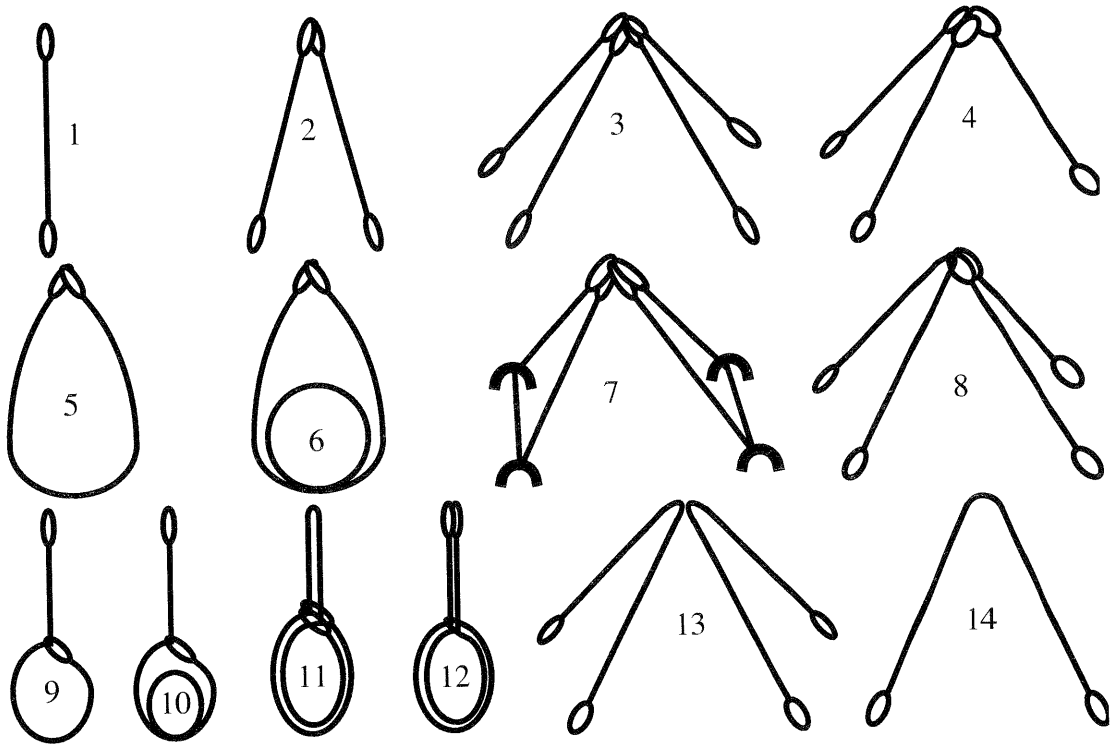
Hitch Types

When deciding which type of hitch is best in a given situation, riggers must evaluate the following: load control, number of legs loaded, tension on legs, position of load center of gravity, and risks.



	Hitch Type	Load C.G. (Above or below lower end of sling)	Leg Loading	Load Control
1	Single Vertical	Below only	One	Poor
2	2-leg Bridle	Below only	Two	Average
3	4-leg Bridle	Above or Below	Two	Excellent
4	3-leg Bridle	Above or Below	Three	Excellent
5	Single Wrap Basket Eyes Up	Above or Below*	Two	Poor
6	Double Wrap Basket Eyes Up	Above or Below*	Two	Average
7	Two Single Baskets Eyes Up	Above or Below*	Four	Poor
8	Basket Eyes Down & 2-leg Bridle	Above or Below	Four	Excellent
9	Single Wrap Choker	Above or Below*	One	Average
10	Double Wrap Choker	Above or Below*	One	Good
11	Double Choker Bight Up	Above or Below*	Two	Good
12	Double Choker Eyes Up	Above or Below*	One	Poor
13	Double Wrap Basket Eyes Down	Below Only	Four	Poor
14	Single Basket Eyes Down	Below Only	Two	Poor

*Never use as a single hitch where the load's center of gravity is above the lower end of the sling. Reprinted courtesy of Wire Rope & Rigging Consultants

Crosby® Shackles

APPLICATION INFORMATION

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.

G/S-209

S-209T

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-209A

S-253

G/S-2130

G/S-2150

G/S-210

G-2169

G/S-2140

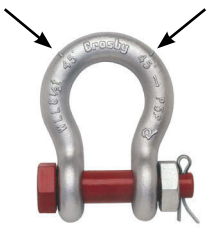
G/S-2160

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.

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

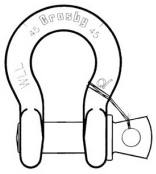


G-2130

Crosby® Shackles

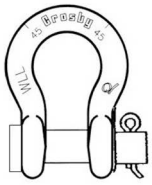
SCREW PIN SHACKLES PIN SECURITY

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

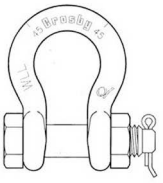


ROUND PIN

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.

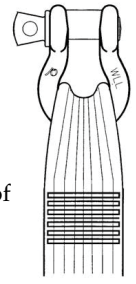


BOLT-TYPE

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

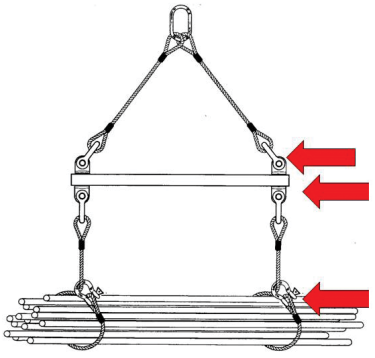
CONNECTION OF SLINGS TO SHACKLES

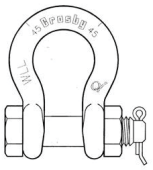
Diameter of shackle must be greater than wire rope diameter if no thimble in eye.



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.

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

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

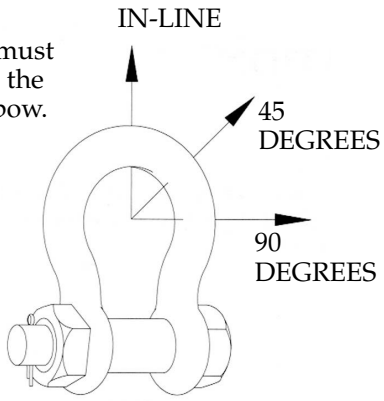
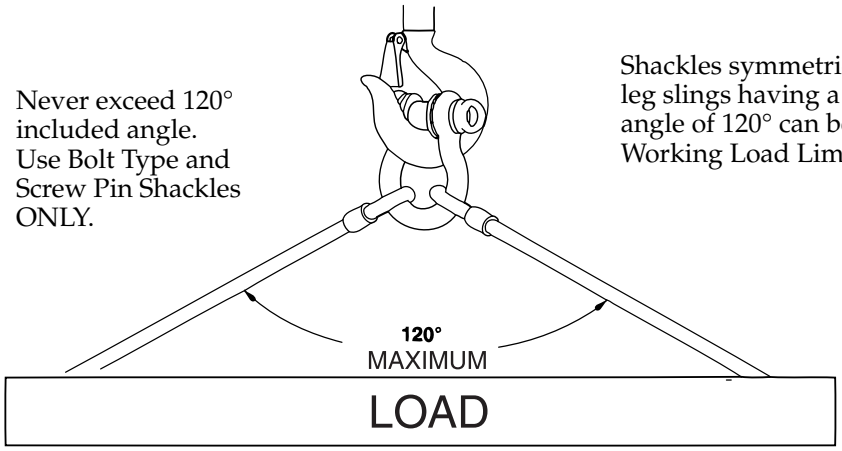


Table 1 Side Loading Reduction Chart for Screw Pin and Bolt Type Shackles Only+	
Angle of Side Load from Vertical In-Line of Shackle	**Adjusted Working Load Limit**
0° - 5° In-Line*	100% of Rated Working Load Limit
45° from In-Line*	70% of Rated Working Load Limit
90° from In-Line*	50% of Rated Working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

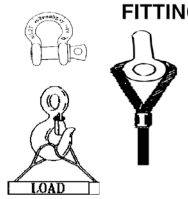
Never exceed 120° included angle. Use Bolt Type and Screw Pin Shackles ONLY.



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

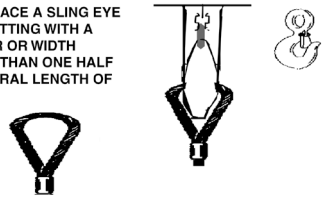


USE A THIMBLE TO PROTECT SLING AND TO INCREASE D/d

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

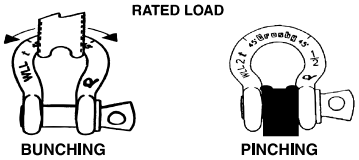
WIRE ROPE SLINGS AND CONNECTIONS TO FITTINGS

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

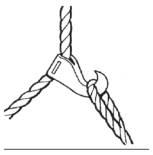
WITH SHACKLES

WRONG!

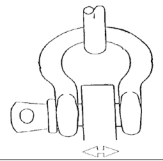
PLACE PIN IN EYE OF SLING

CORRECT!

WITH CHOKER HOOK



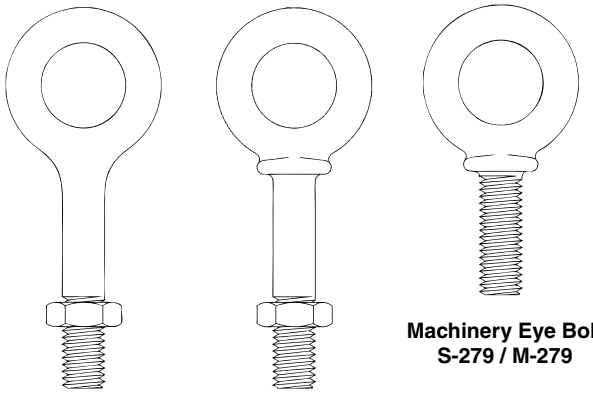
CROSBY SHACKLES POINT LOADING



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

FORGED EYE BOLT WARNINGS AND APPLICATION INSTRUCTIONS



Regular Nut Eye Bolt G-291 | Shoulder Nut Eye Bolt G-277 | Machinery Eye Bolt S-279 / M-279

Important Safety Information - Read & Follow

Inspection/Maintenance Safety:

- Always inspect eye bolt before use.
- Never use eye bolt that shows signs of wear or damage.
- Never use eye bolt if eye or shank is bent or elongated.
- Always be sure threads on shank and receiving holes are clean.
- Never machine, grind, or cut eye bolt.

Assembly Safety:

- Never exceed load limits specified in Table I & Table 2.
- Never use regular nut eye bolts for angular lifts.
- Always use shoulder nut eye bolts (or machinery eye bolts) for angular lifts.
- For angular lifts, adjust working load as follows:

Direction of Pull (from In-Line)	Adjusted Working Load
45 degrees	30% of rated working load
90 degrees	25% of rated working load

- Never undercut eye bolt to seat shoulder against the load.
- Always countersink receiving hole or use washers with sufficient I.D. to seat shoulder.
- Always screw eye bolt down completely for proper seating.
- Always tighten nuts securely against the load.

⚠ WARNING

- **Load may slip or fall if proper eye bolt assembly and lifting procedures are not used.**
- **A falling load can seriously injure or kill.**
- **Read and understand both sides of these instructions, and follow all eye bolt safety information presented here.**
- **Read, understand, and follow information in diagrams and charts below before using eye bolt assemblies.**

Shoulder Nut Eye Bolt – Installation for Angular Loading

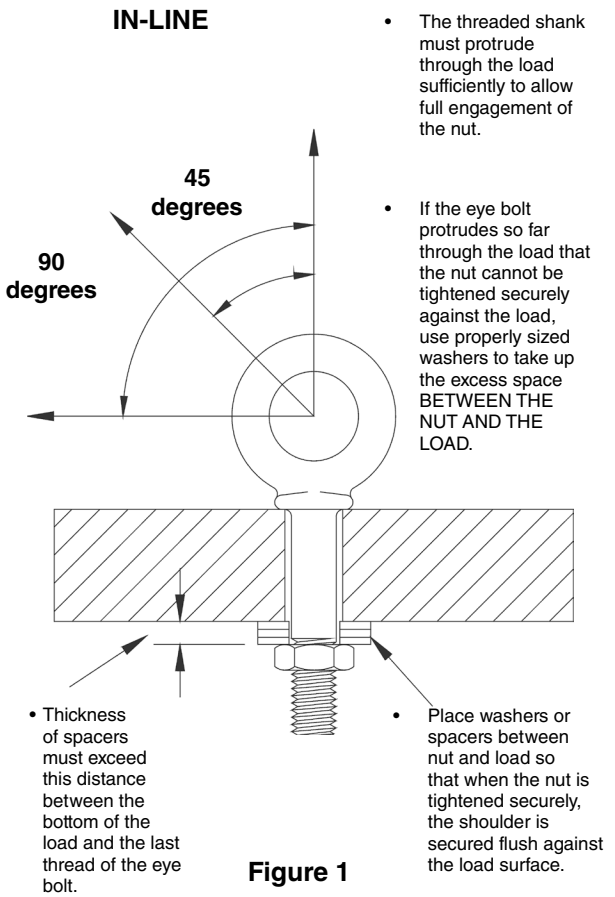


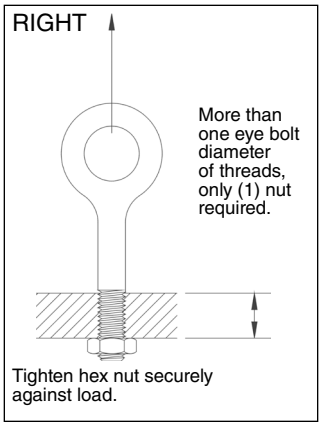
Figure 1

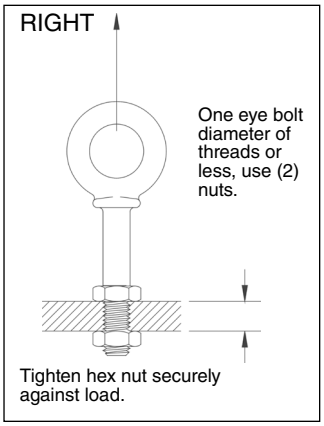
Table 1 (In-Line Load)	
Size (mm)	Working Load Limit (kg)
6.35	295
7.94	544
9.53	703
12.7	1179
15.9	2351
19.1	3266
22.2	4808
25.4	6033
28.6	6804
31.8	9525
38.1	10886
44.5	15422
50.8	19051
63.5	29484

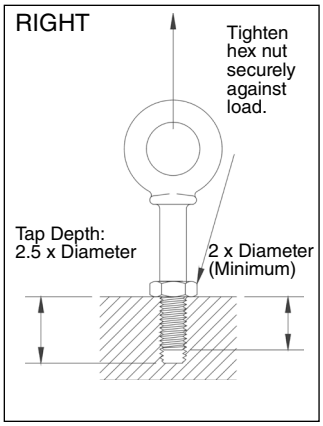
Table 2 (In-Line Load)	
Metric Size	Working Load Limit - kg
m6	200
m8	400
m10	640
m12	1000
m16	1800
m20	2500
m24	4000
m27	5000
m30	6000
m36	8500
m42	14000
m48	17300
m64	29500

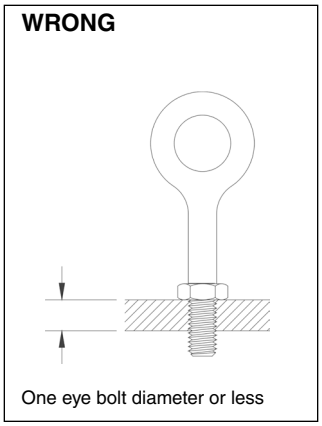
Important – Read and understand these instructions before using eye bolts.

Regular Nut & Shoulder Nut Eye Bolt – Installation for In-Line Loading



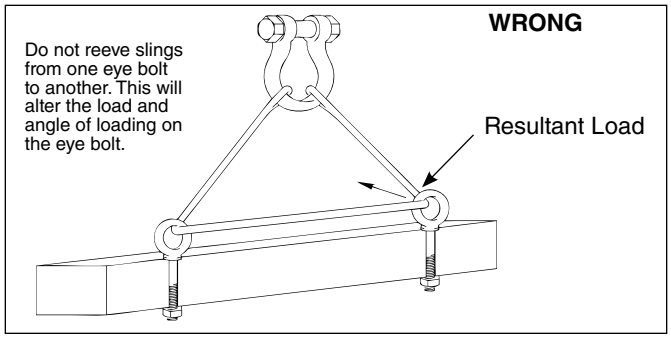


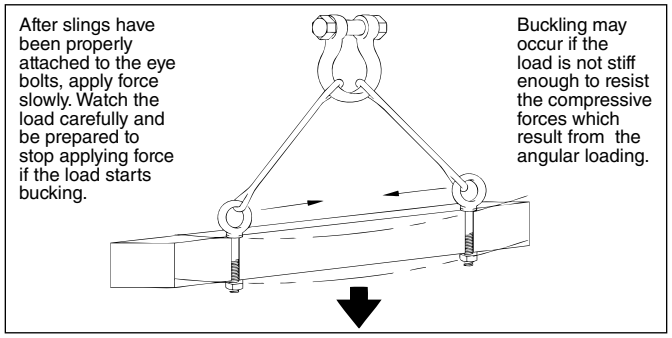




Operating Safety

- Always stand clear of load.
- Always lift load with steady, even pull – do not jerk.
- Always apply load to eye bolt in the plane of the eye – not at an angle.
- Never exceed the capacity of the eye bolt–see Table 1 & 2.
- When using lifting slings of two or more legs, make sure the loads in the legs are calculated using the angle from the vertical sling angle to the leg and properly size the shoulder nut or machinery eye bolt for the angular load.





Machinery Eye Bolt - Installation for In – Line & Angular Loading

These eye bolts are primarily intended to be installed into tapped holes.

1. After the loads on the eye bolts have been calculated, select the proper size eye bolt for the job.

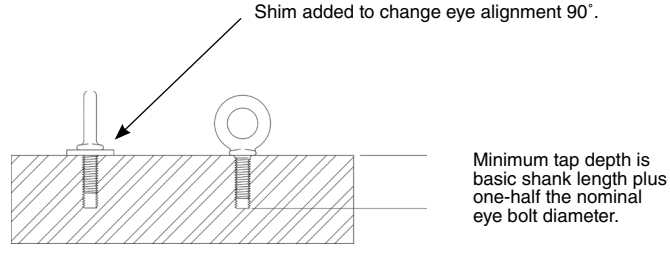
   For angular lifts, adjust working load as follows:

Direction of Pull (from In-Line)	Adjusted Working Load
45 degrees	30% of rated working load
90 degrees	25% of rated working load

2. Drill and tap the load to the correct sizes to a minimum depth of one-half the eye bolt size beyond the shank length of the machinery eye bolt.
3. Thread the eye bolt into the load until the shoulder is flush and securely tightened against the load.
4. If the plane of the machinery eye bolt is not aligned with the sling line, estimate the amount of unthreading rotation necessary to align the plane of the eye properly.
5. Remove the machinery eye bolt from the load and add shims (washers) of proper thickness to adjust the angle of the plane of the eye to match the sling line. Use Table 3 to estimate the required shim thickness for the amount of unthreading rotation required.

Table 3

Eye Bolt Size (in.)	Shim Thickness Required to Change Rotation 90° (in.)	Eye Bolt Size (mm)	Shim Thickness Required to change Rotation 90° (mm)
1/4	.0125	M6	.25
5/16	.0139	M8	.31
3/8	.0156	M10	.38
1/2	.0192	M12	.44
5/8	.0227	M16	.50
3/4	.0250	M20	.62
7/8	.0278	M24	.75
1	.0312	M27	.75
1-1/8	.0357	M30	.88
1-1/4	.0357	M36	1.00
1-1/2	.0417	M42	1.13
1-3/4	.0500	M48	1.25
2	.0556	M64	1.50
2-1/2	.0625	—	—



Rigging Information

THE BASIC RIGGING PLAN:

1 WHO IS RESPONSIBLE (COMPETENT) FOR THE RIGGING?
- COMMUNICATIONS ESTABLISHED?

2. IS THE EQUIPMENT IN ACCEPTABLE CONDITION?
- APPROPRIATE TYPE, PROPER IDENTIFICATION?

3. ARE THE WORKING LOAD LIMITS ADEQUATE?
- CAPACITY OF GEAR KNOWN?
- WHAT IS WEIGHT OF LOAD?
- WHERE IS THE CENTER OF GRAVITY?
- WHAT IS THE SLING ANGLE?
- WILL THERE BE ANY ANGULAR OR SIDE LOADING?
- ARE THE SLINGS PADDED AGAINST CORNERS, EDGES, PROTRUSIONS AND ABRASIVE SURFACES?

4. WILL THE LOAD BE UNDER CONTROL?
- IS THE LOAD RIGGED TO THE CENTER OF GRAVITY?
- IS THE HITCH APPROPRIATE?
- TAG LINE NEEDED?
- IS THERE ANY POSSIBILITY OF FOULING?
- CLEAR OF PERSONNEL?

5. ARE THERE ANY UNUSUAL LOADING OR ENVIRONMENTAL CONDITIONS?
- WIND,TEMPERATURE, OTHER?

6. YOUR SPECIAL REQUIREMENTS?

QUIC-CHECK

"QT" QUENCHED & TEMPERED

RESPONSIBILITY

7

USER RESPONSIBILITY

UTILIZE APPROPRIATE RIGGING GEAR SUITABLE FOR OVERHEAD LIFTING.

UTILIZE THE RIGGING GEAR WITHIN INDUSTRY STANDARDS AND THE MANUFACTURER'S RECOMMENDATIONS.

CONDUCT REGULAR INSPECTION AND MAINTENANCE OF THE RIGGING GEAR.

MANUFACTURER RESPONSIBILITY

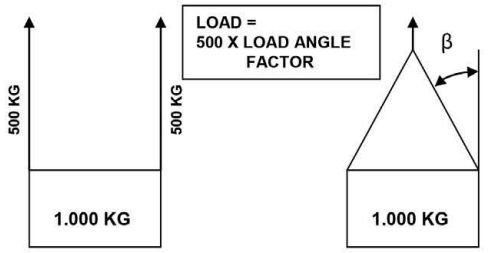
PRODUCT AND APPLICATION INFORMATION

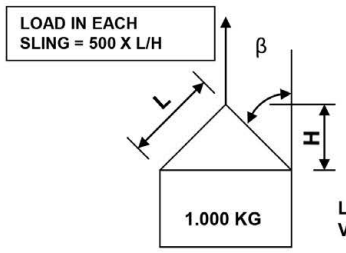
PRODUCT THAT IS CLEARLY IDENTIFIED
- NAME OR LOGO
- LOAD RATING AND SIZE
- QUALITY CONTROL
- TRACEABILITY
- CE (+ LOCAL LEGAL REQUIREMENTS)
- MATERIAL CLASS
- (IF APPLICABLE)

PRODUCT PERFORMANCE
- WORKING LOAD LIMIT
- DUCTILITY
- FATIGUE PROPERTIES
- IMPACT PROPERTIES

SLING ANGLES

8

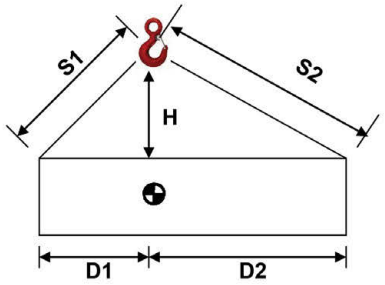




VERTICAL SLING ANGLE β	LOAD ANGLE FACTOR = L/H
0°	1.00
30°	1.16 (1.2)
45°	1.41 (1.4)
60°	2.00 (2.0)

LOAD ON EACH LEG OF SLING = VERTICAL LOAD X LOAD ANGLE FACTOR

UNEQUAL LEGS



LOAD ON SLING CALCULATED

TENSION 1= LOAD X D2 X S1/H(D1 + D2)
TENSION 2= LOAD X D1 X S2/H(D1 + D2)

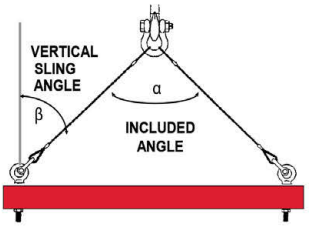
SLING LENGTH FOR DESIRED ANGLE

VERTICAL ANGLE	LENGTH FACTOR	L/H
60 DEGREES	1.15	2
50 DEGREES	1.31	1.55
45 DEGREES	1.41	1.4
40 DEGREES	1.55	1.3
35 DEGREES	1.74	1.21
30 DEGREES	2	1.16

LENGTH = D X (LENGTH FACTOR)

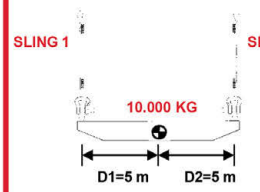
(D = DISTANCE PICK-UP POINT TO C.O.G.)

VERTICAL SLING ANGLE = 1/2 INCLUDED ANGLE

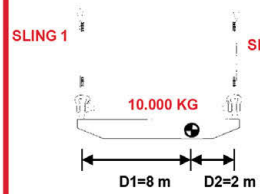


Rigging Information

CENTER OF GRAVITY AND SLING LOADING



WHEN LIFTING VERTICALLY, THE LOAD WILL BE SHARED EQUALLY IF THE CENTER OF GRAVITY IS PLACED EQUALLY BETWEEN THE PICK POINTS.IF THE WEIGHT OF LOAD IS 10.000 KG, THEN EACH SLING WILL HAVE A LOAD OF 5.000KG AND EACH SHACKLE AND EYEBOLT WILL ALSO HAVE A LOAD OF 5.000 KG.



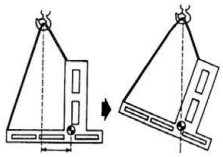
WHEN THE CENTER OF GRAVITY IS NOT EQUALLY SPACED BETWEEN THE PICK POINTS, THE SLINGS AND FITTINGS WILL NOT CARRY AN EQUAL SHARE OF THE LOAD.THE SLING CONNECTED TO THE PICK POINT CLOSEST TO THE CENTER OF GRAVITY WILL CARRY THE GREATEST SHARE OF THE LOAD.

SLING 2 IS CLOSEST TO COG. IT WILL HAVE THE GREATEST SHARE OF THE LOAD.

SLING 2 : 10.000 X 8 / (8 + 2) = 8.000 KG
SLING 1 : 10.000 X 2 / (8 + 2) = 2.000 KG

LOAD STABILITY AND THE CENTER OF GRAVITY

CONNECTION TO THE LOAD MUST BE MADE ABOVE THE CENTER OF GRAVITY. IF NOT, THE LOAD IS UNSTABLE AND WILL SHIFT.
KEEP DISTANCE FROM COG TO SLING AS LARGE AS POSSIBLE.

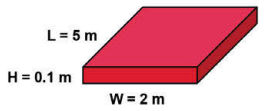


CALCULATE WEIGHT

9

EXAMPLE - FLATS

WEIGHT = L X W X H X UNIT WEIGHT



IF STEEL: UNIT WEIGHT = 7.85 t/m³
WEIGHT = 5 m X 2 m X 0.1 m X 7,85 t/m³ =7,85 t

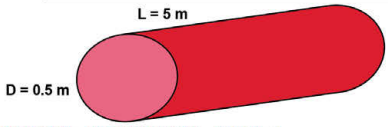
IF ALUMINUM: UNIT WEIGHT = 2.64 t/m³
WEIGHT = 5 m X 2 m X 0.1 m X 2.64 t/m³ = 2.64 t

IF CONCRETE: UNIT WEIGHT = 2.40 t/m³
WEIGHT = 5 m X 2 m X 0.1 m X 2.40 t/m³ = 2.40 t

CALCULATE WEIGHT

EXAMPLE - SOLID CYLINDER

WEIGHT = $\frac{3.14 \text{ X } D^2 \text{ X L X UNIT WEIGHT}}{4}$



IF STEEL: UNIT WEIGHT = 7.85 t/m³
WEIGHT = $\frac{3.14 \text{ X } 0.5^2}{4}$ X 5 m X 7.85 t/m³ =7.70 t

IF CONCRETE: UNIT WEIGHT = 2.40 t/m³
WEIGHT = $\frac{3.14 \text{ X } 0.5^2}{4}$ X 5 m X 2.40 t/m³ =2.35 t

HITCHES

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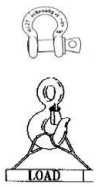
WIRE ROPE, CHAIN AND SYNTHETIC SLINGS

WIRE ROPE SLINGS AND CONNECTIONS TO FITTINGS



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

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

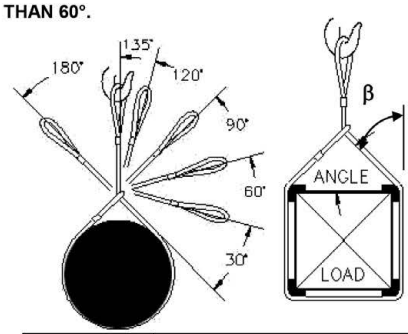
WIRE ROPE SLINGS AND CONNECTIONS TO FITTINGS

NEVER PLACE A SLING EYE GREATER THAN ONE HALF THE NATURAL LENGTH OF THE EYE(L).

1/3(L) FOR SYNTHETICS.

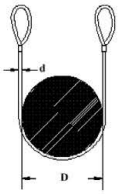
CHOKER HITCHES

A CHOKER HITCH HAS 80% OF THE CAPACITY OF A SINGLE LEG ONLY IF THE CORNERS ARE SOFTENED AND THE VERTICAL SLING ANGLE β IS SMALLER THAN 60°.
USE BLOCKS TO PREVENT ANGLES GREATER THAN 60°.



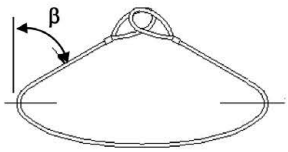
ANGLE OF CHOKE	SLING RATED LOAD PERCENTAGE OF SINGLE LEG SLING CAPACITY
120° - 180°	80%
90° - 119°	65%
60° - 89°	55%
30° - 59°	40%

BASKET HITCH



A BASKET HITCH HAS TWICE THE CAPACITY OF A SINGLE LEG ONLY IF THE D/d RATIO ≥ 25/1 AND LEGS OF SLING ARE VERTICAL.

AT OTHER ANGLES, SEE TABLE.



ANGLE β	PERCENTAGE OF SINGLE LEG CAPACITY
0	200%
30	170%
45	140%
60	100%

Rigging Information

INSPECTION OF HARDWARE

DEFORMATION
REMOVE FROM SERVICE IF ANY SIGNIFICANT DEFORMATION. CHECK THROAT OPENING OF HOOKS.

WEAR
REMOVE FROM SERVICE IF EXCESSIVE WEAR. WEAR IS EXCESSIVE IF:
- MORE THAN 5% WEAR IN THROAT OR EYE OF HOOK AND OTHER CRITICAL AREAS OF HARDWARE.
- MORE THAN 10% WEAR IN OTHER AREAS.

CRACKS, NICKS, GOUGES
REMOVE FROM SERVICE IF CRACKS,NICKS, OR GOUGES ARE DETECTED.

MODIFICATION
DO NOT WELD, DO NOT SUBSTITUTE SHACKLES PINS OR OTHER COMPONENTS, DO NOT HEAT, BEND OR MODIFY IN ANY MANNER.

PROPER FUNCTION
IMPROPERLY INSTALLED HARDWARE OR MALFUNCTION IS CAUSE FOR REMOVAL. CHECK FOR LATCHES, SWIVEL BEARINGS, LOCKING DEVICES, AND INSTALLATION OF WIRE ROPE CLIPS AND WEDGE SOCKETS.

INSPECTION OF WIRE ROPE SLINGS

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ALL SLINGS AND ATTACHMENTS SHALL BE VISUALLY INSPECTED BY THE PERSON HANDLING THE SLING EACH DAY THEY ARE USED. IN ADDITION, A PERIODIC INSPECTION SHALL BE PERFORMED BY A COMPETENT PERSON, AT LEAST ONCE EVERY 6 MONTHS (OR PER LEGAL REQUIREMENTS) AND SHALL INCLUDE A RECORD OF THE INSPECTION.

INSPECTION CRITERIA

KINKING	CORE PROTRUSION
CRUSHING	CORROSION
UNSTRANDING	BROKEN OR CUT
BIRDCAGING	STRANDS
STRAND DISPLACEMENT	BROKEN WIRES

BROKEN WIRES
REFER TO THE APPLICABLE STANDARDS SUCH AS ISO 4309 WITH SPECIFIC DISCARD CRITERIA AND GUIDANCE REGARDING THE NUMBER OF BROKEN WIRES.

DISTORTION OF WIRE ROPE
REMOVE FROM SERVICE WIRE ROPE SLINGS THAT HAVE ANY DAMAGE RESULTING IN DISTORTION OF THE WIRE ROPE STRUCTURE SUCH AS KINKING, CRUSHING, UNSTRANDING, BIRD CAGING, STRAND DISPLACEMENT OR CORE PROTRUSION.

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

WIRE ROPE SLING CAPACITIES (t) (refer to standard EN13414-1)

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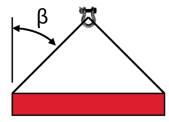
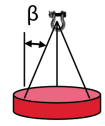
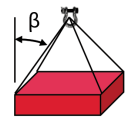
WORKING LOAD LIMITS FOR SLINGS USING STEEL CORED ROPE OF CLASSES 6X19, 6X36 AND 8X36 AND HAVING FERRULE-SECURED EYE TERMINATIONS TENSILE STRENGTH 1770 kN/mm² DESIGN FACTOR 5 / 1

WIRE ROPE SIZE		Crosby Q&T CARB. SHACKLE MIN. SHACKLE SIZE FOR A D/d >1 AT LOAD CONNECTION						
MM	MBL (kN)	SHACKLE SIZE (INCH)	VERTICAL (SINGLE LEG) t	CHOKER t	TWO LEG SLINGS 0° < β ≤ 45° t	TWO LEG SLINGS 45° < β ≤ 60° t	THREE AND FOUR LEG SLINGS 0° < β ≤ 45° t	THREE AND FOUR LEG SLINGS 45° < β ≤ 60° t
8	40.3	3/8	0.75	0.60	1.05	0.75	1.55	1.10
10	63.0	7/16	1.15	0.92	1.60	1.15	2.40	1.70
12	90.7	1/2	1.70	1.36	2.30	1.70	3.55	2.50
13	106	5/8	2.00	1.60	2.80	2.00	4.15	3.00
14	124	5/8	2.25	1.80	3.15	2.25	4.80	3.40
16	161	3/4	3.00	2.40	4.20	3.00	6.30	4.50
18	204	7/8	3.70	2.96	5.20	3.70	7.80	5.65
20	252	7/8	4.60	3.68	6.50	4.60	9.80	6.90
22	305	1	5.65	4.52	7.80	5.65	11.80	8.40
24	363	1-1/8	6.70	5.36	9.40	6.70	14.00	10.00
26	426	1-1/8	7.80	6.24	11.00	7.80	16.50	11.50
28	494	1-1/4	9.00	7.20	12.50	9.00	19.00	13.50
32	645	1-3/8	11.80	9.44	16.50	11.80	25.00	17.50
36	817	1-1/2	15.00	12.00	21.00	15.00	31.50	22.50

RATED CAPACITIES (t) BASED ON PIN DIAMETER OR HOOK NO LARGER THAN THE NATURAL EYE WIDTH (1/2 X EYE LENGTH) OR LESS THAN THE NOMINAL SLING DIAMETER. TURNBACK EFFICIENCY: k = 0,9 FLEMISH EYE TERMINATION OFFERS A HIGHER EFFICIENCY

REFER TO EN 13414-1 FOR FULL DETAILS
VERTICAL SLING ANGLES GREATER THAN 60° ARE NOT RECOMMENDED!

Rigging Information

WEB SLING CAPACITIES IN ACCORDANCE WITH EN 1492-1/2

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	VERTICAL (SINGLE LEG) t	CHOKER t	BASKET t	2 - LEG SLINGS 0°< β ≤ 45° t	2 - LEG SLINGS 45°< β ≤ 60° t	3- / 4 - LEG SLINGS 0°< β ≤ 45° t	3- / 4 - LEG SLINGS 45°< β ≤ 60° t
Violet	1.0	0.8	2.0	1.4	1.0	2.1	1.5
Green	2.0	1.6	4.0	2.8	2.0	4.2	3.0
Yellow	3.0	2.4	6.0	4.2	3.0	6.3	4.5
Grey	4.0	3.2	8.0	5.6	4.0	8.4	6.0
Red	5.0	4.0	10.0	7.0	5.0	10.5	7.5
Brown	6.0	4.8	12.0	8.4	6.0	12.6	9.0
Blue	8.0	6.4	16.0	11.2	8.0	16.8	12.0
Orange	10.0	8.0	20.0	14.0	10.0	21.8	15.0

BASKET HITCH CAPACITY AT NON VERTICAL SLING LEGS

ANGLE β	PERCENTAGE OF SINGLE LEG CAPACITY
0	200%
30	170%
45	140%
60	100%

INSPECTION OF SYNTHETIC SLINGS

ALL SLINGS AND ATTACHMENTS SHALL BE VISUALLY INSPECTED BY THE PERSON HANDLING THE SLING EACH DAY THEY ARE USED. IN ADDITION, A PERIODIC INSPECTION SHALL BE PERFORMED BY A COMPETENT PERSON, AT LEAST ANNUALLY, AND SHALL INCLUDE A RECORD OF THE INSPECTION. EXAMINATION PERIODS TO BE FURTHER DETERMINED BY A COMPETENT PERSON.

INSPECTION CRITERIA

ACID OR CAUSTIC BURNS
MELTING OR CHARRING
HOLES, CUTS
TEARS, SNAGS
BROKEN STITCHES
WORN STITCHES
EXCESSIVE ABRASION
KNOTS

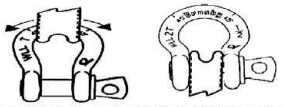
ROUND SLING NOTES

REMOVE FROM SERVICE ROUNDSLINGS THAT HAVE CORE FIBER EXPOSED BY HOLES, TEARS, CUTS, EMBEDDED PARTICLES, WEAR OR SNAGS.
REMOVE FROM SERVICE ROUND SLINGS THAT HAVE MELTING, CHARRING OR WELD SPLATTER ON ANY PART OF SLING.

IDENTIFICATION

WEB SLINGS AND ROUND SLINGS SHALL HAVE A COLOR CODING AND PERMANENTLY MARKED INDICATING: MANUFACTURER'S TRADEMARK, SERIAL NUMBER, WLL AND CE (EN1492-1/2)

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.

Crosby DESIGNED FITTINGS FOR USE WITH SYNTHETIC SLINGS