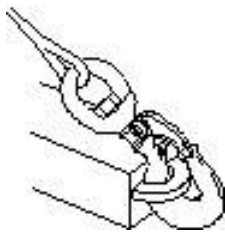


HOOKS AND SHACKLES

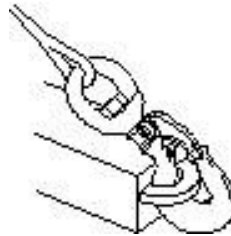


HOOKS-

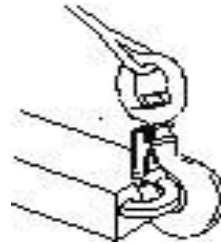
There are various types of hooks used in winching. A few used are: clevis grab hook, eye grab hook, eye sling hook, cradle grab hook, and swivel slip hook. It is important that the hook and any connecting component be of the same grade as the chain it is attached to. Any deformed hook should be removed from service immediately. The load should be applied to the 'bowl' of the hook, never the tip. A safety latch should be in place on each hook, preventing the load from slipping out of the throat. The safety latch should never support the load.



Side Load



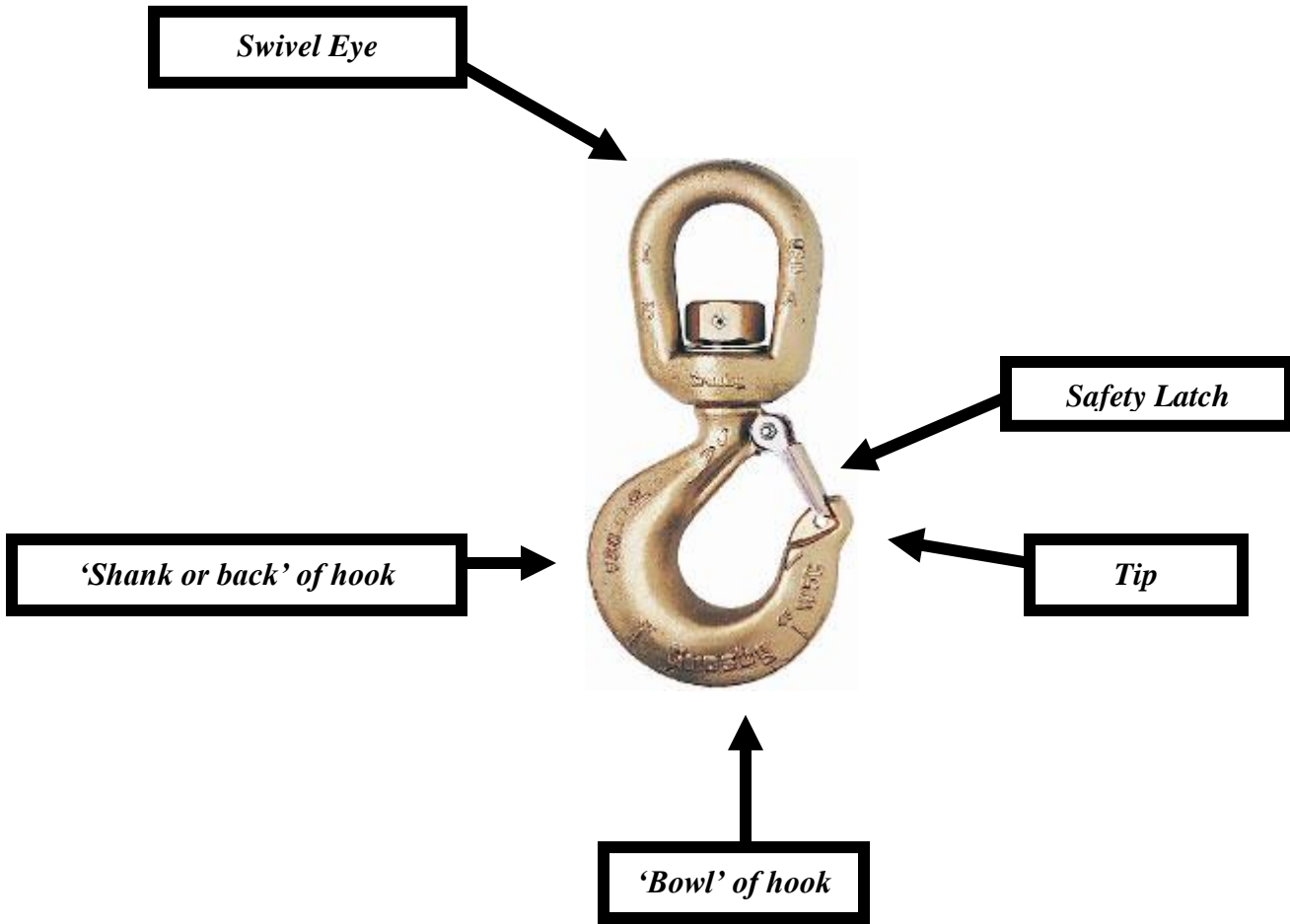
Back Load
WRONG



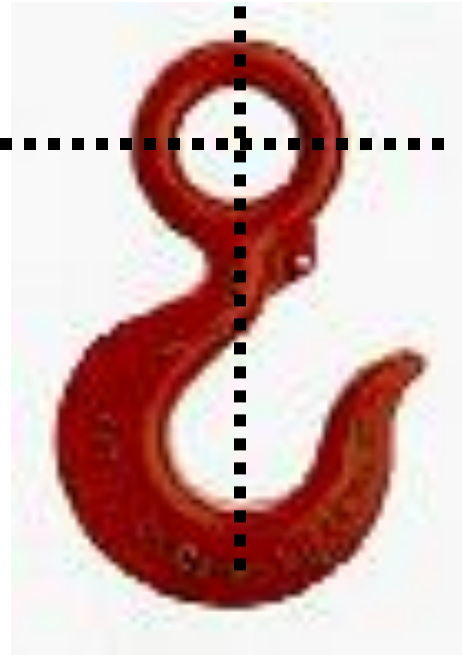
Tip Load

Examples of improper hook loading

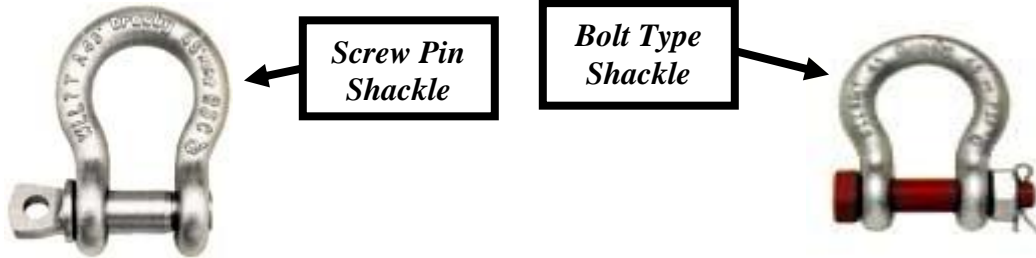
ANATOMY OF A HOOK



How Off-Center (Tip) Loading Reduces WLL of Hooks



Center Loading-100% of WLL
1/4" off center-88% of WLL
1/2" off center-79% of WLL
3/4" off center-71% of WLL
Tip Loading-41% of WLL



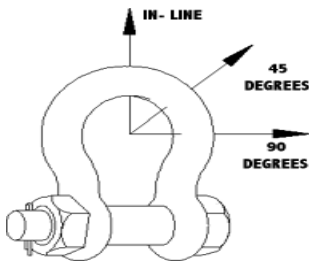
SHACKLES-

Shackles are a “u” shaped device with a pin inserted to prevent the load from slipping out. They are very useful in rigging operations for winching, especially when connecting slings to hooks. The pin inserted into the shackle may be a screw pin type, cotter pin (round pin) or bolt type. For rigging use, only screw pin or bolt type shackles are recommended. Beware when using screw pin shackles as the pin may loosen during use.

HOOK AND SHACKLE USE-

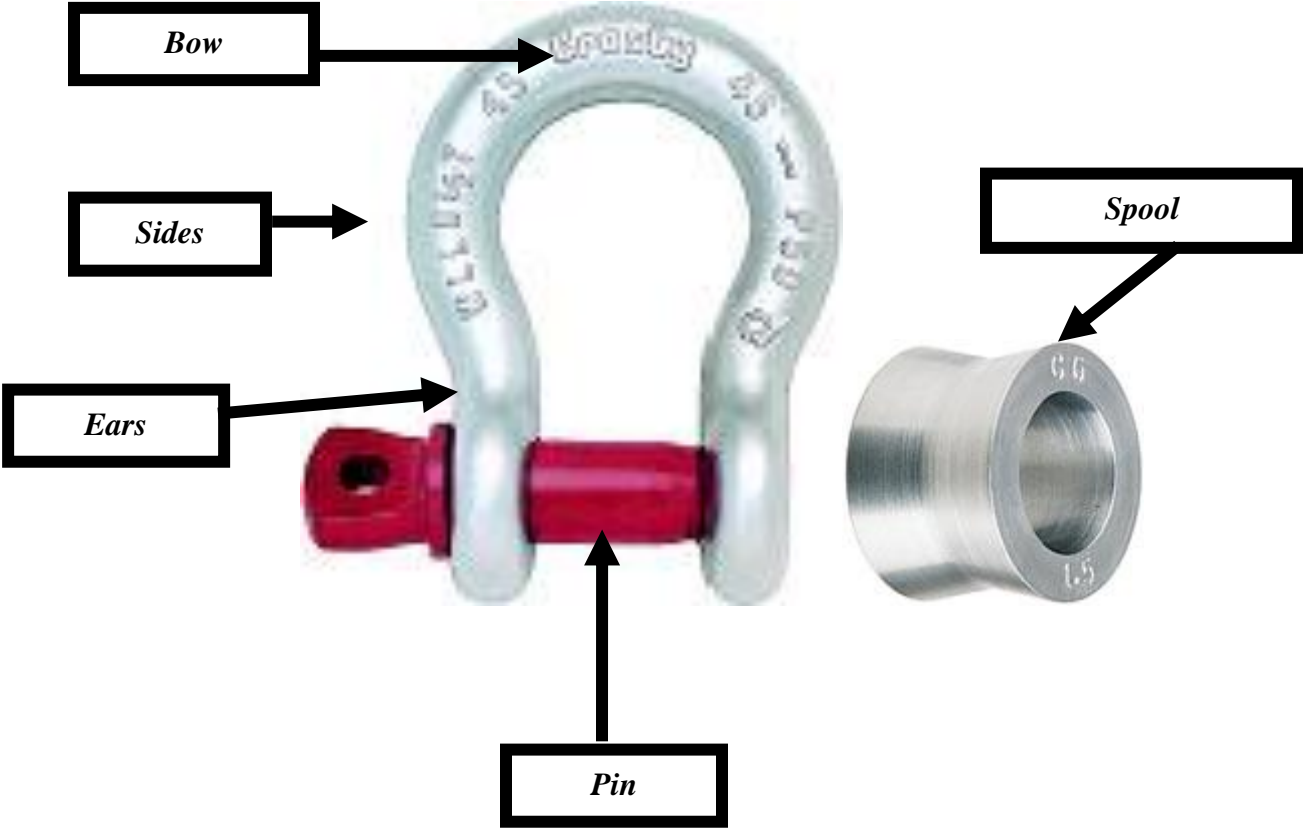
1. **NEVER exceed the WLL of a hook or shackle.**
2. Periodically inspect all hooks and shackles according to applicable standards and document the inspection. Any significant permanent deformation or change in shape indicates the device has been overloaded and it must be removed from service immediately.
3. Never use a hook whose throat opening has been increased or the tip is bent from the original plane of the hook body unless permitted by applicable standards.
4. Don't repair a hook or shackle by welding, heating, or bending.
5. Do not side load a hook. Shackles may be side loaded if permitted by mfg and capacity reduction is calculated, however never side load a round pin shackle. The maximum included angle for multiple leg slings collected in the bow of a shackle is 120 degrees.
6. Load the hook so that it is concentrated in the 'bowl' of the hook. A hook used in rigging should be positioned with the tip upward (or away from responders). Should the hook straighten and fail the tendency is for the rigging to be forced in the direction of the back of the hook (opposite the tip)
7. Don't paint a hook or shackle.
8. Avoid pinching or bunching of a synthetic sling in a shackle or hook.
9. When placing a synthetic sling eye over the pin of a shackle, ensure that the pin diameter is *less* than one-third the length of the sling eye. Do not open the sling eye any greater than the eye length. Synthetic web sling *width* should be no greater than 75% of shackle *width*. Diameter of shackle pin should be greater than wire rope diameter if no thimble is used in the sling eye. A sling eye of either synthetics or wire rope must not be placed over an object (usually a hook or other collector) that is greater than 1/3 of the sling eye length.
10. Never replace any part of a hook or shackle with anything other than a part specified by the manufacturer.

11. Don't use hooks or shackles for lifting personnel, unless recommended by the manufacturer.
12. Shackle screw pins should be tightened fully when installed.



| <i>Angle of Side Load from Vertical In-Line of Shackle</i> | <i>Adjusted WLL</i> |
|--|--------------------------|
| <i>0 degrees</i> | <i>100% of Rated WLL</i> |
| <i>45 degrees</i> | <i>70% of Rated WLL</i> |
| <i>90 degrees</i> | <i>50% of Rated WLL</i> |

ANATOMY OF A SHACKLE





Hook positioning

A hook used in rigging should be positioned with the tip upward (or away from responders). Should the hook straighten and fail the tendency is for the rigging to be forced in the direction of the back of the hook