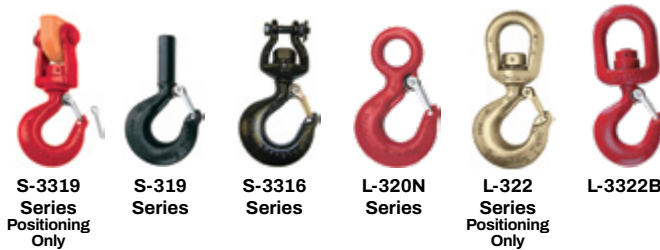


Crosby® HOIST HOOKS

WARNINGS & APPLICATION INSTRUCTIONS



WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv) (B) for personnel hoisting by cranes and derricks, and OSHA Directive CPL 2-1.36 - Interim Inspection Procedures During Communication Tower Construction Activities. A Crosby 319, L-320 or L-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, L-320N or L-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 2-1.36 - 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 L-322, S-3316, and S-3319 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.

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

1. **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.
2. **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.
3. **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.

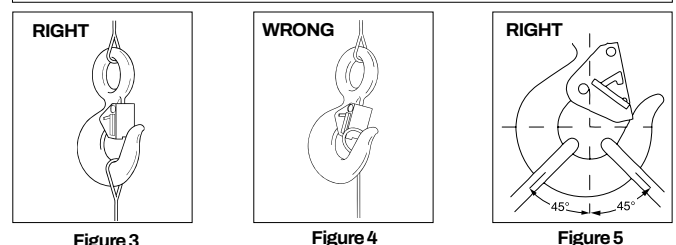
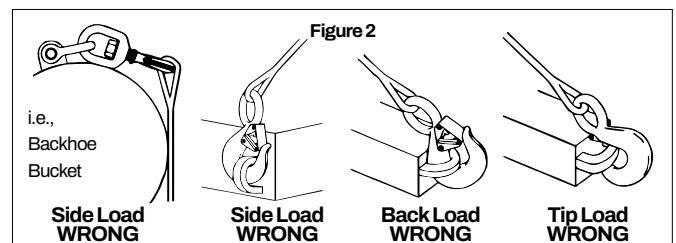
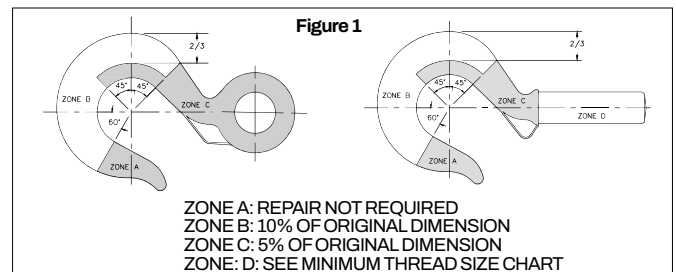


IMPORTANT SAFETY INFORMATION - READ & FOLLOW

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 ASME 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.

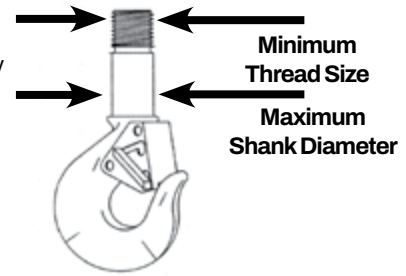
- Never use a hook that is worn beyond the limits shown in Figure 1.
- Any crack in a hook is reason to take it out of service. Hooks with a nick or gouge can be repaired only by a qualified person by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1. Contact Crosby Engineering to evaluate any crack.
- 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, Shank and Swivel hooks are designed to be used with wire rope or chain. Clevis hooks are design to be used with chain. Efficiency of assembly may be reduced when used with synthetic material.
- Do not swivel the L-322, S-3316, or S-3319 swivel hooks while supporting a load. These hooks are distinguishable by hex nuts and flat washers.
- The L-3322 swivel hook is designed to rotate under load. The L-3322 is distinguishable from the L-322 by use of a round nut designed to shield bearing.
- The frequency of bearing lubrication on the L-3322 depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment.
- 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 multileg slings are placed in the base (bowl/saddle) of the hook, the maximum included angle between sling legs shall be 90 deg. The maximum sling leg angle with respect to the hook centerline for any rigging arrangement shall be 45 degrees. A collector ring, such as a link or shackle, should be used to maintain in-line load when more than two legs are placed in a hook or for angles greater than 45 degrees with respect to hook centerline. When more than two legs are placed in the hook bunching of the legs shall be avoided.
- See ASME B30.10 "Hooks" for additional information.



READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE USING HOOKS **IMPORTANT – BASIC MACHINING AND THREAD INFORMATION**

- 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. Install a properly sized retention device to secure the nut to the hook shank after the nut is properly adjusted at assembly. Nut retention devices such as set screws or roll pins are suitable for applications using anti-friction thrust bearings or bronze thrust washers. If the hook is intended for other applications that introduce a higher torque into the nut, a more substantial retaining device may be required.
- Hook shanks are not intended to be swaged on wire rope or rod.
- 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)							Frame Size	Maximum Shank Diameter after Machining (in)	Minimum Thread Size	
319C 319CN L-320C L-320CN L-322C L-322CN	319AN L-320A L-322A L-322AN 3319 L-3322B	319BN	319C 319CN L-320C L-320CN L-322C L-322CN	319A 319AN L-320A L-322A L-322AN L-3322B	319BN	S-3319	S-3316					319C 319CN (Carbon)	319A 319AN (Alloy)
DC	DA	DB	.75	1	.5	—	—	D	.53			1/2 - 13unc	1/2 - 13 unc
FC	FA	FB	1	1.5	.6	—	.45	F	.62			5/8 - 11unc	5/8 - 11 unc
GC	GA	GB	1.5	2	1	—	—	G	.66			5/8 - 11unc	5/8 - 11 unc
HC	HA	HB	2	3	1.4	1.63	.91	H	.81			3/4 - 10unc	3/4 - 10 unc
IC	IA	IB	3	4.5 / 5	2.0	2.5	—	I	1.03			7/8 - 9unc	7/8 - 9 unc
JC	JA	JB	5	7	3.5	4.5	—	J	1.27			1-1/8 - 7unc	1-1/8 - 7 unc
KC	KA	KB	7.5	11	5.0	—	—	K	1.52			1-1/4 - 7unc	1-3/8 - 6 unc
LC	LA	LB	10	15	6.5	—	—	L	1.75			1-5/8 - 8un	1-5/8 - 8 un
NC	NA	NB	15	22	10	—	—	N	2.00			2 - 8un	2 - 8 un
OC	OA	—	20	30	—	—	—	O	2.50			2-1/4 - 8un	2-1/4 - 8 un
PC	PA	—	25	37	—	—	—	P	3.50			2-3/4 - 8un	2-3/4 - 8 un
SC	SA	—	30	45	—	—	—	S	3.50			3 - 8un	3 - 8 un
TC	TA	—	40	60	—	—	—	T	4.00			3-1/4 - 8un	3-1/2 - 8 un
UC	UA	—	50	75	—	—	—	U	4.50			3-3/4 - 8un	4 - 4 unc
—	WA	—	—	100	—	—	—	W	6.12			—	4-1/2 - 8 un
—	XA	—	—	150	—	—	—	X	6.38			—	5-1/2 - 8 un
—	YA	—	—	200	—	—	—	Y	7.00			—	6-1/4 - 8 un
—	ZA	—	—	300	—	—	—	Z	8.62			—	7-1/2 - 8 un

* 319AN, L-320AN, L-3322 and L-322AN are rated at 5 tons.

† 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.

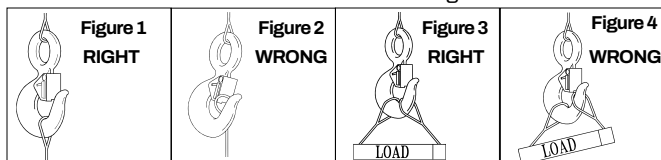
Warning and Application Instructions For Crosby® Hook Latch Kit

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 Figures 1 & 2).
- When placing two (2) sling legs in hooks, make sure the angle between the legs is less the 90° and if the hook or load is tilted, nothing bears against the bottom of this latch (See Figures 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 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv) (B) for personnel hoisting for cranes and derricks. Only a Crosby or McKissick hook with a PL Latch attached and secured with bolt, nut and cotter (or Crosby Toggle Pin) or a Crosby hook with a S-4320 Latch attached and secured with a cotter pin, or a Crosby SHUR-LOC® hook in the locked position may be used for any personnel hoisting. A hook with a Crosby SS-4055 latch attached shall NOT be used for personnel lifting.
- Hook must always support the load. The load must never be supported by the latch.
- DO NOT use this latch in applications requiring non-sparking.
- Read and understand these instructions before using hook and latch.



McKissick® HOIST HOOKS

WARNINGS & APPLICATION INSTRUCTIONS



WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv) (B) for personnel hoisting by cranes and derricks, and OSHA Directive CPL 2-1.36 - Interim Inspection Procedures During Communication Tower Construction Activities. A Crosby 319, L-320 or L-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, L-320N or L-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 2-1.36 - 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 or Split-Nut may corrode and/or strip and drop the load.
- Remove securement nut to inspect or to replace S-322 and S-3319 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.

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.

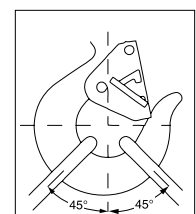
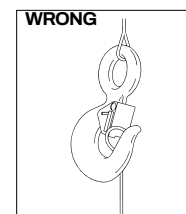
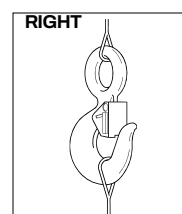
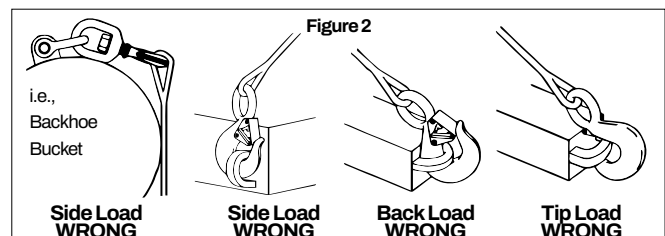
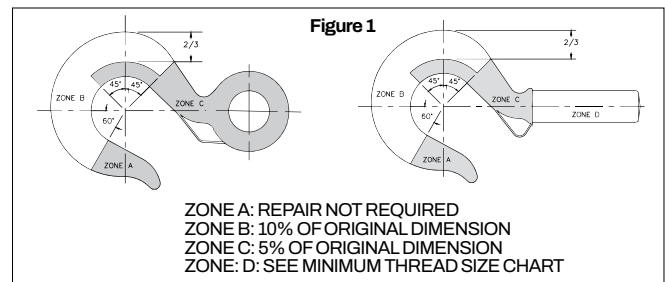
Angle Indicators - Indicates the maximum included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

IMPORTANT SAFETY INFORMATION - READ & 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 ASME 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.
- Any crack in a hook is reason to take it out of service. Hooks with a nick or gouge can be repaired only by a qualified person by grinding lengthwise, following the contour of the hook, provided that the reduced dimension is within the limits shown in Figure 1. Contact Crosby Engineering to evaluate any crack.
- Remove from service any hook which has threads corroded more than 20% of the nut engagement length.
- 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 L-322 or S-3319 swivel hooks while supporting a load. These hooks are distinguishable by hex nuts and flat washers.
- The L-3322 swivel hook is designed to rotate under load. The L-3322 is distinguishable from the L-322 by use of a round nut designed to shield bearing.
- The frequency of bearing lubrication on the L-3322 depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment.
- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, 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 multileg slings are placed in the base (bowl/saddle) of the hook, the maximum included angle between sling legs shall be 90 deg. The maximum sling leg angle with respect to the hook centerline for any rigging arrangement shall be 45 degrees. A collector ring, such as a link or shackle, should be used to maintain in-line load when more than two legs are placed in a hook or for angles greater than 45 degrees with respect to hook centerline. When more than two legs are placed in the hook bunching of the legs shall be avoided.
- Reference Crosby's Hoist Hook Warning and Application Information for basic machining and minimum thread size.
- See ASME B30.10 "Hooks" for additional information.



Removal of Split-Nut assembly (Reference Figure A):

- Remove vinyl cover.
- Remove spring retaining ring.
- Slide steel keeper ring off split nuts **⚠ CAUTION** removal of keeper ring will allow split nut halves to fall from hook shank).
- Remove split nut halves.

Inspection of split nut assembly and hook shank interface area (Reference Figure B):

- Inspect hook shank and split nut for signs of deformation on and adjacent to the load bearing surfaces.
- Inspect outside corner of hook shank load bearing surface to verify the corner is sharp.
- Verify retaining ring groove will allow proper seating of the retaining ring.
- Inspect retaining ring for corrosion or deformation. Remove from service any retaining ring that has excessive corrosion or is deformed.
- Use fine grit emery or crocus cloth to remove any corrosion from machined hook shank and split nut assembly.
- Follow inspection recommendations listed in this document under IMPORTANT SAFETY INFORMATION.
- If corrosion is present on the nut / shank interface area and deterioration or degradation of the metal components is evident, further inspection is required.
 - The use of a feeler gauge is required to properly measure the maximum allowable gap width between the split nut inside diameters and shank outside diameters.
 - With one split nut half seated against the hook shank, push the nut to one side and measure the maximum gaps as shown in Figure B. The hook should be measured in four places, 90-degrees apart.
 - Repeat above inspection procedure with other half of split nut.
 - Remove from service any hook and split nut assembly that exhibits a gap greater than 0.030".

Installation of split nut assembly (Reference Figure A):

- Coat hook shank and inside of split nut with an anti-seize compound or heavy grease.
- Install split nut halves onto shank. The flanged bottom of the

split nut should be closest to the hook shoulder.

- Slide steel keeper ring over split nut halves. Verify the split nut halves properly seat against the load bearing surface of the hook shank and the steel keeper ring seats against the flange of the split nut.
- Install retaining ring onto split nut halves. Verify the retaining ring seats properly in the retaining ring groove on the outside diameter of the split nut assembly.
- Install vinyl cover over split nut and hook shank assembly.
- Verify all fasteners are correctly installed.
- Always use Genuine Crosby replacement parts.

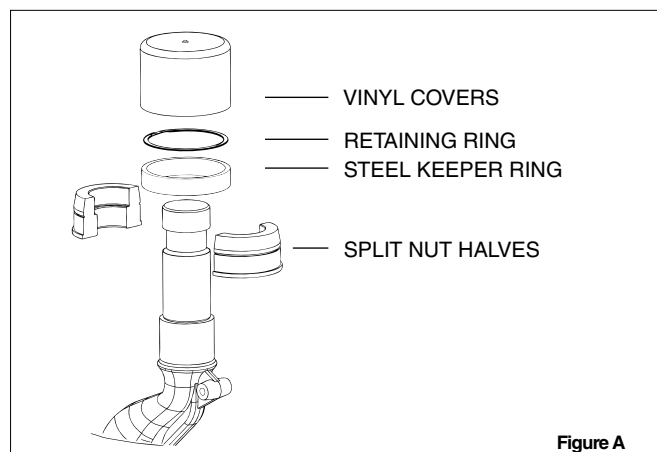


Figure A

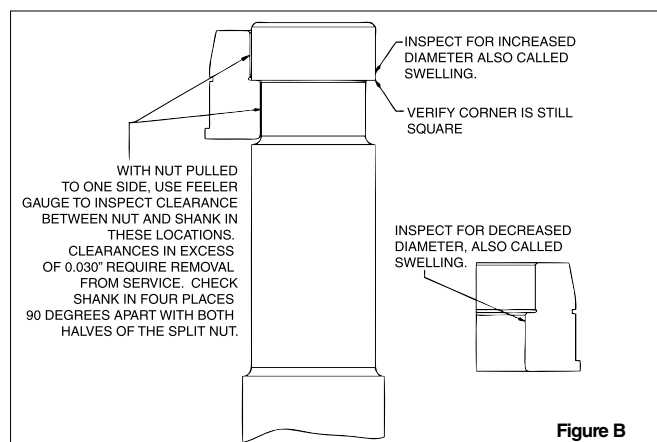
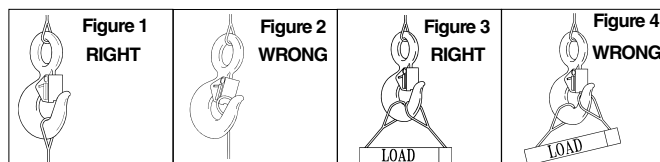


Figure B

Warning and Application Instructions For McKissick® Hook Latch Kit

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 Figures 1 & 2).
- When placing two (2) sling legs in hooks, make sure the angle between the legs is less the 90° and if the hook or load is tilted, nothing bears against the bottom of this latch (See Figures 3 & 4).
- Latches are intended to retain loose sling or devices under slack conditions.
- Latches are not intended to be an anti-fouling device.

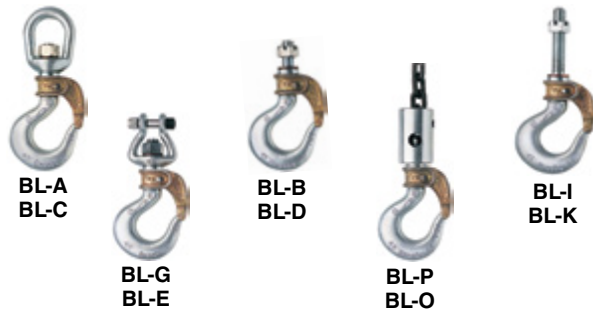


⚠ WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv)(B) for personnel hoisting for cranes and derricks. Only a Crosby or McKissick hook with a PL Latch attached and secured with bolt, nut and cotter (or Crosby Toggle Pin) or a Crosby hook with a S-4320 Latch attached and secured with a cotter pin, or a Crosby SHUR-LOC® hook in the locked position may be used for any personnel hoisting. A hook with a Crosby SS-4055 latch attached shall NOT be used for personnel lifting.
- Hook must always support the load. The load must never be supported by the latch.
- Do not use this latch in applications requiring non-sparking.
- Read and understand these instructions before using hook and latch.

Crosby® / BULLARD® GOLDEN GATE® HOOKS

WARNINGS & APPLICATION INSTRUCTIONS



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 & 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 B 30.10.
- 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 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. Contact Crosby Engineering to evaluate any crack.
- 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.

⚠ 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 sling 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.

Figure 1

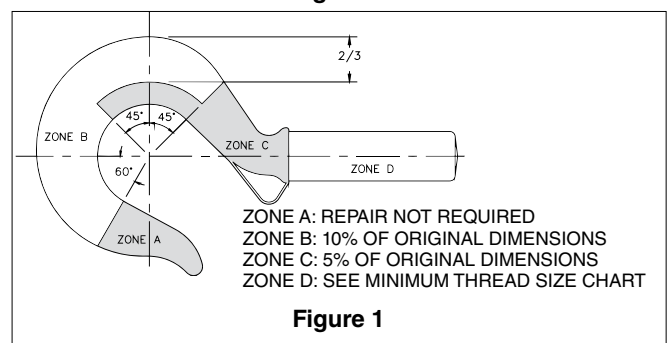


Figure 1

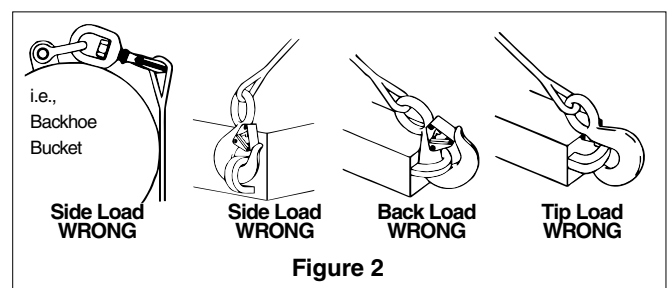
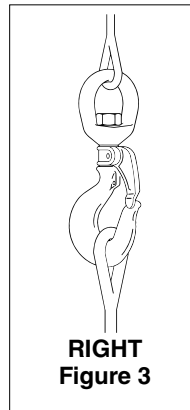


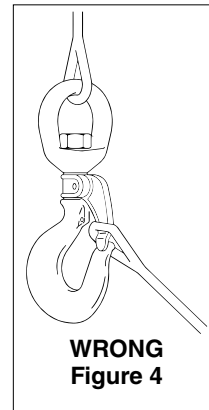
Figure 2

- The use of a latch may be mandatory by regulations or safety codes: e.g., OSHA, MSHA, 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 multileg slings are placed in the base (bowl/saddle) of the hook, the maximum included angle between sling legs shall be 90 deg. The maximum sling leg angle with respect to the hook centerline for any rigging arrangement shall be 45 degrees. A collector ring, such as a link or shackle, should be used to maintain in-line load when more than two legs are placed in a hook or for angles greater than 45 degrees with respect to hook centerline. When more than two legs are placed in the hook bunching of the legs shall be avoided.
- See 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.

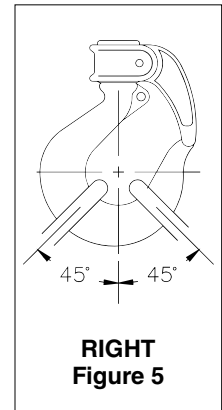
- Load pins or bolts in the chain connectors are worn or bent.
- When hook is used to support a hoist, the weight of the hoist must be deducted from the assigned hook Working Load Limit.
- The rated capacity of chain connector hook assemblies must equal or exceed the capacity of the hoist.



RIGHT
Figure 3



WRONG
Figure 4



RIGHT
Figure 5

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 (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.

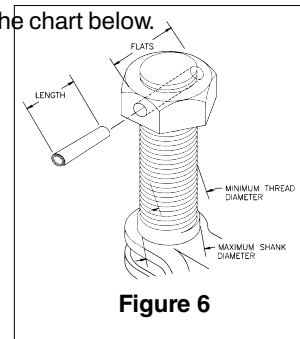


Figure 6

Crosby® / Bullard Golden Gate® Hook Identification and 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	1-1/2 - 6 UNC	7.9	7.8/8.10
2	.90	12.70	1/2 - 13 UNC	3.2	3.15/3.30	12	11.15	41.2	1-5/8 - 5-1/2 UNC	7.9	7.8/8.10
3	1.27	14.20	9/16 - 12 UNC	3.2	3.15/3.30	13	13.6	44.4	1-3/4 - 5 UNC	9.5	9.40/9.7
4	1.54	15.80	5/8 - 11 UNC	3.2	3.15/3.30	14	16.8	50.7	2 - 4-1/2 UNC	9.5	9.40/9.7
5	2.09	19.00	3/4 - 10 UNC	4.0	3.94/4.05	16	22.4	69.8	2-3/4 - 4 UNC	12.7	12.5/12.95
6	3.63	22.20	7/8 - 9 UNC	4.75	4.70/4.90	16-A	29.9	69.8	2-3/4 - 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 - 4 UNC	19.1	18.9/19.30
8	5.00	28.50	1-1/8 - 7 UNC	6.35	6.25/6.50	17-A	59.9	101.5	4 - 4 UNC	19.1	18.9/19.30
9	6.53	31.70	1-1/4 - 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 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.

S-4320 HOOK LATCH KIT

WARNINGS & APPLICATION INSTRUCTIONS



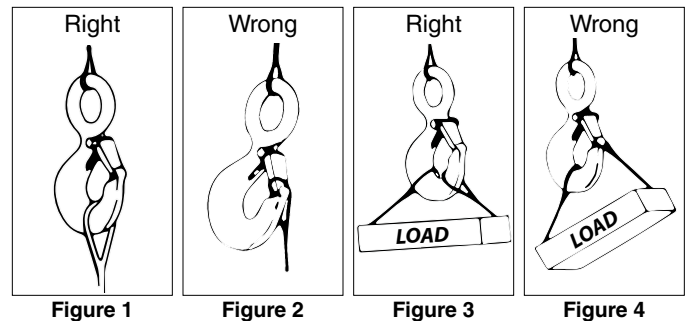
(For Crosby 319N, 320N, and 322N, S-1327, and A-1339 Hooks)

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 Figures 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 Figures 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

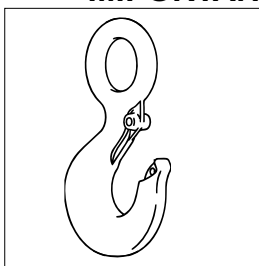
- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Hook must always support the load. The load must never be supported by the latch.
- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv)(B) for Personnel Hoisting by Crane or Derricks. A Crosby S-319N, S-320N, S-322N, S-1327, 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-1327, and A-1339 Hook.
- **DO NOT** use this latch in applications requiring non-sparking.
- Read and understand these instructions before using hook and latch.



Hook Identification Code	Recommended Cotter Pin Dimensions (mm)	
	Diameter	Length
D	3.19	19.1
F	3.19	19.1
G	3.19	25.4
H	4.76	31.8
I	6.35	38.1
J	23.8	50.8
K	23.8	50.8
L	9.53	76.2
N	9.53	76.2

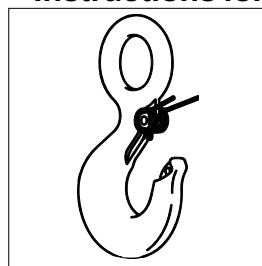
† The current SS-4055 latch kit and the PL latch will not fit new 319N, 320N, or 322N hooks. They will continue to be offered in both styles to service existing hooks. Important – The new S4320 latch kit will not fit the old 319, 320, or 322 hooks.

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



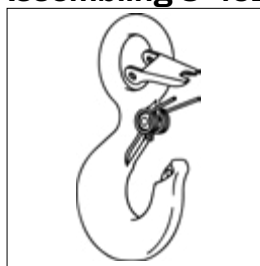
Step 1

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



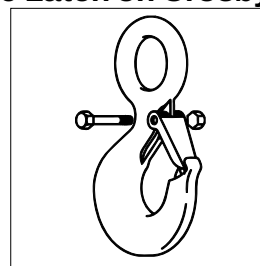
Step 2

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.



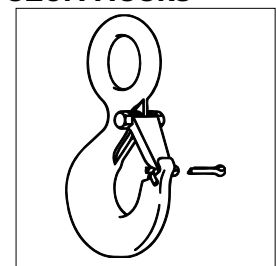
Step 3

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.



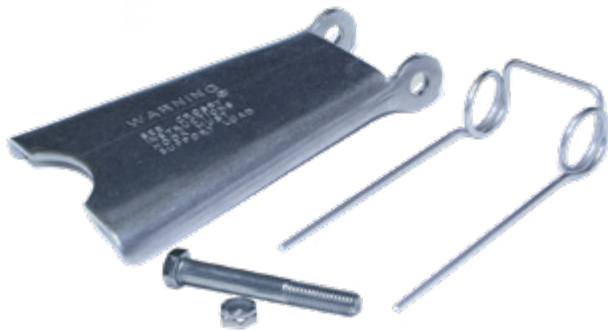
Steps 4, 5, & 6

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

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

Crosby® HOOK LATCH KIT**WARNINGS & APPLICATION INSTRUCTIONS**

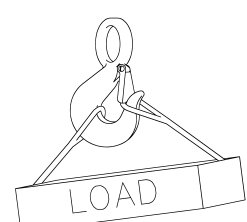
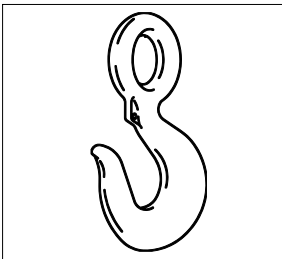
**SS-4055
(Stainless Steel)**

IMPORTANT SAFETY INFORMATION - READ & FOLLOW

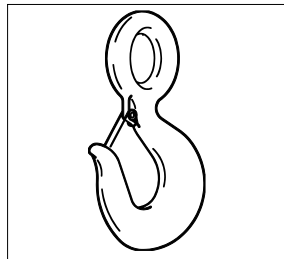
- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load (See Figures 1 & 2).
- When placing two (2) sling legs 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 Figures 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

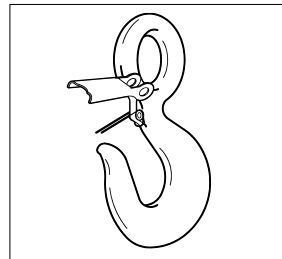
- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1962.1501(g)(4)(iv)(B) A hook and this style latch must not be used for lifting personnel.
- Hook must always support the load. The load must never be supported by the latch.
- Read and understand these instructions before using hook and latch.

RIGHT**Figure 1****WRONG****Figure 2****RIGHT****Figure 3****WRONG****Figure 4****IMPORTANT – Instructions for Assembling Model SS-4055 Latch on Crosby Hooks****Step 1**

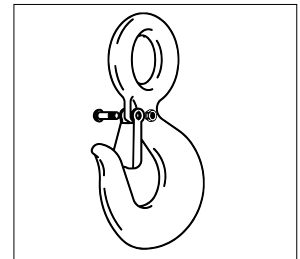
1. Place hook at approximately a 45 degree angle with the cam up.

**Step 2**

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**

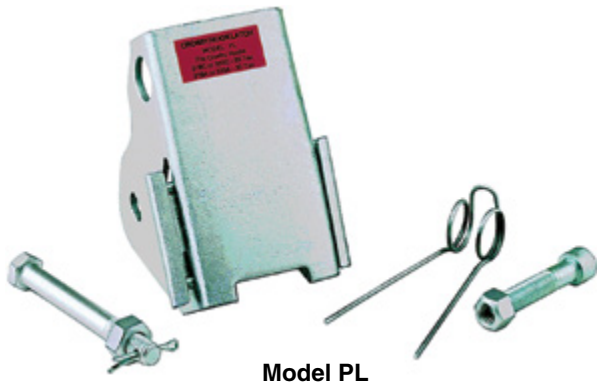
3. Position latch over tines of spring with ears partially over hook cam. Swing latch to one side of hook, point and depress latch and spring until latch clears point of hook.

**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 & APPLICATION INSTRUCTIONS



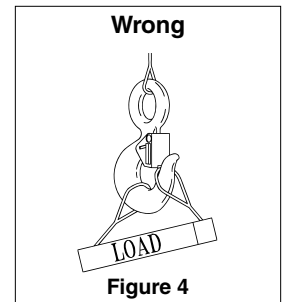
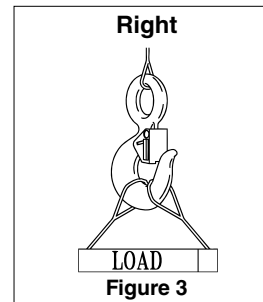
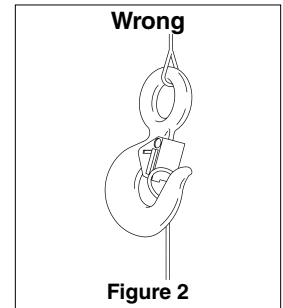
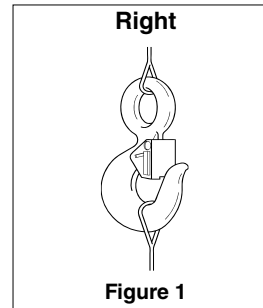
IMPORTANT SAFETY INFORMATION - READ & FOLLOW

(Pat. USA & Canada)

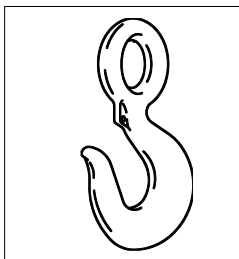
- Always inspect hook and latch before using.
- Never use a latch that is distorted or bent.
- Always make sure spring will force the latch against the tip of the hook.
- Always make sure hook supports the load. The latch must never support the load (See Figures 1 & 2).
- When placing two (2) sling legs 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 Figures 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 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv) (B) 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.
- DO NOT use this latch in applications requiring non-sparking.
- Read and understand these instructions before using hook and latch.

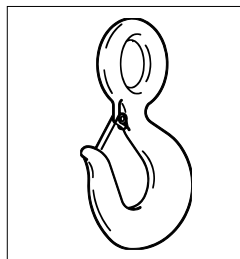


IMPORTANT - Instructions for Assembling Model PL Latch on Crosby or McKissick Hooks



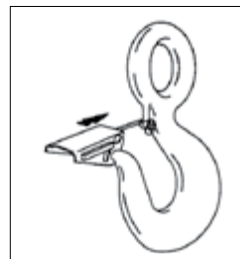
Step 1

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



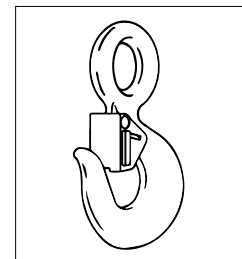
Step 2

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.



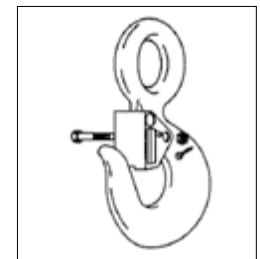
Step 3

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

7. 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.

Crosby® MODEL PL-N/O
HOOK LATCH KIT

WARNINGS & APPLICATION INSTRUCTIONS



Model PL-N/O

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 Figures 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 Figures 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 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv) (B) 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.
- DO NOT use this latch in applications requiring non-sparking.
- Read and understand these instructions before using hook and latch.

RIGHT



Figure 1

WRONG



Figure 2

RIGHT



Figure 3

WRONG

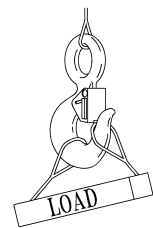
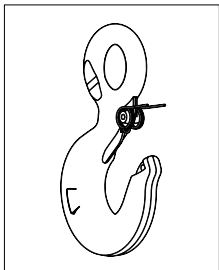
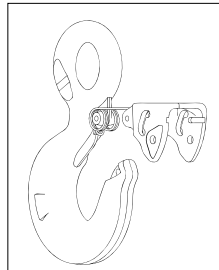


Figure 4

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

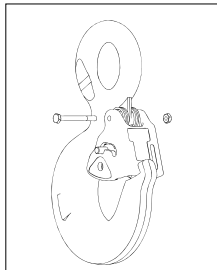
Step 1

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.



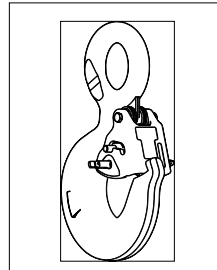
Step 2

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).

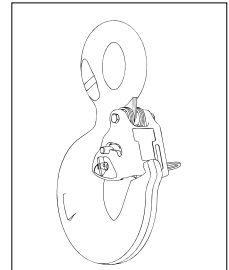


Step 3 4, 5, & 6

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.

Step 7,8 - For
Personnel Lifting

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.

Step 9 - For
Personnel Lifting

9. Rotate toggle 90 degrees to secure pin (ensure toggle is in closed position as shown).

Crosby® SHUR-LOC® HOOKS

WARNING & 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 ASME B30.10.
- For hooks used in frequent load cycles, pulsating loads, or severe duty as defined by ASME B30.10, 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 5%, not to exceed 1/4", (6mm) or shows any visible apparent bend or twist from the plane of the unbent hook, 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 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. Contact Crosby Engineering to evaluate any crack.
- 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).
- S-1326A can be used for limited rotations under load (infrequent, noncontinuous).
- 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).

⚠ WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Positive locking latch will unlock when trigger is depressed. 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.
- Keep hand(s) from between throat of hook and sling or other device.
- Do not use hook tip for lifting.
- Do not use hook handle for lifting.
- Do not rig the finger pull open, place objects in the finger pull area, or in any way inhibit complete and full operation of the finger pull mechanism.
- Shank threads may corrode and/or strip and drop the load.
- Remove securement nut to inspect threads for corrosion or to replace S-1326A bearing washers (2) and or S-13326 thrust bearing.
- Never apply more force than the hook's assigned Working Load Limit (WLL) rating.
- See OSHA Rule 1926.1431(g) and 1926.1501(g) for personnel hoisting by cranes or derricks. A Crosby 1318A, 1326A, 13326, 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.

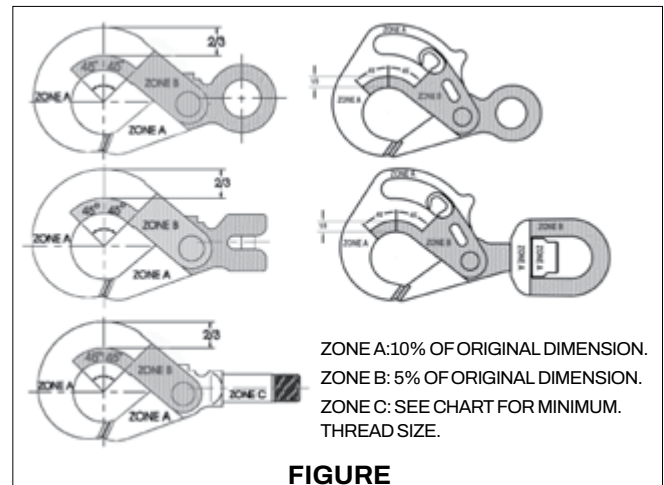


FIGURE 1

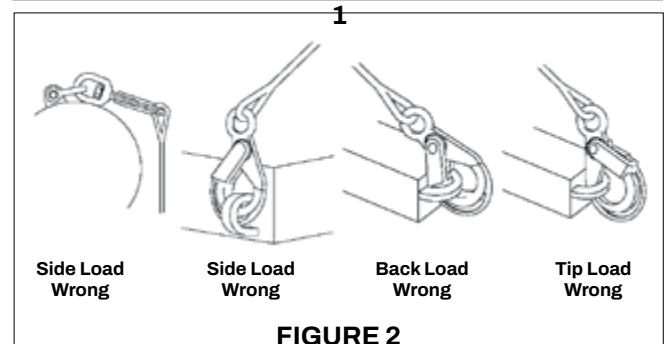


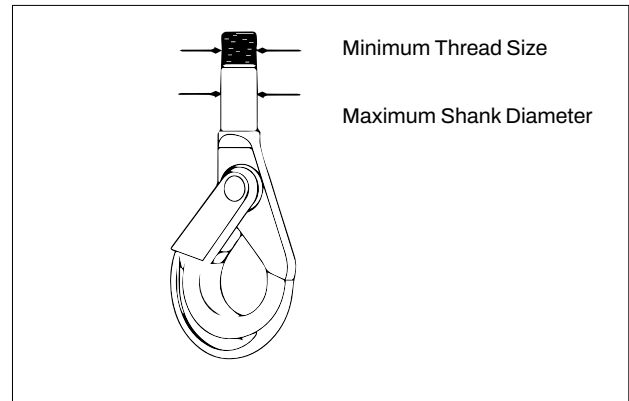
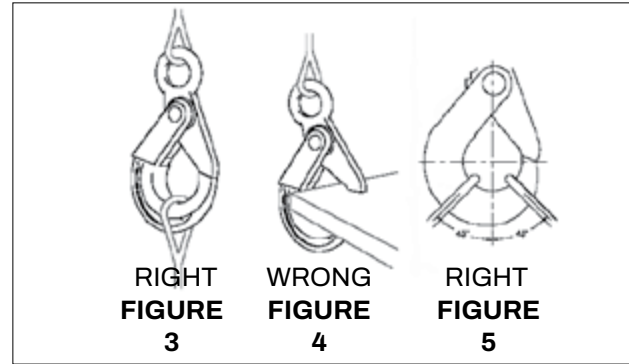
FIGURE 2

- 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 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 en línea 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 (length of shank) 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-1316A & S-1317A Only Grade 100 Chain			S-1318A, S-1326A					S-1318A Only † †		
Chain Size		Working Load Limit (lb)** 4:1	Grade 100 Chain			Wire Rope XXIP Mechanical Splice		Maximum Shank Diameter		Minimum Thread Size (in)
			Chain Size		Working Load Limit (lb)** 4:1	Wire Rope Size (in)	Working Load Limit (lb)* 5:1			
(in)	(mm)		(in)	(mm)				(in)	(mm)	
—	6	3200	—	6	3200	5/16	2200	.72	18	5/8 - 11 UNC
1/4	7	4300	1/4	7 - 8	4300	7/16	4200	.94	24	5/8 - 11 UNC
5/16	8	5700	5/16	8	5700	7/16	4200	.94	24	3/4 - 10 UNC
3/8	10	8800	3/8	10	8800	1/2	5600	1.06	27	3/4 - 10 UNC
1/2	13	15000	1/2	13	15000	5/8	8600	1.19	30	1-1/8 - 7 UNC
5/8	16	22600	5/8	16	22600	7/8	16600	1.38	35	1-3/8 - 6 UNC
3/4	18/20	35300	3/4	18-20	35300	1	22000	—	—	—
7/8	22	42700	7/8	22	42700	1-1/8	26500	—	—	—
1	26	59700	1	26	59700	1-1/4	32500	—	—	—

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

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

† Working Load Limit - The maximum mass of 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.

Technical Information

The following information aims to give advice and explain the most common questions in order to ensure safe and proper use of lifting equipment.

It is of the utmost importance that this information is known to the user, and in accordance with the Machinery Directive 2006/42/EC this information must be delivered to the customer.

See website or user instructions for assembly instructions.

Meets listed current specifications and standards at time of publication of this catalog.

All G80 and G100 Alloy Chains, and Alloy components meet or exceed the safety standards as prescribed by ASME B30.9 and OSHA 1910-184 for slings. Always comply with applicable International, National, Federal and local regulations as they govern worksite activity. Understand all governing laws and safety standards before any products are used. Contact your International, National, Federal and local standards and regulations organizations for reference assistance.

Extreme Environments

The in-service temperature affects the WLL as follows:

Temperature (°F)	Reduction of WLL			
	Gunnebo Grade 10 (400) chain	Crosby Grade 10 & Gunnebo Grade 10 (200) chain	Crosby & Gunnebo Grade 10 components	Crosby & Gunnebo Grade 8 chain & components
-40 to + 392 °F	0 %	0 %	0 %	0 %
+392 to + 572 °F	10 %	Not allowed	10 %	10 %
+572 to + 752 °F	25 %	Not allowed	25 %	25 %

Upon return to normal temperature, the sling reverts to its full capacity within the above temperature range. Chain slings should not be used above or below these temperatures. Note: A chain sling with Grade 10 (100) chain must not be used in temperatures above 392°F.

- Chain and components must not be used in alkaline (>pH10) or acidic conditions (<pH6).
- Comprehensive and regular examination must be carried out when used in severe or corrosive inducing environments.
- In uncertain situations consult your Gunnebo Industries dealer.

Surface Treatment

Note: Hot-dip galvanizing or plating is not allowed outside the control of the manufacturer.

Protect Yourself and Others

- Before each use the chain sling should be checked for obvious damage or deterioration.
- Know the weight of the load, the center of gravity and ensure it is ready to move and no obstacles will obstruct the lift.
- Check the conformity of the load with the WLL of the ID tag for the specific working configuration. Never use a sling without a legible valid ID tag!
- Prepare the landing site.
- Never overload a sling and avoid shock loading.
- Never use an improper sling configuration.
- Never use a worn out or damaged sling.
- Never ride on the load.
- Never walk or stand under a suspended load.
- Take into consideration that the load may swing or rotate.
- Watch your feet and fingers while loading/unloading.
- Always ensure that your back is clear.

General Advice

- Ensure that the sling is precisely as ordered.
- Ensure that the manufacturers certificate is in order.
- A metal I.D. Tag must always be attached to a chain sling, showing serial number, size, reach, rated capacity at angle of lift and manufacturer.
- Ensure that all details of the chain sling are recorded.
- Ensure that the staff using the chain sling has received the appropriate information and training.

Asymmetrical Loading Conditions

For unequally loaded chain legs we recommend that the WLL are determined as follows:

- 2-leg slings calculated as the corresponding 1-leg sling
- 3 and 4-leg slings calculated as the corresponding 1-leg sling. (If it is certain that 2-legs are equally carrying the major part of the load, it can be calculated as the corresponding 2-leg sling.)

Correct Use

Machining and threading specifications for BKT shank hook

- BKT self-locking hook shank machining limits are defined and are given in TABLE 2 and these limits are required for WLL's given. Failure to comply can result in stripped threads and loss of load. Hook shank threads shall end with a thread relief. Hook shank shall not be swaged to wire rope or rod. Hook shank shall not be drilled and internally threaded.
- Gunnebo Industries cannot assume responsibility for:
 - Machining quality,
 - Application,
 - Attachment to power source or load

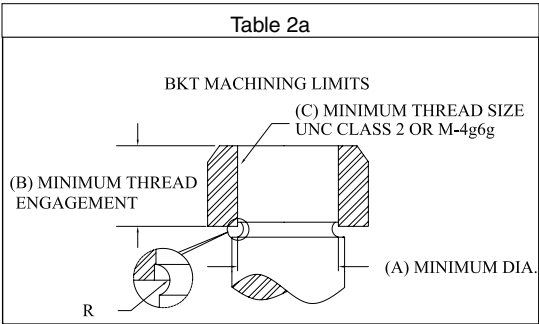
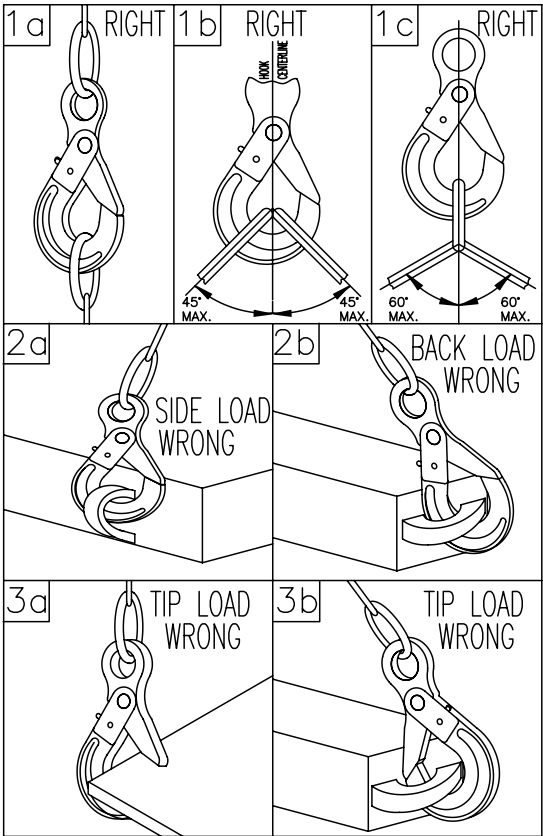


Table 2b				
English				
Trade Size	(A)	(B)	(C) Min. Thread	
MM	IN	Dia.	Len.	Class 2
5/6	7/32	.430	.563	9/16-12 UNC
7/8	9/32	.485	.625	5/8-11 UNC
10	3/8	.600	.750	3/4-10 UNC
13	1/2	.820	1.00	1-8 UNC
16	5/8	1.048	1.25	1-1/4-7 UNC

Table 2c				
Metric				
Table Size	(A)	(B)	(C) Min. Thread	
MM	IN	Dia.	Len.	Class 4g6g
5/6	7/32	11	14	M14x2
7/8	9/32	13	16	M16x2
10	3/8	16	20	M20x2.5
13	1/2	20	24	M24x3
16	5/8	25	30	M30x3.5

Safe use of self-locking hook

- Alloy steel BK self-locking hooks may be used to rig personnel platforms when lift system is in full compliance with OSHA 1926.1501(g) and passing the applicable inspection criteria.
- Loads shall be centered in the base (bowl/ saddle) of hook to prevent point loading of the hook (See Figure 1a, 1b & 1c).
- Hooks shall not be used in such a manner as to place a side load or back load on the hook (See Figure 2a & 2b).
- When using a device to close the throat opening of the hook, care shall be taken that the load is not carried by the closing device (See Figure 3a & 3b).
- Hands, fingers and body shall be kept from between hook and load.
- The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required in all cases.
- Self-locking hooks shall be locked during use.
- When a hook is equipped with a latch, the latch should not be restrained from closing during use.
- Self-locking hooks shall not be rigged with more than two (2) sling legs in the hook saddle and sling leg angles shall not be greater than 45° from hook centerline (Figure 1b).
- Self-locking hooks shall be rigged with a master ring or shackle when three (3) or more sling legs are used or sling leg angles exceed 45° from hook centerline (Figure 1c).



Correct Use

A chain sling is usually attached to the load and the crane by means of terminal fittings such as hooks, links etc.

When frequently using a sling to it's maximum load, we recommend increasing the sling size by one dimension.

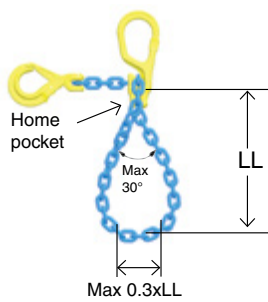


Chain should be without twists or knots, if the chain leg needs length adjustment use a shortening device. The lifting point should be seated well down in the terminal fitting, never on the point or wedged in the opening. The terminal fitting should be free to incline in any direction.

The chain may be passed under or through the load to form a choke hitch or basket hitch. The chain should be allowed to assume it's natural angle and should not be hammered down.

Where choke hitch is employed the WLL of the chain sling shall be reduced by 20%.

Endless chain slings shall be rated in the same way as a 2-legged sling.

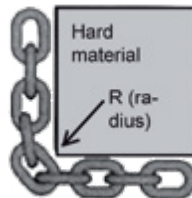


Home pocket loop shall have an internal loop top angle of max. 30°. Rule of thumb: Cross dimension of the load shall be max. 0.3 times the loop length (LL)

Definition: The home pocket is the shortening pocket of the top component directly above the clevis to which the chain is connected.

Sharp edges

Use edge protectors to prevent sharp edges from damaging the chain. If lifting over sharp edges reduce the working load with the following reduction tor.



Edge load	R > 2 x chain Ø	R > chain Ø	R < chain Ø
Reduction factor	1.0	0.7	0.5

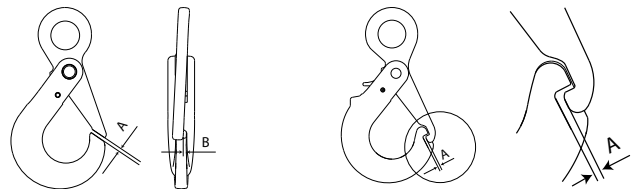
- The angle of the edge must not be below 90°.
- Chain links shall be protected from being bent or deformed and from receiving cuts or gouges.
- Chain sling WLL is to be reduced when chain is rigged over an edge radius R less than two (2) x chain diameter (d).
- Reduced WLL equals chain sling WLL from identification tag x reduction factor.
- Slings shall be padded or protected from the edges of their loads when the edge radius is less than 0.5 of the chain diameter(d).
- Slings shall be rigged to prevent chain from sliding over a load edge radius while lifting.
- Slings used in basket hitch shall have the loads balanced to prevent slipping.

When lifting with chain directly on lugs the lug diameter > 3x the pitch of the chain, otherwise the WLL must be reduced by 50%.

Maintenance

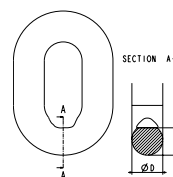
Periodic thorough examination must be carried out at least every 12 months or more frequently according to local statutory regulations, type of use and past experience.

- Overloaded chain slings must be taken out of service.
- If the lifting equipment is more than 25 years old, it must be recorded in the inspection register. An investigation into both its previous operating history and its current use should be made, as there is a potentially significant risk of fatigue, environmental impact etc.
- Chain and components including load pins which have been damaged, deformed, elongated, bent or showing signs of cracks or gouges shall be replaced. Carefully grind away small sharp cuts and burrs. Additional testing by magnetic particle inspection and/or proof loading at max. 2 x WLL may be carried out.
- The maximum permissible increase in hook aperture must not exceed 10% of the products nominal dimension.
- Check the function of latches, triggers and retaining pins / bushes, replace when necessary. Always use Gunnebo Industries original spare parts.
- Max. clearance between hook and latch. Note: For a Griplatch hook measure the difference between dimension A with unloaded spring and dimension A when the latch is pressed against the hook. Clearance B not applicable.



Trade size		Max. clearance (A)				Max. clearance (B)	
		Material handling		Personnel handling		(NA for griplatch hooks)	
mm	inch	mm	inch	mm	inch	mm	inch
6	7/32	2.2	0.09	1.5	0.06	3.5	0.14
7/8	9/32	2.7	0.11	1.9	0.07	4.5	0.18
7	9/32	2.7	0.11	1.9	0.07	4.5	0.18
8	5/16	2.7	0.11	1.9	0.07	4.5	0.18
10	3/8	3.0	0.12	2.1	0.08	6.0	0.24
13	1/2	3.3	0.13	2.3	0.09	7.0	0.28
16	5/8	4.0	0.16	2.8	0.11	9.0	0.35
18/20	3/4	5.5	0.22	3.9	0.15	10.0	0.39
22	7/8	6.0	0.24	4.2	0.17	11.0	0.43
26	1	6.5	0.26	4.6	0.18	12.0	0.47
32	1 1/4	7.0	0.28	4.9	0.19	13.0	0.51

- The wear of the chain and component shall in no place exceed 10% of the products nominal dimension. The chain link wear is defined and measured as the reduction of the mean diameter measured in two perpendicular directions, see picture.



$$\frac{d_1 + d_2}{2} > 0.9d_n$$

d_n = nominal diameter

Quality assurance

Type testing

In order to prove the design, material, heat treatment and method of manufacture, each size of component and chain has been type tested in the finished condition in order to demonstrate that the component and chain possesses the required mechanical properties. The following testing procedures are particularly relevant:

Test for deformation

The Manufacturing Proof Force (MPF) for the relevant size of the component is applied and removed. The dimensions after proof loading shall not alter from the original dimensions within the tolerances prescribed in our specifications and in the international standards.

Static tensile test

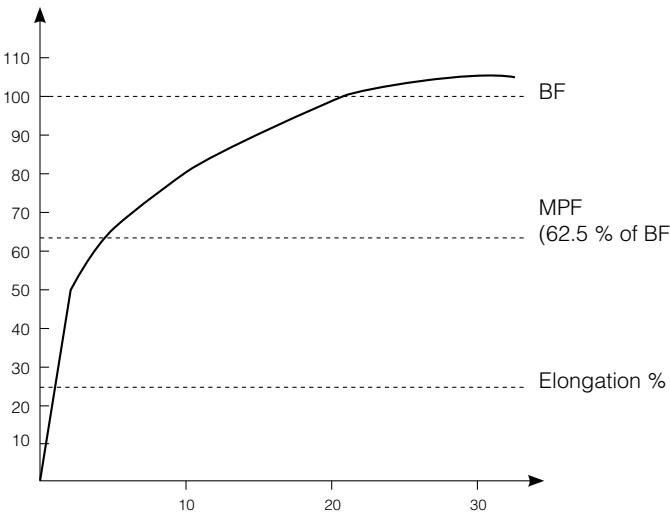
The Breaking Force (BF) for each component and size is verified. The verified value shall be at least equal to the Minimum Breaking Force (MBF) value. The MBF value is equal to the Working Load Limit (WLL) multiplied by the safety factor.

Fatigue test

By fatigue testing in pulsator testing machines the toughest conditions of service are simulated.

Stress / elongation diagram

Force
% of min Breaking Force



Manufacturing testing

During manufacture continuous process tests are carried out according to the requirements in our specifications and in the latest international standards. The following testing procedures are particularly relevant:

Non destructive test

3% of every production batch of forged components are subject to magnetic particle or dye penetrating examination.

Proof force / visual inspection

Each individual component and chain link is tested to the Manufacturing Proof Force (MPF) level before delivery. The MPF level is 2.5 times the WLL, equal to 62.5% of the Minimum Breaking Force. Visual inspection is carried out on each chain link and each forged component to detect defects.

Static tensile and ultimate elongation test

During chain manufacture, samples are tested and the Minimum Breaking Force (MBF) value and the total ultimate elongation are verified.

Bending deflection

During manufacturing, of chain and master links, samples are taken and the minimum bend deflection is verified.

