

Shock Loading

From The NPCA Safety Committee

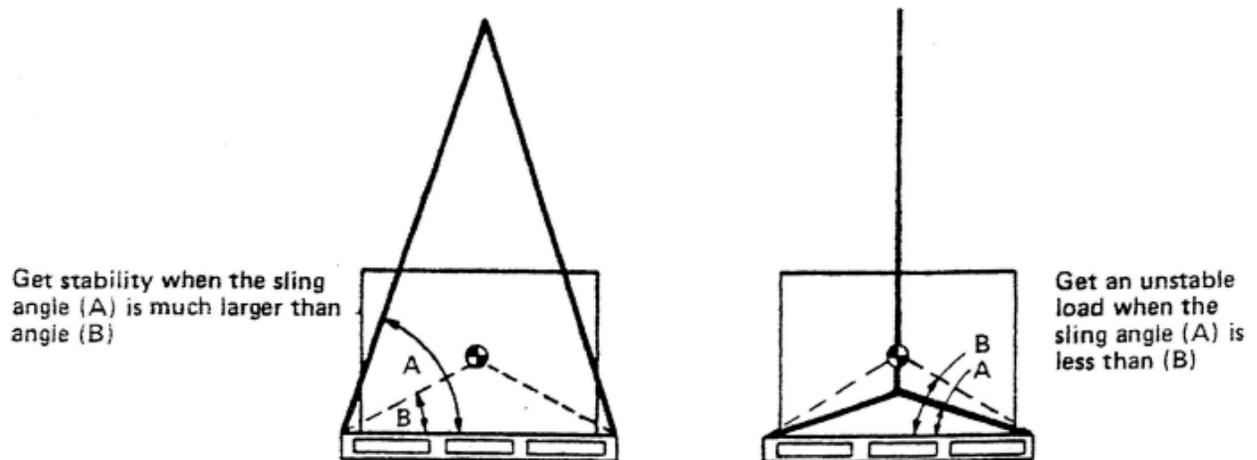


Figure 5-47. Relationship between Load Stability and (A) Location of Loads Center of Gravity and (B) Sling Angle

SHOCK LOADS

Shorten Wire Rope Life

If operating conditions for rope were always ideal, if nothing went wrong to throw unexpected stresses on wire rope, if there weren't any "IFs", there would not be many unexplained things happening to wire rope.

1. AVOID SHOCK LOADS

Wire rope will continue to meet unexpected and unforeseen stresses, but shock loads that obviously overstress the rope should be avoided.

2. WHAT ARE SHOCK LOADS?

Wire ropes are made to a specified catalog breaking strength. All hoisting equipment is designed with a predetermined line pull or load at drum for loads the equipment is made to handle. Any sudden load can develop into a shock load.

For example, see figure above (5-47). Here you see what happens when a given load is applied suddenly to a slack rope. The given load (in this case **6,375 pounds**) remains the same, but the sudden impact to the rope the second that the slack is taken up creates a shock load that may exceed the rope's elastic limit.

Shock Loading

The result may not be an immediate break, but because the rope is overstressed, it may fail on another operating shift, with another operator who does not know about the overstressed condition of the rope. When the slack to be taken is up to **12 inches**, for instance, the stress on the rope at impact is **15,675 pounds** — or more than twice the total of the load at rest.

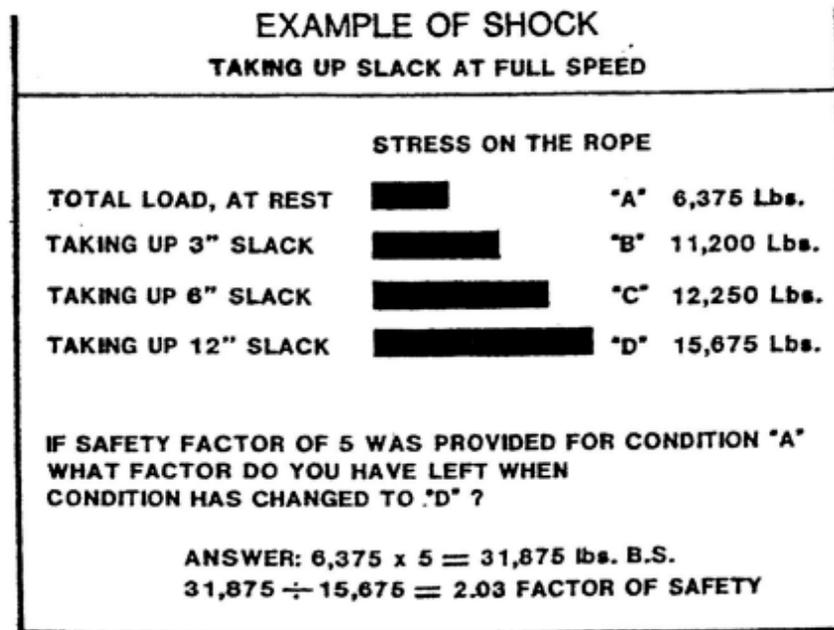


FIGURE 5-48. EXAMPLE OF SHOCK

3. HOW CAN YOU AVOID SHOCK LOADS?

- (a) Make sure that there is no slack and no jerking of the rope at the start of the loading.
- (b) Watch carefully the weight of the loads hoisted to see that they are not beyond the rope's proper working load.
- (c) Do not allow rope to become fouled or jammed either on the drum or by jumping a sheave.
- (d) Start load carefully — accelerating too fast overloads the rope. Watch how the rope "takes it" on the pick-up. Apply power smoothly and steadily.

4. OPERATOR ALL IMPORTANT!!

With the equipment in good condition and the correct rope properly installed, the responsibility lies with the operator to avoid shock loads. A good operator is a rope's best friend. An operator can "make or break" a wire rope. There is no substitute for experience in handling rope and a desire to get the most out of it.