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موضوع: اطلاعیه فنی ۰۸-۰۱۸-۲۰

**A Glance On Marine Equipment and
Their Inspection for MWS- PART2**

نگاهی به تجهیزات دریایی و بازرسی آنها،
ارتباط آن با بازرسی تضمین عملیات - قسمت ۲

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All respectful ICS' Surveyors
With Gratitude,

کلیه بازرسان محترم ICS

The attached items which include Marine Equipment and their inspection for Marine Warranty Surveyor- PART2 has been sent as technical information

با سلام و احترام

پیوست مواردی در خصوص تجهیزات دریایی، بازرسی آنها و ارتباط آن با بازرسی تضمین عملیات - قسمت ۲، در قالب اطلاعیه فنی حضورتان ایفاد می گردد.

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Manager of Convention & Legislation
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رضوان پناه

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موسسه رده بندی ایران

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Code: ICS32F016/2

موسسه رده بندی ایران

نشانی دفتر مرکزی: تهران میدان هفت تیر، خیابان قائم مقام فراهانی، بالاتر از میدان شعاع، کوچه شبنم



WIRE ROPE FITTINGS:

Equipment Title:	Wire Rope Fittings
Application:	Almost All Kinds Of Offshore Projects

Wire rope is terminated with swaged, spliced, poured socket, or wire clip end fittings. Poured sockets or mechanical spliced wire rope end connectors can maintain 100 percent strength.

Fitting	Percent of Original Strength	Remarks
Swaged	90 to 100	Wire core only. For crown and retrieval wires.
Spliced	70 to 90	With or without thimble. Good for slings. Swivel avoids splice spin-out.
Poured Socket	90 to 100	Larger diameter tow wire and ground legs and heavy lift.

CLIPS

The most common method used to make an eye or attach a wire rope to a piece of equipment is with cable or Crosby clips of the U-bolt and saddle type or of the double integral saddle and bolt type (known as Safety or Fist Grip). When applied with proper care, thimbles, and according to the following tables and figures, clipped eye terminations will develop 80% of the wire rope strength.

U-bolt clips must have the U-bolt section on the dead or short end of the rope and the saddle on the live or long end of the rope. The wrong application (U-bolt on live instead of dead end) of even one clip can reduce the efficiency of the connection to 40%.

Never use fewer than the number of clips in below Tables. For maximum holding power the clips should be installed 6 rope diameters apart. Torque nuts to torque recommended in below Tables. After the rope has been in operation for an hour or so, all bolts should be checked for proper torque since the rope will stretch causing a reduction in diameter. Torque of nuts should also be checked periodically during operation.

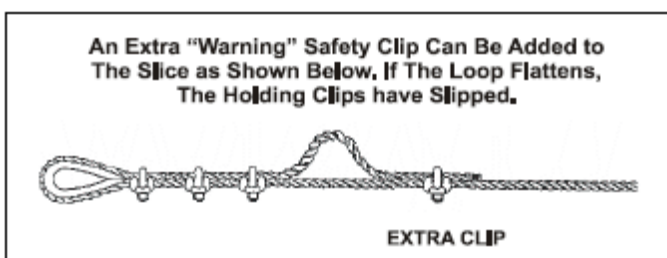
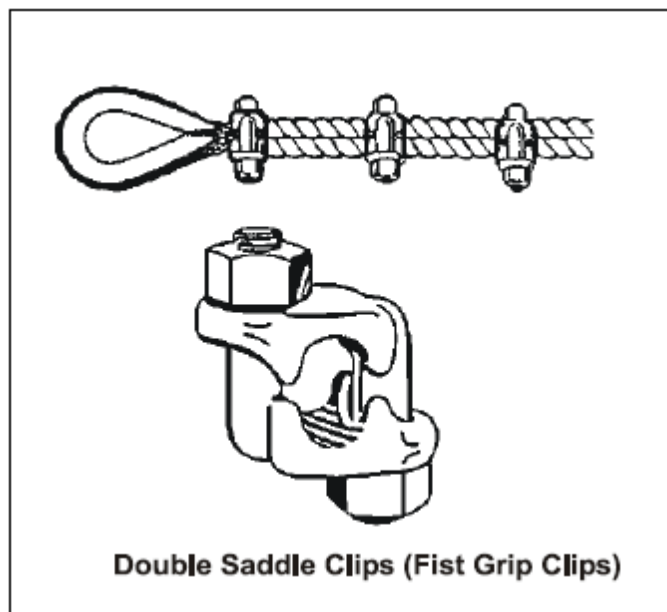
Rope Diameter (in.)	Minimum No. of Clips	Amount of Rope Turn Back from Thimble (in.)	Torque (ft-lbs) Unlubricated Bolts
1/2	3	11	65
5/8	3	13 1/2	130
3/4	3	16	225
1	5	37	225
1 1/4	6	55	360
1 1/2	6	66	500

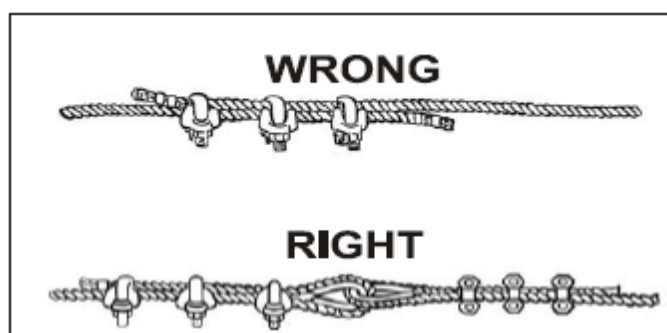
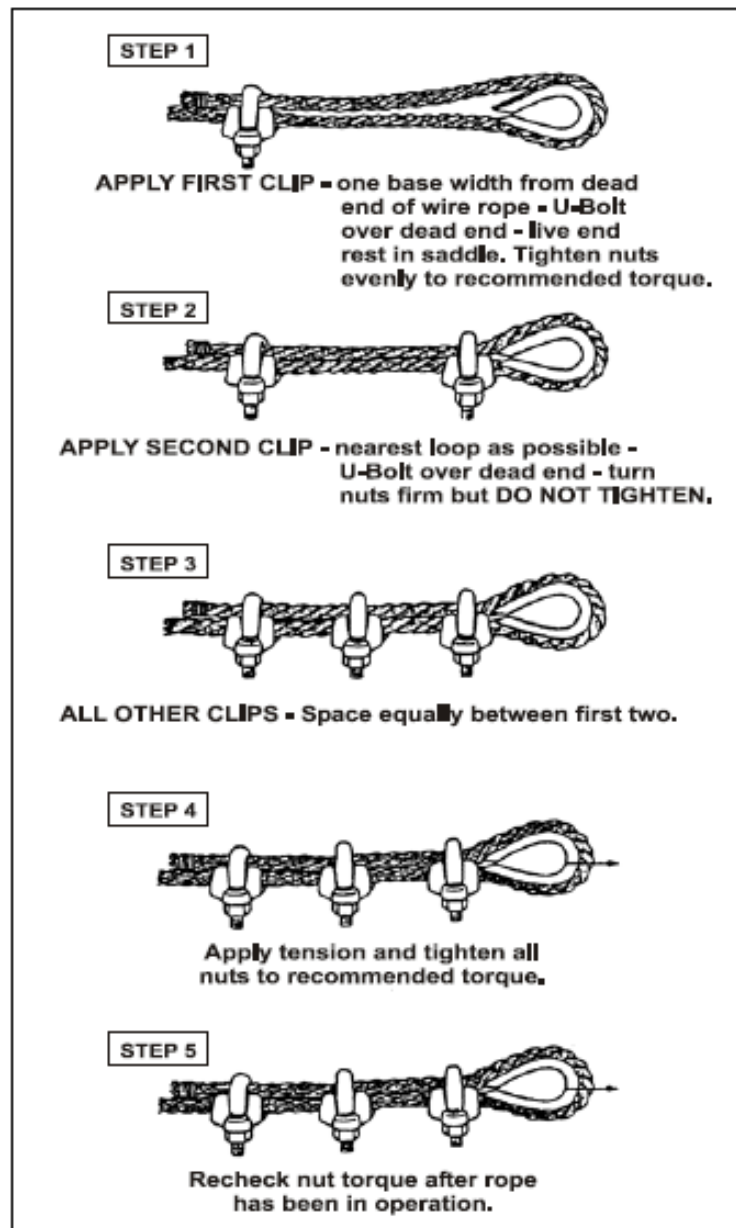
A Glance On Marine Equipment & Their Inspection For Marine Warranty Surveyors



Rope Diameter (in.)	Minimum No. of Clips	Amount of Rope Turn Back from Thimble (in.)	Torque (ft-lbs) Unlubricated Bolts
1/2	3	11 1/2	65
5/8	3	12	95
3/4	4	18	130
1	5	26	225
1 1/4	6	37	360
1 1/2	7	48	360
1 5/8	7	51	430
1 3/4	7	53	590
2	8	71	750
2 1/4	8	73	750
2 1/2	9	84	750
2 3/4	10	100	750

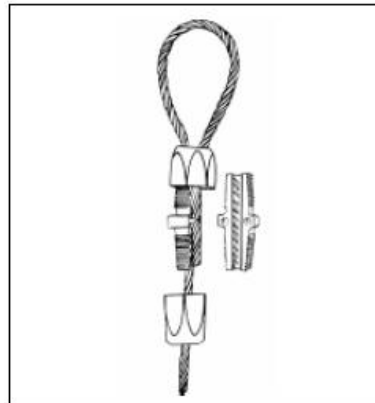
Double saddle clips are preferable to U-bolt clips since it is impossible to install them incorrectly and they cause less damage to the rope.





CLAMPS

A wire clamp can be used with or without a thimble to make an eye in wire rope. Ordinarily, use a clamp to make an eye without a thimble. It has about 90 percent of the strength of the rope. Tighten the two end collars with wrenches to force the clamp to a good snug fit. This crushes the pieces of rope firmly against each other.

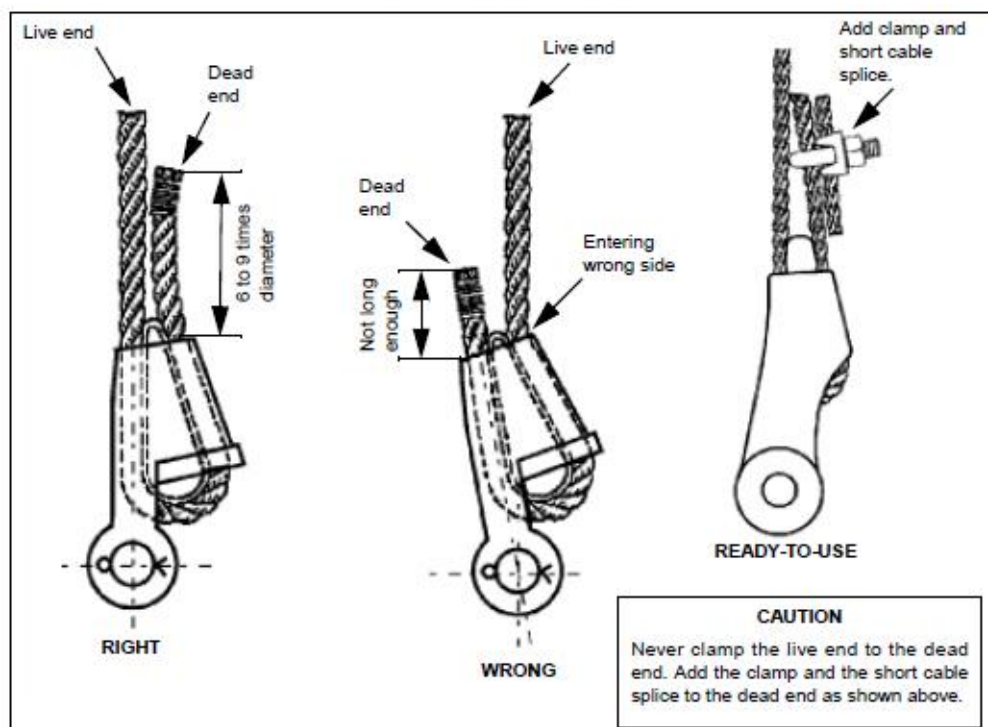


Wire-rope clamps

WEDGE SOCKET

Use a wedge-socket end fitting when it is necessary to change the fitting at frequent intervals. The efficiency is about two-thirds of the strength of the rope. It is made in two parts. The socket itself has a tapered opening for the wire rope and a small wedge to go into this tapered socket. The loop of wire rope must be inserted in the wedge socket so that the standing part of the wire rope will form a nearly direct line to the clevis pin of the fitting.

A properly installed wedge-socket connection will tighten when a strain is placed on the wire rope.

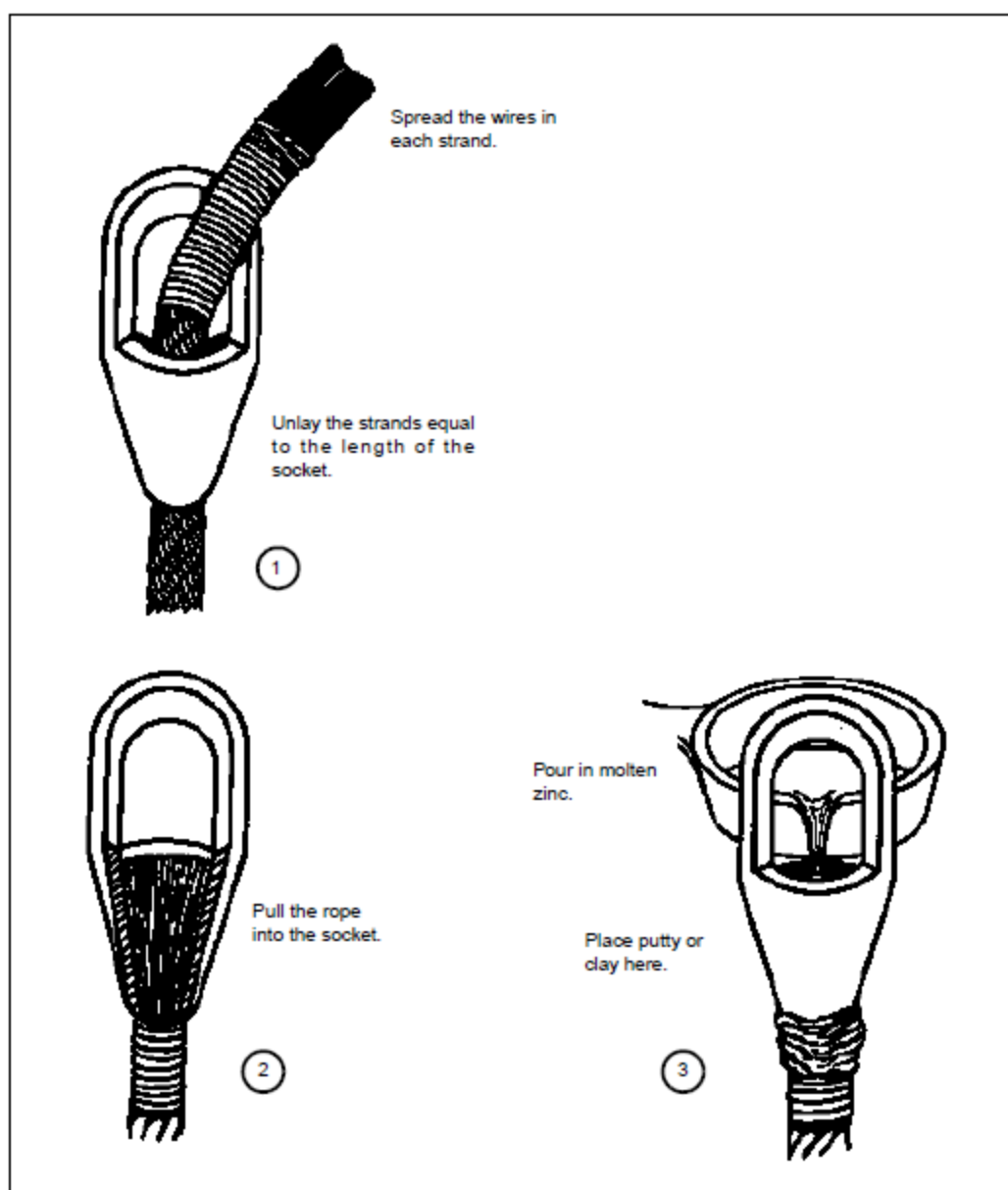


BASKET-SOCKET END FITTING

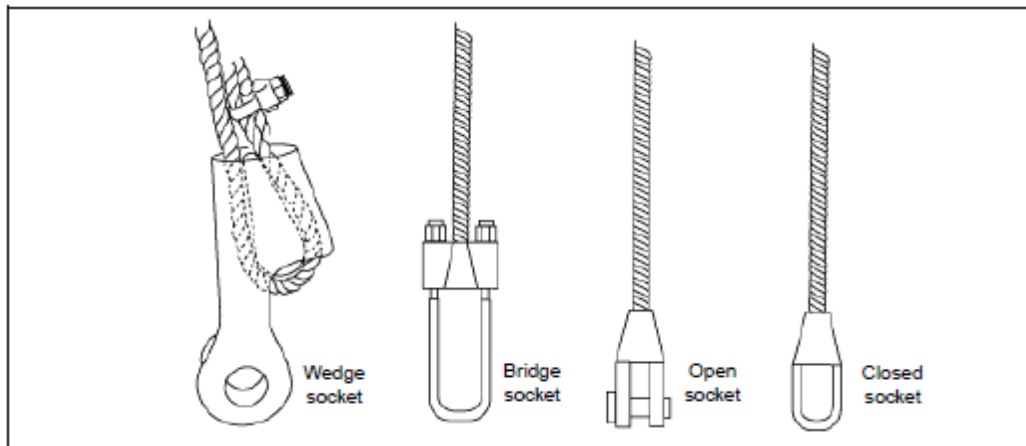
The basket-socket end fittings include closed sockets, open sockets, and bridge sockets. This socket is ordinarily attached to the end of the rope with molten zinc and is a permanent end fitting. If this fitting is properly made up, it is as strong as the rope itself. In all cases, the wire rope should lead from the socket in line with the axis of the socket.

POURED METHOD

The poured basket socket is the most satisfactory method in use. If the socketing is properly done, a wire rope, when tested to destruction, will break before it will pull out from the socket.



Attaching basket sockets by pouring

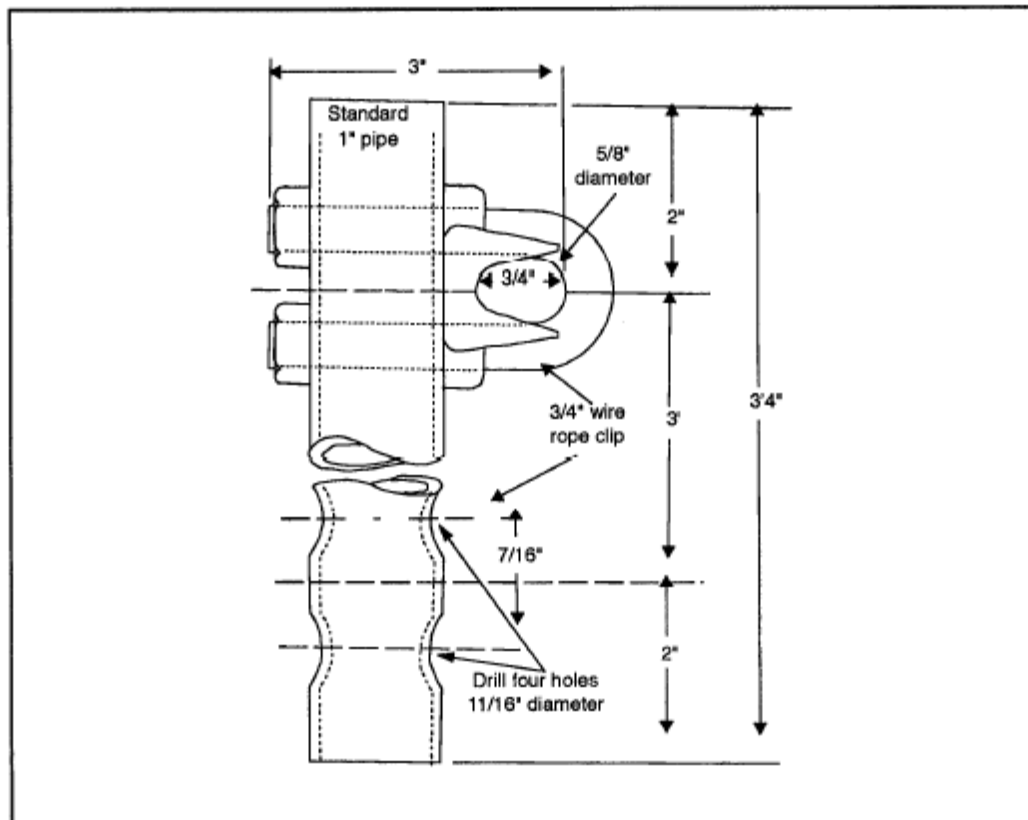


Basket-socket end fittings

STANCHIONS

The standard pipe stanchion is made up of a 1-inch diameter pipe (see Figure 2-56). Each stanchion is 40 inches long. Two 3/4-inch wire-rope clips are fastened through holes in the pipe with the centers of the clips 36 inches apart. Use this stanchion, without modifying it, for a suspended walkway that uses two wire ropes on each side.

However, for hand lines, remove or leave off the lower wire-rope clip. For more information on types and uses of stanchions.



Iron- Pipe stanchions

CHAINS

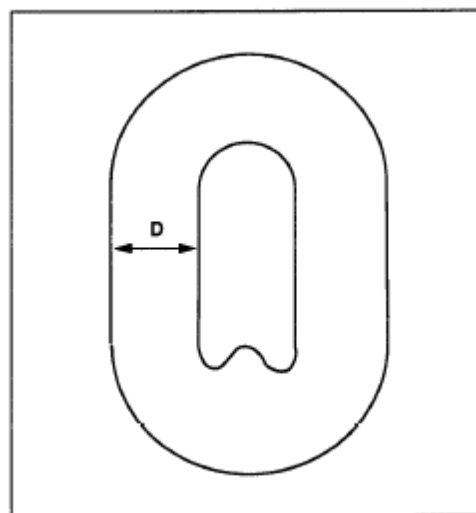
Equipment Title:	Chain
Application:	Salvage Towing Heave Lift

Chains are much more resistant to abrasion and corrosion than wire rope; use them where this type of deterioration is a problem, as in marine work where anchor gear must withstand the corrosive effects of seawater. You can also use chains to lift heavy objects with sharp edges that would cut wire.

In lifting, chains, as well as fiber ropes or wire ropes, can be tied to the load. But for speed and convenience, it is much better to fasten a hook to the end of the lifting line. Also, you can use hooks are in constructing blocks.

Chains are made up of a series of links fastened through each other. Each link is made of a rod of wire bent into an oval shape and welded at one or two points. The weld ordinarily causes a slight bulge on the side or end of the link. The chain size refers to the diameter, in inches, of the rod used to make the link. Chains usually stretch under excessive loading so that the individual links bend slightly.

Bent links are a warning that the chain has been overloaded and might fail suddenly under a load. Wire rope, on the other hand, fails a strand at a time, giving warning before complete failure occurs. If a chain is equipped with the proper hook, the hook should start to fail first, indicating that the chain is overloaded. Several grades and types of chains are available.



Link Thickness

Chains Common uses are:

- Beach gear ground legs
- Towing bridles
- Connecting to attachment points on stranded ships
- Slings
- Towing pendant hawsers from stranded ships
- Multi-point moors
- Cutting through hulls.

CHAIN CONSTRUCTION

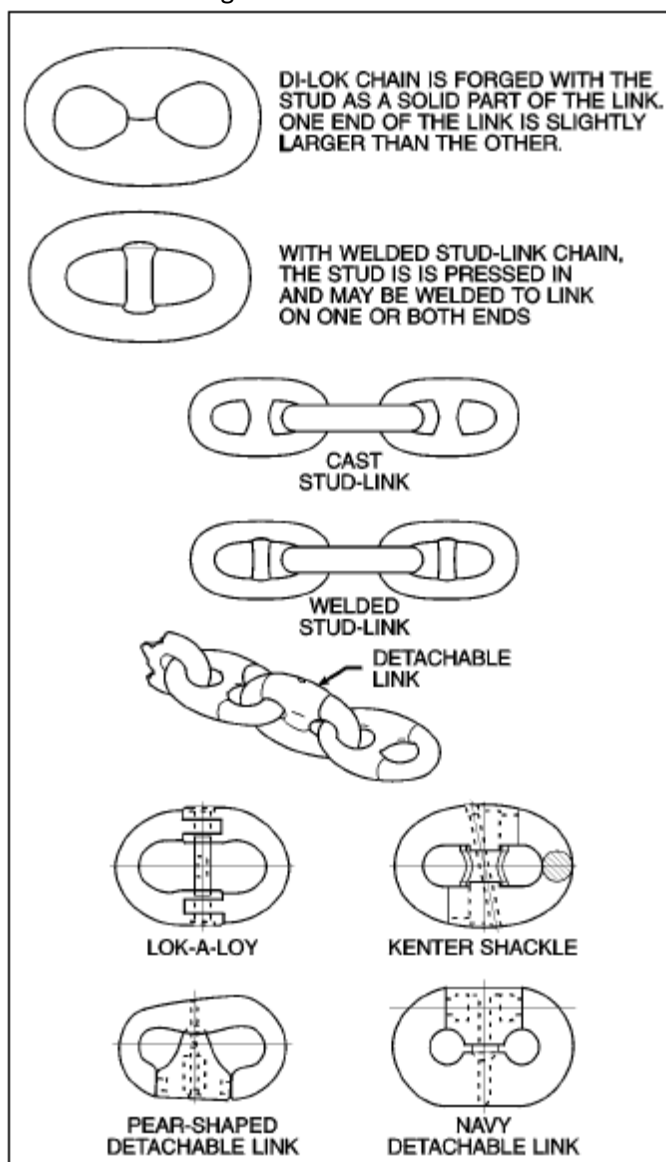
Chain construction is identified visually. Treat unidentifiable chain as commercial Grade 1.

DI-LOK CHAIN CHARACTERISTICS

- Links are larger on one end than on the other.
- Studs are an integral part of the cast link.
- Stronger and more kink-resistant than Stud-Link.
- Preferred for heavy lift legs.
- Suitable for use with small bending radius.

STUD-LINK CHAIN CHARACTERISTICS

- Links have separate studs pressed and welded into them.
- Studs prevent the links from turning.



Identifying Chain and Fittings.



STRENGTH OF CHAINS

To determine the SWC on a chain, apply a FS to the breaking strength. The SWC ordinarily is assumed to be about one-sixth of the BS, giving a FS of 6. Below Table lists SWC for various chains. You can approximate the SWC of an open-link chain by using the following rule of thumb:

$$SWC = 8D^2$$

SWC = Safe working capacity, in tons

D = Smallest link thickness or least diameter measured in inches

The figures given assume that the load is applied in a straight pull rather than by an impact. An impact load occurs when an object is dropped suddenly for a distance and stopped. The impact load in such a case is several times the weight of the load.

Size*	Approximate Weight per Linear Foot (pounds)	SWC (pounds)			
		Common Iron	High-Grade Iron	Soft Steel	Special Steel
1/4	0.8	512	563	619	1,240
3/8	1.7	1,350	1,490	1,650	3,200
1/2	2.5	2,250	2,480	2,630	5,250
5/8	4.3	3,470	3,810	4,230	7,600
3/4	5.8	5,070	5,580	6,000	10,500
7/8	8.0	7,000	7,700	8,250	14,330
1	10.7	9,300	10,230	10,600	10,200
1 1/8	12.5	9,871	10,858	11,944	21,500
1 1/4	16.0	12,186	13,304	14,634	26,300
1 3/8	18.3	14,717	16,188	17,807	32,051

*Size listed is the diameter, in inches, of one side of a link.

chain links from being cut. The padding may be either planks or heavy fabric. Do permit chains to twist or kink when under strain. Never fasten chain links chain together with bolts or wire because such connections weaken the chain and limit its SWC. Cut worn or damaged links out of the chain and replace them with a cold- shut link. Close the cold-shut link and weld it to equal the strength of the other links. Cut the smaller chain links with a bolt cutter; cut large chain links with a hack saw or an oxyacetylene torch. Inspect the chains frequently, depending on the amount of use. Do not paint chains to prevent rusting because the paint will interfere with the action of the links. Instead, apply a light coat of lubricant and store them in a dry and well-ventilated place.

CHAIN INSPECTION.

Inspect chains at least once a month; inspect those that are used for heavy and continuous loading more frequently.

Examine each link, sharp nicks or cuts, worn surfaces, and distortions. Replace those that show any of these weaknesses. If several links are stretched or distorted, do not use the chain; it probably was overloaded or hooked improperly, which weakened the entire chain.

Elongated link check:

- A stretched link will exceed the manufacturer's specified length.
- Hang the link after use, measure its overall length and compare with the standard given in typical dimensional tables. Consider any six links (five links for commercial chain) exceeding the manufacturer's specifications to be stretched.

Cracked link check:

- Ring each link under strain with a hammer.
- Good links will have a clear, ringing tone.
- Bad links will have a dull, flat tone.

INITIAL INSPECTION

Prior to use, all new, altered, modified, or repaired slings shall be inspected by a designated person to verify compliance with the applicable provisions of this part.

FREQUENT INSPECTION

Visual inspection for damage shall be performed by the user or other designated person each day or shift the sling is used.

Conditions that may result in a hazard shall cause the sling to be removed from service. Slings shall not be returned to service until approved by a qualified person.

Written records are not required for frequent inspections.

PERIODIC INSPECTION

A complete inspection for damage of the sling shall be periodically performed by a designated person.

Each link and component shall be examined individually; taking care to expose and examine all surfaces including the inner link surfaces.

Periodic Inspection Frequency. Periodic inspection intervals shall not exceed 1 year. The frequency of periodic inspections should be based on

- (1) frequency of sling use
- (2) severity of service conditions
- (3) nature of lifts being made
- (4) experience gained on the service life of slings used in similar circumstances

Guidelines for the time intervals are

- (1) normal service — yearly
- (2) severe service — monthly to quarterly
- (3) special service — as recommended by a qualified person

A written record of the most recent periodic inspection shall be maintained and shall include the condition of the sling.

REMOVAL CRITERIA

An alloy steel chain sling shall be removed from service if conditions such as the following are present:

- (a) missing or illegible sling identification.
- (b) cracks or breaks.
- (c) excessive wear, nicks, or gouges. Minimum thickness on chain links shall not be below the values listed in related tables.
- (d) stretched chain links or components.
- (e) bent, twisted, or deformed chain links or components.
- (f) evidence of heat damage.
- (g) excessive pitting or corrosion.
- (h) lack of ability of chain or components to hinge (articulate) freely.
- (i) weld splatter.
- (j) other conditions, including visible damage, that cause doubt as to the continued use of the sling.

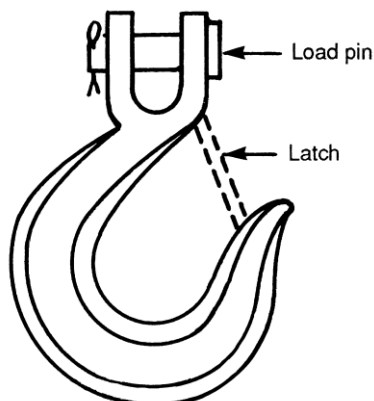
CHAIN PROOF TEST

Prior to initial use, all new and repaired chain and components of an alloy steel chain sling, either individually or as an assembly, shall be proof tested by the sling manufacturer or a qualified person.

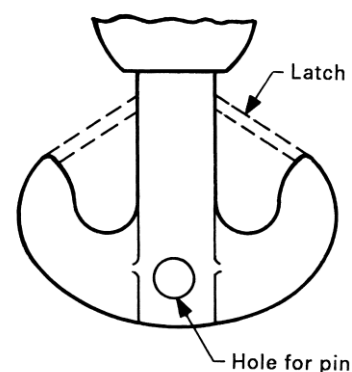
- (a) For single- or multiple-leg slings, each leg shall be proof loaded to a minimum of 2 times the single leg vertical hitch rated load.
- (b) The proof load for components attached to single legs shall be a minimum of 2 times the single-leg vertical hitch rated load.
- (c) Master links for double-leg bridle slings, singlebasket slings, and master coupling links connected to two legs shall be proof loaded to a minimum of 4 times the single-leg vertical hitch rated load.
- (d) Master links for triple- and quadruple-leg bridle slings and double basket bridle slings shall be proof loaded to a minimum of 6 times the single leg vertical hitch rated load.

HOOKS

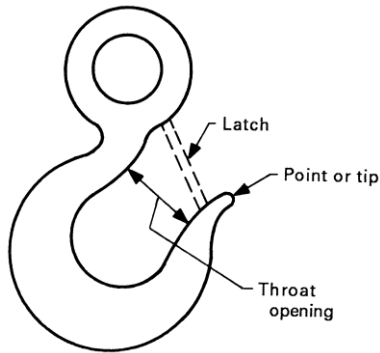
Equipment Title:	HOOKS
Application:	Almost All Kinds Of Offshore Projects



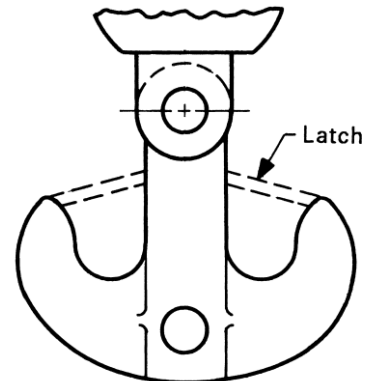
Clevis Hook (Latch — When Required)



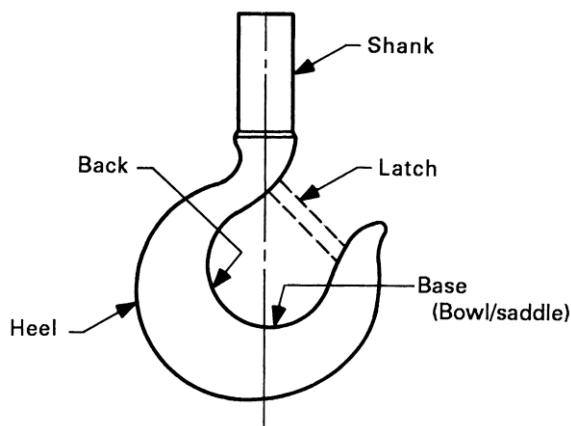
Duplex Hook (Sister)
(Hole for Pin Is Optional) (Latch — When Required)



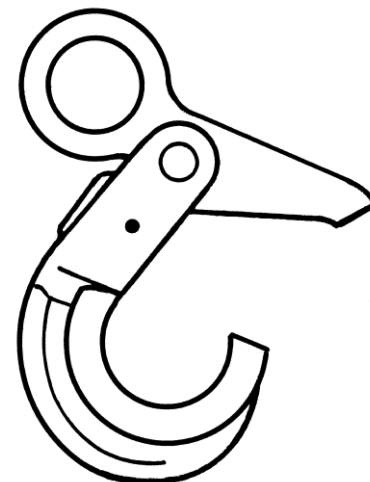
Eye Hook (Latch — When Required)



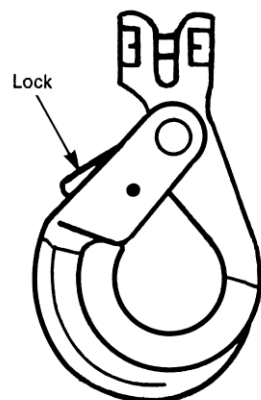
Articulated Duplex Hook (Sister)
(Hole for Pin Is Optional) (Latch — When Required)



Shank Hook (Latch — When Required)



Self-Locking Eye Hook (Open)



Self-Locking Clevis Hook (Closed)



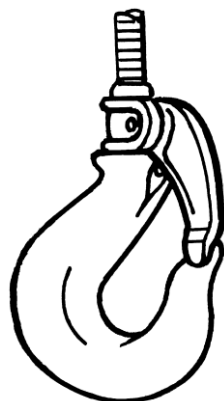
Self-Closing Flapper Latch (Shank Hook)



Self-Closing Bail (Eye Hook)



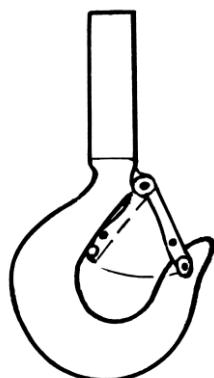
Self-Closing Flapper Latch (Swivel Hook)



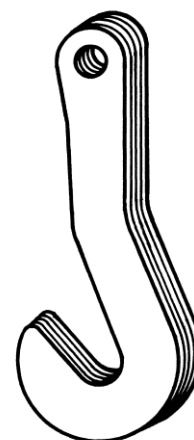
Self-Closing Gate Latch (Shank Hook)



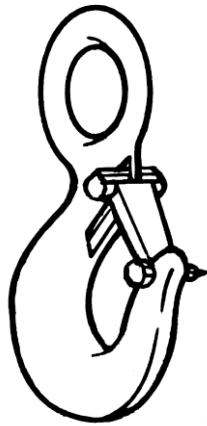
Self-Closing Flipper Latch (Eye Hook)



Self-Closing Tiplock Latch (Shank Hook)



Laminated Plate Hook



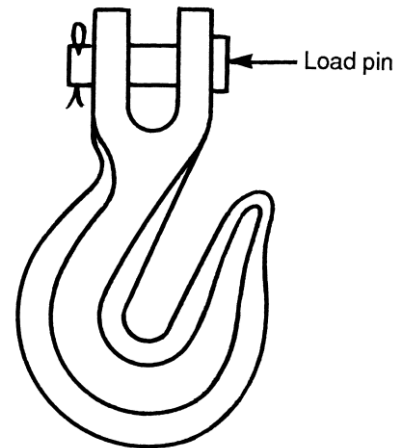
Self-Closing Tiplock Latch (Eye Hook)



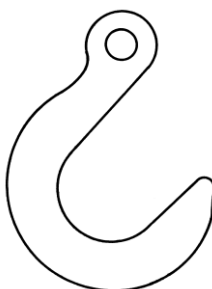
Eye Grab Hook



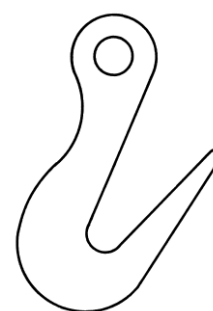
Single Plate Hook



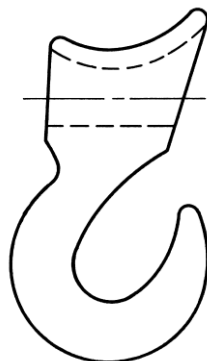
Clevis Grab Hook



Foundry Hook

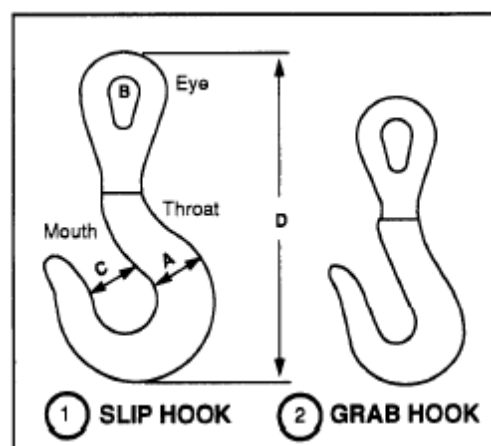


Sorting Hook



Choker Hook

The two general types of hooks available are the slip hook and the grab hook. Slip hooks are made so that the inside curve of the hook is an arc of a circle and may be used with wire rope chains, or fiber rope. Chain links can slip through a slip hook so the loop formed in the chain will tighten under a load. Grab hooks have an inside curve that is nearly U-shaped so that the hook will slip over a link of chain edgewise but will not permit the next link to slip through. Grab hooks have a more limited range of use than slip hooks. They are used on chains when the loop formed with the hook is not intended to close up around the load.



Types of Hooks

STRENGTH OF HOOKS

Hooks usually fail by straightening. Any deviation from the original inner arc indicates that the hook has been overloaded.

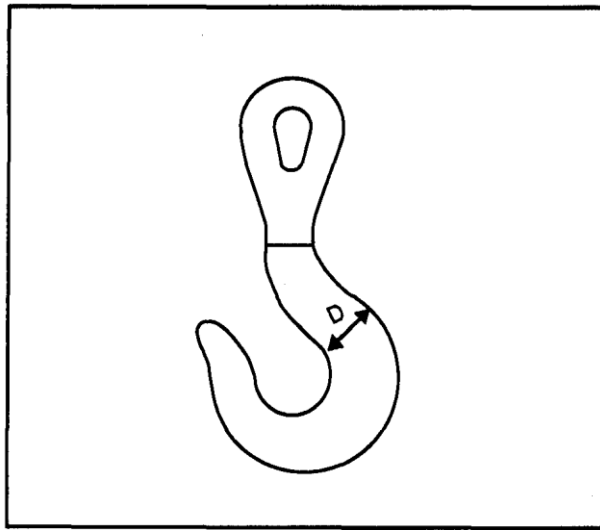
Since you can easily detect evidence of overloading the hook, you should use a hook that is weaker than the chain to which it is attached. With this system, hook distortion will occur before the chain is overloaded. Discard severely distorted,

cracked, or badly worn hooks because they are dangerous.

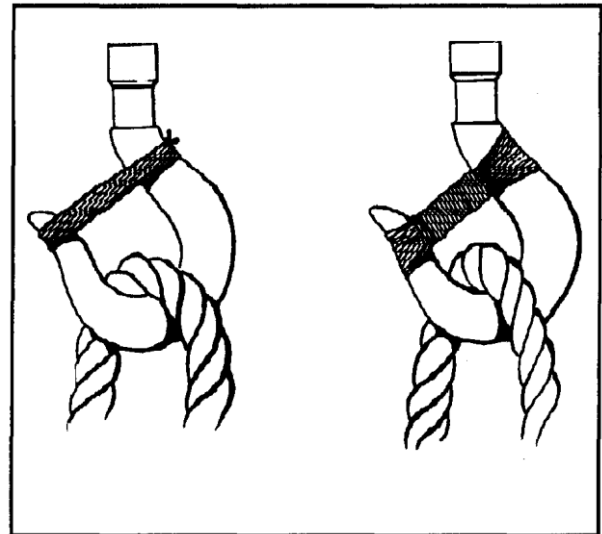
Approximate the SWC of a hook by using the following rule of thumb:

$$SWC = D^2$$

D = the diameter in inches of the hook where the inside of the hook starts its arc. Thus,



Hook Diameter (Thickness)



Mousing Hooks

Diameter of Metal A* (Inches)	Inside Diameter of Eye B (Inches)	Width of Opening C (Inches)	Length of Hook D (Inches)	SWC of Hooks, (pounds)
11/16	1/8	1 1/16	4 15/16	1,200
3/4	1	1 1/3	5 13/32	1,400
7/8	1 1/8	1 1/4	6 1/4	2,400
1	1 1/4	1 3/8	6 7/8	3,400
1 1/8	1 3/8	1 1/2	7 5/8	4,200
1 1/4	1 1/2	1 11/16	8 19/32	5,000
1 3/8	1 5/8	1 7/8	9 1/2	6,000
1 1/2	1 3/4	2 1/16	10 11/32	8,000
1 5/8	2	2 1/4	11 21/32	9,400
1 7/8	2 3/8	2 1/2	13 9/32	11,000
2 1/4	2 3/4	3	14 13/16	13,600
2 5/8	3 1/8	3 3/8	16 1/2	17,000
3	3 1/2	4	19 3/4	24,000

*For reference to A, B, C, or D, see Figure 3-2.

Safe Load of Hooks

MOUSING OF HOOKS

In general, always “mouse” a hook as a safety measure to prevent slings or ropes from jumping off. To mouse a hook after the sling is on the hook. wrap the wire or heavy twine 8 or 10 turns around the two sides of the hook.

Complete the process by winding several turns of the wire or twine around the sides of the mousing and tying the ends securely. Mousing also helps prevent straightening of the hook but does not strengthen it materially.

HOOKS INSPECTION AND TESTING INSPECTION CLASSIFICATION

Initial Inspection. Prior to initial use, all new and repaired hooks shall be inspected to verify compliance with the applicable provisions of this volume.

Inspection procedure and record keeping requirements for hooks in regular service shall be governed by the kind of equipment in which they are used. When such requirements for hooks are stated in standards for the specific equipment, they shall take precedence over the following. Otherwise, there shall be two general classifications based upon intervals at which examination shall be performed. The classifications are herein designated frequent and periodic, with intervals between examinations defined as follows:

1. Frequent Inspection. Visual examinations by the operator or other designated person with records not required:
 - (a) normal service — monthly
 - (b) heavy service — weekly to monthly
 - (c) severe service — daily to weekly
- (1) Periodic Inspection. Visual inspections by a designated person making records of apparent external conditions to provide the basis for continuing evaluation:
 - (a) normal service — yearly, with equipment in place
 - (b) heavy service — semiannually, with equipment in place unless external conditions indicate that disassembly should be done to permit detailed inspection
 - (c) severe service—quarterly, as in heavy service, except that the detailed inspection may show the need for a nondestructive type of testing

FREQUENT INSPECTION

Frequent inspections shall include observations during operation.

A designated person shall determine whether conditions found during the inspection constitute a hazard and whether a more detailed inspection is required.

Hooks shall be inspected for the following items:

- (1) distortion, such as bending, twisting, or increased throat opening
- (2) wear
- (3) cracks, nicks, or gouges
- (4) latch engagement (if provided)
- (5) damaged or malfunctioning latch (if provided)
- (6) hook attachment and securing means
- (7) self-locking hooks for proper operation and locking

PERIODIC INSPECTION

Inspection of hooks shall be performed.

The inspection shall include the requirements.

Hooks having any of the following conditions shall be removed from service until repaired or replaced.

- (1) Deformation. Any visibly apparent bend or twist from the plane of the unbent hook.
- (2) Throat Opening. Any distortion causing an increase in throat opening of 5% not to exceed 1/4 in. (or as recommended by the manufacturer).
- (3) Wear. Any wear exceeding 10% (or as recommended by the manufacturer) of the original section dimension of the hook or its load pin.
- (4) Inability to Lock. Any self-locking hook that does not lock.
- (5) Inoperative Latch. Any latch that does not close the hook's throat.

TESTING

When proof tests are used to verify manufacturing process, material, or configuration, the hooks shall be able to withstand the proof load application without permanent deformation when the load is applied for a minimum of 15 sec. This condition shall be considered to have been satisfied if the permanent increase in the throat opening does not exceed 1% or 0.02 in. (0.5 mm), whichever is greater. For such tests, Table 1 states the proof loads that shall be applied to a hook having a rated load capacity.

For a duplex (sister) hook having a pin hole, the proof load for the pin hole shall be in accordance with Hook standard tables. The proof load on the hook shall be shared equally between the two prongs of a sister hook, unless designed for unbalanced loading.

Performance testing of hooks shall not be required except where necessary to conform to the requirements for the equipment of which they are a part.



APPENDIX. A
Wire Rope End Termination
(Crosby Products Data Sheets)

Wire Rope End Terminations

Wire Rope End Terminations





G-450

Forged Wire Rope Clips



G-429

What It Takes To Be

“Crosby Or Equal”

FORGED FOR CRITICAL APPLICATIONS	COMPETITION	CROSBY
<p>The proper performance of forged clips depends on proper manufacturing practices that include good forging techniques and accurate machining. Forged clips provide a greater rope bearing surface and more consistent strength than malleable cast iron clips. Fist Grip clips provide a saddle for both the “live” and the “dead” end. Fewer forged clips are required for each termination than with malleable cast iron clips. Forged clips reduce the possibility of hidden defects that are sometimes present in malleable cast iron clips. Malleable cast iron clips should only be used in non-critical applications. ANSI, OSHA, and ASTM recommend only forged clips for critical applications.</p>	<p>Ask: <i>is the clip forged?</i></p> <p>Ask: <i>is an adequate cradle provided in the clip base for the wire rope?</i></p> <p>Malleable cast iron clips are sometimes improperly used as replacements for forged clips.</p>	<p>Crosby provides forged “Red” U-Bolt Clips and forged Fist Grip Clips which meet or exceed Federal Specification Number FF-C-450 and are considered the industry standard.</p>
<p>FULL LINE</p> <p>The proper application of forged clips requires that the correct type, size, number, and installation instructions be used (See APPLICATION INFORMATION below for more information.) Availability of a full range of sizes of forged U-bolt clips and forged fist grip clips are essential for design flexibility.</p>	<p>Ask: <i>Do they have both fist grip and U-bolt clips available?</i></p> <p>Ask: <i>Do they have a full range of forged wire rope clip sizes?</i></p> <p>No competitor has the full line of forged U-Bolt clips and fist grip clips that Crosby has.</p>	<p>Only Crosby provides forged “Red” U-Bolt Clips from 1/8" to 3-1/2"* and forged Fist Grip Clips from 3/16" through 1-1/2".</p> <p>* The 3-1/2" base is a steel casting.</p>
<p>IDENTIFICATION</p> <p>The clip’s size, manufacturer’s logo, and a traceability code should be clearly embossed in the forging of the clip. These three elements are essential in developing total confidence in the product.</p>	<p>Ask: <i>Is the manufacturer’s name and size of clip clearly marked?</i></p> <p>Ask: <i>Do they have a traceability system that is actively used in the manufacturing process?</i></p> <p>Most do not have a traceability system.</p>	<p>Crosby clearly embosses its logo, the size, and the Product Identification Code (PIC) into all Crosby “Red” U-bolt Clip bases and Fist Grip clips. Crosby’s traceability system is actively used throughout the manufacturing of forged clips. The material analysis for each heat of steel, is verified within our own laboratory.</p>
<p>APPLICATION INFORMATION</p> <p>Detailed application information will assist you in the proper installation of wire rope clips. This information is most effective when provided at the point of application, as well as in supporting brochures and engineering information. The manufacturer must provide this specific information. Generic information will not provide all the needed application instructions. A formal application and warning system that attracts the attention of the user, clearly informs the user of the factors involved in the task, and informs the user with the proper application procedures as needed.</p>	<p>Ask: <i>Does each clip have the application and warning information?</i></p> <p>Most competitors do not have application and warnings information with each clip.</p>	<p>Crosby provides detailed application and warning information for all forged clips. Each clip is individually bagged or tagged with the application and warning information. Testing and evaluation of special applications can be performed upon special request.</p>



Remember, “When buying Crosby, you’re buying more than product, you’re buying Quality.”

Crosby Value Added

- Full Line: Crosby provides both forged “Red” U-Bolt Clips and forged Fist Grip Clips.
- Forged: Crosby “Red” U-Bolt Clips have forged bases on all sizes, except 3-1/2" (the 3-1/2" base is a steel casting). The entire clip is galvanized to resist corrosive and rusting action. Clip sizes 1/8" through 1-1/2" have U-Bolts with rolled threads which enhance the strength of the material and fatigue properties.
- Forged: Fist Grip Clips are forged, and the entire clip is galvanized. The double saddle design eliminates the possibility of incorrect installation. Designed as an integral part of the clip, the bolts are opposite one another (see G-429 example below). As result, the nuts can be installed in such a way as to enable the operator to swing the wrench in a full arc for ease of installation.
- Application Information: Application and warning information is available for both Crosby “Red” U-Bolt Clips and Fist Grip Clips. The Crosby Warning System is designed to attract the attention of the user, clearly inform the user of the factors involved in the task, and provide the user with proper application procedures. Each Crosby “Red” U-Bolt Clip and Fist Grip Clip is either bagged or tagged with appropriate application and warning information, thus ensuring that the information is available at the point of application for each and every clip during installation.
- Material Analysis: Crosby can provide certified material (mill) analysis for each production lot, traceable by the Product Identification Code (PIC). Crosby, through its own laboratory, verifies the analysis of each heat of steel.
- Testing: Crosby periodically audits the termination efficiencies of the “Red” U-Bolt Clips and Fist Grip Clips. Upon special request, Crosby will determine the efficiencies of clip assemblies when applied to special rope constructions and special applications..



G-450
Red-U-Bolt®, Clip



G-429
Fist Grip Clip

Forged Wire Rope Clips



SEE APPLICATION AND WARNING INFORMATION

On Page 46

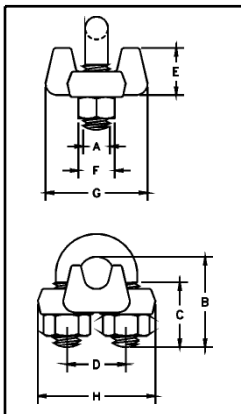
G-450



- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or CG, and a size forged into it.
- Sizes 1/8" through 2-1/2" (3 mm through 76mm) have forged bases.
- Entire Clip-Galvanized to resist corrosive and rusting action
- Only Genuine Crosby clips have a Red U-BOLT® for instant recognition.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Clip sizes up through 1-1/2" (38mm) have rolled threads.
- Look for the Red-U-Bolt®, your assurance of Genuine Crosby Clips.

Crosby Clips, all sizes 1/4" (6 mm) and larger, meet the performance requirements of Federal Specification FF-C-450 TYPE 1 CLASS 1, except for those provisions required of the contractor.

G-450 Crosby® Clips



Rope Size (mm)*	G-450 Stock No.	Std. Package Qty.	Weight Per 100 (kg)	Dimensions (mm)							
				A	B	C	D	E	F	G	H
* 3-4	1010015	100	2.72	5.60	18.3	11.2	11.9	10.4	9.65	20.6	23.9
* 5	1010033	100	4.54	6.35	24.6	14.2	15.0	12.7	11.2	23.9	29.5
6-7	1010051	100	8.62	7.85	26.2	12.7	19.1	16.8	14.2	30.2	36.6
8	1010079	100	12.7	9.65	35.1	19.1	22.4	18.3	17.5	33.3	42.9
9-10	1010097	100	21.8	11.2	38.1	19.1	25.4	23.1	19.1	41.4	49.3
11	1010113	50	35.4	12.7	47.8	25.4	30.2	26.2	22.4	46.0	58.0
12-13	1010131	50	36.3	12.7	47.8	25.4	30.2	28.7	22.4	48.5	58.0
14-15	1010159	50	49.4	14.2	57.0	31.8	33.3	31.0	23.9	52.5	63.5
16	1010177	50	49.9	14.2	60.5	31.8	33.3	34.0	23.9	52.5	63.5
18	1010195	25	64	15.7	70.0	36.6	38.1	35.8	26.9	57.0	72.0
20-22	1010211	25	96	19.1	79.0	41.1	44.5	40.4	31.8	62.0	80.5
24-26	1010239	10	114	19.1	89.0	46.0	47.8	45.2	31.8	67.0	88.0
28-30	1010257	10	128	19.1	98.5	51.0	51.0	48.5	31.8	71.5	91.0
32-34	1010275	10	199	22.4	108	54.0	58.5	55.5	36.6	79.5	105
36	1010293	10	200	22.4	118	58.5	60.5	58.5	36.6	79.5	106
38	1010319	10	247	22.4	125	60.5	66.5	62.0	36.6	86.5	113
41-42	1010337	Bulk	319	25.4	135	66.5	70.0	67.5	41.4	92.0	121
44-46	1010355	Bulk	424	28.7	146	70.0	77.5	74.5	46.0	97.0	134
48-52	1010373	Bulk	590	31.8	164	76.0	86.0	83.5	51.0	113	149
56-58	1010391	Bulk	726	31.8	181	81.0	98.5	81.0	51.0	114	162
62-65	1010417	Bulk	862	31.8	195	87.5	105	93.5	51.0	103	168
** 68-72	1010435	Bulk	1043	31.8	211	90.5	111	124	51.0	127	175
75-78	1010453	Bulk	1406	38.1	233	98.5	121	119	60.5	149	194
** 85-90	1010426	Bulk	1814	38.1	273	114	140	152	60.5	157	213

* Electro-plated U-Bolt and Nuts. ** 70 mm and 89mm base is made of cast steel.

SS-450

- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or CG, and a size forged into it.
- Entire clip is made from 316 Stainless Steel to resist corrosive and rusting action.
- All components are Electro-Polished.
- All Clips are individually bagged or tagged with proper application instructions and warning information.



Rope Size (mm)	SS-450 Stock No.	Std. Package Qty.	Weight Per 100 (kg)	Dimensions (mm)							
				A	B	C	D	E	F	G	H
3-4	1011250	Bulk	2.72	5.60	18.3	11.2	11.9	10.4	9.65	20.6	23.9
5	1011261	Bulk	4.54	6.35	24.6	14.2	15.0	12.7	11.2	23.9	29.5
6-7	1011272	Bulk	9.07	7.85	26.2	12.7	19.1	16.8	14.2	30.2	36.6
9-10	1011283	Bulk	21.3	11.2	38.1	19.1	25.4	23.1	19.1	41.4	49.3
12-13	1011305	Bulk	34.9	12.7	47.8	25.4	30.2	28.7	22.4	48.5	58.0
16	1011327	Bulk	48.1	14.2	60.5	31.8	33.3	34.0	23.9	52.5	63.5

Fist Grip® Wire Rope Clips

 **SEE APPLICATION AND WARNING INFORMATION**
On Page 47

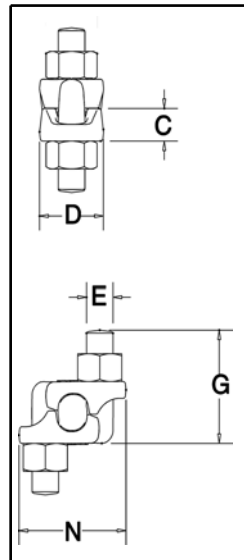
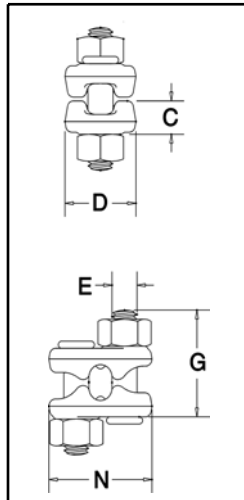
NEW STYLE FIST GRIP CLIPS 5 MM - 16 MM



Fist Grip wire clips meet or exceed the performance requirements of Federal Specification FF-C-450 Type III, Class 1, except for those provisions required of the contractor.

- Bolts are an integral part of the saddle. Nuts can be installed in such a way as to enable the operator to swing the wrench in a full arc for fast installation.
- All sizes have forged steel saddles.
- Entire clip is Galvanized to resist corrosive and rusting action.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Assembled with standard heavy hex nuts.

FIST GRIP® CLIPS 19 MM - 38 MM



Rope Size (mm)*	G-429 Stock No.	Std. Package Qty.	Weight Per 100 (kg)	Dimensions (mm)				
				C	D	E	G	N
5-7	1010471	100	10.4	10.2	23.9	9.65	32.5	36.6
8	1010499	100	12.7	11.9	26.9	9.65	37.3	39.1
10	1010514	50	18.1	13.0	26.9	11.2	46.0	45.2
11-13	1010532	50	28.1	15.0	31.8	12.7	55.5	54.6
14-16	1010550	50	46.7	18.3	38.1	16.0	68.5	65.3
18-20	1010578	25	79	21.8	46.0	19.1	74.5	67.8
22	1010596	25	102	24.6	53.8	19.1	84.0	72.6
24-26	1010612	10	136	28.7	57.0	19.1	94.5	77.7
28-30	1010630	10	181	32.5	60.5	22.4	107	87.4
32-34	1010658	10	181	34.0	63.5	22.4	108	90.4
36-40	1010676	Bulk	318	39.6	76.0	25.4	141	105

* Sizes through 16mm incorporate New Style design.

S-421T Wedge Sockets



SEE APPLICATION AND WARNING INFORMATION

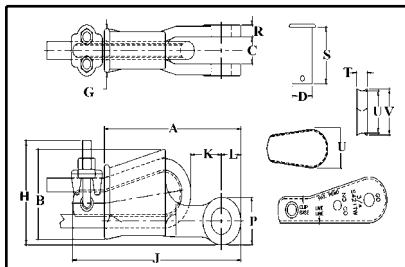
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S-421T



Wedge sockets meet the performance requirements of Federal Specification RR-S-550D, Type C, except those provisions required of the contractor.

- Basket is cast steel.
- Individually magnetic particle inspected.
- Pin diameter and jaw opening allows wedge and socket to be used in conjunction with open swage and spelter sockets.
- Secures the tail or "dead end" of the wire rope to the wedge, thus eliminates loss or "Punch out" of the wedge.
- Eliminates the need for an extra piece of rope, and is easily installed.
- The TERMINATOR™ wedge eliminates the potential breaking off of the tail due to fatigue.
- The tail, which is secured by the base of the clip and the wedge, is left undeformed and available for reuse.
- Incorporates Crosby's patented **QUIC-CHECK®** "Go" and "No-Go" feature cast into the wedge. The proper size rope is determined when the following criteria are met:
 - 1) The wire rope should pass thru the "Go" hole in the wedge.
 - 2) The wire rope should NOT pass thru the "No-Go" hole in the wedge.
- Utilizes standard Crosby Red-U-Bolt® wire rope clip.
- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope.
- Standard S-421 wedge socket can be retrofitted with the new style TERMINATOR™ wedge.
- Available with Bolt, Nut, and Cotter Pin.
- U.S. patent 5,553,360 and foreign equivalents.



S-421T Wedge Sockets

Wire Rope Dia. (mm.)*	S-421T Stock No.*	Weight Each (kg.)	S-421TW Stock No. Wedge Only	Wedge Only Weight Each (kg)	Dimensions (mm)														
					A	B	C	D	G	H	J†	K†	L	P	R	S	T	U	V
9-10	1035000	1.44	1035555	.23	143	70.5	20.6	20.6	35.1	79.0	187	40.6	22.4	39.6	11.2	54.1	11.2	31.8	35.1
11-13	1035009	2.79	1035564	.48	173	90.0	25.4	25.4	41.1	98.0	222	30.7	26.9	49.3	12.7	62.0	13.5	44.5	47.8
14-16	1035018	4.40	1035573	.81	207	111	31.8	30.2	54.0	116	263	41.7	31.0	57.0	14.2	79.5	17.5	51.0	55.5
18-19	1035027	6.58	1035582	1.18	248	122	38.1	35.1	62.0	136	306	55.0	35.6	66.5	16.8	92.2	19.8	59.5	65.0
20-22	1035036	9.75	1035591	1.82	283	118	44.5	41.4	68.5	160	356	56.5	42.2	79.0	19.1	106	22.4	68.5	74.5
24-26	1035045	13.9	1035600	2.44	324	129	51.0	51.0	65.0	178	403	69.0	51.0	95.5	22.4	118	26.2	73.0	83.5
28	1035054	20.5	1035609	3.56	365	140	57.0	57.0	84.0	197	450	63.5	57.0	108	25.4	137	30.2	79.5	90.5
30-32	1040448	26.1	1040607	3.09	406	202	63.5	63.5	90.5	N/A	N/A	86.0	63.5	121	28.4	148	33.3	86.0	97.0

* TERMINATOR™ Assembly includes Socket, Wedge, Pin and Wire Rope Clip.

** 1-1/4" not available in TERMINATOR™ style.

† Nominal

NOTE: For intermediate wire rope sizes, use next larger size socket.

US-422T Utility Wedge Sockets



SEE APPLICATION AND WARNING INFORMATION
On Page 49

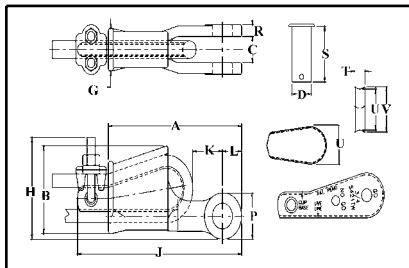
Wire Rope End Terminations

US-422T



Selected sizes now incorporate the "TERMINATOR"™ design.

- Basket is cast steel.
- Cast into each socket is the name "McKissick", "Crosby" or "CG", its model number and its wire line range.
- By simply changing out the wedge, each socket can be utilized for various wire line sizes (Ensure correct wedge is used for wire rope size).
- Wedges are color coded for easy identification.
 - Blue - largest wire line size for socket.
 - Black - mid size wire line for socket.
 - 11 mm on US4
 - 14 mm on US5
 - Orange - smallest wire line size for socket.
- Cast into each wedge is the model number of the socket and the wire line size for which the wedge is to be used.
- Load pin is forged and headed on one end.
- US-422 wedge sockets contain a hammer pad (lip) to assist in proper securement of termination.
- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope.
- UWO-422 Wedges are to be used only with the US-422 Wedge Socket Assemblies.



US-422T Utility Wedge Socket

Model No.	Wire Rope Size (mm)	US-422T Stock No.*	Weight Each (kg)	Wedge Only Stock No.†	Weight Each (kg)	Dimensions (mm)														
						A	B	C	D	G	H	J	K	L	P	R	S	T	U	V
US4	10	1044300*	2.09	1047310†	.27	173	89.5	25.4	25.4	41.4	71.5	76.0	33.3	70.0	49.3	12.7	64.5	13.5	48.5	54.5
US4	11	1044309*	2.09	1047301†	.27	173	89.5	25.4	25.4	41.4	71.5	76.0	33.3	70.0	49.3	12.7	64.5	13.5	44.5	47.8
US4	13	1044318*	2.09	1047329†	.27	173	89.5	25.4	25.4	41.4	71.5	76.0	33.3	70.0	49.3	12.7	64.5	13.5	44.5	47.8
US5	13	1044327*	3.86	1047338†	.45	233	108	35.8	31.8	54.0	84.0	93.5	51.0	102	76.0	16.0	82.5	20.6	48.8	54.5
US5	14	1044336*	3.86	1047347†	.45	233	108	35.8	31.8	54.0	84.0	93.5	51.0	102	76.0	16.0	82.5	17.5	51.0	55.5
US5	16	1044345*	3.86	1047356†	.45	233	108	35.8	31.8	54.0	84.0	93.5	51.0	102	76.0	16.0	82.5	17.5	51.0	55.5
US6	16	1044354*	4.26	1047365†	.64	241	118	38.1	31.8	57.0	92.0	89.0	54.0	114	76.0	14.2	82.5	22.4	60.5	70.0
US6	19	1044363*	4.26	1047374†	.64	241	118	38.1	31.8	57.0	92.0	89.0	54.0	114	76.0	14.2	82.5	22.4	54.0	67.0
US8A	16	1038562	7.94	1046656	1.36	286	124	44.5	41.4	54.0	95.5	104	70.0	125	98.5	19.1	105	25.4	67.5	77.5
US8A	19	1038571	7.94	1046666	1.36	286	124	44.5	41.4	54.0	95.5	106	70.0	125	98.5	19.1	105	25.4	58.5	71.5
US7	22	1038580	7.48	1046674	1.18	286	129	33.3	31.8	68.5	97.5	125	65.0	119	82.5	16.8	82.5	26.9	54.0	65.0
US7	25	1038589	7.48	1046683	1.18	286	129	33.3	31.8	68.5	97.5	125	65.0	119	82.5	16.8	82.5	26.9	47.8	60.5
US8	22	1044408*	9.43	1047422†	1.36	283	145	44.5	41.4	68.5	114	127	54.0	114	79.5	19.1	110	22.4	68.5	74.5
US8	25	1038607	9.43	1046701	1.36	283	145	44.5	41.4	68.5	114	127	54.0	114	79.5	19.1	110	22.4	62.0	68.5
US10	28	1038616	21.1	1046710	4.08	392	202	44.5	41.4	92.0	156	156	76.0	181	111	19.1	105	39.6	89.0	114
US10	32	1038625	21.1	1046919	4.08	392	202	44.5	41.1	92.0	156	156	76.0	181	111	19.1	105	39.6	87.5	113
US11	28	1038634	25.9	1046928	3.18	406	193	63.5	63.5	90.5	152	184	70.0	159	121	28.7	156	33.3	93.0	104
US11	32	1038643	25.9	1046937	3.18	406	193	63.5	63.5	90.5	152	184	70.0	159	121	28.7	156	33.3	86.0	97.0

* US-422T "TERMINATOR"™ Style.

† UWO-422T "TERMINATOR"™ Style

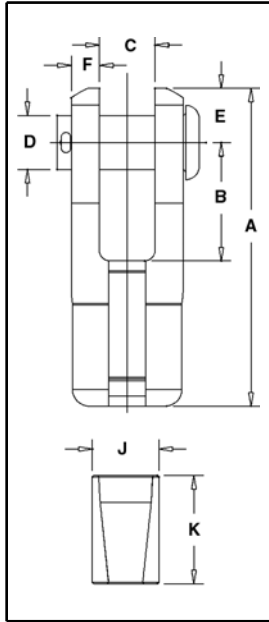
Button Spelter Sockets

SB-427



- Designed for use with mobile cranes. Can be used to terminate high performance, rotation resistant ropes, and standard 6 strand ropes.
- Available in six sizes from 13mm to 38mm.
- Button Spelter terminations have a 100% efficiency rating, based on the catalog strength of the wire rope.
- Easy to install assembly utilizes Crosby® WIRELOCK® socketing compound.
- Sockets and buttons are re-usable.
- Replacement buttons and sockets are available.

Button Spelter Sockets



Wire Rope Size		SB-427 Stock No.	Weight Each (kg)	Socket Only Stock No.	Button Only Stock No.	Dimensions (mm)							
(in.)	(mm)					A	B	C	D	E	F	J	K
1/2 - 5/8	13-16	1052005	2.76	1052107	1052203	183	67.6	325	30.2	31.0	15.7	38.1	63.5
5/8 - 3/4	16-19	1052014	4.67	1052116	1052212	217	79.2	388	35.1	36.6	19.1	44.5	76.2
3/4 - 7/8	19-23	1052023	7.75	1052125	1052221	254	92.0	452	41.1	42.9	22.4	52.3	88.9
7/8 - 1	22-26	1052032	13.24	1052134	1052230	298	111	516	51.0	51.0	26.2	61.9	102
1-1/8 - 1-1/4	28-32	1052041	20.86	1052143	1052249	351	127	643	57.2	63.5	28.2	74.7	127
1-3/8 - 1-1/2	35-38	1052050	35.38	1052152	1052258	424	152	770	69.9	79.2	32.3	91.9	152

Wire Rope Size		WIRELOCK® Required (cc)	WIRELOCK® Stock No.	WIRELOCK® Kit-Size (cc)
(in.)	(mm)			
1/2 - 5/8	13-16	35	1039602	100
5/8 - 3/4	16-19	60	1039602	100
3/4 - 7/8	19-23	100	1039602	100
7/8 - 1	22-26	140	1039602	100
1-1/8 - 1-1/4	28-32	250	1039604	250
1-3/8 - 1-1/2	35-38	420	1039606	500

* 2 kits required.

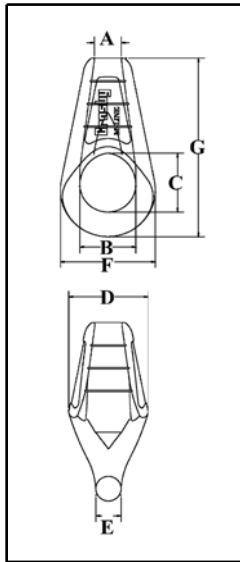
Mooring Sockets

G-517 / S-517



- Designed for today's higher strength classes of wire rope.
- Wide range of sizes available:
 - 50 mm through 92 mm Wire Line
- "M-Line" socket terminations have a 100% efficiency rating, based on the minimum breaking load of the wire rope.
- Design of bail allows for easy connection to shackles and other connecting links.
- Socket design utilizes features to keep cone from rotating.
- Available Galvanized or Self Colored.

G-517 / S-517 "M-Line" Mooring Sockets



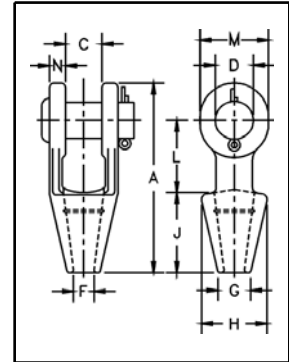
Rope Dia. (mm)	G-517 Stock No.	S-517 Stock No.	Weight Each (kg.)	Dimensions (mm)						
				A	B	C	D	E	F	G
50-54	1005002	1005011	25.8	63.5	121	133	178	53.1	210	407
64-67	1005020	1005039	34.5	70.5	133	146	196	58.7	233	455
64-67	1005048	1005057	47.6	77.5	149	170	217	68.3	257	505
70-73	1005066	1005075	62.6	84.5	165	181	237	76.2	282	549
50-54	1005084	1005093	87.5	89.0	184	197	262	82.6	313	597
82-86	1005105	1005114	104	98.5	194	222	277	88.9	334	654
88-92	1005123	1005132	127	105	203	230	298	93.7	355	692

Open Spelter Sockets

G-416 / S-416



- Forged Steel Sockets thru 38 mm, cast alloy steel 40 mm thru 100 mm.
- Spelter socket terminations have an efficiency rating of 100%, based on the catalog strength of wire rope. Ratings are based on recommended use with 6 x 7, 6 x 19, or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC, or IWRC wire rope.



Open Grooved Sockets meet the performance requirements of Federal Specification RR-S-550D, Type A, except for those provisions required of the contractor.

NOTICE:

All cast steel sockets 40 mm and larger are magnetic particle inspected and ultrasonic inspected. Proof testing available on special order. Drawing illustrates one groove used on sockets 6 mm thru 19 mm. Sizes 22 mm thru 38 mm use 2 grooves. Sizes 40 mm and larger use 3 grooves.

G-416 / S-416 Open Spelter Sockets

Rope Dia. (mm)	Structural Strand Dia. (mm)	Stock No.		Weight Each (kg)	Dimensions (mm)									
		G-416 Galv.	S-416 S.C.		A	C	D	F	G	H	J	L	M	N
6-7	-	1039619	1039628	.50	116	19.1	17.5	9.65	17.5	39.6	57.0	39.6	33.3	9.10
8-10	-	1039637	1039646	.59	123	20.6	20.6	12.7	20.6	42.9	57.0	44.5	38.1	11.2
11-13	-	1039655	1039664	1.02	141	25.4	25.4	14.2	23.9	47.8	63.5	51.0	47.8	12.7
14-16	12-13	1039673	1039682	1.63	171	31.8	30.2	17.5	28.7	57.0	76.0	63.5	57.0	14.2
18	14-16	1039691	1039708	2.64	202	38.1	35.1	20.6	31.8	66.5	89.0	76.0	66.5	15.7
20-22	18-19	1039717	1039726	4.38	235	44.5	41.4	23.9	38.1	82.5	102	89.0	79.5	20.3
24-26	20-22	1039735	1039744	7.03	268	51.0	51.0	28.7	44.5	95.5	114	102	95.5	22.4
28-30	24-26	1039753	1039762	9.75	300	57.0	57.0	31.8	51.0	105	127	117	105	25.4
32-35	28	1039771	1039780	14.1	335	63.5	63.5	38.1	57.0	121	140	127	121	28.7
38	30-32	1039799	1039806	21.4	384	76.0	70.0	41.4	70.0	133	152	152	137	30.2
* 40-42	33-35	1039815	1039824	24.9	413	76.0	76.0	44.5	76.0	140	165	165	146	33.3
* 44-48	36-40	1039833	1039842	37.2	464	89.0	89.0	51.0	79.5	162	191	178	165	39.6
* 50-54	42-45	1039851	1039860	59	546	102	95.5	57.0	95.5	187	216	229	178	46.0
* 56-60	46-48	1039879	1039888	76	597	114	108	63.5	102	210	229	254	197	54.0
* 64-67	50-54	1041633	1041642	114	648	127	121	73.0	114	235	248	274	216	60.5
* 70-73	56-62	1041651	1041660	143	692	133	127	79.0	124	267	279	279	229	73.0
* 75-80	64-67	1041679	1041688	172	737	146	133	86.0	133	282	305	287	241	76.0
* 82-86	70-73	1041697	1041704	197	784	159	140	92.0	146	302	330	300	254	79.0
* 88-92	76-80	1041713	1041722	255	845	171	152	98.5	165	314	356	318	274	82.5
* 94-102	-	1041731	1041740	355	921	191	178	108	184	346	381	343	318	89.0

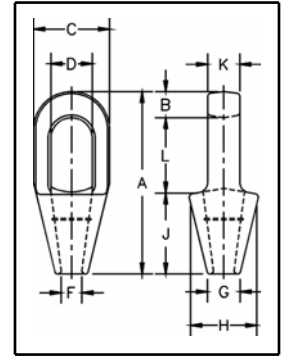
* Cast Alloy Steel.

Closed Spelter Sockets

G-417 / S-417



- Forged Steel Sockets thru 38 mm, cast alloy steel 40 mm thru 100 mm.
- Spelter socket terminations have an efficiency rating of 100%, based on the catalog strength of wire rope. Ratings are based on the recommended use with 6 x 7, 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope.



Closed grooved Sockets meet the performance requirements of Federal Specification RR-S-550D, Type B, except for those provisions required of the contractor.

NOTICE: All cast steel sockets 40 mm and larger are magnetic particle inspected and ultrasonic inspected. Proof testing available on special order.

Drawing illustrates one groove used on sockets 6 mm thru 19 mm. Sizes 22 mm thru 38 mm use 2 grooves. Sizes 40 mm and larger use 3 grooves.

G-417 / S-417 Closed Spelter Sockets

Rope Dia. (mm) †	Structural Strand Dia (mm)	Stock No.		Weight Each (kg)	Dimensions (mm)									
		G-417 Galv.	S-417 S.C.		A	B	C	D*	F	G	H	J	K	L
6-7	-	1039897	1039904	.23	116	12.7	39.6	22.4	9.65	17.5	39.6	57.2	12.7	46.0
8-10	-	1039913	1039922	.34	125	15.8	42.9	24.6	12.7	20.6	42.9	57.2	17.5	52.5
11-13	-	1039931	1039940	.68	140	17.5	51.0	29.5	14.2	23.9	51.0	63.5	22.4	58.5
14-16	12-13	1039959	1039968	1.13	162	20.6	67.0	35.8	17.5	30.2	67.0	76.2	25.4	65.0
18	14-16	1039977	1039986	1.92	194	26.9	76.2	42.2	20.6	33.3	70.0	89.0	31.8	77.5
20-22	18-19	1039995	1040000	3.28	226	33.3	92.0	48.7	24.6	38.1	82.5	102	38.1	90.5
24-26	20-22	1040019	1040028	4.76	254	36.6	105	58.5	28.7	44.5	95.5	114	44.5	108
28-30	24-26	1040037	1040046	6.46	283	39.6	114	65.0	31.8	51.0	105	127	51.0	116
32-35	28	1040055	1040064	8.95	309	41.4	128	71.0	38.1	58.5	119	138	56.5	129
38	30-32	1040073	1040082	13.24	355	49.3	137	81.0	41.4	70.5	132	151	62.5	155
† 40-42	33-35	1040091	1040108	16.32	390	54.0	146	82.5	44.5	76.2	140	165	70.0	171
† 44-48	36-40	1040117	1040126	25.96	445	55.5	171	95.5	51.0	79.5	162	191	76.2	198
† 50-54	42-45	1040135	1040144	35.83	502	62.0	194	111	57.2	95.5	187	216	82.5	224
† 56-60	46-48	1040153	1040162	47.62	556	73.0	216	127	63.5	102	210	229	92.0	254
† 64-67	50-54	1041759	1041768	63.50	597	79.5	241	140	74.5	114	235	248	102	270
† 70-73	56-62	1041777	1041786	99.79	645	79.5	273	159	79.5	124	259	279	124	286
† 75-80	64-67	1041795	1041802	125	686	82.5	292	171	86.0	133	292	305	133	298
† 82-86	70-73	1041811	1041820	142	743	102	311	184	92.0	146	311	330	146	311
† 88-92	76-80	1041839	1041848	181	787	102	330	197	98.5	165	330	356	159	330
† 94-102	-	1041857	1041866	246	845	108	362	216	108	184	362	381	178	356

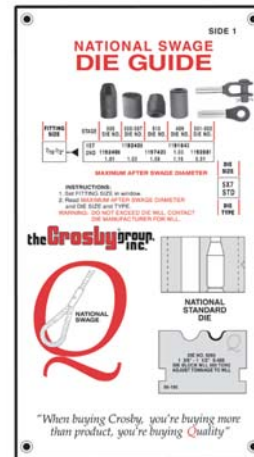
* Diameter of pin must not exceed pin used on companion 416 socket. Reference adjacent page "D" dimension.

† Cast Alloy Steel.

National Steel Swaging Sleeves



S-505



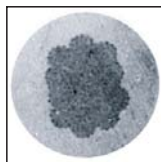
The National Die Guide will assist you in selecting the proper dies to meet your swaging needs.

- For Flemish eye wire rope splicing.
- Designed for low temperature toughness.
- Resists cracking when swaged (equals or exceeds stainless steel sleeves).
- Special processed low carbon steel.
- "Cold Tuff[®]" for better swageability.
- Can be stamped for identification after swaging without concern for fractures when following these directions.
Use round corner stamps to a maximum depth of 0.4 mm. The area for stamping should be on the side of the sleeve in the plane of the sling eye, and no less than 6 mm from either end of the sleeve.
- Standard Steel Sleeve terminations have efficiency ratings as follows based on the catalog strength of wire rope.

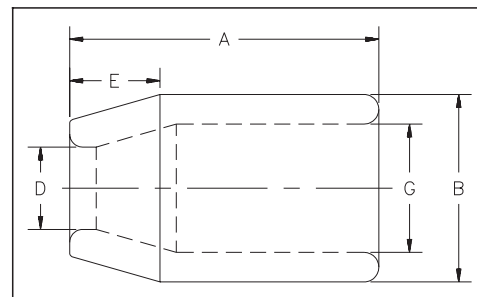
S-505 Termination Efficiency		
Size (mm)	Type of Wire Rope *	
	IWRC	FC
6 - 25	96%	93%
28 - 52	92%	89%
54 and Larger	90%	87%

* NOTE: S-505 Standard Sleeves are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope.

Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured.



"Cross Section of Swaged Sleeve"



NOTE: See Page 37 for dimensional information

For additional swaging information, please refer to the National Swaging Brochure.

National Steel Swaging Sleeves

Wire Rope End Terminations

S-505 "COLD-TUFF" Standard Steel Sleeves

S-505 Standard Steel Sleeve Specifications										Press/ Die Data					
S-505 Stock No.	Rope Size (mm)	Weight Per 100 (kg)	Pkg. Qty.	Before Swage Dimensions (mm)					Maximum After Swage Dimensions (mm)	Die Desc.	Stock No.				
				A	B	D	E	G			500 Tons 1000 Tons 1500 Tons 5x7	Front Load		Side Load	
												1500 ton 6x12	3000 ton 6x12	1500 ton 6x12	3000 ton 6x12
1041063	6-7	3.60	250	25.4	16.8	7.88	7.12	11.9	14.5	1/4 Taper	1197528	-	-	-	-
1041090	8	4.08	200	38.1	23.1	9.66	11.2	15.8	19.1	3/8 Taper	1192364	-	-	-	-
1041107	9-10	5.44	100	38.1	23.1	11.9	9.91	16.8	19.1	3/8 Taper	1192364	-	-	-	-
1041125	11	13.6	50	51.0	31.0	13.5	16.5	21.6	25.7	1/2 Taper	1192408	-	-	-	-
1041143	13	13.2	50	51.0	31.0	16.0	14.2	23.1	25.7	1/2 Taper	1192408	-	-	-	-
1041161	14	30.8	25	70.0	37.3	17.8	16.0	26.2	31.5	5/8 Taper	1192444	-	-	-	-
1041189	16	25.9	25	70.0	37.3	19.1	16.0	27.7	31.5	5/8 Taper	1192444	-	-	-	-
1041205	18-19	40.0	20	81.0	43.7	23.1	21.3	32.5	37.1	3/4 Taper	1192462	-	-	-	-
1041223	22	62	10	90.5	51.5	26.2	25.4	38.9	42.7	7/8 Taper	1192480	-	-	-	-
1041241	25-26	89	10	102	58.0	29.5	28.6	43.7	49.0	1 Taper	1192505	-	-	-	-
1041269	28-29	118	Bulk	122	63.5	32.5	31.8	49.3	54.1	1-1/8 Open 1st Stage 2nd Stage	1192523 1192541	-	-	-	-
1041287	31-32	154	Bulk	132	70.5	36.5	36.8	55.0	58.9	1-1/4 Open 1st Stage 2nd Stage	1192621 1192587	-	-	-	-
1041303	34-35	195	Bulk	148	76.0	39.7	39.7	60.5	64.0	1-3/8 Open 1st Stage 2nd Stage	1192667 1192621	-	-	-	-
1041321	37-38	159	Bulk	159	82.5	42.9	42.9	67.0	69.0	1-1/2 Open 1st Stage 2nd Stage	1192649 1192667	-	-	-	-
1041349	44-45	367	Bulk	184	97.5	49.2	50.0	79.5	78.7	1-3/4 Open 1st Stage 2nd Stage	1192685 1192701	-	-	-	-
1041367	50-52	510	Bulk	216	111	57.0	57.0	92.0	90.4	2 Open 1st Stage 2nd Stage	1192729 1192747	-	-	-	-
1041385	56-57	862	Bulk	243	128	63.5	64.5	102	105	2-1/4 Open 1st Stage 2nd Stage	1192765 1192783	1191089 1191043	1191089 1191043	-	1195085 1195067
1041401	62-64	1043	Bulk	267	140	70.0	71.5	114	114	2-1/2 Open 1st Stage 2nd Stage	-	1191061 1191089	1191061 1191089	1195370 1195469	1195076 1195085
1041429	68-70	1270	Bulk	292	146	76.0	78.5	121	119	2-3/4 Open 1st Stage 2nd Stage	-	1191034 1191052	1191034 1191052	1195389 1195478	1195094 1195101
1041447	75-76	1334	Bulk	305	162	82.5	86.0	133	126	3 Open 1st Stage 2nd Stage	-	1193201 1193229	1193201 1193229	1195398 1195487	1195110 1195129
1041483	87-89	2105	Bulk	356	178	98.5	3.94	148	147	3-1/2 Open 1st Stage 2nd Stage	-	-	1193247 1193265	-	1195138 1195147
1041492	93-95	2495	Bulk	381	191	103	108	160	158	3-3/4 Open 1st Stage 2nd Stage	-	-	1191114 1191132	-	1195263 1195272
1041508	100-105	3130	Bulk	406	206	111	114	173	170	4 Open 1st Stage 2nd Stage	-	-	1191150 1191178	-	1195156 1195165
1041526	112-114	4536	Bulk	457	232	124	129	195	189	4-1/2 Open 1st Stage 2nd Stage	-	-	1191187 1191203	-	1195174 1195183

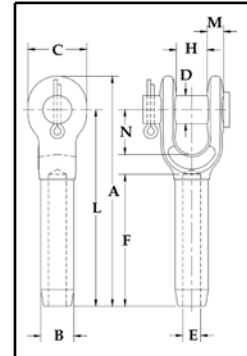
Open Swage Sockets



S-501



- Forged from special bar quality carbon steel, suitable for cold forming.
- Hardness controlled by spheroidize annealing.
- Swage Socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.
- Stamp for identification after swaging without concern for fractures (as per directions in National Swaging Brochure).
- Swage sockets incorporate a reduced machined area of the shank which is equivalent to the proper after Swage dimension. Before swaging, this provides for an obvious visual difference in the shank diameter. After swaging, a uniform shank diameter is created allowing for a QUIC-CHECK® and permanent visual inspection opportunity.
- Designed to quickly determine whether the socket has been through the swaging operation and assist in field inspections, it does not eliminate the need to perform standard production inspections which include gauging for the proper after swage dimensions or proof loading.
- U.S. Patent 5,152,630 and foreign equivalents.



NOTE: S-501 Swage Sockets are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope. Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured. In accordance with ANSI B30.9, all slings terminated with swage sockets shall be proof loaded.*

S-501 Open Swage Sockets

S-501 Open Socket Specifications														Press / Die Data					
S-501 Stock No.	Rope Size (mm) *	Weight Each (kg)	Before Swage Dimensions											Max. After Swage Dim. (mm)	Die Description	Stock No.		Side Load	
			A	B	C	D	E	F	H	L	M	N	500 Ton 5 x 7			1500 Ton 6 x 12	1500 Ton 6 x 12	3000 Ton 6 x 12	
1039021	6-7	0.24	122	12.7	35.1	17.5	6.85	54.0	17.5	102	9.65	38.1	11.7	1/4 Socket	1192845	-	-	-	
1039049	8	0.51	159	19.6	41.1	20.6	8.65	81.0	20.6	135	11.9	44.5	18.0	5/16-3/8 Socket	1192863	-	-	-	
1039067	9-10	0.59	159	19.6	41.1	20.6	10.4	81.0	20.6	135	11.9	44.5	18.0	5/16-3/8 Socket	1192863	-	-	-	
1039085	11-12	0.94	198	24.9	51.0	25.4	12.2	108	25.4	170	14.2	51.0	23.1	7/16-1/2 Socket	1192881	-	-	-	
1039101	13	0.94	198	24.9	51.0	25.4	14.0	108	25.4	170	14.2	51.0	23.1	7/16-1/2 Socket	1192881	-	-	-	
1039129	14	2.12	241	31.8	60.5	30.2	15.5	135	31.8	207	17.3	57.0	29.5	9/16-5/8 Socket	1192907	-	-	-	
1039147	16	2.05	241	31.8	60.5	30.2	17.0	135	31.8	207	17.3	57.0	29.5	9/16-5/8 Socket	1192907	-	-	-	
1039165	18-20	3.62	294	39.4	70.0	35.1	20.3	162	38.1	254	19.8	70.0	36.1	3/4 Socket	1192925	-	-	-	
1039183	22	5.23	341	43.2	79.5	41.1	23.9	189	44.5	295	23.9	82.5	39.4	7/8 Socket	1192949	-	-	-	
1039209	24-26	8.07	393	50.5	93.5	51.0	26.9	216	51.0	340	26.9	95.5	45.7	1 Socket	1192961	-	-	-	
1039227	28	11.5	440	57.0	103	57.0	30.2	243	57.0	381	30.2	108	52.0	1-1/8 Socket	1192989	-	-	-	
1039245	32	16.1	484	64.5	114	63.5	33.8	270	63.5	419	31.0	121	58.5	1-1/4 Socket	1193005	-	-	-	
1039263	34-36	19.8	532	71.0	127	63.5	36.8	297	63.5	461	35.1	133	65.0	1-3/8 Socket	1193023	-	-	-	
1039281	38-40	26.5	581	78.0	140	70.0	40.1	324	76.0	502	42.9	146	71.5	1-1/2 Socket	1193041	1191267	1195355	1195192	
1039307	44	40.3	676	86.0	170	89.0	47.2	378	89.0	584	53.5	171	77.5	1-3/4 Socket	1193069	1191276	1195367	1195209	
1042767	48-52	66	799	100	203	95.5	53.5	432	102	683	60.0	203	90.5	2 Socket	1193087	1191294	1195379	1195218	

* Maximum Proof Load shall not exceed 50% of XXIP rope catalog breaking strength.

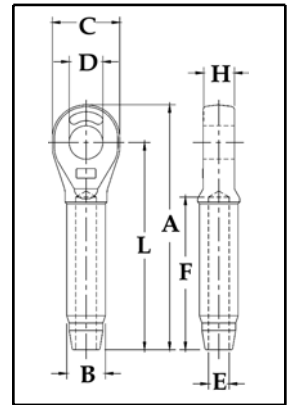
Closed Swage Sockets



S-502



- Forged from special bar quality carbon steel, suitable for cold forming.
- Hardness controlled by spheroidize annealing.
- Swage Socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.
- Stamp for identification after swaging without concern for fractures (as per directions in National Swaging Brochure).
- Swage sockets incorporate a reduced machined area of the shank which is equivalent to the proper after Swage dimension. Before swaging, this provides for an obvious visual difference in the shank diameter. After swaging, a uniform shank diameter is created allowing for a QUIC-CHECK® and permanent visual inspection opportunity.
- Designed to quickly determine whether the socket has been through the swaging operation and assist in field inspections, it does not eliminate the need to perform standard production inspections which include gauging for the proper after swage dimensions or proof loading.
- U.S. Patent 5,152,630 and foreign equivalents.



NOTE: S-502 Swage Sockets are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope. Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured. In accordance with ANSI B30.9, all slings terminated with swage sockets shall be proof loaded.*

S-502 Closed Swage Sockets

S-502 Closed Socket Specifications											Press / Die Data					
S-502 Stock No.	Rope Size (mm)*	Weight Each (kg)	Before Swage Dimensions								Max. After Swage Dim. (mm)	Die Description	Stock No.		Side Load	
			A	B	C	D	E	F	H	L			500 Ton 5 x 7	1500 Ton 6 x 12	1500 Ton 6 x 12	3000 Ton 6 x 12
1039325	6	0.15	109	12.7	35.1	19.1	6.85	54.0	12.7	89.0	11.7	1/4 Socket	1192845	-	-	-
1039343	8	0.34	138	19.6	41.1	22.4	8.65	81.0	17.0	114	18.0	5/16-3/8 Socket	1192863	-	-	-
1039361	9-10	0.33	138	19.6	41.1	22.4	10.4	81.0	17.0	114	18.0	5/16-3/8 Socket	1192863	-	-	-
1039389	11-12	0.64	176	24.9	51.0	26.9	12.2	108	21.8	146	23.1	7/16-1/2 Socket	1192881	-	-	-
1039405	13	0.64	176	24.9	51.0	26.9	14.0	108	21.8	146	23.1	7/16-1/2 Socket	1192881	-	-	-
1039423	14	1.32	220	31.8	60.5	31.8	15.5	135	28.7	184	29.5	9/16-5/8 Socket	1192907	-	-	-
1039441	16	1.29	220	31.8	60.5	31.8	17.0	135	28.7	184	29.5	9/16-5/8 Socket	1192907	-	-	-
1039469	18-20	2.27	261	39.4	73.0	36.6	20.3	162	33.3	219	36.1	3/4 Socket	1192925	-	-	-
1039487	22	3.08	303	43.2	79.0	42.9	23.9	189	38.1	257	39.4	7/8 Socket	1192949	-	-	-
1039502	24-26	4.72	344	50.5	92.0	52.5	26.9	216	44.5	292	45.7	1 Socket	1192961	-	-	-
1039520	28	6.72	382	57.0	102	58.5	30.2	243	51.0	324	52.0	1-1/8 Socket	1192989	-	-	-
1039548	32	9.78	430	64.5	114	65.0	33.8	270	57.0	365	58.5	1-1/4 Socket	1193005	-	-	-
1039566	34-36	12.9	473	71.0	127	66.0	36.8	297	57.0	400	65.0	1-3/8 Socket	1193023	-	-	-
1039584	38-40	17.3	511	78.0	140	71.5	40.1	324	63.5	432	71.5	1-1/2 Socket	1193041	1191267	1193355	1195192
1039600	44	23.1	598	86.0	159	90.5	47.2	378	76.0	508	77.5	1-3/4 Socket	1193069	1191276	1195367	1195209
1042589	48-52	40.5	702	100	184	96.5	53.5	432	82.5	584	90.5	2 Socket	1193087	1191294	1195379	1195218

* Maximum Proof Load shall not exceed 50% of XXIP rope catalog breaking strength.

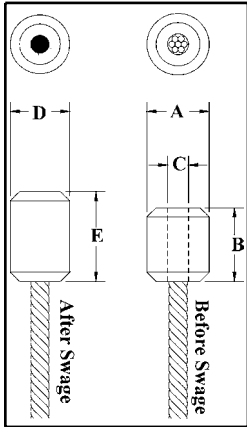
National Swage Buttons

S-409



- Special processed, low carbon steel.
- "Cold Tuff®" for better swageability.
- Swage Button terminations have an efficiency rating of 98% based on the catalog strength of wire rope.
- Stamp for identification after swaging without concern for fractures (as per directions in National Swaging Brochure).

NOTE: S-409 Buttons are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), RRL, FC or IWRC wire rope. Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured.



S-409 COLD-TUFF® Buttons

S-409 Steel Swage Button Specifications									Press / Die Data	
S-409 Stock No.	Size No.	Rope Size (mm)	Weight Per 100 (kg)	Before Swage Dimensions			After Swage Dimensions		Die Desc.	Stock No. 500 Tons 1000 Tons 1500 Tons 5 x 7
				A	B	C	D Maximum After Swage Dimensions	E Length*		
1040171	1 SB	3	.91	11.2	12.7	3.55	10.2	15.5	1/8 - 1/4 Button	1191621
1040215	3 SB	5	1.81	14.2	17.8	5.10	13.2	21.3	1/4 1st Stage	1197528
1040251	5 SB	6-6.5	3.63	16.0	26.9	7.60	14.7	30.5	1/8 - 1/4 Button	1191621
1040297	7 SB	8	7.26	22.4	28.7	9.15	19.6	33.8	3/8 1st Stage	1192364
1040313	8 SB	9-10	6.80	22.4	37.6	10.7	19.6	42.9	3/8 1st stage	1192364
1040331	9 SB	11	13.6	28.7	41.4	12.2	26.2	49.3	1/2 1st Stage	1192408
1040359	10 SB	13	22.7	33.3	48.0	14.0	29.5	55.0	5/8 socket	1192907
1040377	11 SB	14	31.8	36.6	51.5	15.5	32.8	61.0	9/16 -5/8 Button	1191665
1040395	12 SB	16	45.4	39.6	61.5	17.0	36.1	73.5	9/16 -5/8 Button	1191665
1040411	13 SB	18-20	59	42.9	69.5	20.1	39.4	82.5	3/4 1st Stage	1192462
1040439	14 SB	22	100	51.0	83.0	23.9	45.7	98.0	7/8 1st Stage	1192480
1040457	15 SB	25-26	141	57.0	93.0	26.9	52.0	111	1 1st Stage	1192505
1040475	16 SB	28-29	204	65.0	103	30.2	58.5	122	1-1/8 1st Stage	1192523
1040493	17 SB	31-32	295	71.5	116	33.8	66.0	138	1-3/8 Socket	1193023

* NOTE: Length is measured from outside end of termination.

National Swage Duplex Sleeves

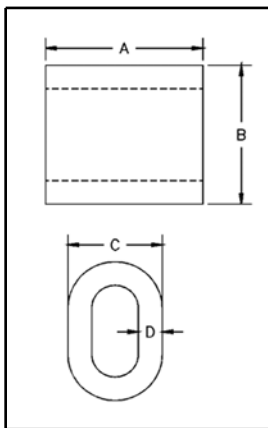
S-506



- For turnback wire rope splicing.
- Designed for lower temperature toughness.
- Resists cracking when swaged (equals or exceeds stainless steel sleeves).
- Special processed low carbon steel.
- "Cold Tuff®" for better swageability.
- Stamp for identification after swaging without concern for fractures (as per directions in National Swaging Brochure).
- Turnback terminations have efficiency ratings of 94% based on the catalog strength of wire rope.

NOTE: S-506 Duplex sleeves are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), RRL, FC or IWRC wire rope. Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured.

S-506 COLD-TUFF® Duplex Non-Tapered Sleeves



S-506 Steel Duplex Non-Tapered Sleeve Specifications									Press / Die Data	
S-506 Stock No.	Rope Size (mm)	Weight per 100 (kg)	Pkg. Qty.	Before Swage Dimensions				Max. After Swage Dimensions (mm)	Die Desc.	Stock No. 500 Ton 1000 Ton 1500 Ton 5 x 7
				A	B	C	D			
1039834	8	7.71	200	31.8	26.9	20.6	4.85	19.6	3/8 1st Stage	1192364
1039852	9-10	5.90	100	31.8	28.4	20.6	3.55	19.6	3/8 1st Stage	1192364
1039870	11	14.1	50	41.4	35.8	25.9	4.85	26.2	1/2 1st Stage	1192408
1039898	13	12.2	50	41.4	36.6	25.9	4.05	26.2	1/2 1st Stage	1192408
1039414	14	28.6	25	57.0	43.7	31.2	5.85	32.8	5/8 1st Stage	1192444
1039432	16	24.5	25	57.0	46.7	32.5	5.10	32.8	5/8 1st Stage	1192444
1039450	18-20	41.3	10	67.0	55.0	38.6	5.85	39.4	3/4 1st Stage	1192462
1039478	22	57	10	73.0	63.5	44.5	6.85	45.7	7/8 1st Stage	1192480
1039496	25-26	85	10	77.5	72.0	51.0	8.40	52.0	1 1st Stage	1192505
1039539	30-32	174	Bulk	103	89.0	63.5	9.65	65.0	1-3/8 socket	1193025

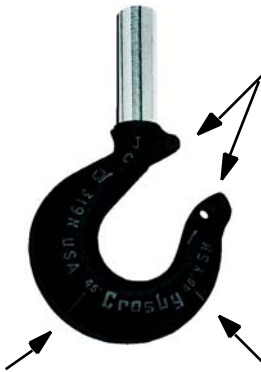
Shank Hooks for Swaging



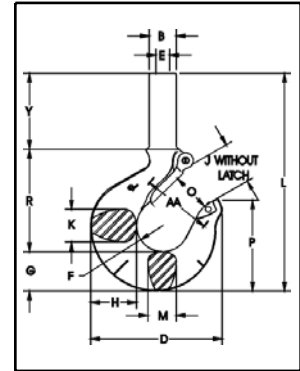
SEE APPLICATION AND WARNING INFORMATION

On Pages 50 - 51

S-319SWG



- Wide range of sizes available:
 - Working Load Limit: 0.35 - 14 tonnes
 - Wire Rope sizes: 5 mm thru 30 mm.
- Utilizes standard Crosby 319N shank hooks with interlocking hook tip. Each hook has a pre-drilled cam which can be equipped with a latch.
- Utilizes standard National Swage swaging dies.
- Forged Carbon Steel.
- Quenched and Tempered. Heat treat process allows for ease of swaging.
- Design Factor of 5 to 1.
- Black Oxide finish on body (Shank is uncoated).
- All hooks incorporate Crosby's patented **QUIC-CHECK®** markings (Angle Indicators and Throat Deformation Indicators). See page 87 for detailed information.



For use with 6 X 19 or 6 X 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC, or IWRC wire rope.

Before using any Crosby fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured. Refer to swage socket or swage button instructions in the National Swage Swaging Products and Procedures Brochure for proper swaging techniques.

S-319SWG Shank Hooks for Swaging

Wire Rope Size (mm)	Hook ID Code	Working Load Limit (t)*	S-319SWG Stock No.	Weight Each (kg)	Required Swaging Die		Maximum After Swage Diameter (mm)
					Die Description	Die Stock No.	
5	DC	0.4	1053002	0.25	1/8" Button	1191621	10.2
6-7	FC	0.7	1053011	0.35	1/4" Socket	1192845	11.7
8	GC	1.1	1053020	0.57	1/4" Button	1191621	14.7
8	HC	1.1	1053039	0.83	3/8" Socket	1192863	18.0
9-10	HC	1.6	1053048	0.82	3/8" Socket	1192863	18.0
11	IC	2.1	1053057	1.65	1/2" Socket	1192881	23.1
12-13	IC	2.8	1053066	1.62	1/2" Socket	1192881	23.1
14-15	JC	3.5	1053075	3.34	5/8" Socket	1192907	29.5
16	JC	4.3	1053084	3.31	5/8" Socket	1192907	29.5
18	KC	6.2	1053093	5.77	3/4" Socket	1192925	36.1
20-22	LC	8.3	1053100	7.97	7/8" Socket	1192949	39.4
24-26	NC	11.0	1053119	14.3	1" Socket	1192961	45.7
28-30	OC**	14.0	1053128	24.4	1-1/8" Socket	1192989	52.1

* Minimum Ultimate Strength is 5 times the Working Load Limit.

** ID Code "O" is old 319 style hook.

Wire Rope Size (mm)	S-319SWG Stock No.	Dimensions (mm)														
		B	D	E	F	G	H	J	K	L	M	O	P	R	Y	AA
5	1053002	11.2	72.5	5.10	16.0	18.5	20.6	23.6	16.0	132	16.0	23.6	49.8	60.5	51.0	38.1
6-7	1053011	12.7	80.0	6.85	17.5	21.3	23.9	24.6	18.0	145	18.0	24.6	56.5	67.0	73.0	51.0
8	1053020	16.5	91.0	8.65	19.1	25.4	29.5	26.9	22.4	162	22.4	26.9	62.0	70.0	63.5	51.0
8	1053039	19.6	101	8.65	20.6	29.0	33.3	30.2	23.9	182	23.9	29.5	70.5	81.5	70.0	51.0
9-10	1053048	19.6	101	10.4	20.6	29.0	33.3	30.2	23.9	182	23.9	29.5	70.5	81.5	70.0	51.0
11	1053057	24.9	123	12.2	25.4	36.6	41.4	38.1	33.3	221	28.7	36.8	88.0	99.5	82.5	63.5
12-13	1053066	24.9	123	14.0	25.4	36.6	41.4	38.1	33.3	221	28.7	36.8	88.0	99.5	82.5	63.5
14-15	1053075	31.8	159	15.5	31.8	46.2	52.5	45.2	42.2	267	36.6	42.9	117	123	95.5	76.0
16	1053084	31.8	159	17.0	31.8	46.2	52.5	45.2	42.2	267	36.6	42.9	117	123	95.5	76.0
18	1053093	39.4	192	20.3	38.1	57.5	67.0	61.0	47.8	321	41.4	56.4	133	152	108	102
20-22	1053100	43.2	212	23.9	41.4	66.0	74.7	66.5	55.5	345	49.3	61.2	145	165	111	102
24-26	1053119	50.5	264	26.9	54.0	76.5	89.0	86.5	68.5	427	60.5	81.0	175	211	137	102
28-30	1053128	57.0	346	30.2	63.5	92.0	117	102	76.0	586	76.0	82.6	223	240	248	165

National Hydraulic Swaging Machines

National offers the highest quality and most complete line of Hydraulic Swaging Machines specifically designed to be used to swage fittings on wire rope.

3 Capacities to Fit your Requirements

- 500 Tonnes
- 1000 Tonnes
- 1500 Tonnes



SEE APPLICATION AND WARNING INFORMATION

On Pages 54 - 55

The following features of National Hydraulic Swaging Machines offer a number of advantages for high production sling shops:



1500 Tonnes Hydraulic Swaging Machines
 Approximate weight 15.6 t. Overall height 2.6 m
 Fast advance and retract speed.
 Automatic slow, precision swaging speed.

- A dual hydraulic system which combines the use of high speed and low pressure to bring dies into position; and the low speed and high pressure necessary for ideal swaging control.

Adjustable tonnage control, so tonnage can be set to match die block Working Load Limit.

- Four column wide stance which provides the operator ample working clearance between columns and a large area for in-process sling storage.
- Vertical swage action which gives an equalized press on the fitting to produce uniform high quality.
- Self locating spring locks snap the shoe-type dies into place for quick set-up and change.
- The National four column wide stance Hydraulic Swaging Machines, each equipped with an up-acting ram, have two side cylinders for fast approach and return of the main ram. They come in three swaging capacities.

- 500 tonnes (4450 kN)
- 1000 tonnes (8900 kN)
- 1500 tonnes (13350 kN)

Swaging Machine Capacity Chart for Swage Sleeves, Ferrules & Buttons

Hydraulic Swaging Machine Size	Swaging Method	Die Size (in.)	Largest Fitting Allowed to Be Swaged (mm)			
			S-505 Sleeve	S-506 Sleeve	S-510 Ferrules	S-409 Buttons
500 Ton	Full Die	2-1/2 x 5 Mark Series 4 x 7 5 x 7	38	32*	14*	22*
1000 Ton	Full Die	4 x 7 5 x 7	64	32*	14*	32*
1500 Ton	Full Die	5 x 7 6 x 12	89	32*	14*	32*
3000 Ton	Full Die	6 x 12	114*	32*	14*	32*

* Largest size fitting available.

NOTE: For special applications or conditions, contact Crosby National at (501) 982-3112.

Swaging Machine Capacity Chart for S-501 & S-502 Swage Sockets

Hydraulic Swaging Machine Size	Swaging Method	Die Size (in.)	Largest Fitting Allowed to be Swaged (mm)
500 Ton	Full Shank	2-1/2 x 5 Mark Series 4 x 7 5 x 7	19
	Progressive	4 x 7 5 x 7	32
1000 Ton	Full Shank	4 x 7 8 x 7	26
	Progressive	4 x 7 5 x 7	38
1500 Ton	Full Shank	5 x 7 6 x 12	32
	Progressive	5 x 7 6 x 12	52
3000 Ton	Full Shank	6 x 12	52
	Progressive	6 x 12	52*

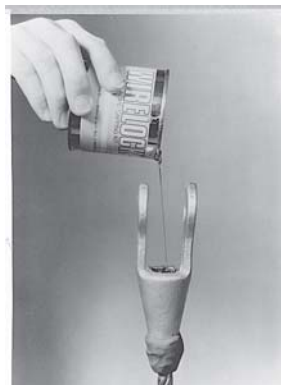
* Largest size fitting available.

WIRELOCK®

RESIN FOR SPELTER SOCKETS

Note: For use on 416, 417 & 517 spelter sockets only.

- 100% termination efficiency.
- Temperature operating range is -54° C to +115° C.
- Ideal for on site applications.
- No hazardous molten metal.
- Improved fatigue life.
- Pouring temperature without booster pack is 9° C to 43° C.
- One booster pack if pouring temperature is 0° C to 9° C.
- Two booster packs if pouring temperature is -10° C to 0° C.
- Refer to WIRELOCK® Technical Manual for more information.



SEE APPLICATION AND WARNING INFORMATION
On Pages 52 - 53



WIRELOCK® W416-7 Socket Compound

Approvals

Lloyd's Register of Shipping
Det Norske Veritas (DNV)
United States Coast Guard
Registro Italiano Navale
Germanischer Lloyd
United States Navy
American Bureau of Shipping.



W416-7 Kits				Booster Pack
Kit Size	Kits Per Case	Stock No.	Weight Each (kg)	Stock No.
100 cc	20	1039602	0.28	1039603
250 cc	12	1039604	0.57	1039605
500 cc	12	1039606	1.15	1039607
1000 cc	12	1039608	2.08	1039609
2000 cc	12	1039610	4.08	1039611



U.S. Department of Transportation
United States Coast Guard



Guide to amount of WIRELOCK® Required

Wire Rope Size	WIRELOCK® Required (cc)	Wire Rope Size	WIRELOCK® Required (cc)
6-7	9	44	700
8	17	48	700
9-10	17	51	1265
11	35	54	1265
13	35	56	1410
14	52	60	1410
16	52	64	1830
20	86	67	1830
22	125	70	2250
26	160	76	3160
28	210	82	3795
32	350	88	4920
36	350	94	5980
40	420	102	7730
42	495		

NATO Numbers:

100cc 8030-21-902-1823
250cc 8030-21-902-1824
500cc 8030-21-902-1825
1000cc 8030-21-902-1826

Witnessed and tested by American Bureau of Shipping. (ABS)

Approximate U.S. Measurements:

250cc's Kit 1 Cup
500cc's Kit 1 Pint
1000cc's Kit 1 Quart

CROSBY CLIPS

WARNINGS AND APPLICATION INSTRUCTIONS



G -450
(Red-U-Bolt)



SS-450
(316 Stainless Steel)



WARNING

- Failure to read, understand, and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using clips.
- Match the same size clip to the same size wire rope.
- Prepare wire rope end termination only as instructed.
- Do not use with plastic coated wire rope.
- Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque (See Table 1, this page).

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble – eye termination for clip sizes 3 mm through 22 mm is 80%, and for sizes 25 mm through 89 mm is 90%.

The number of clips shown (see Table I) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP, XXIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 25 mm and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation - resistant RRL wire rope, 8 x 19 Class, IPS, XIP, XXIP sizes 38 mm and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, XXIP sizes 44 mm and smaller.

For other classes of wire rope not mentioned above, we recommend contacting Crosby Engineering at the address or telephone number on the back cover to ensure the desired efficiency rating.

For elevator, personnel hoist, and scaffold applications, refer to ANSI A17.1 and ANSI A10.4. These standards do not recommend U-Bolt style wire rope clip terminations. The style wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1.

Refer to Table I in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope – live end rests in saddle (Never saddle a dead horse!). Tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque.



Figure 1

2.

When two clips are required, apply the second clip as near the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. Proceed to Step 3.



Figure 2

3.

When three or more clips are required, space additional clips equally between first two - take up rope slack - tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque.



Figure 3

4.

If a pulley (sheave) is used in place of a thimble, add one additional clip. Clip spacing should be as shown.

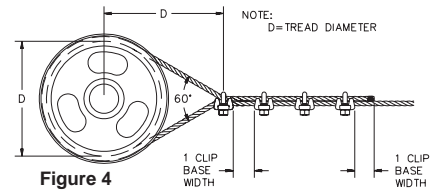


Figure 4

5.

WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.



Figure 5

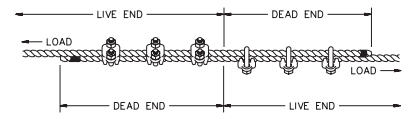


Figure 6

6.

IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size (Inches)	Rope Size (mm)	Minimum No. of Clips	Amount of Rope to Turn Back in mm	* Torque in Nm.
1/8	3-4	2	85	6.1
3/16	5	2	95	10.2
1/4	6-7	2	120	20.3
5/16	8	2	133	40.7
3/8	9-10	2	165	61.0
7/16	11-12	2	178	88
1/2	13	3	292	88
9/16	14-15	3	305	129
5/8	16	3	305	129
3/4	18-20	4	460	176
7/8	22	4	480	305
1	24-25	5	660	305
1-1/8	28-30	6	860	305
1-1/4	33-34	7	1120	488
1-3/8	36	7	1120	488
1-1/2	38-40	8	1370	488
1-5/8	41-42	8	1470	583
1-3/4	44-46	8	1550	800
2	48-52	8	1800	1017
2-1/4	56-58	8	1850	1017
2-1/2	62-65	9	2130	1017
2-3/4	68-72	10	2540	1017
3	75-78	10	2690	1627
3-1/2	85-90	12	3780	1627

If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.

If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

CROSBY FIST GRIP CLIPS

WARNINGS AND APPLICATION INSTRUCTIONS



G-429



WARNING

- Failure to read, understand, and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using clips.
- Match the same size clip to the same size wire rope.
- Do not mismatch Crosby clips with other manufacturer clips.
- Prepare wire rope end termination only as instructed.
- Do not use plastic coated wire rope.
- Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque (See Table 1, this page).

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble-eye termination for clip sizes 3 mm through 22 mm is 80%, and for sizes 25 mm to 38 mm is 90%.

The number of clips shown (see Table I) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP, XXIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 25 mm and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation-resistant RRL wire rope, 8 x 19 Class, IPS, XIP, XXIP sizes 38 mm and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, XXIP sizes 38 mm and smaller.

For other classes of wire rope not mentioned above, we recommend contacting Crosby Engineering at the address or telephone number on the back cover to ensure the desired efficiency rating. The style of wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251

1.

Refer to Table I in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Tighten nuts evenly, alternating from one nut to the other until reaching the recommended torque.



Figure 1

2.

When two clips are required, apply the second clip as near the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. Proceed to Step 3.



Figure 2

3.

When three or more clips are required, space additional clips equally between first two - take up rope slack - tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque.



Figure 3

4.

If a pulley (sheave) is used in place of a thimble, add one additional Fist Grip. Fist Grip spacing should be as shown.

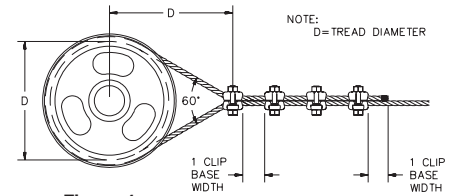


Figure 4

5.

WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.



Figure 5

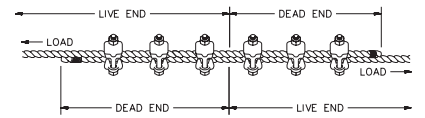


Figure 6

6.

IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

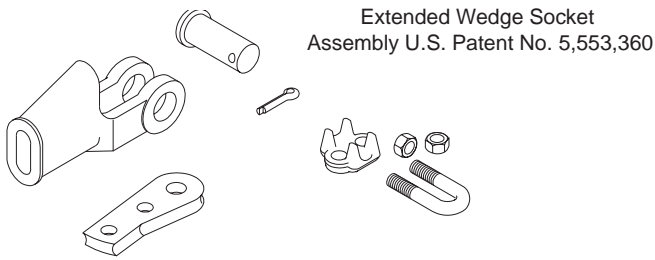
Clip Size (Inches)	Rope Size (mm)	Minimum No. of Clips	Amount of Rope to Turn Back in mm	*Torque in Nm.
3/16	5	2	100	40.7
1/4	6-7	2	100	40.7
5/16	8	2	127	40.7
3/8	9-10	2	133	61.0
7/16	11-12	2	165	88.1
1/2	13	3	279	88.1
9/16	14-15	3	323	176
5/8	16	3	342	176
3/4	18-20	3	406	305
7/8	22	4	660	305
1	24-25	5	940	305
1-1/8	28-30	5	1040	488
1-1/4	32-34	6	1400	488
1-3/8	36	6	1570	678
1-1/2	38-40	7	1980	678

If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4

If a greater number of clips are used than show in the table, the amount of turnback should be increased proportionately.

* The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

WEDGE SOCKET WARNINGS AND APPLICATION INSTRUCTIONS



Extended Wedge Socket
Assembly U.S. Patent No. 5,553,360

S-421T & US-422T "TERMINATOR"™

NOTE: Existing Crosby S-421 Wedge Sockets can be retrofitted with the New Terminator Wedge. The Only existing US-422 Wedge Sockets that can be retrofitted with terminator wedges are US4, US6, and US8. See the Crosby Catalog for additional information.

New **QUIC CHECK**® "Go" and "No-Go" features cast into wedge. The proper size wire rope is determined when the following criteria are met:

1. The wire rope shall pass thru the "Go" hole in the wedge.
2. The wire rope shall NOT pass thru the "No-Go" hole in the wedge.

Important Safety Information - Read and Follow

Inspection/Maintenance Safety

- Always inspect socket, wedge and pin before using.
- Do not use part showing cracks.
- Do not use modified or substitute parts.
- Repair minor nicks or gouges to socket or pin by lightly grinding until surfaces are smooth. Do not reduce original dimension more than 10%. Do not repair by welding.
- Inspect permanent assemblies annually, or more often in severe operating conditions.
- Do not mix and match wedges or pins between models or sizes.
- Always select the proper wedge and socket for the wire rope size

Assembly Safety

- Use only with standard 6 to 8 strand wire rope of designated size. For intermediate size rope, use next larger size socket. For example: When using 9/16" diameter wire rope use a 5/8" size Wedge Socket Assembly. Welding of the tail on standard wire rope is not recommended. The tail length of the dead end should be a minimum of 6 rope diameters but not less than 6" (See Figure 1).
- **To use with Rotation Resistant wire rope** (special wire rope constructions with 8 or more outer strands) ensure that the dead end is welded, brazed or seized before inserting the wire rope into the wedge socket to prevent core slippage or loss of rope lay. The tail length of the dead end should be a minimum of 20 rope diameters but not less than 6" (See Figure 1).
- Properly match socket, wedge and clip (See Table 1) to wire rope size.
- Align live end of rope, with center line of pin. (See Figure 1)
- Secure dead end section of rope. (See Figure 1)
- Tighten nuts on clip to recommended torque. (Table 1)
- Do not attach dead end to live end or install wedge backwards. (See Figure 2)
- **Use a hammer to seat Wedge and Rope as deep into socket as possible before applying first load.**

WARNING

- Loads may slip or fall if the Wedge Socket is not properly installed.
- A falling load can seriously injure or kill.
- Read and understand these instructions before installing the Wedge Socket.
- Do not side load the Wedge Socket.
- Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.
- Do not interchange wedges between S-421T and US422T or between sizes.

FIGURE 1

*Tail Length	
Standard 6 to 8 strand wire rope	Rotation Resistant Wire Rope
A minimum of 6 rope diameters, but not less than 150 mm	A minimum of 20 rope diameters, but not less than 150 mm.

TABLE 1

Rope Size	9-10	11-13	14-16	18-19	20-22	24-26	28
Clip Size	3/8	1/2	5/8	3/4	7/8	1	1 1/8
*Torque Nm.	61	88	129	176	305	305	305

* The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

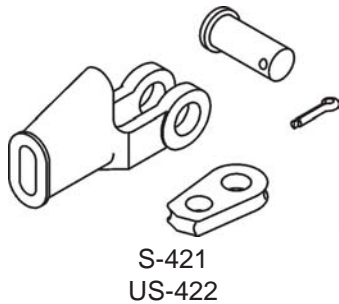
Figure 2

Operating Safety

- Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.
- Efficiency rating of the Wedge Socket termination is based upon the catalog breaking strength of Wire Rope. The efficiency of a properly assembled Wedge Socket is 80%.
- During use, do not strike the dead end section with any other elements of the rigging (Called two blocking).

WEDGE SOCKET

WARNING AND APPLICATION INSTRUCTIONS



Important Safety Information - Read and Follow Inspection/Maintenance Safety

- Always inspect socket, wedge and pin before using.
- Do not use part showing cracks.
- Do not use modified or substitute parts.
- Repair minor nicks or gouges to socket or pin by lightly grinding until surfaces are smooth. Do not reduce original dimension more than 10%. Do not repair by welding.
- Inspect permanent assemblies annually, or more often in severe operating conditions.
- Do not mix and match wedges or pins between models or sizes.
- Always select the proper wedge and socket for the wire rope size.

Assembly Safety

- Use only with standard 6 to 8 strand wire rope of designated size. For intermediate size rope, use next larger size socket. For example: When using 9/16" diameter wire rope use a 5/8" size Wedge Socket Assembly. Welding of the tail on standard wire rope is not recommended. The tail length of the dead end should be a minimum of 6 rope diameters but not less than 6".
- Align live end of rope, with center line of pin. (See Figure 1)
- Secure dead end section of rope. (See Figure 1)
- DO NOT ATTACH DEAD END TO LIVE END . (See Figure 2)
- Use a hammer to seat Wedge and Rope as deep into socket as possible before applying first load.
- To use with Rotation Resistant wire rope (special wire rope constructions with 8 or more outer strands) ensure that the dead end is welded, brazed or seized before inserting the wire rope into the wedge socket to prevent core slippage or loss of rope lay. The tail length of the dead end should be a minimum of 20 rope diameters but not less than 6". (See Figure 1)

WARNING

- Loads may slip or fall if the Wedge Socket is not properly installed.
- A falling load can seriously injure or kill.
- Read and understand these instructions before installing the Wedge Socket.
- Do not side load the Wedge Socket.
- Do not interchange Crosby wedge socket, wedge or pin with non Crosby wedge socket, wedge or pin.
- Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.
- Do not interchange wedges between S-421 and US-422 or between sizes.

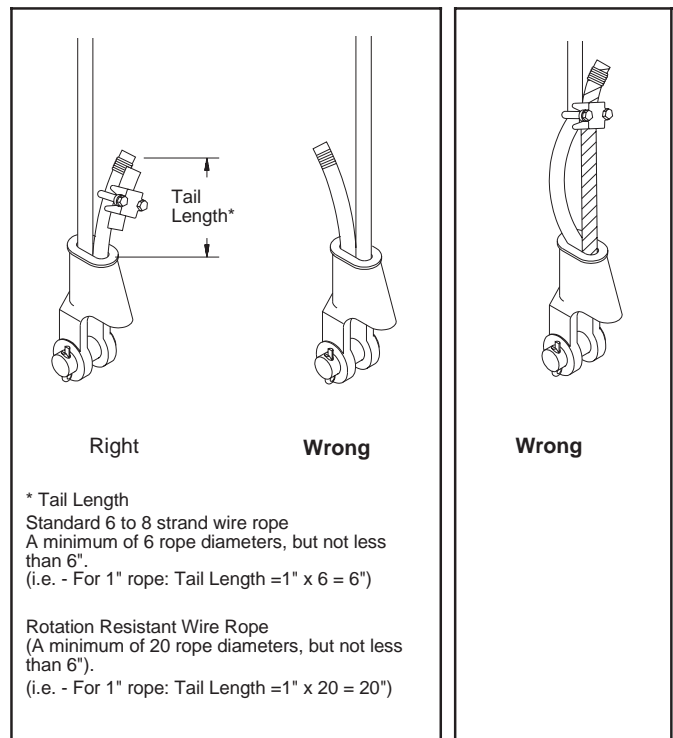


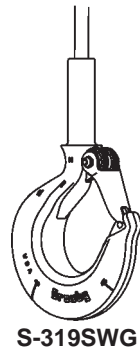
Figure 1

Figure 2

Operating Safety

- Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.
- Efficiency rating of the Wedge Socket termination is based upon the catalog breaking strength of Wire Rope. The efficiency of properly assembled Wedge Socket is 80%.
- During use, do not strike the dead end section with any other elements of the rigging (Called two-blocking).

CROSBY® SHANK HOOKS FOR SWAGING



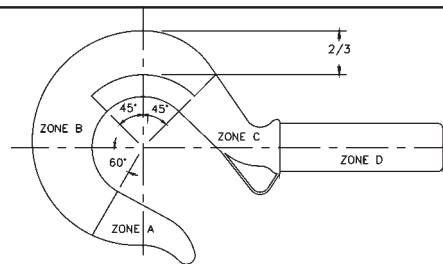
WARNING AND APPLICATION INSTRUCTIONS

- S-319SWG hooks are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope. Before using any National Swage fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructively tested and documented to prove the adequacy of the assembly to be manufactured.
- Use only Crosby shank hooks designed exclusively for swaging.
- A visual periodic inspection for cracks, nicks, wear gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel in compliance with the schedule in ANSI B30. 10.
- For hooks used in frequent load cycles or pulsating loads, the hook should be periodically inspected by Magnetic Particle or Dye Penetrant.
- Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10 degrees out of plane from the hook body, or is in any other way distorted or bent.
- Note: A latch will not work properly on a hook with a bent or worn tip.
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Remove from service any hook with a crack, nick, or gouge. Hooks with a crack, nick, or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1.



WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550(g) for personnel hoisting by cranes or derricks. A Crosby 319 hook with a PL Latch attached (when secured with bolt, nut and pin) may be used for lifting personnel. A Crosby S-319N hook with an S-4320 Latch attached (when secured with cotter pin or bolt, nut and pin) may be used for lifting personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Never exceed the Working Load Limit (WLL) of the wire rope and hook system.
- Read and understand “National Swage Swaging Products and Procedures” manual before swaging the hook.



ZONE A: REPAIR NOT REQUIRED
 ZONE B: 10% OF ORIGINAL DIMENSION
 ZONE C: 5% OF ORIGINAL DIMENSION
 ZONE D: SEE MINIMUM THREAD SIZE CHART

FIGURE 1

- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load, or tip load a hook. (See Figure 2.)
- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, insurance, etc.. (Note: When using latches, see instructions in Understanding: The Crosby Group Warnings for further information.)
- Always make sure the hook supports the load. (See Figure 3). The latch must never support the load (See Figure 4).
- When placing two (2) sling legs in hook, make sure the angle from the vertical to the outermost leg is not greater than 45 degrees, and the included angle between the legs does not exceed 90 degrees* (See Figure 5).

* For angles greater than 90 degrees, or more than two (2) legs, a master link or bolt type anchor shackle should be used to attach the legs of the sling to the hook.

- See ANSI/ASME B30.10 "Hooks" for additional information.
- In accordance with ANSI B30.9, all slings terminated by swaging shall be proof tested.
- S-319SWG hooks are designed to be a component of a system, and therefore rated based on the working limit of the system of which they are attached.
- The frame code on each S-319SWG hook is to facilitate proper latch selection only, and has no reference to the working load limit of the hook.

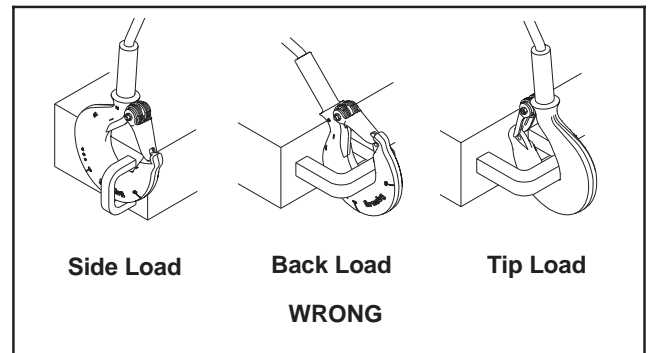


FIGURE 2

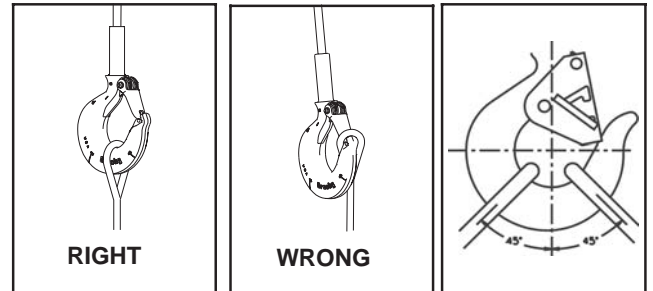


FIGURE 3

FIGURE 4

FIGURE 5

Wire Rope Size (mm)	Hook Frame I.D. Code	Required Swaging Die		Maximum After Swage Dimensions
		Stock No.	Description	
4.75	DC	1191621	3.20 Swage Button Die	10.2
6.35	FC	1192845	6.35 Swage Socket Die	11.7
7.95	GC	1191621	6.35 Swage Button Die	11.7
7.95	HC	1192863	9.55 Swage Socket Die	18.0
9.55	HC	1192863	9.55 Swage Socket Die	18.0
11.1	IC	1192881	12.7 Swage Socket Die	23.1
12.7	IC	1192881	12.7 Swage Socket Die	23.1
14.3	JC	1192907	15.9 Swage Socket Die	29.5
15.9	JC	1192907	15.9 Swage Socket Die	29.5
19.1	KC	1192925	19.1 Swage Socket Die	36.1
22.2	LC	1192949	22.2 Swage Socket Die	39.4
25.4	NC	1192961	25.4 Swage Socket Die	45.7
28.6	OC**	1192989	28.6 Swage Socket Die	52.1

** S319C Style Hook.

WIRELOCK®

WARNINGS AND APPLICATION INSTRUCTIONS

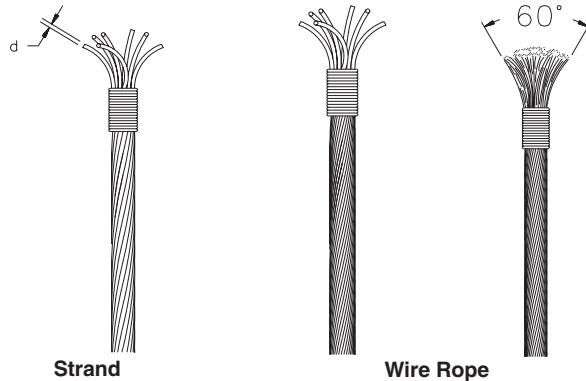


WARNING

- Incorrect use of WIRELOCK® can result in an unsafe termination which may lead to serious injury, death, or property damage.
- Do not use WIRELOCK® with stainless steel rope in salt water environment applications.
- Use only soft annealed iron wire for seizing.
- Do not use any other wire (copper, brass, stainless, etc.) for seizing.
- Never use an assembly until the WIRELOCK® has gelled and cured.
- Remove any non-metallic coating from the broomed area.
- Sockets with large grooves need to have those grooves filled before use with WIRELOCK®.
- Read, understand, and follow these instructions and those on product containers before using WIRELOCK®.

STEP 3 - BROOMING

1. Unlay the strands of the wire rope and IWRC as far as the seizing.
2. Cut out any fiber core.
3. Unlay the individual wires from each strand, including the IWRC, completely, down to the seizing.
4. Remove any plastic material from broomed area.



STEP 4 - CLEANING

1. The method of cleaning will depend on the lubricant and/ or coating on the wire.
2. The methods and materials used for cleaning should comply with the current EPA regulations.
3. Consult the Wire Rope Technical Board, your Wire Rope supplier or the Wire Rope Manufacturer for recommended materials and methods.
4. The currently recommended Trichlorethane does not comply with the "Clean Air Act of 1990, Section 611, Ozone Depletion Substances."

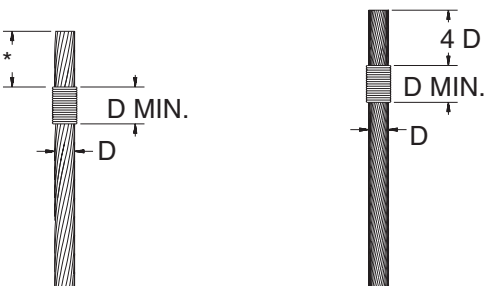
The following simplified, step-by-step instructions should be used only as a guide for experienced users. For full information, consult our document **WIRELOCK® TECHNICAL DATA MANUAL, WIRE ROPE USER MANUAL** by **AISI** and **WIRE ROPE MANUFACTURERS CATALOGS**.

STEP 1 - SOCKET SELECTION

1. WIRELOCK® is recommended for use with Crosby 416 - 417 Spelter Sockets and GS 517.
2. For use with sockets other than Crosby 416 - 417 consult the socket manufacturer or Crosby Engineering.
3. Sockets used with WIRELOCK® shall comply with Federal or International (CEN, ISO) Standards.
4. WIRELOCK®, as with all socketing media, depends upon the wedging action of the cone within the socket basket to develop full efficiency. A rough finish inside the socket may increase the load at which seating will occur. Seating is required to develop the wedging action.

STEP 2 - SEIZING

Seize the wire rope or strand as shown using soft annealed iron wire



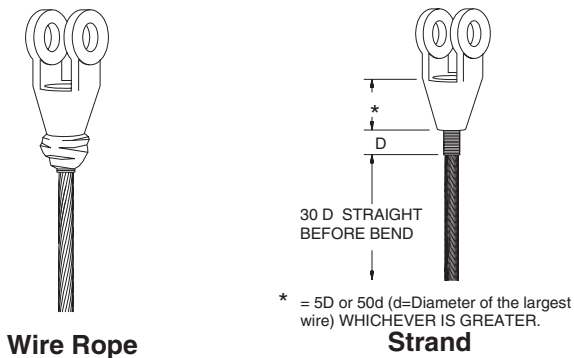
* = 5D or 50d (d= Diameter of the largest wire) WHICHEVER IS GREATER.

Strand

Wire Rope

STEP 5 - POSITIONING OF SOCKET

1. Position socket over the broom until the wires are LEVEL with the top of the socket basket or to a minimum embedded length as shown.
2. Clamp rope and socket vertically ensuring alignment of their axes.
3. **CAUTION: DO NOT USE OVERSIZED SOCKETS FOR WIRE ROPE.**




STEP 6 - SEAL SOCKET

Seal the base of the socket with putty or plasticine to prevent leakage of the **WIRELOCK®**.



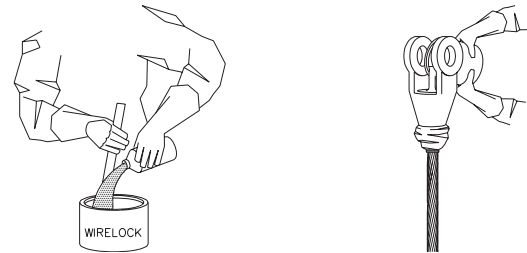
STEP 7 - WIRELOCK— KITS

1. **WIRELOCK®** kits are pre-measured and consist of two (2) containers - one (1) with resin and one (1) with granular compound.
2. Use the complete kit - **NEVER MIX LESS THAN THE TOTAL CONTENTS OF BOTH CONTAINERS.**
3. Each kit has a shelf life clearly marked on each container and this must be observed. **NEVER USE OUT OF DATE KITS.**

 CAUTION	
<ul style="list-style-type: none">● WIRELOCK® resin, in liquid state, is flammable.● Chemicals used in this product can give off toxic fumes and can burn eyes and skin.● Never use out-of-date material.● Use only in well-ventilated work areas.● Never breathe fumes directly or for extended time.● Always wear safety glasses to protect eyes.● Always wear gloves to protect hands.● Avoid direct contact with skin anywhere.	

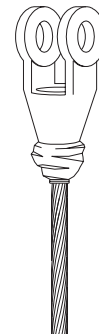
STEP 8 - MIXING AND POURING

1. Mix and pour **WIRELOCK®** within the temperature range of 9 degrees to 43 degrees C. Booster kits are available for reduced temperatures.
2. Pour all the resin into a container containing all the granular compound and mix thoroughly for two (2) minutes with a flat paddle.
3. Immediately after mixing, slowly pour the mixture down one side of the socket until the socket basket is full.



STEP 9 - CURING

1. **WIRELOCK®** will gel in approximately 15 minutes, in a temperature range 18 degrees C. to 24 degrees C.
2. The socket must remain in the vertical position for an additional ten (10) minutes after gel is complete.



3. The socket will be ready for service 60 minutes after gelling.
4. Never heat sockets to accelerate gel or curing.

STEP 10 - RE-LUBRICATION

Re-lubricate wire rope as required.

STEP 11 - PROOF LOADING

Whenever possible, the assembly should be proof loaded. All slings with poured sockets, in accordance with ASME B30.9, shall be Proof Loaded.

IMPORTANT SAFETY INFORMATION

National Four Post Swaging Machine



Operation Safety

- NEVER use dies that are cracked, worn or abraded (galled).
- NEVER use dies that have an oversized cavity.
- ALWAYS use a matched set of dies.
- When swaging steel fittings, DO NOT SHIM DIES. Dies for steel fittings must be free to float and align one to the other.
- When swaging aluminum fittings, THE STEEL DIES MUST BE SHIMMED. Shim the side of the die to ensure the proper cavity alignment for flash removal.
- NEVER shim between the dies.
- When Swaging Crosby National fittings, use only the proper capacity swaging machine for the size of fitting used (See Swaging Capacity Chart). If the swaging machine capacity exceeds the die block Working Load Limit rating, adjust the swaging machine tonnage to the Working Load Limit shown on the die block being used. See **Table 1** for die block Working Load Limit.
- Always use the correct size and type of die for the size wire rope fitting used.
- Always lubricate die faces and cavities with light weight oil.
- Progressive swaging of fittings must be done in accordance with procedure shown in "Swaging Products and Procedures" booklet. Only open channel dies are to be used.
- Stop swaging when the cavity side of both dies touch.
- Make sure part is swaged to the recommended after swage dimensions (See Crosby General Catalog or National Swage Brochure, Die Guide, or Die Chart).
- If a swage fitting other than a Crosby National is used, determine adequacy of the termination by a destructive pull test.
- All swage sockets must be swaged with socket head adjacent to the socket relief (largest radius) on the die.
- For special applications or conditions, contact Crosby National.



WARNING

- Misuse of swaging machine can result in serious injury or death.
- READ, UNDERSTAND, AND FOLLOW all the information in this warning document and the instructions shown in "Swaging Products and Procedures" booklet before operating the swaging machine.
- Swaging machine operators must be trained in accordance with the information supplied by The Crosby Group, Inc. The swaging machine owner is responsible for the training and the safe operation of the swaging machine.
- Do not swage oversize parts.
- Only swage parts of the proper design, material and hardness.
- If misused, dies and/or die holders may break. PROTECT YOURSELF AND OTHERS: Always stay away from the sides of the swaging machine during swaging operations and alert others in your work area.
- Keep head, hands, and body away from moving swaging machine and die parts.
- Consult die manufacturer for correct use of their product.
- Adjust swaging machine tonnage to the Working Load Limit (WLL) tonnage shown on the die block being used. If the Working Load Limit is not legible, refer to Die height & width and corresponding Working Load Limit (See Table 1). Failure to do so can result in serious injury or death.

TABLE 1

Die Size (Height x Width)	Working Load Limit (WLL) *
2" x 3-1/2"	200 Ton Mark Series
2-1/2" x 4"	200 Ton National
2-1/2" x 5"	500 Ton Mark Series
4" x 7"	1,200 Ton Mark Series
5" x 7"	1,500 Ton National
6" x 12"	3,000 Ton National

Note: These Working Load Limits are for Crosby® National Die Blocks only. The Working Load Limits of die blocks from other manufacturers may vary.

Inspection Maintenance Safety

- Make sure all bolts and nuts are in place and tightened to recommended torque as shown in Table A, on page 56.
- Load block or die base plate surfaces must be to manufacturers specifications for thickness and flatness to provide complete support of the die during swaging.
- Make sure die holder side rails are not bent or loose.
- Clean dies and die holder surfaces. Keep free of metal shavings, slag, grit, sand, floor dry, etc.
- Lubricate the four guide bushings daily with light oil.

- Inspect the rods for corrosion. Use #000 emery cloth or steel wool to maintain a high polish surface.
- Do not increase the hydraulic system pressure above the factory preset pressure of: 6500 psi for 500 ton, 1000 ton and 1500 ton swaging machines - 5000 psi for 3000 ton swaging machine.
- Under ordinary operating conditions, drain and clean reservoir every two (2) years.
- Filters inside of the reservoir should be cleaned every time the reservoir is drained and cleaned. The Racine "tell-tale" suction filter should be cleaned every six (6) months.

Die Working Load Limit Pressure Adjustment on Lower Cylinder National 500 Ton through 1500 Ton Swaging Machines

Follow this procedure to adjust swaging tonnage (pressure) on your swaging machine.

1. Install the die holder(s) or die adapter with the dies to be used.
2. Bring the dies together (without a part in the dies) until they just touch.
3. Turn the tonnage control valve, which is located on the control panel left of the tonnage gauge, counter-clockwise about (6) six turns or until knob no longer turns.
4. Now (without a part in the dies) apply pressure to the dies by pressing the foot pedal marked "up".
 - A. If the tonnage is lower than desired Working Load Limit, turn the valve clockwise while continuing to press the foot pedal marked "up" until desired Working Load Limit is reached.
 - B. If tonnage is higher than desired Working Load Limit, release pressure by pressing the pedal marked "down". Then repeat steps 2 through 4.

Die Working Load Limit Pressure Adjustment on 3000 Ton Swaging Machine

For reducing tonnage, use selector switch on front of control panel to select lower tonnage (approximately 1500 Tons) or 3000 Ton.



WARNING

ALWAYS USE 5 X 7 OR 6 X 12 DIES AT 1500 TON SETTING.



WARNING

USE ONLY 6 X 12 DIES ON TONNAGE THAT EXCEEDS 1500 TONS.

Swaging Machine Capacity Chart for Swage Sleeves, Ferrules & Buttons

Hydraulic Swaging Machine Size	Swaging Method	Die Size (in.)	Largest Fitting Allowed to Be Swaged (mm)			
			S-505 Sleeve	S-506 Sleeve	S-510 Ferrules	S-409 Buttons
500 Ton	Full Die	Mark Series 2-1/2 x 5 4 x 5 5 x 7	38	32*	14*	22*
1000 Ton	Full Die	4 x 7 5 x 7	64	32*	14*	32*
1500 Ton	Full Die	5 x 7 6 x 12	89	32*	14*	32*
3000 Ton	Full Die	6 x 12	114*	32*	14*	32*

* Largest size fitting available.

Swaging Machine Capacity Chart for S-501 & S-502 Swage Sockets

Hydraulic Swaging Machine Size	Swaging Method	Die Size (in.)	Largest Fitting Allowed to be Swaged (mm)
500 Tons	Full Shank	Mark Series 2-1/2 x 5 4 x 7 5 x 7	19
	Progressive	4 x 7 5 x 7	32
1000 Tons	Full Shank	4 x 7 5 x 7	26
	Progressive	4 x 7 5 x 7	38
1500 Tons	Full Shank	5 x 7 6 x 12	32
	Progressive	5 x 7 6 x 12	52
3000 Tons	Full Shank	6 x 12	52
	Progressive	16 x 12	52*

* Largest size fitting available.

NATIONAL HYDRAULIC SWAGING MACHINE TORQUE MAINTENANCE INFORMATION

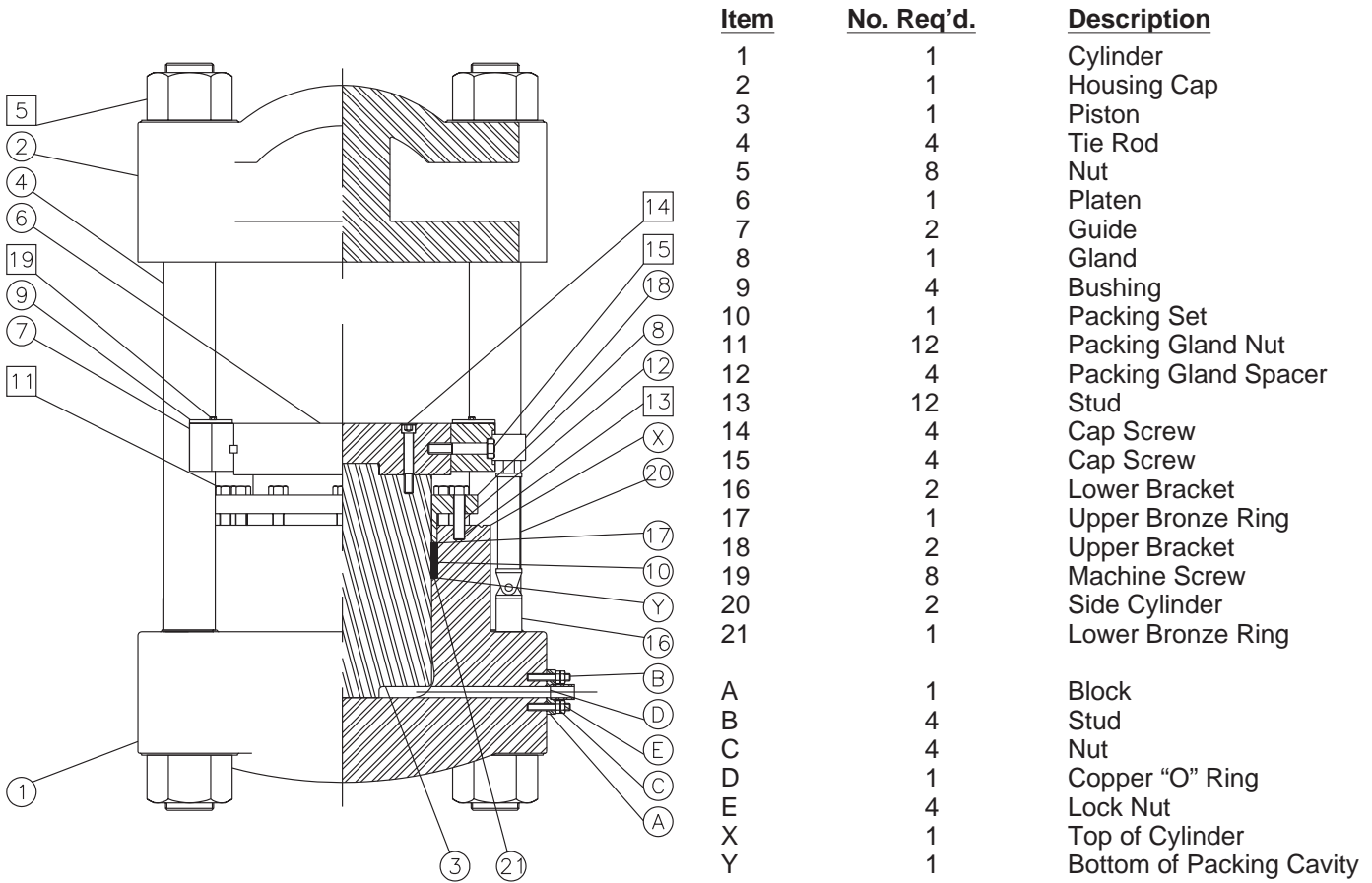
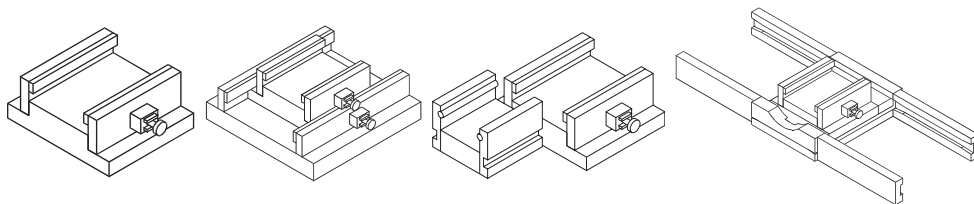


Table A						
Item #	Description	Torque in Nm				Maintenance Schedule
		500 t Swaging Machine	800 t Swaging Machine	1000 t Swaging Machine	1500 t Swaging Machine	
5	Tie Rod Nuts	2712	3051	3390	3390	Weekly
14	Piston Bolts	712	814	814	950	Monthly
11	Packing Gland Nuts (over spacers only) "all others hand tighten"	270	270	270	270	Weekly
15	Platen Guide Bolts	240	340	340	340	Weekly
13	Packing Gland Bolts	950	1085	1085	1085	6 Months
	Side Cylinder Bolts	136	N/A	136	200	Weekly
19	Guide Bushing Bolts	20	20	20	20	Weekly
	80 M Piston Pump Pistons	130 to 170 all swaging machines.				



Torque in ft. / lbs.		
Die Holder*	1/4 - 20 UNC	13
Bolt Torque	5/16 - 18 UNC	15
	5/8 - 11UNC	211
	7/8 - 9 UNC	583



APPENDIX. B
Chain and Accessories
(Crosby Products Data Sheets)

Chain & Accessories



Grade 80 Alloy Chain

GRADE 80 ALLOY CHAIN



- Alloy Steel.
- Heat Treated.
- Finish - Self Colored.
- Permanently embossed with manufacturer's marking and 8(Grade).

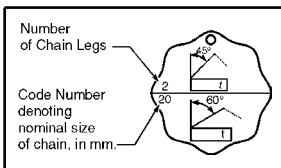
GRADE 80 ALLOY CHAIN

For overhead lifting applications.

Chain Size (mm)	Meters Per Drum	Dimensions (mm)	Working Load Limit (t)	Weight Per Meter (kg)
6	200	6 x 18	1.12	.80
7	200	7 x 21	1.50	1.05
8	200	8 x 24	2.00	1.25
10	200	10 x 30	3.15	2.20
13	100	13 x 39	5.30	3.80
16	100	16 x 48	8.00	5.70
19	50	19 x 54	11.2	8.03
22	50	22 x 66	15.0	10.9
26	-	26 x 78	21.2	15.2
32	-	32 x 96	31.5	23.0

* Proof Loaded at 2-1/2 times the Working Load Limit. Minimum Ultimate Load is 4 times the Working Load Limit.

SLING ID TAG



Sling ID Tag Kit

- Octagonal metal sling tag.
- Prestamped - easy to add sling length, Working Load Limit, name, etc.
- Front side is shown - reverse is blank.
- Available with or without welded attached ring.
- Attaching ring size is 5mm x 50mm.
- Available completely blank for wire rope sling applications.
- Gold painted.

ID Tag Stock No. With Ring	ID Tag Stock No. Without Ring	Application
1152445	1200829	For single leg sling : 90°
1152444	1200830	For multi-leg sling : 45°/ 60°

Grade 80 Chain

GENERAL INFORMATION

WORKING LOAD LIMIT

The "Working Load Limit" is the maximum load which should ever be applied to chain, when the chain is new or "in as new" condition, and when the load is uniformly applied in direct tension to a straight length of chain.

PROOF TEST

The "Proof Test" is a term designating the tensile test applied to new chain for the sole purpose of detecting injurious defects in the material or manufacture. It is the load which the chain has withstood under a test in which the load has been applied in direct tension to a straight length of chain.

ANSI / ASME B30.9c-1997

Paragraph 9-1.4.2 "Mechanically assembled slings shall be comprised entirely of proof tested components." Paragraph 9-1.4.2c "If untested components are employed, the sling shall be proof tested per Para. 9-1.4.1 prior to initial use."

MINIMUM ULTIMATE LOAD

The "Minimum Ultimate Load" is the minimum load at which new chain will break when tested by applying direct tension to a straight length of chain at a uniform rate of speed in a testing machine.

ATTACHMENTS

Any attachments, such as hooks or links, should have a rated "Working Load Limit" at least equal to the chain with which it is used.

CAUTION

Only Crosby Alloy chain, Spectrum 8[®] or Spectrum 10[®], should be used for overhead lifting applications.

It must be recognized that certain factors in the usage of chain and attachments can be abusive and lessen the load that the chain or attachments can withstand. Some examples are twisting of the chain, disfigurement, deterioration by straining, usage, weathering and corrosion, rapid application of load or jerking and applying excessive loads, and sharp corners cutting action.

Due to the crushing effect Grab Hooks have upon chain, the design factor of all chain assemblies must be reduced by 20% for Grab Hook applications.

CHAIN INSPECTION

INSPECTION AND REMOVAL FROM SERVICE PER ANSI B30.9

FREQUENT INSPECTION

Normal Service - Monthly

Severe Service - Daily to Monthly

Check chain and attachments for wear, nicks, cracks, breaks, gouges, stretch, bend, weld splatter, discoloration from excessive temperature, and throat openings of hooks.

- Chain links and attachments should hinge freely to adjacent links.
- Latches on hooks, if present, should hinge freely and seat properly without evidence of permanent distortion.

PERIODIC INSPECTION - INSPECTION RECORDS REQUIRED

Normal Service - Yearly

Severe Service - Monthly

This inspection shall include everything in a frequent inspection plus each link and end attachment shall be examined individually, taking care to expose inner link surfaces of the chain and chain attachments.

- Worn links should not exceed values given in table 1 or recommended by the manufacturer.
- Sharp transverse nicks and gouges should be rounded out by grinding and the depth of the grinding should not exceed values in Table 1.
- Hooks should be inspected in accordance with ANSI B30.10
- If present, latches on hooks should seat properly, rotate freely, and show no permanent distortion.
- Chains use OSHA and ASME regulations and safety information.

See: OSHA 1926.2 (a) 4 and 1910.184

ASME B30.9 Slings

ASME B30.10 Hooks

Normal Chain or Coupling Link Cross Section		Maximum Allowable Wear Diameter (mm)
(in.)	(mm)	
—	6	.79
1/4 - 9/32	7	.94
5/16	8	1.05
3/8	10	1.32
1/2	13	1.75
5/8	16	2.13
3/4	19	2.67
7/8	22	2.95
1	25	3.48
1 1/4	32	4.29

REFER TO ANSI B30.9


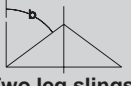

Temperature of Chain		Grade 80	
(F°)	(C°)	Reduction* of Working Load Limit WHILE AT Temperature	Reduction of Working Load Limit AFTER EXPOSURE to Temperatures**
Below 400	Below 204	None	None
400	204	10%	None
500	260	15%	None
600	316	20%	5%
700	371	30%	10%
800	427	40%	15%
900	482	50%	20%
1000	538	60%	25%

* Crosby does not recommend the use of Alloy Chain at temperatures above 800° F.**

**When chain is used at room temperature after being heated to temperatures shown in the first column.

Grade 80 Alloy Chain Slings

WORKING LOAD LIMIT — 4 TO 1 DESIGN FACTOR

Nominal size of sling	 Single-leg slings	 Two leg slings		 Three-and four-leg slings		Choke hitch
		0° $\beta \leq 45^\circ$	45° $\beta \leq 60^\circ$	0° $\beta \leq 45^\circ$	45° $\beta \leq 60^\circ$	
mm	t	t	t	t	t	t
6	1,12	1,60	1,12	2,36	1,70	0,90
7	1,50	2,12	1,50	3,15	2,24	1,20
8	2	2,80	2	4,25	3	1,60
10	3,15	4,25	3,15	6,70	4,75	2,50
13	5,30	7,50	5,30	11,20	8	4,25
16	8	11,20	8	17	11,80	6,40
19	11,20	16	11,20	23,60	17	9
22	15	21,20	15	31,50	22,40	12
26	21,20	30	21,20	45	31,50	17
32	31,50	45	31,50	67	47,50	25,20

The design factor of 4 to 1 on Grade 80 Alloy Chain agrees with the design factor used by the International Standards Organization (I.S.O.) and ANSI B30.9 is the preferred set of Working Load Limit values to be used.

TO MAKE YOUR CROSBY GRADE 8[®] ALLOY CHAIN SLING

Follow these simple steps in making a sling assembly:

Determine the maximum load to be lifted by the sling assembly.

Choose the type of sling assembly suited for the shape of the load and the size of the sling assembly for the load to be lifted. The decision must take into account the angle of the sling legs in multileg slings.

Determine the overall reach for bearing point of master link to bearing point on hook.

Select components, assemble chain and components. Affix sling identification tag to sling. The tag is available from your Crosby Distributor. The tag should be stamped with size chain, reach, type sling, Working Load Limit at a specific angle of lift, and some identifying number for record keeping.

If measurement comes in the link, cut the following link. For two leg type slings count the links and use an even number for clevis hooks and an odd number for eye hooks. This will position hooks in the same plane. In multileg slings always use the same number of links in each leg.

CAUTION

Derate sling in accordance with working load limit chart shown above.

A chain grab hook application will result in 20% reduction of chain capacity.

Care should be taken to observe these derated applications or chain may fracture or permanently stretch at loads less than the advertised chain ultimate strength and proof load respectively.

Crosby® Chain Sling Components

CHAIN ASSEMBLY CHART

Chain Size (mm)	A-344		A-347 (mm)	A-342 (in.)	A-337 (mm)	S-325A (mm)	S-311A (mm)	A-338 (mm)	A-328 (mm)
	1 Leg (mm)	2 Legs (mm)							
6	12	12	13/12	1/2	—	6	6	—	—
7	12	13	17/13	1/2	7	7 - 8	7 - 8	7	7
8	13	17	19/13	5/8	8	7 - 8	7 - 8	—	—
10	17	19	22/17	3/4	10	10	10	10	10
13	19	22	28/22	1	13	13	13	13	13
16	22	25	31/25	1	16	16	16	16	—
19	25	31	40/31	1-1/4	19	—	—	19	19
22	31	36	46/36	1-1/2	22	—	—	22	22
26	36	45	51/45	1-3/4	26	—	—	—	—
32	45	51	—	2-1/4	32	—	—	—	—

Chain Size (mm)	S-314A (mm)	A-339 (mm)	M-315A (mm)	S-316A (mm)	S-317A (mm)	S-320AN L-320AN t	S-322AN L-322AN t	S-326A (mm)
6	6	—	6	6	6	1.25	1.25	6
7	7 - 8	7	7 - 8	7 - 8	7 - 8	1.6	1.6	7 - 8
8	7 - 8	—	7 - 8	7 - 8	7 - 8	2.5	2.5	7 - 8
10	10	10	10	10	10	3.2	3.2	10
13	13	13	13	13	13	5.4	5.4	13
16	16	16	16	16	16	8	8	16
19	—	19	—	—	—	11.5	11.5	—
22	—	22	—	—	—	16	16	—
26	—	—	—	—	—	22	22	—
32	—	—	—	—	—	31.5	31.5	—

Grade 8 Alloy Fitting

WELDED MASTER LINK

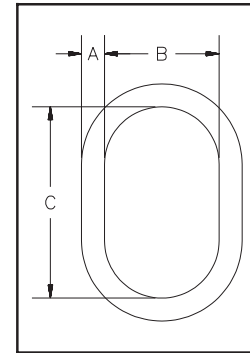
- Each link has a Product Identification Code (PIC) for material traceability, along with the size, and "CG" stamped into it.
- Available in sizes A13 through A51.
- Design Factor of 4 to 1.
- Based on DIN 5688, part 3
- Alloy Steel - Quenched and Tempered
- Individually Proof Tested at 2.5 times the Working Load Limit.



A343

Size	Stock No. S.C.	Chain Size (mm)		Working Load Limit**† t	Weight Each (kg)	Dimensions (mm)		
		Single Leg	Double Leg			A	B	C
A13	593100	6	6 - 7	1.6	.34	13	60	110
A16	593102	8	—	2.0	.53	16	60	110
A18	593103	10	8	3.2	.82	18	75	135
A22	593104	13	10	5.3	1.50	22	90	160
A26	593105	16	13	8.0	2.31	26	100	180
A32	593106	18 - 19	16	11.2	3.95	32	110	200
A36	593107	20 - 22	18 - 19	15.2	6.34	36	140	260
A45	593109	26 - 28	22	25.5	12.82	45	180	340
A51	593110	32	26	36	17.30	51	190	350

* Based on single leg sling. Ultimate Load is 4 times the Working Load Limit.



WELDED MASTER LINK ASSEMBLY

- Each link has a Product Identification Code (PIC) for material traceability, along with the size, and "CG" stamped into it.
- Available in sizes A18 - B13 through A51 - B36.
- Design Factor of 4 to 1.
- Based on DIN 5688, part 3.
- Alloy Steel - Quenched and Tempered
- Individually Proof Tested at 2.5 times the Working Load Limit.

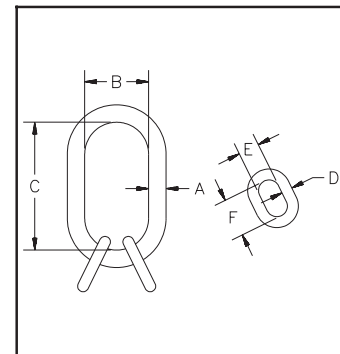


A346

Size	Stock No. S.C.	Chain Size (mm)	Working Load Limit**†	Weight Each (kg)	Dimensions (mm)					
					A	B	C	D	E	F
A18 - B13	1256010	6	2.4	1.16	18	75	135	13	25	54
A22 - B16	1256080	8	4.3	2.22	22	90	160	16	34	70
A26 - B17	1256150	10	6.70	3.37	26	100	180	18	40	85
A32 - B22	1256220	13	11.2	6.07	32	110	200	22	50	115
A36 - B26	1256290	16	17	10.00	36	140	260	26	65	140
A38 - B32	1256360	18	23.6	18.92	45	180	340	32	70	150
A51 - B32	1256395	20	27.0	23.40	51	190	350	32	70	150
A51 - B36	1256430	22	32.5	25.94	51	190	350	35	75	170

*Ultimate Load is 4 times the Working Load Limit.

† Working Load Limit with coupling links at 90 degrees included angle maximum.



Alloy Master Links

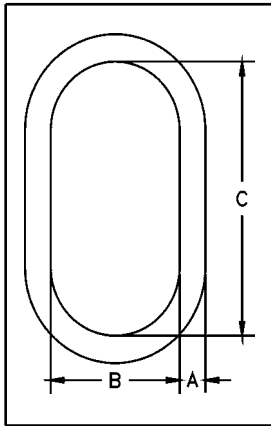


A-342



- Alloy Steel - Quenched and Tempered.
- Individually proof tested to values shown.
- For use with chain (S.F. = 4/1), prooftested to 2.5 times the working load limit.
- For use with rope (S.F. = 5/1), prooftested to 2 times the working load limit.
- Sizes from 13mm to 51mm are drop forged.

A-345



A-342 Alloy Master Links

Size "A" (mm)	A-342 Stock No.	Working Load Limit S.F. = 5:1 for Rope (t)*	Working Load Limit S.F. = 4:1 for Chain (t)	Proofload in kN **	Weight Each (kg)	Dimensions (mm)		
						B	C	Deformation Indicator
** 13	1014262	3.17	2.54	63	0.37	63.5	127	76
** 16	1014280	4.08	3.26	81	0.69	76.0	152	89
** 19	1014306	5.58	4.46	110	0.94	70.0	140	89
** 22	1014315	6.44	5.15	127	1.59	95.5	162	114
** 25	1014324	11.05	8.83	217	2.20	89.0	178	114
** 32	1014342	16.42	13.13	323	4.34	111	222	140
** 38	1014360	25.67	20.54	504	7.36	133	267	165
** 44	1014388	38.51	30.81	756	11.4	152	305	191
** 51	1014404	46.54	37.23	913	16.8	178	356	229
†† 57	1014422	65.6	52.47	1287	24.5	203	406	-
**†† 63	1014468	66.8	58.00	1311	30.7	203	406	-
†† 70	1014440	98.4	78.71	1930	39.8	241	406	-
†† 76	1014486	103	82.73	2029	52	229	457	-
†† 83	1014501	119	95.13	2334	66	254	508	-
†† 89	1014529	126	101	2483	91	305	610	-
†† 95	1015051	152	122	2990	90	254	508	-
†† 102	1015060	169	135	3319	103	254	508	-
†† 108	1015067	160	128	3150	137	305	610	-
†† 121	1015079	163	130	3204	156	356	711	-
†† 121	1015088	176	141	3462	198	356	711	-
†† 127	1015094	179	143	3515	234	381	762	-

* Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120 degrees.

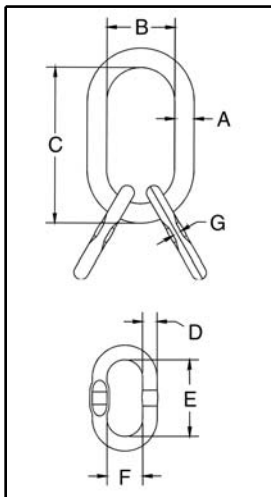
** Proof test load equals or exceeds the requirement of ASTM A957(8.1) and ASME B30.9-1.4 for the chain size and number of legs. For use with chain slings, see page 166.

†† Welded Master Link.

Chain & Accessories

A-345 Master Link Assembly

- Alloy Steel - Quenched and Tempered.
- Individually proof tested at 2.5 times the Working Load Limit with certification.
- Proof Test certification shipped with each link.



"A" Size (mm)	A-345 Stock No.	Working Load Limit (t)*		Weight Each (kg)	Dimensions (mm)						Deformation Indicator	Engineered Flat for S-325A (in.) - (mm)
		Based on Grade 80 Chain Rating	Based on 4:1 Design Factor		B	C	D	E	F	G		
19	1014734	4.13	4.77	1.18	19.1	70.0	140	14.2	85.0	39.9	89	1/4"-5/16", 7-8mm
25	1014752	8.35	11.0	2.77	25.4	89.0	178	17.5	100	60.0	114	3/8", 10mm
32	1014770	14.1	16.3	5.99	31.8	111	222	22.4	100	60.0	140	1/2", 13mm
38	1014798	21.3	24.6	11.0	38.1	133	267	28.7	150	70.0	165	5/8", 16mm
44	1014814	33.3	38.5	16.2	44.5	152	305	31.8	160	90.0	191	3/4", 20mm
51	1014832	40.3	46.6	26.0	51.0	178	356	38.1	180	100	229	No Flat

* Ultimate Load is 4 times the Working Load Limit. Proof Load is 2.5 times the Working Load Limit. Working Load Limit with coupler links at 60 degree included angle maximum.

See page 165 for proper chain selection for triple and quadruple leg slings.

Welded Master Links

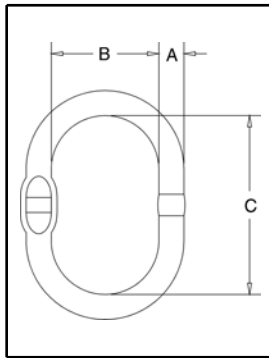


A-344



- Each link has a Product Identification Code (PIC) for material traceability, along with the size and "CG" (The Crosby Group).
- Design Factor of 4 to 1 for chain and 5 to 1 for wire rope.
- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2.5 times the Working Load Limit (4:1) with certification.
- Larger inside width and length for use with thimble.
- Engineered Flat for use with S-325A coupler link.

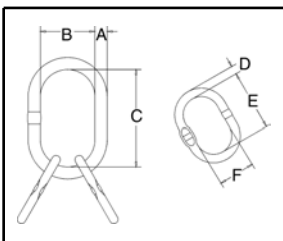
A-347



A-344
Welded Master Link
with Engineered Flat

Size (mm)	A-344 Stock No.	Working Load Limit (t)*		Weight Each (kg)	Dimensions (mm)			Engineered Flat Size for S-325A (in.) - (mm)
		4:1	5:1		A	B	C	
12	1256862-4	1.6	1.6	.30	12	60	120	1/4"-5/16", 7-8mm
13	1256932-4	2.12	2.5	.36	13	60	120	1/4"-5/16", 7-8mm
17	1257002-4	3.15	4	.84	17	90	160	3/8", 10mm
19	1257072-4	5.3	6.5	1.07	19	90	160	1/2", 13mm
22	1257212-4	8	8	1.61	22	100	180	5/8", 16mm
25	1257282-4	11.2	11.5	2.37	25	115	205	5/8", 16mm
28	1257382-4	13	11.8	3.78	28	145	275	No Flat
31	1257422-4	16	16	4.69	31	145	275	No Flat
36	1257492-4	21.2	24	6.83	36	155	285	No Flat
40	1257532-4	25	25	8.90	40	160	300	No Flat
45	1257562-4	31.5	31.5	12.73	45	180	340	No Flat
51	1257632-4	40	45	17.26	51	215	390	No Flat

* Ultimate load based on in line pull. Calculated for a single leg sling or for the resultant load on a two leg sling with included angle not exceeding 90 degrees.



A-347
Welded Master Link Assembly

Size (mm)	A-347 Stock No.	Working Load Limit (t)*		Weight Each (kg)	Dimensions (mm)						Engineered Flat Size for S-325A (in.) - (mm)
		4:1	5:1		A	B	C	D	E	F	
13/12	1257692-4	2.36	2.4	.81	13	60	120	12	85	45	No Flat
17/13	1257762-4	3.15	3.2	1.56	17	90	160	13	120	60	No Flat
19/13	1257832-4	4.25	4.2	1.79	19	90	160	13	120	60	1/4"-5/16", 7-8mm
22/17	1257972-4	6.7	8	3.29	22	100	180	17	160	90	3/8", 10mm
28/22	1258142-4	11.2	12	7.00	28	145	275	22	180	100	1/2", 13mm
31/25	1258182-4	17	17	9.43	31	145	275	25	210	115	5/8", 16mm
40/31	1258332-4	23.6	25	18.28	40	160	300	31	270	140	No flat
45/36	1258402-4	31.5	31.5	26.39	45	180	340	36	285	155	No flat
51/45	1258462-4	45	45	42.88	51	190	350	45	340	180	No flat

* WLL for included angle of maximum 90 degrees. For larger included angles the WLL should be reduced.

Grade 80 Alloy Connecting Links

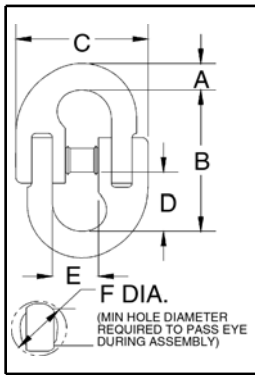


Fatigue Rated

A-337



- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- Locking system that provides for simple assembly and disassembly - no special tools needed.
- Meets ASTM A-952-96 standards for Grade 80 chain fittings.
- Forged Alloy Steel - Quenched and Tempered.
- Fatigue rated.



LOK-A-LOY® 8 Alloy Connecting Link

Chain Size		A-337 Stock No.	Pkg. Qty.	Weight Each (kg)	Working Load Limit (t)*	Dimensions (mm)					
(in.)	(mm)					A	B	C	D	E	F
9/32 (1/4)	7	1014720	24	.13	1.5	8.40	47.8	47.0	19.8	16.0	14.2
5/16	8	1014584	24	.15	2	9.15	55.4	50.0	23.1	16.8	16.0
3/8	10	1014721	24	.34	3.15	11.4	64.3	63.5	26.2	21.6	19.1
1/2	13	1014722	12	.75	5.3	16.3	87.4	81.8	36.6	27.7	23.9
5/8	16	1014723	12	1.30	8	19.1	105	96.0	43.9	35.1	28.7
3/4	20	1014724	1	2.26	11.2	23.6	126	118	53.1	40.4	32.5
7/8	22	1014725	1	3.41	15	26.9	140	143	58.7	50.0	36.6
1	25	1014727	1	5.00	21.2	31.0	152	157	63.5	56.4	47.8
1-1/4	32	1014728	1	9.25	31.5	38.1	189	194	78.5	64.3	55.6

* Ultimate Load is 4 times the Working Load Limit.

Chain & Accessories

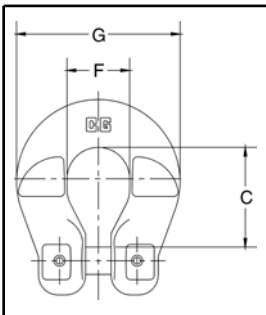


Fatigue Rated

S-325A



- Designed to connect Grade 80 chain fittings produced with "Engineered Flat" to Grade 80 chain.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- Locking system that provides for simple assembly and disassembly - no special tools needed.
- Meets ASTM A-952-96 standards for Grade 80 chain fittings.
- Forged Alloy Steel - Quenched and Tempered.
- Fatigue Rated.



S-325A Grade 80 Coupling Link

Chain Size		S-325A Stock No.	Weight Each (kg)	Working Load Limit (t)*	Dimensions (mm)		
(in.)	(mm)				C	F	G
-	6	1097995	.11	1.12	26.2	19.3	44.7
1/4-5/16	7-8	1098001	.23	2	35.8	23.4	59.0
3/8	10	1098005	.34	3.15	46.7	30.0	69.0
1/2	13	1098009	.75	5.3	55.5	38.1	94.5
5/8	16	1098013	.86	8	71.5	49.8	112

* Ultimate Load is 4 times the Working Load Limit.

SHUR-LOC® Hook Series



Fatigue Rated®

S-316A

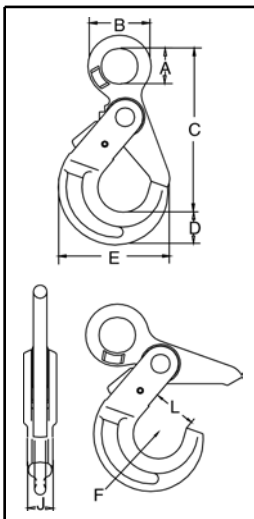


- Positive Lock Latch is Self-Locking when hook is loaded.
- Forged Alloy Steel- Quenched and Tempered.
- Rated for both Wire Rope and Grade 80 Chain.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 80 chain fittings.
- Fatigue rated.
- The SHUR-LOC® hook, if properly installed and locked, can be used for personnel lifting applications and meets the intent of OSHA Rule 1926.550 (g) (4) (iv) (B).
- G-414 Heavy Thimble should be used with wire rope slings.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Trigger repair Kit available (S-4316). Consist of spring, roll pin and trigger.
- Designed with Engineered Flat to connect to Grade 80 chain fittings.
- "Look for the color Gold - Crosby Alloy Hooks".

S-326A



S-316A SHUR-LOC® Eye Hook

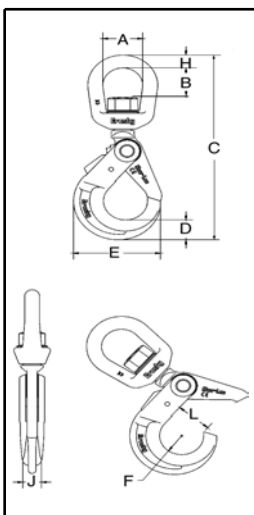


Chain Size		S-316A Stock No.	Grade 80 Alloy Chain Working Load Limit (t) 4:1*	Dimensions (mm)								Flat Size	Weight Each (kg)
(in.)	(mm)			A	B	C	D	E	F	J	L		
-	6	1097918	1.12	19.8	36.1	100	20.1	66.0	17.0	16.0	28.7	-	.39
1/4-5/16	7-8	1097920	2.0	27.4	50.5	135	27.9	89.0	22.1	20.6	35.1	1/4-5/16", 7-8mm	.82
3/8	10	1097921	3.15	33.0	62.0	167	29.7	112	27.9	23.9	44.5	3/8", 10mm	1.47
1/2	13	1097922	5.3	41.9	80.0	209	42.4	138	32.0	29.5	53.5	1/2", 13mm	2.70
5/8	16	1097926	8.0	56.0	100	256	52.0	167	38.1	38.1	63.0	5/8", 16mm	5.78

* Ultimate Load is 4 times the Working Load Limit based on Grade 8 Chain.

S-326A SHUR-LOC® Swivel Hooks

- U.S. Patent 5,381,650 and foreign equivalents.



Chain Size		S-326A Stock No.	Grade 80 Alloy Chain Working Load Limit (t)*	Dimensions (mm)										Weight Each (kg)
(in.)	(mm)			A	B	C	D	E	F	H	J	L		
-	6	1004201	1.12	38.1	33.5	156	20.1	66.0	17.0	12.7	16.0	28.7	.57	
1/4-5/16	7-8	1004210	2.0	44.5	40.4	193	27.9	89.0	22.1	16.0	20.6	35.1	1.19	
3/8	10	1004223	3.15	51.0	43.9	224	29.7	112	27.9	19.1	23.9	44.5	2.13	
1/2	13	1004234	5.3	63.5	60.5	284	42.4	138	32.0	25.4	29.5	53.5	3.92	
5/8	16	1004235	8	70.0	64.5	330	52.0	167	38.1	28.7	38.1	63.0	7.71	

* Ultimate Load is 4 times the Working Load Limit.

SHUR-LOC® Hook Series

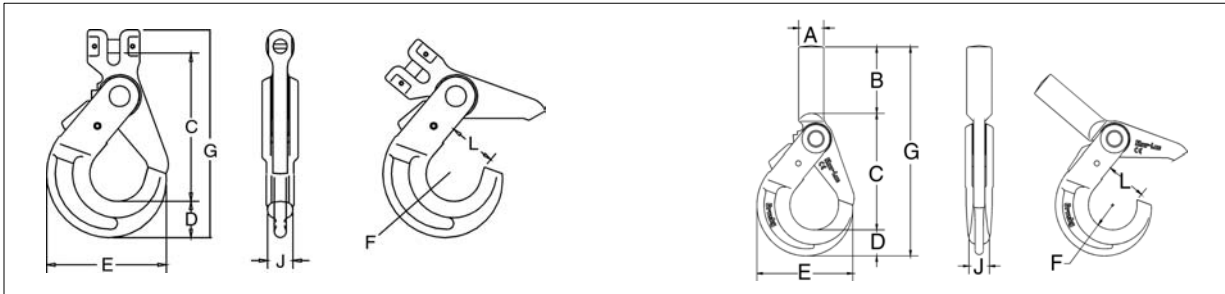


Fatigue Rated

S-317A



S-318A



S-317A SHUR-LOC® Clevis Hooks

Chain Size		S-317A Stock No.	Grade 80 Alloy Chain Working Load Limit (t)*	Dimensions (mm)								Weight Each (kg)
(in.)	(mm)			C	D	E	F	G	J	L		
-	6	1004084	1.12	87.0	20.1	66.0	17.0	121	16.0	28.7	.35	
1/4-5/16	7-8	1004086	2.0	114	27.9	89.0	22.1	159	20.6	35.1	.81	
3/8	10	1004095	3.15	140	29.7	112	27.9	192	23.9	44.5	1.45	
1/2	13	1004102	5.3	173	42.4	138	32.0	242	29.5	53.5	3.06	
5/8	16	1004111	8.0	209	52.0	167	38.1	295	38.1	63.0	5.42	

* Ultimate Load is 4 times the Working Load Limit.

S-318A SHUR-LOC® Shank Hooks

Chain Size		S-318A Stock No.	Grade 80 Alloy Chain Working Load Limit (t)*	Dimensions (mm)									Weight Each (kg)
(in.)	(mm)			A†	B	C	D	E	F	G	J	L	
-	6	1098101	1.12	20.1	55.0	84.0	20.1	66.0	17.0	159	16.0	28.7	.45
1/4-5/16	7-8	1098112	2.0	25.4	61.0	106	27.9	89.0	22.1	195	20.6	35.1	.90
3/8	10	1098123	3.15	29.0	75.0	131	29.7	112	27.9	235	23.9	44.5	1.61
1/2	13	1098134	5.3	34.0	85.0	160	42.4	138	32.0	288	29.5	53.5	3.18
5/8	16	1098145	8.0	41.4	100	185	52.0	167	38.1	337	38.1	63.0	7.26

* Ultimate Load is 4 times the Working Load Limit.

Chain & Accessories

Grade 80 Alloy Eye Hooks



Load Rated

Fatigue Rated



SEE APPLICATION AND WARNING INFORMATION

On Pages 112-113

S-320AN



- The most complete line of Eye hoist hooks.
- Each hook has a Product Identification Code (PIC) for material traceability, along with the size and Crosby & U.S.A. in raised letters.
- Meets ASTM A-952-96 standards for Grade 80 chain fittings.
- Suitable for use with Grade 80 chain in overhead lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component. Per ANSI B30.9-1.
- Forged Alloy Steel - Quenched and Tempered.
- Engineered Flat for use with S-325A coupler link (thru 5/8").
- **QUIC-CHECK®** Hoist hooks incorporate two types of strategically placed markings forged into the product which address two (2) **QUIC-CHECK®** features:
- Deformation Indicators and Angle Indicators (see following page for detailed definition).
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the color Gold - Crosby Alloy Products."
- Can be proof tested to 2-1/2 times the Working Load Limit (4:1).
- Low profile hook tip.
- Working Load Limit for Wire Rope forged on raised lettering pad to allow user to grind off quickly and easily without affecting hook.
 - Crosby recommends grinding the Working Load Limit (which is for a 5 to 1 Design Factor) off the hook when using with Grade 80 chain.
- New integrated latch (S-4320) meets the World class standard for lifting.
 - Heavy duty stamped latch interlocks with the hook tip.
 - High cycle, long life spring.
 - When secured with proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550 (g) for personnel lifting.

Crosby S-320AN Eye Hoist Hook Featuring an Engineered Flat

Grade 80 Alloy Chain Size		Working Load Limit (t) 4:1 *	Hook ID Code	Working Load Limit for Wire Rope (t) 5:1	S-320AN Stock No.	Weight Each (kg)	Replacement Latch Stock No.	Recommended Cotter Pin Dimensions (mm)	
(in.)	(mm)							Dia	Length
7/32	6	1.12	DA	1.00	1022375	.27	1096325	3.2	20
1/4-5/16	7 - 8	2	GA	2.00	1022397	.65	1096421	3.2	25
3/8	10	3.15	HA	2.55	1022406	.93	1096468	5	32
1/2	13	5.3	IA	4.30	1022419	1.95	1096515	6.3	40
5/8	16	8	JA	6.40	1022430	3.76	1096562	8	50
3/4	20	11.2	KA	9.20	1022441	6.80	1096609	8	50
7/8	22	15	LA	12.80	1022452	9.79	1096657	10	80
1	26	21.2	NA	17.60	1022465	17.91	1096704	10	80

* Minimum Ultimate Load is 4 times the Working Load Limit.

Grade 80 Alloy Eye Hooks



Load Rated

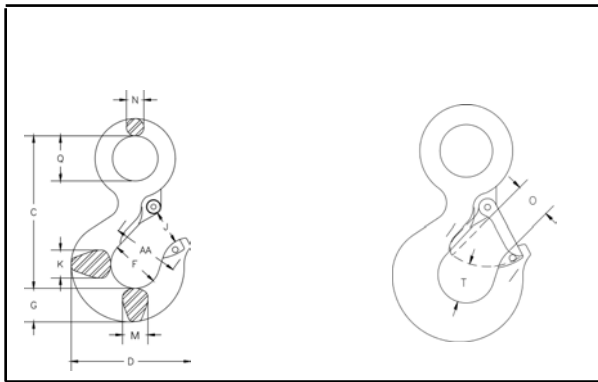
Fatigue Rated

SEE APPLICATION AND WARNING INFORMATION
On Pages 112-113

S-320AN



- Hoist hooks incorporate markings forged into the product which address two (2) **QUIC-CHECK®** features:
 - Deformation Indicators: Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a **QUIC-CHECK®** measurement to determine if the throat opening has changed, thus indicating abuse or overload. To check, use a measuring device (i.e., tape measure) to measure the distance between the marks. The marks should align. If the measurement does not meet this criteria, the hook should be inspected further for possible damage.
 - Angle Indicators: Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.



Hook ID Code	Grade 80 Alloy Chain Size		Working Load Limit (t) 4:1*	Dimensions (mm)										
	(in.)	(mm)		C	D	F	G	J	K	M	N	O	Q	T
DA	7/32	6	1.12	85	72.5	32.0	18.5	22.9	16.0	16.0	9.14	22.6	19.1	22.1
GA	1/4-5/16	7-8	2	108	90.0	38.1	25.4	25.1	22.4	22.4	12.7	25.4	28.7	26.2
HA	3/8	10	3.15	123	101	41.1	28.7	29.2	23.9	23.9	14.2	27.7	32.8	29.5
IA	1/2	13	5.3	150	124	51.0	36.6	38.6	33.3	33.3	17.5	34.5	39.6	38.9
JA	5/8	16	8	191	159	63.5	46.0	44.5	42.2	42.2	23.1	40.9	51.5	49.8
KA	3/4	19	11.2	233	191	76.0	57.0	61.0	47.8	41.4	28.2	52.0	62.0	62.5
LA	7/8	22	15	259	213	82.8	65.8	66.5	55.5	49.3	32.3	57.5	72.0	66.5
NA	1	26	21.2	326	263	108	76.2	86.5	68.5	60.5	39.9	76.5	89.0	72.0

* Minimum Ultimate Load is 4 times the Working Load Limit.

Chain & Accessories

Grade 80 Latching Clevis Hook

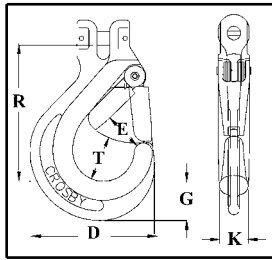


Fatigue Rated

S-314A



- Hook is Forged Alloy Steel - Quenched and Tempered.
- Integrated heavy duty latch.
- Large throat opening.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 80 chain fittings.
- Anti-fouling due to carefully designed contours.
- Individually Proof Tested at 2.5 times the Working Load Limit with certification.
- Fatigue rated.
- "Look for the color Gold - Crosby Alloy Hooks."



S-314A

Clevis Chain Hook with Integrated Latch

Chain Size		S-314A Stock No.	Grade 80 Alloy Chain Working Load Limit (t) 4:1*	Weight Each (kg)	Dimensions (mm)						Replacement Latch Stock No.
(in.)	(mm)				D	E	G	K	R	T	
-	6	1225020	1.12	.32	66.0	20.6	20.0	16.0	72.3	26.0	1291332
1/4 - 5/16	7 - 8	1225021	2	.70	89.0	27.4	28.0	20.5	98.0	32.6	1291402
3/8	10	1225091	3.15	1.29	110.5	36.1	29.3	24.0	125.3	42.2	1291472
1/2	13	1225161	5.3	2.34	138.5	38.6	42.1	29.5	144.5	49.2	1291542
5/8	16	1225162	8	3.67	166.5	48.5	52.0	38.0	172.6	58.9	1291612

* Ultimate Load is 4 times the Working Load Limit.

Grade 80 Latching Eye Hook

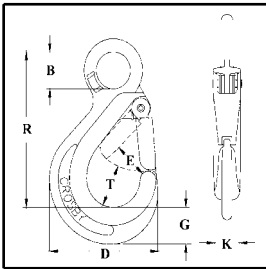


Fatigue Rated

S-315A



- Hook is Forged Alloy Steel - Quenched and Tempered.
- Integrated heavy duty latch.
- Large throat opening.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 80 chain fittings.
- Anti-fouling due to carefully designed contours.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Fatigue rated.
- "Engineered Flat" for use with S-325A Coupler Link.
- "Look for the color Gold - Crosby Alloy Hooks."



S-315A

Eye Chain Hook with Integrated Latch

Chain Size		S-315A Stock No.	Grade 80 Alloy Chain Working Load Limit (t) 4:1*	Working Load Limit for Wire Rope (t) 5:1	Weight Each (kg)	Dimensions (mm)						Replacement Latch Stock No.	
(in.)	(mm)					B	D	E	G	K	R		T
-	6	1029820	1.12	1	.25	20.1	66.0	20.6	20.1	16.0	84.5	25.9	1291332
1/4-5/16	7-8	1029825	2	2	.59	27.9	89.0	27.4	27.9	20.6	117	32.5	1291402
3/8	10	1029830	3.15	3	1.18	36.1	110	36.1	29.5	23.9	157	42.2	1291472
1/2	13	1029835	5.3	5	2.13	46.0	138	38.6	42.4	29.5	186	49.3	1291542
5/8	16	1029840	8	7	3.88	56.0	167	48.5	52.0	38.1	227	59.0	1291612

* Ultimate Load is 4 times the Working Load Limit.

Chain & Accessories

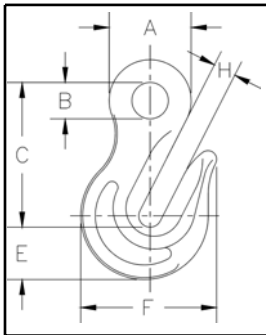
Grade 80 Alloy Fittings



A-328



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.



A-328 Eye Grab Hook

Chain Size (mm)	A-328 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)					
				A	B	C	E	F	H
7	1026017	1.59	.27	35.1	15.0	65.0	23.1	55.0	9.65
10	1026035	3.22	.54	45.7	20.3	82.5	29.5	76.0	12.7
13	1026053	5.45	1.36	57.0	24.9	106	42.9	102	16.0
19	1026099	12.84	3.74	82.0	34.5	151	55.5	139	22.4
22	1026115	15.51	5.40	94.0	39.4	175	65.0	160	26.9

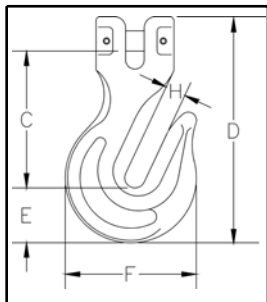
* Ultimate Load is 4 times the Working Load Limit.



A-338



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Pin locking requires no special tools.



A-338 Clevis Grab Hook

Chain Size (mm)	A-338 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)				
				C	D	E	F	H
7	1027659	1.59	.28	66.5	106	22.6	55.0	9.65
10	1027677	3.22	.57	81.5	132	29.5	76.0	12.7
13	1027686	5.45	1.56	106	177	42.9	102	15.7
16	1027695	8.21	2.56	128	210	47.8	118	19.1
19	1027702	12.84	4.72	151	253	55.5	134	22.4
22	1027711	15.51	6.18	176	294	65.0	155	25.4

* Ultimate Load is 4 times the Working Load Limit.

Grade 80 Alloy Fittings

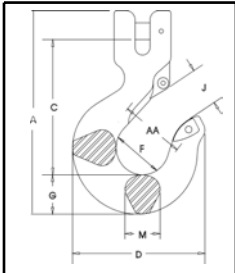
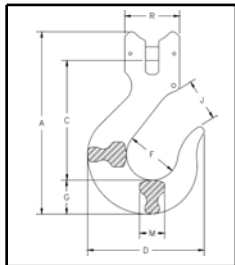


A-339N



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Pin locking requires no special tools.
- New integrated latch (S-4320) fits 6mm - 16mm hooks.
 - Heavy duty stamped latch interlocks with the hook tip.
 - High cycle, long life spring.
 - When secured with proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550 (g) for personnel lifting.
- S-4088 Latch fits 3/4" & 7/8" hooks.

A-339 A-339N



A-339N Clevis Sling Hook

Hook Size		A-339N Stock No.	Hook ID Code	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							
(in.)	(mm)					A	C	D	F	G	J	M	AA
--	6	1027910	DA ‡	1.12	.27	107	75.0	72.5	32.0	18.5	23.6	406	38.1
1/4 - 5/16	7-8	1027914	HA ‡	2	.68	144	101	98.0	41.1	26.2	30.2	484	51.0
3/8	10	1027923	IA ‡	3.15	.95	171	120	111	51.0	30.2	38.9	606	63.5
1/2	13	1027932	JA ‡	5.3	1.90	213	150	142	63.5	36.6	45.2	729	76.2
5/8	16	1027941	KA ‡	8	3.80	259	177	172	76.0	47.8	61.0	929	102
3/4**	20	1027793	-	11.2	5.20	294	170	187	82.5	55.0	68.5	1019	--
7/8**	22	1027800	-	15	8.00	334	193	215	92.0	62.0	77.5	1129	--

* Ultimate Load is 4 times the Working Load Limit

** Old Style 339 hooks.

‡ New A-339N Style hooks.

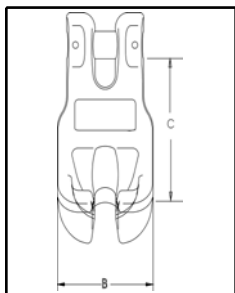


Fatigue Rated

S-311A



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Fatigue rated.
- Provided with spring designed to retain chain.



S-311A Chain Shortener Link

Chain Size		Working Load Limit (t)*	S-311A Stock No.	Weight Each (kg)	Dimensions (mm)	
(in.)	(mm)				B	C
-	6	1.12	1098051	.34	37.1	43.7
1/4-5/16	7 - 8	2	1098062	.45	49.0	67.8
3/8	10	3.15	1098084	.68	57.7	77.2
1/2	13	5.3	1098095	1.47	75.9	99.5
5/8	16	8	1098106	2.54	84.6	120

* Ultimate Load is 4 times the Working Load Limit

Chain & Accessories

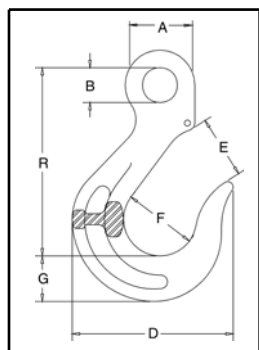
Grade 80 Alloy Fittings



A-327



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- S-4088 Latch Kit fits hooks.



A-327 Eye Sling Hook

Chain Size (mm)	A-327 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							Replacement Latch Stock No.
				A	B	D	E	F	G	R	
7	1003764	1.59	.36	34.0	14.2	88.0	33.0	44.5	22.6	94.5	1090250
10	1003773	3.22	.95	46.5	19.1	116	35.6	56.5	31.8	120	1090251
13	1003782	5.45	1.68	57.0	23.9	140	44.5	63.5	39.4	144	1090252
16	1003791	8.21	2.90	70.5	28.4	165	51.0	73.0	47.8	167	1090253
19	1003808	12.84	4.45	83.0	32.5	187	54.5	83.0	55.0	193	1090254
22	1003817	15.51	7.00	94.5	36.6	215	63.5	92.0	62.5	217	1090255

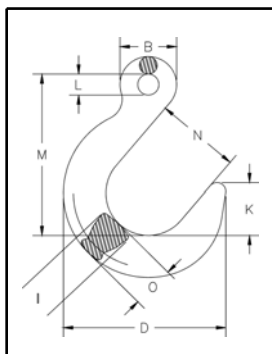
* Ultimate Load is 4 times the Working Load Limit.



A-329



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.



A-329 Eye Foundry Hook

Chain Size (mm)	A-329 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							
				B	D	I	K	L	M	N	O
7	1026179	1.59	1.09	39.6	121	25.4	39.6	16.0	121	63.5	31.2
10	1026197	3.22	2.04	50.8	145	32.3	47.8	19.1	146	76.0	38.1
13	1026213	5.45	3.22	63.5	171	38.1	56.5	25.4	175	89.0	44.5
16	1026231	8.21	5.53	76.2	198	46.0	67.0	31.8	205	102	51.5
19	1026259	12.84	8.75	88.9	232	56.0	89.0	38.1	235	114	65.0
22	1026277	15.51	11.9	102	256	57.0	86.0	44.5	264	127	70.5

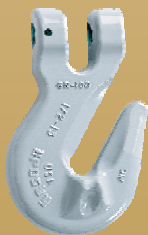
* Ultimate Load is 4 times the Working Load Limit.

INTRODUCING

Spectrum 10[®] Grade 100 Chain Fittings

Crosby 8/10[™]

*SETTING THE STANDARD
FOR PREMIUM CHAIN FITTINGS*



- ✓ Can be used with either Grade 100 or Grade 80 chain.
 - Meets the requirements of the Grade 100 specification.
 - Meets the performance, dimensional and functionality requirements of Grade 8 (80) specification ASTM A952 and EN1677.
- ✓ Forged Alloy Steel - Quenched & Tempered
- ✓ Individually Proof Tested with Certification.
- ✓ *Fatigue Rated* at 1-1/2 times the Working Load Limit at 20,000 cycles.
- ✓ Size for size, *20% to 25% more capacity* than Grade 80 fittings.
- ✓ "Look for the Platinum color"

theCrosby group, inc.

Fatigue Rated



QUIC-CHECK[®]



"When buying Crosby, you're buying more than product, you're buying *Quality*."

Grade 100 Alloy Chain

GENERAL INFORMATION

WORKING LOAD LIMIT

The "Working Load Limit" is the maximum load in tons which should ever be applied to chain, when the chain is new or "in as new" condition, and when the load is uniformly applied in direct tension to a straight length of chain.

PROOF TEST

The "Proof Test" is a term designating the tensile test applied to new chain for the sole purpose of detecting injurious defects in the material or manufacture. It is the load which the chain has withstood under a test in which the load has been applied in direct tension to a straight length of chain.

ANSI / ASME B30.9c-1997

Paragraph 9-1.4.2 "Mechanically assembled slings shall be comprised entirely of proof tested components." Paragraph 9-1.4.2c "If untested components are employed, the sling shall be proof tested per Para. 9-1.4.1 prior to initial use."

MINIMUM ULTIMATE LOAD

The "Minimum Ultimate Load" is the minimum load at which new chain will break when tested by applying direct tension to

a straight length of chain at a uniform rate of speed in a testing machine.

ATTACHMENTS

Any attachments, such as hooks or links, should have a rated "Working Load Limit" at least equal to the chain with which it is used.

CAUTION

Only Crosby Alloy chain, Spectrum 8[®] or Spectrum 10[®], (Grade 80 or Grade 100) should be used for overhead lifting applications.

It must be recognized that certain factors in the usage of chain and attachments can be abusive and lessen the load that the chain or attachments can withstand. Some examples are twisting of the chain; disfigurement; deterioration by straining, usage, weathering and corrosion; rapid application of load or jerking, applying excessive loads; and sharp corners cutting action.

Due to the crushing effect Grab Hooks have upon chain, the design factor of all chain assemblies must be reduced by 20% for Grab Hook applications.

CHAIN INSPECTION

INSPECTION AND REMOVAL FROM SERVICE PER ANSI B30.9

FREQUENT INSPECTION

Normal Service - Monthly
Severe Service - Daily to Monthly

Check chain and attachments for wear, nicks, cracks, breaks, gouges, stretch, bend, weld splatter, discoloration from excessive temperature, and throat openings of hooks.

- Chain links and attachments should hinge freely to adjacent links.
- Latches on hooks, if present, should hinge freely and seat properly without evidence of permanent distortion.

PERIODIC INSPECTION - INSPECTION RECORDS REQUIRED

Normal Service - Yearly
Severe Service - Monthly

This inspection shall include everything in a frequent inspection plus each link and end attachment shall be examined individually, taking care to expose inner link surfaces of the chain and chain attachments.

- Worn links should not exceed values given in table 1 or recommended by the manufacturer.
- Sharp transverse nicks and gouges should be rounded out by grinding and the depth of the grinding should not exceed values in Table 1.
- Hooks should be inspected in accordance with ANSI B30.10.
- If present, latches on hooks should seat properly, rotate freely, and show no permanent distortion.
- Chains use OSHA and ASME regulations and safety information.

See: OSHA 1926.2 (a) 4 and 1910.184
ASME B30.9 Slings
ASME B30.10 Hooks

Normal Chain or Coupling Link Cross Section		Maximum Allowable Wear Diameter (mm)
(in.)	(mm)	
—	6	.79
1/4 - 9/32	7	.94
5/16	8	1.05
3/8	10	1.32
1/2	13	1.75
5/8	16	2.13
3/4	19	2.67
7/8	22	2.95
1	25	3.48
1 1/4	32	4.29

REFER TO ANSI B30.9

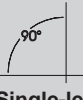
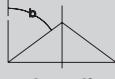

Temperature of Chain		Reduction* of Working Load Limit WHILE AT Temperature	Reduction of Working Load Limit AFTER EXPOSURE to Temperatures**
(F°)	(C°)		
Below 400	Below 204	None	None
400	204	15%	None
500	260	25%	5%
600	316	30%	15%
700	371	40%	20%
800	427	50%	25%

* Crosby does not recommend the use of Alloy Chain at temperatures above 800° F.**

** When chain is used at room temperature after being heated to temperatures shown in the first column.

Grade 100 Alloy Chain

WORKING LOAD LIMIT — 4 TO 1 DESIGN FACTOR

Nominal size of sling		 Single-leg slings	 Two leg slings		 Three and four-leg slings		Choke hitch
			$0^\circ < \beta \leq 45^\circ$	$45^\circ < \beta \leq 60^\circ$	$0^\circ < \beta \leq 45^\circ$	$45^\circ < \beta \leq 60^\circ$	
(in.)	mm	t	t	t	t	t	t
— 1/4	6 7	1.4 2	2 2.8	1.4 2	3 4.2	2.12 3	1.12 1.6
5/16 3/8	8 10	2.5 4	3.55 5.6	2.5 4	5.3 8.4	3.75 6	2.1 3.2
1/2 5/8	13 16	6.7 10	9.5 14	6.7 10	14 21.2	10 15	5.45 8.2

TO MAKE YOUR CROSBY GRADE 100 ALLOY CHAIN SLING

Follow these simple steps in making a sling assembly:

Determine the maximum load to be lifted by the sling assembly.

Choose the type of sling assembly suited for the shape of the load and the size of the sling assembly for the load to be lifted. The decision must take into account the angle of the sling legs in multileg slings.

Determine the overall reach for bearing point of master link to bearing point on hook.

Select components, assemble chain and components. Affix sling identification tag to sling. The tag is available from your Crosby Distributor. The tag should be stamped with size chain, reach, type sling, Working Load Limit at a specific angle of lift, and some identifying number for record keeping.

If measurement comes in the link, cut the following link. For two leg type count the links and use an even number for clevis hooks and an odd number for eye hooks. This will position hooks in the same plane. In multileg slings always use the same number of links in each leg.

CAUTION

Derate chain in accordance with working load limit chart shown above.

A chain grab hook application will result in 20% reduction of chain capacity. If a grab hook is used to make a choker hitch, no reduction to chain capacity is necessary.

Care should be taken to observe these derated applications or chain may fracture or permanently stretch at loads less than the advertised chain ultimate strength and proof load respectively.

Grade 100 Alloy Chain

GRADE 100 ALLOY CHAIN



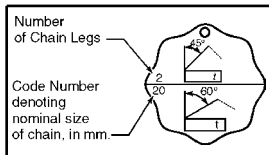
- Alloy Steel
- Heat Treated
- Finish - Self Colored.
- Permanently embossed with manufacturer's marking and 10 (Grade).

Grade 100 Chain For overhead lifting applications

Chain Size		Meters Per Drum	Dimensions (mm)	Working Load Limit (t)*	Weight Per Meter (kg)
(in.)	(mm)				
-	6	200	6 x 18	1.40	.80
1/4	7	200	7 x 21	2.00	1.05
5/16	8	200	8 x 24	2.50	1.25
3/8	10	200	10 x 30	4.00	2.20
1/2	13	100	13 x 39	6.70	3.80
5/8	16	100	16 x 48	10.0	5.70

* Proof loaded at 2-1/2 times Working Load Limit. Minimum Ultimate Load is 4 times the Working Load Limit.

SLING ID TAG



Sling ID Tag Kit

- Octagonal metal sling tag.
- Prestamped - easy to add sling length, Working Load Limit, name, etc.
- Front side is shown - reverse is blank.
- Available with or without welded attached ring.
- Attaching ring size is 5mm x 50mm.
- Available completely blank for wire rope sling applications.
- Gold painted.

ID Tag Stock No. With Ring	ID Tag Stock No. Without Ring	Application
1152445	1200829	For single leg sling 90°
1152444	1200830	For multi-leg sling : 45° / 60°

Grade 100 Chain Sling Components

“Proof Tested” Parts needed to make Self Assembled Slings

Key to Selecting Proper Components

To locate proper size Crosby chain fittings for required chain size, use the following steps.

1. Locate proper table (below) for type of sling being assembled (Single, Double, Triple or Quad Leg).
2. Determine size of chain required from the Working Load Limit table on page 181.
3. Locate proper chain size in the “Grade 100 Chain Size” column in the proper table below.
4. Follow the row across until desired style of fitting is found. The size shown indicates the proper size Crosby chain fitting to be used.



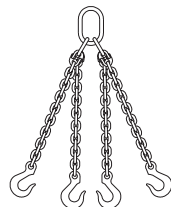
Single Leg Sling



Double Leg Sling



Triple Leg Sling



Quad Leg Sling

All grade 100 fittings shown below can also be attached to Grade 80 Chain. NOTE: This will require the slings rated capacity to be no greater than the load rating of Grade 80 chain (or the weakest component).

SINGLE LEG SLING

Grade 100 Chain Size									
(in.)	(mm)	Master Link A-1342 (in. - mm)	Master Link Assembly A-1345	Chain Coupler S-1325 (in. - mm)	SHUR-LOC® Eye Hook S-1316 (in. - mm)	SHUR-LOC® Clevis hook S-1317 (in. - mm)	Eye Sling Hook S-1320 (in. - mm)	Clevis Sling Hook A-1339 (in. - mm)	Chain Shortener S-1311 (in. - mm)
—	6	1/4-5/16-7-8	—	6	6	6	6	6	6
1/4 (9/32)	7	1/4-5/16-7-8	—	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4 - 7
5/16	8	1/4-5/16-7-8	—	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	5/16 - 8
3/8	10	3/8 - 10	—	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10
1/2	13	1/2 - 13	—	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13
5/8	16	5/8 - 16	—	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16

Chain & Accessories

DOUBLE LEG SLING

Grade 100 Chain Size		Master Link A-1342 (in. - mm)	Master Link Assembly A-1345	Chain Coupler S-1325 (in. - mm)	SHUR-LOC® Eye Hook S-1316 (in. - mm)	SHUR-LOC® Clevis hook S-1317 (in. - mm)	Eye Sling Hook S-1320 (in. - mm)	Clevis Sling Hook A-1339 (in. - mm)	Chain Shortener S-1311 (in. - mm)
(in.)	(mm)	Master Link A-1342 (in. - mm)	Master Link Assembly A-1345	Chain Coupler S-1325 (in. - mm)	SHUR-LOC® Eye Hook S-1316 (in. - mm)	SHUR-LOC® Clevis hook S-1317 (in. - mm)	Eye Sling Hook S-1320 (in. - mm)	Clevis Sling Hook A-1339 (in. - mm)	Chain Shortener S-1311 (in. - mm)
—	6	1/4-5/16-7-8	—	6	6	6	6	6	6
1/4 (9/32)	7	3/8 - 10	—	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4 - 7
5/16	8	3/8 - 10	—	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	5/16 - 8
3/8	10	1/2 - 13	—	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10
1/2	13	5/8 - 16	—	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13

TRIPLE AND QUAD LEG SLINGS

Grade 100 Chain Size		Master Link A-1342 (in. - mm)	Master Link Assembly A-1345 (in. - mm)	Chain Coupler S-1325 (in. - mm)	SHUR-LOC® Eye Hook S-1316 (in. - mm)	SHUR-LOC® Clevis hook S-1317 (in. - mm)	Eye Sling Hook S-1320 (in. - mm)	Clevis Sling Hook A-1339 (in. - mm)	Chain Shortener S-1311 (in. - mm)
(in.)	(mm)	Master Link A-1342 (in. - mm)	Master Link Assembly A-1345 (in. - mm)	Chain Coupler S-1325 (in. - mm)	SHUR-LOC® Eye Hook S-1316 (in. - mm)	SHUR-LOC® Clevis hook S-1317 (in. - mm)	Eye Sling Hook S-1320 (in. - mm)	Clevis Sling Hook A-1339 (in. - mm)	Chain Shortener S-1311 (in. - mm)
—	6	—	1/4-5/16 - 7-8	6	6	6	6	6	6
1/4 (9/32)	7	—	3/8 - 10	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4-5/16 - 7-8	1/4 - 7	1/4 - 7
5/16	8	—	3/8 - 10	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	1/4-5/16 - 7-8	5/16 - 8	5/16 - 8
3/8	10	—	1/2 - 13	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10	3/8 - 10
1/2	13	—	5/8 - 16	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13	1/2 - 13
5/8	16	—	3/4 - 20	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16	5/8 - 16

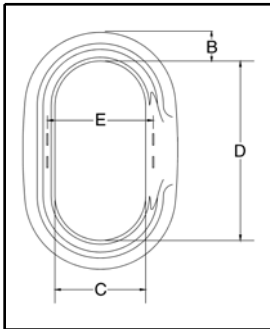
Grade 100 Alloy Master Links



A-1342



- Alloy Steel - Quenched and Tempered.
- Individually proof tested to values shown with certification.
- Proof test certification shipped with each link.
- All sizes are drop forged.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."



A-1342 Master Link

A-1342 Size		A-1342 Stock No.	Working Load Limit (t)*	Proof Load (t)	Weight Each (kg)	Dimensions (mm)			
(in.)	(mm)					B	C	D	E
1/4 - 5/16	7 - 8	1014904	2.6	5.8	.59	19.1	68.5	121	79.5
3/8	10	1014913	4.5	10.3	1.14	24.4	76.0	152	89.0
1/2	13	1014922	6.9	16.0	2.15	31.0	108	178	121
5/8	16	1014931	11.8	27.3	4.35	39.1	127	229	146
3/4	20	1014940	17.75	41.0	7.55	49.5	140	254	165

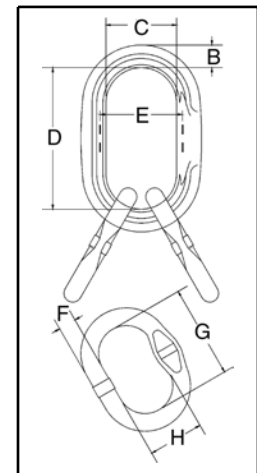
* Minimum Ultimate Load is 4 times the Working Load Limit based on single leg sling.



A-1345



- Alloy Steel - Quenched and Tempered.
- Individually proof tested to values shown with certification.
- Proof test certification shipped with each link.
- All sizes are drop forged.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."



A-1345 Master Link Assembly

A-1345 Size		A-1345 Stock No.	Grade 100 Chain Size		Working Load Limit (t)*	Proof Load (t)	Weight Each (kg)	Dimensions (mm)							
(in.)	(mm)		(in.)	(mm)				B	C	D	E	F	G	H	
1/4 - 5/16	7 - 8	1014003	-	6	3.75	8.7	1.22	19.1	68.5	121	79.5	14.2	85.0	45.0	
3/8	10	1014012	1/4 - 5/16	7 - 8	6.7	15.5	2.59	24.4	76.2	152	89.0	19.1	100	60.0	
1/2	13	1014021	3/8	10	10.4	24.0	3.90	31.0	108	178	121	25.4	160	90.0	
5/8	16	1014030	1/2	13	17.7	40.9	8.98	39.1	127	229	146	31.8	180	100	
3/4	20	1014038	5/8	16	26.6	61.5	13.9	49.5	140	254	165	35.1	205	115	

* Minimum Ultimate Load is 4 times the Working Load Limit based on single leg sling.

Crosby® Grade 100 Eye Hooks



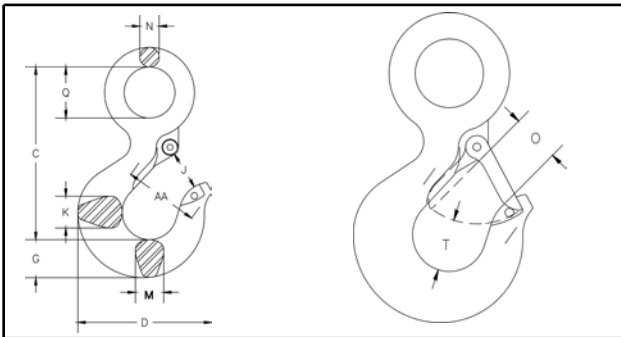
Fatigue Rated

SEE APPLICATION AND WARNING INFORMATION
On Pages 112-113

S-1320



- Each hook has a Product Identification Code (PIC) for material traceability, along with the size and the name Crosby & U.S.A. in raised letters.
- Meets ASTM A-952 standards for Grade 100 chain fittings.
- Suitable for use with Grade 100 chain in overhead lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component. Per ANSI B30.9-1.
- Forged Alloy Steel - Quenched and Tempered.
- Individually proof tested to values shown with certification.
- Proof test certification shipped with each link.
- Engineered Flat for use with S-1325A coupler link.
- **QUIC-CHECK®** Hoist hooks incorporate two types of strategically placed markings forged into the product which address two (2) **QUIC-CHECK®** features : Deformation Indicators and Angle Indicators.
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."
- Low profile hook tip.
- New integrated latch (S-4320) meets the world standard for lifting.
 - Heavy duty stamped latch interlocks with the hook tip.
 - High cycle, long life spring.
 - When secured with the proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550(g) for personnel lifting.



S-1320
Eye Hoist Hook

Grade 100 Alloy Chain Size		Working Load Limit (t)*	Hook ID Code	S-1320 Stock No.	Weight Each (kg)	Dimensions (mm)										Replacement Latch Stock No.	
(in.)	(mm)					C	D	G	J	K	M	N	O	Q	T		AA
-	6	1.4	DA	1025802	.27	85.0	72.5	18.5	22.9	16.0	406	9.15	22.6	19.1	22.1	38.1	1096325
1/4-5/16	7 - 8	2.6	GA	1025811	.65	108	91.2	25.4	25.1	22.4	568	12.7	25.4	28.7	26.2	51.0	1096421
3/8	10	4.0	HA	1025820	.93	123	101	28.7	29.2	23.9	606	14.2	27.7	32.8	29.5	51.0	1096468
1/2	13	6.8	IA	1025839	1.95	147	123	36.6	38.6	33.3	845	17.5	34.5	39.6	38.9	63.5	1096515
5/8	16	10.3	JA	1025848	3.76	187	159	46.0	44.5	42.2	1071	23.1	40.9	51.5	49.8	76.0	1096562

* Ultimate Load is 4 times the Working Load Limit.

Chain & Accessories

Crosby® Grade 100 Clevis Hooks

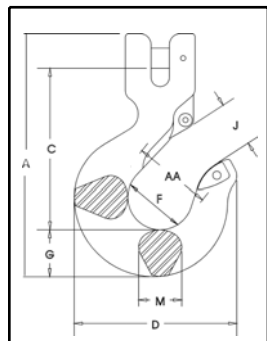


Fatigue Rated

A-1339



- Each hook has a Product Identification Code (PIC) for material traceability, along with the size and the name Crosby & U.S.A. in raised letters.
- Meets ASTM A-952 standard for Grade 100 chain fittings.
- Suitable for use with Grade 100 chain in overhead lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component. Per ANSI B30.9-1.
- Forged Alloy Steel- Quenched and Tempered.
- **QUIC-CHECK®** Hoist hooks incorporate two types of strategically placed markings forged into the product which address two (2) **QUIC-CHECK®** features : Deformation Indicators and Angle Indicators.
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."
- Individually proof tested to values shown with certification.
- New integrated latch (S-4320) meets the world standard for lifting.
 - Heavy duty stamped latch interlocks with the hook tip.
 - High cycle, long life spring.
 - When secured with the proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550(g) for personnel lifting.



A-1339 Clevis Sling Hook

Chain Size		Working Load Limit (t)*	Hook ID Code	A-1339 Stock No.	Weight Each (kg)	Dimensions (mm)					Replacement Latch Stock No.
(in.)	(mm)					C	D	G	J	AA	
-	6	1.4	DA	1048982	.27	75.0	72.5	18.5	23.6	38.1	1096325
1/4	7	1.9	HA	1048991	.43	101	98.0	26.2	30.2	51.0	1096468
5/16	8	2.6	HA	1049000	.43	101	98.0	26.2	30.2	51.0	1096468
3/8	10	4.0	JA	1049009	.97	120	111	30.2	38.9	63.5	1096515
1/2	13	6.8	JA	1049018	1.97	150	142	36.6	45.2	76.0	1096562
5/8	16	10.3	KA	1049027	3.37	177	172	47.8	61.0	102	1096609

* Ultimate Load is 4 times the Working Load Limit.

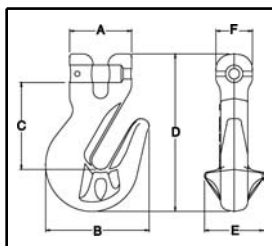


Fatigue Rated

A-1338



- Each hook has a Product Identification Code (PIC) for material traceability, along with the size and the name Crosby & U.S.A. in raised letters.
- Innovative cradle design allows for 100% efficiency of Grade 100 chain.
- Meets ASTM A-952 standard for Grade 100 chain fittings.
- Suitable for use with Grade 100 chain in overhead lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component. Per ANSI B30.9-1.
- Forged Alloy Steel- Quenched and Tempered.
- Individually proof tested to values shown with certification.
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."



A-1338 Cradle Grab Hook

Chain Size		Working Load Limit (t)*	A-1338 Stock No.	Weight Each (kg)	Dimensions (mm)					
(in.)	(mm)				A	B	C	D	E	F
1/4	7	1.9	1049417	.48	43.7	64.5	55.9	98.5	38.1	22.4
5/16	8	2.6	1049426	.48	43.7	64.5	55.4	98.5	38.1	22.4
3/8	10	4.0	1049435	.79	47.0	78.5	65.5	119	46.5	27.7
1/2	13	6.8	1049444	1.62	60.7	97.3	83.3	149	57.2	36.1
5/8	16	10.3	1049453	2.90	67.8	115	97.8	179	74.7	44.5

* Ultimate Load is 4 times the Working Load Limit.

Crosby® Grade 100 SHUR-LOC® Hooks



Fatigue Rated

SEE APPLICATION AND WARNING INFORMATION
On Pages 208-209

S-1316



- Positive Lock Latch is Self-Locking when hook is loaded.
- Meets ASTM A-952 standard for Grade 100 chain fittings.
- Forged Alloy Steel - Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times the Working Load Limit with certification.
- The SHUR-LOC® hook, if properly installed and locked, can be used for personnel lifting applications and meets the intent of OSHA Rule 1926.550 (g) (4) (iv) (B).
- Eye style is designed with "Engineered Flat" to connect to S-1325 chain coupler.
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."

S-1317

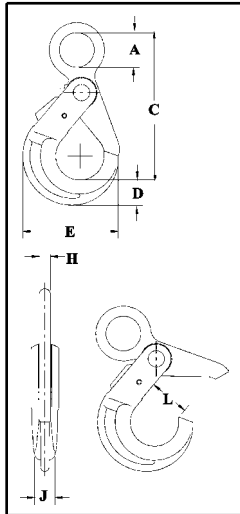


SHUR-LOC® Hook Series with Positive Locking Latch

S-1316 Eye Hook

Chain Size		Working Load Limit (t)*	S-1316 Stock No.	Weight Each (kg)	Dimensions (mm)					
(in.)	(mm)				A	C	D	E	J	L
-	6	1.4	1022896	.39	20.1	100	20.1	66.0	16.0	29.0
1/4-5/16	7-8	2.5	1022914	.82	24.9	135	27.9	89.0	20.6	37.1
3/8	10	4	1022923	1.47	33.0	167	29.7	112	23.9	47.5
1/2	13	6.7	1022932	2.70	46.0	209	42.4	138	29.5	53.5
5/8	16	10	1022941	5.78	56.0	256	52.0	167	38.1	63.0

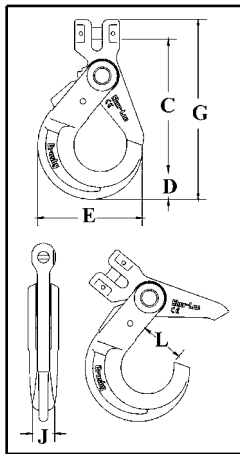
* Minimum Ultimate Load is 4 times the Working Load Limit.



S-1317 Clevis Hook

Chain Size		Working Load Limit (t)*	S-1317 Stock No.	Weight Each (kg)	Dimensions (mm)					
(in.)	(mm)				C	D	E	G	J	L
-	6	1.4	1028991	.35	87.0	20.1	66.0	121	16.0	28.7
1/4	7	2	1029000	.81	114	27.9	89.0	159	20.6	35.1
5/16	8	2.5	1029009	.81	114	27.9	89.0	159	20.6	35.1
3/8	10	4	1029018	1.45	140	29.7	112	192	24.1	44.5
1/2	13	6.7	1029027	3.06	170	42.4	138	242	29.5	53.5
5/8	16	10	1029036	5.42	208	52.0	167	295	38.1	63.0

* Minimum Ultimate Load is 4 times the Working Load Limit.



Chain & Accessories

Crosby® Grade 100 Chain Fittings

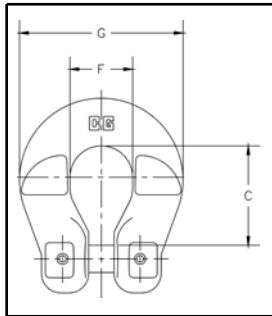


Fatigue Rated®

S-1325



- Designed to connect Grade 100 chain fittings produced with "Engineered Flat" to Grade 100 chain.
- Meets ASTM A-952 standard for Grade 100 chain fittings.
- Forged Alloy Steel- Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times the Working Load Limit with certification.
- Locking system that provides for simple assembly and disassembly - no special tools required.
- Fatigue rated to 20,000 cycles at 1.1/2 times the working load limit.
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."



S-1325 Grade 100 Chain Coupler

Chain Size		S-1325 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)		
(in.)	(mm)				C	F	G
-	6	1098496	1.4	.11	26.2	19.3	44.7
1/4	7	1098500	2	.23	35.8	22.4	59.0
5/16	8	1098504	2.5	.23	35.6	22.4	59.0
3/8	10	1098508	4	.34	46.7	30.0	69.0
1/2	13	1098512	6.7	.75	55.6	38.1	94.5
5/8	16	1098516	10	.86	71.4	49.8	112

* Minimum Ultimate Load is 4 times the Working Load Limit.

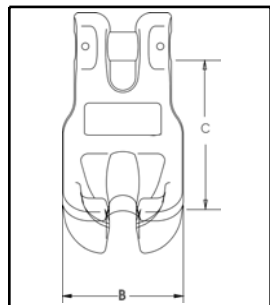


Fatigue Rated®

S-1311



- Alloy Steel - Quenched and Tempered.
- Individually Proof Tested to 2-1/2 times the Working Load Limit with certification.
- Meets ASTM A-952 standard for Grade 100 chain fittings.
- Provided with spring designed to retain chain.
- Fatigue Rated
- "Look for the Platinum Color - Crosby Grade 100 Alloy Products."



S-1311 Grade 100 Chain Shortener Link

Chain Size		S-1311 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)	
(in.)	(mm)				B	C
-	6	1017797	1.4	.34	37.1	43.7
1/4	7	1017806	2	.45	49.0	67.8
5/16	8	1017815	2.5	.45	49.0	67.8
3/8	10	1017824	4	.68	57.7	77.2
1/2	13	1017833	6.7	1.47	75.9	99.5
5/8	16	1017842	10	2.54	84.6	120

* Minimum Ultimate Load is 4 times the Working Load Limit.

Chain

ENGINEERING SPECIFICATIONS

Crosby Proof Coil — Spectrum 3 [®] Chain						
Trade Size (mm)	Size Material (mm)	Working Load Limit t	Maximum Inside Length (mm)	Minimum Inside Width (mm)	Maximum Length 100 links (mm)	Weight Per 30 Meters (kg)
5	5.50	.34	24.9	7.62	2489	17.7
7	7.00	.59	31.5	9.65	3150	29.5
8	8.00	.87	32.8	11.2	3277	45.4
10	10.0	1.21	35.1	14.0	3505	65
13	13.0	2.04	45.5	18.3	4547	113
16	16.0	3.13	55.9	20.1	5588	190
19	20.0	4.81	69.9	25.0	6985	294

SPECTRUM 3[®]

Crosby High Test — Spectrum 4 [®] Chain						
Trade Size (mm)	Size Material (mm)	Working Load Limit t	Maximum Inside Length (mm)	Minimum Inside Width (mm)	Maximum Length 100 links (mm)	Weight Per 30 Meters (kg)
7	7.00	1.18	31.5	9.65	3150	31.8
8	8.00	1.77	32.8	11.2	3277	48.1
10	10.0	2.45	35.1	14.0	3505	70
11	11.9	3.27	35.6	16.5	3560	93
13	13.0	4.18	45.5	18.3	4547	121
16	16.0	5.22	55.9	20.1	5588	182
19	20.0	7.35	70.1	24.9	7010	257

SPECTRUM 4[®]

Chain & Accessories

Crosby Transport — Spectrum 7 [®] Chain						
Trade Size (mm)	Size Material (mm)	Working Load Limit t	Maximum Inside Length (mm)	Minimum Inside Width (mm)	Maximum Length 100 links (mm)	Weight Per 30 Meters (kg)
7	7.00	1.44	31.5	9.65	3150	36.7
8	8.70	2.14	33.5	12.2	3353	44.5
10	10.0	3.00	35.1	14.0	3505	64
11	11.9	3.98	41.7	16.5	4166	98
13	13.0	5.13	45.5	18.3	4547	112

SPECTRUM 7[®]

Crosby Alloy — Spectrum 8 [®] Chain						
Trade Size (mm)	Size Material (mm)	Working Load Limit t	Maximum Inside Length (mm)	Minimum Inside Width (mm)	Maximum Length 100 links (mm)	Weight Per 30 Meters (kg)
7	7.00	1.59	22.9	8.64	2286	32.7
8	8.70	2.04	25.4	12.2	2540	49.0
10	10.0	3.22	31.8	12.5	3175	67
13	13.0	5.45	41.7	16.3	4166	110
16	16.0	8.21	51.3	20.1	5131	159
19	20.0	12.84	64.0	24.9	6401	265
22	22.0	15.51	70.4	27.4	7036	320

SPECTRUM 8[®]

Proof Coil Chain

SPECTRUM 3® DRUM



- Carbon Steel.
- Standard Container - fiber drum.
- Finish - Self colored and galvanized.
- Minimum Ultimate load is 4 times the Working Load Limit.
- Permanently embossed with CG®(Crosby Group) and 3 (Grade).

SPECTRUM 3® Proof Coil Chain

Chain Size (mm)	Working Load Limit (t)	Meters Per Drum	Weight Per 30 m (kg)	Drum Stock No. S.C.	Drum Stock No. Galv.
5	.36	244	17.7	275151	276150
6	.59	244	29.5	275259	276258
8	.86	168	45.4	275357	276356
10	1.20	122	65.5	275455	276454
13	2.04	61	113	275552	276551
16	3.13	46	191	275650	276659
19	4.81	30	294	275758	276757

* Proof Loaded at 2 times the Working Load Limit.

SPECTRUM 3® PAIL



Proof Coil Chain - SPECTRUM 3® 100 Pound Pail

Chain Size (mm)	Weight Per Pail (kg)	Meters Per Pail	Stock No. S.C.	Stock No. Galv.
5	44.5	76	275115	276114
6	41.7	43	275213	276212
8	41.3	28	275311	276310
10	41.3	19	275419	276418

* Spectrum 3® Proof Coil Chain is not recommended for overhead lifting. For these applications, Spectrum 8® or grade 80 alloy chain should be used. See page 162.

High Test Chain

SPECTRUM 4® DRUM



- Carbon Steel.
- Standard Container - fiber drum.
- Finish - Self Colored.
- Minimum Ultimate load is 3 times the Working Load Limit.
- Permanently embossed with CG® (Crosby Group) and 4 (Grade).

SPECTRUM 4® High Test Chain

Chain Size (mm)	Working Load Limit (t)	Meters Per Drum	Weight Per 30 m (kg)	Drum Stock No. S.C.	1/2 Drum Stock No. S.C.
6	1.18	244	31.8	272788	272895
8	1.77	168	48.1	272797	272902
10	2.45	122	69.9	272804	272911
11	3.27	91	94.8	272813	272920
13	4.17	61	121	272822	272939
16	5.21	46	182	272831	272948
19	9.16	30	257	272840	272957

SPECTRUM 4® PAIL



High Test Chain - SPECTRUM 4® 100 Pound Pail

Chain Size (mm)*	Weight Per Pail (kg)	Meters Per Pail	Stock No. S.C.
6	42.2	41	273000
8	43.1	27	273019
10	44.5	20	273028

* Spectrum 4® High Test Chain is not recommended for overhead lifting. For these applications, Spectrum 8® or grade 80 Alloy chain should be used. See page 162.

Transport Chain

SPECTRUM 7® DRUM



- High Tensile Carbon Steel.
- Standard container - fiber drum.
- Finish - Self Colored.
- Minimum Ultimate load is 4 times the Working Load Limit.
- Permanently embossed with CG®(Crosby Group) and 7 (Grade).

SPECTRUM 7® High Tensile Transport Chain

Chain Size (mm)	Working Load Limit (t)*	Meters Per Drum	Weight Per 30 m (kg)	Drum Stock No. S.C.	1/2 Drum Stock No. S.C.
6	1.43	244	36.7	273153	273260
8	2.13	168	44.5	273162	273279
10	3.00	122	64.0	273171	273288
11	3.97	91	98.0	273180	273297
13	5.13	61	112	273199	273304

* Proof Loaded at 2 times the Working Load Limit.

SPECTRUM 7® PAIL



High Tensile Transport Chain - SPECTRUM 7® 100 Pound Pail

Chain Size (mm)*	Weight Per Pail (kg)	Meters Per Pail	Stock No. S.C.
6	49.4	41	273377
8	39.9	27	273386
10	44.5	20	273395

*

Spectrum 7® High Tensile Transport chain is not recommended for overhead lifting. For these applications, Spectrum 8® or grade 80 alloy chain should be used. See page 162.

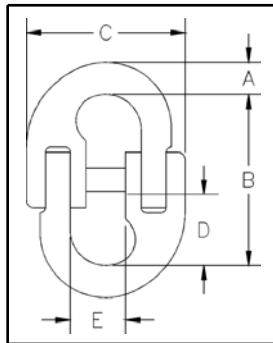
Crosby® Connecting Links



A-336



- Forged Alloy Steel - Quenched and Tempered.
- Individually Proof Tested.
- Easy to assemble - see instructions on page 210



LOK-A-LOY® 6 Connecting Link

Chain Size (in.)	A-336 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)					Diameter of Hole to Accept Link
				A	B	C	D	E	
6-7	1014397	1.47	.11	7.85	52.5	42.9	19.8	19.8	12.7
8-10	1014413	3.00	.27	11.4	69.0	58.5	26.9	27.7	16.8
13	1014431	5.10	.54	14.7	85.0	80.5	32.5	35.8	22.4
16	1014459	7.48	1.10	19.8	99.5	100	39.6	42.9	26.9
19	1014477	11.20	1.76	22.6	123	113	50.0	51.0	30.2
22	1014495	13.04	2.75	25.4	148	135	60.5	64.0	35.1
26	1014510	17.58	3.19	27.4	165	154	72.0	65.0	37.3
32	1014538	26.00	6.00	35.1	215	194	96.0	96.0	44.0

* Ultimate Load is 4 times the Working Load Limit.

The WLL of the A-336 are less than Grade 80 chain ratings. When using in Grade 80 chain slings, ANSI B30.9c requires that the Working Load Limit of a sling must not exceed the lowest Working Load Limit of the components in the system.

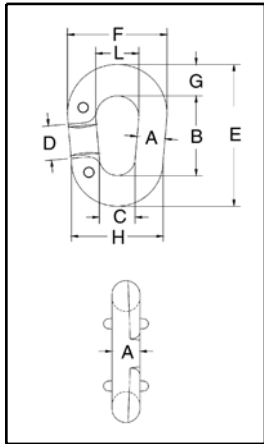
Crosby® Connecting Links



G-334 / S-334



- Forged Steel - Quenched and Tempered.
- Has larger inside dimensions making it easier to attach hooks or other fittings to the chain.
- An exclusive Crosby product.
- After making connections, rivets must be peened.



Pear Shape "Missing Link"® Replacement Links

Chain Size (mm)	Stock No.		Working Load Limit (t)*	Weight Per 100 (kg)	Dimensions (mm)								
	G-334 Galv.	S-334 S.C.			A	B	C	D	E	F	G	H	L
10	1013432	1013441	.84	11.3	10.4	51.0	14.2	20.6	74.5	41.4	11.9	35.1	20.6
13	1013450	1013469	1.50	22.7	12.7	63.5	17.5	25.4	92.0	51.0	14.2	42.9	25.4
16	1013478	1013487	2.27	34.0	16.0	70.0	20.6	26.9	102	60.5	16.0	52.5	28.7
19	1013496	1013502	3.22	56.7	19.1	79.5	25.4	28.7	121	70.0	20.6	63.5	31.8
22	1013511	1013520	4.35	90.7	22.4	93.5	31.8	35.1	141	82.5	23.9	76.0	38.1

* Ultimate Load is 4 times the Working Load Limit.

Not Suitable for use with Grade 80 chain and chain slings used in overhead lifting.

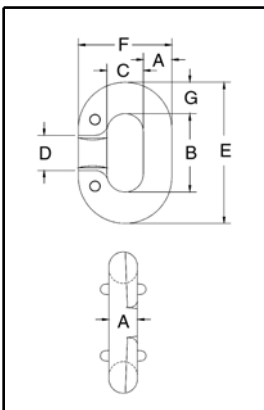


G-335 / S-335



- Forged Steel - Quenched and Tempered.
- Integral rivets join the two halves.
- After making connections, rivets must be peened.

Meets or exceeds the performance requirements of Federal Specifications RRC-271D, Type II, except for those provisions required of the contractor.



"Missing Link"® Replacement Links

Chain Size (mm)	Stock No.		Working Load Limit (t)*	Links Per Box	Weight Per 100 (kg)	Dimensions (mm)						
	G-335 Galv.	S-335 S.C.				A	B	C	D	E	F	G
**5	1013094	1013101	.36	20	1.13	6.35	17.5	8.65	8.65	30.2	19.8	7.10
**7	1013110	1013129	.60	10	2.83	7.10	22.4	11.2	11.2	38.1	25.4	7.85
**8	1013138	1013147	.89	10	5.67	8.65	23.9	11.9	11.9	42.9	29.5	9.65
10	1013156	1013165	1.25	10	9.07	10.4	28.7	14.2	14.2	52.5	35.1	11.9
11	1013174	1013183	1.65	10	12.5	11.9	32.5	15.0	15.0	59.5	38.9	13.5
13	1013192	1013209	2.15	10	17.0	13.5	37.3	16.8	16.8	67.5	43.7	15.0
16	1013236	1013245	3.30	10	32.9	16.8	46.0	19.8	20.6	84.0	53.0	19.1
19	1013254	1013263	4.65	10	55.5	19.8	54.0	23.9	26.9	98.5	63.5	22.4
22	1013272	1013281	5.45	Bulk	79.5	23.1	63.5	28.7	28.7	114	74.5	25.4
† 26	1013290	1013307	7.00	Bulk	113	26.2	70.0	31.8	31.8	127	84.0	28.7

* Ultimate Load is 4 times the Working Load Limit.

** Rivets Only - No interlocking lugs.

† Has reinforced rivet holes. All sizes have countersunk rivet holes.

Not Suitable for use with Grade 80 chain and chain slings used in overhead lifting.

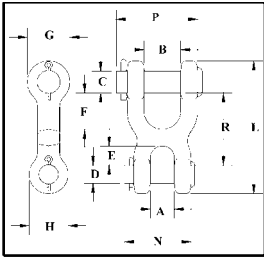
Crosby® Connecting Links



S-247



- Designed for linking all popular sizes of Crosby Spectrum 3® and Spectrum 4® chain to rings, end links, eye hooks, pad eyes, tractor eyebolts, etc.
- All pins Alloy Steel - Quenched and Tempered.
- Body is forged and heat treated carbon steel.
- Features quick and easy assembly.



S-247 Double Clevis Link

Chain Size (mm)	S-247 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)											
				A	B	C	D	E	F	G	H	L	N	P	R
7	1013021	1.18	.17	12.7	19.1	12.7	7.85	9.65	19.1	25.4	20.6	71.5	35.1	42.2	38.1
8-10	1013049	2.45	.37	14.2	25.4	16.0	11.2	11.9	25.4	30.2	25.4	89.5	44.5	57.0	48.5
11	1013067	3.27	.57	17.5	28.7	17.5	14.2	15.0	27.7	33.3	30.2	103	51.0	63.5	55.5
13	1013085	4.17	.71	20.6	31.8	19.1	16.0	16.8	31.8	36.6	33.3	115	57.0	70.0	62.5

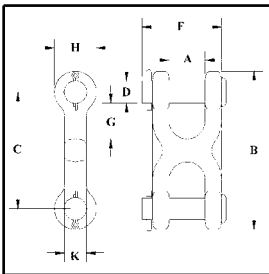
* Ultimate Load is 4 times the Working Load Limit.



S-249



- Available in three popular sizes.
- Body is forged and heat treated carbon steel.
- All pins Alloy Steel - Quenched and Tempered.
- Features quick and easy assembly.
- Twin Clevis design provides a variety of uses and can be used with Crosby Spectrum 3®, Spectrum 4® and Spectrum 7® chain.



S-249 Twin Clevis Link

Chain Size (mm)	S-249 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							
				A	B	C	D	F	G	H	K
7-8	1012861	2.13	.14	11.9	63.5	39.6	9.65	33.3	10.9	23.9	12.7
10	1012889	3.00	.20	13.5	71.5	46.0	11.2	38.9	12.7	25.4	14.2
11-13	1012905	5.10	.44	16.5	92.0	58.5	14.2	48.5	16.0	33.3	20.6

* Ultimate Load is 4 times the Working Load Limit.

Not Suitable for use with Grade 80 chain and chain slings used in overhead lifting.

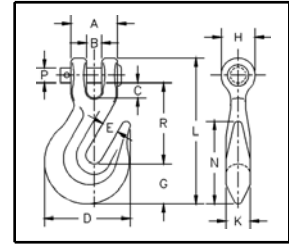
Crosby® Grab Hooks



H-330 / A-330



- Forged Steel - Quenched and Tempered.
- Features quick and easy assembly.
- H-330 designed for Crosby Spectrum 4® chain.
- A-330 designed for Crosby Spectrum 7® chain.
- Design factor is 4:1.



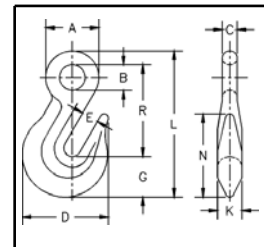
Chain Size (mm)	Stock No.		Working Load Limit (t)		Weight Each (kg)	Dimensions (mm)											
	H-330 Carbon	A-330 Alloy*	H-330 Carbon	A-330 Alloy		A	B	C	D	E	G	H	K	L	N	P	R
7	1027105	1027249*	1.18	1.59	.16	25.4	8.15	7.85	46.0	8.65	22.4	18.3	11.9	77.5	44.5	7.85	41.7
8	1027123	1027267*	1.77	2.04	.29	30.2	9.90	9.15	54.0	11.2	24.6	23.1	15.0	93.0	52.5	9.65	61.5
10	1027141	1027285*	2.45	3.22	.45	35.1	11.4	11.4	64.5	12.7	29.7	25.4	18.3	109	59.5	11.2	61.0
11	1027169	1027301	3.27	4.54	.59	42.2	16.8	15.7	78.5	14.2	33.3	28.7	17.5	125	67.5	14.2	70.0
13	1027187	1027329*	4.17	5.44	.95	47.8	14.5	17.8	90.5	16.8	38.9	31.8	19.8	145	75.5	16.0	81.0
16	1027203	1027347	5.90	7.16	1.91	58.0	23.1	21.3	112	19.8	45.2	39.6	27.7	179	109	19.1	104
19	1027221	1027365	9.16	11.2	2.95	66.5	23.9	23.9	133	23.9	54.0	47.8	33.3	207	129	22.4	118

* Is suitable for use with Grade 80 chain in over head lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component per ANSI B30.9c. We recommend the use of the A-338.

H-323 / A-323



- Forged Steel - Quenched and Tempered.
- Design Factor is 4:1.
- H-323 designed for Crosby Spectrum 4® chain.
- A-323 designed for Crosby Spectrum 7® chain.



H-323 A-323 Eye Grab Hooks

Chain Size (mm)	Stock No.		Working Load Limit (t)*		Weight Each (kg)	Dimensions (mm)										
	H-323 Carbon	A-323 Alloy	H-323	A-323		A	B	C	D	E	G	K	L	N	R	
7	1026204	1026384*	1.18	1.59	.13	27.7	13.5	7.85	46.0	8.65	22.4	11.9	77.5	44.5	47.8	
8	1026222	1026400*	1.77	2.04	.20	33.3	15.7	9.65	54.0	11.2	24.6	15.0	91.0	52.5	58.0	
10	1026240	1026428*	2.45	3.22	.36	39.6	19.1	11.2	64.5	12.7	29.7	18.3	109	59.5	68.5	
13	1026286	1026464*	4.17	5.44	.79	49.3	22.4	13.5	90.5	16.8	38.9	19.8	138	75.5	86.0	
16	1026302	1026482	5.90	7.16	1.47	60.5	26.9	16.8	112	19.8	48.0	25.4	169	96.0	104	
19	1026320	1026507	9.16	11.2	2.69	73.0	35.1	19.1	133	23.9	54.0	33.3	205	129	131	

* Is suitable for use with Grade 80 chain in over head lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component per ANSI B30.9c. Crosby recommends the use of the A-328.

BL-GRB



Bullard Alloy Grab Hook with Latch

Hook Type	Chain Size (mm)	BL-GRB Stock No.	Working Load Limit (t)*	Weight Each (kg)
GRAB HOOK	7	1051904	1.60	.23

* Ultimate Load is 4 times the Working Load Limit.

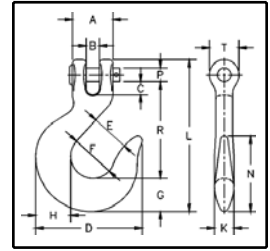
Crosby® Slip Hooks



H-331 / A-331



- Forged Carbon Steel or Forged Alloy Steel - Quenched and Tempered.
- All pins are Alloy Steel - Quenched and Tempered.
- **Not Suitable for use with Grade 80 chain and chain slings used in overhead lifting. For slings or lifting chains, Grade 80 or 100 alloy components are recommended.**



H-331 / A-331 Clevis Slip Hooks

Chain Size (mm)	Stock No.		Working Load Limit (t)*		Weight Each (kg)	Dimensions (mm)													
	H-331 Carbon	A-331 Alloy	H-331 Carbon	A-331 Alloy		A	B	C	D	E	F	G	H	K	L	N	P	R	T
7	1027383	1027524	.89	1.25	.25	26.9	8.15	7.35	70.0	23.9	30.2	20.6	22.4	12.7	100	54.0	8.65	65.5	18.3
8	1027409	1027542	1.30	1.95	.36	31.0	10.9	8.65	77.5	26.9	31.8	23.9	25.4	14.2	115	57.0	11.2	73.0	24.6
10	1027427	1027560	1.81	2.38	.55	35.1	11.4	11.2	92.0	33.3	38.1	28.7	30.2	16.8	131	65.0	11.9	82.5	26.9
11	1027445	1027588	2.27	3.18	.93	43.9	15.0	15.2	110	39.6	46.0	35.1	36.6	20.6	152	77.5	14.2	94.0	30.2
13	1027463	1027604	2.95	4.08	1.25	47.8	14.5	13.5	122	42.9	49.3	39.6	41.4	23.1	166	87.5	16.0	102	33.3
16	1027481	1027622	4.20	6.12	2.15	58.5	18.0	18.0	143	51.0	60.5	46.0	49.3	27.7	200	102	19.1	125	39.6
19	-	1027640	-	8.73	5.12	81.0	30.0	32.8	187	63.5	76.2	60.5	63.5	36.6	255	129	25.4	155	53.0

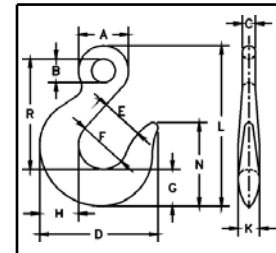
* Ultimate Load is 4 times the Working Load Limit.



H-324



- Forged Carbon Steel - Quenched and Tempered.



H-324 Eye Slip Hooks

Chain Size (mm)	H-324 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)											
				A	B	C	D	E	F	G	H	K	L	N	R
7	1026749	.89	.18	26.9	12.7	7.10	70.0	23.9	30.2	20.6	22.4	12.7	93.0	54.0	65.0
8	1026767	1.30	.29	31.8	16.0	8.65	77.5	26.9	31.8	23.9	25.4	14.2	107	57.0	75.0
10	1026785	1.81	.50	38.9	18.3	10.4	92.0	33.3	38.1	28.7	30.2	16.8	124	65.0	85.5
11	1026801	2.27	.71	42.9	20.6	11.2	110.2	39.6	46.0	35.1	36.6	20.6	145	77.5	98.5
13	1026829	2.95	.95	49.3	23.9	12.7	122.2	42.9	49.3	39.6	41.4	23.1	161	87.5	109
16	1026847	4.20	1.77	60.5	28.7	16.0	143.0	51.0	60.5	46.0	49.3	27.7	195	102	133
19	1026865	5.67	3.14	73.0	35.1	19.1	171.5	54.0	70.0	55.5	58.5	33.3	222	121	147


* Ultimate Load is 4 times the Working Load Limit.

Not Suitable for use with Grade 80 chain and chain slings used in overhead lifting. For slings or lifting chains, Grade 80 or 100 alloy components are recommended.

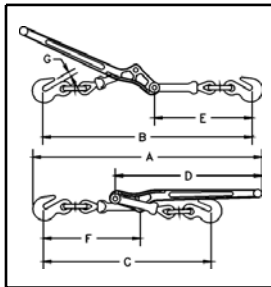
Lebus® Load Binders



Load Rated™


SEE APPLICATION AND WARNING INFORMATION
On Page 207

L-150



L-150

Standard Lever Type Load Binders

- Extra heavy construction at leverage point to prevent spreading. Heel of binder toggles away from load, permitting easy release.
- Ball and socket swivel joints at hook assemblies permit a straight line pull.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Model	Stock No.	Std. Pkg.	Min-Max Chain Size (mm)	Working Load Limit (t)	Proof Load (kN)*	Ultimate Load (t)	Weight Each (kg)	Handle Length (mm)	Take Up (mm)	Dimensions (mm)						
										A	B	C	D	E	F	G
7-1	1048128	4	8 - 10	2.45	48	8.63	3.18	406	114	613	562	454	406	264	264	127
A-1	1048146	4	10 - 13	4.17	82	15.0	5.66	475	114	730	654	540	475	313	314	16.0
C-1	1048164	4	13 - 16	5.90	116	20.9	8.93	533	121	794	756	635	533	372	349	18.3

* Binders shown with Proof Loads have been individually proof tested to these values shown, prior to shipment.

Lebus® Load Binders

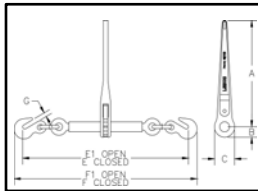
Load Rated

SEE APPLICATION AND WARNING INFORMATION
On Page 207

L-140



- Utilizes standard Crosby A-323 Alloy Eye Grab Hooks.
- New design "one piece" forged handle.
- Continuous take-up feature, infinite adjustment, gets the last half link of chain.
- One piece assembly, no bolts or nuts to loosen.
- Ratchet spring rust proofed.
- All load bearing or holding parts forged.
- Easy operating positive ratchet.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.



L-140 Standard Ratchet Type Load Binders

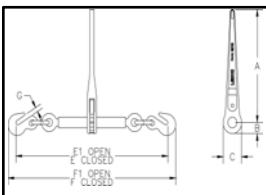
Model	Stock No.	Min-Max Chain Size (mm)	Working Load Limit (t)*	Proof Load (kN)	Weight Each (kg)	Handle Length (mm)	Barrel Length (mm)	Take Up (mm)	Dimensions (mm)							
									A	B	C	E	E1	F	F1	G
R-7	1048404	8 - 10	3.00	59	5.09	356	254	203	356	35.1	70.0	583	786	638	842	12.7
R-A	1048422	10 - 13	4.17	82	5.82	356	254	203	356	35.1	70.0	641	845	702	905	16.0
R-C	1048440	13 - 16	5.90	116	6.60	356	254	203	356	35.1	70.0	670	873	748	951	18.3

* Ultimate Load is 3 times the Working Load Limit.

L-140/R-7QL



- Utilizes standard Crosby A-323 Alloy Eye Grab Hooks.
- New design "one piece" forged handle.
- Continuous take-up feature, infinite adjustment, gets the last half of chain.
- One piece assembly, no bolts or nuts to loosen.
- Ratch spring rust proofed.
- All load bearings or holding parts forged.
- Easy operating positive ratchet.



R-7QL QUIC-LINK Ratchet Load Binder

Model	R-7QL Stock No.	Min-Max Chain Size (mm)	Working Load Limit (t)*	Proof Load (kN)	Weight Each (kg)	Handle Length (mm)	Barrel Length (mm)	Take Up (mm)	Dimensions (mm)							
									A	B	C	E	E1	F	F1	G
R-7QL	1048413	8 - 10	3.00	59	5.56	356	254	203	356	35.1	70.0	630	833	686	889	12.7

* Ultimate Load is 3 times the Working Load Limit.

Binders shown with proof loads have been individually proof tested to these values shown, prior to shipment.

Lebus® Load Binders



Load Rated



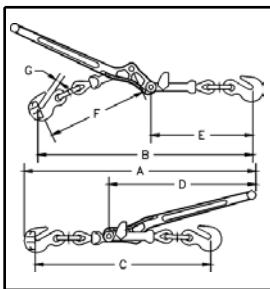
SEE APPLICATION AND WARNING INFORMATION

On Page 207

L-150 A-1W



- Used as a come-a-long for short take-up on chain.
- Forged steel - Quenched and Tempered.
- Binder toggles away from the load.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

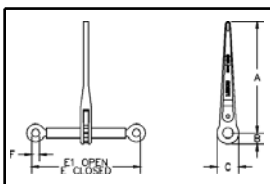


A-1W Walking Load Binder

Model	Stock No.	Chain Size (mm)	Working Load Limit (t)	Proof Load (kN) *	Ultimate Load (t)	Weight Each (kg)	Handle Length (mm)	Dimensions (mm)						
								A	B	C	D	E	F	G
A-1W	1048388	13 only	4.17	82	15.0	5.94	475	730	654	540	475	313	314	16.0

* Binders shown with proof loads have been individually proof tested to these values shown, prior to shipment.

L-140 R-10



R-10 Binder without Links and Hooks

- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Model	R-10 Stock No.	Chain Size (mm)	Working Load Limit (t) *	Weight Each (kg)	Handle Length (mm)	Barrel Length (mm)	Take Up (mm)	Dimensions (mm)					
								A	B	C	E	E1	F
R-10	1048468	16	5.90	3.65	356	254	203	356	35.1	70.0	356	559	25.4

* Ultimate Load is 3 times the Working Load Limit.

Lebus® Load Binders



Load Rated

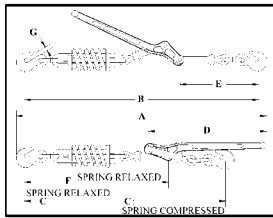
SEE APPLICATION AND WARNING INFORMATION
On Page 207

7-12 & A-12



- Forged steel - Quenched and Tempered.
- Spring cushion for load protection, cushions shock and sway.
- Binder toggles away from the load.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

L-150 Snubbing Load Binders



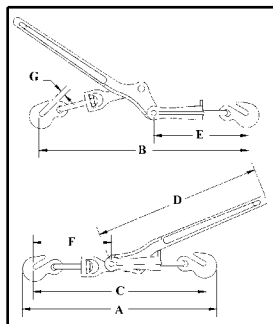
Model	Stock No.	Min-Max Chain Size (mm)	Working Load Limit (t)	Ultimate Load (t)	Weight Each (kg)	Handle Length (mm)	Take Up (mm)	Compression Strength of Spring (kg)	Dimensions (mm)							
									A	B	C	C1	D	E	F	G
7-12	1048280	8 - 10	2.45	7.27	5.10	406	108	1040	832	781	711	673	406	264	483	12.7
A-12	1048306	10 - 13	4.17	9.09	8.48	470	114	1500	945	864	749	773	475	313	530	16.0

L-130



L-130 Midget Load Binder

- Forged handle, hooks and swivel link.
- Steel swivels and clevis.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.



Model	L-130 Stock No.	Min-Max Chain Size (mm)	Working Load Limit (t)	Ultimate Load (t)	Weight Each (kg)	Take Up (mm)	Dimensions (mm)						
							A	B	C	D	E	F	G
W-1	1048100	5 - 6	.66	2.31	1.17	61.0	410	346	279	286	159	167	8.65

Chain & Accessories

Boomer Chains

C-186



C-186

Spectrum 4® High Test Boomer Chains

- Ends fitted with Crosby H-330 Quenched and Tempered carbon steel clevis grab hook.
- Finish - Self Colored.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Chain Size (mm)	C-186 Stock No.	Working Load Limit (kg)	Standard Length (m)	Weight Each (kg)
6	278988	1180	6.10	7.3
8	278997	1770	6.10	11.3
10	279004	2450	6.10	15.4
11	279013	3270	6.10	20.4
13	279022	4170	6.10	27.2
16	279031	5900	6.10	40.8

C-187



C-187

Spectrum 7® Transport Boomer Chains

- Ends fitted with Crosby A-330 Quenched and Tempered alloy clevis grab hook.
- Finish - Self Colored.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Chain Size (mm)	C-187 Stock No.	Working Load Limit (kg)	Standard Length (m)	Weight Each (kg)
6	279576	1430	6.10	7.3
8	279585	2130	6.10	11.3
10	279594	3000	6.10	15.4
11	279601	3970	6.10	20.4
13	279610	5130	6.10	27.2

Boomer Chains and Fittings

C-188



C-188 Spectrum 8® Alloy Boomer Chains

- Heat treated alloy steel.
- Ends fitted with Crosby A-330 Quenched and Tempered alloy clevis grab hook.
- Finish - Self Colored.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Chain Size (mm)	C-188 Stock No.	Working Load Limit (kg)	Standard Length (m)	Weight Each (kg)
10	279889	3200	6.10	13.7
13	279898	5400	6.10	24.5

L-180



L-180 Winchline Tail Chains

- Hooks are Forged - Quenched and Tempered.
- Spectrum 4® High Test Carbon Steel from 5/16" thru 5/8" (8mm thru 16mm).
- Spectrum 8® Alloy Steel from 3/4" thru 1-1/8" (19mm thru 29mm).
- Individually Proof Tested.
- Meets or exceeds DOT and CVSA Cargo securement Guidelines, August 1993.

Wire Rope Diameter (mm)*	L-180 Stock No.	Working Load Limit (kg) †	Length (mm)	No. of Links	Weight Each (kg)
8 - 10	1091473	2450	457	11	1.36
13 - 16	1091482	5900	457	7	2.81
19 - 22	1091511	15510	610	8	8.25
25 - 29	1091516	21640	457	5	9.60
25 - 29	1091525	21640	610	7	10.6

* Recommended for IPS or XIP (EIP), RRL, FC or IWRC wire rope.

† Ultimate lload is 3.5 times the Working Load Limit.

Boomer Chains and Fittings



SEE APPLICATION AND WARNING INFORMATION

For O-318 : Pages 208-209

For O-319 : Pages 112-113

O-318

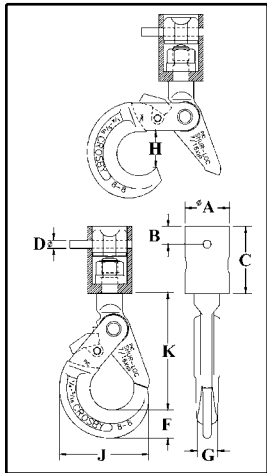


- A product Identification Code (PIC) for material traceability, the size, and the name Crosby or "CG" is forged or stamped onto each hook and swivel assembly (chain nest).
- Fits 1/4" thru 9/16" (6mm thru 14mm) hoist chain.
- Available in Working Load Limits of 1.7, 2.3, and 4.2 Tons (1.5, 2.1, 3.8 tonnes).
- Hooks are forged alloy steel - Quenched and Tempered.
- Chain connecting pin is alloy
- Fitted with ball bearings and is designed to swivel under load.
- Entire assembly is zinc plated.
- Repair kit available consisting of bearing, nut and pin.
- O-318 Hooks utilize Crosby SHUR-LOC® "Positive Locking" hooks. Latch is Self-Locking when hook is loaded.
- O-319 Hooks utilize Crosby standard 319 Shanks Hooks with the registered QUIC-CHECK® marking.
- Replacement latch kits are available. Replacement Hooks for Chain Hoists

O-319



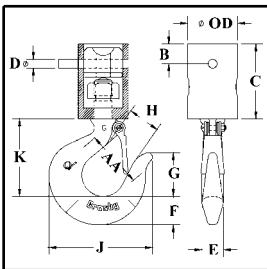
O-318 Chain Nest Hooks



Chain Size (mm)	O-318 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)								
				A	B	C	D	F	G	H	J	K
6 - 7	1098409	1.5	1.59	44.5	17.8	66.5	9.65	27.9	20.6	37.1	89.0	117
8 - 10	1098427	2.1	2.72	54.0	17.8	81.0	12.7	29.2	23.9	47.5	110	144
10 - 11	1098445	3.8	6.24	76.0	25.4	111	14.2	42.2	29.5	53.5	138	179
13 - 14	1098463	3.8	6.24	76.0	25.4	111	19.1	42.2	29.5	53.5	138	179

* Ultimate Load is 4 times the Working Load Limit.

O-319 Chain Nest Hooks



Chain Size (mm)	O-319 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)										
				OD	AA	B	C	D	E	F	G	H	J	K
6 - 7	1098312	1.5	1.16	44.5	51.0	17.8	66.5	9.65	19.1	25.4	38.9	25.4	92.0	68.5
8 - 10	1098334	2.1	1.81	54.0	51.0	17.8	81.0	12.7	21.3	28.4	43.7	28.4	104	77.5
10 - 11	1098356	3.8	4.54	76.0	63.5	25.4	111	14.2	28.4	36.6	54.0	34.0	123	96.0
13 - 14	1098378	3.8	4.54	76.0	63.5	25.4	111	19.1	28.4	36.6	54.0	34.0	123	96.0

* Ultimate Load is 4 times the Working Load Limit.

Replacement Hooks for Chain Hoists



SEE APPLICATION AND WARNING INFORMATION
On Pages 114-115

LINK CHAIN NEST



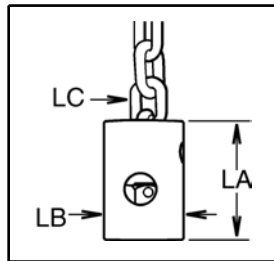
- A Product Identification Code (PIC) for material traceability, the size, and the name Crosby or "CG" is forged or stamped onto each hook and swivel assembly (chain nest).
- Fits 1/4" thru 9/16" (6mm thru 14mm) hoist chain.
- Available in Working Load Limits of 1.7, 2.3, and 4.2 Tons (1.5, 2.1, 3.8 tonnes).
- Hooks are forged alloy steel - Quenched and Tempered.
- Hooks utilize Crosby standard 319 Shank Hooks with the registered QUIC-CHECK® marking (See page 84 for details).

ROLLER CHAIN NEST



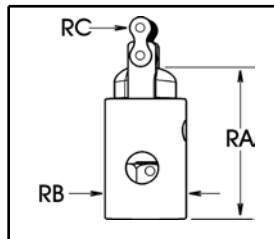
BL-S --with self-closing gate.
BL-R--with manual-closing gate.
Attachment with ball-bearing swivel and full-floating connector.

BL-O--with self-closing gate
BL-P --with manual-closing gate
With ball-bearing swivel; attaches to chain by alloy pin.



Hook Size	BL-O Stock No.	BL-P Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)		
						LA	LB	LC
4:1/4-9/32	1051409	1051508	PIN-LOK	1.5	1.13	66.8	44.5	6 - 7
5:5/16-3/8	1051442	1051541	ROLLOX	2.1	2.04	81.0	54.1	8 - 10
7:3/8-7/16	1051464	1051563	ROLLOX	3.8	5.00	111	76.2	10 - 14
7:1/2-9/16	1051486	1051585	ROLLOX	3.8	5.00	111	76.2	10 - 14

* Ultimate Load is 4 times the Working Load Limit.



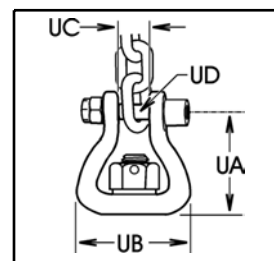
Hook Size	BL-S Stock No.	BL-R Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)		
						RA	RB	RC
4 :# 50	1051310	1051200	PIN-LOK	0.68	1.32	88.9	44.5	16
5 :# 60	1051321	1051211	ROLLOX	1.13	2.36	111	54.1	19
6 :# 60	1051332	1051222	ROLLOX	1.13	2.81	111	52.3	19

* Ultimate Load is 4 times the Working Load Limit.

OPEN SWIVEL BAIL



- BL-E --with self-closing gate.
- BL-G --with manual-closing gate.
- Open swivel bail for attachment to link chain.



Hook Size	BL-E Stock No.	BL-G Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)			
						UA	UB	UC	UD
3	1051607	1051706	PIN-LOK	1.3	.82	54.1	59.7	13.5	10
4	1051618	1051717	PIN-LOK	1.5	.95	54.1	59.7	13.5	10
5	1051629	1051728	ROLLOX	2.1	1.45	66.8	66.8	16.5	13

* Ultimate Load is 4 times the Working Load Limit.

Job Tough® Hoists / Trolleys



JT-2000 HAND HOIST



JOB TOUGH® HOISTS

- Tough, durable protective covers.
- Load chain is zinc plated alloy steel.
- A factory installed Overload Limiting Device.
- Top and bottom hooks are genuine Crosby, forged steel - Quenched & Tempered.
- Each hook is protected with a yellow chromate finish that increases corrosion resistance.
- Hooks incorporate Crosby's patented QUIC-CHECK® markings. Deformation Indicators and Angle Indicators are forged into each hook.
- A variety of "Genuine" Crosby replacement hooks are available.
- All hooks furnished with a heavy duty stamped latch that interlocks with hook tip. Latch utilizes high cycle, long life spring. Replacement kit available.
- Job Tough® "JT-2500" trolleys available to fit all sizes.
- Made in U.S.A.

JOB TOUGH® JT-2000 Hand Hoists				Optional Chain Nest Hook Assemblies		
JT-2000 Stock No.	Standard Lift Range*	Hoist Capacity (t)	Weight Each (kg)	QUIC-CHECK® Hooks		SHUR-LOC® Hooks
				O-319 Stock No.	BL-O Stock No.	O-318 Stock No.
1007000	2.45 m	0.4	15.9	1098312	1051420	1098409
1007019	2.45 m	0.9	16.8	1098312	1051420	1098409
1007028	2.45 m	1.8	27.2	1098334	1051442	1098427
1007037	2.45 m	2.7	44.0	-	-	-
1007046	2.45 m	3.6	44.0	-	-	-
1007055	2.45 m	4.5	57.6	-	-	-
1007064	2.45 m	5.4	57.6	-	-	-

* Optional Length Available.

JT-2500 TROLLEY




JOB TOUGH® JT-2500 Trolleys

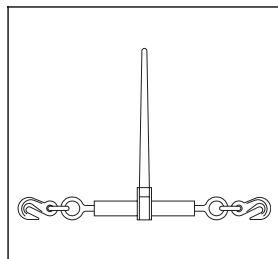
JT-2500 Stock No.	Capacity (t)	Operating Beam Flang Type	Operating Beam Flange Width Range (mm)	Weight Each (kg)
1008003	0.4 - 0.9	Sloped/Flat	76.0 - 143	19.5
1008012	0.4 - 0.9	Sloped/Flat	108 - 168	20.0
1008021	1.35 - 1.8	Sloped/Flat	82.5 - 178	23.1
1008030	1.35 - 1.8	Sloped/Flat	127 - 219	24.0
1008049	2.7 - 3.6	Sloped	102 - 165	45.3
1008058	2.7 - 3.6	Flat	102 - 165	45.3
1008085	2.7 - 3.6	Sloped	165 - 229	47.6
1008094	2.7 - 3.6	Flat	165 - 229	47.6
1008067	4.5 - 5.4	Sloped	117 - 181	79.4
1008071	4.5 - 5.4	Flat	117 - 181	79.4
1008076	4.5 - 5.4	Sloped	184 - 248	82.1
1008110	4.5 - 5.4	Flat	184 - 248	82.1

LOAD BINDER

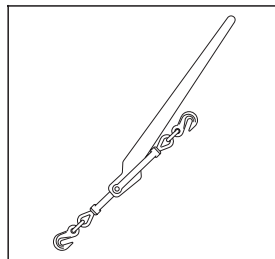
WARNINGS AND APPLICATION INSTRUCTIONS


WARNING

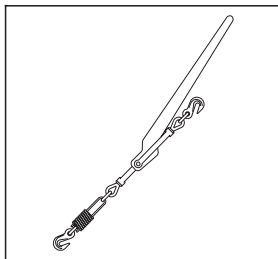
- Failure to use this load binder properly may result in serious injury or even death to you or others.
- Do not operate load binder while standing on the load.
- Move handle with caution. It may whip - Keep body clear.
- Keep yourself out of the path of the moving handle and any loose chain laying on the handle.
- You must be familiar with state and federal regulations regarding size and number of chain systems required for securing loads on trucks.
- Always consider the safety of nearby workers as well as yourself when using load binder.
- While under tension, load binder must not bear against an object, as this will cause side load.
- Do not throw these instructions away. Keep them close at hand and share them with any others who use this load binder.
- Do not use handle extender - see instructions.
- Do not attempt to close or open the binder with more than one person.



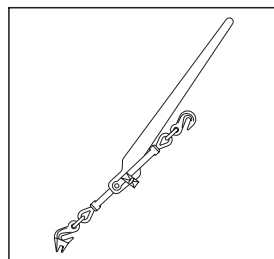
Ratchet Type



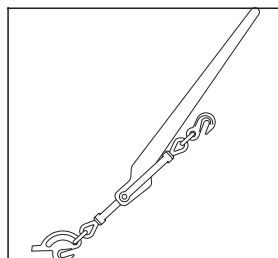
Lever Type



Lever Snubbing Type



Lever Walking Type



Lever Releasing Type

Mechanical Advantage

Lever Type Binder = 25 : 1
Ratchet Type Binder = 50 : 1

Example: 100 kg of effort applied to the binder results in the following force on the binder.

Lever Type:
2500 (100 kg x 25) kg of force
Ratchet Type:
5000 (100 kg x 50) kg of force

Instructions - Lever Type Load Binders



- Hook load binder to chain so you can operate it while standing on the ground. Position load binder so its handle can be pulled downward to tighten chain (see photo). **Be aware of ice, snow, rain, oil, etc. that can affect your footing. Make certain your footing is secure.**
- The Crosby Group, Inc. specifically recommends AGAINST the use of a handle extender (cheater pipe). If sufficient leverage cannot be obtained using the lever type load binder by itself, a ratchet type binder should be used.
- If the above recommendation is disregarded and a cheater pipe is used, it must closely fit the handle and must slide down the handle until the handle projections are contacted. The pipe should be secured to the handle, for example, by a pin, so that the pipe cannot fly off the handle if you loose control and let go. The increased leverage, by using a cheater pipe, can cause deformation and failure of the chain and load binder.
- During and after tightening chain, check load binder handle position. **Be sure** it is in the locked position and that its bottom side touches the chain link.
- Chain tension may decrease due to load shifting during transport. To be sure the load binder remains in proper position: Secure handle to chain by wrapping the loose end of chain around the handle and the tight chain, or tie handle to chain with soft wire.
- When releasing load binder, remember there is a great deal of energy in the stretched chain. This will cause the load binder handle to move very quickly with great force when it is unlatched. **Move handle with caution. It may whip - Keep body clear.**
- **Never use a cheater pipe or handle extender to release handle.** Use a steel bar and pry under the handle and **stay out of the path of handle** as it moves upward.
- If you release the handle by hand, use an open hand under the handle and push upward. **Do not close your hand around the handle. Always keep yourself out of the path of the moving handle.**

Instructions - Ratchet Load Binders

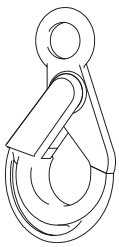
- Position ratchet binder so it can be operated from the ground.
- **Make sure your footing is secure.**

Maintenance of All Load Binders.

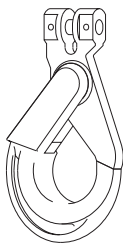
- Routinely check load binders for wear, bending, cracks, nicks, or gouges. **If bending or cracks are present - Do not use load binder.**
- Routinely lubricate pivot and swivel points of Lever Binders, and pawl part and screw threads of Ratchet Binders to extend product life and reduce friction wear.

CROSBY SHUR-LOC[®] HOOK

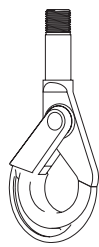
WARNINGS AND APPLICATION INSTRUCTIONS



S-316A
S-1316



S-317A
S-1317



S-318A



S-326A

Important Safety Information - Read and Follow

- A visual periodic inspection for cracks, nicks, wear, gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel in compliance with the schedule in ANSI B30.10.
- For hooks used in frequent load cycles or pulsating load, the hook and threads should be periodically inspected by Magnetic Particle or Dye Penetrant. (Note: Some disassembly may be required.)
- Never use a hook whose throat opening has been increased, or whose tip has been bent or twisted.
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Remove from service any hook with a crack, nick, or gouge. Hooks with a crack, nick, or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1.
- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load or tip load a hook. Side loading, back loading and tip loading are conditions that damage and reduce the capacity of the hook. (See Figure 2).

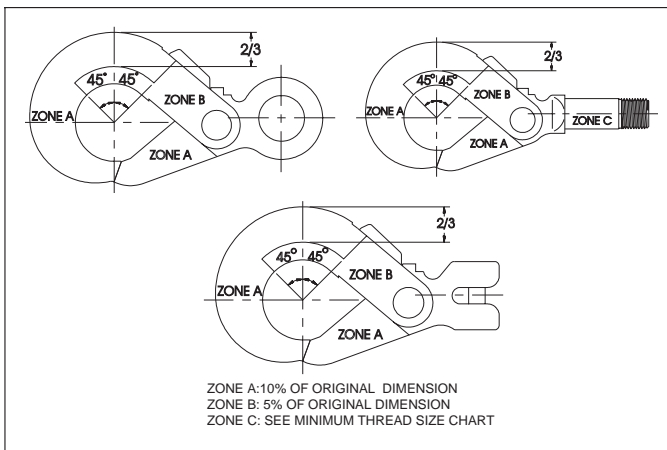


Figure 1



WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Never use hook unless hook and latch are fully closed and locked.
- Keep body parts clear of pinch point between hook tip and hook latch when closing.
- Do not use hook tip for lifting.
- Shank threads may corrode and/or strip and drop the load.
- Remove nut securement to inspect or to replace S-326A bearing washers (2).
- Never apply more force than the hook's assigned Working Load Limit (WLL) rating.
- See OSHA Rule 1926.550 (g) for personnel hoisting by cranes or derricks. A Crosby 316A, 317A, 318A, 326A, 1316A, or 1317A hook may be used for lifting personnel.
- Use only genuine Crosby parts as replacements.
- Read and understand these instructions before using hook.

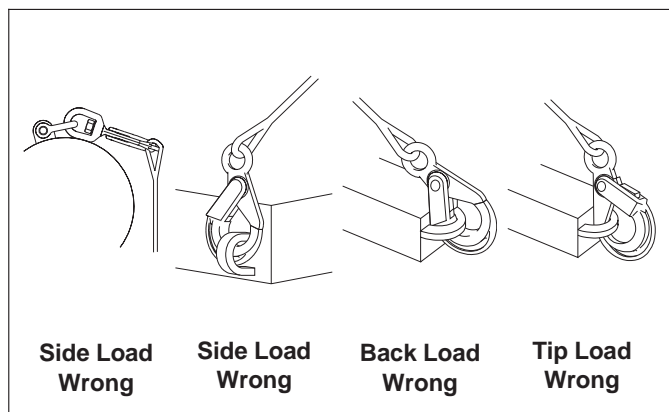
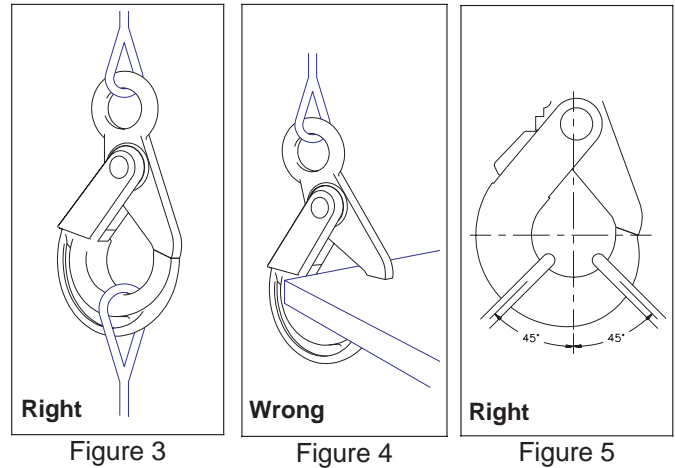


Figure 2

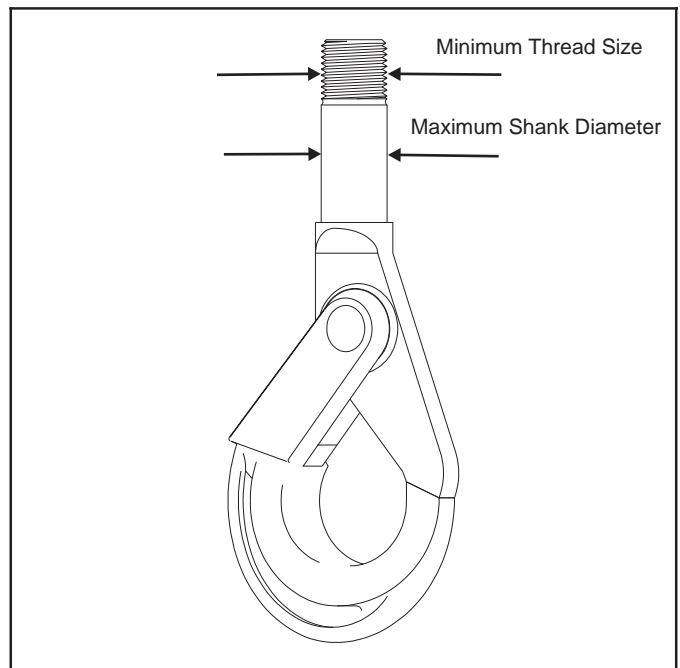
- Efficiency of synthetic sling material may be reduced when used in eye or bowl of hook.
- Always make sure the hook supports the load. (See Figure 3).
- Do not use hook tip for lifting (See Figure 4).
- When placing two (2) sling legs in hook, make sure the angle from vertical to the leg nearest the hook tip is not greater than 45 degrees, and the included angle between the legs does not exceed 90 degrees* (See Figure 5).
- See ANSI/ASME B30.10 "Hooks" for additional information.

* For two legged slings with angles greater than 90°, use an intermediate link such as a master link or bolt type shackle to collect the legs of the slings. The intermediate link can then be placed over the hook to provide an in-line load on the hook. This approach must also be used when using slings with three or more legs.



Important Basic Machining and Thread Information Read and Follow

- Wrong thread and/or shank size can cause stripping and loss of load.
- The maximum diameter is the largest diameter, after cleanup, that could be expected after allowing for straightness, pits, etc.
- All threads must be Class 2 or better.
- The minimum thread length engaged in the nut should not be less than one (1) thread diameter.
- Hook shanks are not intended to be swaged on wire rope or rod.
- Hook shanks are not intended to be drilled and internally threaded.
- Crosby cannot assume responsibility for, (A) the quality of machining, (B) the type of application, or (C) the means of attachment to the power source or load.
- Consult the Crosby Hook Identification & Working Load Limit Chart (See below) for the minimum thread size for assigned Working Load Limits (WLL).†
- Remove from service any Hook which has threads corroded more than 20% of the nut engaged length.



Crosby Hook Identification & Working Load Limit Chart†

S-1316 & S-1317 Only Grade 100 Chain			S-316A, S-317A, S-318A, S-326A					S-318A Only	
			Grade 80 Chain		Wire Rope XIP Mechanical Splice				
Chain Size		Working Load Limit (t) ** 4:1	Chain Size		Working Load Limit (t) ** 4:1	Wire Rope Size (mm)	Working Load Limit* (t) 5:1	Maximum Shank Diameter (mm)	Minimum Thread Size
(in.)	(mm)		(in.)	(mm)					
—	6	1.4	—	6	1.12	8	.91	18.3	1/2-13 UNC
1/4	7	2	1/4-5/16	7-8	2	11	1.7	23.9	5/8-11 UNC
5/16	8	2.5	—	—	—	—	—	—	—
3/8	10	4	3/8	10	3.15	13	2.3	26.9	3/4-10 UNC
1/2	13	6.7	1/2	13	5.3	16	3.5	30.2	1" -8 UNC
5/8	16	10	5/8	16	8	22	6.9	35.1	1 1/4" - 7 UNC

* Ultimate Load is 5 times the Working Load Limit based on XIP Wire Rope.

** Ultimate Load is 4 times the Working Load Limit based on Grade 80 or Grade 100 Chain.

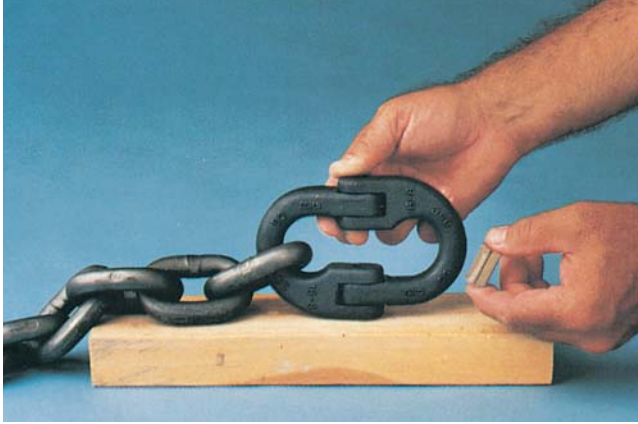
† Working Load Limit - The maximum mass or force which the product is authorized to support in general service when the pull is applied in-line, unless noted otherwise, with respect to the centerline of the product. This term is used interchangeably with the following terms:

1. WLL, 2. Rated Load Value, 3. SWL, 4. Safe Working Load, 5. Resultant Safe Working Load.

General Information

HOW TO ASSEMBLE A LOK-A-LOY® 8 CONNECTING LINK

Crosby Spectrum 8 Chain Slings are easy to assemble; the only tool required is a hammer



1. Place the locking sleeve between the assembled half link forgings.

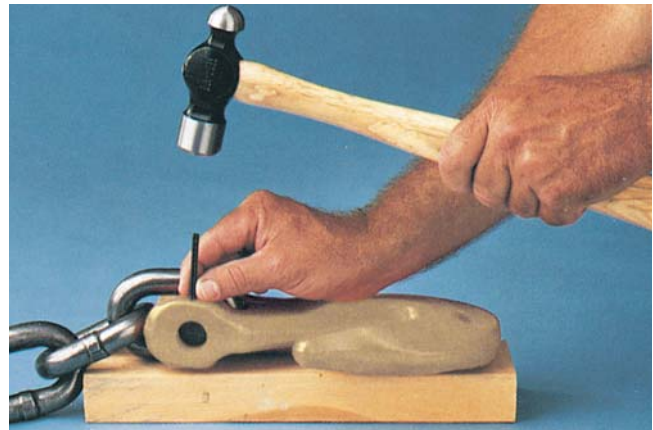


2. Drive the pin through the assembled link ends and sleeve until the end of the pin is flush with the outside of the connecting link halves.

HOW TO ASSEMBLE A CROSBY CLEVIS TYPE HOOK



1. Place chain link into clevis slot of hook. Insert pin fully into the clevis ears.



2. Place the hook on its side and using a hammer, drive the locking pin into the clevis ear until it is flush with the outside surface.

HOW TO ASSEMBLE AN S-325/S-1325 COUPLER LINK



1. Slide Coupler Link over Engineered Flat of Master Link



2. Rotate Coupler Link so that clevis fitting is to the outside of Master Link and attach to chain sling.



APPENDIX. C
Hooks and Swivels
(Crosby Products Data Sheets)

Hooks & Swivels





S-320N

Hoist Hooks 319, 320, 322, 316

What It Takes To Be

“Crosby Or Equal”



S-319N

DESIGN	COMPETITION	CROSBY
<p>The theoretical reserve capability of a hoist hook should be a minimum of 5 to 1 for carbon eye hooks, alloy eye hooks and carbon shank hooks and 4.5 to 1 for alloy shank hooks. Known as the DESIGN FACTOR, it is usually computed by dividing the catalog ultimate load by the working load limit. The ultimate load is the average load or force at which the product fails or no longer supports the load. The working load limit is the maximum mass or force which the product is authorized to support in general service. The design factor is generally expressed as a ratio such as 5 to 1. Also important to the design of hooks is the selection of proper steel.</p>	<p>Ask: <i>What is the design factor?</i></p> <p>Ask: <i>Is each production lot performance tested?</i></p>	<p>Crosby hoist hooks meet the design factor requirements of 5 to 1 for all carbon hooks, 5 to 1 for all alloy eye and swivel hooks and 4.5 to 1 for alloy shank hooks. Crosby's QC1400 program determines the mechanical properties of each manufacturing lot of hoist hooks. In addition to the heat treat process, Crosby hooks are designed with a cross section that, when overloaded, allows uniform deformation and straightening before ultimate failure.</p>
<p>QUENCHED AND TEMPERED</p> <p>Quenching and tempering assures the uniformity of performance and maximizes the properties of the steel. This means that each hook meets its rated strength and other properties. This quenching and tempering process develops a tough material that reduces the risk of a brittle, catastrophic failure, thus improving impact and fatigue properties. As a result, if overloaded, the hook will deform before ultimate failure occurs, thus giving warning. The requirements of your job demand this reliability and consistency. Quench and Tempering insures that not only is the working load limit met, but that ductility, fatigue and impact properties are appropriate.</p>	<p>Ask: <i>Are their hooks quenched and tempered?</i></p> <p>Ask: <i>If overloaded, do their hooks deform, giving warning before ultimate failure?</i></p> <p>Some competitors normalize the hooks, and as a result, desired properties are not achieved. A few even provide hooks in an "as forged" condition, which can result in brittle failure.</p>	<p>Crosby hoist hooks are quenched and tempered. This heat treatment process assures a hook that will deform prior to ultimate failure. Impact and fatigue properties are superior with quenched and tempered hooks. Crosby's Quenched and Tempered carbon and alloy hoist hooks are recommended for all critical applications, including overhead lifting.</p> 
<p>FULL LINE AND IDENTIFICATION</p> <p>The proper application of hoist hooks requires that the correct type, size, and working load capacity of hook be used. All hooks must be load rated (with either the working load or a cross reference code). In addition the traceability code, size, and manufacturer's name should be boldly marked on the product. Availability of a full line of eye, shank, and swivel hooks in carbon and alloy steel is essential when selecting the desired hook for the proper application.</p>	<p>Ask: <i>Do they have a traceability system?</i></p> <p>Ask: <i>Does their traceability system tie into a comprehensive material testing program?</i></p> <p>Ask: <i>Does their product offering cover the full range?</i></p> <p>Most competitors do not have the full line of hooks that Crosby produces. Most do not have a traceability system.</p>	<p>Crosby forges "Crosby" or "CG," the Product Identification Code (P.I.C.), and working load limit (or working load cross reference code) into its full line. Crosby's traceability system and P.I.C. are an integral part of the QC1400 program.</p> 
<p>APPLICATION INFORMATION</p> <p>Detailed application information will assist you in the proper selection and use of hoist hooks. This information is most effective when provided in supporting brochures and engineering information. A formal application and warning system that attracts the attention of the user, clearly informs the user of the factors involved in the task, and informs the user of the proper application procedures is needed.</p>	<p>Ask: <i>Do they provide hook application and warning information attached directly to the hook?</i></p> <p>Ask: <i>What training support is provided?</i></p> <p>Most competitors do not have a comparable product warnings system and application information for hoist hooks.</p>	<p>The Crosby Product Warnings System provides detailed application and warning information for hoist hooks. In addition, a video on hook maintenance is also available. Field inspection criteria and repair instructions are also available. Training seminars conducted by Crosby provide training on the proper use of hoist hooks. Crosby training packets, supplied free to attendees of Crosby's seminars, provide training materials needed to explain the proper use of hoist hooks.</p>



Remember, "When buying Crosby, you're buying more than product, you're buying Quality."

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Crosby Value Added

- **U.S. ratings:** When comparing to other hooks which are rated in short tons, the design factor of Crosby hooks (in short tons) is 5 to 1 for all carbon hooks, 5 to 1 for alloy eye and swivel, 4.5 to 1 for alloy shank hooks and 4 to 1 for all bronze hooks.
- **Application information:** Application and warning information is available for Crosby hoist hooks. The Crosby Warning System is designed to attract the attention of the user, clearly inform the user of the factors involved in the task, and provide the user with proper application procedures. Each Crosby hoist hook is tagged with appropriate application and warning information, thus insuring that the information is available at the point of application.
- **Charpy impact properties:** Crosby's quenched and tempered hooks have enhanced impact properties for greater toughness at all temperatures. Crosby can provide typical Charpy impact properties on selected sizes upon special request at the time of order.
- **Fatigue properties:** Typical fatigue properties are available for selected sizes. In addition, these properties will be provided upon special request for other sizes. Crosby is in the process of fatigue rating hoist hooks to 20,000 cycles at 1-1/2 times the *Working Load Limit*.
- **Ductility properties:** Crosby's QC 1400 program provides results of actual test values for ductility of the material. These results are measured by reduction of area and elongation. This is done for each production lot and is traceable by the Product Identification Code (PIC).
- **Tensile strengths:** Crosby's QC 1400 program provides hardness, tensile, and yield strength for each production lot of hoist hooks. They are traceable by the Product Identification Code (PIC).
- **Material Analysis:** Crosby can provide certified material (mill) analysis for each production lot, traceable by the Product Identification Code (PIC). Crosby, through its own laboratory, verifies the analysis of each heat of steel. Crosby purchases only *special bar* forging quality steel with specific cleanliness requirements and guaranteed hardenability.
- **Field inspection:** Written instructions for visual, magnaflux, and dye penetrant inspection of hooks are available from Crosby. In addition, acceptance criteria and repair procedures for hooks are available.
- **Proof testing:** If requested at the time of order, hooks can be furnished proof tested with certification. All SHUR-LOC[®] hooks (S-316A) are 100% proof tested with certificates.
- **Mag Certification:** If requested at the time of order, hooks can be Mag inspected with certification.
- **World Class Certification:** Certification to World Class Standards can be furnished upon request at the time of order. Specific standards include American Bureau of Shipping, Lloyds Register of Shipping, Det Norske Veritas, American Petroleum Institute, RINA, Nuclear Regulatory Commission, and other world wide standards.
- **Bronze Hooks:** Crosby provides bronze shank hooks for non-sparking applications.
- **QUIC-CHECK[®]:** Hoist hooks incorporate markings forged into the product which address two (2) QUIC-CHECK[®] features: *Deformation Indicators:* Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a QUIC-CHECK[®] measurement to determine if the throat opening has changed, thus indicating abuse or overload. *Angle Indicators:* Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.



320N



320



322N



319



319N



316

Crosby® Shank Hooks



SEE APPLICATION AND WARNING INFORMATION

On Pages 112 - 113

S-319 / S-319N



Patented trademark indicates QUIC-CHECK® product.

Hook ID Codes: A-Alloy Steel,
B-Bronze High Strength,
C-Carbon Steel.

- Hoist hooks incorporate markings forged into the product which address two (2) QUIC-CHECK® features.
 - Deformation Indicators -- Two strategically placed marks, one just below the shank or eye and the other on the hook up, which allows for a QUIC-CHECK® measurement to determine if the throat opening has changed, thus indicating abuse or overload.
 - To check, use a measuring device (i.e. tape measure) to measure the distance between the marks. The marks should align according to the dimensions in column "AA" on next page. If the measurement does not meet this criteria, the hook should be inspected further for possible damage.
 - Angle Indicators -- Indicates the maximum included angle which is allow between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

Working Load Limit (t)*			Hook ID Code	Shank Hooks Stock No.			Shank Length ‡	Weight Each (kg)	Rep. Latch Kits		
Carbon	Alloy	Bronze		Carbon S-319CN	Alloy S-319AN	Bronze S-319BN			S-4320 Stock No.	PL Stock No.	SS-4055 Stock No.
3/4	1.25	.5	D †	1028505	1028701	1028900	Std.	.23	1096325	-	-
1	1.6	.6	F †	1028514	1028710	1028909	Std.	.34	1096374	-	-
1.6	2.5	1	G †	1028523	1028723	1028918	Std.	.45	1096421	-	-
2	3.2	1.4	H †	1028532	1028732	1028927	Std.	.83	1096468	-	-
3.2	5.4	2	I †	1028541	1028741	1028936	Std.	1.67	1096515	-	-
5	8	3.5	J †	1028550	1028750	1028945	Std.	3.29	1096562	-	-
7-1/2	11.5	5	K †	1028563	1028765	1028954	Std.	6.12	1096609	-	-
10	16	6.5	L †	1028572	1028774	1028963	Std.	8.16	1096657	-	-
15	22	10	N †	1028581	1028783	1028972	Std.	16.0	1096704	-	-
20	30	-	O	1024386	1024803	-	Std.	32.7	-	1093716	1090161
20	30	-	O	1024402	1024821	-	Long	38.8	-	1093716	1090161
25	37	-	P	1024420	1024849	-	Std.	61	-	1093717	1090189
25	37	-	P	1024448	1024867	-	Long	78	-	1093717	1090189
30	45	-	S	1024466	1024885	-	Std.	83	-	1093718	1090189
30	45	-	S	1024484	1024901	-	Long	97	-	1093718	1090189
40	60	-	T	1024509	1024929	-	Std.	122	-	1093719	1090205
40	60	-	T	1024545	1024965	-	Long	142	-	1093719	1090205
50	75	-	U	1024563	1024983	-	Std.	177	-	1093720	-
50	75	-	U	1024581	1025009	-	Long	193	-	1093720	-
-	100	-	W	-	1025027	-	Std.	277	-	1093721	-
-	100	-	W	-	1025045	-	Long	306	-	1093721	-
-	150	-	X	-	1025063	-	Std.	333	-	1093721	-
-	200	-	Y	-	1025081	-	Std.	463	-	1093723	-
-	300	-	Z	-	1025090	-	Std.	630	-	1093724	-

* NOTE: Proof load is 2 times Working Load Limit. All carbon hooks - average straightening load (ultimate load) is 5 times Working Load Limit. Alloy shank hooks 1.25 ton through 300 ton - average straightening load (ultimate load) is 4 times Working Load Limit. All bronze hooks - average straightening load (ultimate load) is 4 times Working Load Limit.

† New 319N style hook.

‡ See column "Y" on following page for actual length.

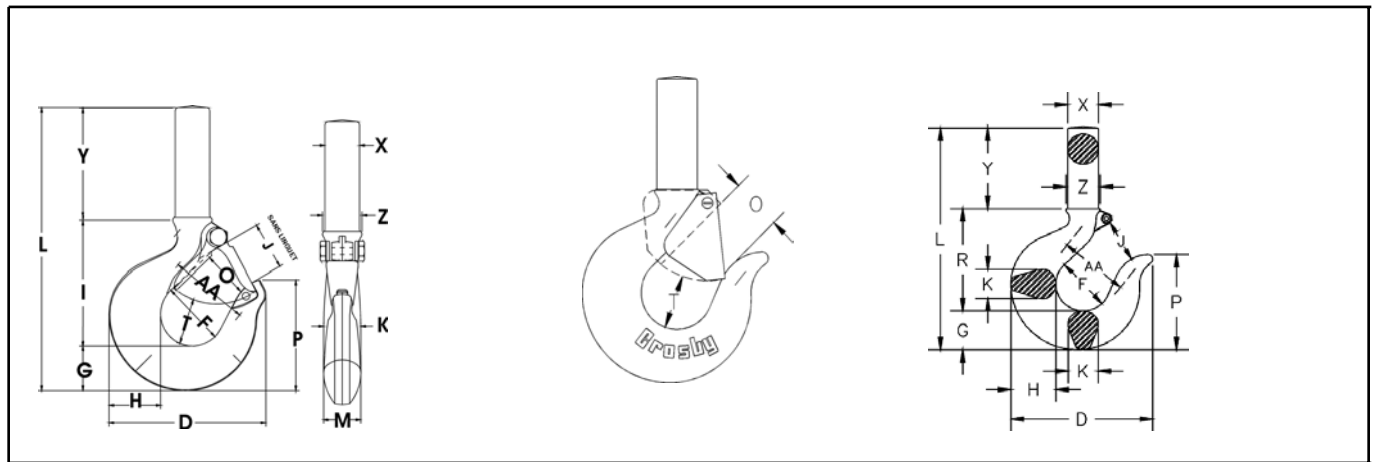
Crosby® Shank Hooks



SEE APPLICATION AND WARNING INFORMATION
On Pages 112 - 113

S-319 / S-319N

- The most complete line of shank hoist hooks. Available 3/4 to 300 tons.
- Available in carbon steel, alloy steel, and bronze.
- Quenched and Tempered.
- Proper design, careful forging, and precision controlled quench and tempering give maximum strength without excessive weight and bulk.
- Every Crosby Shank Hook has a pre-drilled cam which can be equipped with a latch. Simply purchase the latch assemblies listed and shown on pages 89-91. Even years after purchase of the original hook, latch assemblies can be added.
- Load Rating code stamped on each hook.



Hook D Code	Dimensions (mm)															
	D	F	G	H	J	K	L	M	O	P	R	T	X*	Y	Z	AA
D	725	31.8	18.5	20.6	23.6	16.0	131	16.0	†23.6	49.8	59.5	24.6	15.0	52.5	17.5	38.1
F	805	35.1	21.3	23.9	24.6	18.0	144	18.0	†24.6	56.5	66.0	24.6	16.8	57.0	19.8	50.8
G	910	38.1	25.4	29.5	26.9	22.4	161	22.4	†26.9	62.0	70.0	26.2	18.3	66.0	22.4	50.8
H	102	41.1	29.0	33.3	30.2	23.9	181	23.9	†29.5	70.5	80.5	29.5	22.4	72.0	25.4	50.8
I	123	51.0	36.6	41.4	38.1	33.3	219	28.7	†35.8	88.0	98.0	38.9	29.5	87.5	31.8	63.5
J	160	63.5	46.2	52.5	45.2	42.2	265	36.6	†42.9	117	121	49.3	35.8	97.5	39.6	76.2
K	192	76.0	57.5	67.0	61.0	47.8	318	41.4	†56.5	133	149	62.5	46.0	111	49.3	101
L	212	82.5	66.0	74.5	66.5	55.5	342	49.3	†61.0	151	162	66.0	51.0	114	55.5	101
N	263	108	76.5	89.0	86.5	68.5	423	60.5	†81.0	175	207	71.5	65.0	140	67.0	127
O	346	127	92.0	117	102	76.0	586	76.0	82.5	223	240	87.5	79.0	254	79.0	165
O	346	127	92.0	117	102	76.0	790	76.0	82.5	223	240	87.5	79.0	457	79.0	165
P	357	137	116	127	108	92.0	816	76.0	76.0	287	318	98.5	102	381	102	177
P	357	137	116	127	108	92.0	1044	76.0	76.0	287	318	98.5	102	610	102	177
S	392	152	129	140	121	94.5	867	82.5	86.0	319	356	121	106	381	106	203
S	392	152	129	140	121	94.5	1095	82.5	86.0	319	356	121	106	610	106	203
T	470	178	152	165	146	113	916	99.5	105	375	395	145	114	368	114	254
T	470	178	152	165	146	113	1208	99.5	105	375	395	145	114	660	114	254
U	524	197	170	184	165	133	1045	108	137	420	492	152	127	381	127	292
U	524	197	170	184	165	133	1249	108	137	420	492	152	127	584	127	292
W	584	173	218	251	149	140	1070	140	114	438	468	178	178	381	178	305
W	584	173	218	251	149	140	1222	140	114	438	468	178	178	533	178	305
X	619	171	232	278	152	152	1162	152	114	457	467	178	184	457	184	330
Y	678	191	248	300	168	178	1283	178	127	502	521	203	203	508	203	330
Z	765	241	270	329	203	184	1389	203	159	576	597	210	241	508	241	381

* Dimension before machining (as forged). See Hoist Hook Warnings - for maximum clean up dimensions after machining.
† Dimensions shown are for S-4320 Latch Kits. Dimensions for sizes 20 ton carbon and larger are for PL Latch Kits.

Crosby® Eye Hooks



Load Rated

Fatigue Rated

S-320 & S-320N EYE HOOKS



- All Crosby 320 Eye Hoist Hooks incorporate the following features:
- The most complete line of Eye hoist hooks.
- Proper design, careful forging and precision controlled quenched and tempering give maximum strength without excessive weight and bulk.
- Every Crosby Eye Hook has a pre-drilled cam which can be equipped with a latch. Even years after purchase of the original hook, latch assemblies can be added. (See pages 89-91)
- Eye hooks are load rated.
- Available in carbon steel and alloy steel.
- Hoist hooks incorporate two types of strategically placed markings forged into the product which address two (2) QUIC-CHECK® features:
 - Deformation Indicators and Angle Indicators (see following page for detailed definition).
- The following additional features have been incorporated in the new Crosby S-320N Eye Hoist Hooks. (Sizes 3/4 ton Carbon through 22 ton Alloy.)
- A new cross section design that enhances the overall performance.
- Fatigue rated at 1-1/2 times the Working Load Limit at 20,000 cycles.
- Low profile hook tip.
- New integrated latch (S-4320) meets the World class standard for lifting.
 - Heavy duty stamped latch interlocks with the hook tip.
 - High cycle, long life spring.
 - When secured with proper cotter pin through the hole in the tip of hook, meets the intent of OSHA Rule 1926.550(g) for personnel hoisting.



SEE APPLICATION AND WARNING INFORMATION

On Pages 112 - 113

Working Load Limit (t) [†]		Hook ID Code	Eye Hook Stock No.			Weight Each (kg)	Replacement Latch Kits		
Carbon	Alloy		Carbon S-320C S.C.	Carbon G-320C Galv.	Alloy S-320A S.C.		S-4320 Stock No.	PL Stock No.	SS-4055 Stock No.
.75†	1.25 †	D	1022200	1022208	1022375	.28	1096325	-	-
1†	1.6 †	F	1022211	1022219	1022386	.40	1096374	-	-
1.6†	2.5 †	G	1022222	1022230	1022397	.65	1096421	-	-
2†	3.2 †	H	1022233	1022241	1022406	.94	1096468	-	-
3.2†	5.4 †	I	1022244	1022249	1022419	1.95	1096515	-	-
5†	8 †	J	1022255	1022262	1022430	3.76	1096562	-	-
7.5†	11.5 †	K	1022264	1022274	1022441	6.80	1096609	-	-
10†	16 †	L	1022277	1022285	1022452	9.80	1096657	-	-
15†	22 †	N	1022288	1022296	1022465	17.9	1096704	-	-
20	30	O	1023289	-	1023546	27.2	-	1093716	1090161
25	37	P	1023305	-	1023564	47.6	-	1093717	1090189
30	45	S	1023323	-	1023582	67	-	1093718	1090189
40	60	T	1023341	-	1023608	103	-	1093719	1090205

* Carbon eye hooks .75tC-40tC: proofload is 2 times working load limit. Designed with a 5 to 1 safety factor.
 Alloy eye hooks 1.5tA-22tA : proofload is 2.5 times working load limit. Designed with a 4 to 1 safety factor.
 Alloy eye hooks 31.5tA - 60tA: proofload is 2 times working load limit. Designed with a 4 to 1 safety factor.

† New 320N style hook.

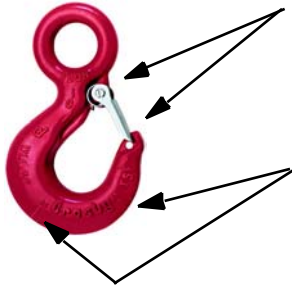
Crosby® Eye Hooks



Load Rated

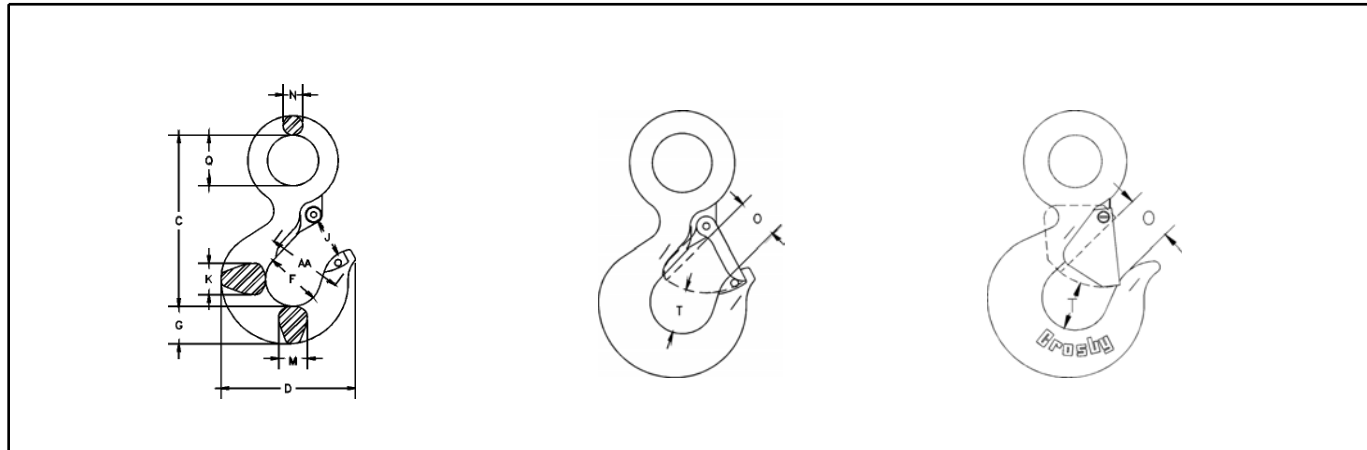
Fatigue Rated

S-320 & S-320N EYE HOOKS



- Hoist hooks incorporate markings forged into the product which address two (2) QUIC-CHECK® features.
- Deformation Indicators -- Two strategically placed marks, one just below the shank or eye and the other on the hook up, which allows for a QUIC-CHECK® measurement to determine if the throat opening has changed, thus indicating abuse or overload.
- To check, use a measuring device (i.e. tape measure) to measure the distance between the marks. The marks should align. If the measurement does not meet this criteria, the hook should be inspected further for possible damage.
- Angle Indicators -- Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

SEE APPLICATION AND WARNING INFORMATION
On Pages 112 - 113



Hook ID Code	Dimensions (mm)											
	C	D	F	G	J	K	M	N	O	Q	T	AA
D	85.0	72.0	31.8	18.5	22.9	16.0	16.0	9.14	22.6	19.1	22.1	38.1
F	97.0	79.0	35.1	21.3	23.6	18.0	18.0	10.7	23.1	23.1	24.9	50.8
G	105	89.5	38.1	25.4	25.4	22.4	22.4	14.0	25.4	28.7	26.2	76.2
H	119	101	41.4	28.7	28.7	23.9	23.9	14.7	27.7	31.8	29.5	50.8
I	147	122	51.0	36.6	37.3	33.3	33.3	18.3	34.5	39.6	38.9	63.5
J	187	159	63.5	46.0	44.5	42.2	42.2	22.9	40.9	51.0	49.8	76.2
K	230	189	76.0	57.0	58.0	47.8	41.4	28.2	53.0	62.0	62.5	102
L	256	211	82.5	66.0	63.5	55.5	49.3	32.3	57.5	72.0	66.5	102
N	318	262	108	76.0	84.0	68.5	60.5	39.6	76.5	89.0	72.0	127
O	357	346	127	92.0	102	76.0	76.2	44.5	82.5	89.0	87.5	165
P	462	357	137	116	108	102	81.0	51.0	76.0	114	98.5	178
S	511	392	152	129	121	114	82.6	55.4	86.0	125	121	203
T	602	470	178	152	146	140	99.3	64.3	105	145	145	254

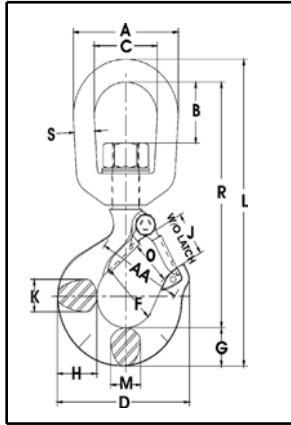
Crosby® Swivel Hooks



SEE APPLICATION AND WARNING INFORMATION

On Pages 112 - 113

S-322CN / S-322AN



- Forged — Quenched and Tempered.
- Proper design, careful forging, and precision controlled quench and tempering gives maximum strength without excessive weight and bulk.
- Every Crosby Swivel hoist hook has a pre-drilled cam which can be equipped with a latch. Simply purchase the latch assemblies listed and shown on pages 89-91. Even years after purchase of the original hook, latch assemblies can be added.
- Load rating codes stamped on each hook. 322 Swivel Hooks use the same load rating code as 319 Shank Hooks, see page 84 for proper Hook Identification Codes.
- Hoist hooks incorporate markings forged into the product which address two (2) **QUIC-CHECK®** features:
 - Deformation Indicators -- Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a **QUIC-CHECK®** measurement to determine if the throat opening has changed, thus indicating abuse or overload.
 - Angle Indicators — Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.



This hook is a positioning device and is not intended to rotate under load. For swivel hooks designed to rotate under load, see pages 94, 101, 106-110. Use in salt water requires shank and nut inspection in accordance with A.S.M.E. B30.10-1.2.1(b)(2)(c) 1996.

- U.S. Patents 5,381,650 & 5,193,480 & 5,103,755 and foreign equivalents.

Working Load Limit (t)		S-322 CN Stock No.	S-322 AN Stock No.	Weight Each (kg)	Dimensions (mm)														Rep. Latch Stock No.	
Carbon	Alloy				A	B	C	D	F	G	H	J	K	L	M	O	R	S		AA
.75	1.25	1048600	1048804	.34	51.0	20.8	31.8	72.5	31.8	18.5	20.6	23.6	16.0	144	16.0	23.6	116	9.65	38.1	1096325
1	1.60	1048609	1048813	.57	63.5	33.3	38.1	80.0	35.1	21.3	23.9	24.6	18.0	170	18.0	24.6	136	12.7	50.8	1096374
1.6	2.50	1048618	1048822	1.02	76.0	38.1	44.5	91.0	38.1	25.4	29.5	26.9	22.4	197	22.4	26.9	155	16.0	50.8	1096421
2	3.20	1048627	1048831	1.04	76.0	38.1	44.5	102	41.1	28.7	33.3	30.2	23.9	210	23.9	29.5	165	16.0	50.8	1096468
3.2	5.4	1048636	1048837	2.25	89.0	41.7	50.8	123	51.0	36.6	41.4	38.1	33.3	246	28.7	35.8	191	19.1	63.5	1096515
5	8.0	1048645	1048854	4.67	116	58.0	63.5	160	63.5	46.0	52.5	45.2	42.2	317	36.6	42.9	245	25.4	76.2	1096562
7.5	11.5	1048654	1048865	7.34	127	64.5	70.0	192	76.0	57.0	67.0	51.0	47.8	375	41.4	56.5	289	28.7	101	1096609
10	16	1048663	1048877	10.5	143	63.0	79.0	212	82.5	66.0	74.5	66.5	55.5	417	49.3	61.0	311	31.8	101	1096657
15	22	1048672	1048886	21.3	180	95.5	104	263	108	76.0	89.0	86.5	68.5	542	60.5	81.0	424	38.1	127	1096704
-	31.5	-	1025688	32.0	180	95.5	104	346	127	93.0	118	102	72.5	590	76.2	82.6	459	38.1	165	1093716

* NOTE: Carbon swivel hooks .75tC-15tC: proofload is 2 times working load limit. Designed with a 5 to 1 safety factor.

Alloy swivel hooks 1.5tA-22tA : proofload is 2.5 times working load limit. Designed with a 4 to 1 safety factor.

Alloy swivel hook 31.5tA: proofload is 2 times working load limit. Designed with a 4 to 1 safety factor.

Dimensions for hooks 3/4 ton carbon thru 22 ton alloy are for S-4320 latch kits. Dimensions for hooks 31.5 ton alloy are for PL latch kit.

S-4320 Latch Kits



SEE APPLICATION AND WARNING INFORMATION

On Page 116

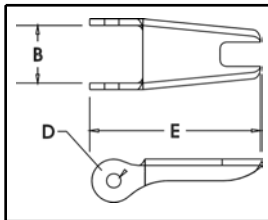
S-4320 LATCH KITS



- Heavy duty stamped latch interlocks with the hook tip.
- High cycle, long life spring.
- Can be made into a "Positive Locking" Hook when proper cotter pin is utilized.
- Latch kits shipped unassembled and individually packaged with instructions.

IMPORTANT: The new S-4320 Latch Kit will not fit the old style 319, 320 and 322 hooks.

Hooks & Swivels



S-4320 Replacement Latch Kit for New 319N, and 320N, 322N and 339N Hooks.

Hook Size (t)			Hook ID Code	S-4320 Stock No.	SS-4320 Stock No.†	Weight Each (kg)	Dimensions (mm)		
Carbon	Alloy	Bronze					B	D	E
.75	1.25	.5	D	1096325	1097100	.01	12.7	3.80	36.6
1	1.6	.6	F	1096374	1097109	.02	13.7	4.30	39.6
1.6	2	1	G	1096421	1097118	.02	16.0	4.30	42.2
2	3.2	1.4	H	1096468	1097127	.03	16.8	4.30	48.5
3.2	5.4	2	I	1096515	1097136	.05	21.1	5.10	58.5
5	8	3.5	J	1096562	1097145	.07	26.4	5.10	87.5
7.5	11.5	5	K	1096609	1097154	.13	31.8	6.85	90.5
10	16	6.5	L	1096657	1097163	.15	34.3	6.85	97.0
15	22	10	N	1096704	1097172	.38	42.2	9.90	132

* SS-4320 is Stainless Steel construction with cad plated steel nuts.

Positive Locking Flapper Latches



SEE APPLICATION AND WARNING INFORMATION

On Pages 118 - 119

PL LATCH KITS



PL LATCH
(Patented in U.S.A. & Canada)

• LATCH ORDERING INSTRUCTIONS

- 1. Specify PL, PL-N or PL-O latch kit stock number from charts below.
- 2. Specify capacity of hook to which latch will be assembled.
- 3. Specify hook material (carbon or alloy).

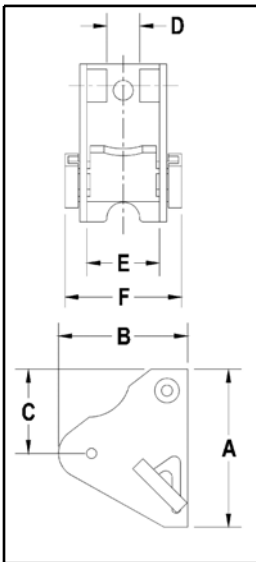
PL-N/O



NOTE: The PL latch will not work on 319N, 320N or 322N hooks.
The PL-N/O Latches, in the sizes available, will work on both the old style and new style hooks.

PL Latch Kits

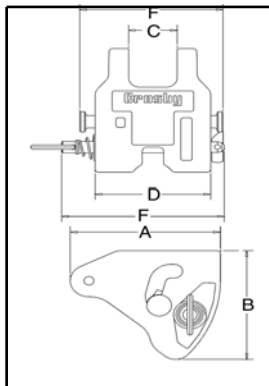
- Heavy duty latch with easy operating features.
- Hot dip galvanized.
- Flapper lever indicates locked or unlocked position.
- Assembly instructions included with each latch.
- For additional dimensional data on eye, shank or swivel hooks refer to pages 84 through 88 in this section.
- Meets the intent of OSHA Rule 1926.550 (g) (when secured with the bolt, nut and pin) for lifting personnel.



Hook Size (t)		PL Latch Kit Stock No.	Weight Each (kg)	Dimensions (mm)					
Carbon	Alloy			A	B	C	D	E	F
3.2	5.4	1093711	24	65.5	59.5	49.3	14.2	28.7	51.0
5	8	1093712	30	76.0	59.5	51.0	16.0	35.1	56.5
7.5	11.5	1093713	45	92.0	70.5	60.5	16.0	41.4	60.5
10	16	1093714	57	102	82.0	68.5	16.0	47.8	86.0
15	22	1093715	1.34	135	102	74.0	21.3	60.5	87.5
20	31.5	1093716	1.84	152	113	81.0	26.9	73.0	108
25	37	1093717	3.91	178	168	103	57.0	114	155
30	45	1093718	4.54	171	178	102	57.0	121	162
40	60	1093719	6.49	203	195	111	88.0	140	184
50	75	1093720	12.2	251	208	130	86.0	165	226
-	100-150	1093721	15.1	276	281	162	86.0	191	254
-	200	1093723	20.4	302	284	162	86.0	222	286
-	300	1093724	24.9	318	310	203	86.0	248	330


PL-N/O Latch Kits

- Heavy duty latch with easy operating features.
- PL-N designed for Crosby 319N & 320N style hooks, PL-O designed for Crosby 319 & 320 old style hooks.
- Flapper lever indicates locked or unlocked position.
- Assembly instructions included with each latch.
- For additional dimensional data on eye, shank or swivel hooks refer to pages 84 through 88 in this section.
- Meets the intent of OSHA Rule 1926.550 (g) (when secured with the supplied toggle pin) for lifting personnel.



Hook Size (tons)		Hook ID Code	PL-N Stock No.	PL-O Stock No.	Weight Each (kg)	Dimensions (mm)					
Carbon	Alloy										
3.2	5.4	I	1092000	1091900	.36	60.9	51.0	21.1	54.1	68.8	87.4
5	8	J	1092001	1091901	.58	74.7	63.5	25.4	64.0	81.0	97.3
7.5	11.5	K	1092002	1091902	.90	92.2	76.7	30.2	69.9	87.4	111
10	16	L	1092003	1091903	1.27	102	86.1	34.0	81.0	102	114
15	22	N	1092004	1091904	2.22	132	110	40.9	98.0	122	130

SS-4055 and S-4088 Latch Kits

 **SEE APPLICATION AND WARNING INFORMATION**
On Page 117

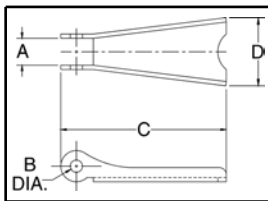
SS-4055



• LATCH ORDERING INSTRUCTIONS

- Specify latch kit stock number.
- Specify capacity of hook to which latch will be assembled.
- Specify hook material (carbon or alloy).

NOTE: These latches will not work on new "N" style Hooks.

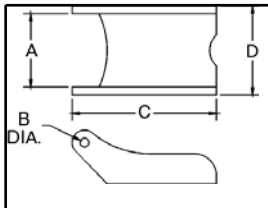


SS-4055 Latch Kits

- Stainless steel construction with cadmium plated steel nuts.
- Shipped packaged and unassembled.
- Instructions included for easy field assembly.

Hook Size (t)			Hook ID Code	SS-4055 Stock No.	Weight Each (kg)	Dimensions (mm)			
Carbon	Alloy	Bronze				A	B	C	D
.75	1.25	.5	D	1090027	.01	9.65	4.05	36.6	15.0
1	1.6	.6	F	1090045	.01	9.65	4.05	40.6	15.0
1.6-2.0	2.5-3.2	1.0-1.4	G / H	1090063	.01	11.9	4.85	46.7	20.8
3.2	5.4	2.0	I	1090081	.03	14.2	4.30	61.0	25.4
5	8	3.5	J	1090107	.05	14.7	5.10	75.5	30.7
7.5-10	11.5-16	5.0 -6.5	K / L	1090125	.08	15.0	6.86	93.0	38.1
15	22	10.0	N	1090143	.18	21.1	9.90	125	48.3
20	30	--	O	1090161	.29	23.9	13.2	149	65.0
25-30	37 -45	--	P / S	1090189	.51	55.5	9.90	165	97.5
40	60	--	T	1090205	.80	84.0	13.2	200	105

S-4088



S-4088 Alloy Hook Latch Kits

- To be used on A-327 and A-339 Grade 8 Sling Hooks.
- Latch Kits shipped unassembled and individually packaged with instructions.

Hook Chain Size (mm)	S-4088 Stock No.	Weight Each (kg)	Dimensions (mm)			
			A	B	C	D
6-7	1090250	.03	19.8	4.05	51.5	23.9
8-10	1090251	.06	26.2	4.85	68.5	31.8
13	1090252	.07	26.2	4.85	76.0	31.8
16	1090253	.07	26.2	4.85	82.5	31.8
19	1090254	.07	38.9	6.60	105	47.8
22	1090255	.07	38.9	6.60	118	51.0

HOOK CONNECTORS

The 6 connector styles shown below make it possible for Crosby to furnish a Golden Gate Hook to fit almost any make or model of hoisting equipment including

American Engineering Lo-Hed, ARO, Coffing, Electro Lift, Ingersoll-Rand, P & H, Robbins and Myers, Shepard Niles, CM, Shaw-Box, Wright, Yale & Towne.

CLOSED SWIVEL BAIL

For use where hoisting line or shackle can be inserted into the bail.
Hook sizes: 1 through 14



Style C — with self-closing gate.
Style A — with manual-closing gate.

SHANK-TYPE HOOK (Standard Length)

For use on existing load blocks, with standard shank length.
Hook sizes: 2 through 14



Style D — with self-closing gate.
Style B — with manual-closing gate.

SHANK-TYPE HOOK (Long Length)

For use on existing load blocks requiring extra shank length.
Hook sizes: 4 through 17



Style K — with self-closing gate.
Style I — with manual-closing gate.

UNIVERSAL TYPE

Open swivel bail for attachment to link chain.
Hook sizes: 3, 4 and 5



Style E — with self-closing gate.
Style G — with manual-closing gate.

LINK CHAIN NEST

With ball-bearing swivel; attaches to chain by an alloy pin.
Hook sizes: 4, 5 and 7



Style O — with self-closing gate.
Style P — with manual-closing gate.

ROLLER CHAIN NEST

Attachment with ball-bearing swivel and full-floating connector.
Hook sizes: 4, 5 and 6



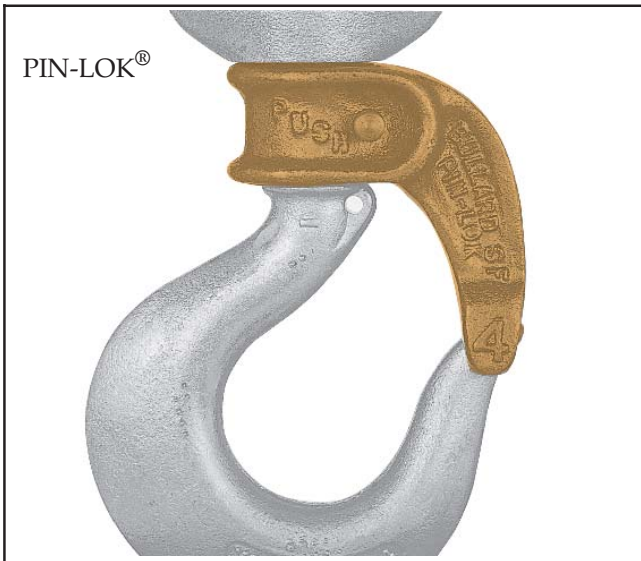
Style S — with self-closing gate.
Style R — with manual-closing gate.

Letter designations shown beneath each illustration above indicate BOTH connector style and gate type. Each connector is available with either a self-closing or manual-closing gate. (e.g.: A size 4 hook with a closed swivel bail connector and self-closing gate is 4-C; with manual-closing gate, it is 4-A.)

GATE TYPES

Brass alloy Golden Gates® are engineered for quality, easy handling and dependability. The heavy duty, corrosion resistant locking mechanism will stay locked until an operator releases it; yet, can easily

be shut with one hand. Cost effective, these gates reduce down time, providing the alternative to conventional latches.



LIF-LOK® GATE - Size 1

- To lock: close the gate; the built-in spring locks the gate against the hook tip.
- To unlock: lift the gate upward on the hook shank and swing open.

PIN-LOK® - Sizes 2 through 4

- To lock: close the gate; a stainless steel pin is carried in a horizontal bore and engages a milled slot in the hook shank.
- To unlock: simply depress the stainless steel pin which causes the pin to disengage from the milled slot.

ROLLOX® GATE - Sizes 5 through 9

- To lock: close the gate; a stainless steel pin is mounted in a horizontal bore which passes through the gate and engages a notch milled in the hook shank.
- To unlock: move the lever downward a quarter-turn or until it stops, the gate can now swing open 160° (approx.)

TIP-LOK® GATE - Sizes 10 through 17

- To lock: press the arm down until the lock trips; two arms of the gate now enclose the tip of the hook.
- To unlock: manually depressing the locking trigger automatically raises the movable arm, allowing the gate to be rotated open.

Crosby® / Bullard® Golden Gate® Hooks



SEE APPLICATION AND WARNING INFORMATION

On Pages 114 - 115

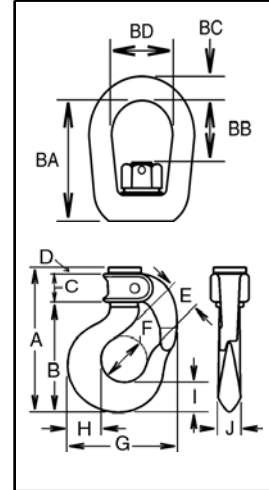
CLOSED SWIVEL BAIL

BAIL



• For use where hoisting line or shackle can be inserted into the bail.

- BL-C - with self-closing gate.
- BL-A - with manual-closing gate.



Hook Size	BL-C Stock No.	BL-A Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)													
						A	B	C	D	E	F	G	H	I	J	BA	BB	BC	BD
1	1050210	1050001	LIF-LOK	.45	.36	82.0	58.7	16.0	6.60	17.5	22.4	57.0	17.5	16.0	11.2	44.5	16.0	7.85	25.4
2	1050221	1050012	PIN-LOK	.90	.59	105	76.2	23.6	4.06	24.6	31.8	73.0	20.6	19.1	11.2	47.2	24.1	9.65	31.8
3	1050232	1050023	PIN-LOK	1.3	.86	114	84.0	23.9	5.58	26.9	35.1	84.0	23.9	21.3	16.0	62.0	33.3	12.7	38.1
4	1050243	1050034	PIN-LOK	1.5	1.00	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	67.5	34.3	12.7	38.1
5	1050254	1050045	ROLLOX	2.1	1.72	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	74.0	40.6	16.0	44.5
6	1050265	1050056	ROLLOX	3.6	2.09	158	119	31.8	6.35	35.3	41.7	116	39.9	34.0	24.6	78.5	35.8	16.0	44.5
7	1050276	1050067	ROLLOX	3.8	3.13	168	132	28.4	6.35	38.1	51.0	125	41.4	36.6	28.7	88.5	42.4	19.1	51.0
8	1050287	1050078	ROLLOX	5.0	4.35	182	147	26.9	7.11	44.5	57.0	148	51.0	41.9	31.2	103	51.0	22.4	57.0
9	1050298	1050089	ROLLOX	6.5	6.12	199	164	26.9	7.87	47.8	63.5	165	52.5	46.0	36.1	118	56.0	26.2	63.5
11	1050309	1050100	TIP-LOK	8.3	9.30	244	203	31.8	7.87	57.0	76.0	192	67.0	57.0	41.1	124	66.5	28.7	70.0
12	1050320	1050111	TIP-LOK	11.1	12.3	267	225	31.8	9.65	63.5	82.5	221	74.5	65.5	49.3	130	57.0	31.8	79.5
14	1050342	1050133	TIP-LOK	16.7	25.0	320	273	35.8	9.65	86.0	108	279	89.0	75.5	60.5	203	108	41.4	104

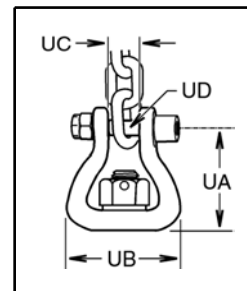
* Ultimate Load is 4 times the Working Load Limit.

OPEN SWIVEL BAIL



• Open Swivel Bail for attachment to link chain.

- BL-E - with Self-Closing Gate
- BL-G - with Manual-Closing Gate



Hook Size	BL-E Stock No.	BL-G Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)													
						A	B	C	D	E	F	G	H	I	J	UA	UB	UC	UD
3	1051607	1051706	PIN-LOK	1.3	.81	114	84.5	23.9	5.58	26.9	35.1	81.0	23.9	21.3	16.0	53.0	59.0	13.2	9.65
4	1051618	1051717	PIN-LOK	1.5	.95	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	54.5	59.0	13.2	9.65
5	1051629	1051728	ROLLOX	2.1	1.45	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	65.0	67.0	15.7	11.2

* Ultimate Load is 4 times the Working Load Limit.

Crosby® / Bullard® Golden Gate® Hooks

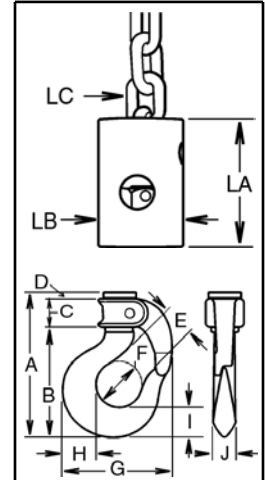


SEE APPLICATION AND WARNING INFORMATION
On Pages 114 - 115

LINK CHAIN NEST



- With ball bearing swivel; attaches to chain by an alloy pin.
 - BL-O - with Self-Closing Gate
 - BL-P - with Manual Closing Gate



Hooks & Swivels

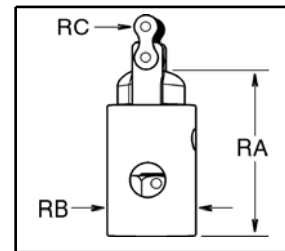
Hook Size	BL-O Stock No.	BL-P Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)												
						A	B	C	D	E	F	G	H	I	J	LA	LB	LC
4:1/4-9/32	1051409	1051508	PIN-LOK	1.5	1.13	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	67.0	44.5	6.35-7.15
5:5/16-3/8	1051442	1051541	ROLLOX	2.1	2.04	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	76.0	57.0	7.95-9.50
7:3/8-7/16	1051464	1051563	ROLLOX	3.8	5.0	168	132	28.4	6.35	38.1	51.0	125	41.4	36.6	28.7	111	76.0	9.50-14.3
7:1/2-9/16	1051486	1051585	ROLLOX	3.8	5.0	168	132	28.4	6.35	38.1	51.0	125	41.4	36.6	28.7	111	76.0	9.50-14.3

* Ultimate Load is 4 times the Working Load Limit.

ROLLER CHAIN NEST



- Attachment with ball-bearing swivel and full-floating connector.
 - BL-S - with Self-Closing Gate
 - BL-R - with Manual Closing Gate



Hook Size	BL-S Stock No.	BL-R Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)												
						A	B	C	D	E	F	G	H	I	J	RA	RB	RC
4 : #50	1051310	1051200	PIN-LOK	.68	1.32	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	89.5	44.5	15.9
5 : #60	1051321	1051211	ROLLOX	1.13	2.36	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	108	54.0	19.1
6 : #60	1051332	1051222	ROLLOX	1.13	2.81	158	119	31.8	6.35	35.3	41.7	116	39.9	34.0	24.6	108	54.0	19.1

* Ultimate Load is 4 times the Working Load Limit.

Crosby® / Bullard® Golden Gate® Hooks



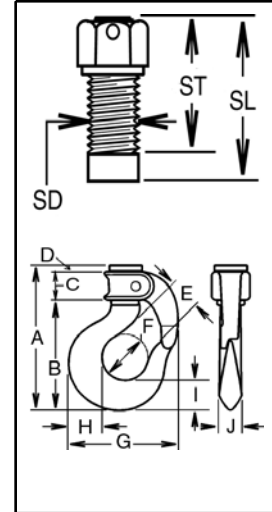
SEE APPLICATION AND WARNING INFORMATION

On Pages 114 - 115

STANDARD LENGTH SHANK HOOKS



- For use on existing load blocks, with standard shank length.
- No.'s 2 through 12 style hooks are threaded approximately 80% of shank length.
 - **BL-D** - with Self-Closing Gate
 - **BL-B** - with Manual Closing Gate



Hook Size	BL-D Stock No.	BL-B Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)												
						A	B	C	D	E	F	G	H	I	J	SD	SL	ST
2	1050606	1050408	PIN-LOK	.91	.50	105	76.2	23.6	4.06	24.6	31.8	73.0	20.6	19.1	14.2	12.7	23.1	15
3	1050617	1050419	PIN-LOK	1.3	.59	114	84.1	23.9	5.58	26.9	35.1	81.0	23.9	21.3	16.0	14.2	31.8	19.1
4	1050628	1050430	PIN-LOK	1.5	.77	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	16	33.3	30.2
5	1050639	1050441	ROLLOX	2.1	1.13	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	19.1	33.3	25.4
6	1050650	1050452	ROLLOX	3.6	1.59	158	119	31.8	6.35	35.3	41.7	116	39.9	34.0	24.6	22.4	43	29.5
7	1050661	1050463	ROLLOX	3.8	2.36	168	132	28.4	6.35	38.1	51.0	125	41.4	36.6	28.7	25.4	46	35.1
8	1050672	1050474	ROLLOX	5.0	3.22	182	147	26.9	7.11	44.5	57.0	148	51.0	41.9	31.2	28.7	52.5	38.1
9	1050683	1050485	ROLLOX	6.5	4.31	199	164	26.9	7.87	47.8	63.5	165	52.5	46.0	35.1	31.8	62	46
11 †	1050694	1050496	TIP-LOK	8.3	7.08	244	203	31.8	7.87	57.0	76.0	192	67.0	57.0	41.1	38.1	68.5	47.8
12 †	1050705	1050507	TIP-LOK	11.2	9.53	267	225	31.8	9.65	63.5	82.5	221	74.5	65.5	49.3	41.4	73	54
13 †	1050716	1050518	TIP-LOK	13.6	13.6	285	242	31.8	9.65	76.0	95.0	245	83.5	70.0	49.3	44.5	89	56
14 †	1050727	1050529	TIP-LOK	16.8	18.1	320	273	35.8	9.65	86.0	108	279	89.0	75.5	60.5	51	92.5	60.5

* Ultimate Load is 4 times the Working Load Limit.

† Requires a drawing indicating the hook's exact shank diameter, shank length, thread length and throat opening requirements. If a drawing is not available, complete a Crosby/Bullard HOOKDATA FORM on page 333.

Hook No.'s 2 through 12 style hooks are threaded approximately 80% of the shank length.

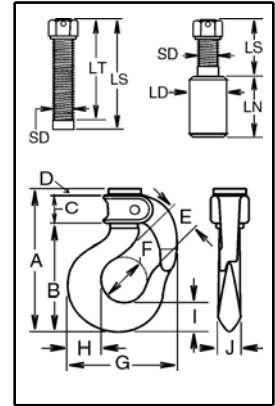
Crosby® / Bullard® Golden Gate® Hooks

SEE APPLICATION AND WARNING INFORMATION
On Pages 114 - 115

LONG LENGTH SHANK HOOKS



- For use on existing load blocks requiring extra shank length.
- No.'s 4 through 9 style hooks are threaded approximately 80% of shank length.
 - BL-K - with Self-Closing Gate
 - BL-I - with Manual Closing Gate



Hooks & Swivels

Hook Size	BL-K Stock No.	BL-I Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)													
						A	B	C	D	E	F	G	H	I	J	LD	LN	LS	LT
4 :1/2	1061002	1050804	PIN-LOK	1.45	.86	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	12.7	11.2	81.0	81.0
4:9/16	1061013	1050815	PIN-LOK	1.5	.86	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	14.2	12.2	81.0	81.0
4 :5/8	1061024	1050826	PIN-LOK	1.5	.86	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1	16.0	14.0	84.0	81.0
5	1061035	1050837	ROLLOX	2.1	1.36	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3	19.1	16.0	90.5	82.5
6	1061046	1050848	ROLLOX	3.6	1.72	158	119	31.8	6.35	35.3	41.7	116	39.9	34.0	24.6	22.4	19.1	103	90.0
7	1061057	1050859	ROLLOX	3.8	2.68	168	132	28.4	6.35	38.1	51.0	125	41.4	36.6	28.7	25.4	22.4	116	105
8	1061068	1050870	ROLLOX	5.0	3.54	182	147	26.9	7.11	44.5	57.0	148	51.0	41.9	31.2	28.4	23.9	129	114
9	1061079	1050881	ROLLOX	6.5	4.90	199	164	26.9	7.87	47.8	63.5	165	52.5	46.0	35.1	31.8	26.9	141	125
12 ††	1061101	1050903	TIP-LOK	11.2	12.7	267	225	31.8	9.65	63.5	82.5	221	74.5	65.5	49.3	41.4	39.6	137	118
13 ††	1061112	1050914	TIP-LOK	13.6	15.9	285	242	31.8	9.65	76.0	95.5	245	83.5	70.0	49.3	44.5	38.1	187	146
14 ††	1061123	1050925	TIP-LOK	16.8	20.4	320	273	35.8	9.65	86.0	108	279	89.0	75.5	60.5	51.0	50.8	137	102
16 †	1061134	1050936	TIP-LOK	30.0	46.7	388	332	38.1	16.0	102	127	346	118	92.0	76.0	70.0	70.0	406	178
17 †	1061156	1050958	TIP-LOK	60.0	168	615	522	66.8	23.9	146	178	470	165	152	113	102	100	578	356

* Ultimate Load is 4 times the Working Load Limit.

† Requires a drawing indicating the hook's exact shank diameter, shank length, thread length and throat opening requirements. If a drawing is not available, complete a Crosby/Bullard HOOK DATA FORM as shown on page 333.

Hook No.'s 4 through 9 are threaded approximately 80% of the shank length.

‡ Hook will have the shank extended by use of a Coupling Nut.

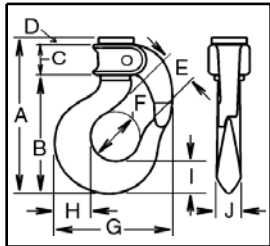
Crosby® / Bullard® Golden Gate® Hooks



SEE APPLICATION AND WARNING INFORMATION

On Pages 114 - 115

BL-PKU DOUBLE ENDED HOOK



Double Ended Hook

Available only with Manual Closing gate.

Hook Size and Type	BL-PKU Stock No.	Gate Type	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)									
					A	B	C	D	E	F	G	H	I	J
4PKU	1051805	PIN-LOK	1.5	2.27	124	92.2	25.4	5.58	28.7	38.1	92.0	29.5	25.4	19.1
5PKU	1051816	ROLLOX	2.1	3.63	143	105	31.2	6.35	31.8	41.7	104	33.3	28.4	21.3
6PKU	1051827	ROLLOX	3.6	5.00	158	119	31.8	6.35	35.3	41.7	116	39.9	34.0	24.6

* Ultimate Load is 4 times the Working Load Limit.

Crosby® / Bullard Golden Gate Hooks Service Parts

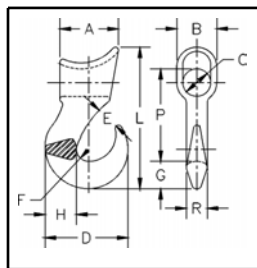
Hook Size	Gate Type	BL-GA Gate Assemblies		BL-RK Gate Repair Kit Stock No.
		Manual Close Stock No.	Self Close Stock No.	
2	PIN-LOK	1100298	1100309	1100100
3	PIN-LOK	1100320	1100331	1100100
4	PIN-LOK	1100342	1100353	1100100
5	ROLLOX	1100364	1100375	1100111
6	ROLLOX	1100386	1100397	1100111
7	ROLLOX	1100408	1100419	1100122
8	ROLLOX	1100430	1100441	1100122
9	ROLLOX	1100452	1100463	1100122
10	TIP-LOK	1100474	1100485	1100133
11	TIP-LOK	1100496	1100507	1100144
12	TIP-LOK	1100518	1100529	1100155
13	TIP-LOK	1100540	1100551	1100166
14	TIP-LOK	1100562	1100573	1100177
15	TIP-LOK	1100584	1100595	1100188
16	TIP-LOK	1100606	1100617	1100199
17	TIP-LOK	1100639	1100628	1100210

Crosby® Choker Hooks



A-350

- Forged Alloy Steel -- Quenched and Tempered.



A-350 Sliding Choker Hook

Single Part Rope Size (in. - mm)	Eight Part Rope Size (mm)	A-350 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)										
					A	B	C	D	E	F	G	H	L	P	R
3/8 - 10	-	1028042	1.13	.35	52.5	28.7	16.0	61.0	16.0	9.65	21.3	23.1	109	66.0	16.0
1/2 - 13	3	1028060	1.50	.54	57.0	33.3	19.1	75.5	19.8	12.7	24.6	26.9	126	78.5	19.1
† 5/8 - 16	4	1028088	2.27	1.31	77.5	41.4	19.1	90.5	23.9	14.2	28.7	33.3	162	98.5	25.4
† 5/8 - 16	4	1028104	2.27	1.22	77.5	41.4	25.4	90.5	23.9	14.2	28.7	33.3	162	102	28.7
† 3/4 - 20	6	1028122	3.63	2.35	86.0	54.0	25.4	108	29.5	16.0	36.6	41.4	195	116	28.7
† 3/4 - 20	6-7	1028140	3.63	2.27	86.0	54.0	36.6	108	29.5	16.0	36.6	41.4	195	121	28.7

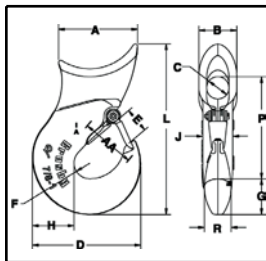
- * Ultimate Load is 5 times the Working Load Limit.
- † Determine EYE diameter "C", before ordering.

Hooks & Swivels



A-350L

- Cast Alloy Steel - Quenched and Tempered.
- Low profile hook tip.
- New integrated latch (S-4320) meets the World Class standard for lifting.



A-350L Sliding Choker Hook with Latch

Single Part Rope Size (mm)	A-350L Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)													Replacement Latch Stock No.
				A	B	C	D	E	F	G	H	J	L	P	R	AA	
22-25	1028177	6.75	4.40	112	53.8	31.8	154	35.8	22.4	51.0	59.2	42.4	243	145	38.1	76.2	1096515

- * Ultimate Load is 5 times the Working Load Limit.

Crosby® SHUR-LOC® Eye Hooks



Fatigue Rated



SEE APPLICATION AND WARNING INFORMATION

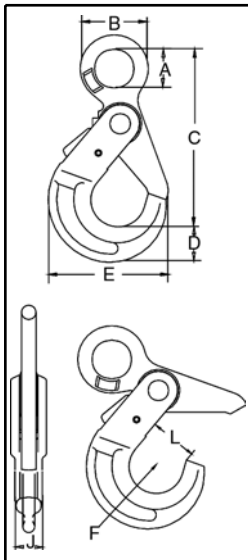
On Pages 208-209

S-316A



- Positive Lock Latch is Self-Locking when hook is loaded.
- Forged Alloy Steel- Quenched and Tempered.
- Rated for both Wire Rope and Grade 8 Chain.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 8 chain fittings.
- Fatigue rated.
- The SHUR-LOC® hook, if properly installed and locked, can be used for personnel lifting applications and meets the intent of OSHA Rule 1926.550 (g) (4) (iv) (B).
- G-414 Heavy Thimble should be used with wire rope slings.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Trigger repair Kit available (S-4316). Consist of spring, roll pin and trigger.
- Designed with Engineered Flat to connect to Grade 8 chain fittings.
- "Look for the color Gold - Crosby Alloy Hooks".

S-316A SHUR-LOC® Eye Hook



Chain Size		S-316A Stock No.	Grade 80 Alloy Chain Working Load Limit (t) 4:1 *	Wire Rope XIP IWRC Mechanical Splice		Weight Each (kg)
(in.)	(mm)			Size (mm)	Working Load Limit (t) 5:1 *	
-	6	1097918	1.12	8	.9	.39
1/4-5/16	7-8	1097920	2.0	11	1.7	.82
3/8	10	1097921	3.15	13	2.3	1.47
1/2	13	1097922	5.3	16	3.5	2.70
5/8	16	1097926	8.0	22	6.9	5.78

* Ultimate Load is 4 times the Working Load Limit based on Grade 8 Chain.

S-316A Stock No.	Dimensions (mm)								Engineered Flat Size for S-325A (in.) - (mm)
	A	B	C	D	E	F	J	L	
1097918	19.8	36.1	100	20.1	66.0	17.0	16.0	28.7	-
1097920	27.4	50.5	135	27.9	89.0	22.1	20.6	35.1	1/4-5/16", 7-8mm
1097921	33.0	62.0	167	29.7	112	27.9	23.9	44.5	3/8", 10mm
1097922	41.9	80.0	209	42.4	138	32.0	29.5	53.5	1/2", 13mm
1097926	56.0	100	256	52.0	167	38.1	38.1	63.0	5/8", 16mm

Crosby® SHUR-LOC® Swivel Hooks



Fatigue Rated

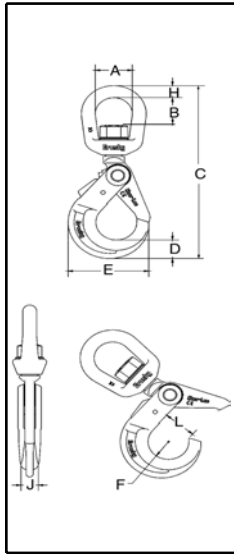
SEE APPLICATION AND WARNING INFORMATION
On Pages 208-209

S-326A



- Positive Lock Latch is Self-Locking when hook is loaded.
- Forged Alloy Steel - Quenched and Tempered.
- Rated for both Wire Rope and Grade 8 Chain.
- Meets ASTM A-952-96 and proposed Euronorm standards for Grade 8 chain fittings.
- Fatigue rated.
- The SHUR-LOC® hook, if properly installed and locked, can be used for personnel lifting applications and meets the intent of OSHA Rule 1926.550 (g) (4) (iv) (B).
- G-414 Heavy Thimble should be used with wire rope slings.
- Individually Proof Tested at 2-1/2 times the Working Load Limit with certification.
- Trigger repair Kit available (S-4316). Consists of spring, roll pin and trigger.
- Designed to rotate under load during infrequent, noncontinuous rotation.
- "Look for the color Gold - Crosby Alloy Hooks".

U.S. Patent 5,381,650 and foreign equivalents.



S-326A SHUR-LOC® Swivel Hooks

Chain Size		S-326A Stock No.	Grade 8 Alloy Chain Working Load Limit (t) 4:1*	Wire Rope XIP IWRC Mechanical Splice		Weight Each (kg)
(in.)	(mm)			Size (mm)	Working Load Limit (t) 5:1 *	
-	6	1004201	1.12	8	9	.57
1/4-5/16	7-8	1004210	2.0	11	1.7	1.18
3/8	10	1004223	3.15	13	2.3	2.13
1/2	13	1004234	5.3	16	3.5	3.92
5/8	16	1004235	8.0	22	6.9	7.71

* Ultimate Load is 4 times the Working Load Limit based on Grade 8 Chain.

S-326A Stock No.	Dimensions (mm)									
	A	B	C	D	E	F	H	J	L	
1004201	38.1	33.5	156	20.1	66.0	17.0	12.7	16.0	28.7	
1004210	44.5	40.4	193	27.9	89.0	22.1	16.0	20.6	35.1	
1004223	51.0	43.9	224	29.7	112	27.9	19.1	23.9	44.5	
1004234	63.5	60.5	284	42.4	138	32.0	25.4	29.5	53.5	
1004235	70.0	64.5	330	52.0	167	38.1	28.7	38.1	63.0	

Hooks & Swivels

Crosby® Forged Hooks

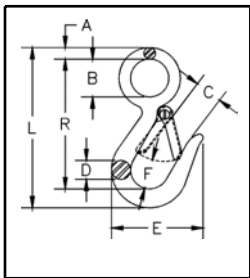


G-3315



- Forged Carbon Steel -- Quenched and Tempered.
- Pressed steel latches and stainless steel springs, bolts and nuts.
- For replacement latch kit, order Stock No. 9900299.

G-3315 Snap Hooks



Hook Size (in.)	G-3315 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							
				A	B	C	D	E	F	L	R
7/16	1023056	.34	.11	6.35	19.1	19.1	11.2	57.0	19.1	100	82.5
9/16	1023074	.45	.22	8.65	28.4	20.6	14.2	68.5	22.4	120	97.5

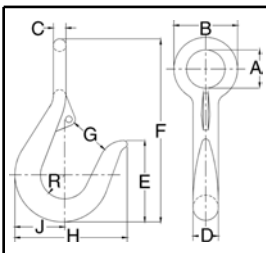
* Ultimate Load is 4 times the Working Load Limit.

1210



1210 Round Reverse Eye Hook

- Forged Carbon Steel -- Galvanized.



Size (in.)	1210 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Latch Stock No.	Dimensions (mm)									
					A	B	C	D	E	F	G	H	J	R
1/2	919019	.14	.18	1090027	20.6	35.1	7.10	12.7	41.1	102	19.1	57.0	24.6	11.9
5/8	919037	.18	.27	1090027	23.9	39.6	7.85	15.7	51.0	114	23.9	70.0	31.0	15.0
3/4	919055	.31	.50	1090045	28.4	47.8	9.65	19.1	57.0	133	26.9	76.0	36.6	17.5
7.8	919073	.54	.73	1096468	30.2	52.5	11.2	22.4	76.0	165	31.8	86.0	41.4	19.1
1 - 1-1/8	919091	.82	.91	1090081	38.1	70.0	15.7	28.4	89.0	203	38.1	111	51.0	23.9
1-1/4 - 1-3/8	919135	1.2	2.49	1090081	47.8	89.0	20.6	35.1	102	232	41.1	127	60.5	26.9

* Ultimate Load is 4 times the Working Load Limit.

Crosby® Forged Hooks

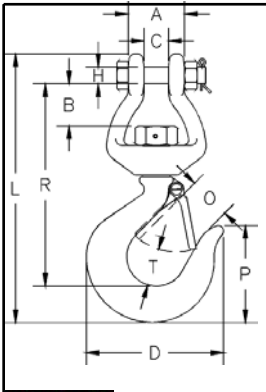


S-3316



- Easily attaches to any chain and electric hoist with welded link load chain, roller chain or wire rope with suitable end fitting.
- Swivel jaw is forged.

S-3316 Replacement Hook



Working Load Limit (t)*	S-3316 Stock No.	Weight Each (kg)	Dimensions (mm)										Rep. Latch Kit Stock No.
			A	B	C	D	H	L	O	P	R	T	
.45	1023029	.57	33.3	19.3	14.2	81.0	9.65	155	24.6	57.0	117	20.6	1093444
.91	1023047	1.18	39.6	25.4	17.5	104	11.2	195	28.4	72.0	148	30.2	1093462

* Ultimate Load is 5 times the Working Load Limit.

Hooks & Swivels



S-377

- Forged Carbon Steel - Quenched and Tempered.
- Meets the performance requirements of Federal Specification RR-C-271D, Type V, Class 6, except for those provisions required of the contractor.

S-377 Barrel Hooks



Working Load Limit Per Pair (t)*	S-377 Stock No. Per Pair	Weight Each Per Pair (kg)	Dimensions (mm)			
			I.D. of Eye	O.D. of Eye	Overall Length	Width of Lip
1.0	1028248	1.61	39.6	71.4	127	73.2

* Ultimate Load is 4 times the Working Load Limit.



A-378

- Forged Alloy Steel - Quenched and Tempered.
- Deep straight throat permits efficient handling of flat plates or large cylindrical shapes.

A-378 Sorting Hook



Working Load Limit at tip of Hook (t)*	Working Load Limit at bottom of Hook (t)*	A-378 Stock No.	Style	Weight Each (kg)	Dimensions (mm)			
					I.D. of Eye	Overall Length	Opening at top of Hook	Radius at bottom of Hook
1.8	6.8	1028024	No Handle	2.91	35.0	246	71.4	15.9
1.8	6.8	1028033	With Handle	2.91	35.0	246	71.4	15.9

* Ultimate Load is 4 times the Working Load Limit.

Crosby® Forged Hooks



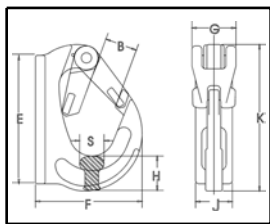
SEE APPLICATION AND WARNING INFORMATION

On Pages 120 - 121

BH-313



- Designed for attachment to mobile lifting equipment to provide a pick point for easy sling attachment.
- Forged Alloy Steel.
- Wide range of sizes available: 1-10 Metric Ton capacity.
- Large weld pad.
- Heavy duty latch interlocks with the hook tip. Replacement latches available.
- Detailed installation and application instructions included with each hook.



BH-313 Weld-On Hooks

Working Load Limit (t)*	BH-313 Stock No.	Weight Each (kg)	Dimensions (mm)								Replacement Latch Stock No.
			B	E	F	G	H	J	K	S	
1	1029105	.52	23.1	97.0	71.0	36.1	26.9	25.9	107	18.0	1092101
2	1029114	.84	23.1	82.0	91.0	36.1	24.9	34.0	115	21.1	1092101
3	1029123	1.18	29.0	117	105	36.1	31.0	36.1	131	23.9	1092101
4	1029132	1.90	34.0	131	114	46.0	36.1	42.9	147	29.0	1092102
5	1029141	2.55	34.0	161	133	47.0	45.0	43.9	173	29.0	1092102
8	1029150	3.30	35.1	166	135	47.0	52.0	52.0	178	39.1	1092102
10	1029169	5.00	49.0	205	168	47.0	57.0	54.0	222	39.1	1092103

* Ultimate Load is 5 times the Working Load Limit.



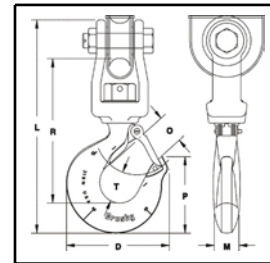
SEE APPLICATION AND WARNING INFORMATION

On Pages 112 - 113

S-3319



- Designed for utility applications using synthetic rope.
- Capacities of 1.63, 2.50 and 4.50 metric tons.
- Design of hook provides needed overhaul weight.
- Hook is forged Alloy Steel - Quenched and Tempered.
- Utilizes spool & shield designed to:
 - Protect rope
 - Keep rope positioned correctly on spool.
 - Provide wider rope bearing surface resulting in an increased area for load distribution and reduces rope abrasion.
- Can be proof tested to 2 times the Working Load Limit.
- Low profile hook tip designed to utilize Crosby integrated latch (S-4320), that meets the World class standard for lifting.



S-3319 Utility Swivel Hook

Working Load Limit (t)*	S-3319 Stock No.	Weight Each (kg)	Hook ID Code	Synthetic Rope Size (mm)	Dimensions (mm)							Replacement Latch Kit Stock No.
					D	L	M	O	P	R	T	
1.63	1002054	1.90	H	14 - 16	101	222	23.9	29.5	70.6	151	29.5	1096468
2.50	1002063	3.62	I	19 - 21	123	268	30.2	35.8	88.1	179	38.9	1096515
4.50	1002072	6.80	J	22 - 28	160	324	36.6	45.2	117	221	49.3	1096562

* Ultimate Load is 5 times the Working Load Limit.

This hook is a positioning device and is not intended to rotate under load. For swivel hooks designed to rotate under load, see pages 94, 101, 106-110. Use in salt water requires shank and nut inspection in accordance with A.S.M.E. B30.10-1.2.1(b)(2)(c) 1996.

Crosby® Forged Cargo Hooks



1021



Portland Pattern

Size	1021 Stock No.	Working Load Limit (t)*	Weight Each (kg)
22	890307	9.07	7.48

* Ultimate Load is 4 times the Working Load Limit.

1022



New York Pattern

Size	1022 Stock No.	Working Load Limit (t)*	Weight Each (kg)
12	890343	4.54	11.3
13	890361	9.07	14.3

* Ultimate Load is 4 times the Working Load Limit.

1023



Seattle Pattern

Size	1023 Stock No.	Working Load Limit (t)*	Weight Each (kg)
42	890423	4.54	20.0
43	890441	9.07	32.7

* Ultimate Load is 4 times the Working Load Limit.

Crosby® Swivels

Load Rated™

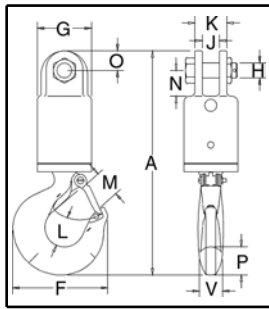


- EQUIPPED WITH TAPERED ROLLER THRUST BEARING.
- Designed to swivel under load.
- All swivels individually proof tested with certification.
- All hooks furnished with latches assembled.
- All jaws complete with bolts, nuts and cotter pins.
- Pressure lube fitting provided.
- NOT TO BE USED ON DEMOLITION (WRECKING) BALLS.
- Other types and capacities up to 600 tons, available to meet your requirements.



IMPORTANT - Crosby Swivels should only be used with the recommended wire rope. Contact the wire rope manufacturer for the proper wire rope to be used with Crosby Swivels.

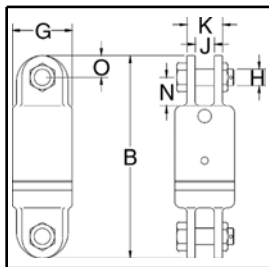
S-1 Jaw & Hook



Swivel No.	S-1 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)											
					A	F	G	H	J	K	L	M	N	O	P	V
3-S-1	297011	3	13	4.45	291	123	70.0	19.1	22.4	41.1	38.9	35.8	33.3	25.4	36.6	28.4
5-S-1	297217	5	16	7.04	339	160	76.0	22.4	25.4	57.0	49.3	42.9	41.1	28.4	46.0	36.6
8-S-1	297413	8-1/2	19	13.3	418	192	102	25.4	39.5	71.5	62.5	56.5	54.0	35.1	57.0	41.1
10-S-1	297618	10	22	21.2	502	212	114	38.1	44.5	86.0	66.0	61.0	89.0	44.5	66.0	49.3
15-S-1	297814	15	26	33.5	565	263	127	38.1	44.5	86.0	71.5	81.0	89.0	44.5	76.0	60.5
25-S-1	298118	25	-	64	680	346	152	51.0	51.0	117	87.5	92.0	93.5	60.5	93.0	76.0
35-S-1	298216	35	-	100	760	367	165	51.0	51.0	117	98.5	95.5	93.5	60.5	116	81.0
45-S-1	298314	45	-	114	891	392	178	57.0	63.5	127	121	108	102	76.0	129	82.5

* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

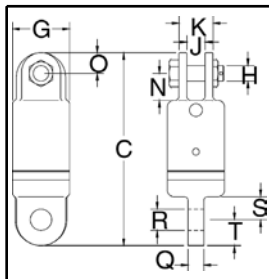
S-2 Jaw & Jaw



Swivel No.	S-2 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)						
					B	G	H	J	K	N	O
3-S-2	297020	3	13	4.37	236	70.0	19.1	22.4	41.1	33.3	25.4
5-S-2	297226	5	16	6.21	262	76.0	22.4	25.4	57.0	41.1	28.4
8-S-2	297422	8-1/2	19	11.9	321	102	25.4	39.5	71.5	54.0	35.1
10-S-2	297627	10	22	20.8	426	114	38.1	44.5	86.0	89.0	44.5
15-S-2	297823	15	26	28.5	435	127	38.1	44.5	86.0	89.0	44.5
25-S-2	298127	25	-	64	527	152	51.0	51.0	117	93.5	60.5
35-S-2	298225	35	-	70	527	165	51.0	51.0	117	93.5	60.5
45-S-2	298323	45	-	107	641	178	57.0	63.5	127	102	76.0

* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

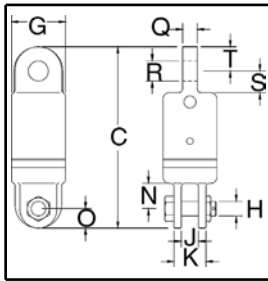
S-3 Jaw & Eye



Swivel No.	S-3 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)										
					C	G	H	J	K	N	O	Q	R	S	T
3-S-3	297039	3	13	4.14	237	70.0	19.1	22.4	41.1	33.3	25.4	19.1	26.2	28.4	31.8
5-S-3	297235	5	16	6.12	256	76.0	22.4	25.4	57.0	41.1	28.4	25.4	32.5	31.8	31.8
8-S-3	297431	8-1/2	19	11.3	311	102	25.4	39.5	71.5	54.0	35.1	31.8	35.8	41.1	38.1
10-S-3	297636	10	22	19.7	409	114	38.1	44.5	86.0	89.0	44.5	42.9	42.9	70.0	47.8
15-S-3	297832	15	26	27.7	425	127	38.1	44.5	86.0	89.0	44.5	49.3	51.5	70.0	54.0
25-S-3	298136	25	-	61	546	152	51.0	51.0	117	93.5	60.5	57.0	58.5	98.5	60.5
35-S-3	298234	35	-	68	546	165	51.0	51.0	117	93.5	60.5	57.0	58.5	98.5	60.5
45-S-3	298332	45	-	102	657	178	57.0	63.5	127	102	76.0	63.5	64.5	102	76.0

* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

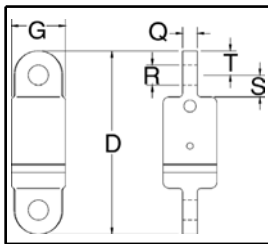
Crosby® Swivels



S-4 Eye & Jaw

Swivel No.	S-4 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)										
					C	G	H	J	K	N	O	Q	R	S	T
3-S-4	297048	3	13	4.08	237	70.0	19.1	22.4	41.1	33.3	25.4	19.1	26.2	28.4	31.8
5-S-4	297244	5	16	5.60	256	76.0	22.4	25.4	57.0	41.1	28.4	25.4	32.5	31.8	31.8
8-S-4	297440	8-1/2	19	13.2	311	102	25.4	39.5	71.5	54.0	35.1	31.8	35.8	41.1	38.1
10-S-4	297645	10	22	20.0	409	114	38.1	44.5	86.0	89.0	44.5	42.9	42.9	70.0	47.8
15-S-4	297841	15	26	27.7	425	127	38.1	44.5	86.0	89.0	44.5	49.3	51.5	70.0	54.0
25-S-4	298145	25	-	61	546	152	51.0	51.0	117	93.5	60.5	57.0	58.5	98.5	60.5
35-S-4	298243	35	-	68	546	165	51.0	51.0	117	93.5	60.5	57.0	58.5	98.5	60.5
45-S-4	298341	45	-	102	657	178	57.0	63.5	127	102	76.0	63.5	64.5	102	76.0

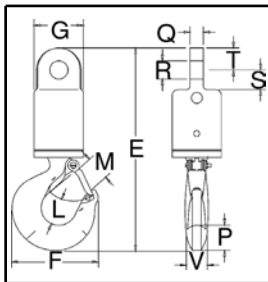
* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.



S-5 Eye & Eye

Swivel No.	S-5 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)					
					D	G	Q	R	S	T
3-S-5	297057	3	13	3.86	239	70.0	19.1	26.2	28.4	31.8
5-S-5	297253	5	16	5.13	249	76.0	25.4	32.5	31.8	31.8
8-S-5	297459	8-1/2	19	13.3	302	102	31.8	35.8	41.1	38.1
10-S-5	297654	10	22	19.1	394	114	42.9	42.9	70.0	47.8
15-S-5	297850	15	26	22.2	416	127	49.3	51.5	70.0	54.0
25-S-5	298154	25	-	59	565	152	57.0	58.5	98.5	60.5
35-S-5	298252	35	-	66	565	165	57.0	58.5	98.5	60.5
45-S-5	298350	45	-	98	673	178	63.5	64.5	102	76.0

* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.



S-6 Eye & Hook

Swivel No.	S-6 Stock No.	Working Load Limit (t)*	Wire Rope Size (mm)	Weight Each (kg)	Dimensions (mm)										
					E	F	G	L	M	P	Q	R	S	T	V
3-S-6	297066	3	13	4.23	292	123	70.0	38.9	35.8	36.6	19.1	26.2	28.4	31.8	28.4
5-S-6	297262	5	16	6.46	332	160	76.0	49.3	42.9	46.0	25.4	32.5	31.8	31.8	36.6
8-S-6	297468	8-1/2	19	14.5	408	192	102	62.5	56.5	57.0	31.8	35.8	41.1	38.1	41.1
10-S-6	297663	10	22	20.6	486	212	114	66.0	61.0	66.0	42.9	42.9	70.0	47.8	49.3
15-S-6	297869	15	26	28.6	540	263	127	71.5	81.0	76.0	49.3	51.5	70.0	54.0	60.5
25-S-6	298163	25	-	61	699	346	152	87.5	92.0	93.0	57.0	58.5	98.5	60.5	76.0
35-S-6	298261	35	-	98	780	357	165	98.5	95.5	116	57.0	58.5	98.5	60.5	81.0
45-S-6	298369	45	-	122	907	392	178	121	108	129	63.5	64.5	102	76.0	82.5

* Individually Proof Tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

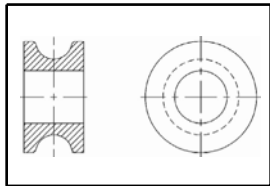
Crosby® Swivels



ANGULAR CONTACT BEARING SWIVELS



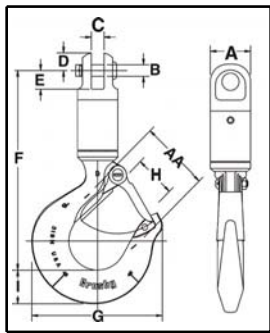
- Wide range of product available.
- Capacity: 0.40 through 31.5 tonnes
- Wire Rope Sizes: 3 mm through 38 mm
- Angular contact bearings maximize efficiency, reliability and service life of swivel and extend the life of the wire rope.
- Designed for high rotation speed: Lower torque required to initiate rotation.
- Individually Proof Tested to 2 times the Working Load Limit with certification.
- Hook models utilize genuine Crosby hooks which are forged alloy steel, Quenched and Tempered and contain patented QUIC-CHECK® markings.
- Design Factor of 5 to 1.
- Entire swivel is Zinc plated to resist corrosion.
- Each swivel, 7.65 tonnes and larger is furnished with a pressure lubrication fitting.



AS-20 Thimble Insert

- When terminating with wire rope clips, we recommend the use of the Thimble Insert. The result will be extended wire rope life.
- Allows standard swivel to be used in application requiring a thimble fitting.
- For use with our Bullet Style (AS-7) and Jaw Style (AS-1, AS-2, AS-3 & AS-4) swivels.
- Machined from carbon steel. Zinc plated.

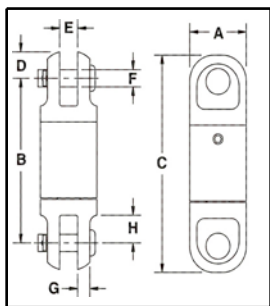
Wire Rope Size (mm)	AS-20 Stock No.
13	1038200
16	1038209
19	1038218
22-25	1038227
28-32	1038236
38	1038245



AS-1 Jaw & Hook

AS-1 JAW & HOOK				Dimensions (mm)									Deformation Indicator AA
Working Load Limit (t)*	Wire Line Size (mm)	AS-1 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G	H	I	
.40	3	1016001	.32	22.4	6.35	6.35	9.65	10.4	110	72.5	23.6	18.5	38.1
.68	6	1016010	.68	33.3	9.65	7.85	11.2	14.2	138	80.0	24.6	21.3	38.1
1.35	10	1016025	1.04	41.4	12.7	12.7	17.5	19.8	161	102	29.5	29.0	38.1
2.70	13	1016026	2.95	51.0	19.1	19.1	23.9	30.2	221	123	35.8	36.6	63.5
4.50	16	1016040	5.85	63.5	22.4	25.4	28.7	38.9	272	160	42.9	46.2	76.0
7.65	19	1016045	12.0	76.0	30.2	39.5	34.0	53.0	347	212	61.0	66.0	102
9.00	22	1016056	24.0	102	38.1	44.5	44.5	89.0	456	263	81.0	76.0	127
13.5	25	1016064	24.0	102	38.1	44.5	44.5	89.0	456	263	81.0	76.0	127
22.5	32	1016075	44.0	127	51.0	51.0	60.5	93.5	530	346	82.5	92.0	165
31.5	38	1016082	63.5	127	51.0	51.0	60.5	93.5	610	357	76.0	116	178

* Ultimate Load is 5 times the Working Load Limit.



AS-2 Jaw & Jaw

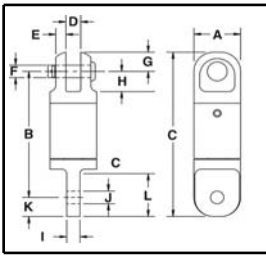
AS-2 JAW & JAW				Dimensions (mm)							
Working Load Limit (t)*	Wire Line Size (mm)	AS-2 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G	H
.40	3	1016103	.18	22.4	60.5	79.5	9.65	6.35	6.35	4.80	10.4
.68	6	1016114	.41	33.3	90.0	113	11.2	7.85	9.65	5.60	14.2
1.35	10	1016122	.91	41.4	103	138	17.5	12.7	12.7	7.10	19.8
2.70	13	1016131	2.22	51.0	159	207	23.9	19.1	19.1	9.65	30.2
4.50	16	1016139	4.35	63.5	197	270	28.7	25.4	22.4	13.5	38.9
7.65	19	1016148	7.17	76.0	245	313	34.0	39.5	30.2	14.2	53.0
9.00	22	1016157	18.1	102	356	445	44.5	44.5	38.1	20.6	89.0
13.5	25	1016166	18.1	102	356	445	44.5	44.5	38.1	20.6	89.0
22.5	32	1016175	35.4	127	405	526	60.5	51.0	51.0	28.7	93.5
31.5	38	1016184	35.4	127	405	526	60.5	51.0	51.0	28.7	93.5

* Ultimate Load is 5 times the Working Load Limit.

Crosby® Swivels

Hooks & Swivels

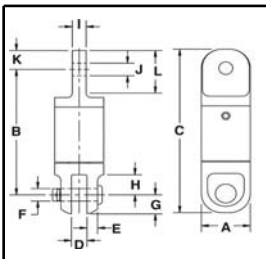
AS-3 Jaw & Eye



AS-3 JAW & EYE				Dimensions (mm)											
Working Load Limit (t)*	Wire Line Size (mm)	AS-3 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G	H	I	J	K	L
.40	3	1016205	.14	22.4	63.5	82.5	6.35	4.80	6.35	9.65	10.4	6.35	6.35	9.65	21.3
.68	6	1016216	.41	33.3	93.5	116	7.85	5.60	9.65	11.2	14.2	7.85	9.65	11.0	22.4
1.35	10	1016224	.86	41.4	106	138	12.7	7.10	12.7	17.5	19.8	12.7	16.8	16.0	35.1
2.70	13	1016232	2.09	51.0	157	207	19.1	9.65	19.1	23.9	30.2	19.1	23.1	25.0	51.0
4.50	16	1016243	4.13	63.5	200	259	25.4	13.5	22.4	28.7	38.1	25.4	31.8	30.0	67.0
7.65	19	1016250	7.08	76.0	241	311	39.5	14.2	31.8	34.0	53.0	31.8	35.8	38.0	79.5
9.00	22	1016259	17.7	102	349	440	44.5	20.6	38.1	44.5	89.0	51.0	41.4	46.0	119
13.5	25	1016268	18.1	102	341	440	44.5	20.6	38.1	44.5	89.0	51.0	51.0	54.0	119
22.5	32	1016277	35.4	127	406	527	51.0	28.7	51.0	60.5	93.5	57.0	58.5	61.0	133
31.5	38	1016286	35.4	127	406	527	51.0	28.7	51.0	60.5	93.5	57.0	58.5	61.0	133

* Ultimate Load is 5 times the Working Load Limit.

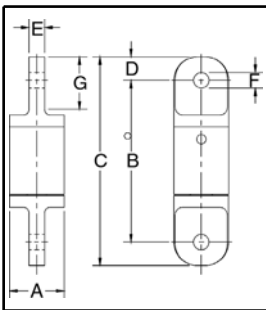
AS-4 Eye & Jaw



AS-4 EYE & JAW				Dimensions (mm)											
Working Load Limit (t)*	Wire Line Size (mm)	AS-4 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G	H	I	J	K	L
.40	3	1016306	.14	22.4	63.5	82.5	6.35	4.80	6.35	9.65	10.4	6.35	6.35	9.65	20.6
.68	6	1016314	.41	33.3	92.0	116	7.85	5.60	9.65	11.2	14.2	7.85	9.65	11.0	22.4
1.35	10	1016325	.86	41.4	106	140	12.7	7.10	12.7	17.5	19.8	12.7	16.8	16.0	34.0
2.70	13	1016332	2.09	51.0	157	207	19.1	9.65	19.1	23.9	30.2	19.1	23.1	25.4	51.0
4.50	16	1016343	4.13	63.5	200	259	25.4	13.5	22.4	28.7	36.6	25.4	31.8	30.2	67.0
7.65	19	1016352	7.12	76.0	240	311	39.5	14.2	30.2	34.0	53.0	31.8	35.8	38.1	79.5
9.00	22	1016361	17.7	102	359	451	44.5	20.6	38.1	44.5	89.0	43.7	42.2	46.0	119
13.5	25	1016370	18.1	102	351	451	44.5	20.6	38.1	44.5	89.0	51.0	51.5	54.0	119
22.5	32	1016375	34.0	127	405	527	51.0	28.7	51.0	60.5	93.5	57.0	58.5	60.5	133
31.5	38	1016379	34.0	127	405	527	51.0	28.7	51.0	60.5	93.5	57.0	58.5	60.5	133

* Ultimate Load is 5 times the Working Load Limit.

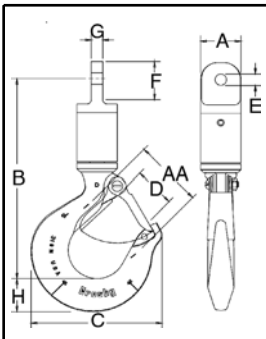
AS-5 Eye & Eye



AS-5 EYE & EYE				Dimensions (mm)						
Working Load Limit (t)*	Wire Line Size (mm)	AS-5 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G
.40	3	1016409	.14	22.4	67.0	86.0	9.65	6.35	6.35	20.6
.68	6	1016418	.41	33.3	95.0	118	11.2	7.85	9.65	22.4
1.35	10	1016427	.82	41.4	110	141	16.0	12.7	16.8	34.0
2.70	13	1016436	1.95	51.0	156	207	25.4	19.1	23.1	51.0
4.50	16	1016445	3.90	63.5	197	270	30.2	25.4	31.8	67.0
7.65	19	1016454	7.00	76.0	237	313	38.1	31.8	35.8	79.5
9.00	22	1016463	16.8	102	353	445	46.0	43.7	41.4	119
13.5	25	1016472	17.7	102	337	445	54.0	51.0	54.0	119
22.5	32	1016481	32.7	127	406	527	60.5	57.0	58.5	133
31.5	38	1016490	32.7	127	457	527	60.5	57.0	58.5	133

* Ultimate Load is 5 times the Working Load Limit.

AS-6 Eye & Hook

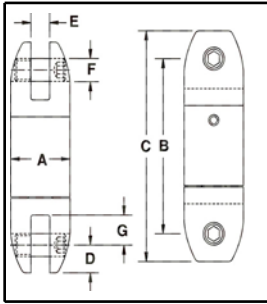


AS-6 EYE & HOOK				Dimensions (mm)										Deformation Indicator AA
Working Load Limit (t)*	Wire Line Size (mm)	AS-6 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G	H			
.40	3	1016502	.32	22.4	111	72.5	23.6	6.35	20.6	6.35	18.5	38.1		
.68	6	1016513	.68	33.3	141	80.0	24.6	9.65	22.4	7.85	21.3	38.1		
1.35	10	1016520	1.32	41.4	158	102	29.5	16.8	34.0	12.7	29.0	51.0		
2.70	13	1016529	2.81	51.0	219	123	35.8	23.1	51.0	19.1	36.6	63.5		
4.50	16	1016538	5.62	63.5	274	160	42.9	31.8	67.0	25.4	46.2	76.0		
7.65	19	1016547	10.7	76.0	343	212	61.0	35.6	79.5	31.8	66.0	102		
9.00	22	1016556	23.6	102	459	263	81.0	42.2	119	43.7	76.0	127		
13.5	25	1016565	24.0	102	448	263	81.0	51.5	119	51.0	76.0	127		
22.5	32	1016574	42.6	127	530	346	82.5	59.0	133	57.0	92.0	165		
31.5	38	1016583	62.6	127	610	357	76.0	59.0	133	57.0	116	178		

* Ultimate Load is 5 times the Working Load Limit.

Crosby® Swivels

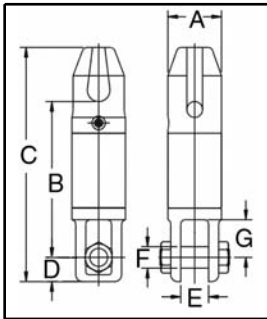
AS-7 Bullet Style Jaw & Jaw



AS-7 BULLET STYLE JAW & JAW				Dimensions (mm)						
Working Load Limit (t)*	Wire Line Size (mm)	AS-7 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G
.40	3	1016604	.18	22.4	60.5	79.5	9.65	6.35	7.85	10.2
.68	6	1016611	.50	33.3	90.0	113	11.2	7.85	9.65	14.2
1.35	10	1016622	.82	41.4	103	132	14.2	12.7	11.2	20.6
2.70	13	1016631	1.72	51.0	138	179	20.6	19.1	16.0	23.9
4.50	16	1016640	3.63	63.5	197	256	28.7	25.4	22.4	39.5
7.65	19	1016649	6.58	76.0	251	314	31.8	33.3	25.4	54.0
9.00	22	1016652	18.1	102	334	425	44.5	44.5	38.1	82.5
13.5	25	1016658	18.1	102	334	425	44.5	44.5	38.1	82.5
22.5	32	1016662	38.1	127	405	527	60.5	51.0	51.0	93.5
31.5	38	1016667	38.1	127	405	527	60.5	51.0	51.0	93.5

* Ultimate Load is 5 times the Working Load Limit.

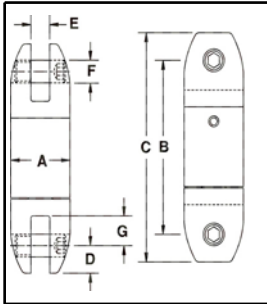
AS-11 Thimble & Jaw



AS-11 THIMBLE & JAW				Dimensions (mm)						
Working Load Limit (t)*	Wire Line Size (mm)	AS-11 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G
7.65	19	1017020	12.0	76.2	22.0	330	34.0	39.6	30.2	53.1
13.5	25	1017029	24.0	102	296	445	44.5	45.0	38.1	89.0

* Ultimate Load is 5 times the Working Load Limit.

AS-17 Bullet Style Jaw & Jaw Slurry Swivel



- The Crosby AS-17 Slurry Swivel is a zinc plated Bullet Type Swivel (AS-7), designed with two rubber lip style seals about the shaft. The threaded cap is sealed with a silicone sealant and secured with a set screw. The swivels are provided with an Alemite grease fitting for easy lubrication.

AS-17 BULLET JAW SLURRY SWIVEL				Dimensions (mm)						
Working Loadn Limit (t)*	Wire Line Size (mm)	AS-17 Stock No.	Weight Each (kg)	A	B	C	D	E	F	G
7.65	19	8013342	6.57	76.2	257	321	31.8	33.3	25.4	54.1
13.5	25	8013343	18.1	102	343	432	44.5	44.5	38.1	82.5
22.5	32	8013376	38.1	127	410	531	60.5	51.0	51.0	93.7
31.5	38	8013344	38.1	127	410	531	60.5	51.0	51.0	93.7

* Ultimate Load is 5 times the Working Load Limit.

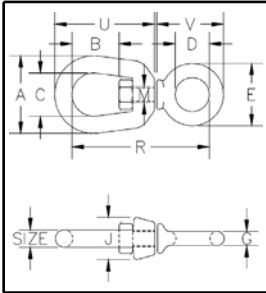
Crosby® Forged Swivels



- FORGED SWIVELS**
- Hot dip Galvanized
 - Quenched & Tempered

401, 402 and 403 swivels are positioning devices and are not intended to rotate under load. For load swivels see pages 106-110.

Hooks & Swivels

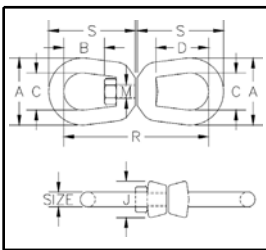


G-401 Chain Swivels

- Meets the performance requirements of Federal Specification RR-C-271D, Type VII, Class 1, except for those provisions required of the contractor.

Size (mm)	G-401 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)										
				A	B	C	D	E	G	J	M	R	U	V
6	1016233	.39	.06	31.8	17.5	19.1	15.7	28.4	6.35	17.5	7.85	57.0	42.9	31.8
8	1016251	.57	.11	6.35	41.4	20.6	25.4	19.1	35.1	7.85	20.6	69.0	52.5	37.3
10	1016279	1.02	.24	51.0	23.9	31.8	25.4	44.5	9.65	25.4	12.7	87.5	63.5	47.8
13	1016297	1.63	.51	63.5	33.3	38.1	31.8	57.0	12.7	33.3	16.0	108	81.0	62.0
16	1016313	2.36	.95	76.2	39.6	44.5	38.1	70.0	15.8	38.1	19.1	130	98.5	74.5
19	1016331	3.27	1.40	89.0	44.5	51.0	44.5	82.5	19.1	47.8	22.4	147	125	88.0

* Ultimate Load is 5 times the Working Load Limit.

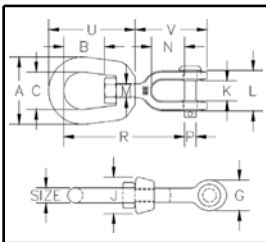


G-402 Regular Swivels

- Meets the performance requirements of Federal Specification RR-C-271D, Type VII, Class 2, except for those provisions required of the contractor.

Size (mm)	G-402 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)							
				A	B	C	D	J	M	R	S
6	1016019	.39	.10	31.8	17.5	19.1	26.9	17.5	7.85	74.5	42.9
8	1016037	.57	.18	41.4	20.6	25.4	31.8	20.6	9.65	90.0	52.0
10	1016055	1.02	.32	51.0	23.9	31.8	38.1	25.4	12.7	109	63.5
13	1016073	1.63	.60	63.5	33.3	38.1	51.0	33.3	16.0	138	81.0
16	1016091	2.36	1.13	76.0	39.5	44.5	60.5	38.1	19.1	167	98.5
19	1016117	3.27	1.82	89.0	44.5	51.0	67.0	47.8	22.4	183	109
22	1016135	4.54	2.83	102	52.0	57.0	77.5	54.0	25.4	213	127
25	1016153	5.67	4.06	114	58.5	63.5	89.0	60.5	28.7	245	146
32	1016199	8.16	7.42	143	68.5	79.5	93.5	76.0	41.4	291	172
38	1016215	20.5	20.8	178	98.5	102	106	102	57.0	435	254

* Ultimate Load is 5 times the Working Load Limit.



G-403 Jaw End Swivels

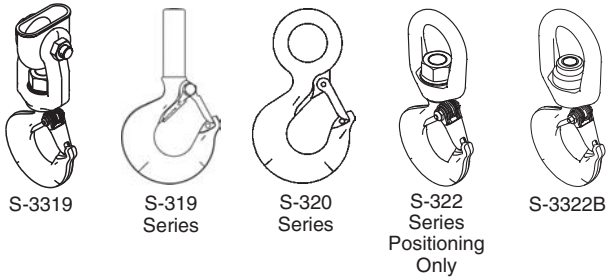
- Meets the performance requirements of Federal Specification RR-C-271D, Type VII, Class 3, except for those provisions required of the contractor.
- U.S. Patent 5,381,650 and other equivalents.

Size (mm)	G-403 Stock No.	Working Load Limit (t)*	Weight Each (kg)	Dimensions (mm)												
				A	B	C	G	J	K	L	M	N	P	R	U	V
6	1016395	.39	.10	31.8	17.5	19.1	17.5	17.5	11.9	26.2	7.85	22.4	6.35	67.0	42.9	42.9
8	1016411	.57	.15	41.4	20.6	25.4	20.6	20.6	12.7	28.7	9.65	22.4	7.85	74.5	52.0	46.0
10	1016439	1.02	.30	51.0	23.9	31.8	25.4	25.4	16.0	35.8	12.7	26.9	9.65	92.0	63.5	57.0
13	1016457	1.63	.61	63.5	33.3	38.1	33.3	33.3	19.1	44.5	16.0	33.3	12.7	114	81.0	73.0
16	1016475	2.36	1.12	76.0	39.5	44.5	41.4	38.1	23.9	52.0	19.1	38.1	16.0	135	98.5	87.5
19	1016493	3.27	1.76	89.0	44.5	51.0	47.8	47.8	28.7	64.5	22.4	44.5	19.1	154	109	102
22	1016518	4.54	2.66	102	52.0	57.0	54.0	54.0	30.2	70.0	25.4	52.0	22.4	178	127	115
25	1016536	5.67	4.46	114	58.5	63.5	67.0	60.5	44.5	94.5	28.7	71.5	28.7	217	146	151
32	1016572	8.16	7.14	145	68.5	79.5	79.5	76.0	52.0	109	41.4	71.5	35.1	248	179	162
38	1016590	20.5	24.8	178	98.5	102	143	102	73.0	152	57.0	113	57.0	374	254	275

* Ultimate Load is 5 times the Working Load Limit.

CROSBY HOIST HOOK

WARNINGS AND APPLICATION INSTRUCTIONS



Important Safety Information - Read and Follow

- A visual periodic inspection for cracks, nicks, wear, gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel in compliance with the schedule in ANSI B30.10.
- For hooks used in frequent load cycles or pulsating loads, the hook and threads should be periodically inspected by Magnetic Particle or Dye Penetrant. (Note: Some disassembly may be required.)
- Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10 degrees out of plane from the hook body, or is in any other way distorted or bent. **Note: A latch will not work properly on a hook with a bent or worn tip.**
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Remove from service any hook with a crack, nick, or gouge. Hooks with a crack, nick, or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1.
- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load, or tip load a hook. (Side loading, back loading and tip loading are conditions that damage and reduce the capacity of the hook). (See Figure 2.)
- Eye hooks, shank hooks and swivel hooks are designed to be used with wire rope or chain. Efficiency of assembly may be reduced when used with synthetic material.
- Do not swivel the S-322 swivel hook while it is supporting a load. *The S-322 is distinguishable by hex nut and flat washers.*
- The S-3322 swivel hook is designed to rotate under load. *The S-3322 is distinguishable from the S-322 by use of a round nut designed to shield bearing.*
 - The frequency of bearing lubrication on the S-3322 depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgement.
- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, Insurance, etc.. (Note: When using latches, see instructions in "Understanding: The Crosby Group Warnings" for further information.)
- Always make sure the hook supports the load. (See Figure 3). The latch must never support the load (See Figure 4).

WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550(g) for personnel hoisting by cranes and derricks, and OSHA Directive CPL 2-1.29 — Interim Inspection Procedures During Communication Tower Construction Activities. A Crosby 319, 320 or 322 hook with a PL latch attached and secured with a bolt, nut and cotter pin (or toggle pin) may be used for lifting personnel. A Crosby 319N, 320N or 322N hook with an S-4320 latch attached and secured with cotter pin or bolt, nut and pin; or a PL-N latch attached and secured with toggle pin may be used for lifting personnel. A hook with a Crosby SS-4055 latch attached shall NOT be used for personnel lifting.
- See OSHA Directive CPL 2-1.29 — Crosby does not recommend the placement of lanyards directly into the positive locking Crosby hook when hoisting personnel. Crosby requires that all suspension systems (vertical lifelines / lanyard) shall be gathered at the positive locked load hook by use of a master link, or a bolt-type shackle secured with cotter pin.
- Threads may corrode and/or strip and drop the load.
- Remove securement nut to inspect or to replace S-322 bearing washers (2).
- Hook must always support the load. The load must never be supported by the latch.
- Never apply more force than the hook's assigned Working Load Limit (WLL) rating.
- Read and understand these instructions before using hook.

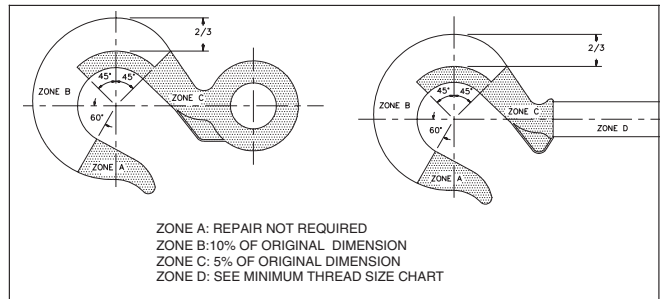


Figure 1

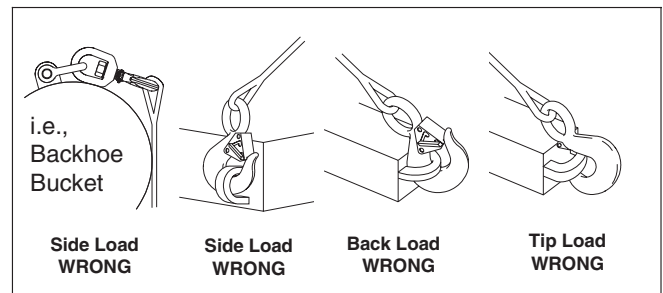


Figure 2

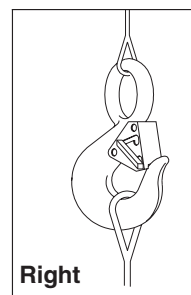


Figure 3



Figure 4

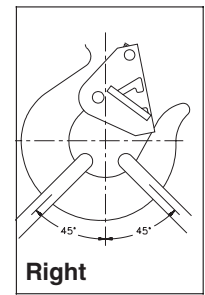
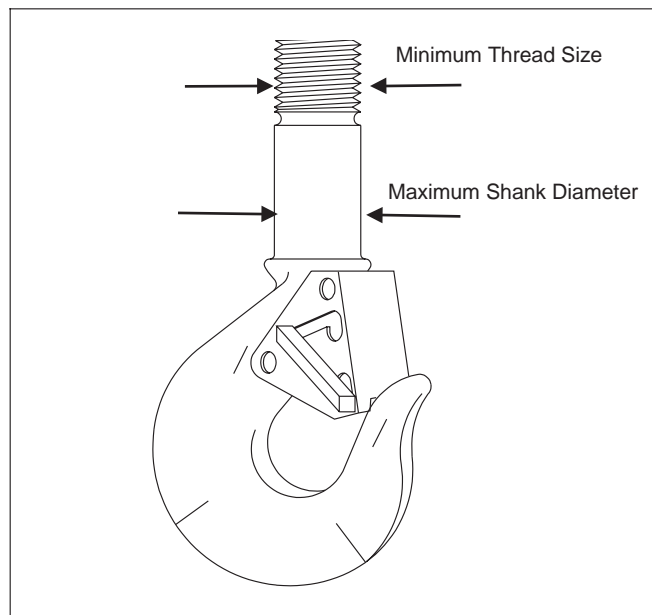


Figure 5

Read and Understand These Instructions Before Using Hooks

Important — Basic Machining and Thread Information Read and Follow

- Wrong thread and/or shank size can cause stripping and loss of load.
- The maximum diameter is the largest diameter, after cleanup, that could be expected after allowing for straightness, pits, etc.
- All threads must be Class 2 or better.
- The minimum thread length engaged in the nut should not be less than one (1) thread diameter.
- Hook shanks are not intended to be swaged on wire rope or rod. See S319SWG for hook designed for swaging.
- Hook shanks are not intended to be drilled (length of shank) and internally threaded.
- Crosby can not assume responsibility for, (A) the quality of machining, (B) the type of application, or (C) the means of attachment to the power source or load.
- Consult the Crosby Hook Identification & Working Load Limit Chart (See below) for the minimum thread size for assigned Working Load Limits (WLL).[†]
- Remove from service any Hook which has threads corroded more than 20% of the nut engaged length.



Crosby Hook Identification & Working Load Limit Chart [†]

Hook Identification			Working Load Limit ^t				Maximum Shank Diameter after Machining (mm)	Minimum Thread Size	
319-C 319-CN 320-C 320-CN 322-C 322-CN	319-A 319-AN 320-A 320-AN 322-A 322-AN	319-BN	319-C 319-CN 320-C 320-CN 322-C 322-CN	319-A 319-AN 320-A 320-AN 322-A 322-AN	319-BN	319-C 319-CN (Carbon)		319-A 319-AN (Alloy) 319-BN (Bronze)	
DC	DA	DB	.75	1.25	.5	13.4	1/2-13 unc	1/2-13 unc	
FC	FA	FB	1	1.6	.6	15.7	5/8-11 unc	5/8-11 unc	
GC	GA	GB	1.6	2.5	1	16.8	5/8-11 unc	5/8-11 unc	
HC	HA	HB	2	3.2	1.4	20.6	3/4-10 unc	3/4-10 unc	
IC	IA	IB	3.2	5.4	2.0	26.2	7/8-9 unc	7/8-9 unc	
JC	JA	JB	5	8	3.5	32.3	1 1/8-7 unc	1 1/8-7 unc	
KC	KA	KB	7.5	11.5	5.0	38.6	1 1/4-7 unc	1 3/8-6 unc	
LC	LA	LB	10	16	6.5	44.5	1 5/8-8 un	1 5/8-8 un	
NC	NA	NB	15	22	10	50.8	2-8 un	2-8 un	
OC	OA	—	20	30	—	63.5	2 1/4-8 un	2 1/4-8 un	
PC	PA	—	25	37	—	89.0	2 3/4-8 un	2 3/4-8 un	
SC	SA	—	30	45	—	89.0	3-8 un	3-8 un	
TC	TA	—	40	60	—	102	3 1/4-8 un	3 1/2-8 un	
UC	UA	—	50	75	—	114	3 3/4-8 un	4-4 unc	
—	WA	—	—	100	—	155	—	4 1/2-8 un	
—	XA	—	—	150	—	162	—	5 1/2-8 un	
—	YA	—	—	200	—	178	—	6 1/4-8 un	
—	ZA	—	—	300	—	219	—	7 1/2-8 un	

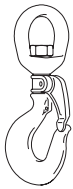
*319AN, 320-AN, and 322AN, 3322 are rated at 5 tonnes

[†] Working Load Limit - The maximum mass or force which the product is authorized to support in general service when the pull is applied in-line, unless noted otherwise, with respect to the centerline of the product. This term is used interchangeably with the following terms:

1. WLL 2. Rated Load Value 3. SWL 4. Safe Working Load 5. Resultant Safe Working Load.

CROSBY / BULLARD GOLDEN GATE® HOOK

WARNING AND APPLICATION INSTRUCTIONS



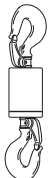
BL-A
BL-C



BL-B
BL-D



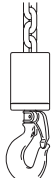
BL-I
BL-K



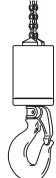
BL-PKU



BL-G
BL-E



BL-P
BL-O



BL-R
BL-S

QUIC-CHECK® Hoist Hooks incorporate markings forged into the product which address two (2) **QUIC-CHECK®** features:

Deformation Indicators - Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a **QUIC-CHECK®** measurement to determine if the throat opening has changed, thus indicating abuse or overload.

To check, use a measuring device (i.e., tape measure) to measure the distance between the marks. The marks should align to either an inch or half-inch increment on the measuring device. If the measurement does not meet criteria, the hook should be inspected further for possible damage.

Angle Indicators - Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.



Important Safety Information - Read and Follow

- A visual periodic inspection for cracks, nicks, wear, gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel in compliance with the schedule in ANSI B30. 10.
- For hooks used in frequent load cycles or pulsating loads, the hook and threads should be periodically inspected by Magnetic Particle or Dye Penetrant. (Note: Some disassembly may be required.)
- See WARNING box and Figure 6 for special instructions for securing the nut to the shank at assembly.
- Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10 degrees out of plane from the hook body, or is in any other way distorted or bent. **Note: A gate will not work properly on a hook with a bent or worn tip.**
- Manual - closing gates must be completely closed for the lock to work.
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Remove from service any hook with a crack, nick, or gouge. Hooks with a crack, nick, or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1.

WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Before using, inspect the hook and gate daily to ensure it is in proper operating condition.
- Failure to properly insert the pin could result in the load falling.
- All Golden Gate® Hooks with threaded shanks require a pin to secure the nut to the shank. This pin prevents the nut from backing off or unscrewing from the threads and causing the load to drop.
- If the pin and nut are removed from the shank to replace any hook components, the pin and nut must be installed before use.

NOTE:

1. If a solid pin was used, the old pin "must" be discarded and a new pin inserted to secure the nut to the shank.
2. If a spring pin (coil type) was used, it may be reused provided that the spring pin and / or the drill hole was not damaged.

- The Gate is not a load-bearing device. Do not allow the slings or other loads to bear against the gate.
- Threads may corrode and/or strip and drop the load.
- Hands, fingers and body should be kept away from the hook and load whenever possible.
- Never apply more force than the hook's assigned Working Load Limit (WLL) rating.
- Read and understand these instructions before using.

- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load, or tip load a hook. Side loading, back loading and tip loading are conditions that damage and reduce the capacity of the hook. (See Figure 2.)
- Eye hooks, shank hooks and swivel hooks are designed to be used with wire rope or chain. Efficiency of assembly may be reduced when used with synthetic material.

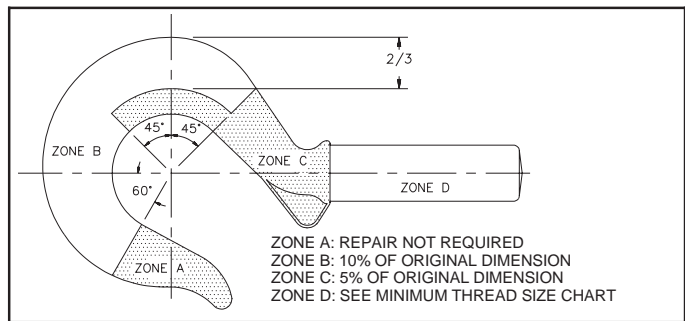


Figure 1

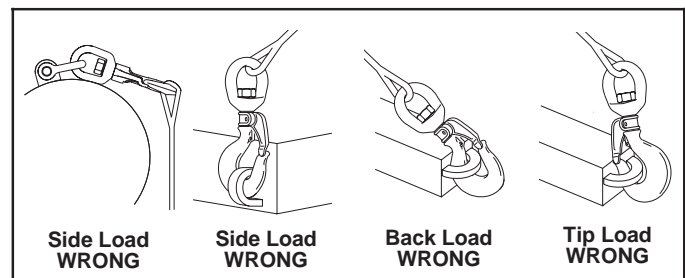


Figure 2

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- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, Insurance etc.
- Always make sure the hook supports the load. (See Figure 3). The gate must never support the load (See Figure 4).
- When placing two (2) sling legs in hook, make sure the angle from the vertical to the outermost leg is not greater than 45 degrees, and the included angle between the legs does not exceed 90 degrees* (See Figure 5).
- See ANSI/ASME B30.10 "Hooks" for additional information.
- If any of the following conditions exist, remove hook from service immediately and repair with genuine Crosby / Bullard Golden Gate[®] hook parts or replace the hook.
 - The gate does not lock in the closed position.
 - The gate is worn, deformed, inoperative, or fails to bridge the hook throat opening.
 - Load pins or bolts in the chain connectors are worn or bent.

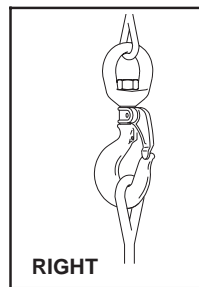


Figure 3

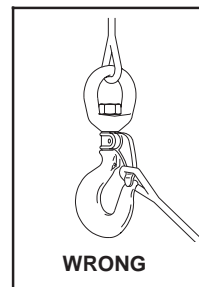


Figure 4

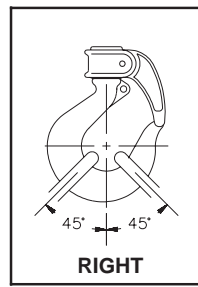


Figure 5

- When hook is used to support a hoist, the weight of the hoist must be deducted from the assigned hook Working Load Limit.
- The rated capacity of chain connector hook assemblies must equal or exceed the capacity of the hoist.

* For two legged slings with angles greater than 90°, use an intermediate link such as a master link or bolt type shackle to collect the legs of the slings. The intermediate link can then be placed over the hook to provide an in-line load on the hook. This approach must also be used when using slings with three or more legs.

Important — Basic Machining and Thread Information Read and Follow

- Wrong thread and/or shank size can cause stripping and loss of load.
- The maximum diameter is the largest diameter that will fit into the gate.
- All threads must be Class 2 or better.
- The minimum thread length engaged in the nut should not be less than one (1) thread diameter.
- All nuts must be secured to the shank by cross drilling the nut and threaded shank and inserting the appropriate coil type spring pin. (See WARNING box and Figure 6 for special instructions)
- Coil type spring pin must be as long as the distance across the nut flats or diameter (See Figure 6).
- Consult the Crosby / Bullard Golden Gate[®] Hook Identification and Working Load Limit Chart (See below) for the coil type spring pin diameter.
- Remove any hook from service that requires a larger coil type spring than that shown in the chart below.
- Hook shanks are not intended to be swaged on wire rope or rod.

- Hook shanks are not intended to be drilled and internally threaded.
- Crosby cannot assume responsibility for, (A) the quality of machining, (B) the type of application, or (C) the means of attachment to the power source or load.
- Consult the Crosby/ Bullard Golden Gate[®] Hook Identification & Working Load Limit Chart (See chart below) for the minimum thread size for assigned Working Load Limits(WLL).†
- Remove from service any hook which has threads corroded more than 20% of the nut engaged length.

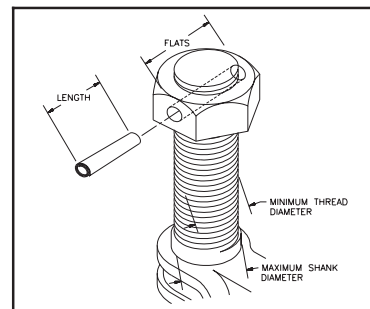


Figure 6

Crosby / Bullard Golden Gate[®] Hook Identification & Working Load Limit Chart

Hook / Gate Size	Working Load Limit**† (t)	Maximum Shank Diameter (mm)	Minimum Thread Size	Spring* Pin Size (mm)	Drilled Hole Size (mm)	Hook / Gate Size	Working Load Limit (t)	Maximum Shank Diameter (mm)	Minimum Thread Size	Spring* Pin Size (mm)	Drilled Hole Size (mm)
1	.45	—	—	—	—	11	8.35	38	1½ - 6 UNC	7.9	7.8/8.10
2	.90	12.70	½ - 13 UNC	3.2	3.15/3.30	12	11.15	41.2	1⅝ - 5½ UNC	7.9	7.8/8.10
3	1.27	14.20	⅜ - 12 UNC	3.2	3.15/3.30	13	13.6	44.4	1¾ - 5 UNC	9.5	9.40/9.7
4	1.54	15.80	⅝ - 11 UNC	3.2	3.15/3.30	14	16.8	50.7	2 - 4½ UNC	9.5	9.40/9.7
5	2.09	19.00	¾ - 10 UNC	4.0	3.94/4.05	16	22.4	69.8	2¾ - 4 UNC	12.7	12.5/12.95
6	3.63	22.20	⅞ - 9 UNC	4.75	4.70/4.90	16-A	29.9	69.8	2¾ - 4 UNC	12.7	12.5/12.95
7	3.81	25.30	1 - 8 UNC	4.75	4.70/4.90	17	44.9	101.5	4 - 8 UN	19.1	18.9/19.30
8	5.00	28.50	1⅛ - 7 UNC	6.35	6.25/6.50	17-A	59.9	101.5	4 - 8 UN	19.1	18.9/19.30
9	6.53	31.70	1¼ - 7 UNC	6.35	6.25/6.50	—	—	—	—	—	—

* Heavy Duty Coil Type Spring Pin.

** Minimum ultimate strength is 4 times the Working Load Limit.

† Working Load Limit - The maximum mass or force which the product is authorized to support in general service when the pull is applied in-line, unless noted otherwise, with respect to the centerline of the product. This term is used interchangeably with the following terms: 1. WLL, 2. Rated Load Value, 3. SWL, 4. Safe Working Load, 5. Resultant Safe Working Load. Ultimate Load is 4 times the Working Load.

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S-4320 HOOK LATCH KIT

(For Crosby 319N, 320N, and 322N, S-1320, A-339N & A-1339 Hooks)

WARNINGS AND APPLICATION INSTRUCTIONS

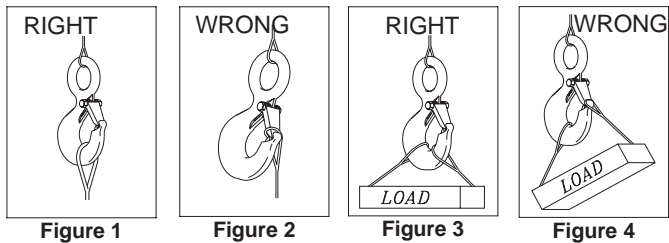
Important Safety Information – Read & Follow

- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load. (See Figure 1 & 2.)
- When placing two (2) sling legs in hook, make sure the angle between the legs is less than 90° and if the hook or load is tilted, nothing bears against the bottom of this latch. (See Figure 3 & 4.)
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.
- When using latch for personnel lifting, select proper cotter pin (See Figure 5). See Step 7 below for proper installation instructions.
 - Never reuse a bent cotter pin.
 - Never use a cotter pin with a smaller diameter or different length than recommended in Figure 5.
 - Never use a nail, a welding rod, wire, etc., in place of recommended cotter pin.
 - Always ensure cotter pin is bent so as not to interfere with sling operation.
 - Periodically inspect cotter pin for corrosion and general adequacy.



⚠ **WARNING**

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Hook must always support the load. The load must never be supported by the latch.
- See OSHA Rule 1926.550 (g) for personnel hoisting by crane or Derricks. A Crosby S-319N, S-320N, S-322N, S-1320, A-339 and A-1339 Hook with an S-4320 latch attached (When secured with cotter pin) may be used for lifting personnel.
- An S-4320 Latch is only to be used with a Crosby S-319N, S-320N, S-322N, S-1320, A-339 and A-1339 Hook.
- DO NOT use this latch in applications requiring non sparking.

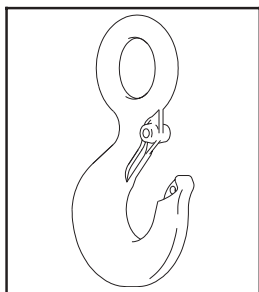


Hook Identification Code *		Recommended Cotter Pin Dimensions (mm)	
Carbon	Alloy	Diameter	Length
D	D	3.2	20
F	F	3.2	20
G	G	3.2	25
H	H	5.0	32
I	I	6.3	40
J	J	8.0	50
K	K	8.0	50
L	L	10.0	80
N	N	10.0	80

† The current SS-4055 latch kit and the PL latch will not fit new 319N, 320N, or 322N hooks. They will continue to be offered in both styles to service existing hooks. **Important** - The new S4320 latch kit will not fit the old 319, 320, or 322 hooks.

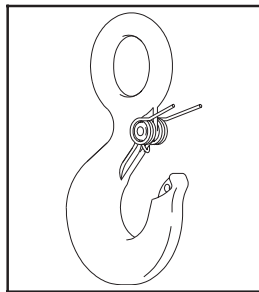
Figure 5

IMPORTANT - Instructions for Assembling S-4320 Latch on Crosby 320N Hooks



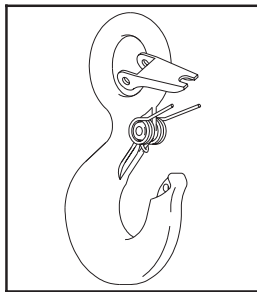
Step 1

Place hook at approximately a 45 degree angle with the cam up.



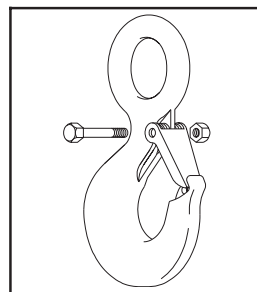
Step 2

Position coils of spring over cam with legs of spring pointing toward point of hook and loop of spring positioned down and lying against the hook.



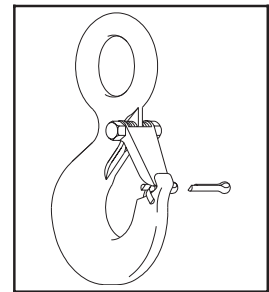
Step 3

Position latch to side of hook points. Slide latch onto spring legs between lockplate and latch body until latch is partially over hook cam. Then depress latch and spring until latch clears point of hook.



Steps 4, 5, & 6

4. Line up holes in latch with hook cam.
5. Insert bolt through latch, spring, and cam.
6. Tighten self-locking nut on one end of bolt.



Step 7 — For Personnel Lifting

With latch in closed position and rigging resting in bowl of hook, insert cotter pin through hook tip and secure by bending prongs.

HOOK LATCH KIT

WARNING AND APPLICATION INSTRUCTIONS



SS- 4055

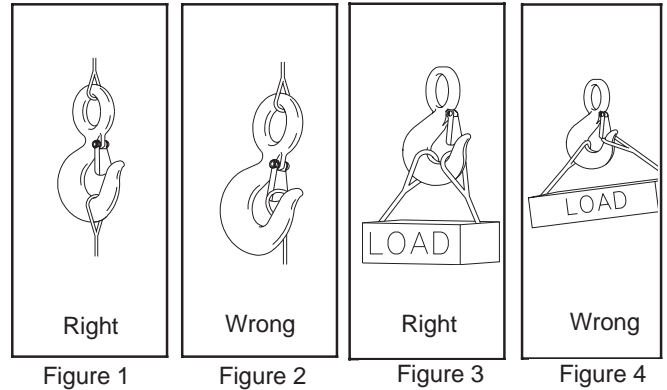
Important Safety Information - Read and Follow

- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load. (See Figure 1 & 2)
- When placing two (2) sling legs in hook, make sure the angle between legs is small enough and the legs are not tilted so that nothing bears against the bottom of the latch. (See Figure 3 & 4)
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.

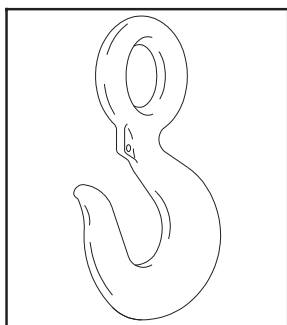


WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550(g)(4)(iv)(B). A hook and this style latch must not be used for lifting personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Read and understand these instructions before using hook and latch.

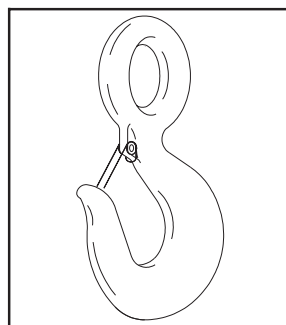


IMPORTANT - Instructions for Assembling SS-4055 Latch on Crosby Hooks



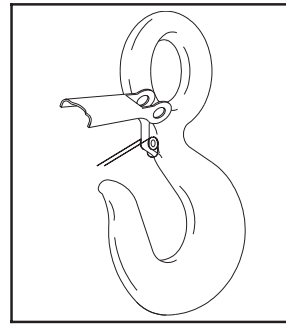
Step 1

Place hook at approximately a 45 degree angle with the cam up.



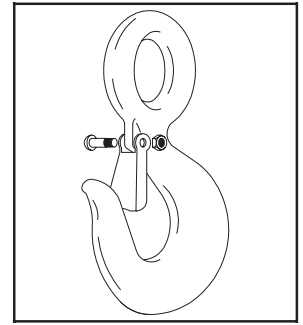
Step 2

Position coils of spring over cam with tines of spring pointing toward point of hook and loop of spring positioned down and lying against the hook.



Step 3

Position latch over tines of spring with ears partially over hook cam. Swing latch to one side of hook, point and depress latch and spring until latch clears point of hook.

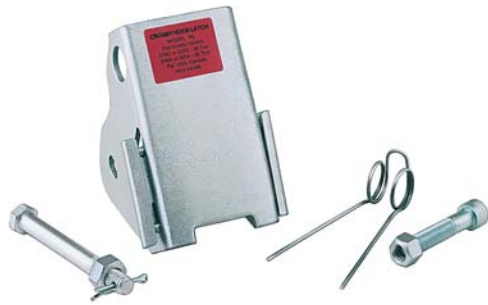


Steps 4, 5, & 6

4. Line up holes in latch with hook cam.
5. Insert bolt through latch, spring, and cam.
6. Tighten self-locking nut on one end of bolt.

CROSBY® MODEL PL HOOK LATCH KIT

WARNINGS AND APPLICATION INSTRUCTIONS



Model PL*
(Pat. U.S.A. & Canada)

Important Safety Information - Read & Follow

- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load. (See Figure 1 & 2.)
- When placing two (2) sling legs in hook, make sure the angle between the legs is less than 90° and if the hook or load is tilted, nothing bears against the bottom of this latch. (See Figure 3 & 4.)
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.

⚠ WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550 (g) for Personnel Hoisting by Cranes or Derricks. A Crosby or McKissick Hook with a positive Locked PL or S-4320 Latch may be used to Lift Personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Read and understand these instructions before using hook and latch.

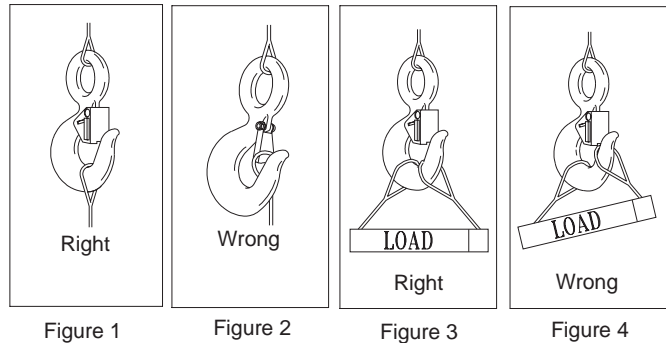


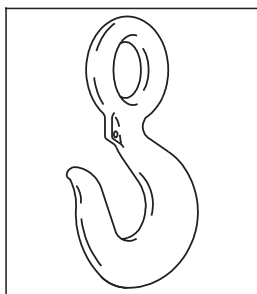
Figure 1

Figure 2

Figure 3

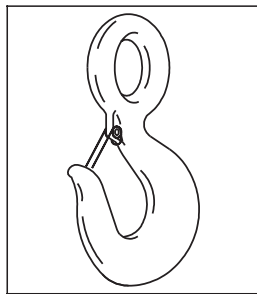
Figure 4

IMPORTANT - Instructions for Assembling Model PL Latch on Crosby or McKissick Hooks



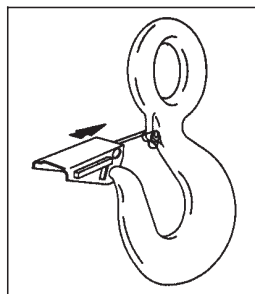
Step 1

Place hook at approximately a 45 degree angle with the cam up.



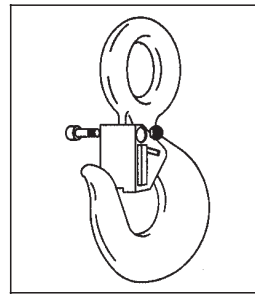
Step 2

Position coils of spring over cam with legs of spring pointing toward point of hook and loop of spring positioned down and lying against the hook.



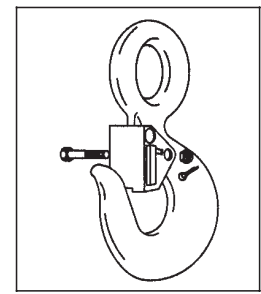
Step 3

Position latch to side of hook points. Slide latch onto spring legs between lockplate and latch body until latch is partially over hook cam. Then depress latch and spring until latch clears point of hook.



Steps 4, 5, & 6

4. Line up holes in latch with hook cam.
5. Insert bolt through latch, spring, and cam.
6. Tighten self-locking nut on one end of bolt.



Step 7 — For Personnel Lifting

With latch in closed position and rigging resting in bowl of hook, insert bolt through latch and secure with nut and cotter pin. When bolt, nut and cotter pin are not being used, store them in a designated place upon the personnel platform.

*The Model PL Latch Replaces Model G-5066

CROSBY MODEL PL-N/O HOOK LATCH KIT

WARNINGS AND APPLICATION INSTRUCTIONS



Model PL-N/O
(Pat. U.S.A. & Canada)

Important Safety Information - Read & Follow

- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load. (See Figure 1 & 2.)
- When placing two (2) sling legs in hook, make sure the angle between the legs is less than 90° and if the hook or load is tilted, nothing bears against the bottom of this latch. (See Figure 3 & 4.)
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.

⚠ WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.550 (g) for Personnel Hoisting by Crane or Derricks. A Crosby or McKissick Hook with a Positive Locked PL-N/O or S-4320 Latch may be used to Lift Personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Read and understand these instructions before using hook and latch.

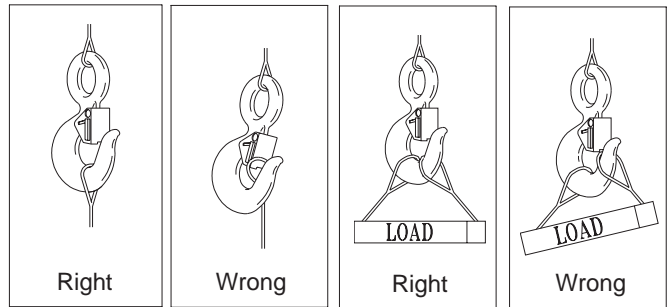


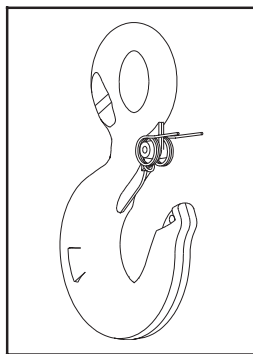
Figure 1

Figure 2

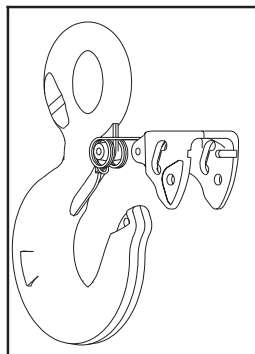
Figure 3

Figure 4

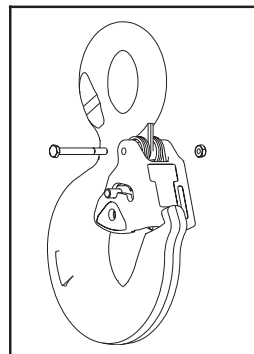
IMPORTANT - Instructions for Assembling Model PL-N/O Latch on Crosby or McKissick Hooks



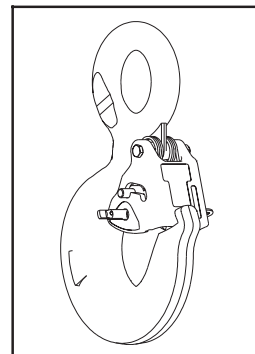
Step 1



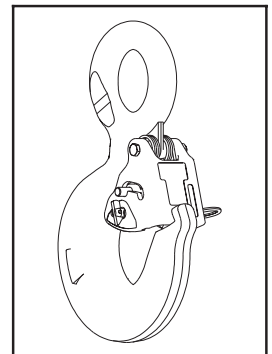
Step 2



Step 3, 4, 5 & 6



Step 7,8 - For
Personnel Lifting



Step 9 - For
Personnel Lifting

1. Place hook in upright position. Position coils of spring over cam with legs of spring pointing toward tip of hook, and loop of spring positioned down and lying against the hook.
2. Slip the latch over the spring until the two spring legs are positioned into the grooves located on the inside of the latch housing (legs of spring should fit between the gate and the housing).
3. Slide latch housing up the spring legs until latch clears hook tip.
4. Resting latch on interlocking hook tip, line up holes in latch with hook cam.
5. Insert bolt through latch spring & cam.
6. Tighten self-locking nut on one end of bolt.
7. Rigging should be resting in bowl of hook, with latch in closed position and gate locked.
8. Insert toggle lock pin through hole and depress spring until toggle clears hole on other side of latch.
9. Rotate toggle 90 degrees to secure pin (ensure toggle is in closed position as shown).

CROSBY® WELD-ON HOOKS

WARNING AND APPLICATION INSTRUCTIONS



BH-313

Important Safety Information - Read and Follow

- Weld-On hooks are to only be welded to a structure, equipment or machinery in an area (load point) approved by the original equipment manufacturer. (Some manufacturers may not approve the modification of their product).
 - For hydraulic excavator lift capacity rating, refer to SAE standard J1097.
 - A visual periodic inspection for cracks, nicks, wear, gouges and deformation as part of a comprehensive documented inspection program, should be conducted by trained personnel.
 - A visual periodic inspection of the weld should be performed. Check the weld visually, or use a suitable NDE method if required.
 - As excavator buckets are not specifically designed for constant use with excavator hooks, we recommend regular and very thorough inspection of the excavator bucket welding area to insure no distortion has been made to the work area.
 - Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10 degrees out of plane from the hook body, or is in any other way distorted or bent.
- Note: A latch will not work properly on a hook with a bent or worn tip.**
- Never use a hook that is worn beyond the limits shown in Figure 1.
 - Remove from service any hook with a crack, nick, or gouge. Hooks with a crack, nick, or gouge shall be repaired by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1.
 - Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
 - Always make sure the hook supports the load. The load is to be applied within the range shown in Figure 2. The latch must never support the load (See Figure 3).
 - Never side load (See Figure 4), or tip load (See Figure 5) a hook.
 - The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, Insurance, etc. (Note: When using latches, see instructions in "Understanding: The Crosby Group Warnings" for further information.)
 - Ensure latch functions properly. Use only genuine Crosby replacement parts.
 - Never attach more than one sling directly in hook. For collecting two or more slings to the hook, use proper hardware.
 - See ANSI/ASME B30.10 "Hooks" for additional information.

WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Hook must always support the load. The load must never be supported by the latch.
- Never apply more force than the hook's assigned Working Load Limit (WLL) rating.
- Do not use Crosby weld on hook for personnel hoisting. See OSHA Rule 19216.550(g).
- Read and understand these instructions before welding on, or using hook.

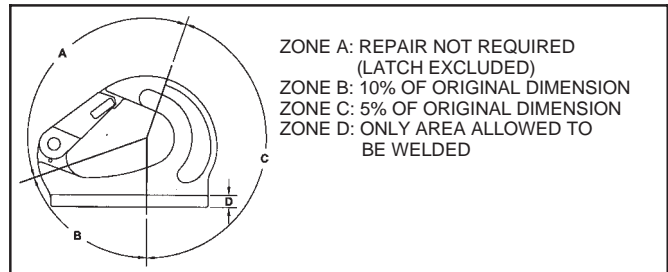


Figure 1

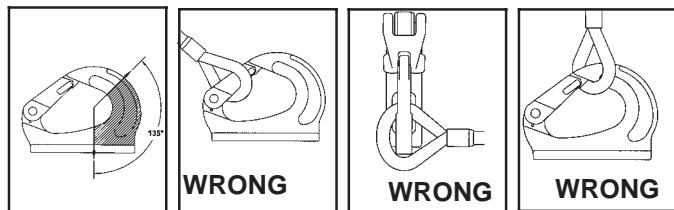


Figure 2

Figure 3

Figure 4

Figure 5

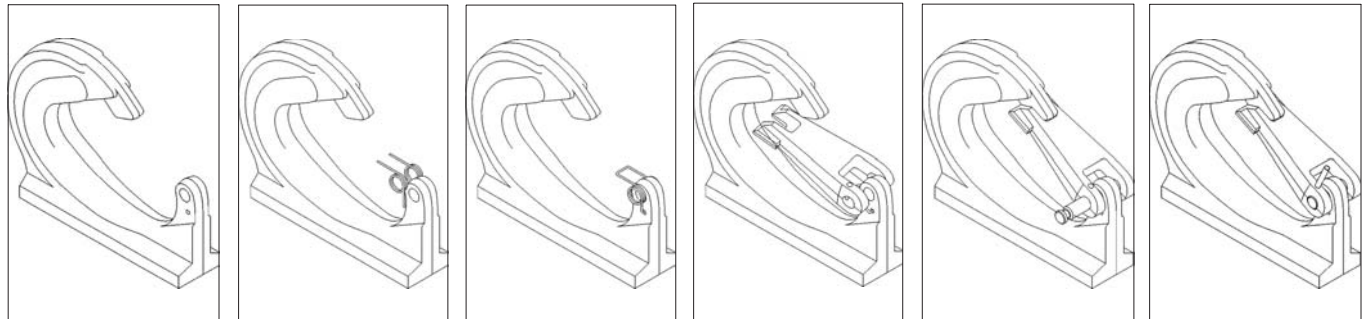
- The strength of the weld-on hook depends upon the method of attachment. Extreme care must be used in choice of support as well as during the attachment process.
- The support structure that the hook is attached to must be of suitable size, composition and quality to support the anticipated loads of all operating positions. The required support structure material thickness for a given application is dependent on variables such as unsupported length and material strength, and should be determined by a qualified individual. Minimum plate thickness required to support the welds are shown in Table 1.

Table 1

Working Load Limit (t)	Minimum Plate Thickness (in.)	Minimum Fillet Size All Around (in.)
1	5	5
2	6	6
3	8	8
4	8	8
5	10	10
8	13	13
10	13	13

- Position the hook to insure that the load is applied in the plane of the hook, and the load is supported by the hook in all operating positions. Insure that the hook does not interfere with the operation of other mechanisms or cause pinch points.
- Insure that the maximum gap between hook base and support does not exceed 1/8". Modify the support structure if required to reduce gap.
- When welding hook to carbon or low alloy steels (less than .40% carbon), the following welding recommendations are to be followed. For welding hook to other grades of steel, a qualified weld procedure must be developed. Crosby hook material is AISI 8622 modified.
- Welding is to be performed by a qualified welder using qualified procedure in accordance with American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) requirements.
- Welding electrode to be in accordance with AWS A5.4 E-312-16. Observe the electrode manufacturers recommendations.
- Welding preheat range outlined below.
 - Minimum preheat temperature: 212F (100C)
 - Maximum temperature: 716F (380C)
- Before welding, the surface to be welded on, including the hook and support structure, must be clean and free from rust, grease and paint.
- Fillet weld leg size should be of minimum shown in Table 1. Weld profiles to be in accordance with AWS. Weld size is measured by length of leg.
- Welding should be carried out completely around base in a minimum of two passes to insure adequate root penetration at the base of the hook.
- Do not rapidly cool the weld.
- After welding, a visual inspection of the weld should be performed prior to painting.
- No Cracks, pitting, inclusions, notches or undercuts are allowed. If doubt exists, use a suitable NDE method, such as Magnetic particle or Liquid Penetrate to verify.
- If repair is required on weld, grind out defect and re-weld using original qualified procedure.
- After welding, the assembly should be proof tested before putting into service.

Important - Instructions for Assembling S-4313 Latch on BH-313 Weld-On Hook



Step 1

Place hook flat on work surface as shown.

Step 2

Hook sizes 1 to 3 tons
Position coils of spring over hook cam, with legs of spring pointing towards hook tip and coil of spring positioned down as shown.

Step 2 A

Hook sizes 4 to 10 tons.
Spread legs of spring and place into drilled hole. Position coils of spring over hook cam, with end of spring pointing toward hook tip as shown.

Step 3

Position latch over spring, aligning latch ears and spring coil. On pin hole side of latch, insert non grooved end of latch pin through hole in latch and through spring until contact is made with hook body (a small punch may be required for proper alignment).

Step 4

Align holes in latch with holes in cam of hook. Continue pushing the pin through hook, spring and latch.

Step 5

Insert roll-pin into latch, driving it in with a hammer, while ensuring that latch pin groove is in alignment.