Power Climber® INNOVATING SINCE 1972

Topic of Interest

Wire Rope Signs of Damage

According to ANSI A10.4

For Personnel hoists wire rope should be removed from service if any of the following conditions are present.

1. 6 broken wires in one rope lay or 1 broken wire in a valley. (Running Ropes)
2. 3 broken wires in one strand. (Running Ropes)
3. 2 Broken wires in one rope lay or 1 broken wire in a valley. (Standing Ropes)
4. 2 Broken wires at an end connection. (Standing Rope)

Wire rope can also be considered bad if any of the following conditions are present: abrasion, corrosion, scrubbing, flattening, peening, kinking, exposure to excessive heat, exposure to electricity and broken wires. If the wire rope being inspected fails any of these inspections, or there is any doubt about its ability to sustain the required loads with the necessary safety factors it should be immediately removed from service.

Inspecting Wire Rope

Wire rope is a consumable item and as such it begins to wear at the moment that it is first placed into service. How fast this wear will occur depends on several things:

- *How often it is used.*
- *How badly it is abused.*
- *Job site conditions (rigging misaligned)*
- *Type of job (sandblasting, etc.)*
- *Condition of the equipment it is being used with.*

Wear on wire rope is ultimately weakening the rope, therefore inspection is extremely important. The equipment operator must monitor the condition of the wire rope daily. Even minor changes in the rope could indicate a problem.

The daily inspection should include a visual inspection for:

- *Rust and corrosion*
- *Kinking*
- *Abrasion*
- *Exposure to heat, electricity, chemicals*
- *Broken wires*

In addition to the operator's inspection of the wire rope, the inlet and exit guides of the machine being used with the wire rope should be inspected for damage that could lead to further wear.

At the first sign of damage to the wire rope or machine that the rope contacts, a fully trained and knowledgeable person should be called to make a further determination that the rope is safe to use.

Power Climber®
365 Upland Drive
Seattle, WA 98188 USA

Phone: 1-800-560-2546
E-mail: CustomerService@SafeWorks.com
Internet: www.PowerClimber.com

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Inspection Records

Written records of wire rope inspection should be kept and should include:

1. Name of the inspector.
2. Date of installation
3. Date of inspection
4. Identifying characteristics
5. Address of installation
6. Hours of service that the rope has been used
7. Type of use
8. Results of both pre and post rental inspection
9. Comments

Wire Rope Preparations

Preparation of the wire rope for use in a Power Climber traction hoist is very important. The manufacturer of the rope prepares the main body of the wire rope. When you prepare to place the rope into service for the first time there are three things that you must decide.

1. Length of wire rope
2. Type of terminations to use at the uppermost portion where it will connect to your suspension equipment
3. Type and process to be used for the tail line section

Buildings and structures vary in height, so you should have on hand varied lengths of wire rope. Use the length of rope that is closest to the height of the structure that you intend to rig.

The types of terminations that you can use are many, check with your wire rope supplier for the safest and most acceptable method for your needs. Be aware that each particular process for wire rope termination has a required procedure that must be followed. Before selecting any one method make sure that this procedure can be strictly followed. If you are unsure of the process that you must follow, contact the vendor or the manufacturer for the procedure.

The use of fistgrips for primary termination of suspended wire ropes is an accepted practice in our industry. Yet few people know how to correctly install these clips. The procedure for fistgrips is plainly printed on the packaging. For a 5/16” fistgrip, this procedure includes the use of a torque wrench to insure 30ft. lb. of torque.

- ***Request a copy of SI-041 Service Instruction for cautions on the use of common terminations.***

Tail line preparation of the wire rope must be brazed in most applications. The finished product of the brazing procedure is known as a bullet or bullet end.

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This is process is generally performed with an Oxy-acetylene torch and a brazing rod. Some may finish the bullet with a grinder, but with experience your skill will improve and this should not be necessary.

The first step in this process is to make sure that the center core of the wire rope is cut back about two inches. This will prevent the core from milking to the end and destroying the bullet.

Did You Know?

- The torque for a 3/8" fistgrip is 45-ft. lb.
- Wire ropes are generally manufactured 5% above their nominal diameter
- Ropes larger than 5% above the specified diameter will cause premature hoist wear
- Ropes smaller than 5% below the specified diameter will cause traction problems
- The alternating use of oversized ropes and undersized ropes on the same hoist will lead to irregular wear patterns inside of the hoist and will cause traction problems
- Fistgrips have a daily inspection and tightening procedure

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