

CLAMPS 201



Guide for using and maintaining lifting clamps.

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1. Lifting Clamps: Using Starts NOW

It's time to get started. You've done your research, read the "[Clamps 101](#)" eBook and purchased Crosby lifting clamps for your next material handling project. The next step is to use your lifting clamp. However, before getting out into the field and putting your new equipment to use, it's important to make sure you have the knowledge and training required to use lifting clamps correctly and confidently with every lift.

If CrosbyIP clamps are maintained as described in this manual, they will remain in optimum condition. We believe that CrosbyIP clamps are the most reliable lifting clamps available. But using reliable tools does not automatically mean that practices are reliable. The people who work with clamps play an equally important role in reliable lifting. Ensure that everyone who works with CrosbyIP lifting clamps has been instructed in the proper application of the clamps.

CrosbyIP lifting clamps provide a 10 year warranty for its clamps. In order to benefit from this warranty program and for more details on maintenance procedures, please consult www.thecrosbygroup.com/resources/CrosbyIP-10-year-guarantee for more information.

Please read and understand these instructions before using the lifting clamp.

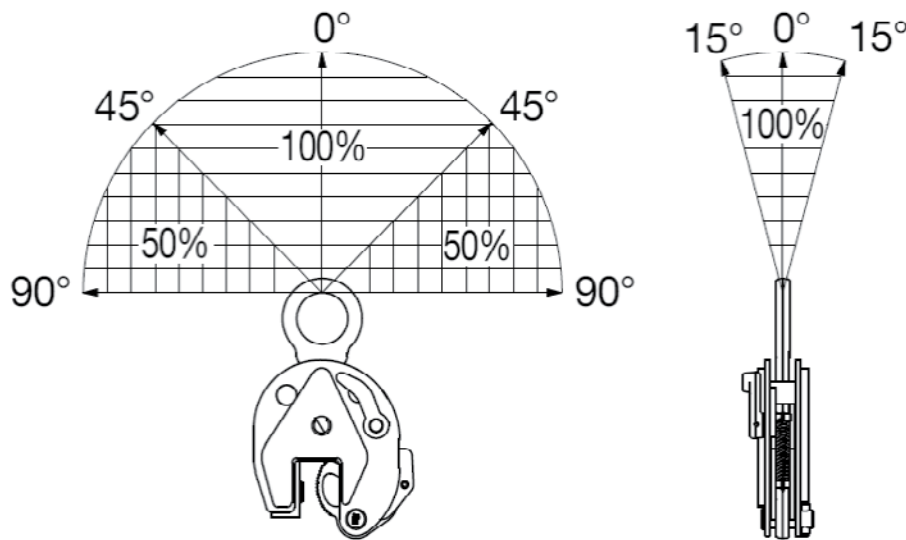
While the "Clamps 101" eBook provided an introduction to lifting clamp basics (the different types of lifting clamps, how they are used), "Clamps 201" delves into the details of the using and maintaining lifting clamps.

After reading this eBook, you will have a better understanding of some of the most common best practices for using lifting clamps and will be able to identify many hazards.

2. Safety Precautions

Proper instruction for the user is of vital importance. This will contribute to maximum reliability in the working environment.

- The lifting clamps may be applied per piece (depends of the type of clamp), per pair (the IPH10, IPHNM10, IPHOZ and IPPE10 horizontal clamps, have to be used in pairs of more) or several at the same time for the lifting of steel plates. It is important that when more than 2 clamps are used each clamp receives an equal share of the load, it is recommended that an equalizing beam is used.
- **Hardness:** With the standard clamps it is possible to lift steel with a surface hardness of 363 HV10 in case of marring lifting clamps. With the clamps IP..H and IPU..H steel up to a surface hardness of 472 HV10 may be lifted. For harder steel types contact your CrosbyIP Customer Service Center. See table on the back page (example) for hardness conversions.
- Contact your CrosbyIP Customer Service Center before using this clamp for plates and constructions that have a radius.
- **Temperature:** The standard lifting clamps may be used with temperatures that lie between 212 °F (100 °C) and -40 °F (-40 °C). For non-marring clamps temperatures that lie between 158 °F (70 °C) and -4 °F (-20 °C). For other conditions contact your CrosbyIP Customer Service Center.
- There are restrictions for operation in special conditions (e.g. high humidity, explosive, saline, acid, alkaline).
- **Loads:** For proper application of the clamp consult always the load diagrams. Angle of side load gives LOSS of W.L.L. Example load diagram:



- For each lift only one plate may be transported or lifted unless specifically is noted that bundles of plates can be lifted.
- Pivot(s) and camsegment (if applicable) may not be placed on sloping or conical surfaces. Contact your CrosbyIP Customer Service Center for assistance in selecting a clamp suitable for beveled plates.
- Ensure that all attachments between lifting eye and crane are properly fitted, secured and coupled.
- When the crane hook or attachment is too large and/or too heavy, use a properly sized CrosbyIP 5000 stinger assembly (see Crosby general catalog for stock no.) or a chain sling with D-shackle of 30 inch (75 cm), with a strength that corresponds to the W.L.L. of the clamp. This will, when setting the load down, prevent the hook from descending too far allowing the clamp to open under the weight of the hook, or, in the case of an unprotected crane hook, its descending from the lifting eye.
- When suspending the clamp directly on the secured crane hook attention must be given to ensuring that the crane hook can move freely in the lifting eye. Ensure that the crane hook and other material is protected.
- **Remark:** when handling the load, one should ensure that the load and or clamp does not encounter obstacles which could release the load on the clamps prematurely (depends on the type of lifting clamp).
- A clamp is a device that must be clean when used. Dirt has an adverse effect on the operation and also on the reliability of the clamp. When the clamp is dirty and greasy it can be cleaned with diesel oil or petroleum. Then blow dry with air or dry with a cloth and apply lubricant. It is important to ensure that the gripping surfaces are clean at all times. Regular cleaning will enhance the life and reliability of the clamps.



3. Inspection Protocols

Prior to every application of the clamp, it is important the clamp operator inspects the clamp for proper functioning.

Attention must be paid to the following as example for a specific type of lifting clamp (see illustration(s) 3 for part reference):

- Ensure that the plate surface with which the clamp is to come into contact is free of scale, grease, oil, paint, water, ice, moisture, dirt and coatings that might impede the contact of the gripping surface with the plate.
- Inspect pivot(s) (C) and camsegment (B) for wear and defects (if applicable). The pivot(s) and teeth must be sharp and free of dirt.
- Check the body (N) and the jaw for damage, cracks or deformation (this may indicate overloading). The clamp must open and close properly (when the operation of the clamp is stiff or heavy, it should be removed from operation for inspection).
- Check the lifting eye (D) and camsegment shaft (G) for readily detectable wear and/or damage.
- Check the spring (M). Press when the latch lever (A) is closed on the lifting eye (D). There should be apparent spring tension. The clamp should, when the lifting eye is released, return to the closed position without problems.
- Check whether the W.L.L. and the jaw opening stamped on the body corresponds with the load to be lifted.

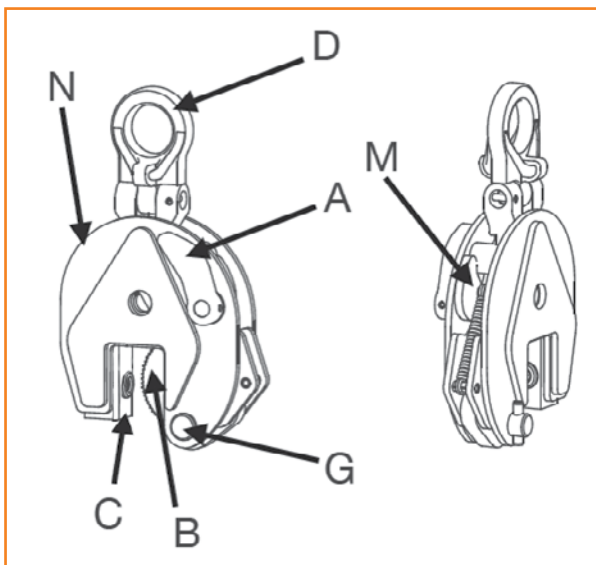


Illustration 3

4. Minimum Load

Always apply the minimum load, otherwise the load risks slipping out unintentionally.

Minimum load permitted:

- For clamps 0,5t IP10 and 0,5t IPU10:
5% of the W.L.L. applying to plate
surface hardness 363 HV10.
- 5% of the W.L.L. applying to plate
surface hardness 279 HV10.
- 10% of the W.L.L. applying to plate
surface hardness 363 HV10.

For clamps IP..H and IPU..H:

- 10% of the W.L.L. applying to plate
surface hardness 472 HV10.

The pivot(s) and the camsegment are the most critical parts in the clamp and require extra attention during inspection. Ensure good light during inspection.

Observe the following rules during every inspection:

Pivots: Reject when the sharpness of one ring is damaged or worn for 50% or more.

Camsegment: Reject when the sharpness of one tooth is damaged or worn for 50% or more.

Some illustrations have been included of damaged and worn (rejected) pivots and camsegments with explanations. In most cases, however the areas of damage are much less extensive. In doubtful cases, an authorized or certified repairer should assess the clamp.



1 complete teeth not sharp and 1 damaged



2 teeth damaged for 50%



2 teeth damaged for 50%



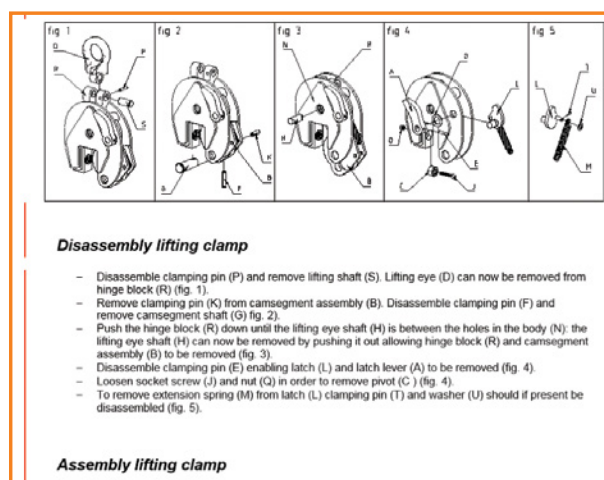
2 rings damaged for 100%



Interior ring damaged for 100%

These areas of damage, precisely as wear, are not covered by the warranty.

In the repair handbook you will find an extensive explanation of all CrosbyIP lifting clamps. Every clamp is dealt with separately, with attention to the following:



How to assemble and disassemble.

[illegible]

The order information of spare parts.

Every repair handbook is registered. This means that the book is personalized – therefore not interchangeable – and that our system has registered which companies have not yet received the information required. This is currently valid for Europe, and in-progress for USA and RoW.

This information will be sent direct to you and you can add this new amended information to your repair handbook.



The 10 year warranty period of the IP lifting clamps:

The standard series of the CrosbyIP lifting clamps are, irrespective of type and model, covered by a warranty period of 10 years. This warranty is conditional upon regular maintenance and the use of original parts.

10 year warranty preventive maintenance procedure:

During every maintenance, service the most critical parts. Being pivot(s), camsegment and spring are replaced and, when necessary, any rejected parts will be replaced.

For clamps with a Working Load Limit (W.L.L.) of 9 ton or more, parts will be replaced only when they no longer meet our standards.

10 year warranty repair procedure:

During every repair service the most critical parts, being pivot(s), camsegment, spring, shafts and latch lever will be replaced and, when necessary, any rejected parts will be replaced.

For clamps with a Working Load Limit (W.L.L.) of 9 ton or more, parts will be replaced only when they no longer meet our standards.

Please consult www.thecrosbygroup.com/resources/CrosbyIP-10-year-guarantee for more information on maintenance procedures.

Maintenance without 10 year warranty:

Annually, clamps are subjected to inspection* and parts will be replaced only when they no longer meet our standards.

An employee authorized for that purpose within the company will carry out periodic safety inspections.

You, the authorized CrosbyIP repairer, must conduct the maintenance and overhaul services.

The frequency of the inspections and services is stipulated in:

- the terms and conditions of warranty and operating instructions, you will find these on our website; www.CrosbyIP.com/garantie
- this repair handbook.

The frequencies will depend on the intensity of application.

For normal use (up to 18 operating hours per week) a different maintenance schedule applies than for intensive use (more than 18 operating hours per week).

*CrosbyIP authorized repairer

Depending on the number of operating years, you should, as authorized CrosbyIP repairer, first conduct a maintenance or overhaul service, after which the warranty will commence for a period of at most to 10 years from the purchase date. Naturally, the remaining period will be subject to the maintenance schedule applying to new CrosbyIP lifting clamps in order to meet the warranty conditions.

Included in the packaging of a newly purchased CrosbyIP lifting clamp you find the instructions for use, the warranty conditions, and the maintenance book, that you can also find on our website www.CrosbyIP.com/garantie.

In the warranty period, the user of an CrosbyIP lifting clamp will receive a reminder - by e-mail – to bring/send the clamp to you for an overhaul or maintenance service. We will send you an e-mail (CC) at the same time so that you remain informed.

Maintenance and repair sets

For this 10-year warranty for the standard series of CrosbyIP lifting clamps maintenance and repair sets have been assembled.

The maintenance set consists of: camsegment, pivot, and spring.

The repair set consists of: camsegment, pivot, spring, latch complete, camsegment shaft, and hoisting eye shaft.

You will find a list of the sets per clamp in the chapter for the CrosbyIP lifting clamp.

These sets are part of the “10 year warranty and safety plan” and should be used in their entirety for every maintenance or overhaul service.



Maintenance set.



Repair set.

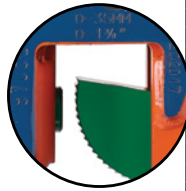


Total tool set for repairs.

Hardness Conversion Table

Crosby® Lifting Clamps

Vickers hardness (HV10)	Brinell hardness 10 mm wolfram carbide ball	Rockwell hardness		
Force 10 kgf	Force 3000 kg	B scale 100 kg force	C scale 150 kg force	D scale 100 kg force
940	-	-	68.0	76.9
920	-	-	67.5	76.5
900	-	-	67.0	76.1
880	(767)	-	66.4	75.7
860	(757)	-	65.9	75.3
840	(745)	-	65.3	74.8
820	(733)	-	64.7	74.3
800	(722)	-	64.0	73.8
780	(710)	-	63.3	73.3
760	(698)	-	62.5	72.6
740	(684)	-	61.8	72.1
720	(670)	-	61.0	71.5
700	(656)	-	60.1	70.8
690	(647)	-	59.7	70.5
680	(638)	-	59.2	70.1
670	(630)	-	58.8	69.8
660	620	-	58.3	69.4
650	611	-	57.8	69.0
640	601	-	57.3	68.7
630	591	-	56.8	68.3
620	582	-	56.3	67.9
610	573	-	55.7	67.5
600	564	-	55.2	67.0
590	554	-	54.7	66.7
580	545	-	54.1	66.2
570	535	-	53.6	65.8
560	525	-	53.0	65.4
550	517	-	52.3	64.8
540	507	-	51.7	64.4
530	497	-	51.1	63.9
520	488	-	50.5	63.5
510	479	-	49.8	62.9
500	471	-	49.1	62.2
490	460	-	48.4	61.6
480	452	-	47.7	61.3
470	442	-	46.9	60.7
460	433	-	46.1	60.1
450	425	-	45.3	59.4
440	415	-	44.5	58.8
430	406	-	43.6	58.2
420	397	-	42.7	57.5
410	388	-	41.8	56.8
400	379	-	40.8	56.0
390	369	-	39.8	55.2
380	360	(110.0)	38.8	54.4
370	350	-	37.7	53.6
360	341	(109.0)	36.6	52.8
350	331	-	35.5	51.9
340	322	(108.0)	34.4	51.1
330	313	-	33.3	50.2
320	303	(107.0)	32.2	49.4
310	294	-	31.0	48.4
300	284	(105.0)	29.8	47.5
295	280	-	29.2	47.1
290	275	(104.5)	28.5	46.5
285	270	-	27.8	46.0
280	265	(103.5)	27.1	45.3
275	261	-	26.4	44.9
270	256	(102.0)	25.6	44.3
265	252	-	24.8	43.7
260	247	(101.0)	24.0	43.1
255	243	-	23.1	42.2
250	238	99.5	22.2	41.7
245	233	-	21.3	41.1
240	228	98.1	20.3	40.3
230	219	96.7	(18.0)	-
220	209	95.0	(15.7)	-
210	200	93.4	(13.4)	-
200	190	91.5	(11.0)	-
190	181	89.5	(8.5)	-
180	171	87.1	(6.0)	-
170	162	85.0	(3.0)	-
160	152	81.7	(0.0)	-
150	143	78.7	-	-
140	133	75.0	-	-
130	124	71.2	-	-
120	114	66.7	-	-
110	105	62.3	-	-
100	95	56.2	-	-
95	90	52.0	-	-
90	86	48.0	-	-
85	81	41.0	-	-



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