



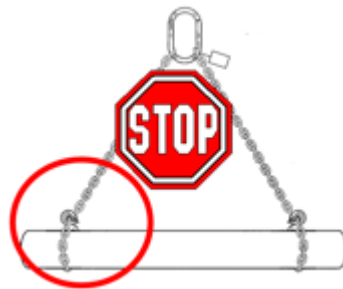
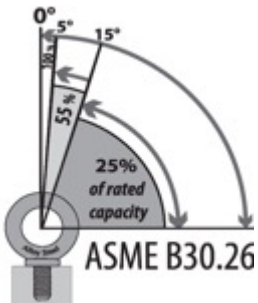
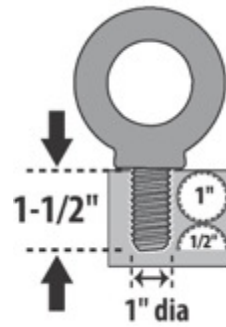
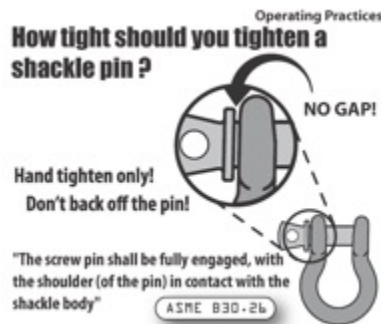
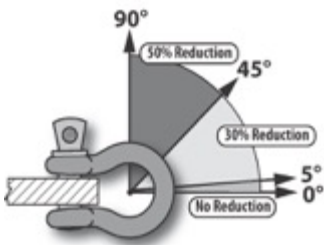
SUPERVISOR AWARENESS

STRIKE POINTS

Standards for Lifting Equipment	<p>All lifting equipment must conform to a standard</p> <ul style="list-style-type: none"> - ASME B30.26 for Rigging Hardware - ASME B30.9 for Slings - ASME B30.10 for Hooks - ASME B30.20 for Below Hook Devices - ASME B30.16 for Hand Chain Hoists - ASME B30.21 for Lever Hoists
Design Factors / Stretching	<p>Design factor represents the ratio between the riggings rated load and its ultimate breaking strength. Manufacturers must meet or exceed this ratio to comply to ASME.</p> <ul style="list-style-type: none"> - Hardware, Synthetic and Wire rope slings 5:1 - Chain slings, Manual Hoists 4:1 - Hooks design factor must conform to what they are attached to.
Inspections	<p>Initial inspections: Prior to use each new, altered, or repaired rigging device must be inspected to verify compliance to the ASME standard.</p> <p>Frequent Inspections: Each shift before the rigging is used, by the user.</p> <p>Periodic Inspections: Must be performed at least annually, by a designated person and if issues found, not returned to service until approved by a qualified person.</p>
Markings	<p>All rigging must be marked with the appropriate identification, this will vary between products, but the manufacturers name or trademarks must be marked on ALL rigging equipment.</p> <ul style="list-style-type: none"> - A marking unique to a swivel hoist ring is the torque value! - Eyebolts DO NOT require load ratings.
Temperatures	<p>Although many products are capable of being utilized in cold temperatures up to -40 Celsius, users must have access to the specifications to the products to confirm temperatures.</p> <p>For example: Carbon steel eye bolts are rated -1 Celsius.</p>
Angles of Shackles, Hooks and Eyebolts	<p>Workers must confirm with the manufacturer of allowable angles for their rigging to be used and how angular loading affect the lift. Generally:</p> <ul style="list-style-type: none"> - Shackles can be used to 120 degrees max included angle on balanced loads, unbalanced loads will reduce their maximum load rating - Hooks can be used to 90 degrees maximum included angle and it is recommended to apply no more than two legs or two eyes (ASME) - Eyebolts CAN lose up to 75% of their rated load if loaded beyond 15 degrees from vertical.
Modifications	<p>Absolutely no modifications or repairs are permitted on lifting equipment unless it has been approved by the manufacturer or a qualified person.</p>
Sling Tensions	<p>Workers must calculate sling tension!</p> <ul style="list-style-type: none"> - As the angle of the slings decreases, the tension (load) on the slings increases.

Sling Tension	- $\text{Load Weight} \div 2 \times \text{L.A.F. (load angle factor)} = \text{Tension}$
D/d Ratios	Workers must be aware that full load ratings for basket hitches using wire rope or chains require minimum D/d ratios. This is the ratio between the wire rope or chain diameter vs. its load diameter. The minimum D:d ratios are 25:1 for wire rope and 6:1 for chain. Workers must derate the slings if these ratios cannot be achieved.
Hitches and Ratings	Users must be aware that slings ratings can be affected if the hitch method (vertical, choker, or basket) is manipulated. For example: <ul style="list-style-type: none"> - Choker hitches only maintain 100% of their capacity, if the choke angle is 120 degrees or greater. Users can see up to a 50% reduction in capacity when choke angles are less than 120 degrees - In a basket hitch, slings maintain 100% of rated capacity when each leg of the sling are at 90 degrees horizontal angle. When horizontal sling angles decrease, the basket rating also decreases.
Rigging Hand Book and Rigging Resource Centre	For more information, workers and supervisors can access the Rigging Resource Centre at any time from a desk top or mobile device. Furthermore, information can be accessed using the rigging hand book or rigging pocket guide.

Points of Interest



Horizontal Angle	L.A.F.
5 °	11.49
10 °	5.75
15 °	3.861
20 °	2.924
25 °	2.364
30 °	2.00
35 °	1.742
40 °	1.555
45 °	1.414
50 °	1.305
55 °	1.221
60 °	1.155
65 °	1.104
70 °	1.064
75 °	1.035
80 °	1.015
85 °	1.004
90 °	1.00

