

Operating Instructions

Original

Lashing Chains

Grade 8 and 10/XL

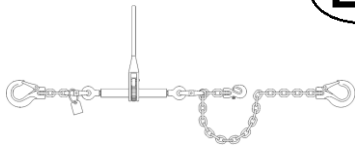
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1 Description and Intended Use

THIELE lashing chains consist of round steel chains (according to DIN EN 818-2), associated components and tensioning elements and are designed according to DIN EN 12195-3 for securing the load of solid goods on road vehicles.

Lashing chains are particularly suitable for direct lashing of heavy loads.

THIELE lashing chains are manufactured in assembled designs with clevis systems and/or connecting links. Components are usually hooks, connecting links, tensioning and shortening elements. There are various types which differ in length, nominal size and combination of components.

THIELE lashing chains have a safety factor of at least 2 in relation to the maximum lashing capacity (LC).

Lashing chains and associated components are marked with nominal chain size, grade, manufacturer's mark (e.g. BG stamp 'H4') and traceability code.

Lashing chains are made of round steel chains and components of the same nominal size and grade. Documentation (operating instructions, etc.) has to be prepared for any deviating versions.

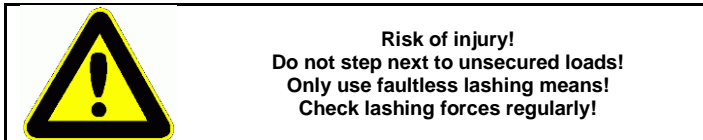
Round steel chains and components are generally identical in construction to those in chain sling assemblies for lifting loads. Therefore, the same instructions and standards for use and maintenance apply to them.

Lashing chains may only be used,

- in conjunction with suitable lashing points on the vehicle and on the load,
- within the permissible lashing forces,
- within the permissible lashing types and lashing angles,
- within the permissible temperature limits,
- with suitable connecting links and components,
- by instructed and authorized persons.

Lashing chains must not be used for lifting or transport of persons.

2 Safety Notes



- Operators, fitters and maintenance personnel must in particular observe the vehicle operating manual, the documentations DGUV V 1, DGUV V70 and DGUV I 214-003 issued by the German Employers' Liability Insurance Association, the VDI guideline sheets 2700, the standards DIN EN 12195, DIN 685-5, as well as the StVO and StVZO.
- Outside the Federal Republic of Germany the specific provisions issued locally in the country where the items are used must also be observed. The directions given in these Operating Instructions and specified documentations relating to safety, assembly, operation, inspection and maintenance must be made available to the respective persons.
- Make sure these Operating Instructions are available in a place near the product during the time the equipment is used. Please contact the manufacturer if replacements are needed. See also chapter 11.
- When performing work make sure to wear your personal protective equipment!
- **Improper assembly and use may cause personal injury and/or damage to property.**
- Assembly and removal as well as inspection and maintenance must exclusively be carried out by skilled and authorized persons.
- Structural changes are impermissible (e.g. welding, bending).
- **Operators must visually inspect the lashing chain and check the function of the safety devices before each use.**
- Never put to use worn-out, bent or damaged lashing chains.
- Never expose lashing chains to loads exceeding the specified lashing capacity LC.
- Do not use force when mounting/positioning the lashing chains or attachment components.
- Make sure the load can take the forces to be applied without suffering deformation.

- Do not tip-load a hook.
- Do not twist or knot the chains together.
- Avoid choke hitch applications if possible. The lashing capacity is reduced to 80 % if choke hitch applications are involveld.
- Avoid sharp edges. Use edge protectors or reduce the lashing capacity LC by 20 %.
- Hooks must have well-functioning safety latches.
- Safety elements must not be excessively stressed or strained operationally.
- Do not stress chain links and components to bending. For example, hooks must not bear against the edges of the vehicle.
- Make sure only to use shortening/grab hooks or claws for chain shortening purposes.
- The use of shortening elements is only permitted with additional safety elements against unintentional loosening (e.g. shortening hooks according to TWN 0827/1, TWN 1827/1) ¹⁾.
- **Shortening hooks may only be used to shorten the chain; a direct connection e.g. at sheet metal edges is forbidden.**
- In case of shortening claws only put loads on the chain exiting the claw pocket bottom.
- **If two chain legs are mounted into one connecting link half for the alternate use of the legss (e.g. chain leg with hook and short chain leg with shortening element), only one of the two chain legs may be loaded!**
- Make sure no one including you (operator) is in the way of the moving load (hazard area).
- Only remove lashing means by hand.
- Avoid parts of the lashing chain to get caught under the load.
- When using tensioning elements, ensure that both sides of the spindle are extended or retracted symmetrically so that the greatest possible tension path is available.
- **Prior to opening the lashing, it must be ensured that the load poses no danger of tipping over or falling out, especially if the vehicle is standing on an inclined plane.**
- Check the lashing means regularly during longer transport times and after unattended breaks.
- The simultaneous use of different lashing means for securing in the same direction of loading is not permitted due to different behaviour.
- Before further transport of the load, e.g. by lifting, all lashing means must be removed from the load.
- Draw up a load securing protocol before transport.
- In the event of doubts about the use, inspection, maintenance or similar things contact your safety officer or the manufacturer!

THIELE will not be responsible for damage caused through non-observance of the instructions, rules, standards and notes indicated!

As regards quality grade 10/XL THIELE does not give its general approval to the assembly of components stemming from different manufacturers!

Lashing chains are not permissible for the transportation of persons!

1) TWN = THIELE shop standard

3 Commissioning

When using the lashing means for the first time ensure that

- the components are as ordered and are undamaged,
- test certificates and operating instructions are included
- markings and documents are matching,
- the inspection cycles and the competent persons are intended for inspection,
- a visual and functional check is carried out and documented,
- all related documents are properly stored in a safe place.

Dispose of all packaging material according to local environmental regulations.

4 Technical Data of round steel chains and components


4.1 Round steel chain TWN 0805, Grade 8

| Size | Lashing capacity LC [daN] | Article No. RAL 9005 | Mass [kg/m] |
|------|---------------------------|----------------------|-------------|
| 8-8 | 4.000 | F01465 | 1,4 |
| 10-8 | 6.300 | F01470 | 2,2 |
| 13-8 | 10.000 | F01475 | 3,8 |
| 16-8 | 16.000 | F01480 | 5,7 |


4.2 Round steel chain TWN 1805, Grade 10/XL

| Size | Lashing capacity LC [daN] | Article No. RAL 5002 | Mass [kg/m] |
|----------|---------------------------|----------------------|-------------|
| 8-10/XL | 5.000 | F01615B | 1,5 |
| 10-10/XL | 8.000 | F01622B | 2,3 |
| 13-10/XL | 13.400 | F01629B | 3,9 |
| 16-10/XL | 20.000 | F01635B | 5,8 |


4.3 Connecting links TWN 1320, Grade 8

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|------|---------------------------|-------------|
|  | 8-8 | 4.000 | F30816 |
| | 10-8 | 6.300 | F30826 |
| | 13-8 | 10.000 | F30836 |
| | 16-8 | 16.000 | F30846 |


4.4 Connecting links TWN 1820, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|----------|---------------------------|-------------|
|  | 8-10/XL | 5.000 | F30817 |
| | 10-10/XL | 8.000 | F30827 |
| | 13-10/XL | 13.400 | F30837 |
| | 16-10/XL | 20.000 | F30847 |


4.5 Sling hook with clevis TWN 1340/1, Grade 8

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|------|---------------------------|-------------|
|  | 8-8 | 4.000 | F336110 |
| | 10-8 | 6.300 | F336210 |
| | 13-8 | 10.000 | F336310 |
| | 16-8 | 16.000 | F336410 |


4.6 Sling hook with clevis TWN 1840/1, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|----------|---------------------------|-------------|
|  | 8-10/XL | 5.000 | F336150 |
| | 10-10/XL | 8.000 | F336250 |
| | 13-10/XL | 13.400 | F336350 |
| | 16-10/XL | 20.000 | F336450 |


4.7 Shortening hook with clevis TWN 0827/1, Grade 8

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|------|---------------------------|-------------|
|  | 8-8 | 4.000 | F33201 |
| | 10-8 | 6.300 | F33211 |
| | 13-8 | 10.000 | F33221 |
| | 16-8 | 16.000 | F33231 |


4.8 Shortening hook with clevis TWN 1827/1, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|----------|---------------------------|-------------|
|  | 8-10/XL | 5.000 | F33205 |
| | 10-10/XL | 8.000 | F33215 |
| | 13-10/XL | 13.400 | F33225 |
| | 16-10/XL | 20.000 | F33235 |

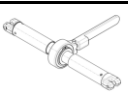
4.9 Shortening claw RAPID TWN 1852, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Article No. |
|---|----------|---------------------------|-------------|
|  | 8-10/XL | 5.000 | F34775 |
| | 10-10/XL | 8.000 | F34780 |
| | 13-10/XL | 13.400 | F34785 |
| | 16-10/XL | 20.000 | F34790 |

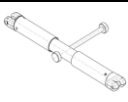
4.10 Short screw tensioner with toggle TWN 1450, Grade 8

| Type | Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|---|------|---------------------------|-------------------------------------|-------------|
|  | 8-8 | 4.000 | 1.800 | F34179 |
| | 10-8 | 6.300 | 2.200 | F34199 |
| | 13-8 | 10.000 | 2.600 | F34189 |
| | 16-8 | 16.000 | --- | --- |


4.11 Short screw tensioner with ratchet TWN 1451, Grade 8

| Type | Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|---|------|---------------------------|-------------------------------------|-------------|
|  | 8-8 | 4.000 | 1.800 | F34175 |
| | 10-8 | 6.300 | 2.200 | F34195 |
| | 13-8 | 10.000 | 2.600 | F34185 |
| | 16-8 | 16.000 | --- | --- |

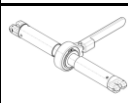
4.12 Screw tensioner with toggle TWN 1452, Grade 8

| Type | Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|---|------|---------------------------|-------------------------------------|-------------|
|  | 8-8 | 4.000 | --- | --- |
| | 10-8 | 6.300 | --- | --- |
| | 13-8 | 10.000 | 2.600 | F341871 |
| | 16-8 | 16.000 | 3.100 | F34197 |

4.13 Screw tensioner with toggle TWN 1454, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|---|----------|---------------------------|-------------------------------------|-------------|
|  | 8-10/XL | 5.000 | --- | --- |
| | 10-10/XL | 8.000 | --- | --- |
| | 13-10/XL | 13.400 | 2.600 | F341877 |
| | 16-10/XL | 20.000 | 3.100 | F341977 |

4.14 Screw tensioner with ratchet TWN 1455, Grade 10/XL

| Type | Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|---|----------|---------------------------|-------------------------------------|-------------|
|  | 8-10/XL | 5.000 | --- | --- |
| | 10-10/XL | 8.000 | --- | --- |
| | 13-10/XL | 13.400 | 2.600 | F341878 |
| | 16-10/XL | 20.000 | 3.100 | F341978 |

4.15 Lashing chain with toggle TWN 1400, Grade 8



| Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|------|---------------------------|-------------------------------------|-------------|
| 8-8 | 4.000 | 1.800 | F34171 |
| 10-8 | 6.300 | 2.200 | F34172 |
| 13-8 | 10.000 | 2.600 | F34173 |
| 16-8 | 16.000 | 3.100 | F34174 |

Standardlänge 3500 mm, with shortening hook TWN 0827/1

4.16 Lashing chain with ratchet TWN 1401, Grade 8



| Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|------|---------------------------|-------------------------------------|-------------|
| 8-8 | 4.000 | 1.800 | F34171R |
| 10-8 | 6.300 | 2.200 | F34172R |
| 13-8 | 10.000 | 2.600 | F34173R |
| 16-8 | 16.000 | 3.100 | --- |

Standard length 3500 mm, with shortening hook TWN 0827/1

4.17 Lashing chain with toggle TWN 1410, Grade 10/XL



| Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|----------|---------------------------|-------------------------------------|-------------|
| 8-10/XL | 5.000 | --- | --- |
| 10-10/XL | 8.000 | --- | --- |
| 13-10/XL | 13.400 | 2.600 | F34183 |
| 16-10/XL | 20.000 | 3.100 | F34184 |

Standard length 3500 mm, with shortening claw RAPID TWN 1852

4.18 Lashing chain with ratchet TWN 1411, Grade 10/XL



| Size | Lashing capacity LC [daN] | Normal tension force S_{TF} [daN] | Article No. |
|----------|---------------------------|-------------------------------------|-------------|
| 8-10/XL | 5.000 | --- | --- |
| 10-10/XL | 8.000 | --- | --- |
| 13-10/XL | 13.400 | 2.600 | F34183R |
| 16-10/XL | 20.000 | 3.100 | F34184R |

Standard length 3500 mm, with shortening claw RAPID TWN 1852

4.19 Other components

Please refer to the documentation on the THIELE homepage „www.thiele.de“ for data on other components, e.g. safety load hooks or shackles.

5 Assembly and Disassembly

5.1 Preparatory actions

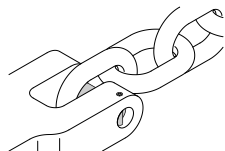
Ensure that the load to be secured, all components to be fitted and the vehicle are in perfect condition and that the lashing capacities of all components are sufficient.

Check the documentation for completeness.

The installation and operating instructions for all components must be observed.

5.2 Clevis-type Hook System

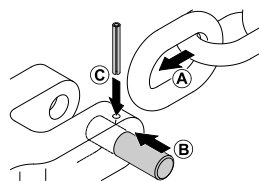
The fixed-size clevis-type hook system only permits attachment of the nominal chain size that suits the attachment component.



Assembly

If necessary, remove dowel pin and pin.

- Place end of chain leg between the lateral clevis elements.
- Push pin from the side fully into the clevis and through the last chain link of the leg.
- Drive dowel pin fully in (must not project) to secure the pin. The slot must face away from the pin.



Check whether the chain runs smoothly!

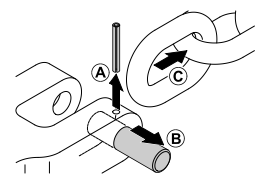
Only connect pins and attachment components of identical quality grades (starting with \varnothing 13 mm the pins are marked on the front end).

The dowel pins must only be installed once.

Disassembly

Slacken the respective chain leg.

- Drive dowel pin out using hammer and drift punch.
- Push pin out using a drift punch.
- Remove the chain.



A set of drifts to TWN 0945 is available by Article No. Z03303.

5.3 Connecting links

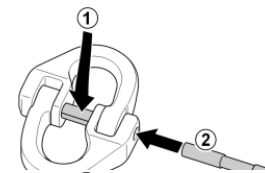
In mounted lashing chains the chains are, for example, joined to other components by means of connecting links. In this way, components can be mounted the nominal size of which deviates from that of the chain.

Sizes and quality grades of chain and connecting link must always coincide!

Assembly

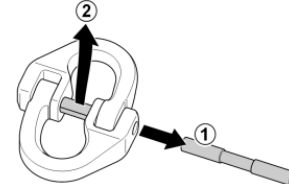
Install the connecting link halves in the components to be connected and join both halves.

- Position split sleeve as shown.
- Push pin up to the split sleeve, align pin bevels to suit split sleeve and drive the pin in using a hammer.
- Check to make sure split sleeve safely embraces the pin centrally.



Disassembly

- Use drift to drive pin out.
- Remove the split sleeve.
- Separate connecting link halves from the component they joined.



A set of drifts to TWN 0945 is available by Article No. Z03303.

The split sleeves must only be installed once.

Make sure the component to be connected can move freely within the connecting link halves they are placed in.

6 Usage

6.1 Normal Use

Plan and calculate load securing and lashing means of sufficient length and capacity in good time before departure. The selection and number of lashing means depends on the load to be secured, the type of load securing and the circumstances on the vehicle. For calculation details see DIN EN 12195-1 or corresponding VDI guidelines (e.g. VDI 2700). Also take partial discharges into account.

The lashing chains are usually attached to the load and the lashing points using their hooks on both sides. For this purpose, the hook mouth must surround the respective fastening point so that the safety latch also closes again. Take care not to twist the chain when attaching it.

Lifting means of a previous transport must not obstruct the load securing.

Lashing chains are usually equipped with a tensioning element. At the beginning, the two spindles of the tensioning element must each be unscrewed as far as the stop of the unscrewing safety device, so that an optimum tensioning path is available.

Depending on the equipment, a chain leg can be shortened by means of a shortening element so that the tensioning path of the tensioning element is sufficient to tighten the entire lashing chain. When shortening, make sure that the chain is not twisted and produces as little slack chain as possible.

The lashing chain is further shortened and tensioned by actuating the tensioning element. The maximum hand force with one hand must not exceed 50 daN. The use of lever extensions is not permitted. The normal tension force (S_{TF}) specified on the tag is achieved with a manual force of 50 daN

The tensioning element must be secured against unintentional release, e.g. by a safety chain. The safety chain is tight around the toggle to tie and fasten, so that an unintentional loosening of the tensioner is prevented. For tensioners with ratchets, the freewheel position or the fastening position must be set after lashing.

Only dimensionally stable loads are suitable for tie-down lashing with lashing chains. Note that lashing chains glide poorly over the load, especially at edges, and the lashing forces within a chain leg are not evenly spread. Therefore, when lashing down, the tensioning elements must be arranged alternately on the left and right sides of the vehicle and suitable edge protectors must be used.

If possible, the lashing chain should not be guided over edges. If this is unavoidable, edge protectors must be used. Sharp edges can damage lashing chains and cargo.

Make sure that the lever of the tensioning element does not project beyond the outer contour of the vehicle and that the marking tag is not jammed or damaged.

Two pairs of lashing chains must be used for diagonal lashing, for other lashings at least two lashing chains per load must be used.

With diagonal lashing, the lashing chains should be arranged symmetrically and pretensioned evenly so that they cannot hang or come loose unintentionally. Forces caused by vehicle accelerations in conjunction with very high preloads can lead to overloading of the lashing chain; therefore pretension the lashing chains carefully.

If possible, use anti-slip mats to effectively increase the coefficient of friction between load and vehicle.

All components of the lashing chains must not be in contact with other components when tensioned in order to avoid damage and to ensure full and safe functionality.

After a short drive, check the lashing means and its pretensioning.

Before opening the lashing means, ensure that the load is secure even without lashing means and that there is no danger of slipping and/or falling. In case of doubt, the load can be equipped with lifting means for further transport and thus secured. Completely remove the lashing means before further transport.

6.2 Influence of Temperature

Temperature application ranges of all components used:

| Grade | Temperature range |
|-------|---------------------|
| 8 | -40 °C ≤ t ≤ 100 °C |
| 10/XL | -30 °C ≤ t ≤ 100 °C |

When the lashing chains are to be used within other temperature ranges please get in touch with the manufacturer.

If the lashing chains have been exposed to temperatures exceeding the maximum values specified they must no longer be used.

The change in ambient temperature during the transport process can influence the preload forces. In the event of considerable increase of temperature after installation, the lashing forces must be checked.

6.3 Environmental Influence

Lashing chains must not be used in environments where acids, aggressive or corrosive chemicals or their fumes are present.

Hot-dip galvanizing or a galvanic treatment is prohibited as well.

Lashing chains must not be exposed to dirt that hinders the free movement of the components.

Cleaning with high-pressure water jets is not suitable.

6.4 Shortening Devices

When using shortening elements, e.g. shortening hooks or claws, please observe the corresponding separate operating and assembly instructions.

7 Marking

A tag is attached to lashing chains for identification.

Example:



Individual tags are available under Article No. Z07264.

8 Inspections, Maintenance, Disposal

Inspections and maintenance must be arranged for by the Owner!

Inspection deadlines shall be determined by the Owner!

Inspections must be carried out and documented by competent persons regularly but at least once a year, or more frequently if the lashing chains are in heavy-duty service. After three years at the latest they must additionally be examined for cracks. A load test shall never be considered a substitute for this examination.

The results of the inspection shall be entered into a register (DGUV I 209-062 or DGUV I 209-063) to be prepared when the lashing chain is first used. The register will show characteristic data of the chains and components as well as identity details.

Immediately stop using lashing chains that show the following defects:

- missing or illegible identification/markings,
- deformation, elongation or fractures of chains or components,
- cuts, notches, cracks, incipient cracks, pinching,
- links heated beyond permissible limits,
- severe corrosion,
- pitch elongation of individual chain links by more than 5 % each,
- reduction of the averaged link thickness by more than 10 % as mean value of measurements taken perpendicularly towards each other,
- impaired or missing safety systems, for example if the hook safety latch is defect,
- widening of the hook by more than 5 % or if the safe seating of the hook safety latch is no longer ensured,
- limited hinging capability (halves get stuck),
- wear in excess of 10 %, e.g. in the receiving area of the connecting link halves or of the pin diameter,
- spindle on the tensioning element is sluggish or blocked,
- missing or damaged pin locks or removal preventing guards.

Cleaning (e.g. prior to inspections) must not take place by using flames or methods that might cause hydrogen embrittlement (e.g. pickling or immersion in acidic solutions).

The following chain gauges are available for use during inspections:

- Chain gauges for quality grade 8: Art.-Nr. F48856
- Chain gauge, Size 8-10/XL: Art.-Nr. F01691
- Chain gauge, Size 10-10/XL: Art.-Nr. F01692
- Chain gauge, Size 13-10/XL: Art.-Nr. F01693
- Chain gauge, Size 16-10/XL: Art.-Nr. F01694

Inspection Service

THIELE offers inspection, maintenance and repair services by trained and competent personnel.

Maintenance

Maintenance and repair work must only be performed by competent persons.

Do not repair individual links but instead replace complete chain legs only.

If the safety latch of hooks does not longer engage properly with the tip of the hook chances are that not only the hook but also at least the chain leg might have been overloaded. In all such cases replace all items used in the respective leg (chain, shortening element, hook etc.).

Minor notches and cracks may be eliminated by careful grinding observing the maximum cross section reduction requirement of 10 % and avoid making more severe cuts or scores.

All maintenance and repair activities are to be documented.

Disposal

All components and accessories of steel taken out of service are to be scrapped in line with local regulations and provisions.

9 Spare Parts

See also chapter 4, Technical data.

Only use original spare parts.

Article Numbers for Spares Sets (Pins and Dowel Pins)

Clevis-type Hook System – Quality Grade 8

| Size | Article No. Spares Set | e.g for clevis-type hook systems of the components according to: |
|------|------------------------|--|
| 6-8 | F48694 | TWN 0810/1 -/2 -/4 Master links TWN 0811/1 -/2 -/4 Master links |
| 8-8 | F48352 | TWN 0812 Ring shackles |
| 10-8 | F48355 | TWN 0820 Oblong master links TWN 0827/1 Shortening hooks |
| 13-8 | F48358 | TWN 0835/1 Sling hooks TWN 1450 Screw tensioners |
| 16-8 | F48361 | TWN 1451 Screw tensioners TWN 1452 Screw tensioners |

Article Numbers for Spares Sets (Pins and Dowel Pins)

Clevis-type Hook System – Quality Grade 10/XL

| Size | Article No. Spares Set | e.g for clevis-type hook systems of the components according to: |
|----------|------------------------|--|
| 6-10/XL | F48686 | TWN 1810/1 -/2 -/4 Master links TWN 1811/1 -/2 -/4 Master links |
| 8-10/XL | F48687 | TWN 1812 Ring shackles |
| 10-10/XL | F48688 | TWN 1835 -/1 Sling hooks TWN 1827/1 Shortening hooks |
| 13-10/XL | F48689 | TWN 1454 Screw tensioners TWN 1455 Screw tensioners |
| 16-10/XL | F48690 | |

Detailed spare parts information can be found in the separate mounting or operation instructions for the components available for THIELE products at www.thiele.de or on request.

10 Storage

Make sure lashing chains and components are stored in dry locations at temperatures ranging between 0 °C and +40 °C. Avoid corrosion.

11 THIELE Operating and Mounting Instructions

Current operating and installation instructions are available as a PDF download on the homepage.



12 Impressum

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,# Changes to previous edition.