

WIRE ROPE INSTALLATION ON MOBILE CRANES

Wire rope is an integral part of the mechanics that are necessary for mobile crane operation and, like any other mechanical part, it performs best when installed correctly. Two factors are key to proper installation no matter what type of equipment, or which wire rope is being used: making sure the rope is free of twist and assuring that the rope is tightly spooled on the drum.

Twist-free Installation

Normal spooling and handling can induce twist in a rope. If a twist becomes trapped in the rope it can cause spooling problems or a kink resulting in permanent damage and/or operational problems with spooling or block rotation.

One method to assure release of trapped twist is to remove the rope from the shipping reel and pull it straight out on the ground. Mount the reel on a shaft supported by two jacks, a roller payoff or unreeling stand. Remove the rope from the spool by grasping the end and, keeping the rope straight, walk it away. This will allow any trapped twist to work itself out as the rope is pulled onto the drum.

In areas of limited space it can be necessary to install directly from the shipping reel to the drum. This may result in a twist being trapped in the rope on the crane. Mounting the reel on a shaft supported by two jacks on the ground reel while spooling rope onto the crane's drum. Never apply a brake against the spooled rope itself or pass the rope between a pair of blocks used as a caliper brake. This will damage the rope and may make it unusable.

Install the rope on the drum focusing on keeping twist out of the rope and on thread laying the rope on the drum.

Before proceeding with reeving, make a final check for twists that may still be trapped in the rope (this is particularly important with direct-from-shipping reel installation). Pull enough rope off the drum to allow it to hang slack from a horizontal position. If the rope wraps together and does not form a smooth "U" shape, there is a twist trapped in the rope.

To remove any twist found in a single part line, extend the boom to maximum length and raise it to its highest point. Pay out the rope with only the overhaul ball attached and let it hang, just off the ground, fully extended until the twist works itself out.

Twist may also be removed by pulling the rope straight off the drum onto the ground. If this method is used, the end of the rope must be completely straight. Cut off any dogleg present from an end termination. Allow the end of the rope to rotate as twist comes out when the rope is spooled back onto the crane's drum.

Rope Tension on the Drum

All wire ropes work better on grooved drums. The grooves guide the rope for proper spacing of the wraps. Smooth-faced drums always present a problem. Small variation in rope diameter from one rope to another affects the position of the layer to slide on the smooth drum face when the second layer spools over it. It also leads to loss of thread lay at the change of layer point. It is essential to establish correct spooling and proper tension on the lower layers of rope on smooth-faced drums to prevent their displacement as upper layers are spooled over them.

Regardless of the type of drum, to assure tight spooling, a brief, but thorough breaking-in period is required. This removes the constructional stretch. This slightly reduces the rope's diameter and makes it more dense which increases resistance to crushing in multiple layer spooling. This is especially important for the lower layers on a drum that may drum under tension. Again, it is very important lower layers are spooled under tension to reduce "pull-down" or "suck-in" of tensioned upper wraps. If this condition occurs, the lower layers should be re-installed under greater tension.

To break in a rope, reeve the crane so that, with the boom fully raised and the load ready to be picked up, there are three dead wraps on the drum. Initially, lift a light load - approximately 2-3% of the rope's minimum breaking force - several inches off the ground and hold for a few minutes. Slowly lift and lower the load several times and monitor the drum winding and rope travel for any potential problems.

Increase the weight to 20%-50% of maximum working load and perform several repetitions of full cycle lifts. The rope will "seat" itself, thus removing constructional stretch, increasing rope tension on the drum and increasing the rope's resistance to crushing.

These basic procedures for proper installation will help prevent damage to the wire rope and result in better rope spooling and extend the working life of the rope. Attention to these installation guidelines will more than pay for itself in fewer mechanical problems, less frequent rope changes and reduced downtime.

