Mike's Mobile Crane Safety Tips

Mike's Mobile Crane Safety Tips

by Mike Parnell

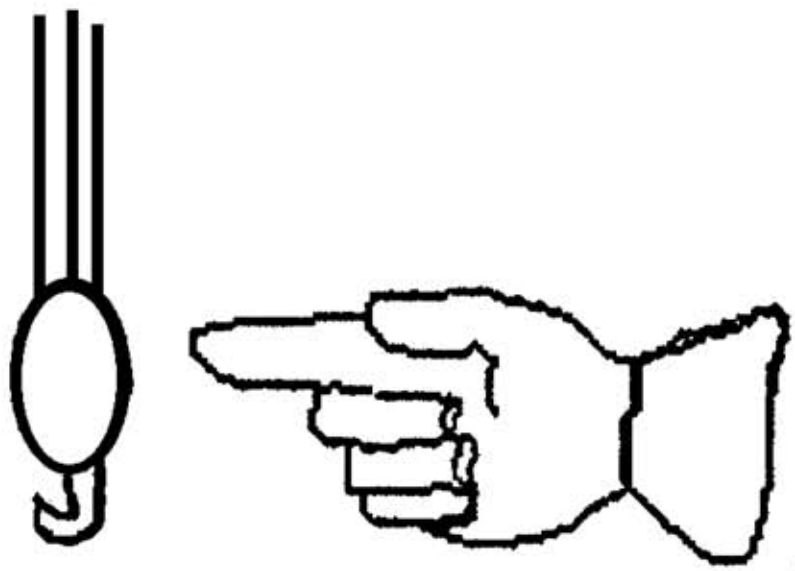
PREFACE

Trials and Tribulations of Stinker and Tinker

As you review the Tips in this booklet, you may observe an italicized comment about two brothers, Stinker and Tinker. These two characters have been involved with cranes and rigging for a while, but haven't spent much time getting any training or "sticking to the rules". The humor is there only to lighten the moment, but the seriousness of the risks involved should never be lost on the reader. At the end of the day, you don't want to be like these two infamous brothers. Their basic approach is to act first and think second.

For this booklet and other crane, rigging and
heavy equipment training materials,
contact Training & Inspection Resource Center at
888-567-8472 or www.tirc.net.

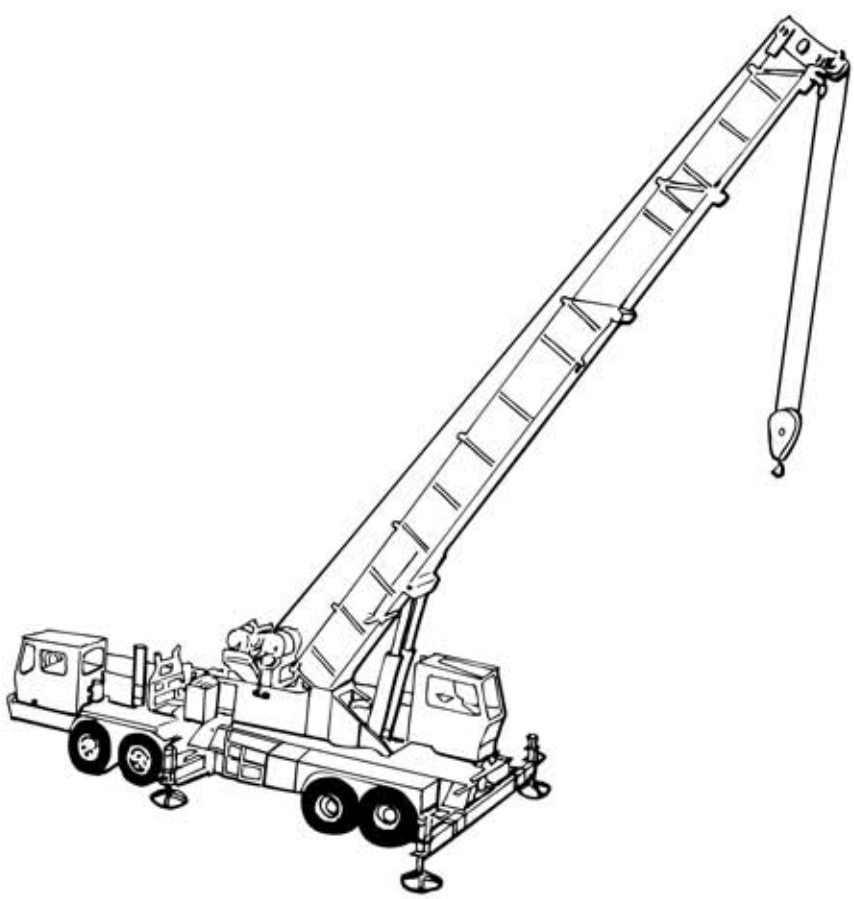
1. **If a load is swinging left and right, catch it by gently swinging (rotating) the boom in the same direction as the moving load, when the load is at the bottom of its arc.** *Tinker's rhythm is so bad, when he tries to "catch" the hook, he always wraps the block around the boom at least three times. We're gonna start calling him "old tetherball".*



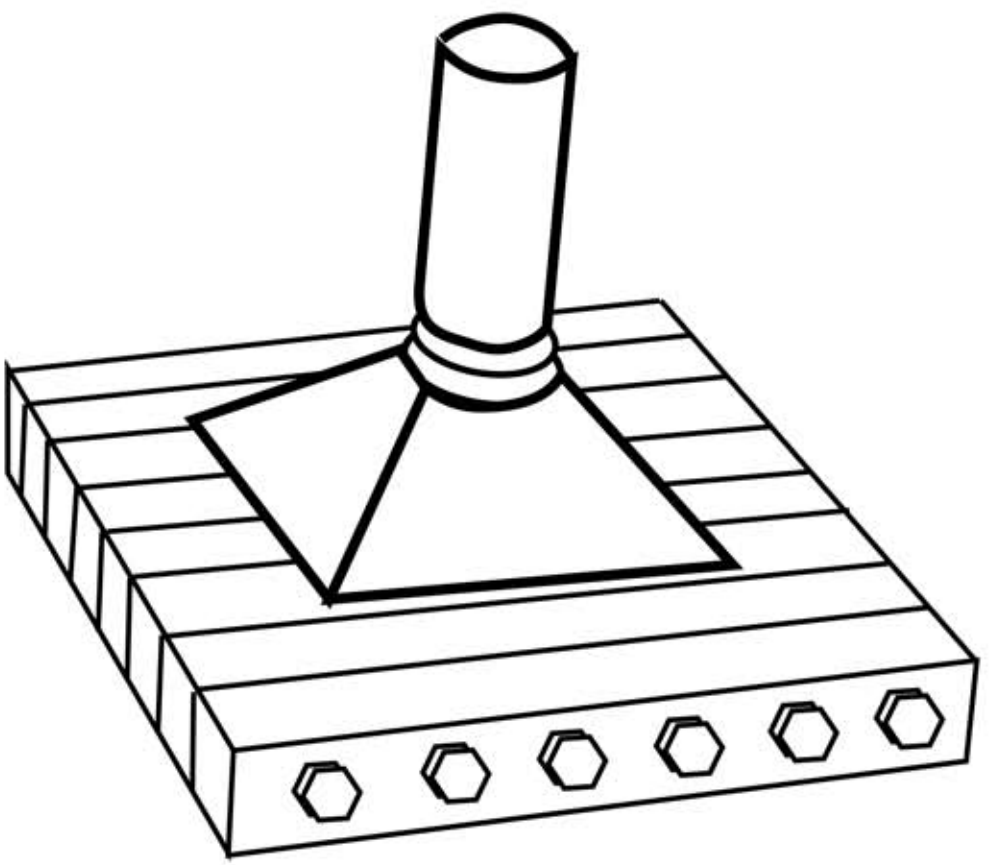
2. **Two-blocking can occur when telescoping out, booming down or over hoisting.** Never count on an alarm or positive device to save you. Know your remaining hoisting height at all times.

3. With a telescopic crane, the boom deflection may be significant. **You might need to "boom" the load off the ground rather than "hoist".** *Stinker's old juice rig looks like a 10 lb. pole trying to reel in a 30 lb. salmon, when it picks a big load.*

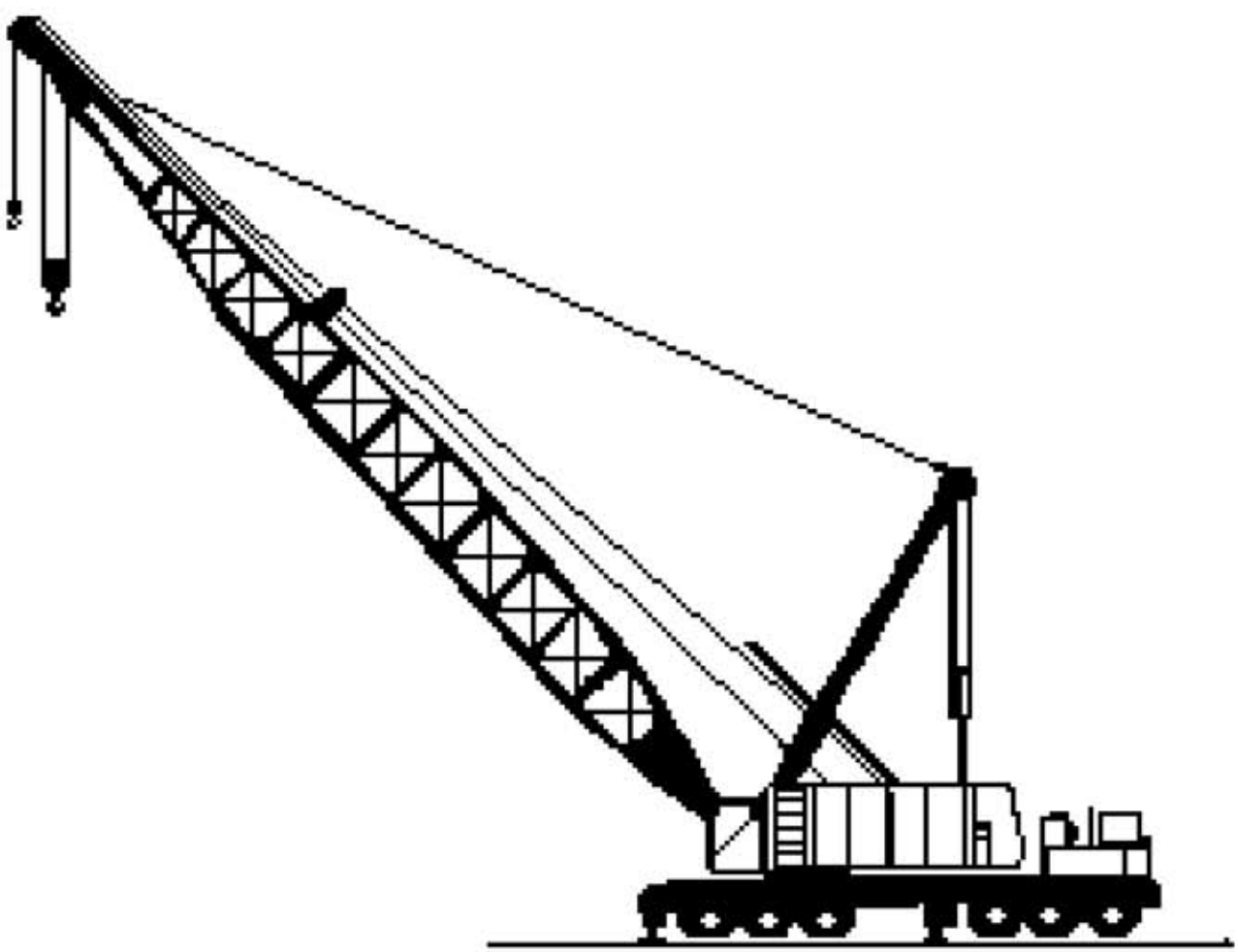
4. After extending your outriggers and lowering the jacks, take a walk around the crane. Kick the tires like you're buying the crane. **Ensure that the crane's weight is supported by the outriggers.** Make sure the crane is level and is at the outrigger setting for the desired load chart. *You don't want to try to make a ten dollar lift with a five buck set-up.*



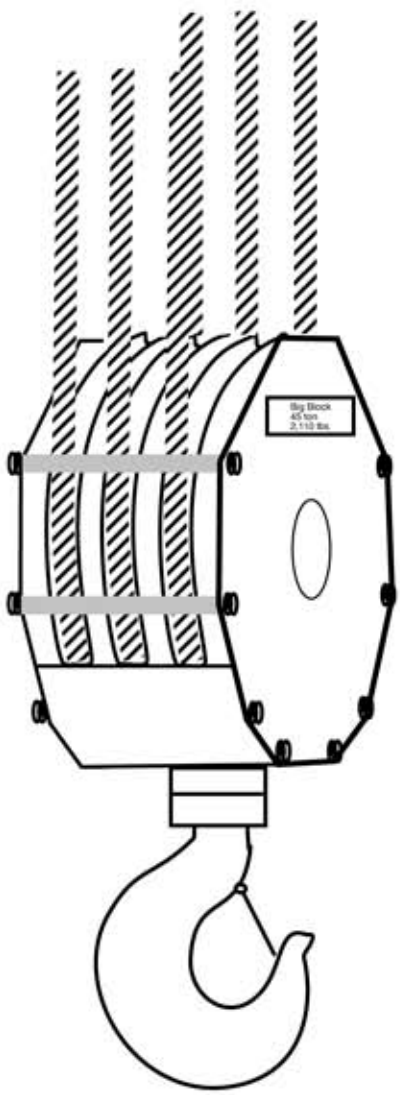
5. When setting up a crane on outriggers, always check for ground faults, underground vaults, backfill or other conditions that result in poor foundation. **Use outrigger cribbing and matting for any set-up that is less than "rock solid".** *This tip is offered in loving memory of Stinker's uncle who is remembered as "Quicksand Willie".*



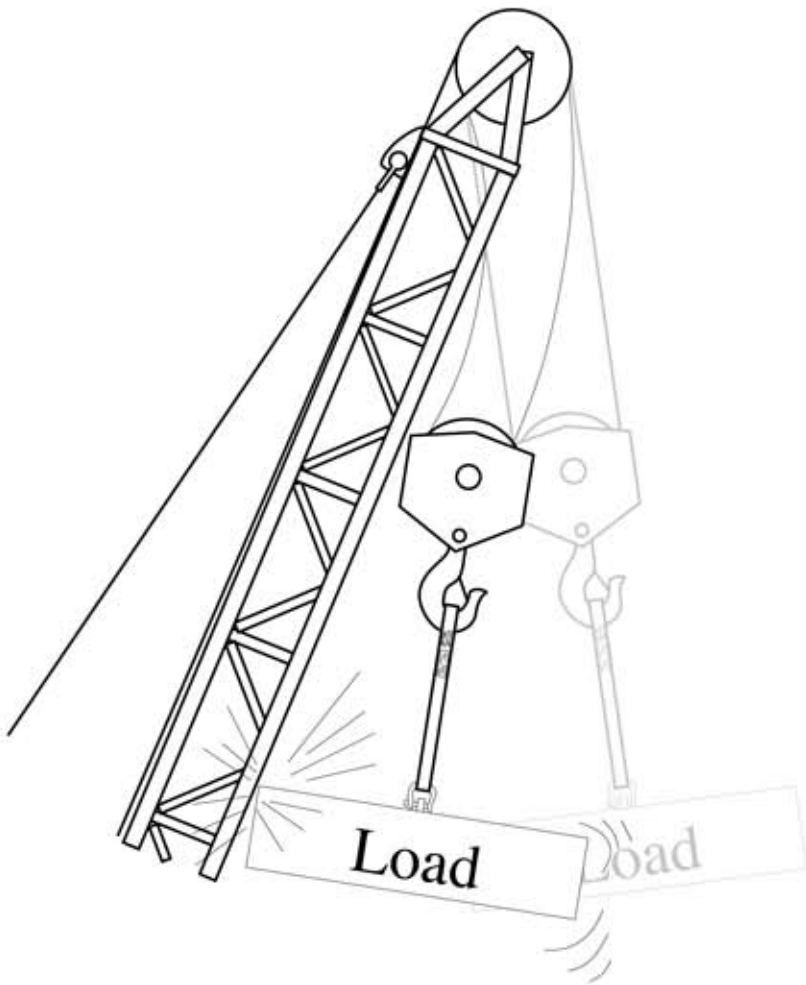
6. An elevated crane block with many parts of line can sometimes be slow to lower, due to sheave friction and boom-side rope weight. **The operator should avoid running the hoist line down at maximum speed.** Overspeed of the hoist drum while lowering can cause the wire rope to "rat's nest" in a heartbeat.



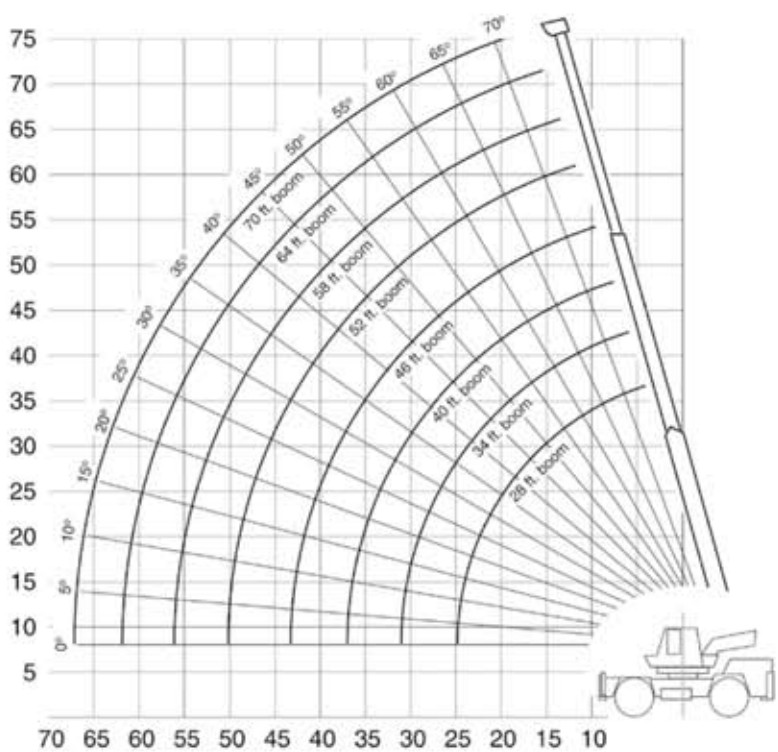
7. **Keep the running lines straight and true.** Operating the block when multiple parts of lines are twisted around each other is "illegal" and truly damages the wire rope. It may be so bound up that all you can do is boom down. Booming down may place the load beyond the crane's capacity. *Ouch!*



8. A quick boom down action can cause the suspended load to swing away from the crane and cause a structural overload or tipping condition. **Boom up and down slowly.** A pendulum action can cause the load or the suspended blocks to smack the boom. *Tinker was reminded of that 7th grade science experiment when he stood on an empty pop can while the teacher lightly tapped its side. Collapsed pop can, baby! Experiment over!*

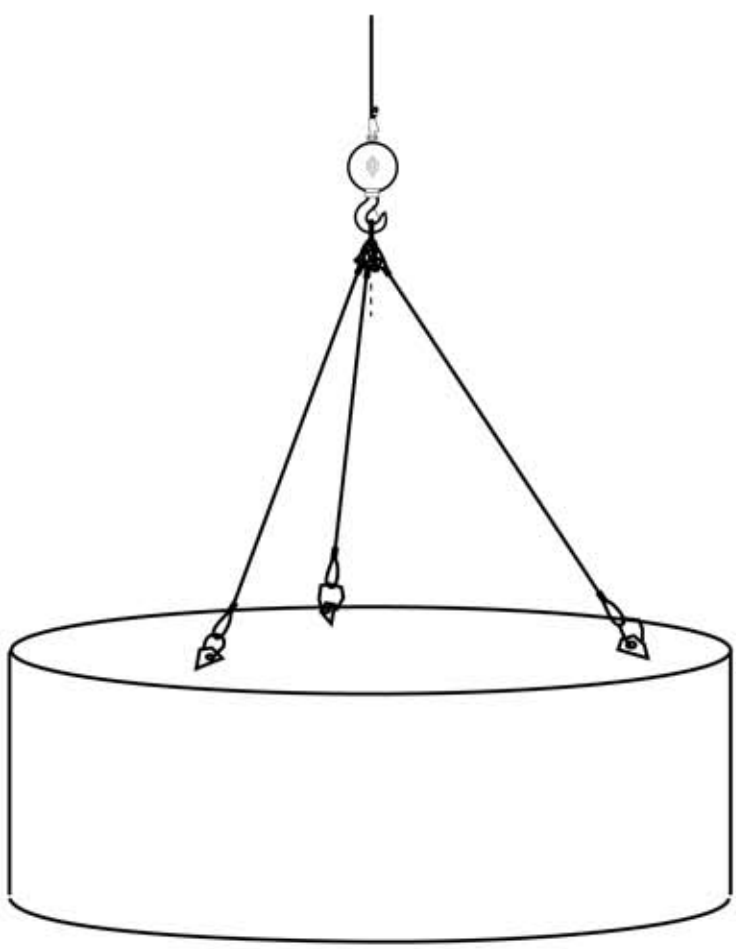


9. Like the old carpenter's rule, "Measure twice and cut once"; it doesn't hurt to **check the crane's load chart twice before a lift of over 50% capacity.** Remember to check the gross capacity at the necessary boom length/ radius, the parts of line required and which hook block is to be used.



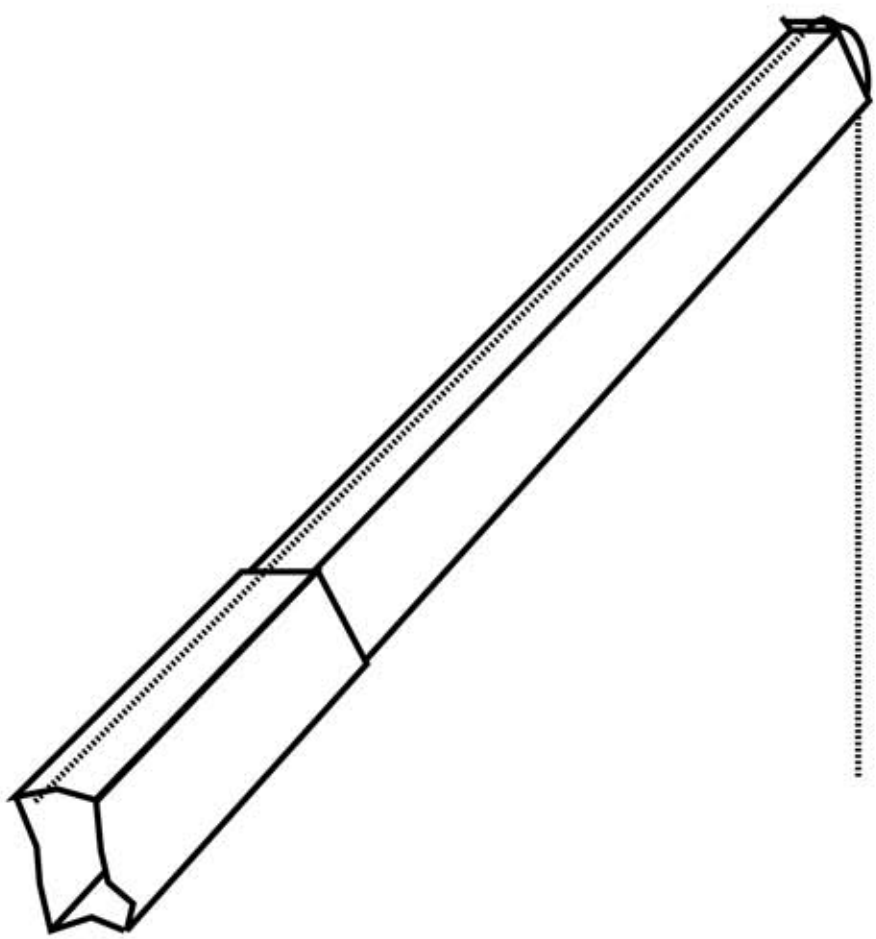
10. **Remember to check the fluid levels during the pre-use inspection.** It's embarrassing to have the engine seize up with no oil, while it's overheating from no coolant, and not being able to extend the boom because there's no hydraulic fluid. *Stinker has a completely stove-up Detroit diesel sitting in his front yard as a monument to the difference between checking the dipstick and being one.*

11. **Be an operator with quiet hands and great patience.** The best crane operators are the ones that the riggers never think about. That means the hook is quietly where it needs to be, when it needs to be there, the load is smoothly lifted on command, and it gently drifts into position with the slightest of signals. *Most riggers are constantly reminded when Tinker's in the crane cab.*

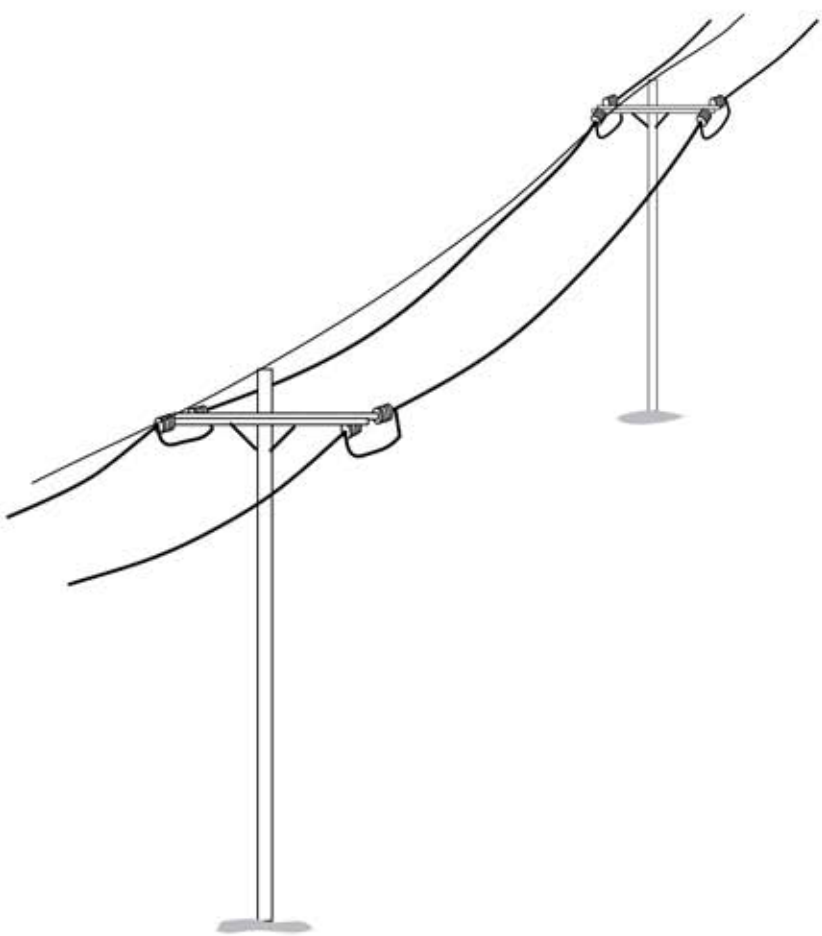


12. **A good operator makes the load appear to be floating at the same elevation when booming up or down,** while hoisting or lowering the load block. Generally, the boom lever is fully engaged while the hoist lever is used to float the load at a constant elevation. Also remember that the boom point is constantly changing elevation while booming up and down. *Stinker seems to think that the command "boom-up and hold the load" gives him a chance to roller coaster it as it comes closer to the crane. Simple minds are simply amused.*

13. **Unless told otherwise, extend the boom sections of a hydraulic crane equally.** Some cranes have the ability to extend sections independently, and the crane's load chart is generally designed for equal length sections. The most hazardous case would be having the last section scoped out and lifting at radii intended for an equal length extension.



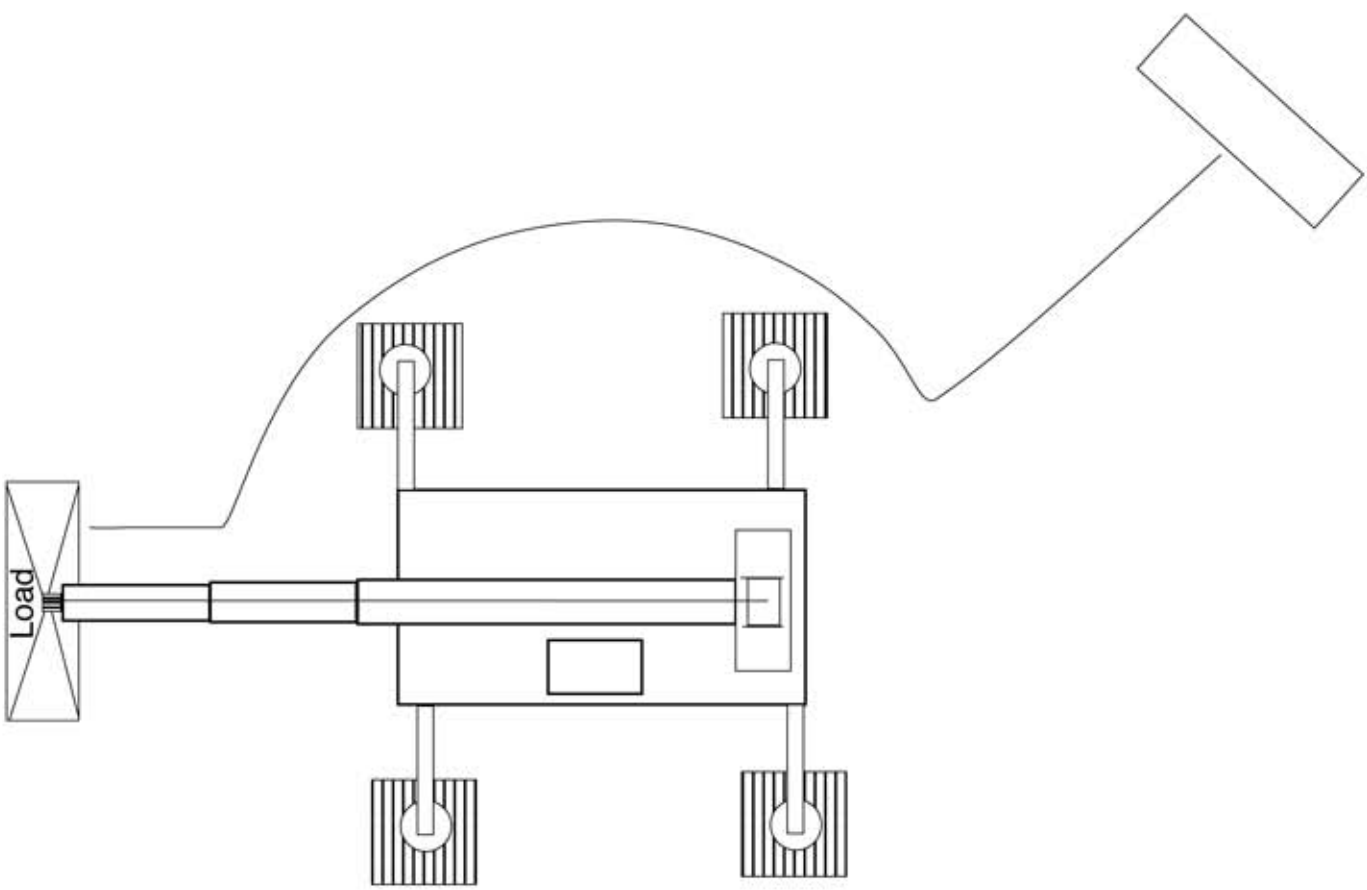
14. Energized power lines can kill. **Ensure that you have placed the crane at the correct operating distance from any energized line** according to the applicable federal/ state OSHA requirement. *To Tinker, the phrase, "getting lit up" has numerous meanings.*



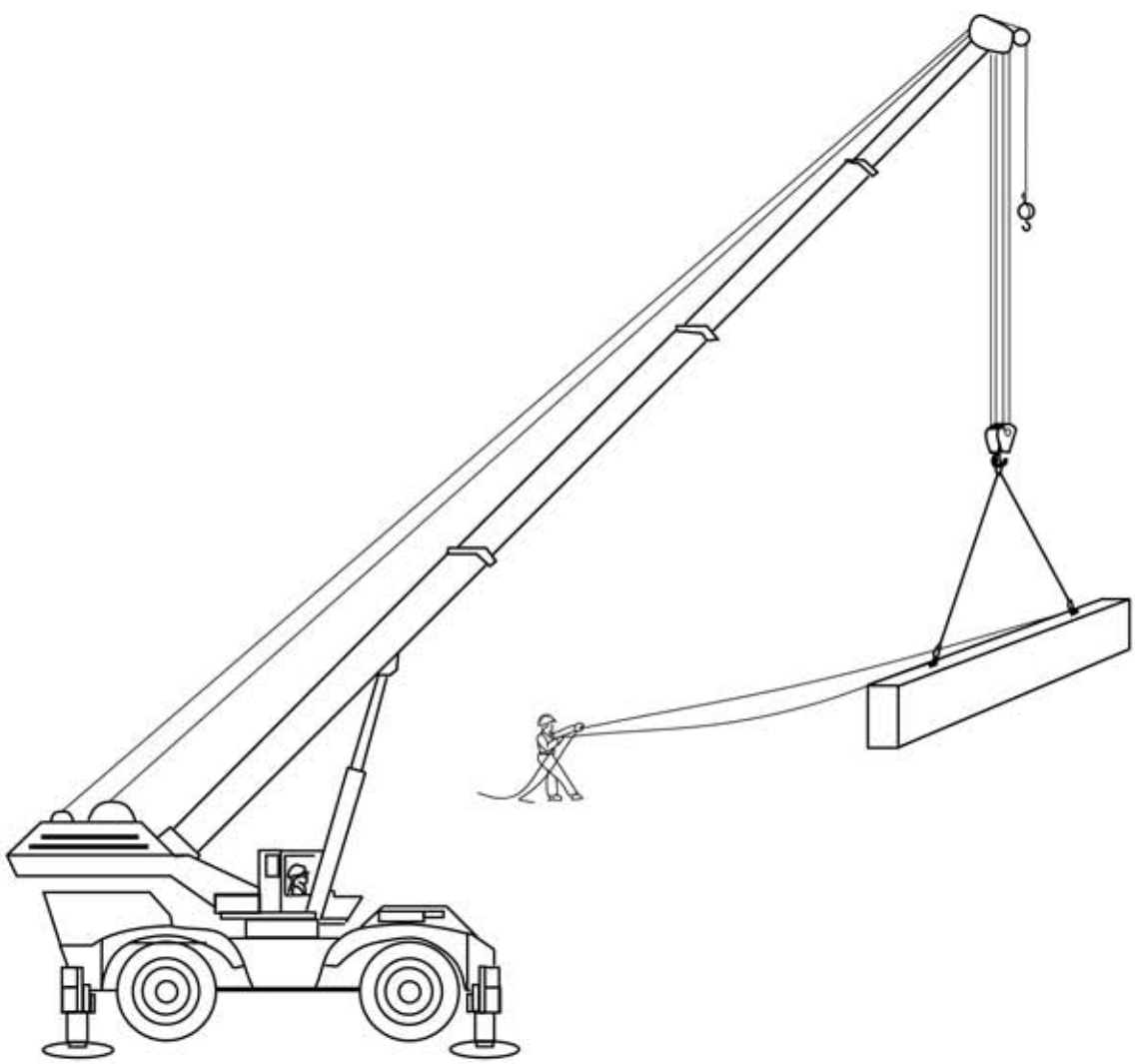
15. When re-reeving a crane block, **ensure that minimum wraps are still on the drum with the boom extended to the greatest length necessary** and boomed up to the highest boom angle for the work to be performed. Some telescoping cranes cannot store all of the wire rope necessary for the maximum parts of line, at maximum boom length and at a short radius. *That's how "Run-past Ronnie" got his nickname. He was lowering the hook and then it started lifting without him turning loose of the "hoist down" lever. He "run-past" the dead end on the drum, and started back-wrapping the hoist line.*

16. During blind "picks", **ensure that relay hand signals are easily visible to the crane operator,** or a secure radio communication system is in use between the operator and the on-site rigger. *The crew decided to let cousin Hinkey signal during a blind pick one day. With that nervous hand twitch of his, it took a half hour to make a 5-minute load move. Spud wrenches were fixin' to fly that day.*

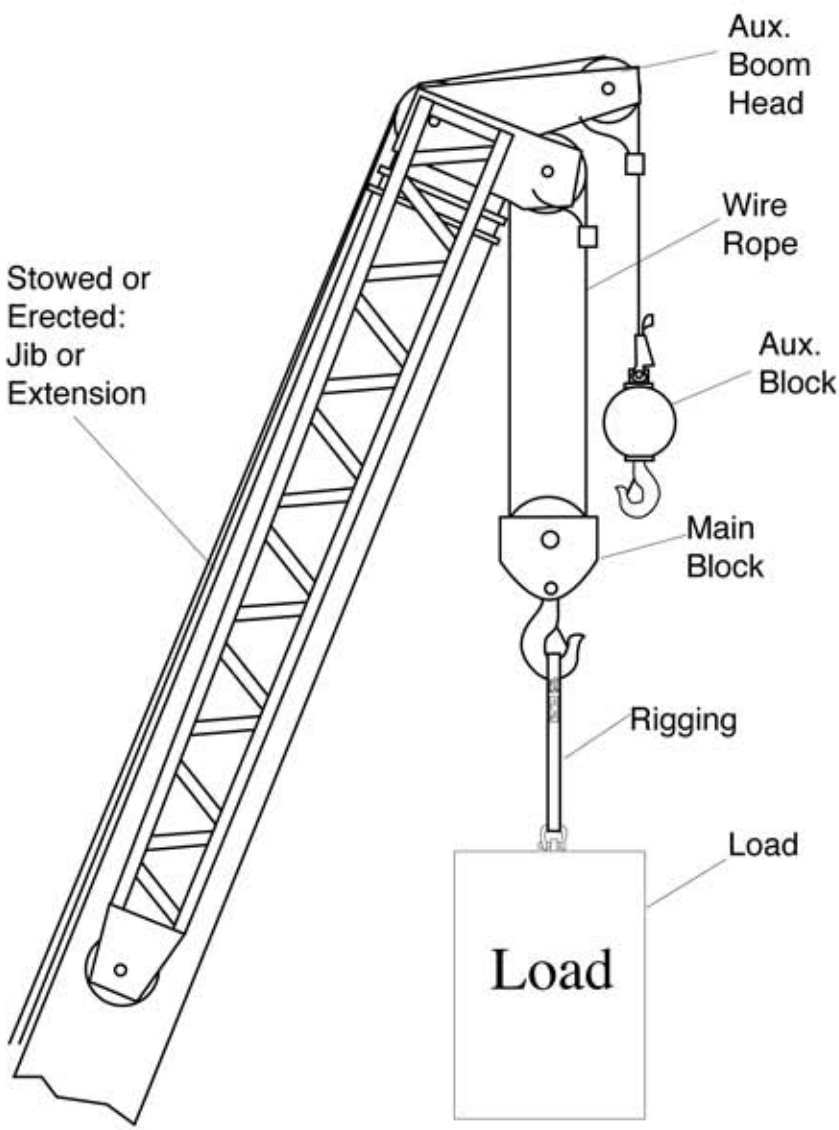
17. Don't allow riggers or ground personnel to stand between the load and any nearby obstruction while lifting a load from its starting point. All designated personnel should use extreme caution when assisting in landing a load, to **avoid getting into a pinch point.** *Tinker's cousin Ernie got the nickname "Pinball" during his first year of crane operating. Think about it.*



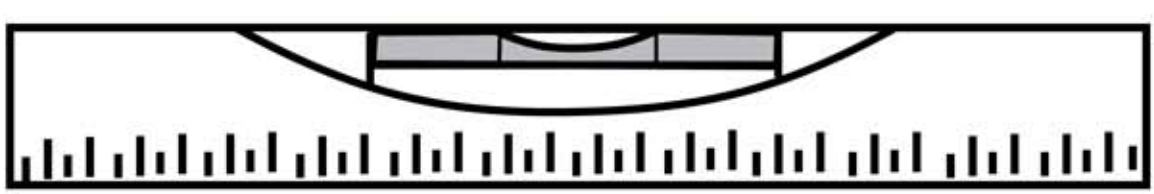
18. The operator should wait while the assigned signaler moves personnel out of the immediate flight path of the load (or provides a warning horn before moving). **Avoid handling loads over people.** *If someone calls the crane operator "Piper Cub", he should take heed and quit flying loads over people.*



19. **Account for all of the weight handled by the crane when reviewing the gross capacity chart and reeving/ block/hook minimums.** The gross load generally includes the load, the rigging, the suspended blocks, headache ball, the hoist rope(s) as applicable, stowed or erected jibs/extensions and the auxiliary boom head.

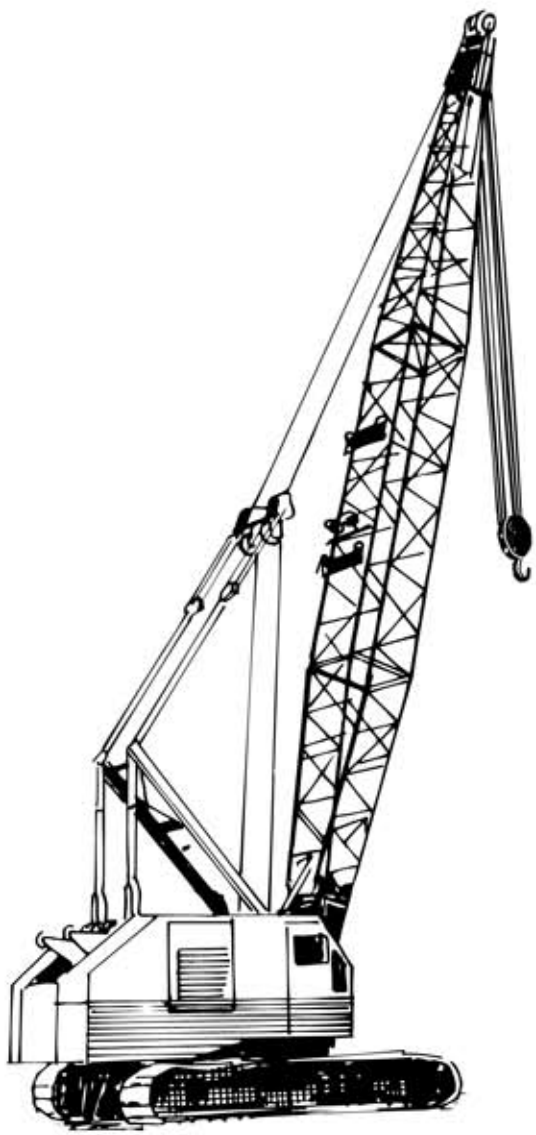


20. **Check the levelness of the machine before daily operation** and throughout the day to ensure there is no bleed off of hydraulics in the outrigger jacks, or settling of the soil under the jacks or crawlers. *Tinker is often described as being a full bubble off, in more ways than one.*

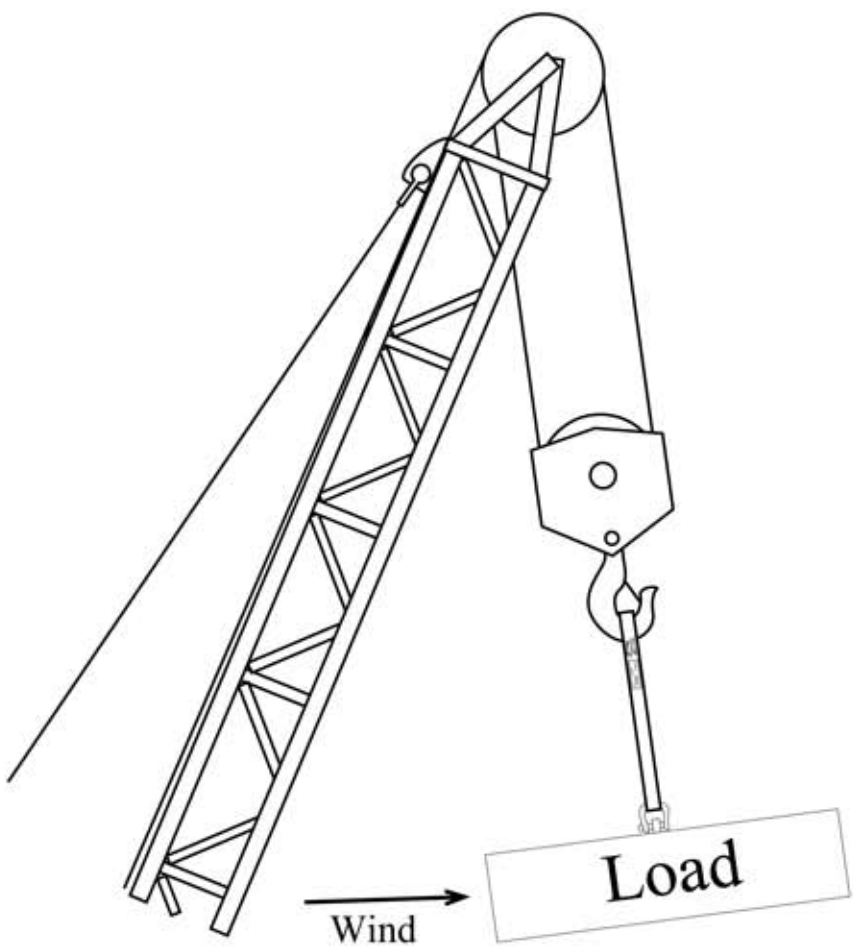


21. **Conduct a pre-lift meeting with the load moving crew before beginning an operation.** Don't assume everyone knows their immediate role or where the load will be relocated to. Always identify the load's landing spot, making sure everyone understands the goal. The crew should pre-place cribbing near the load's landing point if it needs to be blocked for stability purposes.*The load's landing spot should not be a big honkin surprise to the crane operator. He needs the information up front and before take-off.*

22. Crawler tracks and outrigger jacks can slide on ice. **Ensure proper footing is provided for the crane when working in areas with ice, snow or mud.** The best action is to have the ground scraped and cleared for the crane set-up, and have matting or blocking prepared for support as conditions warrant.

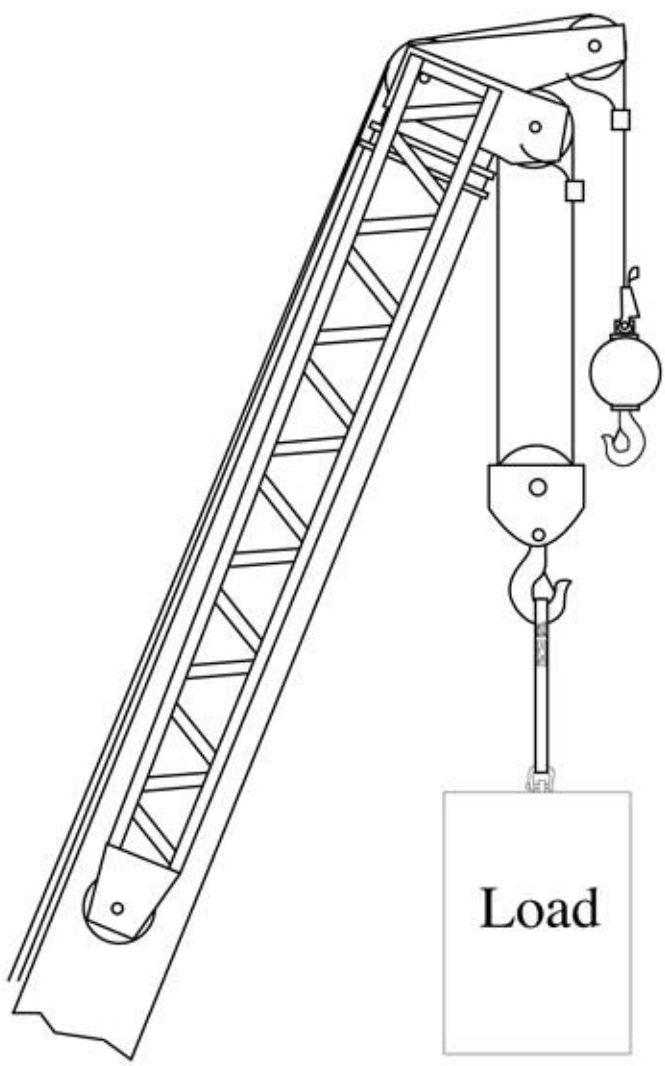


23. Wind on the boom and load can greatly affect the crane's structural strength and stability. **Know the manufacturer's recommended wind speed limitations for the crane you are operating.** *You know it's a little too windy when Stinker starts flying a stunt kite out the cab door.*



24. **Ensure that the crane receives its pre-operational inspection before use, each shift.** If possible, have operators inspect cranes they don't run on a daily basis to ensure a "fresh pair of eyes" when conducting the inspections. Sometimes we become complacent when looking at the same equipment each day, and may be overlooking damage or conditions that should be repaired.

25. **The operator should refuse to handle a load when he knows the lift is beyond the crane's capacity** or when the crane will be compromised in a manner warned against by the manufacturer. *When everyone else refuses to pick a given load and you hear Tinker say, "hold my lunch box and watch this", run and run far.*



Mike's Overhead Crane Safety Tips

Mike's Overhead Crane Safety Tips

by Mike Parnell

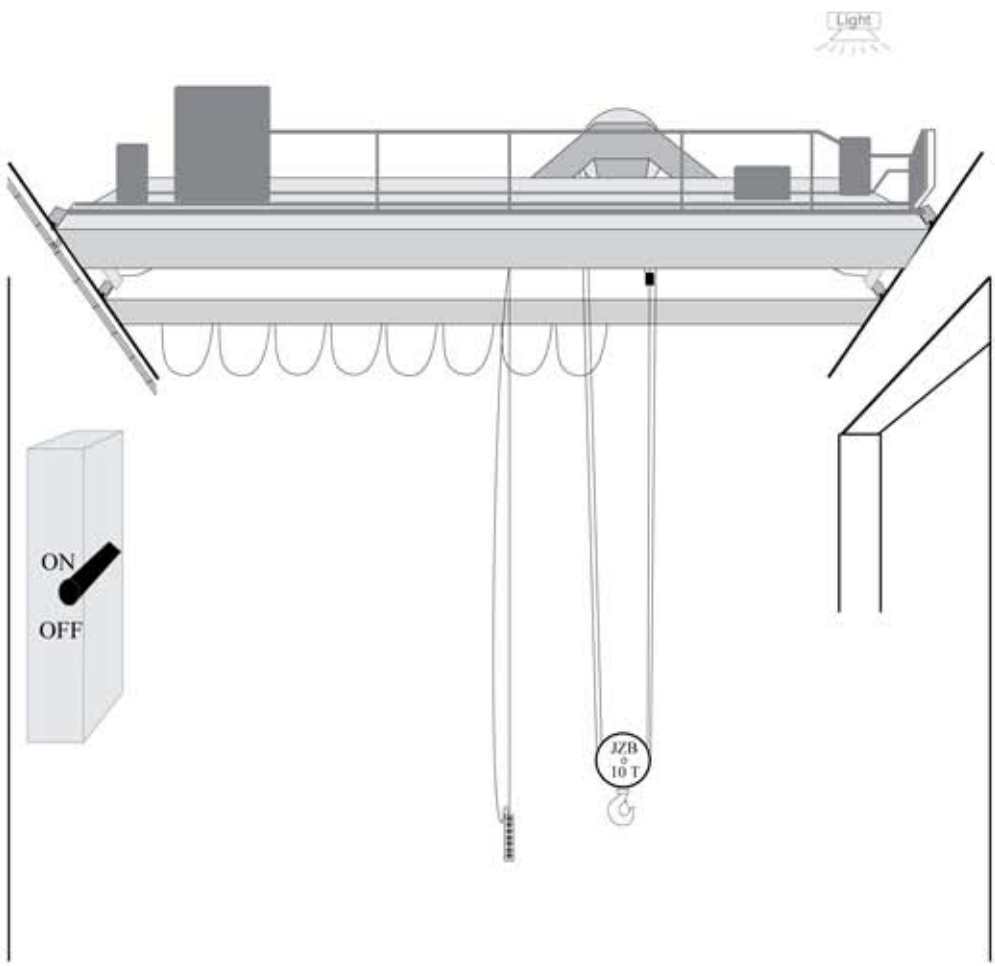
PREFACE

Trials and Tribulations of Stinker and Tinker

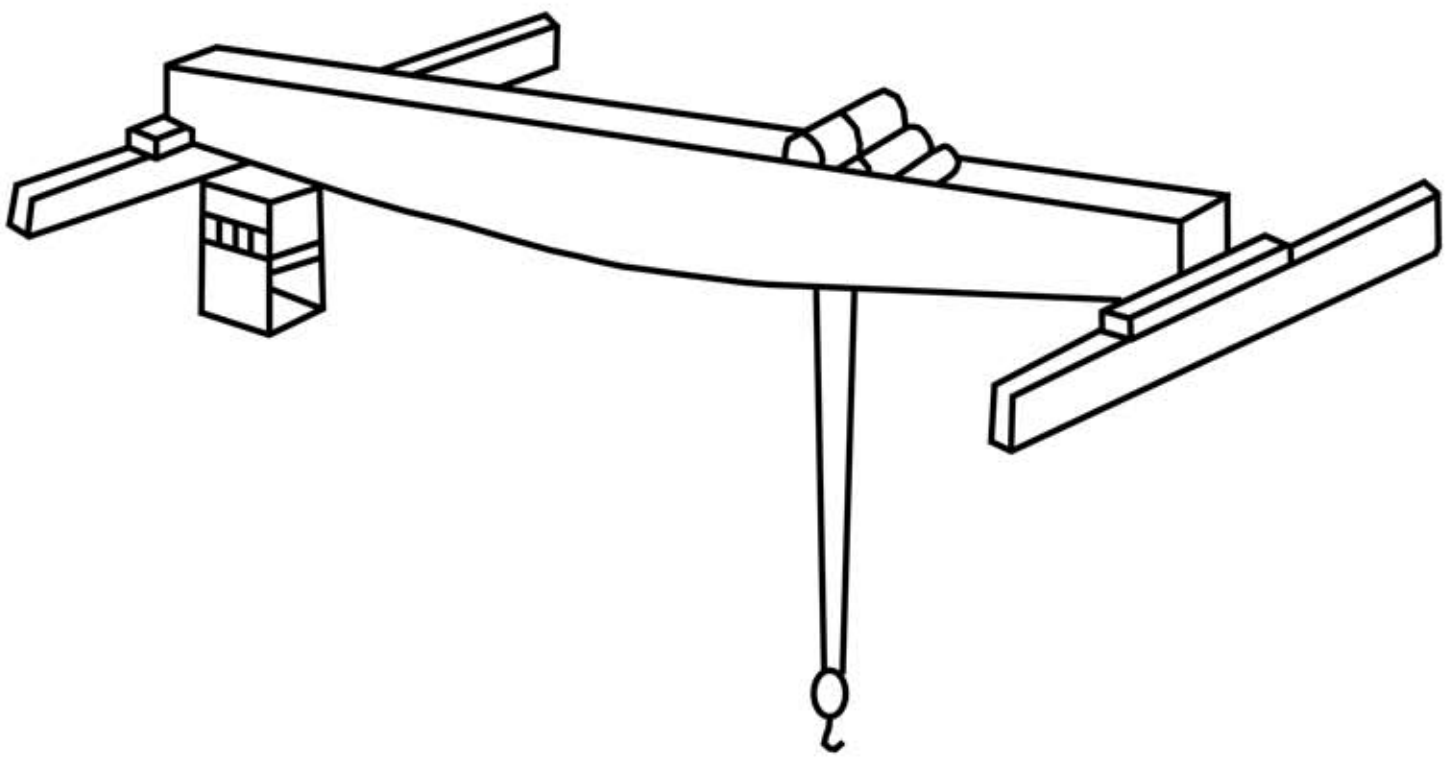
As you review the Tips in this booklet, you may observe an italicized comment about two brothers, Stinker and Tinker. These two characters have been involved with cranes and rigging for a while, but haven't spent much time getting any training or "sticking to the rules". The humor is there only to lighten the moment, but the seriousness of the risks involved should never be lost on the reader. At the end of the day, you don't want to be like these two infamous brothers. Their basic approach is to act first and think second.

For this booklet and other crane, rigging and
heavy equipment training materials,
contact Training & Inspection Resource Center at
888-567-8472 or www.tirc.net.

1. Always **make sure no one is standing between the load about to be lifted and an obstruction.** Pinch points can be deadly. When a load is hoisted, it can swing twice the out-of-plumb distance. If the crane hook is 2' north of the center-of-gravity, the load can swing 4' during initial lift-off.



2. During the pre-use inspection, **ensure that the location of the Main Disconnect or Emergency Shut-off is identified and accessible**. A function button can stick, and the crane can be a runaway. *It's no fun to be high-stepping to a breaker box that has 12 tons of stuff packed in front of it.*



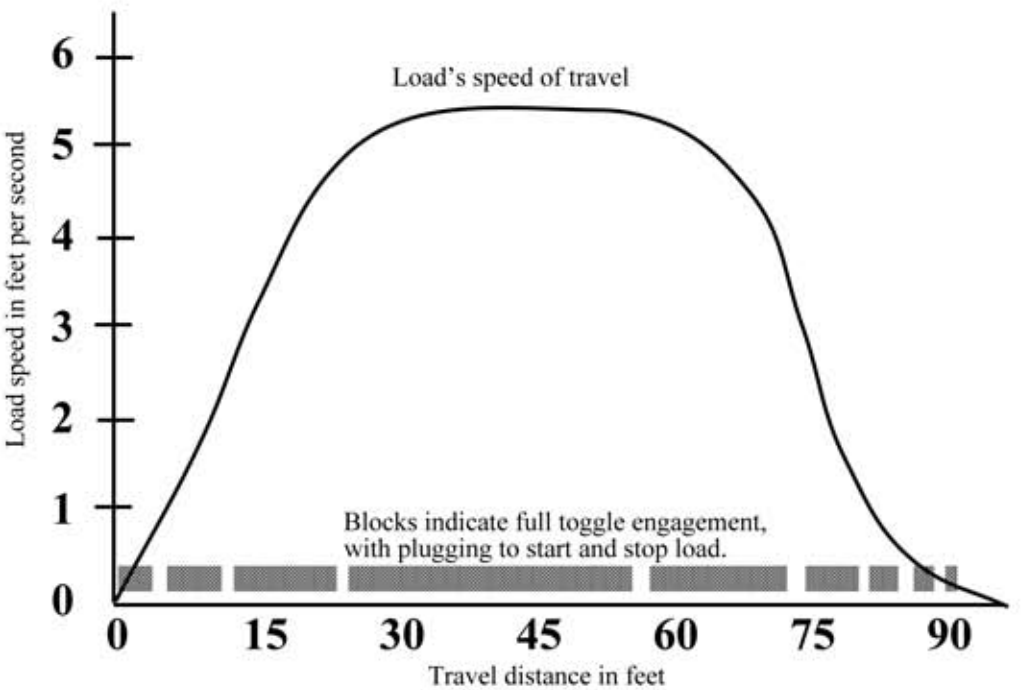
3. When first testing the crane's functions at the beginning of the shift, start the hoist in the "lower" mode. Second, position the crane by traveling the bridge or trolley to an area where there is open floor space under the crane hook. **After ensuring that the bridge and trolley function are operational, hoist the load block slowly in order to check the upper limit switch**. *The phrase "let her rip" shouldn't be used in good crane conversation.*

4. Always **check to see if any runway maintenance "stops" or obstructions are in the way** which might inhibit travel and operations. A ladder or aerial work platform may be in use and create inadvertent contact during bridge travel. *Like the roads near home, running a stop sign can be deadly.*

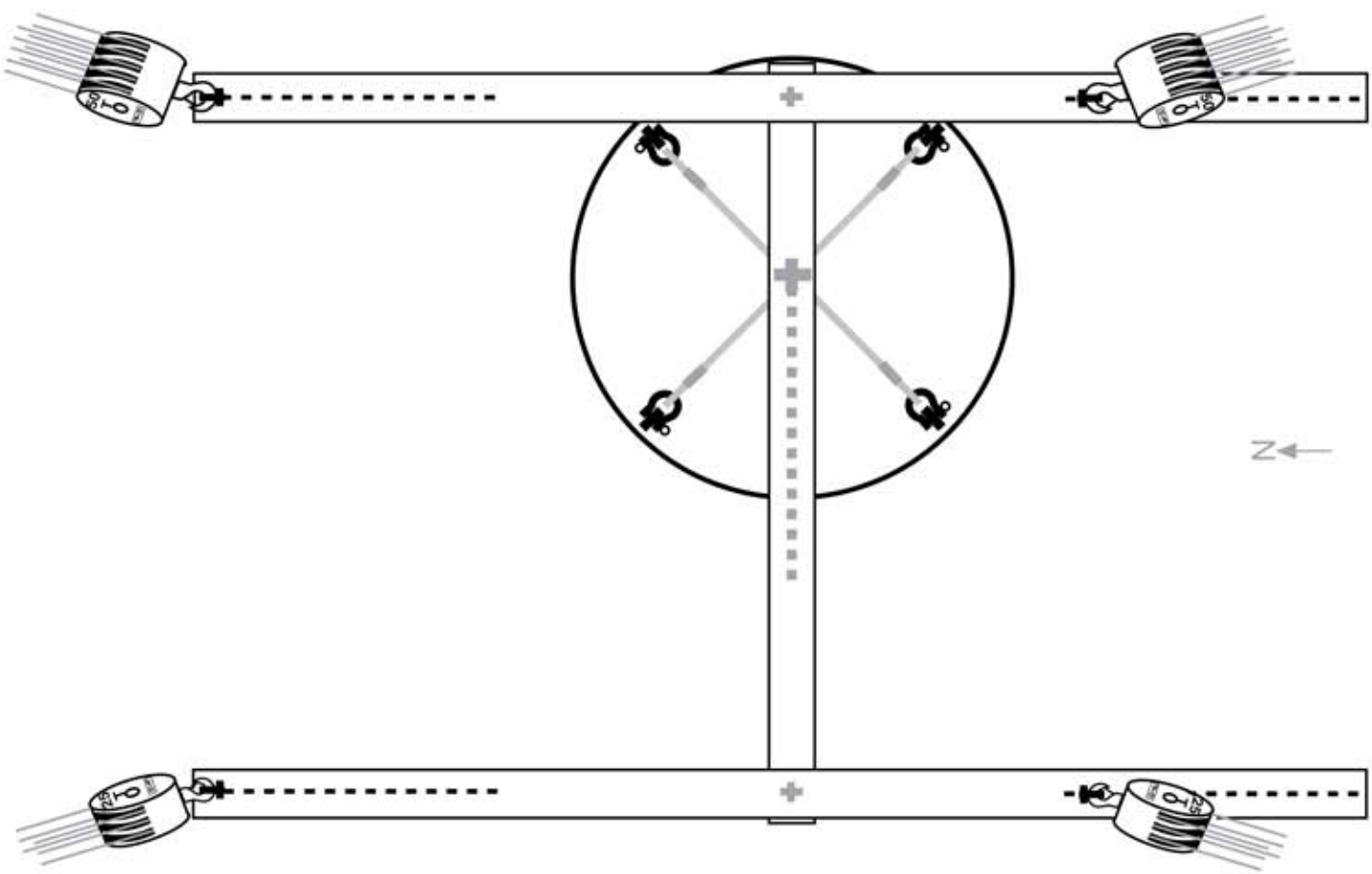
5. **Avoid carrying loads over people**. Use bells, horns, whistles or verbal instructions to clear fellow employees out of the load's direct path. *There's not much time to run when a load is falling at about 120 mph. Pancake city!*

6. To **minimize load swing**, start the suspended load by "inching" the bridge or trolley in the direction desired. When nearing the targeted travel distance, "inch" or reduce the horizontal speed by engaging the 1st speed detent. If the load is swinging, travel the crane in the direction of the swing when the load is at the bottom of its swing arc.

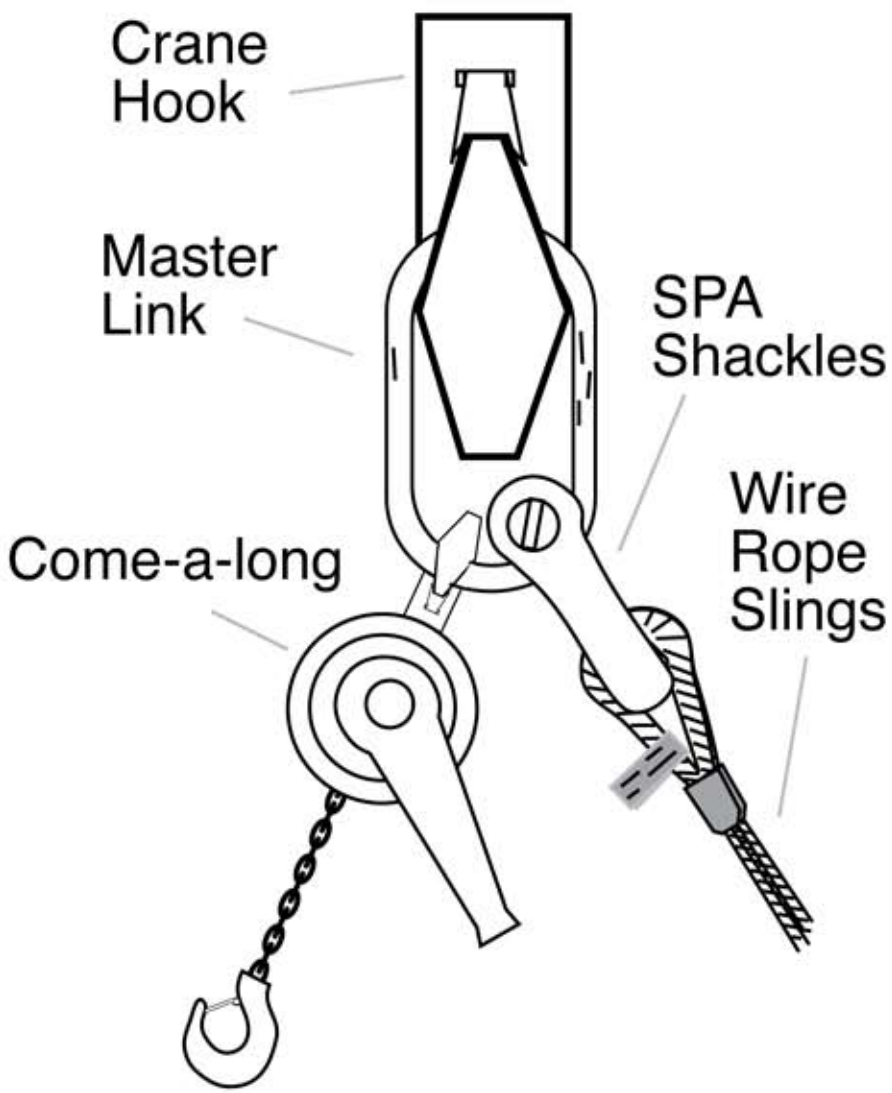
0 1 2 3 4 5 6



7. Always **be aware of other overhead cranes in the surrounding area**. Ensure that two cranes are not on a course to occupy the same space at the same time. Always yield to the other crane, assuming the other operator is not aware of your presence. *Bumper cars at the county fair are fun. Bumper cranes at work can knock a building down. Avoid at all cost!*

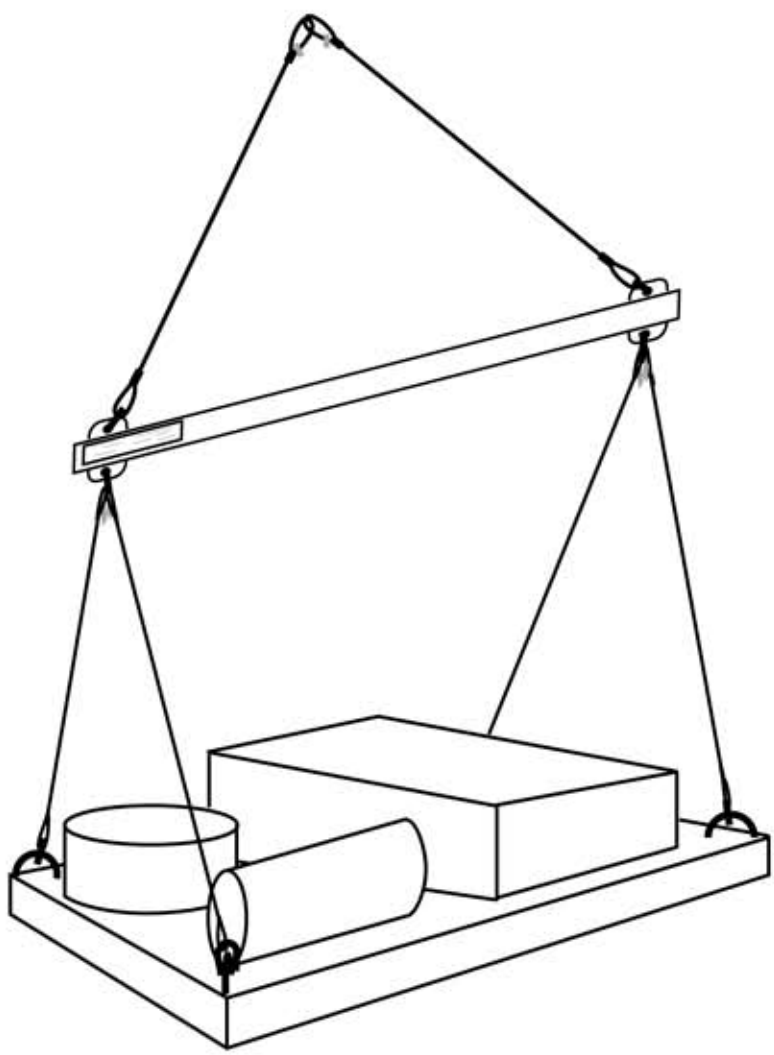


8. **Stay focused on the job at hand**. It seems as though the rigging and un-rigging of a load consumes 75% of the time, while 25% is directly related to having the load "in-flight". Take it easy. It's not a race. The operator is responsible for the load while it is moving under crane power and as he accepts signals while following the lifting plan.

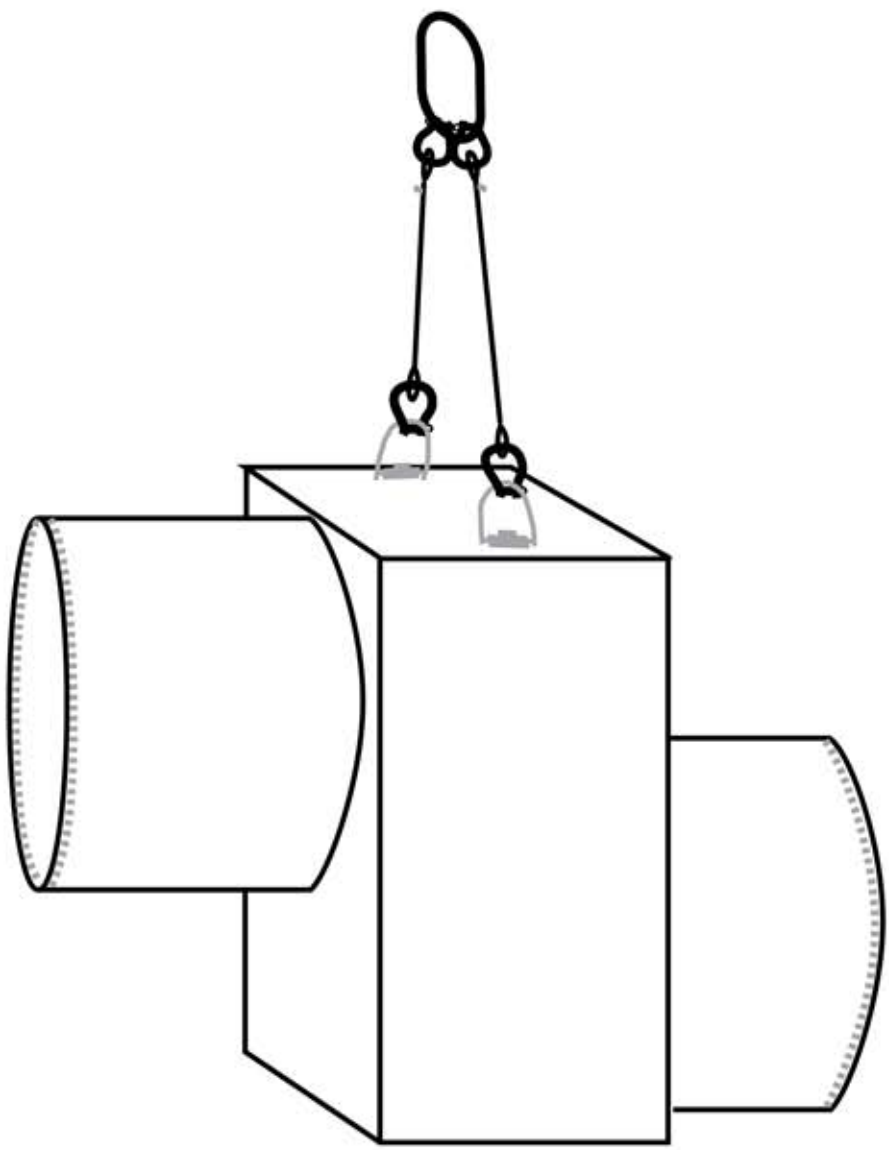


9. **Use a tagline with a load that presents a problem with rotation or swinging**. The tagline is simply intended to help reorient the load. The person handling the tagline should not attempt to pull the load. He may end up sliding under the load if it swings away from him. **The tagline person should never wrap the line around his arm or waist.** *One day you would have thought Stinker got tangled with a rodeo bull while trying to make the 8 second clock. He had that tagline wrapped around both arms and a leg. He got bucked off. It weren't pretty.*

10. When using an overhead crane, **the load should be at a traveling height that permits clearance over travel path obstructions**. Constantly adjusting the height of a traveling load to minimize its clearance will increase risk of contact with obstructions. *It's funny to see a load have more ups and downs in a bay than a Macy's elevator. Funny but sad.*



11. When using an outdoor gantry or overhead crane, ensure that the wind does not push the crane or load. **Know the maximum allowable wind speed for operation**. Realize that two open doors in a building can provide a wind tunnel effect and can result in the unexpected movement of a suspended load.



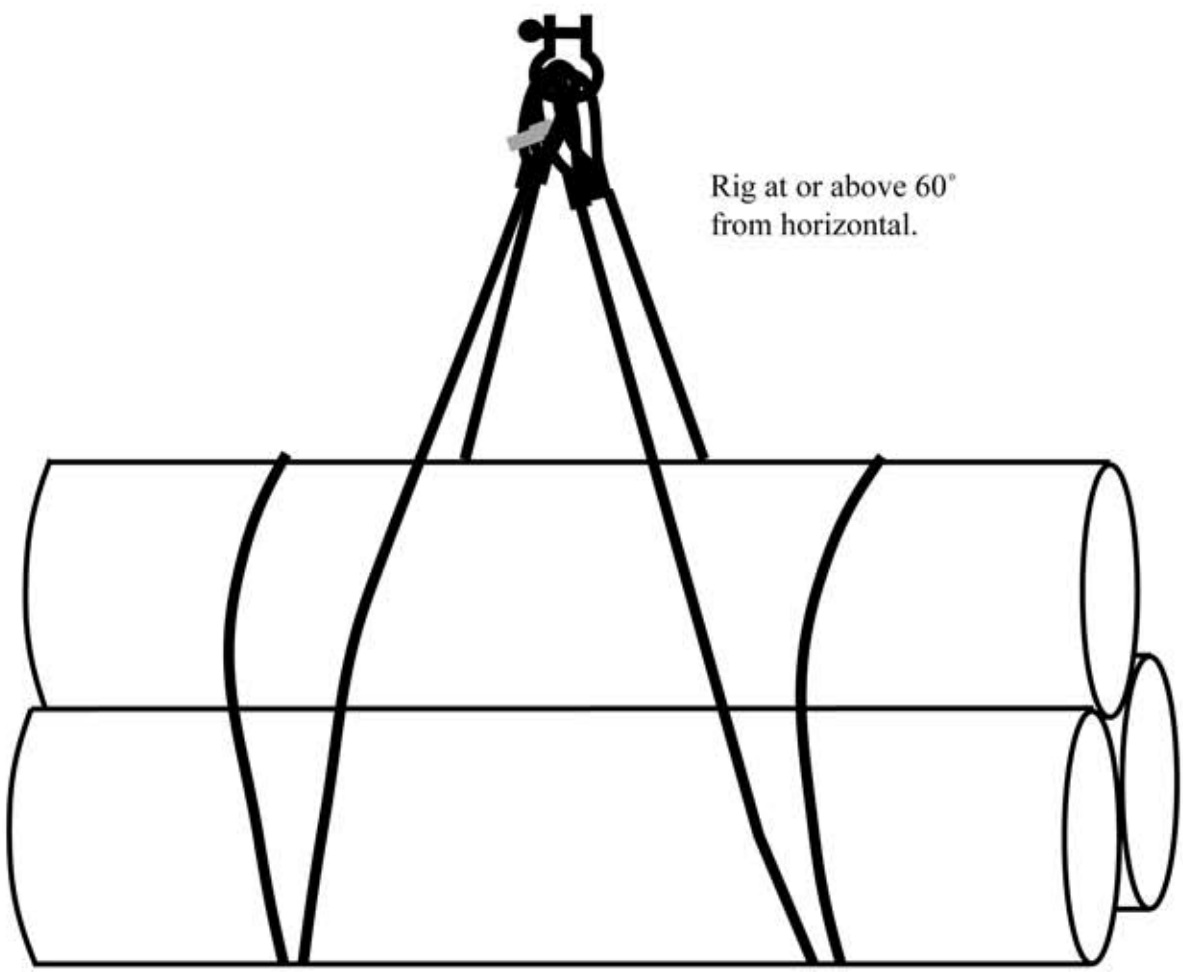
12. When turning a load using two hoists from the same bridge, accidental overloading can occur. **The hoist that "receives" the load should have the capacity to carry the whole weight**. *Stinker now remembers, "tail with the tiny hook, head with the big hook".*

13. When up-righting or laying a load down, **ensure the rigging is attached to acceptable locations**, or use a "step block". Load flopping can be damaging to the crane, the building and/or the load.

14. Try to **minimize the load's swing in the direction of travel** before moving it in a perpendicular motion. It is difficult to stop a load's circular movement. *Tinker can make a load look like a "tilt-a-whirl" at the county fair with no trouble at all.*

15. Work to **align the crane's hook over the load's center-of-gravity** before "take-off". Position the traveling hook over the CG by viewing the alignment from two locations 90 degrees from each other.

16. **Ensure that the rigging is well secured to the load before lifting**. Using unrestricted basket or choker hitches at low sling angles can lead to sling slippage. Slings moving along a load's surface can result in sling failure and/or loss of the load. *"Ready to Launch" is Tinker's favorite saying.*

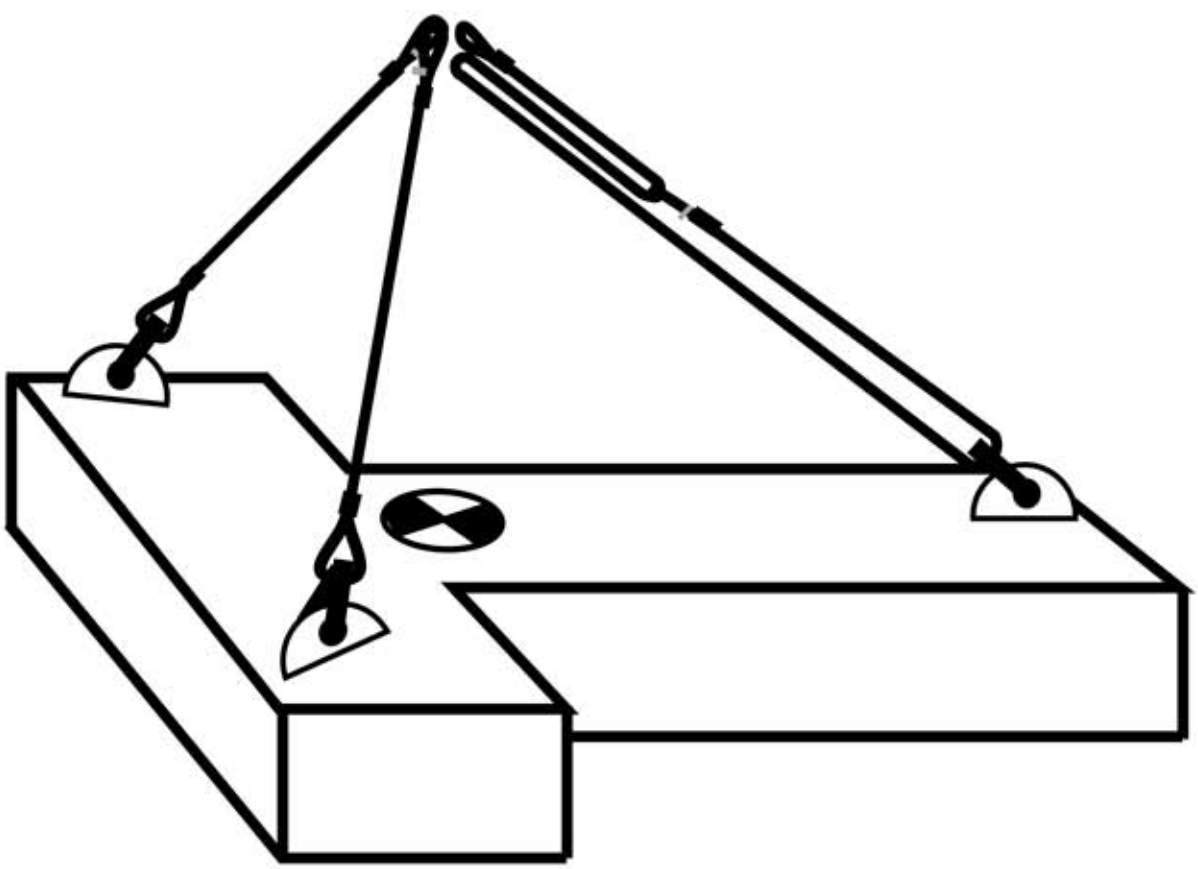


17. The crane's **limit switch(es) should never be used as a "stop"** during normal operations. These devices are strictly for accidental over-hoisting, over-travel or over-trolley as applicable. They are not intended to be continuously used as a fail-safe brake device. *Tinker's nephew Lazy Louie just keeps the hoist button mashed until the block trips the upper limit. That way he's sure it's all the way up and he "don't have to figure when to quit, 'cause it's automatic". Someone once mentioned Louie, brains, dynamite and him not being able to blow his own nose. Didn't get the whole conversation, but I got the drift. How about you?*

18. Erratic operation when hoisting or lowering can induce shock loads to the crane, rigging and load. **Avoid continuous bouncing of the load** by plugging the hoist-up or hoist-down function. *This is a favorite game of Stinker's son Bert. He calls it "Earthquake", and he likes to see the dust fall off the top of the crane bridge.*

19. If the lowering function of the hoist drum motor is too fast when attempting to place a load, **consider suspending the load from a rated chain fall or turnbuckle to allow for incremental lowering**.

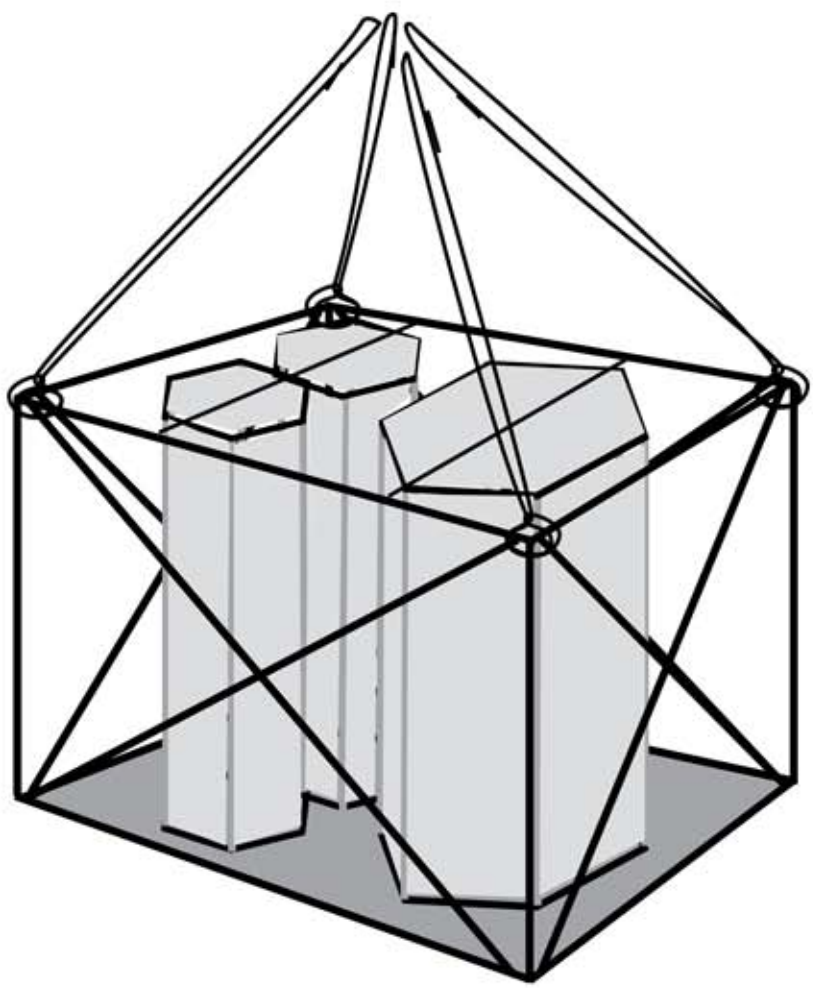
20. **Never ride a load suspended by an overhead crane.** If temporary access is required to a suspended load, ensure that all functions that can cause movement are "off" and isolated to avoid accidental movement and an unstable condition for employees.



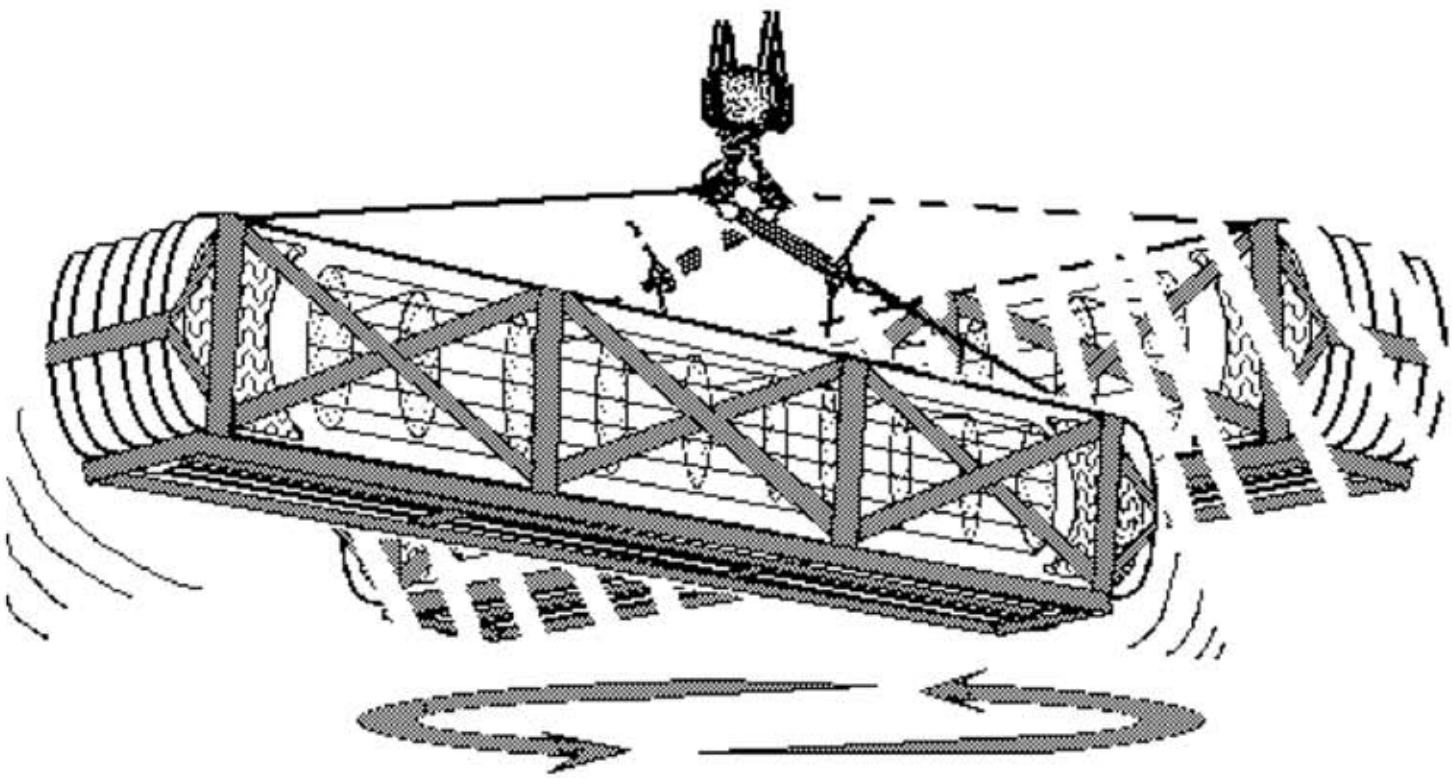
21. The operator should become familiar with the crane's sounds and noises. Being able to **recognize when the crane is straining to lift a load that is still anchored or beyond the crane's capacity** can be a life-saver for all assigned employees. *Tinker is always happy to use a crane as a jack to break a load free. Apparently he missed that day during his apprenticeship training that covered lifting "non-restricted" or "over-capacity" loads.*

Listen for trouble

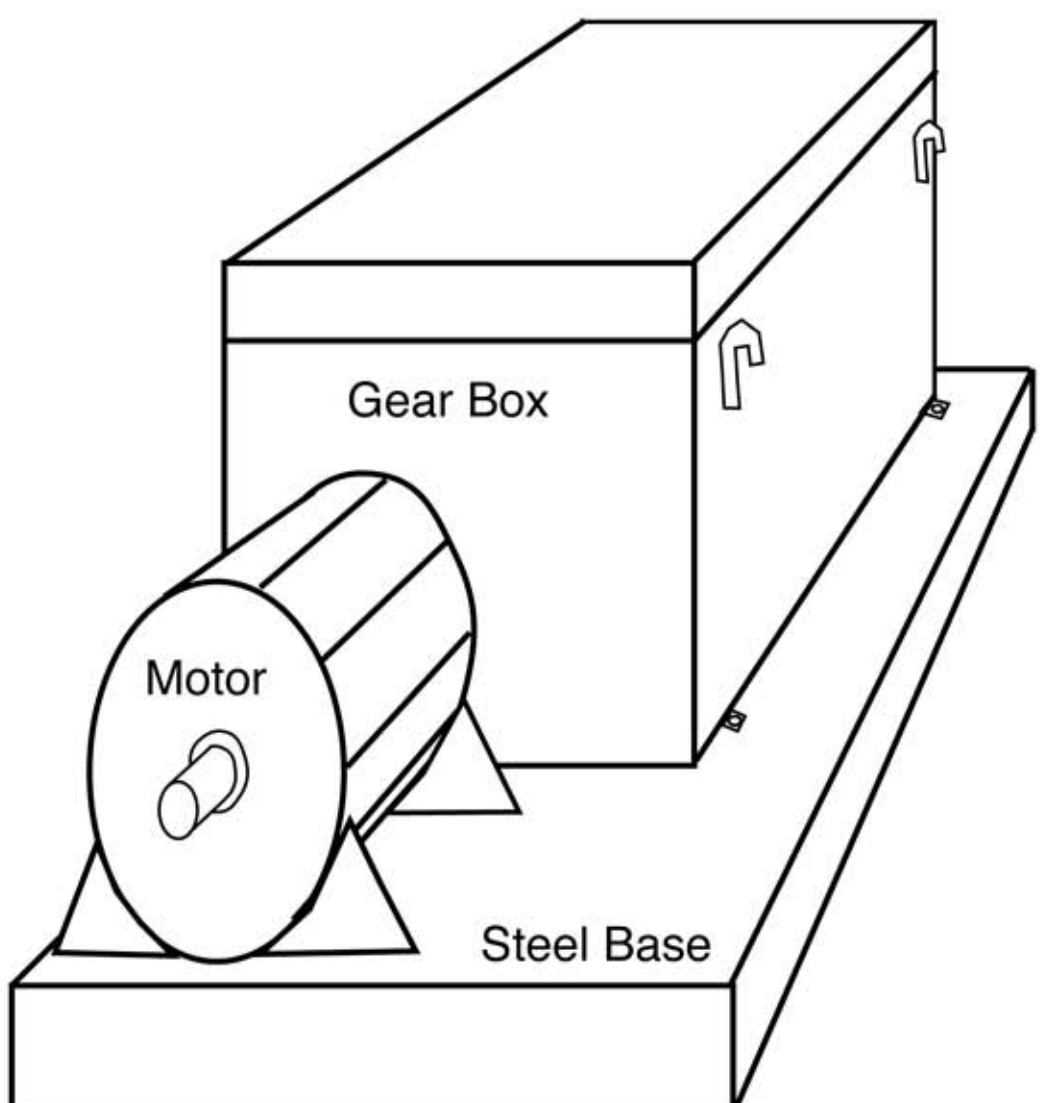
22. Always have the load comfortably suspended at the correct height before moving it horizontally. **Attempting to travel before lifting can induce severe side loading to the crane** and its components. *Ever meet Draggin Bill? He's left load skid marks all over the shop. His mom used to write letters to him real slow 'cause she knew he didn't read fast.*



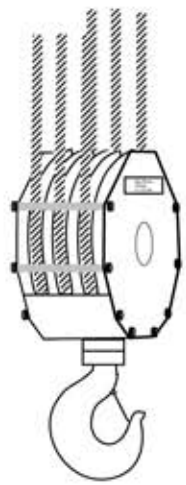
23. **Allowing the crane to contact end stops on the trolley or bridge runways can cause shock load and damage**. If a load is suspended when this occurs, it can result in loss of load or building damage. *The only Big Bang Theory I know about is when Stinker is running the bridge crane north and he answers his cell phone along the way. Big Bang!*

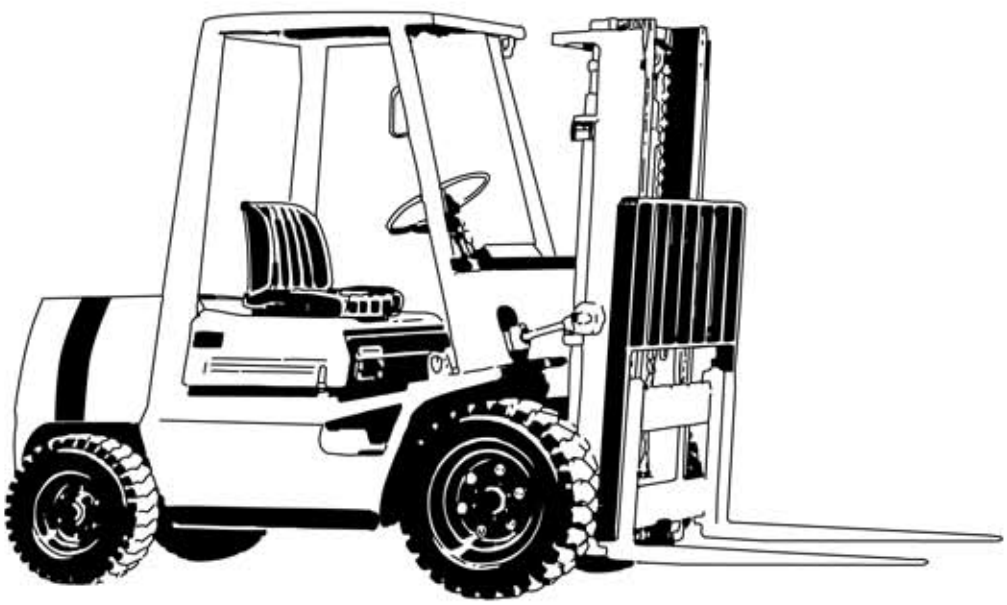


24. **Know the weight of the load to be lifted**. Overloading a crane can cause injury or death to the operator and fellow employees. Structural, mechanical and electrical damage can result from hoisting loads beyond the crane's capacity.

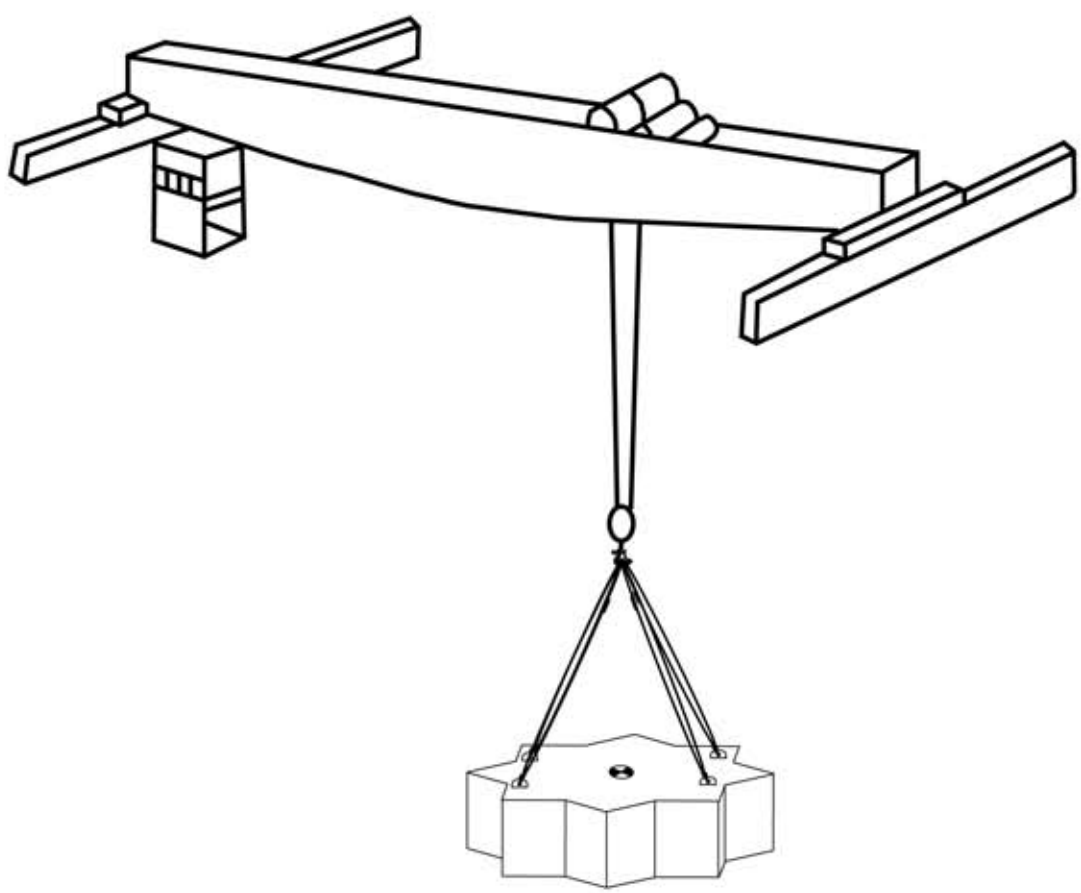


25. **Park the crane in a designated location** so that contact by other equipment is avoided. Make sure the parked hoist block is above the height of mobile equipment operating in the immediate area, such as forklifts, trucks and retracted aerial work platforms. *Tinker thinks it's cute to snag Stinker's forklift when he drives by. Not funny, not cute, not cool. Park it right.*





26. If the crane operator must set the crane control unit aside with a load suspended, he should not venture beyond the width of the crane bridge. About the only reason to leave a load up in the air for a moment is to prepare its landing spot. **Don't abandon a suspended load**. Get it placed and stabilized.



Mike's Rigging Safety Tips

Mike's Rigging Safety Tips

by Mike Parnell

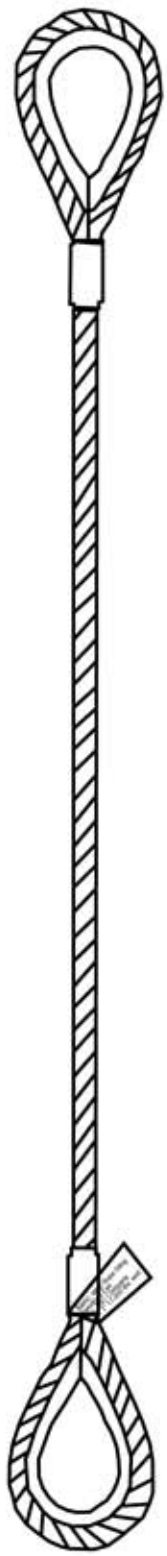
PREFACE

Trials and Tribulations of Stinker and Tinker

As you review the Tips in this booklet, you may observe an italicized comment about two brothers, Stinker and Tinker. These two characters have been involved with cranes and rigging for a while, but haven't spent much time getting any training or "sticking to the rules". The humor is there only to lighten the moment, but the seriousness of the risks involved should never be lost on the reader. At the end of the day, you don't want to be like these two infamous brothers. Their basic approach is to act first and think second.

For this booklet and other crane, rigging and
heavy equipment training materials,
contact Training & Inspection Resource Center at
888-567-8472 or www.tirc.net.

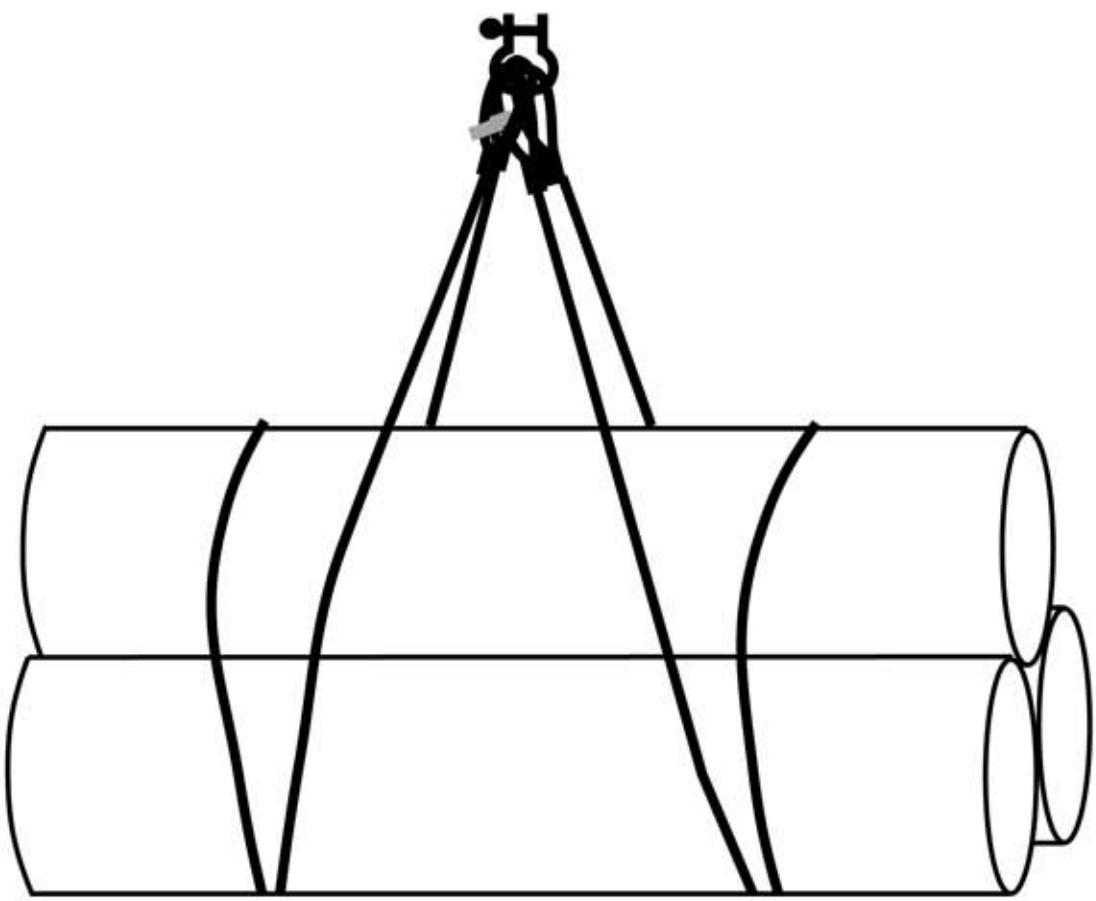
1. Carry slings by hand, in a truck, with a forklift or by a crane from point to point. **Slings should not be dragged** on the floor or over an abrasive surface.



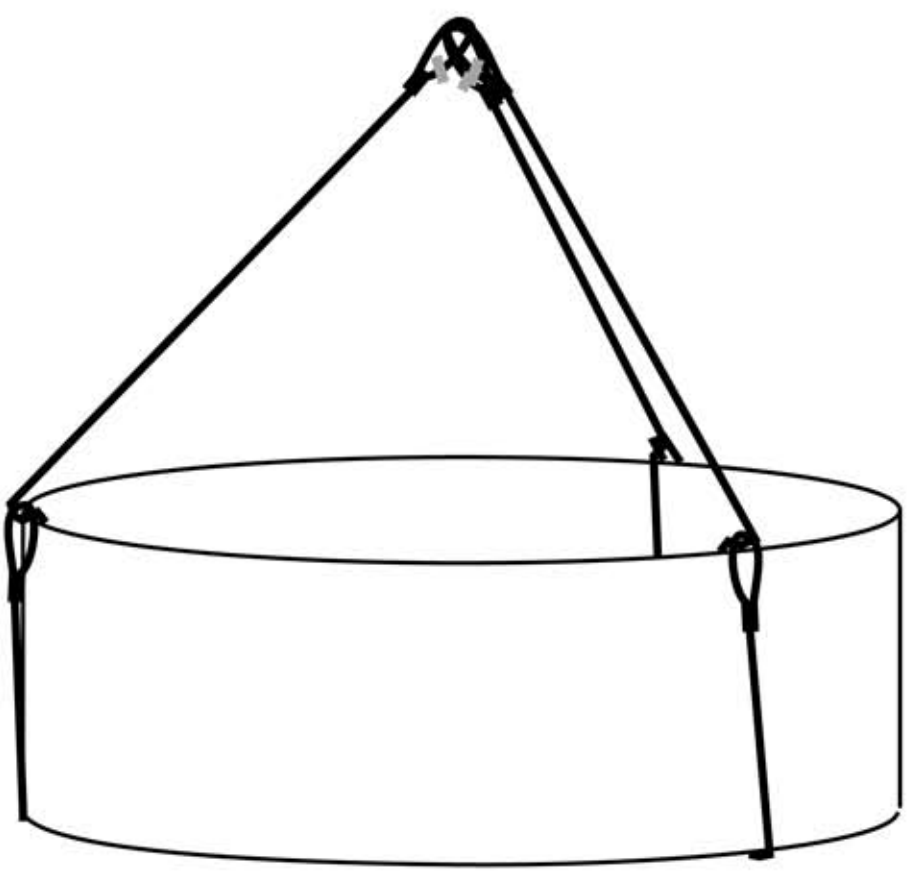
2. Twisting chain sling legs to help shorten them can cause a significant loss of strength and do damage to the links. It may produce torsion to the crane hook or load connection point. **Slings shall not be shortened or lengthened by knotting or twisting.** *Stinker likes to twist chain sling legs because they spin so well when he disconnects them. Sometimes he forgets to duck and the sling hook slaps him like a ten pound horse tail swatting flies.*

3. Heating and bending a come-a-long or sling hook back into its original shape will cause loss of strength in the hook and can result in failure under load. **Damaged components shall be replaced and not repaired.**
If you ever get a hankering to fix something, leave hooks off the list. Take up car body work, welding ornamental bird cages or fixin' old dirt shovels, but don't get the torch out for a hook, ya' hear?

4. When tightening slings around a load while lifting with a crane, **keep your hands and fingers from between the sling and load.** All portions of the human body shall be kept from between the sling and the load, and from between the sling and the crane hook or hoist hook. *You know what they call the last tough guy that held onto the sling while the crane tightened the rigging? Stumpy.*

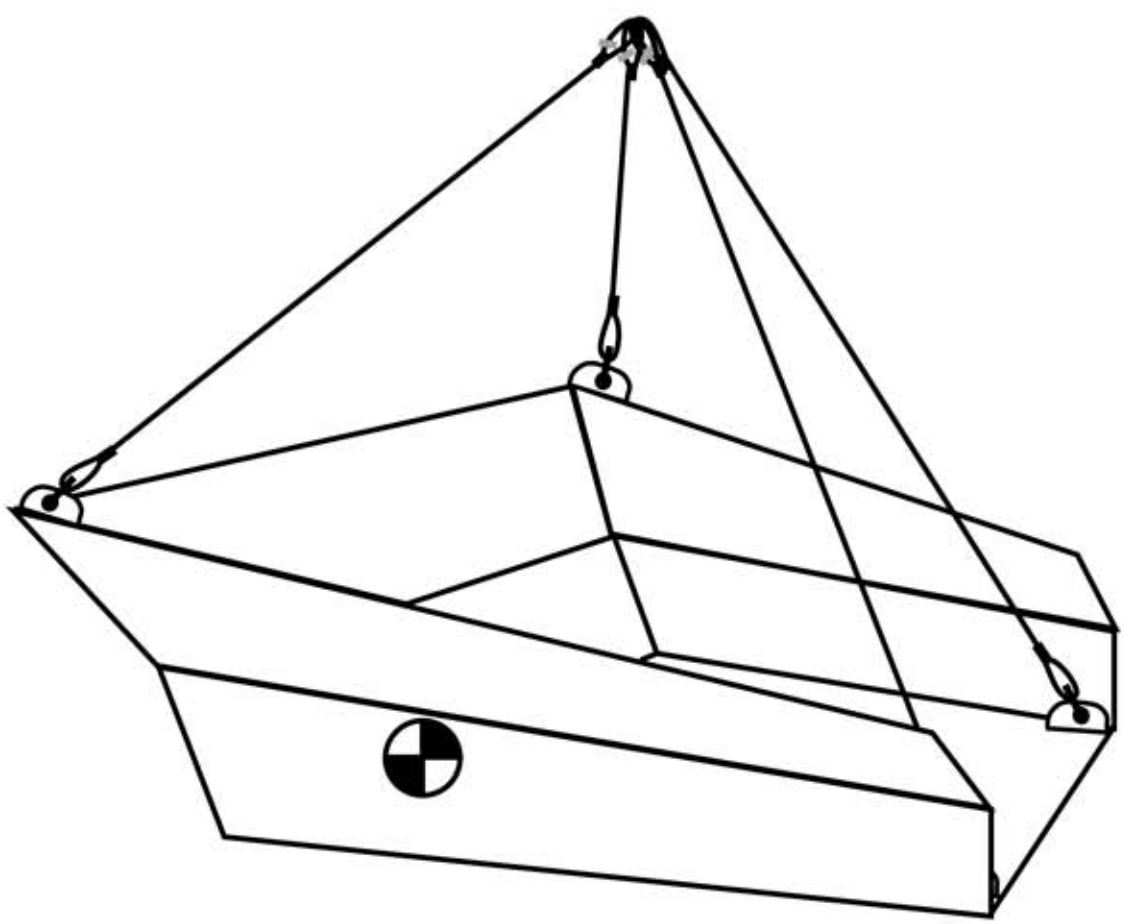


5. When choking or basketing a load, use two or more slings to ensure that the CG is contained within the slings' straddle or connection area. **The slings shall be hitched in a manner providing control of the load.** *You don't want anyone to start singing a rendition of that old Simon and Garfunkle song, "Slip, Sliding Away" when that bundle of pipe tilts, and they shoot out all over three counties.*

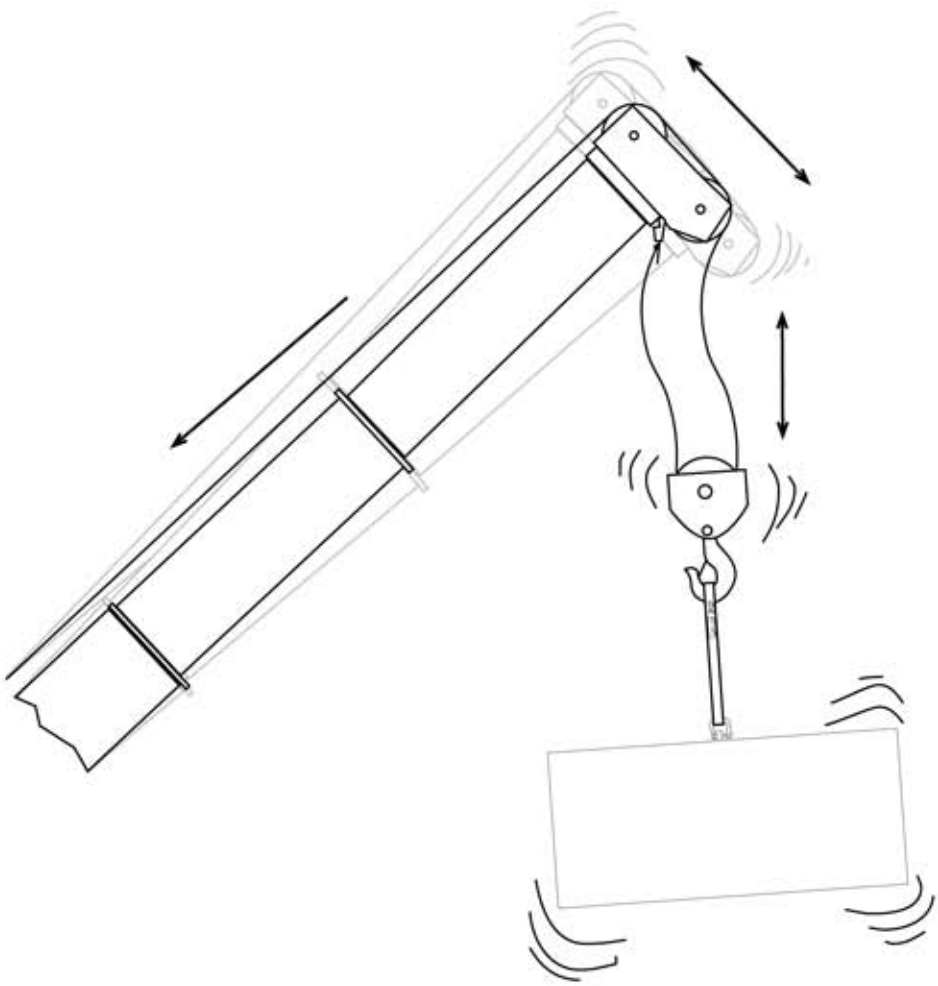


6. Always insert high pressure resistant sling protectors between the sling and a load contact point, to avoid damage to the sling. **Edges in contact with the sling should be padded with material of sufficient strength to protect the sling.** *It's amazing how slow a load can go up and how fast it can come down after the slings get cut. My dad used to say, "Remember, you signed up for a rigging job, not a drop test".*

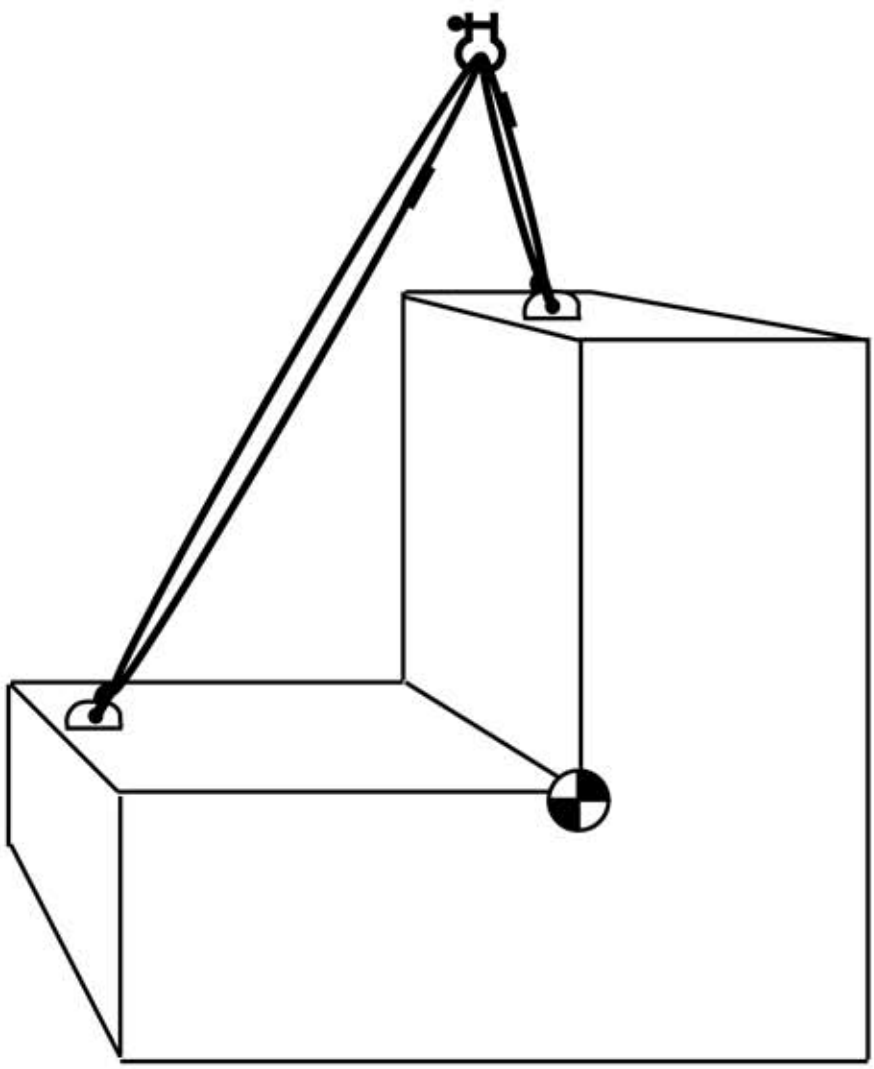
7. When rigging with slings of different length due to an offset CG, **always take the time to have a qualified person calculate the net load at each pick point, and the resulting sling tension based on angle.** *You may have to get Jethro to do some ciphering, but it'll be worth it to not have the slings get overloaded and possibly fail 'cause we didn't do our "gazentas". You know, 2 gazenta 8, 4 times.*



8. Bouncing a load while jerking it, tipping it over or free falling it can momentarily produce 2-3 times more payload to the slings and crane. **Shock loading should be avoided.** *Stinker used to think his little cherry picker was a fishing pole, snatching loads left and right until one day he snapped the boom like a twig. He decided to leave that rough stuff to when he went to the catfish pond.*



9. **Avoid contacting synthetic web slings and roundslings with hot loads.** These types of slings should not be used with loads in excess of 180˚F. *Tinker never minded the smell of burnt webbing until one day a fresh welded pipe planted itself right next to him and speared his coveralls to the ground.*



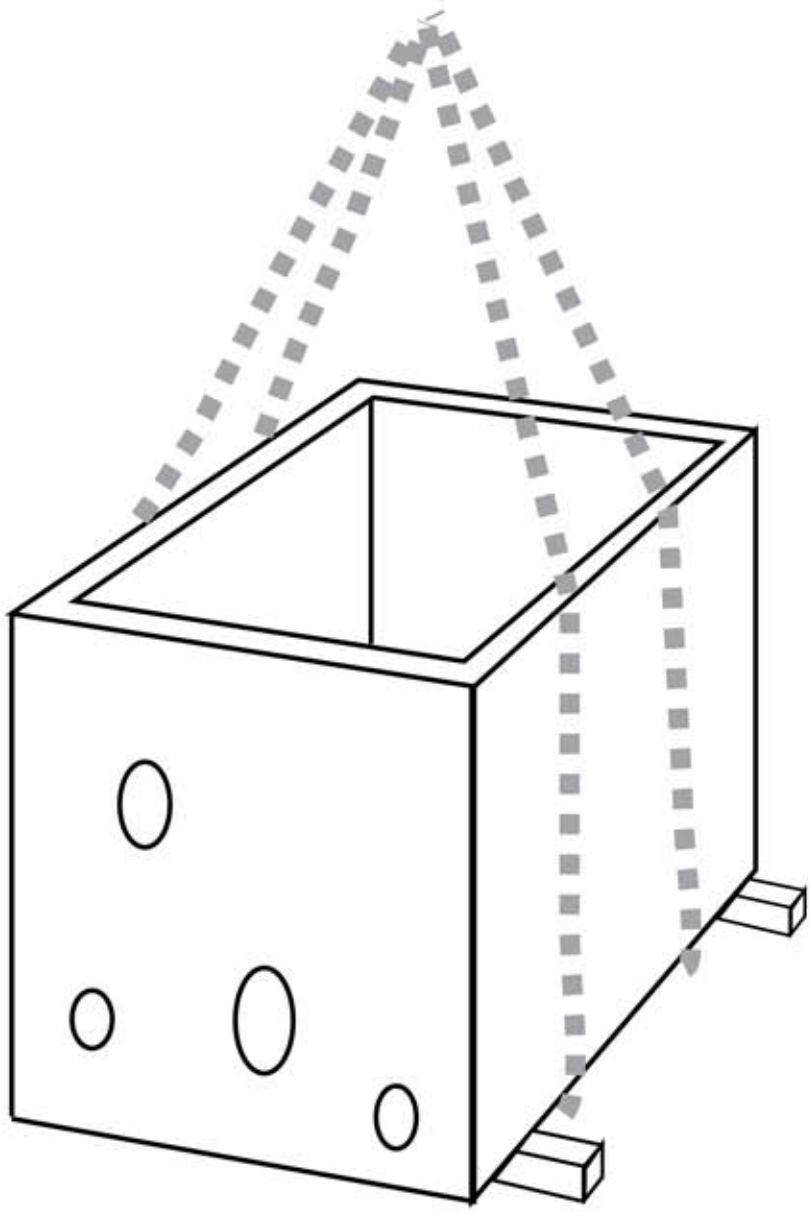
10. **When synthetic rope or web slings are affected by ultraviolet rays, their strength can be reduced by 50% or more.** *Stinker always calls his tool box web sling set his "Florida Collection", because he lets them get more sun than any other slings in the mill.*

11. **Landing loads directly on slings can destroy the sling from future use.** Do not pull trapped slings out from under a load with a crane. The load can flip over, the slings can get damaged and the slings may smack the living snot out of the rigger.

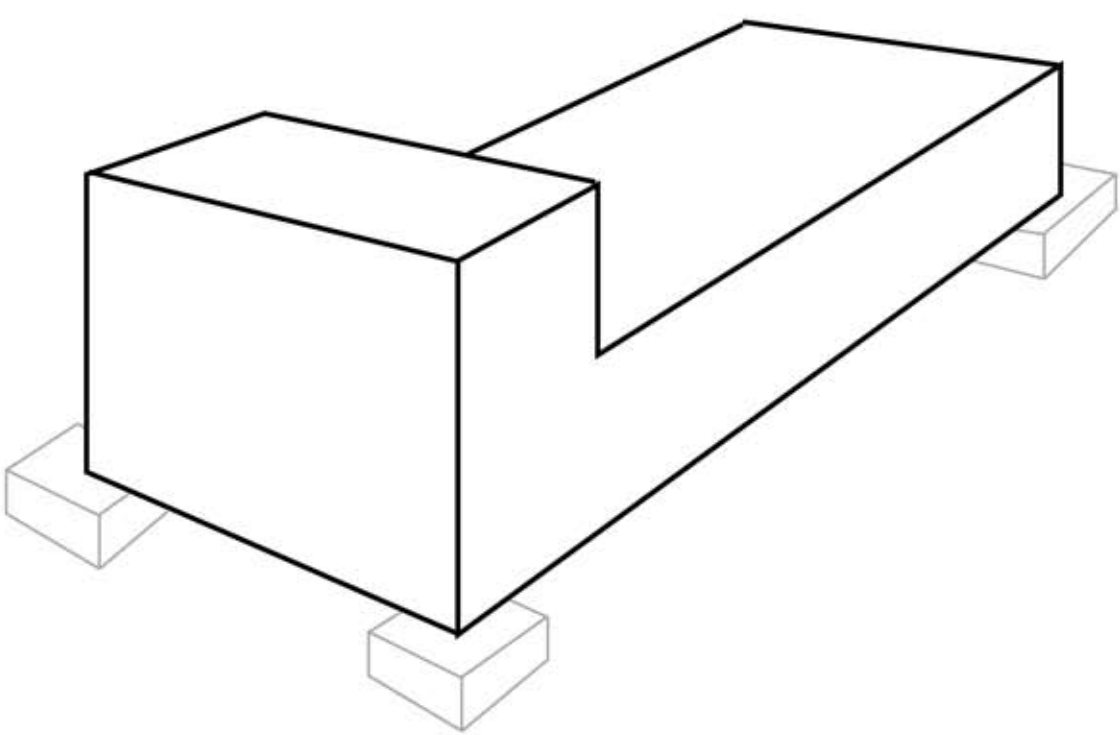
12. **Put the shackle pin to the sling eye, not on the body, when creating a choker hitch.** *"What goes zing, thud?" The shackle flying off the sling after the body rolls the pin out, and the load hitting the ground.*

13. **Always choke on the body of the sling, not on the splice, fitting or sleeve.** Hanging the load on a wire rope sling sleeve is a real bad way to start the day, especially if it decides to go south.

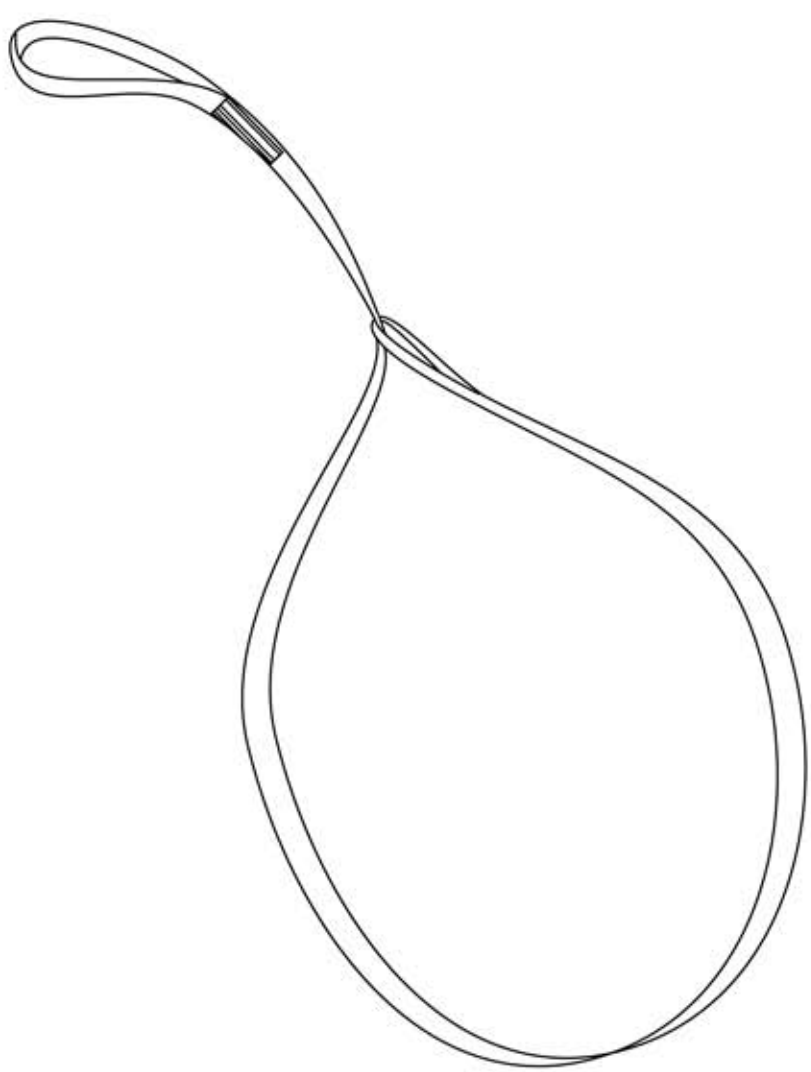
14. **When synthetic slings directly contact load corners, they can fail from cutting or friction** due to horizontal sliding while under tension. Use good, solid, Herculean corner protectors with all synthetic slings. If not, the load might leave a lasting impression on the sling.



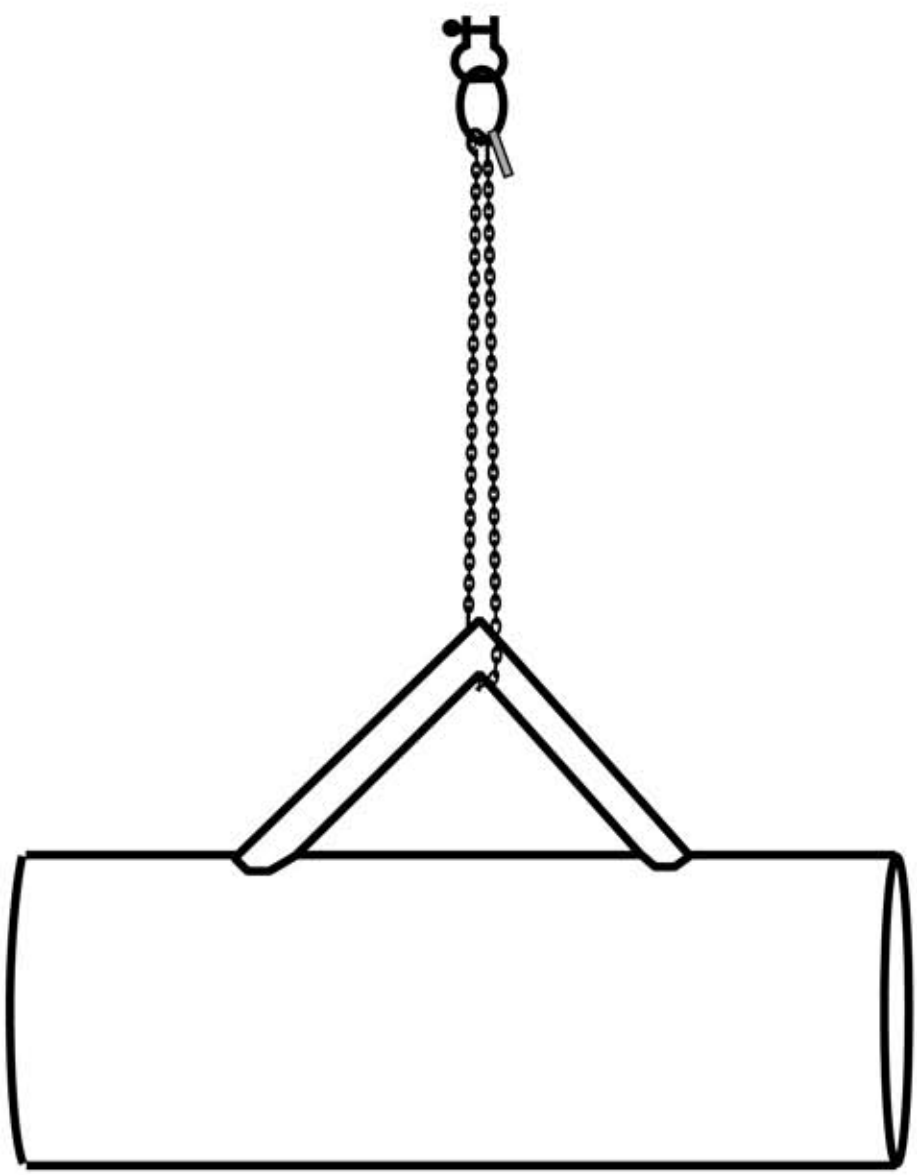
15. *Hey Stinker, do you think you get cute points for cribbing that load so it leans like the Tower of Pisa?* **Use hardwood blocking to build a solid and level foundation for the load to rest on.** Don't stack cribbing more than twice as high as the cribbing base is wide.



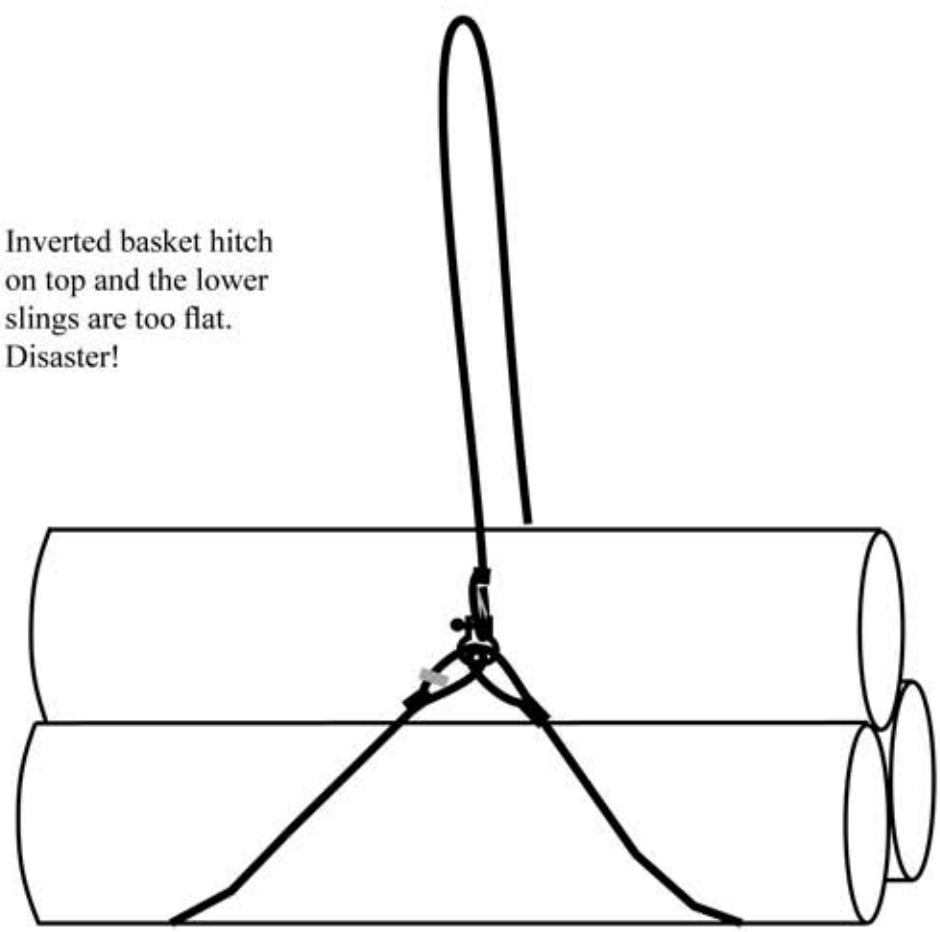
16. *"Hey Tinker, I got this load ready! You didn't think I was smart enough to shrink this sling."* *(He tied 4 overhand knots in it.)* **Knots in slings can reduce their tensile strength by 50%.** All sling types can be affected by knots; alloy chain, wire rope, metal mesh, synthetic rope, synthetic webbing and roundslings, and fall arrest lanyards aren't any different. Knots in rigging gear can be deadly.



17. **Attaching the lower hook of a single leg chain sling into the upper master link doesn't produce a basket hitch capacity.** Its rating is still only that of a single leg.



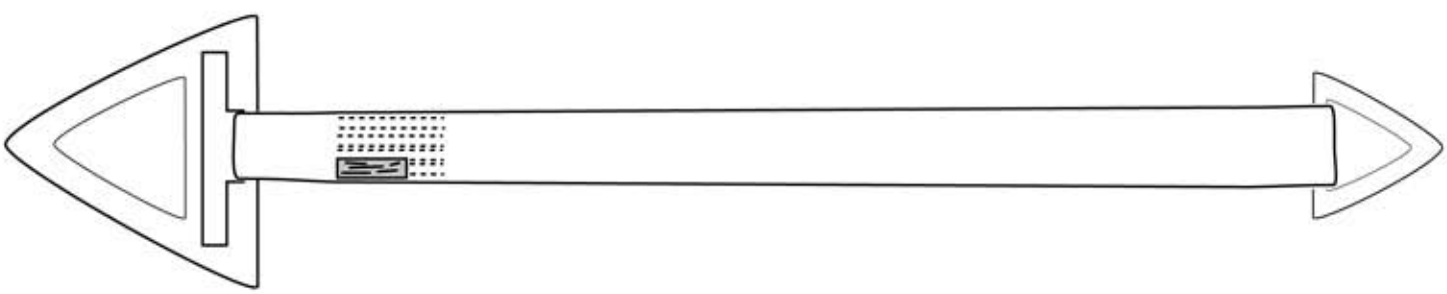
18. **When a load is rigged with two choker or basket hitches, their angle should be at or above 60° from horizontal.** If the slings slide toward the center during the lift, they likely will not travel at the same rate or distance, causing the load to tilt and slide out through the slings. *Cousin Walter got nicknamed "Dumper". He always reached for too much real estate with his slings and pretty soon one would slide and dump the load.*



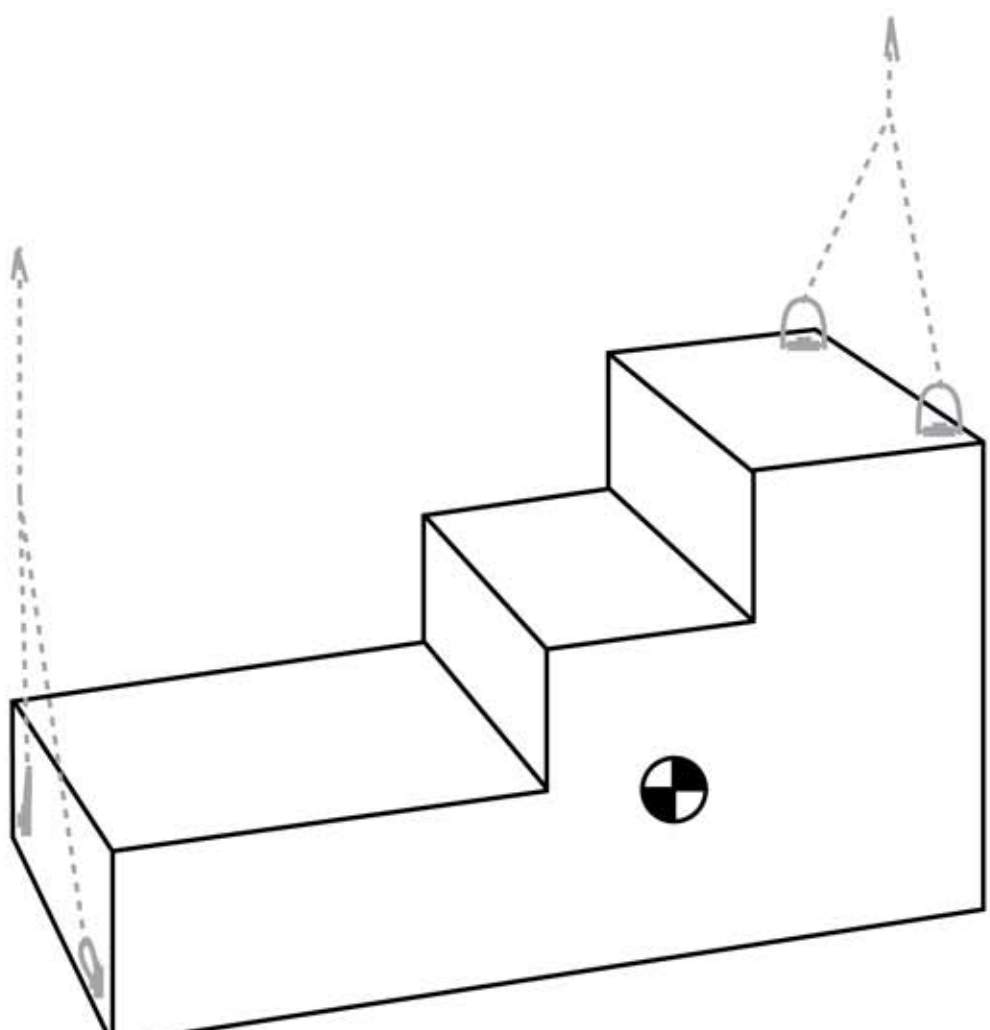
Inverted basket hitch on top and the lower slings are too flat. Disaster!

19. **Make sure not to split the eye out of a web sling when placing it over a large crane hook.** The stitching can break and drop the sling and load.

20. A web sling with permanently attached rigging hardware can require some extra attention. The bearing area between the hardware and the "hidden" sling webbing can get chaffed and cut. **Inspect all sling types at their hardware connection points.**



21. When turning a load, sling damage can occur quickly and with deadly results. **Make sure the slings aren't cut, friction damaged or ripped against the load's edge or corner during the turn.** Use a spreader bar if possible to keep the slings from contacting the load.

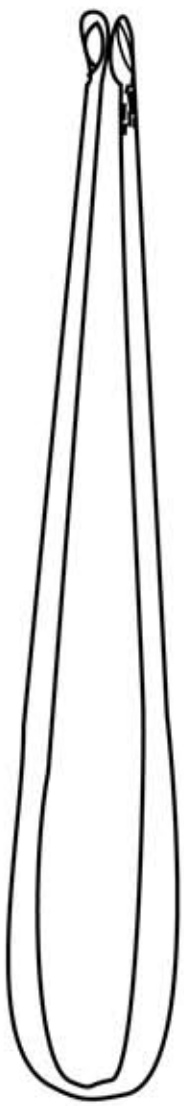


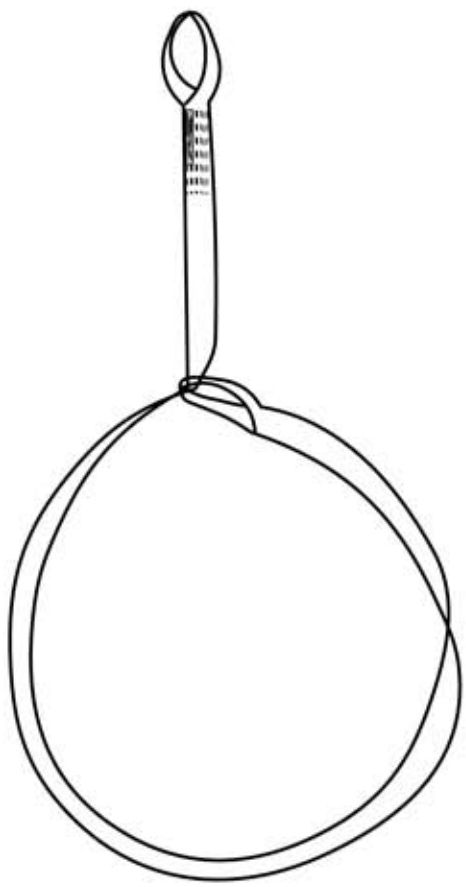
22. **When using a winch line and rigging blocks, remind everyone to stay out of the bight.** (The bight is the interior angle formed by the line as it is routed through a block system.) If a sling, shackle or rigging block fail, the whole shooting match may scream forward and take out members of the crew.

23. **The bow of a shackle is where two or more slings should ride.** The shackle pin is fine for the crane hook or a single sling.

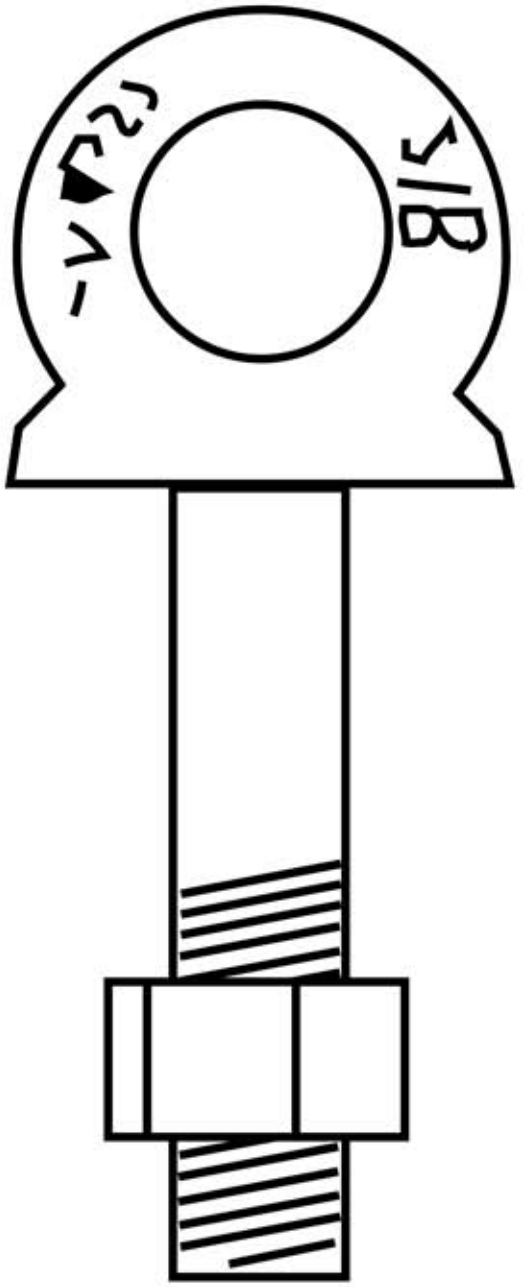
24. **Pulling on half the shackle bow** (sideways) **with a sling reduces the shackle's capacity by half.**

25. If a vertical sling = 100%,
then a choker hitch = 75%
and a vertical basket = 200%.
If a rigger changes the hitch type for a load, there may be a major loss of capacity. Re-rigging a basket hitch to a choker hitch means a loss of 62% of its rated capacity.



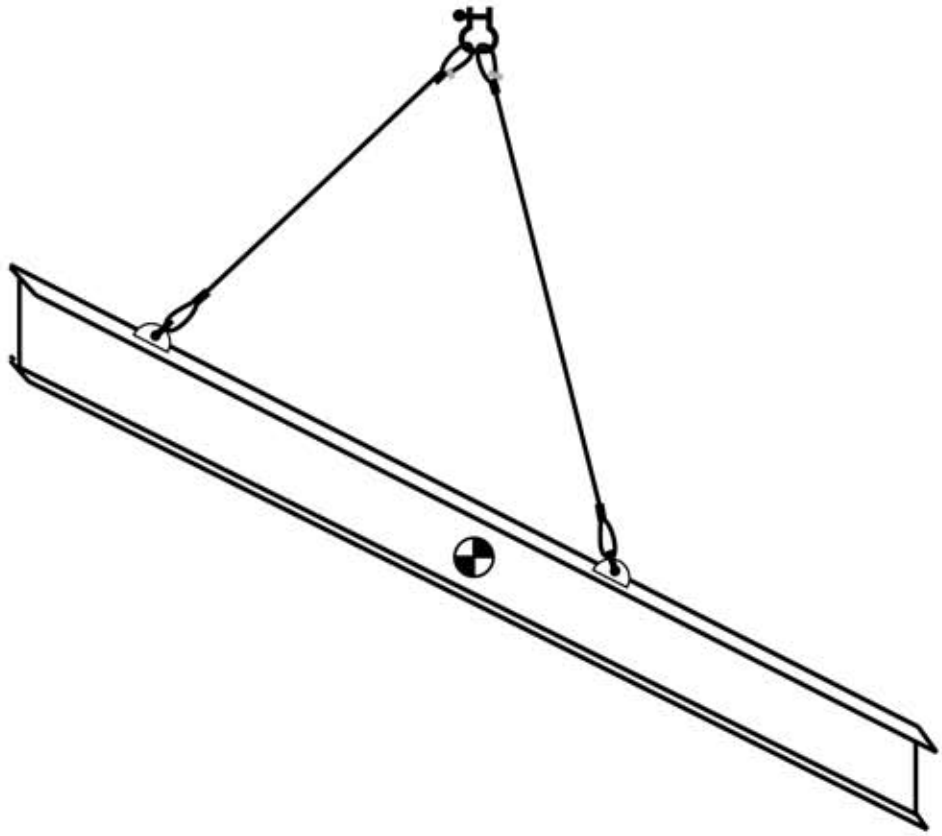


26. **Eye bolts do not bend well, so use them for 90° vertical lifting only.** Using swivel hoist rings that are rated and torqued allows for holding at nearly any angle, while freely rotating.



27. **Using double wrap choker hitches can increase friction and compression on a load.** Beating the choking eye of a choker hitch towards the load, greatly increases the sling's tension.

28. Rig slings with their rating **tags up towards the hook**, and not on the load where they can get damaged or ripped off.



29. **Standing next to a sling that is under tension puts you at great risk.** If the sling or connection fails, or the load slips or flips, the rigger is exposed to injury or death.

30. **The rigger should use a tagline whenever possible.** It puts distance between him and the load and the tagline can help start or stop load rotation as needed.