

# 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**



**JAW AND JAW TURNBUCKLE**

**ITEM 8109**

The original language of this technical specification is Italian

## 1) TECHNICAL SPECIFICATIONS

### Material / Reference Standard:

BODY steel C45 - UNI EN 10083-2

JAWS steel C45 - UNI EN 10083-2

PIN steel C45 - UNI EN 10083-2

SCREW steel strength class 8 - EN ISO 898/1

NUT steel strength class 4 - UNI EN 20898-2

### Heat Treatment:

BODY normalized - UNI EN 10083-2 (table -10)

JAWS hardened and tempered - UNI EN 10083-2 (table -9)

PIN hardened and tempered - UNI EN 10083-2 (table -9)

### Surface Treatment:

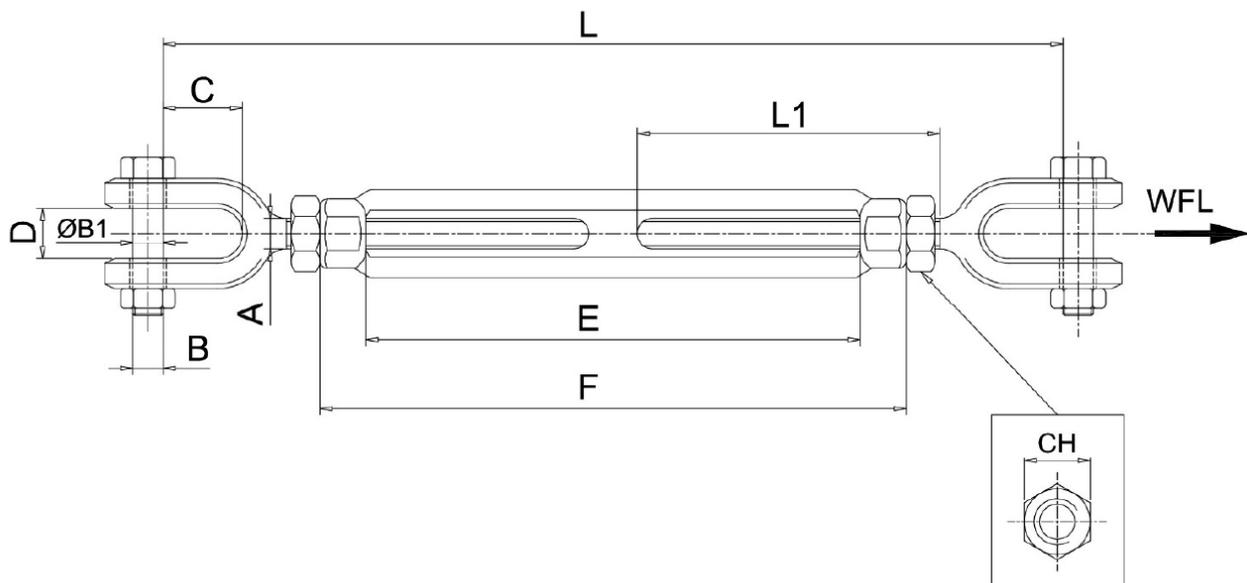
BODY and JAWS hot dip galvanized

BODY HEADS orange painted (RAL 2011)

The test is performed on the basis of in-house specifications and rules in accordance with UNI EN ISO 9001.

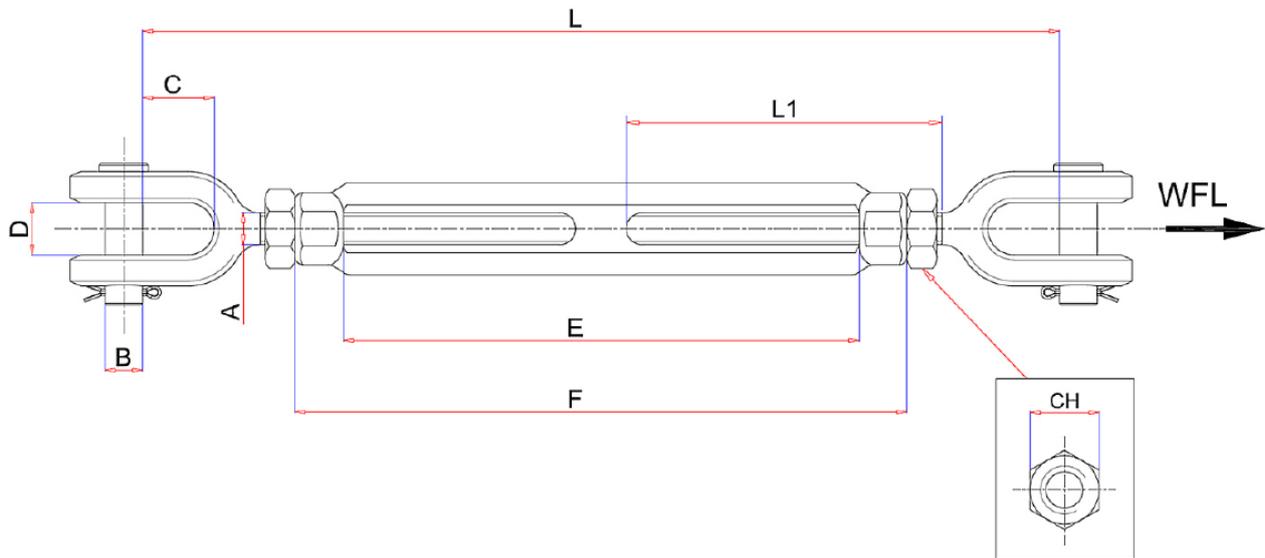
This item complies with Machinery Directive 2006/42/EC.

### DIMENSIONAL SPECIFICATIONS:



**TABLE "A"**

SIZE "	A Thread	Number of threads per inc.	B Thread	ØB1	Number of threads per inc.	C	D	E	F	CH	L min	L max	L1	 g	WFL kg
3/8 x 6	3/8" UNC	16	5/16" UNC	7.8	18	21.5	12.0	152	183	17	258	410	94.0	370	540
1/2 x 6	1/2" UNC	13	3/8" UNC	9.6	16	26.0	16.0	152	193	19	306	458	99.0	430	1000
1/2 x 9	1/2" UNC	13	3/8" UNC	9.6	16	26.0	16.0	229	269	19	368	597	138.5	790	1000
1/2 x 12	1/2" UNC	13	3/8" UNC	9.6	16	26.0	16.0	305	346	19	456	761	176.0	1100	1000
5/8 x 6	1/2" UNC	13	3/8" UNC	12.5	16	32.5	18.0	152	202	24	346	498	105.0	1180	1590
5/8 x 9	5/8" UNC	11	1/2" UNC	12.5	13	32.5	18.0	229	279	24	401	630	143.5	1470	1590
5/8 x 12	5/8" UNC	11	1/2" UNC	12.5	13	32.5	18.0	305	366	24	500	805	192.5	2460	1590
3/4 x 6	3/4" UNC	10	5/8" UNC	15.5	11	38.0	24.0	152	213	30	369	521	110.0	1920	2360
3/4 x 9	3/4" UNC	10	5/8" UNC	15.5	11	38.0	24.0	229	289	30	432	660	149.0	2310	2360
3/4 x 12	3/4" UNC	10	5/8" UNC	15.5	11	38.0	24.0	305	366	30	519	824	187.0	2720	2360
3/4 x 18	3/4" UNC	10	5/8" UNC	15.5	11	38.0	24.0	457	518	30	671	1128	263.0	3700	2360
7/8 x 12	7/8" UNC	9	3/4" UNC	18.6	10	42.5	27.5	305	376	32	542	847	192.5	3710	3270
7/8 x 18	7/8" UNC	9	3/4" UNC	18.6	10	42.5	27.5	457	528	32	713	1170	268.5	4650	3270
1 x 6	1" UNC	8	7/8" UNC	22.0	9	50.5	30.5	152	234	36	425	577	121.0	3860	4540
1 x 12	1" UNC	8	7/8" UNC	22.0	9	50.5	30.5	305	386	36	577	882	198.0	5440	4540
1 x 18	1" UNC	8	7/8" UNC	22.0	9	50.5	30.5	457	538	36	751	1208	274.0	6460	4540



**TABLE "B"**

SIZE "	A Thread	Number of threads per inc.	B	C	D	E	F	CH	L min	L max	L1	 g	WFL kg
1.1/4 x 12	1.1/4" UNC	7	29	71.5	44.0	305	385	46	644	948	211.0	9750	6900
1.1/4 x 18	1.1/4" UNC	7	29	71.5	44.0	457	537	46	796	1253	287.0	11000	6900
1.1/4 x 24	1.1/4" UNC	7	29	71.5	44.0	610	689	46	948	1558	363.5	12700	6900
1.1/2 x 12	1.1/2" UNC	6	35	71.0	52.0	305	401	55	675	942	222.0	17300	9710
1.1/2 x 18	1.1/2" UNC	6	35	71.0	52.0	457	553	55	825	1282	298.0	19400	9710
1.1/2 x 24	1.1/2" UNC	6	46	71.0	52	610	706	55	979	1589	374.0	21600	9710
1.3/4 x 18	1.3/4" UNC	5	41	86.0	59.5	457	577	70	938	1316	295.0	30900	12700

All measurements are expressed in mm.

WFL = WORKING FORCE LIMIT

SAFETY COEFFICIENT: 5



#### Definitions:

- ❖ **WFL** (working force limit): the maximum force the item can support (along the main axis, if not otherwise specified) under operating conditions.
- ❖ **Safety coefficient:** guaranteed minimum breaking force to working force limit ratio.
- ❖ **Inspection:** visual testing of the state of the turnbuckle, 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 turnbuckle.
- ❖ **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.

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

## 2) TESTING SPECIFICATIONS

The individual parts of the item are subjected to several stringent tests 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.

### 2.A Dimensional test

Making sure that the dimensions of the item meet such tolerances as established in inhouse working 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 the material complies with the limits established under the relevant standards.

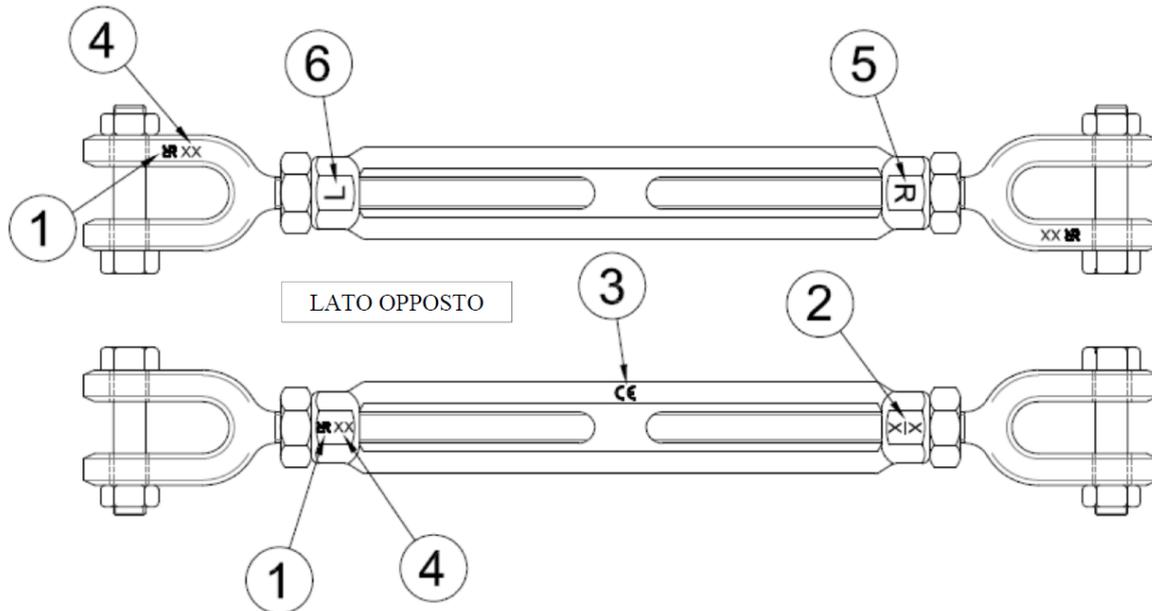
### 2.D Tensile stress tests

Making sure that the accessory subjected to tensile stress will break, after the applied force has at least exceeded the working force limit 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) Manufacturer's logo RR
- 2) Size in inches (e.g.  $\frac{3}{8}$  x 6)
- 3) CE mark
- 4) Traceability code
- 5) R (Right) Right-handed thread
- 6) L (Left) Left-handed thread



#### 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.

The constructor retains 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, we 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 turnbuckles 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 turnbuckle:

##### 5.A WORKING FORCE LIMIT

The tensile stress exerted by the turnbuckle **should be lower than or equal to** the working force limit (WFL) recommended for the item being considered, and shown in Table "A" "B".

##### 5.B CONNECTING PART

Make sure that the connecting part suits the load capacity of the turnbuckle, has a suitable diameter – as per Table "A" "B", item "ROPE min.  $\varnothing$ " - and an adequate mechanical resistance to tensile forces.

##### 5.C OPERATING TEMPERATURES

The permissible operating temperature should range between 0°C and +200°C.

The working force limit will not be guaranteed outside this range.



## 6) NONPERMISSIBLE CONDITIONS

The turnbuckles should not be operated under the following circumstances:

- when the applied force exceeds the permissible “WFL”;
- when dynamic stresses or swinging loads may result;
- when the turnbuckles are operated under any temperatures other than the permissible temperatures;
- when the directrix of forces does not develop along the main axis crossing the two terminals.

## 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 turnbuckle; 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” “B”**.
- Check the state of all the parts of the marking, so that the accessory can be accurately identified according to the working force.
- Make sure that the threads fit.

## 8) INSTALLATION, ASSEMBLY INSTRUCTIONS

During the installation of the accessory please use adequate Personal Protective Equipment: gloves, safety shoes, helmet, etc.

Unscrew both jaws, so that the maximum available opening can be obtained, and connect them to the parts to pull.

Insert one rope or one part for each terminal.

Exert tensile stress through the main body, making sure that, after the operating condition has been reached, the jaws have been inserted into the body at least throughout the length of its thread.

While exerting tensile stress, make sure that the turnbuckle can freely move and position itself; hence no forcing or interference should occur, to prevent any lateral force components from being produced.

Tensile stress should be checked after a short period, to make up for any system adjustments.

Particular attention is required while tensioning, to prevent the working force limit (WFL, see Table “A” “B”) from being exceeded, which would result in permanent deformation, especially if any levers or mechanical means are used.

## 9) USING ACCESSORY – GRIP AND HANDLING

The turnbuckle is designed to be used in static situations; periodically check tensile stress, the state of preservation of the parts and their connection, according to the Table “Maintenance jobs and inspections”.

## 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 use the accessory for direct lifting purposes;
- 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 use the accessory to pull restrained loads;
- 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" "B"**. **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" "B"**.

**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.

<b>Maintenance jobs and inspections</b>			
<b>Type of inspection</b>			
	Whenever used	Month	Year
General visual inspection	<b>X</b>		
Thread state	<b>X</b>		
Deformation	<b>X</b>		
Wear		<b>X</b>	
State of preservation			<b>X</b>

If the turnbuckle 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, if:

- it is permanently worn compared to the original size;
- any cracks or distortions are shown, 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.