open the Link Block ❹.
4. Mount the upper eye of the Elevator Link Connector to the lower eye of the Elevator Link ❺. Use the crane for this installation step.
5. Fold back the Link Block and place the bolt.

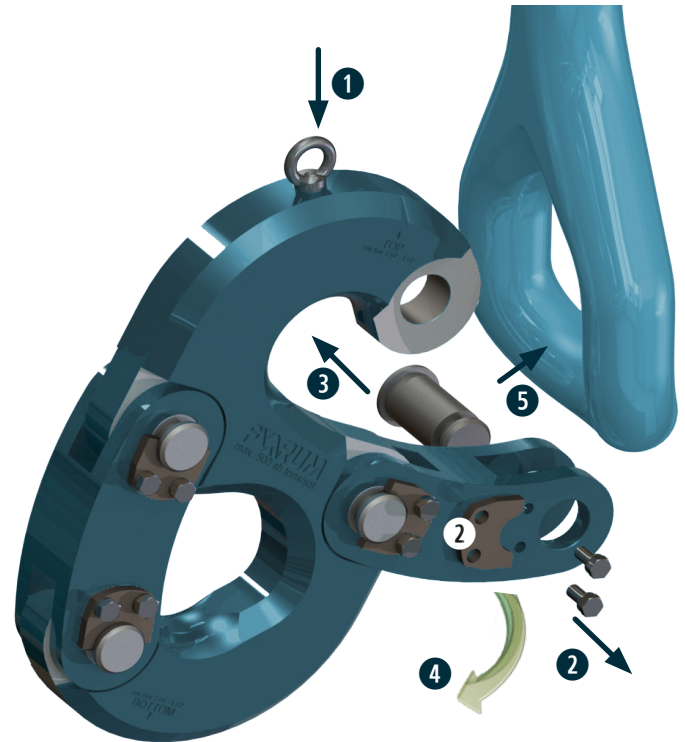


Fig. 25: Mounting the Elevator Link to upper Connector*

6. Secure the bolt by installing the securing plate, the two screws and washers with wedge lock. Use a torque of 210 Nm for the screws.
7. Disconnect the Elevator Link Connector from the crane and remove the used ring bolt.
8. Repeat Steps 1 - 7 on the remaining Elevator Link Connector.

9. Lower the Top Drive System to the height of the second Elevator Link.
10. Loosen and remove the screws, the securing plate and pull the bolt out of the lower Link Block of the Elevator Link Connector.
11. Open the Link Block.
12. Hook the upper eye of the link into the lower eye of the link connector. Use a crane **6**.
13. Close the Link Block and insert the bolt **7**.

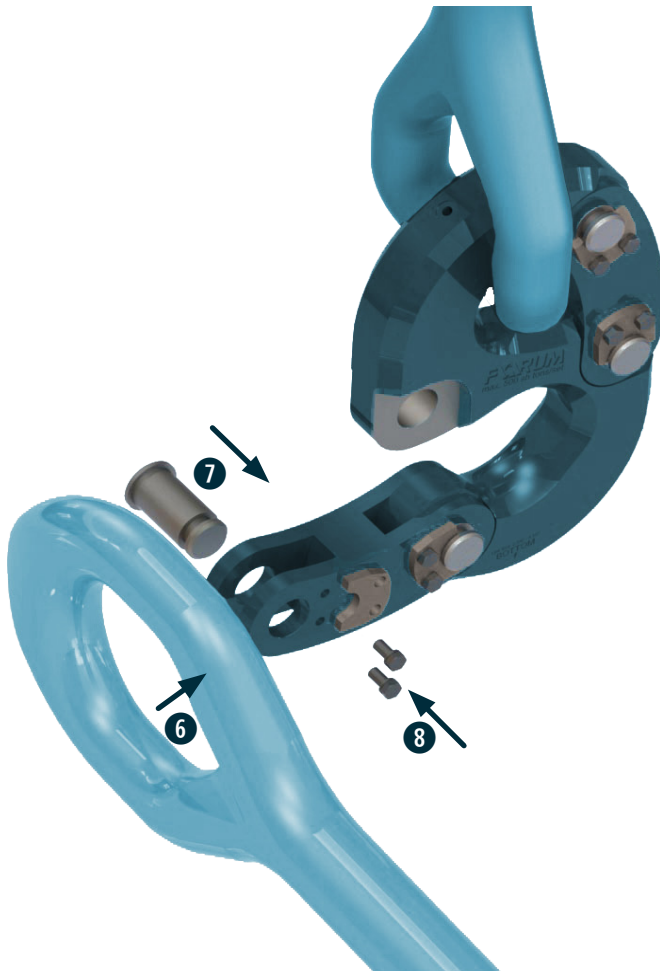


Fig. 26: Mounting the Elevator Link to the lower Connector*s

14. Secure the bolt by mounting the securing plate, screws and washers with wedge lock **8**. Use a torque of 210 Nm for the screws.
15. Slowly raise the Top Drive System. Guide the links on the ground with ropes.
 - » The Elevator Link Connectors are now installed.

4.2 Operation

⚠ WARNING

Danger of pinching/crushing body!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

- » NEVER stand below or under moving components.
- » STAY AWAY from the Elevator Link during operation.



⚠ WARNING

Danger of pinching/crushing hands!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

- » DO NOT reach between moving components.
- » DO NOT guide Elevator Link, Elevator Link Extensions - LE, LE2 or Elevator Link Connectors manually. Use ropes or cables therefore.



⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

- » NEVER stand under suspended loads and in the swing area of suspended loads.



⚠ WARNING

Danger of pinching/crushing feet!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

- » NEVER step below moving components.
- » STAY AWAY from the Elevator Link during operation.



Safe Working

1. Take care of yourself and your colleagues during operation.
2. Ensure that visual contact is always present between the deck personnel, and the operator in the doghouse.
3. Keep away from Elevator Links, Elevator Link Extensions - LE, LE2, and Elevator Link Connectors during operation.
4. All Elevator Links, Elevator Link Extensions - LE, LE2 and Elevator Link Connectors must be installed correctly.

4.3 Checklists

4.3.1 Checklist for Elevator Links und Elevator Link Extensions - LE and LE2

Perform the following checks before first use:

- OK ☐ The Elevator Links do not show any external, visible damages, or deformations.
- OK ☐ The Elevator Link pair used consists of Elevator Link of the same type and size.
- OK ☐ The Elevator Links have been mounted correctly (vertically, horizontally).
- OK ☐ The Elevator Links are mounted straight and parallel.
- OK ☐ The Elevator Links are compatible with the elevator and the rated load.
- OK ☐ Components especially safety components, e.g. bolts, screws, link blocks and washers, are in a faultless condition and complete.
- OK ☐ Components especially safety components, e.g. bolts, screws, link blocks and washers, are mounted correctly.
- OK ☐ The Elevator Links have been installed according to this operation maintenance manual.

4.3.2 Checklist for Elevator Link Connector

Perform the following checks before first use:

- OK ☐ The Elevator Link Connectors do not show any external, visible damages, or deformations.
- OK ☐ The Elevator Link Connector pair used consists of Elevator Link Connectors of the same type and size.
- OK ☐ The Elevator Link Connectors have been mounted correctly (vertically, horizontally).
- OK ☐ The Elevator Link Connectors are mounted straight and parallel.
- OK ☐ The Elevator Link Connectors are compatible with the Elevator Links and the rated load.
- OK ☐ Components especially safety components, e.g. bolts, screws, link blocks and washers, are in a faultless condition and complete.
- OK ☐ Components especially safety components, e.g. bolts, screws, link blocks and washers, are mounted correctly.
- OK ☐ The Elevator Link Connectors have been installed according to this operation maintenance manual.

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SERVICE

SERVICE

5 Service

INFO

i Only use original spare parts for maintenance and repair work. These spare parts ensure the operational reliability and usability of your Elevator Link Extensions - LE, LE2 or the Elevator Link Connectors.

5.1 Malfunction

If a malfunction occurs trouble-shoot as follows:

1. Check the Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors for visible damage.
2. Check the Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors due to correct installation.
3. Verify that the problem occurs from the Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors.
4. Check for deformation.
5. Check for completeness and integrity of all components which belongs to the Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors.
6. Check for damages on other devices, caused by Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors.
7. Check all recent modifications.
8. Note and document all information which belong to the problem. Take photos and describe the process in detail. The more information you collect, the more FORUM Handling Tools will help you.
9. Replace defective components if necessary.

INFO

i In the event of problems, which cannot be remedied with the aid of this manual, please contact the FORUM Handling Tools Technical Support or one of the authorized service companies.

5.2 Repair

5.2.1 Repair by Customer

It is only permissible for the customer/company operating the machine to replace defective parts with OEM (Original Equipment Manufacturer) parts approved by FORUM Handling Tools in conformance with the present operating instructions. Use of parts not approved by FORUM Handling Tools voids the guarantee.

5.2.2 Repair by Manufacturer

Ensure that any repair work required on the Elevator Links, Elevator Link Extensions - LE/ LE2, Elevator Link Connectors is performed only by FORUM Handling Tools or an authorized service company.

INFO

i Please contact the FORUM Handling Tools Technical Support or one of the authorized service companies to perform repair or maintenance work.

5.2.3 Securing Screws with Nord Lock washers

Nord Lock bolt securing systems use geometry to safely lock bolted joints in the most critical applications. The key is the difference in angles. Since the cam angle „ α “ is larger than the thread pitch „ β “, the pair of washers expands more than the corresponding pitch of the thread. Any attempt from the bolt/nut to rotate loose is blocked by the wedge effect of the cams.

When the pushed movements of the device will get in contact with the under surface of the securing plate, this surface contact will secure the plate and prevents any motion in the axial direction.

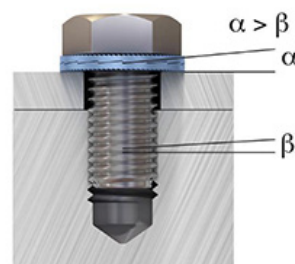


Fig. 27: Nord Lock Washer principle illustration

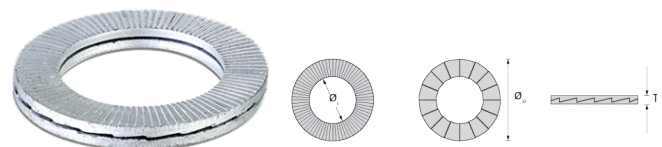


Fig. 28: Nord Lock Washer detailed illustration

Tightening torque recommendations for wedge lock washers

The appendix contains numerous hyperlinks (FORUM Handling Tools Extranet), which forward to numerous documents from FORUM Handling Tools suppliers. One of these hyperlinks refers to a document in which you will find detailed information about the wedge lock manufacturer (information about tightening torque). If the torque which is necessary to tighten a screw / nut is not explicitly listed in this manual, refer to the head of the screw / nut for information about the screw gland and it's recommended tightening torque. The hyperlink opens the necessary document.

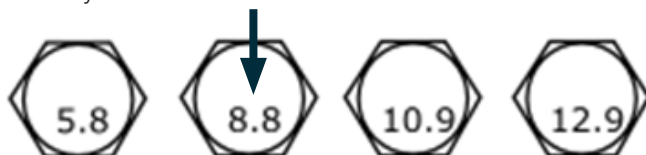


Fig. 29: Nord Lock Marking

FORUM Handling Tools uses the metric grades 8.8, 10.9 and 12.9. Refer to the appendix for third party documents.

INFO

As a result from tests the NORD LOCK washers were safely secured even after reuse 30 times. Only a limited part of the clamp load was lost due to normal settlements between contact surfaces. The cam edges of the washers got rounded off but were still intact after the reuse test.



The best thing to do is to make ocular inspection of the washers during every maintenance.

Make sure that the cams (cam tops) look good and that the teeth are not worn off. Lubricate the joint and the mating surfaces if possible so that the friction conditions do not change. When reassembling, care should be taken that the two washer halves are mated correctly.

If all these criteria are met, the washers can be safely reused.

5.3 Drawing, Parts List and Spare Parts

INFO



Please contact FORUM Handling Tools Technical Support or an authorized service company („XI Contact worldwide“ on page 10), to order spare parts.

5.3.1 554150 Link Connector

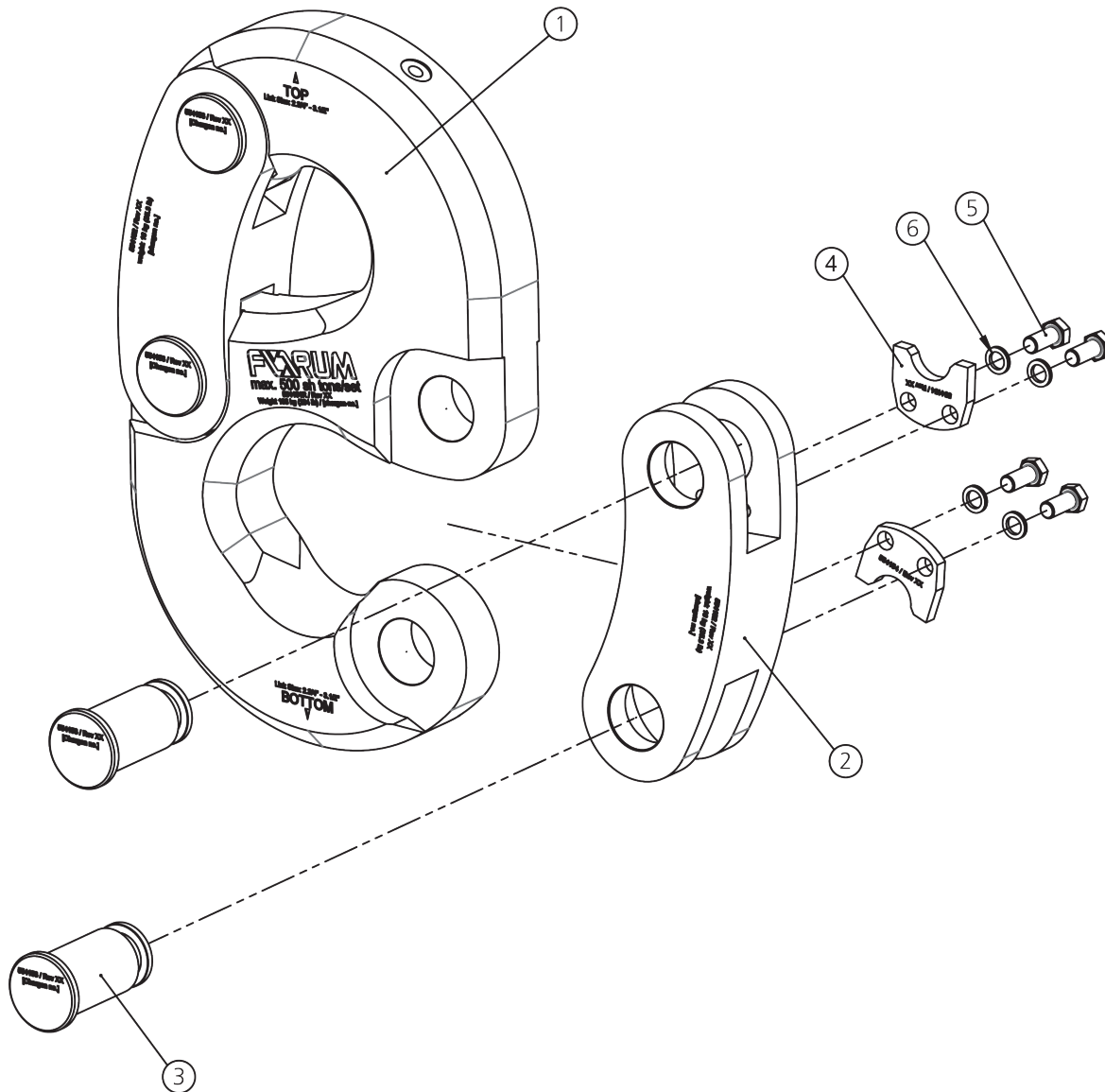


Fig. 30: 554150 Link Connector*

Part lists 554150

No.	Qty.	Part No.	Description
1	2	554151B-BF	S-Frame
2	4	554152	Link Block
3	8	554153	Link Block Pin
4	8	554154	Securing Plate
5	16	710541	Screw
6	16	792106	Washer

554150-RSP Recommended Spare part for 1 Year

No.	Qty.	Part No.	Description
1	1	554152	Link Block
2	2	554153	Link Block Pin
3	1	554154	Securing Plate
4	16	710541	Screw
5	16	792106	Washer

5.3.2 Link Extension - LE

Part No.	Description
234120-Y-LE	Link Extension 2.3/4" x 120"
234096-Y-LE	Link Extension 2.3/4" x 96"

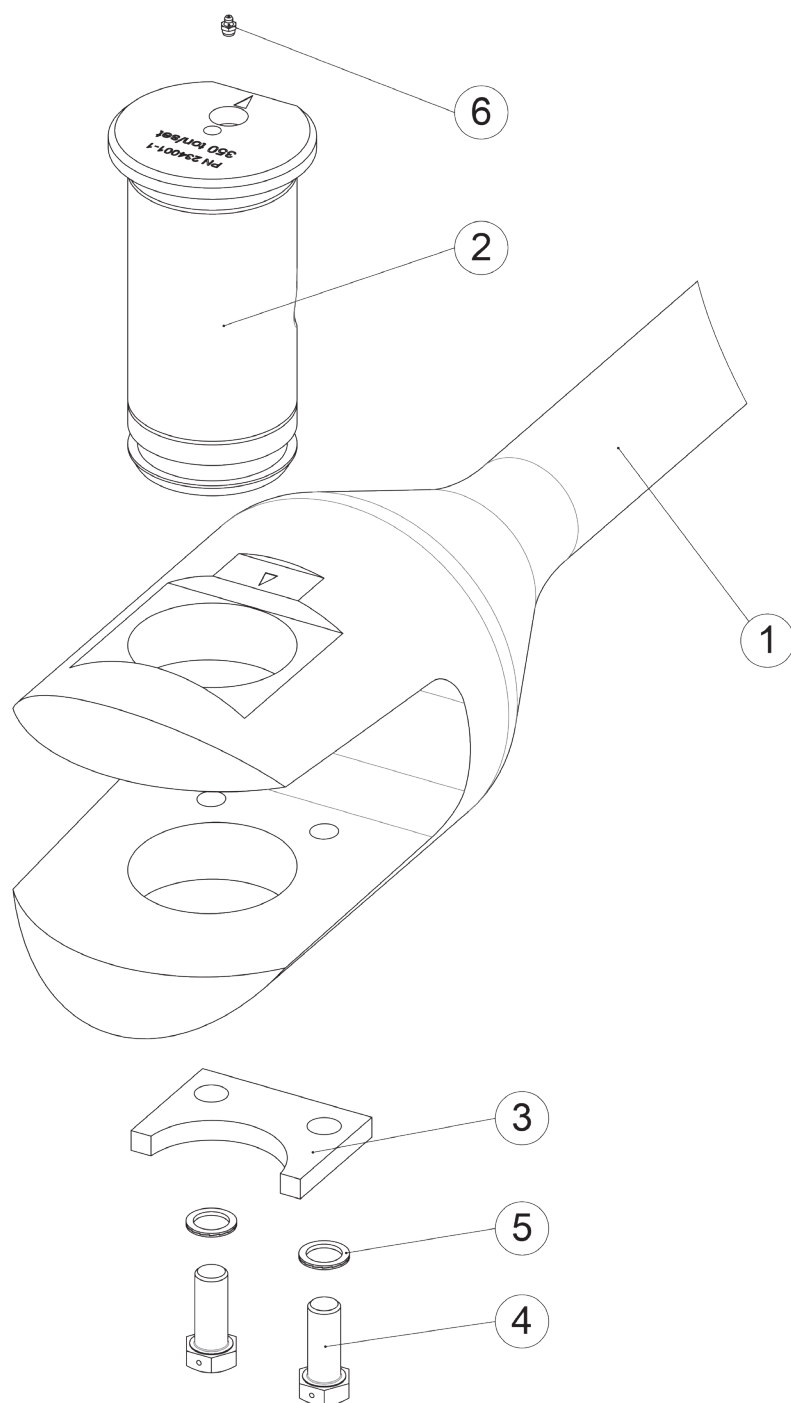


Fig. 31: Isometric view Link Extension - LE

Part lists / Spare parts 234120-Y-LE

No.	Qty.	Part No.	Description
1	1	234120-LE-BF	FORUM Handling Tools Type Set of Elevator Links
2	2	234001-1	Link Connector Bolt
3	2	554105-5	Securing Plate
4	4	234007	Screw
5	4	792171	Washer
6	2	70064	Grease Fitting

Part lists / Spare parts 234096-Y-LE

No.	Qty.	Part No.	Description
1	1	234096-LE-BF	FORUM Handling Tools Type Set of Elevator Links
2	2	234001-1	Link Connector Bolt
3	2	554105-5	Securing Plate
4	4	234007	Screw
5	4	792171	Washer
6	2	70064	Grease Fitting

5.3.3 Link Extension - LE2

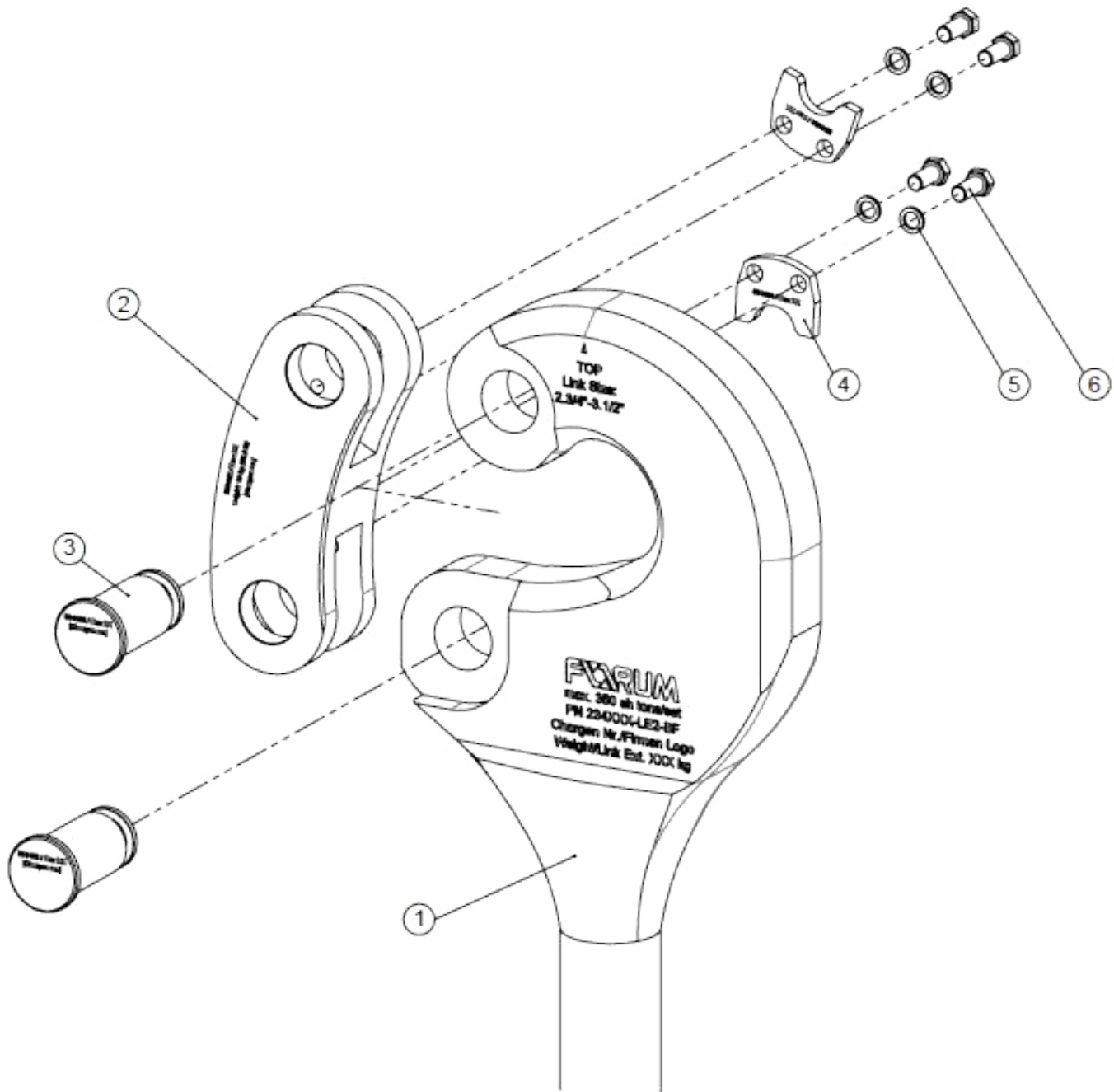


Fig. 32: Isometric view Link Extension - LE2

Parts List for 234xxx-Y-LE2_IM [Imperial] (312xxx-Y-LE2_IM [Imperial])

No.	Qty.	Part No.	Description
1	2	234xxx-LE2-BF [for 2.3/4" Link Extension 2.0] (312xxx-LE2-BF [for 3.1/2" Link Extension 2.0])	Link Extension 2.0
2	2	554152_IM	Link Block
3	4	554153	Link Block Pin
4	4	554154	Securing Plate
5	8	792106	Washer
6	8	613902-2	Screw

Parts List for 234xxx-Y-LE2 [Metric] (312xxx-Y-LE2 [Metric])

No.	Qty.	Part No.	Description
1	2	234xxx-LE2-BF [for 2.3/4" Link Extension 2.0] (312xxx-LE2-BF [for 3.1/2" Link Extension 2.0])	Link Extension 2.0
2	2	554152_IM	Link Block
3	4	554153	Link Block Pin
4	4	554154	Securing Plate
5	8	792106	Washer
6	8	710541	Screw

234000-Y-LE2 Spare Parts for 2.3/4" and 3.1/2" Link Extension 2.0

No.	Qty.	Part No.	Description
1	4	710541	Screw
2	4	792106	Washer
3	4	613902-2	Screw

INSPECTION / MAINTENANCE

INSPECTION /
MAINTENANCE

6 Inspection / Maintenance

This chapter provides important information on how to maintain Elevator Links, Elevator Link Extensions - LE/LE2 and Elevator Link Connectors correctly and economically. This information will help you avoid dangerous situations and reduce repair costs and downtime. In addition, by following the instructions, you will increase the reliability and life time of your equipment.



Ensure that inspection and maintenance work are always accomplished only by sufficiently qualified and trained personnel.



Read these instructions carefully before performing inspections and maintenance work on Elevator Links, Elevator Link Extensions - LE / LE2, Elevator Link Connectors.



WEAR EYE PROTECTION!



WEAR PROTECTIVE HELMET!



WEAR PROTECTIVE GLOVES!



WEAR SAFETY SHOES!

Instructions for inspection and maintenance

1. In the event of visible damages, deformations or increased wear, contact the FORUM Handling Tools Service or an authorized repair company.
2. Welding on Elevator Links, Elevator Link Extensions and Elevator Link Connectors are strictly forbidden.
3. Ensure that all other maintenance work is performed only by personnel trained for this work and familiar with the risks involved in operating these kind of equipment.
4. Ensure that all repair work not performed by FORUM Handling Tools is nevertheless accomplished in compliance with the manufacturer's specifications and instructions.
5. If minor cracks and surface anomalies have been detected, always contact FORUM Handling Tools. Do not start repair work on your own.
6. After repair always check the repaired part in a suitable manner to ensure that the defect has been remedied.

Requirements for maintenance work

1. The Elevator Links, Elevator Link Extensions - LE / LE2 and Elevator Link Connectors are secured and stable so that they can not tilt or fall.
2. The workplace is adequately dimensioned and illuminated.
3. The Elevator Links, Elevator Link Extensions - LE / LE2 and Elevator Link Connectors must be removed from the area around the drill hole center to prevent objects from falling into the drill hole during maintenance.



⚠ WARNING

Welding on Elevator Links, Elevator Link Extensions and Elevator Link Connectors are strictly forbidden.

6.1 Lubrication



⚠ WARNING

Lubricants can pose a health hazard!

Lubricants irritate skin and eyes.

» Avoid contact with lubricants.



WEAR EYE PROTECTION!



WEAR PROTECTIVE GLOVES!

INFO



Lubricants can be ordered by FORUM Handling Tools. Please contact the FORUM Handling Tools Technical Support or one of the authorized service companies.

Lubrication Points

All yellow surfaces marked on the Elevator Link, Elevator Link Extension or Elevator Link Connector must be lubricated. Apply a large amount of grease with a brush to suit your personal requirements.

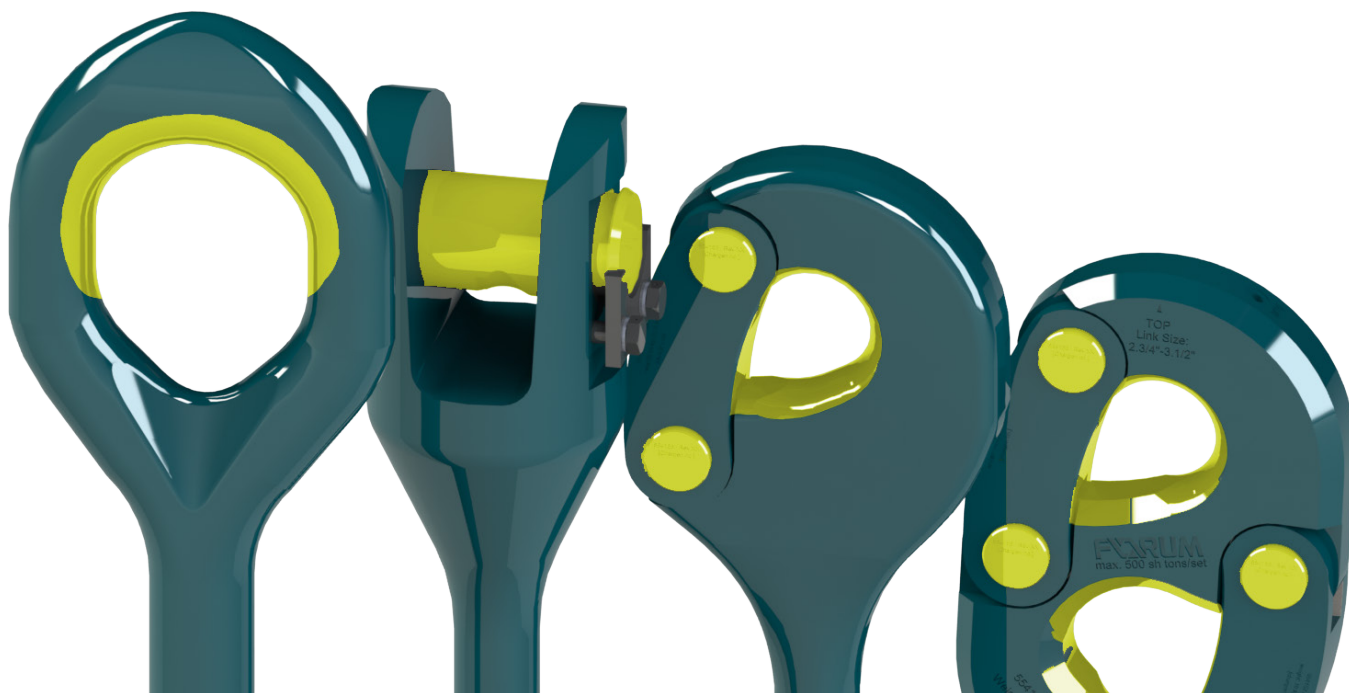


Fig. 33: Lubrication Points

6.2 Inspections

Inspections should be carried out according to the intervals and inspection categories specified in API RP 8B. By contrast, the frequency of necessary inspections depends on the operating conditions. Storage, disassembly, modification, repair and maintenance are always very suitable for inspections.

Before any inspection, remove any foreign material such as dirt, paint, lubricants, oil, abrasion from the affected bodies and components. Use suitable methods (pickling, steam cleaning, sand blasting, etc.).

After an inspection, the scope and results of tests carried out should be documented and kept.

Periodic inspections and inspections after critical events are carried out at the place of operation by the operators under the supervision of a supervisor.

In case of cracks or increased wear contact FORUM Handling Tools or an authorized service company.

INFO

The specified maintenance intervals are recommended for the Link during its service life. The necessity of inspections depends primarily on the following conditions:

- Ambient conditions
- Load cycles
- Regulatory requirements
- Period of use
- Tests
- Repairs
- Overhauls

Inspections after critical loads

Perform an inspection immediately after critical or unexpected loads. Critical loads can be:

- Shock loads when the pipe is set.
- Pulling on wedged drill rods.
- Exceeding permissible nominal loads.
- Operation at very low ambient temperatures
- (< -20 °C / -4 °F).

6.3 Inspection Categories

Always carry out a complete inspection according to the requirements of categories III and IV before and after critical loads. Each inspection must be carried out by a person with appropriate knowledge.

INFO



Inspection categories according to API RP 8B.

Category	Interval	Preparatory measures
I	Daily	Equipment mounted
II	Weekly	Equipment mounted
III	Semiannually	Equipment disassembled
IV	Annually	Equipment disassembled

INFO



The above-mentioned inspection intervals refer to a 100% use of the equipment on each day of a week (24 / 7). Personal inspection intervals may vary according to the type and extent of use and may need to be adjusted. All inspection categories are in accordance with the latest API RP 8B.

6.3.1 Inspection Category I

The Elevator Links have to be observed during operation. Recognizing inadequate performance and apparent defects is the goal of this category.

Scope/Prerequisites/Procedure:

- Daily visual inspection of the Elevator Links for damages and defects during operation. Repair them if necessary.
- Functional test.
- The test must be carried out by a person with appropriate expertise.

6.3.2 Inspection Category II

The inspection of category II includes all inspections of inspection category I and additional tests.

Scope/Prerequisites/Procedure:

- Checking the state of lubrication, the condition of the entire Link and settings.
- The test must be carried out by a person with appropriate expertise.

6.3.3 Inspection Category III

The inspection of category III includes all inspections of inspection category II and additional tests.

Scope/Prerequisites/Procedure:

- Non-Destructive Testing (NDT) of selected critical areas and verification of all wear limits.
- Before carrying out an NDT test, remove all foreign material such as dirt, paint, lubricants, oil, abrasion from the affected parts. Use suitable methods such as pickling, steam cleaning and sandblasting.

6.3.4 Inspection Category IV

The inspection of category IV includes all inspections of inspection category III and additional tests.

Scope/Prerequisites/Procedure:

- Before carrying out an NDT test, remove all foreign material such as dirt, paint, lubricants, oil, abrasion from the affected parts. Use suitable methods such as pickling, steam cleaning and sandblasting.
- Non-destructive material testing (NDT) of all critical areas and replacement of selected consumables and hydraulic components.

6.4 Inspection Intervals and inspection tasks

Pos.	Task	Daily	Weekly	Semiannually	Annually
1	Function test.	✓	✓	✓	✓
2	Checks for signs of deformations, wear and corrosion.	✓	✓	✓	✓
3	Check for no loose components and presence of all warning signs.	✗	✓	✓	✓
4	Check for state of lubrication and conservation.	✗	✓	✓	✓
5	Check all possible settings.	✗	✓	✓	✓
6	Checking the condition of the overall structure (Elevator Links, Elevator) and the interaction of all components and possible attachments with the Elevator Links.	✗	✓	✓	✓
7	Checking wear limits (component measurement).	✗	✗	✓	✓
8	NDT tests of selected components	✗	✗	✓	✓
9	Complete NDT test of all critical areas.	✗	✗	✗	✓
10	Replacement of wear-intensive components (recommended spare parts).	✗	✗	✗	✓
		✓	Necessary	✗	Not necessary

INFO

NDT Non-destructive testing



- Magnetic Particle Inspection (MPI)
- Ultrasonic Measurement Methods (UT)
- Eddy Current Testing (ET)
- Dye Penetrant Inspection (DPI)

6.5 Check Lists for Inspections

INFO



The following check lists serve as copy templates for inspections to be performed in compliance with API 8B and are required to file performed inspections as defined in the user manual. Inspections must always be documented and stored safely.



Ensure that maintenance work is accomplished only by sufficiently qualified and trained personnel.

Machine model

- ☐ Elevator Link
☐ Links Connector
☐ Links Extension

Serial number

Part number

Inspection Category I

Date / Place of Inspection	Checked OK NOK	Name of Inspection Operator / Supervisor	Sign.
	<input type="checkbox"/> <input type="checkbox"/>		

Remarks:

Inspection Category II

Date / Place of Inspection	Checked OK NOK	Name of Inspection Operator / Supervisor	Sign.
	<input type="checkbox"/> <input type="checkbox"/>		

Remarks:

Inspection Category III

Date / Place of Inspection	Checked OK NOK	Name of Inspection Operator / Supervisor	Sign.
	<input type="checkbox"/> <input type="checkbox"/>		

Remarks:

Inspection Category IV

Date / Place of Inspection	Checked OK NOK	Name of Inspection Operator / Supervisor	Sign.
	<input type="checkbox"/> <input type="checkbox"/>		

Remarks:

6.5.1 Wear Dimensions Elevator Link

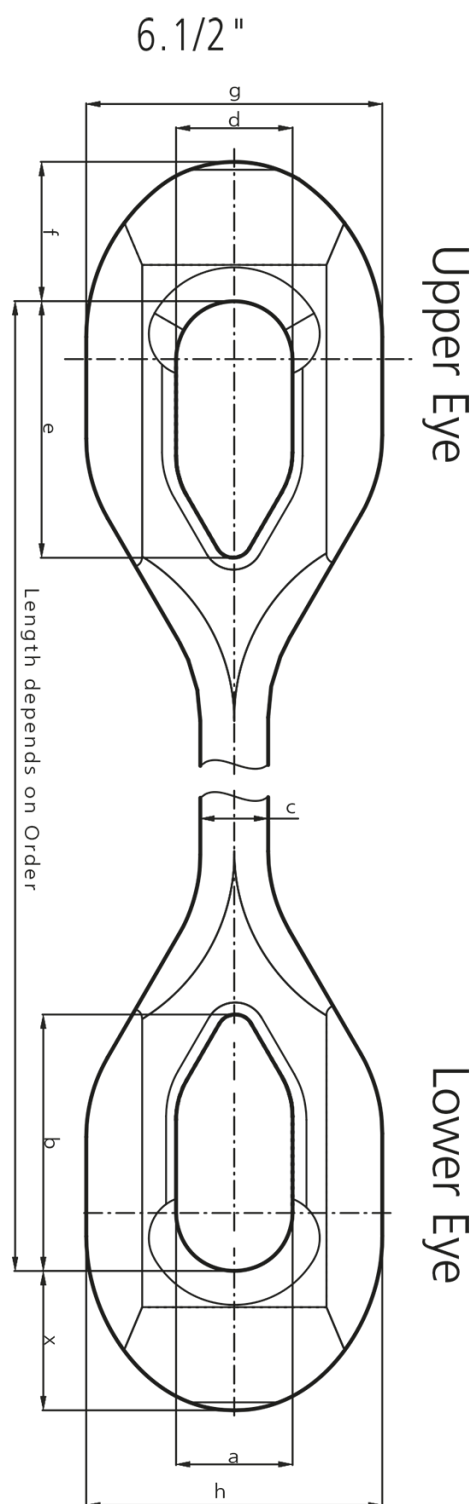


Fig. 34: Wear dimensions of the Elevator Link

6.5.2 Wear table Elevator Link

Type Series wear table

		1.¾-150 tons		2.¼-250 tons		2.¾-350 tons		3.½"-500 tons		4.¾"-750 tons	
		New	max. Wear	New	max. Wear	New	max. Wear	New	max. Wear	New	max. Wear
Dimension f	[in]	3.62	3.¾	4.92	4.¾	5.24	4.¾	5.96	5.⅝	4.53	4.¾
	[mm]	92.0	85.7	125.0	120.7	133.0	120.7	151.5	142.9	115.0	111.1
Dimension x	[in]	2.09	1.⅝	2.26	2.⅛	2.78	2.⅝	3.46	3.¼	4.53	4.¾
	[mm]	53.0	46.8	57.5	54.0	70.5	66.7	88.0	82.6	115.0	111.1
Capacity per set	[ton]	150	150	250	250	350	350	500	500	750	750
	10 ³ daN	135	135	222	222	312	312	445	445	670	670

		5.½"-1000 tons		5.½"-1250 tons		6.½"-1500 tons	
		New	max. Wear	New	max. Wear	New	max. Wear
Dimension f	[in]	8.07	7.¾	8.07	8.⅛	6.49	6.¾
	[mm]	205.0	196.8	205.0	204.8	164.0	161.9
Dimension x	[in]	8.07	7.¾	8.07	8.⅛	6.49	6.¾
	[mm]	205.0	196.8	205.0	204.8	164.1	161.9
Capacity per set	[ton]	1000	1000	1250	1250	1500	1500
	10 ³ daN	893	893	1116	1116	1334	1334

MTO'Elevator Link wear table

		6.½"-1380 tons	
		New	max. Wear
Dimension f	[in]	13.46	13.⅝
	[mm]	342.0	346.0
Dimension x	[in]	13.46	13.⅝
	[mm]	342.0	346.0
Capacity per set	[ton]	1380	1380
	10 ³ daN	1232	1232

¹ MTO - Made to [Customer specific] Order

6.5.3 Wear table Elevator Link Connector

Elevator Link Connector	A	B	C	D	E
New Dimension max:	62,05 [2,44]	63,50 [2,5]	61,89 [2,44]	136,50 [5,37]	136,50 [5,37]
Dimension max worn:	62,44 [2,46]	63,89 [2,52]	61,49 [2,42]	135,70 [5,34]	135,70 [5,34]

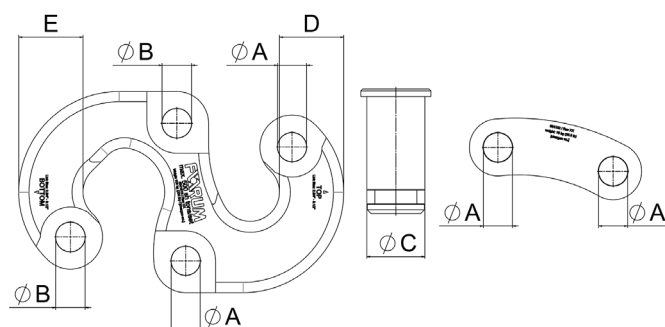


Fig. 35: Measure points wear Elevator Link Connector*

6.5.4 Wear table Elevator Link Extension - LE

Elevator Link Extension	
A New Dimension:	129,9 mm
A max worn:	129,4 mm
B New Dimension:	130,3 mm
B max worn:	130,8 mm
C New Dimension:	120,4 mm
C max worn:	119,9 mm

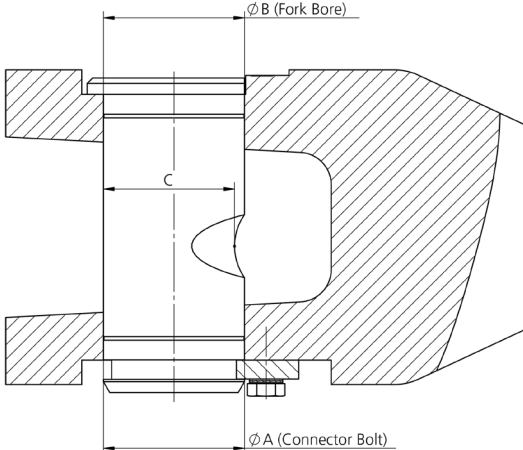


Fig. 36: Measure points wear Elevator Link Extension - LE

6.5.5 Wear table Elevator Link Extension - LE2

Elevator Link Connector	A	B	C	E
New Dimension max:	62,05 [2,44]	63,50 [2,5]	61,89 [2,44]	136,50 [5,37]
Dimension max worn:	62,44 [2,46]	63,89 [2,52]	61,49 [2,42]	135,70 [5,34]

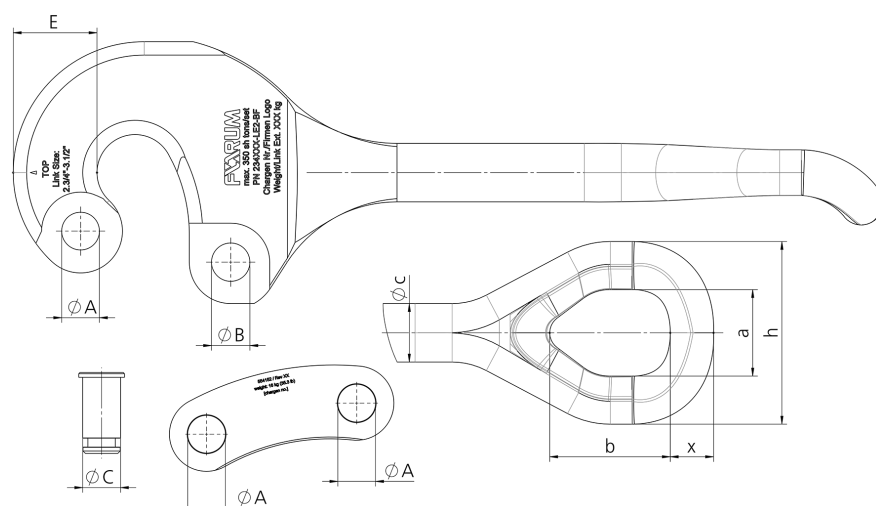


Fig. 37: Measure points wear Elevator Link Extension - LE2

6.5.6 Critical area overview

The marked critical areas have to be checked as described in the inspection list.

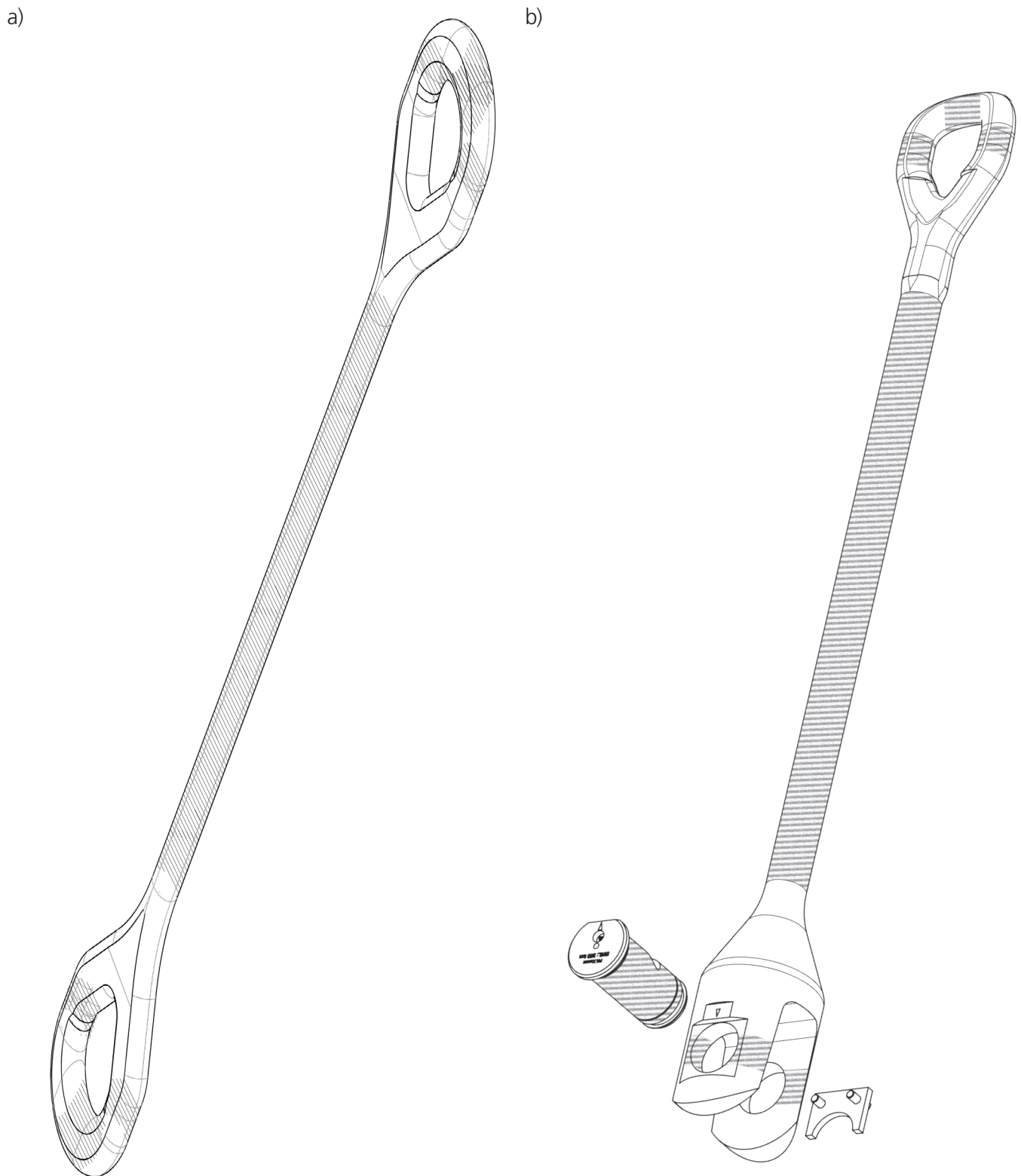


Fig. 38: critical areas: a) Elevator Links, b) Elevator Links Extension - LE

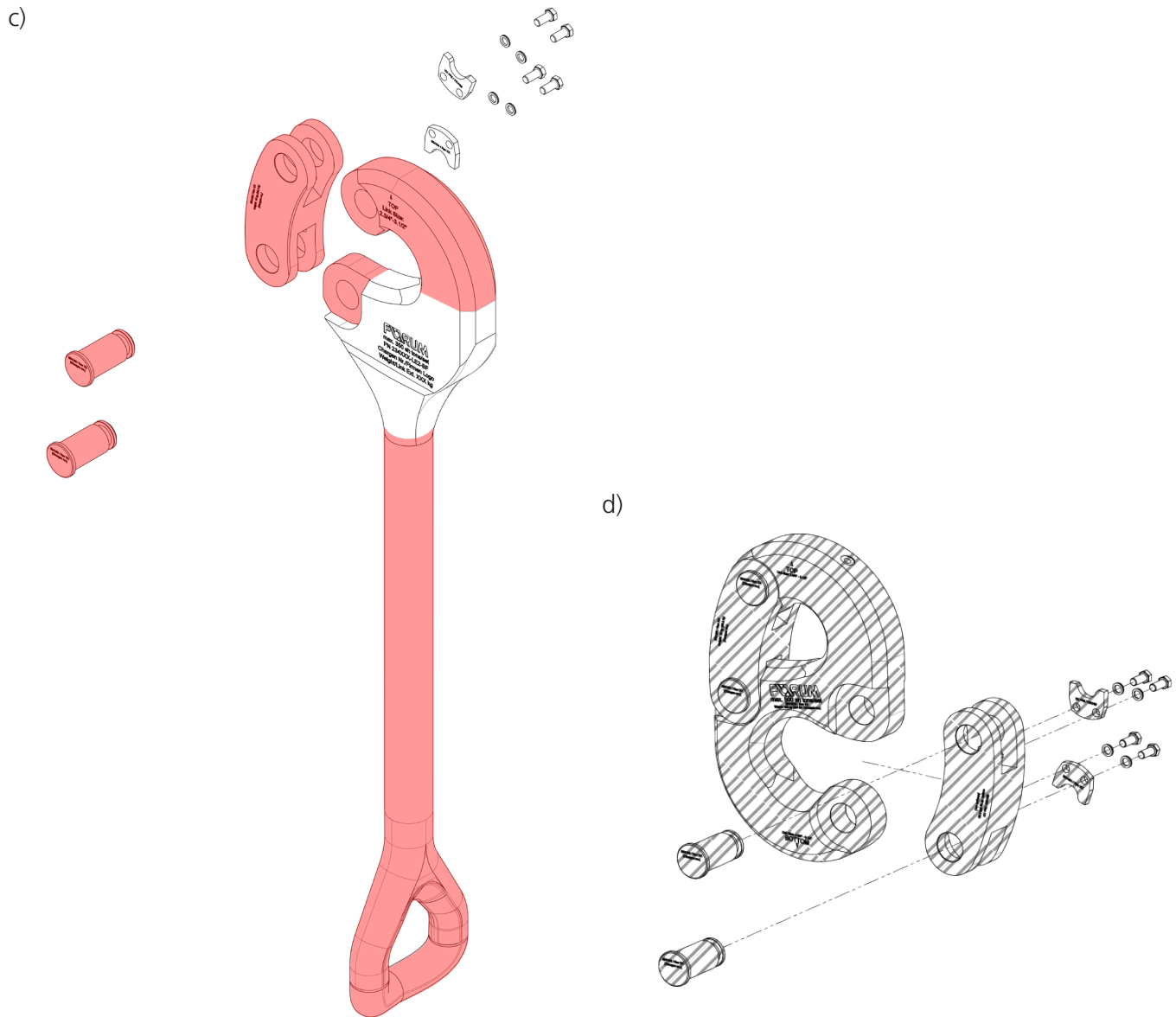


Fig. 39: c) critical areas: Elevator Links Extension - LE2, d) Elevator Link Connector

6.6 Cleaning



⚠ WARNING

Health hazards from service products!

Splashes of cleaning supplies, and dirt.

- » ALWAYS wear your personal protective equipment.



WEAR EYE PROTECTION!



WEAR PROTECTIVE GLOVES!

The operating conditions and operating environment result in contamination on the equipment. Remove this contamination regularly to prevent incrustation and ensure safe operation of the equipment. The equipment should be cleaned thoroughly at the end of each shift at the latest. FORUM Handling Tools recommends cleaning the equipment with a high pressure steam cleaner.

STORAGE / DISPOSAL

STORAGE /
DISPOSAL

7 Storage / Disposal

7.1 Storage

Safe Storage

1. Clean the Elevator Links / Elevator Link Extensions / Elevator Link Connectors, before you store them.
2. Always use pallets with borders and frames for Storage.
3. Always ensure that Elevator Links / Elevator Link Extensions / Elevator Link Connectors are fixed and stored securely.
4. Ensure that Elevator Links / Elevator Link Extensions / Elevator Link Connectors are stored so that people can not be injured by moving parts or sharp edges.
5. Store Elevator Links / Elevator Link Extensions / Elevator Link Connectoren only on flat and stable surfaces, which are designed for the weight.
6. Preserve your Elevator Links / Elevator Link Connectors by covering them with a foil and providing corrosion protection on all bare surfaces.
7. Check the state of your preservation when stored for a longer period.

Intermediate Storage

Protection of equipment	<ul style="list-style-type: none"> • Apply corrosion preventative to all bare surfaces. • Protect all other bare surfaces with Tectyl Type 864 or an equivalent agent. • Place Elevator Links / Elevator Link Extensions / Elevator Link Connectors only on surrounded pallets, frames and secure them with tensioning cables and anti-slip mats.
Ambient Conditions	<ul style="list-style-type: none"> • Store in dry surroundings (maximum humidity 80%).

Longer Storage

Protection of equipment	<ul style="list-style-type: none"> • Apply corrosion preventative to all bare surfaces. • Protect all other bare surfaces with Tectyl Type 864 or an equivalent agent. • Place Elevator Links / Elevator Link Extensions / Elevator Link Connectors only on surrounded pallets, frames and secure them with tensioning cables and anti-slip mats. • Protect the Elevator Links / Elevator Link Extensions / Elevator Link Connectors against water penetration with a plastic tarp.
Ambient Conditions	<ul style="list-style-type: none"> • Store in dry surroundings (maximum humidity 80%).

7.2 Disposal

Elevator Links / Elevator Link Extensions / Elevator Link Connectors do not pose any hazard for users or the environment. However, operation of the Elevator Links / Elevator Link Extensions / Elevator Link Connectors requires use of lubricants and cleaning agents which can pollute the environment. For this reason, always ensure that such substances are disposed of properly according to international, national and local regulations. The dispose of greases, oily cleaning rags or oily water together with industrial or domestic wastes is forbidden. Observe the safety data sheets published by the manufacturers on environmental hazards and disposal of the service and operating products used. Ensure that all service and operating products as well as replacement parts are disposed of safely and ecologically. Please note specifically that FORUM Handling Tools is not obligated to take back used equipment.

List of Service Products Used

The safety data sheets for the materials used are available in the appendix of this manual.

7.3 Storage Examples

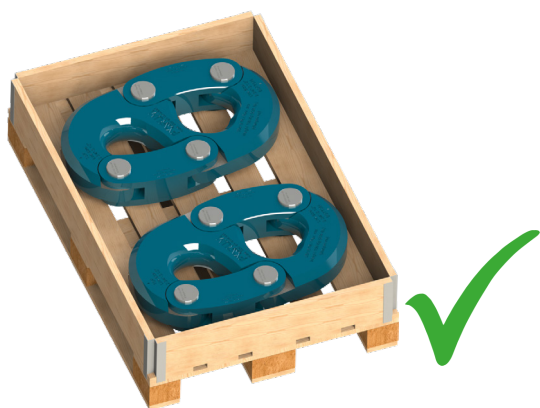


Fig. 40: Correct storage on pallet with pallet borders

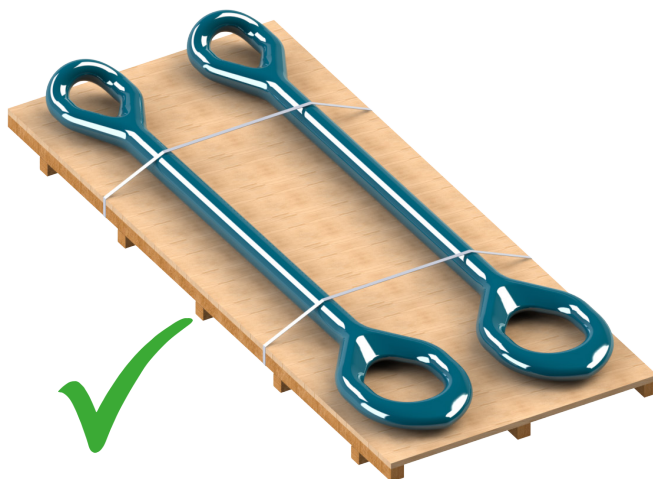


Fig. 42: Correct storage on pallet with fixation cables

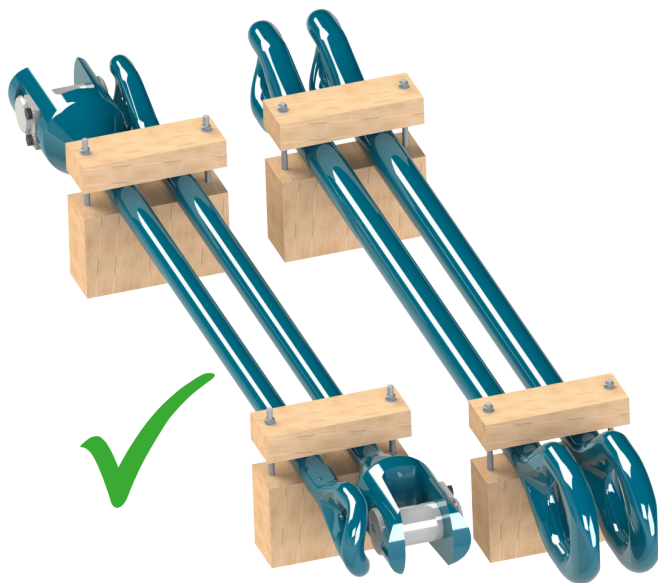


Fig. 41: Correct storage with frames

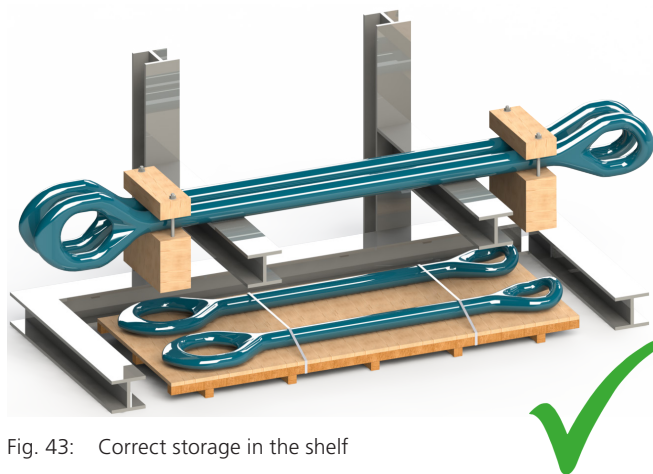


Fig. 43: Correct storage in the shelf



Fig. 44: Incorrect storage

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APPENDIX

APPENDIX

8 Appendix

A.	SAMPLE OF EC DECLARATION I	67
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A. Sample of EC Declaration I



FORUM B + V Oil Tools GmbH

EC-DECLARATION OF CONFORMITY

We,

**FORUM B + V Oil Tools GmbH
Hermann-Blohm-Strasse 2
20457 Hamburg / Germany**

declare that the products: **Elevator Links 150 / 250 / 350 / 500 / 750 / 1000 / 1250 / 1380 / 1500**

which is the subject of this declaration, fulfils all of the relevant requirements of:

2006/42/EC	Machinery Directive
2014/34/EC	ATEX Directive of Equipment for use in hazardous areas

Amongst others following harmonized and technical standards and specifications were used:

API 8C, 5. Edition	Specification for Drilling and Well Servicing Equipment
ISO 14693	Petroleum and natural gas industries - Drilling and well-servicing equipment
DIN EN ISO 12100	Safety of machinery, Risk assessment and Risk Reduction
DIN EN ISO 80079-36	Non-electrical equipment for use in potentially explosive atmospheres

Description of Product:

The following named lifting accessory will be described in more detail in the accompanying Data Book and/or certificate and the associated Technical Documentation

Product / Device Type: [refer to data book]
 Rated Capacity: [refer to data book]
 Part Number: [refer to data book]
 Serial Number: [refer to data book]
 Delivery date: [refer to data book]
 Order No.: [refer to data book]
 Marking: **CE** **Ex** II 2G T6

The Engineering Manager of FORUM B + V Oil Tools GmbH, Hermann-Blohm-Strasse 2, 20457 Hamburg, Germany, is authorized to compile the technical files. Documents in accordance to Directive 2014/34/EU Article 13 (1) b) ii) have been deposit at the notified body IBExU - Institut für Sicherheitstechnik GmbH, Fuchsmühlenweg 7, D-09599 Freiberg, Notified Body No. 0637, reference IB-14-6-001/200, Archive-No. 219/14. FORUM B + V Oil Tools has established a quality assurance system in accordance to ISO 9001 and API 01 approved by API Quality Registrar, Washington D.C./USA, Registration No. 2850 + 01-2769.

Hamburg, issued on [refer to data book]

Authorized Representative

Name
Position


Matthias Theiss
Managing Director























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Blohm + Voss is a trademark of Blohm + Voss Shipyards GmbH®












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Banking: HSBC Trinkaus & Burkhardt AG
BIC / SWIFT: TUBD DE 33 033
EUR-Acc.: IBAN: DE73 3003 0880 0012 8350 19
USD-Acc.: 401 / 2835 / 006 / IBAN: DE50 3003 0880 4012 8350 06
14.09.2017

Fig. 45: EC Certificate of Conformity Sample I

B. Third Party Documents

I Safety Data-Sheet

Material Name	Link to file
[Aerosol] Krylon Paint Aerosols	
[Aerosol] Rust O Leum Paint Aerosols	
[Hydraulic Fluid] Aral Vitam GF 32	
[Hydraulic Fluid] Citgo AW 68	
[Hydraulic Fluid] Conoco Megaflow AW 32 68	
[Hydraulic Fluid] Shell Tellus S2 M 32	
[Hydraulic Fluid] Shell Tellus S2 M 68	
[Hydraulic Fluid] Shell Tellus S2 V 15	
[Hydraulic Fluid] Shell Tonna S2 M 68	
[Lubricant] Buster 2007	
[Lubricant] AVIATICON FETT XRF	
[Lubricant] KO5	
[Lubricant] Lubrimatic Multipurpose Lithium	
[Lubricant] MasterPro Hi Temp WB	
[Lubricant] Mobil CM L	
[Lubricant] Mystik JT 6 Multi purpose #2	
[Lubricant] Permatex 767 Anti Seize Lubricant	
[Lubricant] Shell Gadus S2 V220 2	
[Lubricant] Shell Stamina RLS 2	
[Lubricant] Sprayon LU 100 White Lithium	
[Lubricant] Super S Hi Temp Red	
[Lubricant] Thermaplex Hi Temp Bearings	

Material Name	Link to file
[Paint] Paint Gallon	
[Paint] Paint Marker	
[Paint] Paint Marking Ink	
[Paint] Ruthless Paint and Varnish Remover	
[Paint] Startex Paint Thinner	
[Paint] Uni Paint Markers	
[Safety adhesive] Loctite 242 Threadlocker	
[Safety adhesive] Loctite 262 (High Strength)	
[Safety adhesive] Loctite 515 Gasket Eliminator	
[Safety adhesive] Loctite Clover Compound	
[Safety adhesive] Loctite Silver Grade Anti Seize	

II Components

Component Name	Link to file
[Safety Washer] NordLock	
[Lifting] RUD VRS Starpoint	
[Lifting] RUD VLBG Load Ring	

Our goal is to become the leading provider of mission critical oilfield products and related services in terms of customer satisfaction, safety and financial performance.

Our experienced management team and employees are dedicated to solving our customers' problems. We invest in long term relationships and cooperate on product development with our clients, we consider them our partners.

OUR CORE VALUES

- Integrity:** In everything we do, in every interaction, both internally and externally, we strive to operate with the upmost integrity and mutual respect.
- Customer focused:** Our products enhance our customer's performance and we listen to their needs and work with them to solve their challenges.
- Good place to work:** We are committed to creating a workplace that fosters innovation, teamwork and pride. Every team member is integral to our success and is treated equally and fairly.
- No one gets hurt:** The safety of our employees and customers is our first priority coupled with a healthy respect for the environment.



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