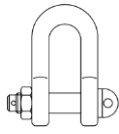


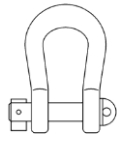
Special
Shackles

TWN 0870



Bolt Shackles
Form C

TWN 0871
TWN 1871



Load Shackles

TWN 0898
TWN 0898/1



The following Operating Instructions must always be followed to avoid the risk of personal injury or property damage.

Do not use a shackle before reading these Operating Instructions.

1. ABOUT THIS INSTRUCTION

This Operating Instructions describes in particular how shackles according to TWN 0870, TWN 0871, TWN 1871, TWN 0898 and TWN 0898/1 (TWN = THIELE Shop Standard) are to be safely used for lifting purposes.

The instructions apply analogously to components of identical design.

To comply with these Operating Instructions is essential to help avoid hazards and increases the reliability and service life of the shackles.



DANGER! Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.



WARNING! Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.



CAUTION! Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE! Is used to address practices not related to physical injury.

SAFETY INSTRUCTIONS

Safety Instructions signs indicate specific safety-related instructions or procedures.

Chains and accessories marked with the American nominal size 7/32" already corresponded to European nominal size 6 mm. In order to achieve a better match, the previous nominal size 7/32" is now converted to the new nominal size 15/64". The Working Load Limits have now also been adjusted.

Definitions

Working Load Limit (WLL)

The maximum load which a shackle is designed to support.



NOTICE

Read ASME B30.26 "Rigging Hardware", Chapters 26-0, 26-1, 26-4.

2. BASIC SAFETY REQUIREMENTS



To prevent the risk of injury never walk or stay under lifted loads!

The Working Load Limit must not be exceeded!
Shackles as well as lifting and attachment means to be used must be free from defects!

Working under the influence of drugs, medications impairing the sense and/or alcohol is strictly forbidden!

SAFETY INSTRUCTIONS

- Operators, fitters and maintenance personnel must in particular observe the Operating Instructions as well as standards ASTM A 906/A 906 M (Standard Specification for Grade 80 and Grade 100 Alloy Steel Chain Slings for Overhead Lifting), ASTM A 952/A 952 M (Standard Specification for Forged Grade 80 and Grade 100 Steel Lifting Components and Welded Attachment Links), ISO 2415 (Forged shackles for general lifting purposes - Dee shackles and bow shackles), ISO 7593 (Chain slings assembled by methods other than welding; Grade T(8)) and ISO 4778 (Round steel short link chains for lifting purposes – Chains slings of welded construction – Grade 8).
- The specific safety and operating regulations and standards issued locally in the country where the items are used must 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 persons operating and using the shackles.
- These Operating Instructions must be 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.

OPERATING INSTRUCTIONS

SHACKLES

GRADES 80 AND 100

- During operation work, wear your personal protective equipment!
- **Improper assembly and use may cause personal injury and/or damage to property.**
- Assembly and removal as well as inspections and maintenance must exclusively be carried out by skilled, qualified, trained and authorized persons only.
- Structural changes are impermissible (e.g. welding, bending).
- Never attempt to make the shackle opening smaller by bending or welding in intermediate elements.
- **Operators must carry out a visual inspection and, if necessary, a functional test of the safety equipment before each use.**
- Never use worn-out, bent or damaged shackles.
- Never expose shackles to loads exceeding the specified Working Load Limits.
- Make sure the load can take the forces to be applied without suffering deformation.
- Lateral loads bending the shackles are not permissible. Shackles must be capable of aligning themselves in loading direction.
- Do not start lifting before you have made sure the load has been correctly attached.
- **No one including you (operator) must be in the way of the moving load (hazard area).**
- During lifting make sure your hands or other body parts do not come into contact with lifting means. Only remove lifting means manually (use your hands).
- Avoid impacts, e.g. due to abruptly lifting loads with lifting means in slack condition.
- Applications where the bolt may become threaded out, e.g. by a rope or load, shall be avoided. If such applications cannot be avoided bolts with safety pins shall be used.
- If shackles are expected to perform under continuous service conditions (multi-shift, automatic operations or the like) contact the manufacturer first to reduce the WLL as necessary.
- Never move a suspended load over persons.
- Never cause suspended loads to swing.
- Always monitor a suspended load.
- Put the load only down in flat places/sites where it can be safely deposited.
- Do not use force when mounting/positioning the shackles.
- Avoid shackles to get caught under the load.
- Usage without working safety elements (cotter pins, dowel pins) is not permissible.
- In the event of doubts or concerns about the proper and safe use, inspection, maintenance or similar things contact your safety officer or the manufacturer.

THIELE is not responsible for damage caused by non-observance of the instructions, rules, standards and notes indicated!

As regard grade 100, THIELE does not give its approval to the assembly of components sourced from different manufacturers!

As a rule, shackles are not permitted for the transportation of persons.

3. DESCRIPTION AND INTENDED USE

THIELE Shackles are intended as end fittings or suspensions means to take pull forces transmitted between lifting means or other components.

Normally, shackles are not used as permanent connecting elements.

The shackle type shall suit the relevant application purpose.

Shackles of TWN 0870 are intended to be mounted once to be left on the load permanently.



Shackles must exclusively be used

- within the limits of their permissible Working Load Limit,
- for permissible attachment methods and sling angles,
- within the temperature limits prescribed,
- with their original bolts and dowel pins of appropriate size,
- by trained and authorized persons.

Failure to do so may cause serious injury or property damage.

THIELE shackles meet EG Machinery Directive 2006/42/EG requirements and feature a safety factor of at least 4 based on Working Load Limit.

The shackles are designed to withstand 20,000 dynamic load changes under maximum load conditions. In the event of higher loads (e.g. multi-shift/automatic operation) the Working Load Limit must be reduced before the parts are put to use.

Shackles are marked with nominal chain size and quality grade, manufacturer's symbol and traceability code.



Shackles must only be used with a single loaded chain leg.

Shackles can also be used within lashing chain assemblies. When used within a lashing system the maximum lashing capacity is obtained by doubling the Working Load Limit.

Any alternating use for lifting and lashing purposes is impermissible!

4. COMMISSIONING

Prior to using the components for the first time assure that

- the shackles comply with the order and have not been damaged,
- test certificates and Operating Instructions are at hand,
- markings correspond with what is specified in the documentation,

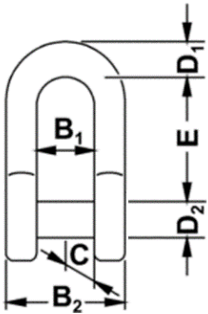
- inspection deadlines and the qualified persons for examinations are determined,
- visibility and functional testings are carried out and documented,
- documentation is safely kept in an orderly manner.

Dispose of the packing in an environmentally compatible way according to local rules.

5. TECHNICAL DATA

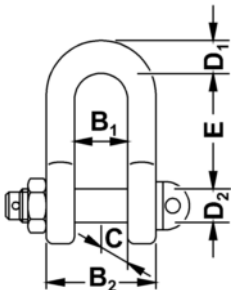
Tables include only article numbers of standard and not customized parts.

5.1 Special Shackles, TWN 0870, Grade 80



Nominal Size	Article No.	WLL [lbs.]	Size acc. DIN 82191	Article No. Spare Sets (Bolt + Dowel Pin)	Dimensions [mm]						Mass [lbs.]
					E	D ₁	D ₂	C	B ₁	B ₂	
3/8	F30311	7,100	1	F48036	49	15	16	32	21	47	0.77
1/2	F30321	12,000	1.6	F48039	61	19	20	40	27	61	1.63
5/8	F30331	18,100	2.5	F48042	73	23	24	48	33	75	2.87
3/4	F30341	28,300	4	F48045	91	29	30	60	42	96	5.73
7/8	F30351	34,200	5	F48048	111	33	36	72	47	107	8.82
1	F30361	47,700	6	F48051	120	37	39	78	53	121	12.56
1 1/8	F30371	55,100	8	F48054	140	41	45	90	60	136	22.04
1 1/4	F30381	72,300	10	F48057	147	45	48	96	66	150	23.14
1 27/64	F30391	88,200	12	F48060	158	50	52	104	73	167	30.64
1 37/64	F30401	110,200	16	F48063	185	55	60	120	81	185	45.18
1 25/32	F30411	138,900	20	F48066	211	61	68	136	90	206	58.63

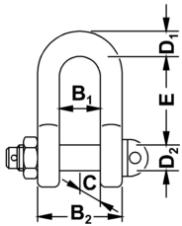
5.2 Bolt Shackles Type C, TWN 0871, Grade 80



Nominal Size	Article No.	WLL [lbs.]	Size acc. DIN 82191	Article No. Spare Sets (Bolt + Dowel Pin)	Dimensions [mm]						Mass [lbs.]
					E	D ₁	D ₂	C	B ₁	B ₂	
15/64	Z04147 ¹⁾	2,500	0.4	---	30	8	10	20	14	13	0.22
5/16	Z04145	4,500	0.6	---	36	10	12	24	17	37	0.44
3/8	F30310	7,100	1.0	F30451	49	15	16	32	21	47	0.99
1/2	F30320	12,000	1.6	F30461	61	19	20	40	27	61	1.85
5/8	F30330	18,100	2.5	F30471	73	23	24	48	33	75	3.09
3/4	F30340	28,300	4	F30481	91	29	30	60	42	96	6.83
7/8	F30350	34,200	5	F30491	111	33	36	72	47	107	9.92
1	F30360	47,700	6	F30501	120	37	39	78	53	121	13.89
1 1/8	F30370	55,100	8	F30511	140	41	45	90	60	136	22.26
1 1/4	F30380	72,300	10	F30521	147	45	48	96	66	150	27.11
1 27/64	F30390	88,200	12	F30531	158	50	52	104	73	167	34.38
1 37/64	F30400	110,200	16	F30541	185	55	60	120	81	185	48.93
1 25/32	F30410	138,900	20	F30551	211	61	68	136	90	206	57.97

1) galvanized, welded-on nut

5.3 Bolt Shackles Type C, TWN 1871, Grade 100



Nominal Size	Article No.	WLL [lbs.]	Size acc. DIN 82191	Article No. Spare Sets (Bolt + Dowel Pin)	Dimensions [mm]						Mass [lbs.]
					E	D ₁	D ₂	C	B ₁	B ₂	
3/8	F303100	8,800	1.0	F304510	49	15	16	32	21	47	0.99
1/2	F303200	15,000	1.6	F304610	61	19	20	40	27	61	1.85
5/8	F303300	22,600	2.5	F304710	73	23	24	48	33	75	3.11

6. ASSEMBLY AND REMOVAL

6.1 General

All components to be installed or used must be in perfect condition and the relevant Working Load Limits of all parts must accommodate the respective load to be handled.



Always assemble/remove shackles or parts in load-free condition.

To prevent unilateral loads and misalignment spacers may be arranged to center the load application point on the bolt.

Disassemble the parts in reverse order.

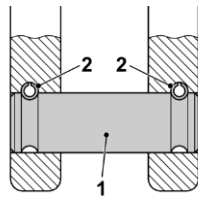
Use a suitable drift punch to drive the dowel pins out.

Suitable drift punches are available by Article No. Z03303.

Dowel pins and cotter pins must only be installed once.

6.2 Assembly of TWN 0870

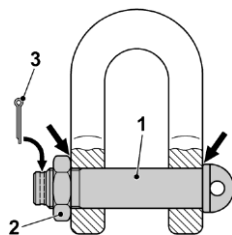
1. Move the bolt through both holes in the shackle ends and see to it that the two grooves in the bolt are positioned concentrically with the dowel pin holes in the shackle body.



2. Insert the dowel pins. Make sure the slot faces away from the bolt towards the shackle bow.

6.3 Assembly of TWN 0871 and TWN 1871

1. Fully insert the bolt through both shackles bore-holes.
2. Retain the bolt with a suitable nut and tighten the nut so as to be hand-tight using an appropriate tool. Make sure bolt and nut are evenly seated against the shackle body.



3. Finally, insert the cotter pin in the respective hole in the bolt to secure the connection.

7. CONDITIONS OF USE

7.1 Normal Use



Make sure forces are exerted in longitudinal direction when attaching loads.

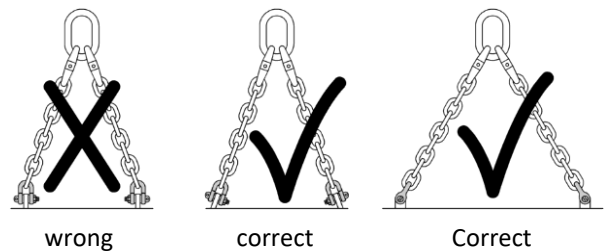
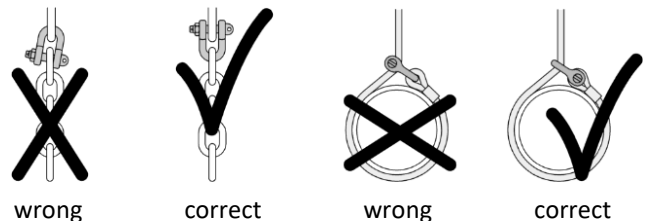
Shackles must not be exposed to bending loads; make sure eccentric loads are avoided.

Shackles must be able to move freely. Supporting of shackles on other parts is not permitted.

Take care that

- incorrect arrangements are avoided, e.g. eccentric loads,
- damage of lifting or lashing accessories, e.g. by sharp edges, is not possible,
- the shackles can be reached easily for fitting/unhinging lifting or lashing accessories.

The degree of danger when used in offshore applications, the lifting of hazardous loads, such as for example liquid metal, or similar risk potentials have to be assessed by a competent person in the form of a risk analysis. Any additional rules and directives must be followed in this case.



7.2 Influence of Temperature



The respective temperature range limits must be considered for all components used.

Using shackles at elevated temperatures will cause the Working Load Limit to be reduced as indicated below.

	Temperature range	Remaining WLL
Grade 80	-40 °C ≤ t ≤ 205 °C -40 °F ≤ t ≤ 400 °F	100 %
	205 °C < t ≤ 300 °C 400 °F < t ≤ 572 °F	90 %
Grade 100	300 °C < t ≤ 400 °C 572 °F < t ≤ 752 °F	75 %
	-40 °C ≤ t ≤ 205 °C -40 °F ≤ t ≤ 400 °F	100 %



If the shackles have been exposed to temperatures exceeding the maximum values specified they must not be used furthermore.

7.3 Environmental Influence



Shackles 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.

7.4 Especially Hazardous Conditions



The degree of danger when used in offshore applications, the lifting of hazardous loads, such as for example liquid metal or similar, risk potentials must be assessed by a competent person in the form of a risk analysis. Any additional rules and directives must be followed in this case.



For applications in abrasive blasting environments short inspection intervals must be scheduled. Selecting a shackle of the next greater nominal size will increase the permissible wear allowance.

8. INSPECTION, MAINTENANCE, DISPOSAL



Inspections and maintenance must be arranged by the Owner!

Inspection intervals shall be determined by the Owner!

Visual inspections must be regularly carried out and documented by competent and trained persons, at least once a year or more frequently if the shackles are in heavy duty service. After three years at the latest they must additionally be examined for cracks. A load test is not a substitute for this examination.

The results of the inspection shall be kept in a file that has to be set up for each shackle before first used. The register will show characteristic data of the shackles as well as identity details.

Immediately stop using shackles that show the following defects:

- missing or illegible identification/markings,
- deformation, elongation or fractures,
- cuts, notches, cracks, incipient cracks, pinching,
- damaged threads,
- shackles heated beyond permissible limit,
- severe corrosion,
- impaired or missing safety systems,
- wear in excess of 10 %, e.g. in the receiving area of the pin diameter,
- 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).

8.1 Inspection Service

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

8.2 Maintenance



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

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 must be documented properly.

8.3 Disposal

NOTICE

All steel components and accessories taken out of service must be scrapped in accordance with local regulations and provisions.

9. SPARE PARTS



Use only original spare parts.

See Chapter 5, Technical Data.

10. STORAGE

NOTICE

Shackles must be stored properly sorted and in dry conditions at temperatures between 32 °F and 104 °F.

Do not store in a manner that cause mechanical damage.

11. THIELE OPERATING AND MOUNTING INSTRUCTIONS

NOTICE

Current mounting and operating instructions are available as a PDF download on the THIELE-website www.thiele.de.



12. PUBLISHING INFORMATION

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