

Crosby® Shackles

APPLICATION INFORMATION

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 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 90).

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.



G/S-209

S-209T



G-209A

S-253



G/S-210

G-2169



G/S-2130

G/S-2150



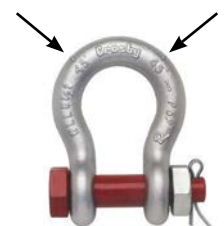
G/S-2140

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® INFORMATION

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.



G-2130

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

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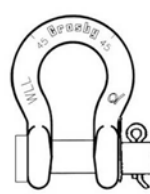
SCREW PIN SHACKLES PIN SECURITY

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

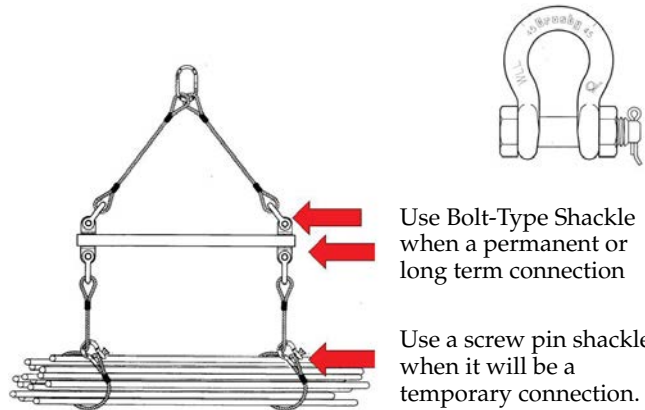
Diameter of shackle must be greater than wire rope diameter if no thimble in eye.



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.

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 page 91.

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Shackles

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

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

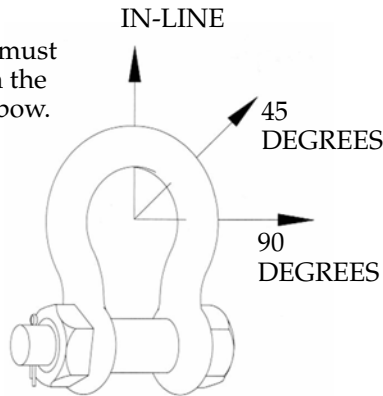
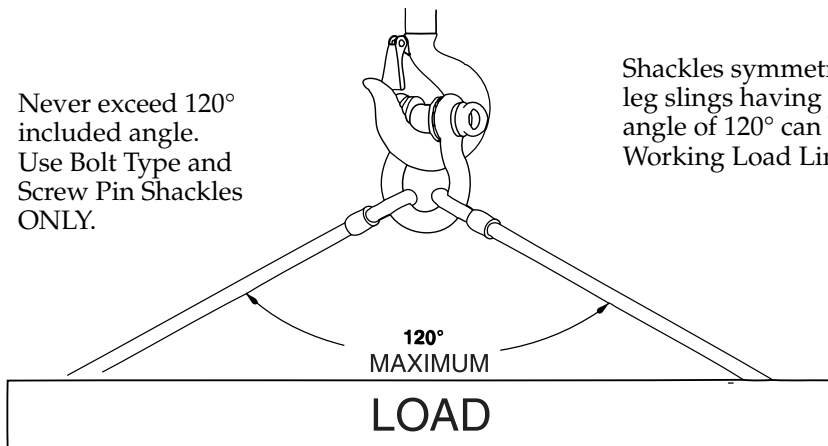


Table 1 Side Loading Reduction Chart for Screw Pin and Bolt Type Shackles Only+	
Angle of Side Load from Vertical In-Line of Shackle	Adjusted Working Load Limit
0° - 5° In-Line*	100% of Rated Working Load Limit
45° from In-Line*	70% of Rated Working Load Limit
90° from In-Line*	50% of Rated Working Load Limit

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

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

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.

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

ANSI B30.9-1994

CHOKER HITCH FORMED

WITH SHACKLES

WRONG!

PLACE PIN IN EYE OF SLING

WITH CHOKER HOOK

CORRECT!

CROSBY SHACKLES POINT LOADING

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 80% OR MORE OF SHACKLE SPREAD IS BEST PRACTICE