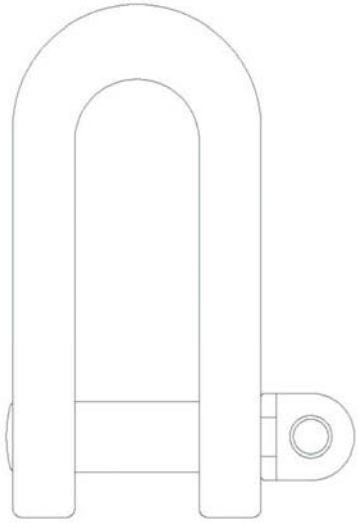
Robur

R/SP/8026/03
Date 30/06/2016

PRODUCT SPECIFICATIONS

OPERATING AND MAINTENANCE INSTRUCTIONS

Technical Specifications
Operating Conditions and Limits
Operator's Instructions
Residual Risks
How and how often periodical fitness inspections should be conducted



STRAIGHT SHACKLES
FOR LIFTING ITEM 8026

The original language of this technical specification is Italian

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1) TECHNICAL SPECIFICATIONS OF ACCESSORY

Material:	BODY steel S235JR PIN steel S235JR
Heat Treatment:	Normalized
Reference Standards:	Material UNI EN 10025-2
Surface Treatment:	Galvanized A2E EN ISO 4042

The test is performed on the basis of in-house specifications and rules in accordance with UNI EN ISO 9001.
The item complies with Machine Directive 2006/42/EC.

DIMENSIONAL SPECIFICATIONS:

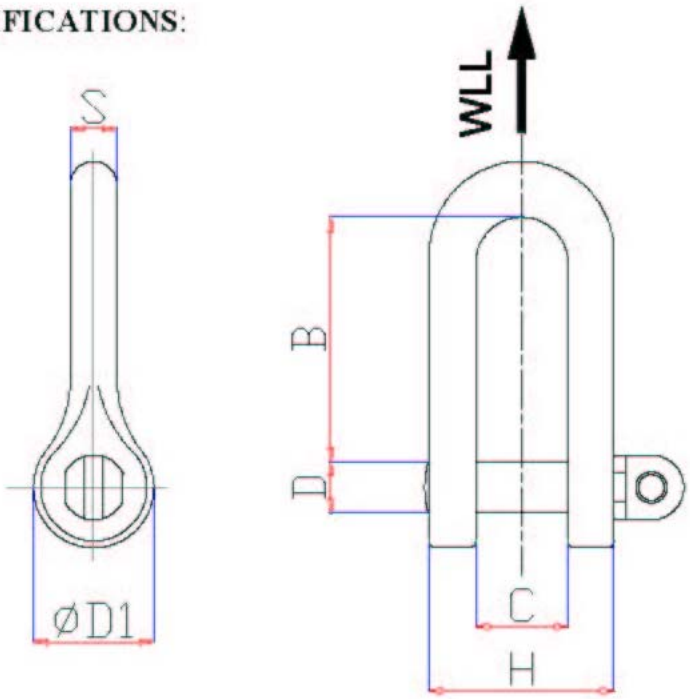


TABLE "A"

Size	D	D "	B	C	ØD1	H	S	g	WLL kg	n	ITEM NUMBER
12	M12	1/2	42	20	26	40	12	190	630	100	080260012
14	M14	9/16	46	22	29	44	13	250	800	90	080260014
16	M16	5/8	50	24	32	48	14	320	1000	60	080260016
18	M18	11/16	54	26	35	53	15	430	1300	40	080260018
20	M20	3/4	58	28	38	58	17	590	1600	35	080260020
22	M22	7/8	69	32	44	68	20	930	2000	20	080260022
25	M24	1"	79	36	50	78	23	1400	2500	15	080260025
28	M27	1"1/8	90	40	56	88	26	2200	3150	/	080260028
32	M30	1"1/4	100	45	64	99	29	2850	4000	/	080260032
36	M36X3	1"3/8	110	50	72	110	32	4400	5000	/	080260036
40	M39X3	1"9/16	120	55	80	123	36	5600	6300	/	080260040
42	M42X3	1"5/8	131	60	85	136	40	7650	8000	/	080260042
45	M45X3	1"3/4	143	65	90	149	45	10500	10000	/	080260045
50	M48X3	2"	155	70	100	164	50	13900	12500	/	080260050

All measurements are expressed in mm.

WLL = WORKING LOAD LIMIT
SAFETY COEFFICIENT: 5

CAUTION: The safety coefficient is only provided by way of example, in relation to product safety. The working load limits (WLL) shown in the table should never be exceeded.

Definitions:

- **Working load limit (WLL)**: the maximum load the item can support (along the main axis, if not otherwise specified) under operating conditions.
- **Safety coefficient:** guaranteed minimum breaking load to working load limit ratio.
- **Inspection:** visual testing of the state of the shackle, to check for clear damage or wear which may affect its use.
- **Accurate examination:** visual inspection performed by a trained person, supported, if need be, by any other instruments, including non-destructive testing, to check for damage or wear which may affect the use of the part.
- **Trained person:** a designated, suitably trained person who has proper know-how and practical expertise and has been given the instructions needed to perform any required tests and examinations.

2) TESTING SPECIFICATIONS

The accessory is subjected to several stringent spot checks for serviceability, performance and compliance with specifications.
The number of samples and the related sampling plans are chosen according to the characteristic to test under UNI ISO 2859/1, and the results are filed in the quality department of the factory in Sulmona.

2.A Dimensional test
Making sure that the dimensions of the item meet such tolerances as established in in-house drawings.

2.B Visual test
Testing for defects resulting from forming, mechanical working, surface coating and correspondence between the marking and in-house drawings.

2.C Chemical analysis
Making sure that the chemical composition of material S235JR complies with the limits established under UNI EN 10025-2 2005.

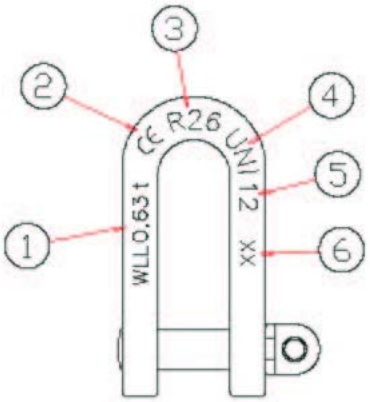
2.D Metallographic analysis
Testing the normalization process: at 500 enlargements, ferrite and pearlite should be uniformly distributed.

2.E Tensile stress tests
Making sure that the accessory subjected to tensile stress will break, after the applied force has at least exceeded the working load as multiplied by the safety coefficient.
The test is performed in accordance with UNI 10002/1.

3) HOW TO READ MARKINGS

The accessory carries indelible marks and codes which identify the product and define the specifications and applications.

1) Working load limit
2) CE mark
3) Manufacturer's mark and item number
4) Regulatory body
5) Size
6) Traceability code



4) GENERAL WARNINGS

The manual must be kept by the person in charge in a suitable place and readily available for consultation, in optimal conditions. should it be lost or damaged, the manual can easily be retrieved on the constructor's web site: www.roburitaly.com
the constructor detains all material and intellectual rights on the manual, and restricts its modification, albeit partial, for any commercial use.
As regards the information provided in these operating instructions, BETA UTENSILI SPA will accept no responsibility in the event of:

- any use of the accessories other than the uses under national safety and accident prevention laws;
- mistaken choice or arrangement of the apparatus they are going to be connected to;
- failure to comply with, or properly follow, the operating instructions;
- changes to the accessories;
- misuse or failure to carry out routine maintenance jobs;
- use with noncompliant accessories.

!CAUTION: The marking data should not be removed by grinding or abrasion (whether accidental or not – any shackles that do not carry any identification references should be made unusable and scrapped).
No characters other than the manufacturer's may be affixed.

5) SELECTION CRITERIA

The following parameters should be carefully considered in choosing the shackles:

5.A WORKING LOAD LIMIT

The weight of the load to lift **should be lower than or equal to** the working load limit (WLL) recommended for the shackle being considered, as printed on the product and shown in Table "A".

5.B CONNECTING PART

Make sure that the connecting part suits the load capacity of the shackle, is thick enough, has a proper chemical composition and an adequate mechanical resistance to traction forces.

5.C OPERATING TEMPERATURES

The maximum operating temperature is +80 °C.
For applications under 0 °C please use our shackles in accordance with EN 13889 items 8026R, 8029R, 8031R etc. or inox items 8225, 8227, 8228 etc.

5.D LIFE AND FREQUENCY OF USE

The accessory is perfectly serviceable as long as its geometric and physical characteristics remain unchanged.Hence the shackle should be replaced in case of reduced section, deformation, corrosion or connecting instability.

6) NONPERMISSIBLE CONDITIONS

The following loads should not be handled:

- any load exceeding the working load limit in weight;
- any load whose frame is not resistant enough to traction forces;
- any load whose temperature does not lie within the permissible range;
- any load classified as hazardous (e.g. flammable, explosive materials etc.);
- any load that may change its static configuration and/or centre of gravity or chemical and physical state;
- any load immersed in acid solutions or exposed to acid vapours.

7) PRELIMINARY TESTS

Before the accessories are operated and/or assembled, they should be tested by a suitably trained person.

- Check the state of the accessory; in particular make sure that it is free from cuts, bends, indentations, abrasions, cracks, irregular threads, corrosions, sharp burrs, wear or defects resulting from improper storage.
- Measure and record the dimensions according to **Table "A".**
- Check the state of all the parts of the marking; in particular make sure that the capacity requirements are met, so that the accessory can be accurately identified according to the working load.
- Make sure that the body and pin and the threads fit.

8) INSTALLATION - ASSEMBLY INSTRUCTIONS

During the installation of the accessory please use adequate Personal Protective Equipment: gloves, safety shoes, helmet, etc.
The shackle can be used as both a connecting part in static situations and a lifting accessory. Shackles with screw collar pin are normally used for removable, non-lasting connections, when the pin cannot rotate and possibly be unscrewed. In case the shackle is to be left in place for a prolonged period or where the pin can rotate and unscrew, the use of shackles with safety bolt is recommended; if this is not possible, secure the screw collar pin to the body of the shackle.
Unscrew the pin and remove it from the body; connect the shackle to the part to lift.
Tighten the pin, making sure that it is locked to the body, avoiding overpulling the threads or causing flexure towards the inner part of the shackle.
Apply the load to the curved part of the shackle, aligning the parts with each other (fig. 1).

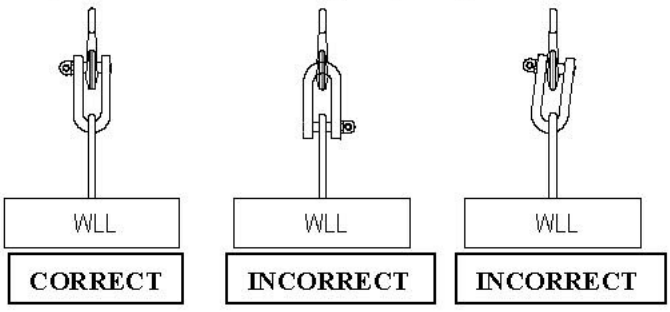


Fig. 1

Free spacers are allowed on the pin to fit the hook and avoid dangerous angles.
The working load limit (WLL) refers to lifting with single leg sling, where the load is perfectly aligned along the main axis of the shackle.
When lifting with multi-leg slings, their opening angle should not exceed 90°.
Do not apply the load onto the pin (fig. 2).
When multi-leg slings are used for lifting, the working load limit referred to in Table "A" (WLL) should be reduced; then apply 70% of the stated value.

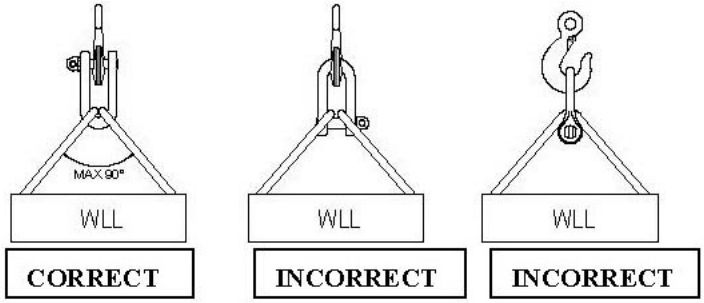


Fig. 2

Lifting by means of shackles should always be such that any leg sling can freely move and position themselves; hence no forcing or interference should occur between the hanging part and the load to lift.
The shackles should not be used when lifting results in lateral force components (fig. 3).

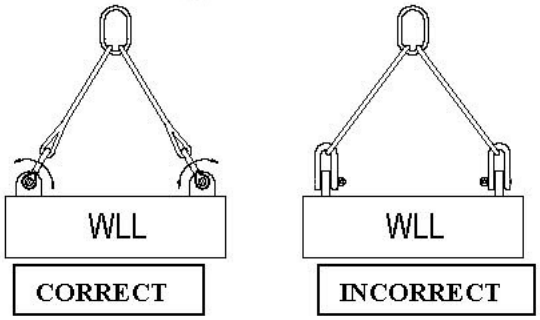


Fig. 3

When any shackle is used in slipknot sling configurations, the sliding part of the rope should pass onto the curved part of the shackle (fig. 4).
Under such circumstances, apply 80% of the working load limit (WLL) stated in "Table A".

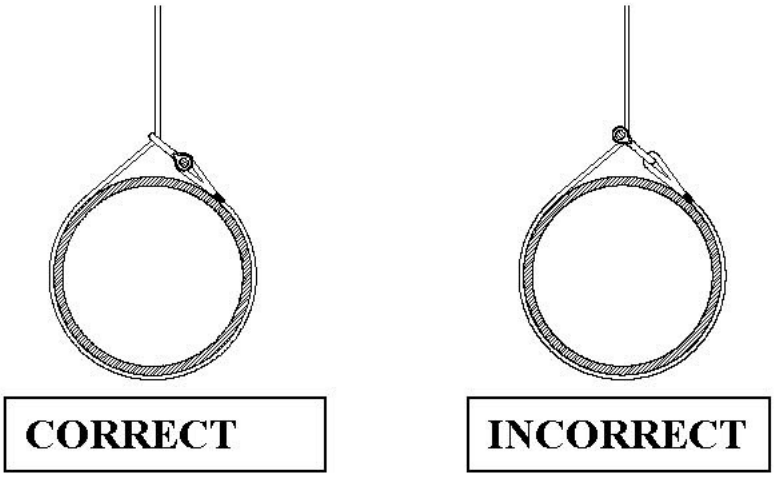


Fig. 4

Pull the ropes without lifting; check the centre of gravity and distribution of forces. Please note that when unbalanced loads are lifted with multi-leg slings, the heavier weight is always supported by the shorter one. Take the most suitable measures to balance the load according to sling type.

9) USING ACCESSORY – GRIP AND HANDLING

Always pay attention to any specific warning when handling the load. Before operating the lifting apparatus, make sure that the load is capable of freely moving and is not stopped by any connecting parts or any other obstacles.

Pull the ropes before lifting the load.
Keep your hands or any other parts of the body away if the ropes have been pulled.
The load should be lifted slowly, making sure that it has been fixed firmly and takes the expected position.
Move the load slowly, linearly and continuously, avoiding sudden acceleration or braking, which may cause – through inertia – dangerous swinging.
Choose the place where to put down the load onto the ground beforehand, making sure that the ground (or the floor) is capable of supporting the load.
Make sure that the place where the load is to be put down is free from obstacles and that everybody is safely distant from it.
The load should be put down cautiously, being careful not to get the chain sling entangled.
Before loosening the ropes, make sure that the load is suitably supported and firm.
Once the load has been put down safely, the chain sling should be removed by hand and should never be moved away with the lifting apparatus.

10) NONPERMISSIBLE USE

Using the accessory for any purposes other than the purposes it has been designed for, using it under extremely dangerous conditions and performing poor maintenance may pose **a severe hazard to the safety of the people being exposed** and cause severe damage to the working environment, while affecting the actual serviceability and safety of the product. The precautions mentioned below, which, obviously enough, cannot cover the whole spectrum of potential **"misuses"** of the accessory, should be "reasonably" deemed to be the most common steps to take. Therefore:

- DO NOT connect the accessory to any apparatus which does not match its specifications in terms of size, temperature, hook-up point and shape;
- DO NOT lift the load while subjecting the accessory to impulsive strain;
- DO NOT let the load swing while handling it;
- DO NOT use the accessory to lift and carry suspended loads in flight (aircrafts);
- DO NOT use the accessory to pull restrained loads;
- DO NOT stretch any apparatus that may change its static configuration, centre of gravity or chemical and physical state;
- DO NOT use the accessory to lift or carry people or animals;
- DO NOT work in areas where any explosion/spark-proof parts are expected to be used or in the presence of big magnetic fields;
- DO NOT weld any metal parts to the accessory; do not use any filling welds; do not use the accessory as mass for any welder.

11) FITNESS FOR USE

The accessory was subjected to spot check in order to test serviceability and performance at the manufacturer's. The certificate supplied with it states that the tests were passed. However, before starting working, the user should test the installed accessory for serviceability and performance, to prove the entire system is fit for use.

12) INSPECTION AND MAINTENANCE

Inspections and maintenance jobs should be carried out by trained personnel, who should perform accurate tests during operation.Below is a list of tests to perform at such intervals as stated in the table "**Maintenance jobs and inspections".**

- VISUAL TEST: making sure that the accessory is free from surface defects, including cracks, indentations, cuts, fissures and abrasions.
- THREAD TEST: making sure that the thread is free from wear, deformation and dents, that its fit is accurate and stable, and that there is not too much clearance.
- DEFORMATION TEST: making sure that the accessory has not got deformed, using a gauge to measure such critical dimensions as shown in **Table "A"**. NO DEFORMATIONS will be tolerated compared to the measurements made when the accessory was **first put into operation.**
- WEAR TEST: making sure that the points of contact are not worn, using a gauge to measure such critical dimensions as shown in **Table "A"**.
- PRESERVATION TEST: making sure that the accessory is free from oxidation and corrosion, especially in case of outdoor use; using suitable methods (e.g. liquid penetrants) to make sure that it is free from cracks.

The results of the above-mentioned tests should be stored.

Maintenance jobs and inspections			
Type of inspection			
	Whenever used	Month	Year
General visual inspection	x		
Thread state	x		
Deformation	x		
Wear		x	
State of preservation			x

If the shackle has been used for heavy-duty jobs, both wear and the state of preservation should be tested for more frequently.

13) SCRAPPING ACCESSORY

The accessory should be scrapped by cutting, so that it can no longer be used, whether at the end of its expected lifetime or if:

- it is permanently worn compared to the original size;
- any cracks or distortions are shown, and/or the sections have become small compared to the original size;
- the state of the thread is such that the parts do not fit perfectly, any threads are worn, deformed, irregular etc.

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