Operating Practices — Wire Rope Hardware

WIRE ROPE CLIPS

⚠ WARNING

- Failure to read, understand and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using clips.
- Prepare wire rope end termination only as instructed.
- Do not use with plastic coated wire rope.
- Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next check and retighten nuts to recommended torque. (see Table 1)

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble-eye termination for clip sizes 1/8" through 7/8" is 80%.

1.

Refer to Table 1 in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope live end rests in saddle. Tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque.

2.

When two clips are required, apply the second clip as near the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn-nuts on second clip firmly, but do not tighten. Proceed to Step 3.

3.

When three or more clips are required, space additional clips equally between first two - take up rope slack - tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque.

4. IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque. In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse and general adequacy.

TABLE 1

Clip Size (Inches)	Minimum No. of Clip	Amount of Rope to Turn Back in Inches	Torque in Ft. Lbs.
1/8	2	3-1/4	4.5
3/16	2	3-3/4	7.5
1/4	2	4-3/4	15
5/16	2	5-1/4	30
3/8	2	6-1/2	45
7/16	2	7	65
1/2	3	11-1/2	65
9/16	3	12	95
5/8	3	12	95
3/4	4	18	130
7/8	4	19	225

WINCH LINE AND HOIST HOOKS

⚠ WARNING

- Loads may disengage from hook if proper procedures are not followed.
- A falling load may cause serious injury or death.
- Threads may corrode and/or strip and drop the load.
- Hook must always support the load. The load must never be supported by the latch.
- Never apply more force than the hook's assigned Working Load Limit (WLL rating.)
- Never shock load a hook.
- Read and understand these instructions before using hook.
- Always visually inspect hook before using.
- Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10 degrees out of plane from the hook body, or is in any other way distorted or bent. **Note: A latch will not work properly on a hook with a bent or worn tip.**
- Remove from service any hook with a crack, nick, or gouge.
- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load, or tip load a hook. (see figure 2)
- Eye hooks, shank hook and swivel hooks are designed to be used with wire rope or chain.
- Do not swivel a swivel hook while it is supporting a load.
- Always make sure the hook supports the load. (see figure 3) The latch must never support the load. (see figure 4)
- See ASME B30.10 "Hooks" for additional information.
- Do not stand between disabled vehicle and recovery vehicle.

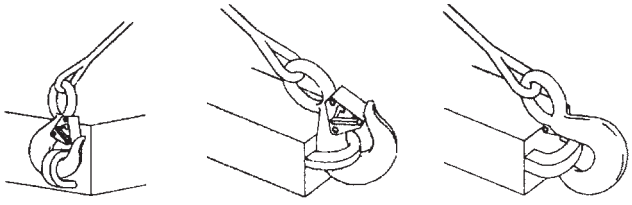


FIGURE 2

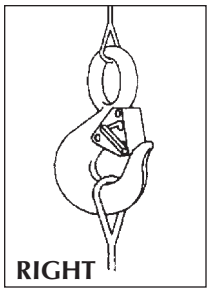


FIGURE 3

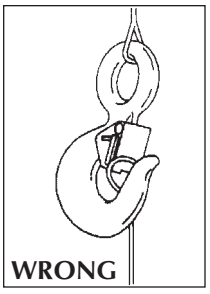


FIGURE 4

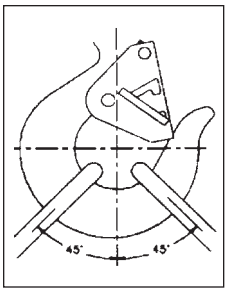
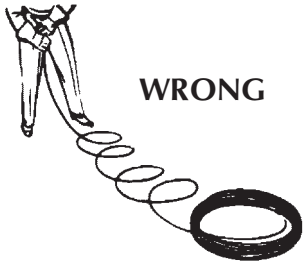


FIGURE 5

PROPER UNWINDING

A wire rope can be damaged permanently even before it has gone into operation. Short lengths of wire rope often come in coils. Uncoil these lengths by rolling the coil slowly like a wheel, leaving behind a trail of *straight* rope. (Uncoiling by laying the coil flat and pulling off the top can give you hard-to-handle kinky rope.)

RIGHT



WRONG

When spooling onto operating drums, best service will be received if the rope can be first laid out straight on the ground prior to reeving and then pulled into the system under tension.

SHEAVES AND DRUMS

When an inspector examines a rope, he may see sections showing excessive wear. By flagging the rope, he can quickly determine where the rope is rubbing or contacting parts of the equipment, and then repair, replace, or modify the condition causing the wear.

Inspection of sheaves is a relatively simple, yet vital task.

Sheaves should be checked for:

1. Correct groove diameter.
2. Roundness or contour to give proper support to the rope.
3. Small holes, cracks, uneven surfaces, or other defects. which might be detrimental to the rope.
4. Extreme deep wear.

A sheave should also be checked to make sure it turns freely, is properly aligned, has no broken or cracked flanges, and has bearings that work properly.

Drums should also be inspected for signs of wear which could damage rope.

Operating with a smooth drum calls for special care. Be sure the rope is always tightly wound and thread laid on the first layer. Any loosening of the line is easily observed as the winding will be bad and the rope will be coming off with a series of "bad spots".

Other places of contact such as rollers, scrub boards, guides and end attachments should also be inspected.

FREQUENT INSPECTION

Wire rope shall be visually inspected by the person handling the wire rope each day it is used. These visual observations should be concerned with discovering gross damage, such as listed below, which may be an immediate hazard:

(a) distortion of rope such as kinking, crushing, unstranding, bird caging, main strand displacement, or core protrusion. Loss of rope diameter in short rope lengths or unevenness of outer strands should provide evidence the rope should be replaced.

(b) general corrosion;

(c) broken or cut strands;

(d) number, distribution, and type of visible broken wires.

PERIODIC INSPECTION

A periodic inspection shall be performed by a designated person on a regular basis with frequency of inspection based on:

(a) frequency of wire rope use;
(b) severity of service conditions;
(c) nature of lifts being made;
(d) experience gained on the service life of wire rope used in similar circumstances.

REMOVAL FROM SERVICE

Wire Rope shall be immediately removed from service if any of the following conditions are present:

1. Kinks, bird caging or popped core in the working section of the wire rope.
2. Discoloration due to excessive heat.
3. Corrosion with pitting of the wires.
4. More than 11 broken wires in 6 diameters of length.
5. More than 3 broken wires in any one strand.
6. More than 2 broken wires at the end connection.
7. U-bolt clip installation other than specified and illustrated on page 25.

OPERATING PRACTICES

The following rules are required operating practices to be followed each time wire rope is used.

⚠ WARNING

- Failure to read, understand and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using wire rope.
- The weight of load shall be within the rated load (working load limit of the wire rope).
- Wire rope shall not be shortened or lengthened by knotting, by wire rope clips, or other methods not approved by the wire rope manufacturer.
- Wire rope that appears to be damaged shall not be used unless inspected and accepted as usable.
- The wire rope shall be hitched in a manner providing control of the load.
- Never use a winch line as a tie down securement.
- Rollback winch lines are used to position the vehicle upon the deck. After this is accomplished and the vehicle has been secured with tie downs, the winch line must be removed from the vehicle prior to traveling.
- Sharp corners in contact with the wire rope shall be padded with material of sufficient strength to minimize damage to the wire rope.
- Portions of the human body should be kept from between the winch and the load.
- Personnel should stand clear of the suspended or winching load.
- Shock loading should be avoided.
- Wire rope should not be pulled from under a load when the load is resting on the wire rope.
- Twisting and kinking the legs shall be avoided.
- The load applied to the hook should be centered in the base (bowl) of the hook to prevent point loading on the hook.
- During lifting, with or without load, personnel shall be alert for possible snagging.
- Do not inspect a wire rope by passing bare hands over the wire rope body. Broken wires, if present, may puncture hands.
- Fiber core wire rope should not be subjected to degreasing or a solvent because of possible damage to the core.
- Fiber core wire rope shall not be exposed to temperatures in excess of 180°F (82 °C).
- Do not stand between disabled vehicle and recovery vehicle.