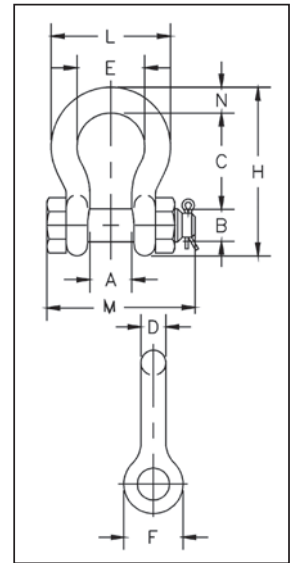


# Crosby® Bolt Type Shackles



**G-2130 / S-2130**  
Bolt Type Anchor shackles with thin head bolt - nut with cotter pin. Meets the performance requirements of Federal Specification RR-C-271F Type IVA, Grade A, Class 3, except for those provisions required of the contractor. For additional information, see page 452.

- Capacities 1/3 thru 150 metric tons, grade 6.
- Working Load Limit and grade "6" permanently shown on every shackle.
- Forged – Quenched and Tempered, with alloy bolts.
- Hot Dip galvanized or self colored. (85, 120, and 150 metric ton shackles are all hot dip galvanized bows and the bolts are Dimetcoated® and painted red)
- Fatigue rated (1/3t - 55t).
- Shackles 25t and larger are **RFID EQUIPPED**.
- Approved for use at -40 degree C (-40 degree F) to 204 degree C (400 degree F).
- Meets or exceeds all requirements of ASME B30.26.
- Shackles 85 metric tons and larger are individually proof tested to 2.0 times the working load limit.
- Type Approval certification in accordance with ABS 2007 Steel Vessel Rules 1-11-17.7 and ABS Guide for Certification on Cranes available. Certificates available when requested at time of order and may include additional charges
- 3.1 Certification as standard available for charpy and statistical proof test from 3.25t up to 25 tons to DNV2.7-1 and EN13889.
- Crosby 3.25t through 25t G2130OC anchor shackles are type approved to DNV Certification Notes 2.7-1- Offshore Containers. These Crosby shackles are statistical proof and impact tested to 42 joules (31 ft-lbs.) min. avg. at -20 degree C (-4 degree F). The tests are conducted by Crosby and 3.1 test certification is available upon request. Refer to page 88 for Crosby COLD TUFF® shackles that meet the additional requirements of DNV rules for certification of lifting applications - Loose Gear.
- All other 2130 shackles can meet charpy requirements of 42 joules (31 ft-lbs) avg at -20 degree C (-4 degree F) when requested at time of order.
- Look for the Red Pin® . . . the mark of genuine Crosby quality.



Shackles



**SEE APPLICATION INFORMATION**  
On Page 92 of the General Catalog  
Para Español: [www.thecrosbygroup.com](http://www.thecrosbygroup.com)

## G-2130 / S-2130 Bolt Type Anchor Shackles

Nominal Size (in.)	Working Load Limit (t)*	Stock No.			Weight Each (lbs.)	Dimensions (in.)											Tolerance +/-	
		G-2130	S-2130	G-2130OC		A	B	C	D	E	F	H	L	M	N	C	A	
3/16	1/3 ‡	1019464	-	-	.06	.38	.25	.88	.19	.60	.56	1.47	.98	1.29	.19	.06	.06	
1/4	1/2	1019466	-	-	.11	.47	.31	1.13	.25	.78	.61	1.84	1.28	1.56	.25	.06	.06	
5/16	3/4	1019468	-	-	.22	.53	.38	1.22	.31	.84	.75	2.09	1.47	1.82	.31	.06	.06	
3/8	1	1019470	-	-	.33	.66	.44	1.44	.38	1.03	.91	2.49	1.78	2.17	.38	.13	.06	
7/16	1-1/2	1019471	-	-	.49	.75	.50	1.69	.44	1.16	1.06	2.91	2.03	2.51	.44	.13	.06	
1/2	2	1019472	1019481	-	.79	.81	.64	1.88	.50	1.31	1.19	3.28	2.31	2.80	.50	.13	.06	
5/8	3-1/4	1019490	1019506	1262013	1.68	1.06	.77	2.38	.63	1.69	1.50	4.19	2.94	3.56	.69	.13	.06	
3/4	4-3/4	1019515	1019524	1262022	2.72	1.25	.89	2.81	.75	2.00	1.81	4.97	3.50	4.15	.81	.25	.06	
7/8	6-1/2	1019533	1019542	1262031	3.95	1.44	1.02	3.31	.88	2.28	2.09	5.83	4.03	4.82	.97	.25	.06	
1	8-1/2	1019551	1019560	1262040	5.66	1.69	1.15	3.75	1.00	2.69	2.38	6.56	4.69	5.39	1.06	.25	.06	
1-1/8	9-1/2	1019579	1019588	1262059	8.27	1.81	1.25	4.25	1.13	2.91	2.69	7.47	5.16	5.90	1.25	.25	.06	
1-1/4	12	1019597	1019604	1262068	11.71	2.03	1.40	4.69	1.29	3.25	3.00	8.25	5.75	6.69	1.38	.25	.06	
1-3/8	13-1/2	1019613	1019622	1262077	15.83	2.25	1.53	5.25	1.42	3.63	3.31	9.16	6.38	7.21	1.50	.25	.13	
1-1/2	17	1019631	1019640	1262086	19.00	2.38	1.66	5.75	1.53	3.88	3.63	10.00	6.88	7.73	1.62	.25	.13	
1-3/4	25	1019659	1019668	1262095	33.91	2.88	2.04	7.00	1.84	5.00	4.19	12.34	8.80	9.68	2.25	.25	.13	
2	35	1019677	1019686	-	52.25	3.25	2.30	7.75	2.08	5.75	4.81	13.68	10.15	10.81	2.40	.25	.13	
2-1/2	55	1019695	1019702	-	98.25	4.13	2.80	10.50	2.71	7.25	5.69	17.90	12.75	13.58	3.13	.25	.25	
3	† 85	1019711	-	-	154.00	5.00	3.30	13.00	3.12	7.88	6.50	21.50	14.62	15.13	3.62	.25	.25	
3-1/2	† 120 ‡	1019739	-	-	265.00	5.25	3.76	14.63	3.62	9.00	8.00	24.88	17.02	17.00	4.38	.25	.25	
4	† 150 ‡	1019757	-	-	338.00	5.50	4.26	14.50	4.00	10.00	9.00	25.68	18.00	17.75	4.56	.25	.25	

\* NOTE: Maximum Proof Load is 2.0 times the Working Load Limit. Minimum Ultimate Strength is 6 times the Working Load Limit. For Working Load Limit reduction due to side loading applications, see page 94. † Individually Proof Tested with certification. ‡ Furnished in Anchor style only and furnished with Round Head Bolts with welded handles.

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## Round Pin Shackles



G/S-213



G/S-215

**Round Pin Shackles** can be used in tie down, towing, suspension or lifting applications where the load is strictly applied in-line. Round pin shackles should never be used in rigging applications to gather multiple sling legs, or where side loading conditions may occur.

## Screw Pin Shackles



G/S-209



S-209T



G-209A



G/S-210



S-253



G-2169

**Screw Pin Shackles** are used in Pick and Place\* applications. For permanent or long-term installations, Crosby recommends the use of bolt type shackles.

If you choose to disregard Crosby's recommendation, the screw pin shall be secured from rotation or loosening (Page 93).

Screw pin shackles can be used for applications involving side-loading circumstances. Reduced working load limits are required for side-loading applications. While in service, do not allow the screw pin to be rotated by a live line, such as a choker application.

\* Pick and Place application: Pick (move) a load and place as required. Tighten screw pin before each pick.

## Bolt-Type Shackles



G/S-2130



G/S-2150



G/S-2140



G/S-2160

**Bolt-Type Shackles** can be used in any application where round pin or screw pin shackles are used. In addition, they are recommended for permanent or long term installations and where the load may slide on the shackle pin causing the pin to rotate. The bolt-type shackle's secondary securement system, utilizing a nut and cotter, eliminates the requirement to tighten pin before each lift or movement of load.

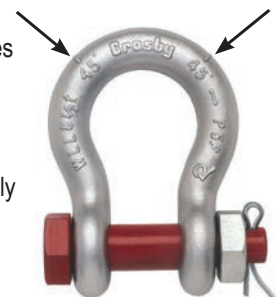
**QUIC-CHECK®** All Crosby Shackles, with the exception of 2160, 2169, 2170, 252 and 253 styles



incorporate markings forged into the product that address an easy to use **QUIC-CHECK®** feature. Angle indicators are forged into the shackle bow at 45 degree\*\* angles from vertical. These are utilized on screw pin and bolt type shackles to quickly check the approximate angle of a two-legged hitch, or quickly

check the angle of a single leg hitch when the shackle pin is secured and the pull of the load is off vertical (side loaded), thus requiring a reduction in the working load limit of the shackle.

\*\* Round Pin Shackles utilize the 45 degree **QUIC-CHECK®** indicators to ensure load is applied strictly in-line.

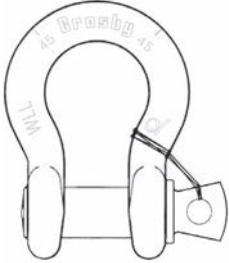


G-2130

## RIGGING PRACTICE SHACKLES

Screw pin shall be fully engaged. If designed for a cotter pin, it shall be used and maintained. Applied load should be centered in the bow to prevent side loading. Multiple sling legs should not be applied to the pin. If side loaded, the rated load shall be reduced according to Table 1 on pages 94.

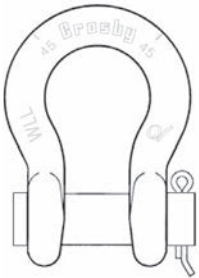
## Screw Pin Shackles Pin Security



### MOUSE SCREW PIN WHEN USED IN LONG-TERM OR HIGH-VIBRATION APPLICATIONS.

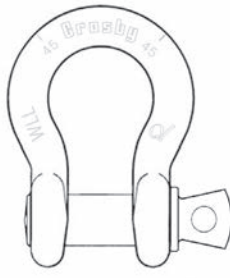
Mouse or Mousing (screw pin shackle) is a secondary securement method used to secure screw pin from rotation or loosening. Annealed iron wire is looped through hole in collar of pin and around adjacent leg of shackle body with wire ends securely twisted together.

## Shackles



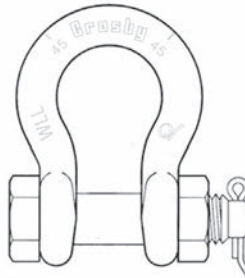
### ROUND PIN

Do not side load, do not use as a collector ring, always use cotter pin.



### SCREW PIN

Use when picking and placing a load, tighten pin prior to each lift.



### BOLT-TYPE

Use in permanent or long-term installations, always use nut and cotter.

## Connection of Slings to Shackles

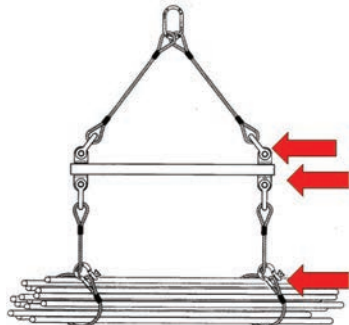


Diameter of shackle must be greater than wire rope diameter if no thimble in eye.



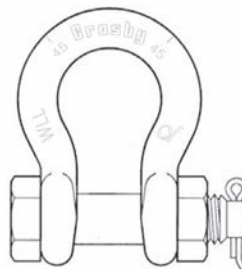
Shackle must be large enough to avoid pinching of synthetic slings.

## Bolt-Type Shackles

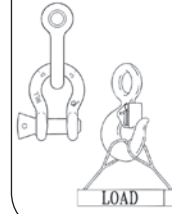


Use Bolt-Type Shackle when a permanent or long-term connection.

Use a screw pin shackle when it will be a temporary connection.



## WIRE ROPE SLINGS AND CONNECTIONS TO FITTINGS

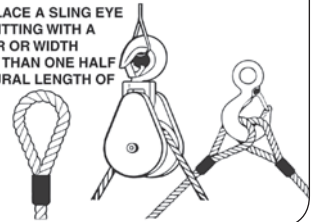


USE A THIMBLE TO PROTECT SLING AND TO INCREASE D/d

NEVER PLACE EYE OVER A FITTING SMALLER DIAMETER OR WIDTH THAN THE ROPE'S DIAMETER

## WIRE ROPE SLINGS AND CONNECTIONS TO FITTINGS

NEVER PLACE A SLING EYE OVER A FITTING WITH A DIAMETER OR WIDTH GREATER THAN ONE HALF THE NATURAL LENGTH OF THE EYE



## SYNTHETIC SLINGS RATED LOAD

FOLDING, BUNCHING OR PINCHING OF SYNTHETIC SLINGS, WHICH OCCURS WHEN USED WITH SHACKLES, HOOKS OR OTHER APPLICATIONS, WILL REDUCE THE RATED LOAD



BUNCHING

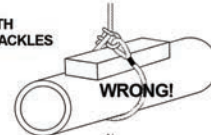


PINCHING

ASME B30.9

## CHOKER HITCH FORMED

WITH SHACKLES



WITH CHOKER HOOK



PLACE PIN IN EYE OF SLING

CORRECT!

## CROSBY SHACKLES POINT LOADING

POINT LOADING OF CROSBY SHACKLE BOWS IS ACCEPTABLE

POINT LOADING OF CROSBY SHACKLE PINS IS ACCEPTABLE AS LONG AS LOAD IS REASONABLY CENTERED ON THE PIN

ALTHOUGH POINT LOADING IS ACCEPTABLE, A PAD EYE WIDTH OF 50%-80% OR MORE OF SHACKLE SPREAD IS BEST PRACTICE



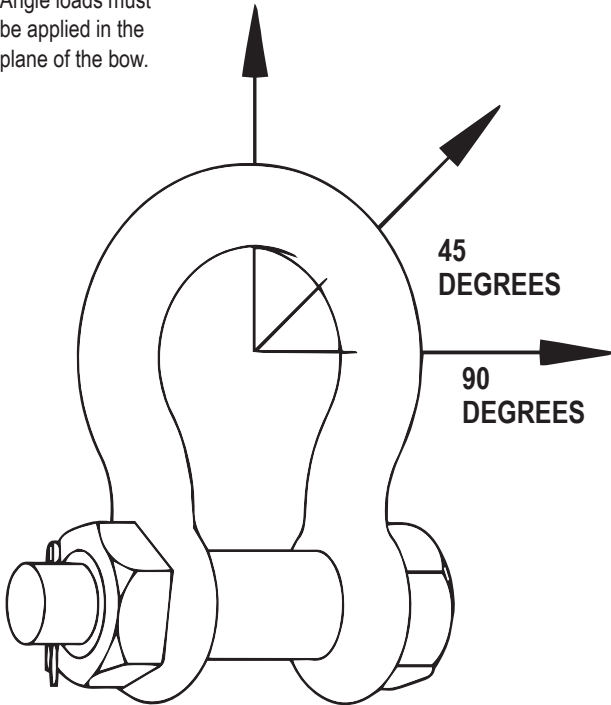
### Point Loading of Crosby® Shackles

It has been determined that all Crosby® shackles can be point-to-point loaded to the Working Load Limit without bending of the pin/bolt. This loading can be bow-to-bow, bow-to-pin, or pin-to-pin (if there is not interference between the diameter of the shackle ears). However, caution should be given to maintain the load at the center of the span by spacers so the load will not slide over to one side, and overload that ear. See "Off Center Loading Of Crosby® Screw Pin & Bolt Type Shackles – 3/16" to 3" Sizes"

### Angular Loading Of Crosby® Screw Pin & Bolt Type Shackles

Crosby® has made representative tests with smaller size shackles with the load applied at 90 degrees to the normal plane of loading (ie. in-line). The test results indicated that in order to maintain a proof load of 2 times the Working Load Limit (2 x WLL), the Working Load Limit should be reduced to 50% (ie. one-half the catalog working load rating). **DO NOT SIDE LOAD G/S-213 OR G/S-215 ROUND PIN SHACKLES.** Calculations based on the above test indicates the Working Load Limit should be reduced as shown below for loads applied at various angles to the normal plane of loading:

Angle loads must be applied in the plane of the bow.



### SIDE LOADED RATING REDUCTION TABLE FOR 3/16" - 3" (120 METRIC TONS)

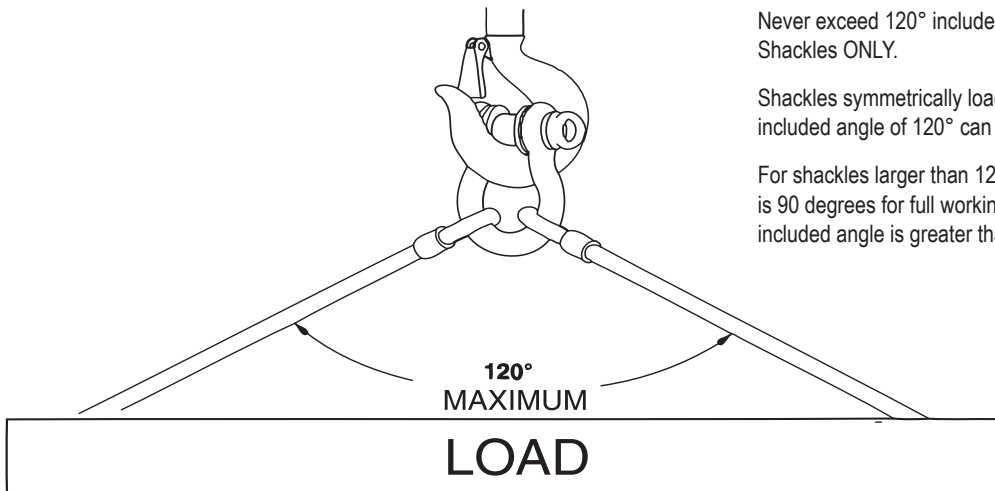
Table 1	
Side Loading Reduction Chart for Screw Pin and Bolt Type Shackles Only+	
Angle of Side Load from Vertical In-Line of Shackle	Adjusted Working Load Limit
0° - 10° In-Line*	0% of Rated Working Load Limit
11° - 20° from In-Line*	15% of Rated Working Load Limit
21° - 30° from In-Line*	25% of Rated Working Load Limit
31° - 45° from In-Line*	30% of Rated Working Load Limit
46° - 55° from In-Line*	40% of Rated Working Load Limit
56° - 70° from In-Line*	45% of Rated Working Load Limit
71° - 90° from In-Line*	50% of Rated Working Load Limit

+ In-Line load is applied perpendicular to pin. \* **DO NOT SIDE LOAD ROUND PIN SHACKLE.**

Table 1	
SHACKLE SIZE GREATER THAN 3" ANGLE FROM IN-LINE (DEGREES) REDUCTION IN WLL	
0° - 5° In-Line*	0% of Rated Working Load Limit
6° - 10° from In-Line*	15% of Rated Working Load Limit
>10° from In-Line*	ANALYSIS REQ'D.

For shackles larger than 125 metric tons, where the angle of the side load is greater than 5 degrees, contact Crosby Engineering.

### INCLUDED ANGLE - SHACKLES



Never exceed 120° included angle. Use Bolt Type and Screw Pin Shackles ONLY.

Shackles symmetrically loaded with two leg slings having a maximum included angle of 120° can be utilized to full Working Load Limit.

For shackles larger than 125 metric tons, the maximum included angle is 90 degrees for full working load limit. Contact Crosby Engineering if included angle is greater than 90 degrees.