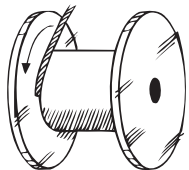


How to identify and correct three common problems in the field.

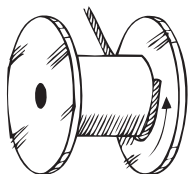
HOW TO DETERMINE THE PROPER DIRECTION OF DRUM WINDING.

Overwind left to right, use right lay rope.



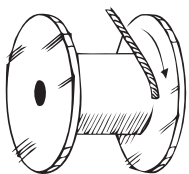
Right lay Overwind

Underwind right to left, use right lay rope.



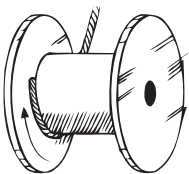
Right lay Underwind

Overwind right to left, use left lay rope.



Left lay Overwind

Underwind left to right, use left lay rope.



Left lay Underwind

DRUM SPOOLING: A TIGHT SITUATION FOR CRANE OPERATORS.

When you're installing a new rope onto a crane, there's a primary objective: spool the rope onto the equipment tightly without trapping any twist in the rope on the drum. (See installation guidelines for details.)

For multiple-layer spooling, it's essential to get the first layers of rope spooled with sufficient tension. Particularly with smooth-faced drums, the first layers must be tight with each wrap snug against the preceding wrap. Since the first layer provides the "grooving" for upper layers, wraps must be placed tightly together. If not, wraps in upper layers will pull down between wraps already on the drum, which can cause crushing damage and reduced rope strength and service life.

When you encounter spooling problems, check the following list to identify the possible cause. If any of these are incorrect, the result can include open (or loose) spooling, random spooling or stacking of rope against drum flanges.

DRUM ALIGNMENT.

Before spooling, make sure the drum is level and at right angles to the boom. Many drums are mounted on the frame so that adjustment can be made in alignment.

DRUM WINDING.

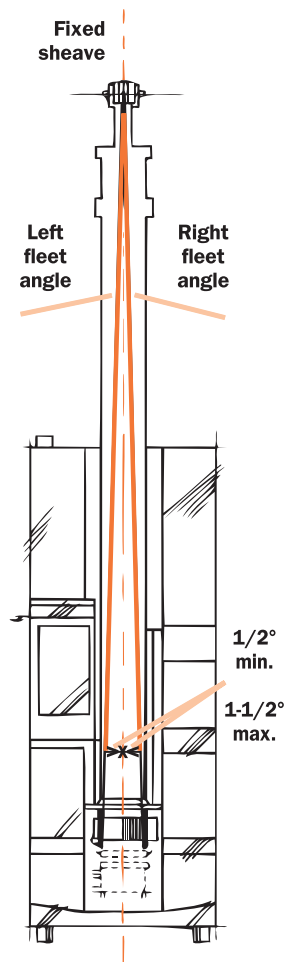
Wire rope should wind onto the smooth-faced drum as shown. Make sure you wrap the rope left or right and over or under as recommended.

USE OF A SWIVEL.

Except for Category 1 rotation-resistant ropes and XLT⁴, a swivel end termination will let the rope lay lengthen when loaded. As the rope spools onto a drum, the unlaidd rope travels over the point sheave and accumulates between the drum and point sheave. This leads to block rotation, erratic spooling, unbalancing and decreased rope service. Category 1 rotation resistant ropes and XLT⁴ may be used with a swivel without these concerns.

FLEET ANGLE.

One of the most important factors in proper winding of rope on drums. For smooth-faced drums, this angle should be between 1/2° and 1-1/2". For grooved drums, it should be between 1/2" and 2". Fleet angles larger than these can cause spooling problems and the rope to rub against the flanges of the sheave – plus may lead to rope crushing and abrasion on the drum. Fleet angles smaller than these may cause the rope to pile up at the flanges.



POINT SHEAVE.

When more than one sheave is in use at the boomtip, make sure the lead line presents the optimum fleet angle to the drum.

GROOVED DRUMS.

Groove spacing must be adequate to prevent the rope from crowding out adjacent wraps as the rope spools across the drum. In addition, groove spacing must not be excessive, which can allow wraps of the next layer to pull down between wraps of the previous layer, causing abrasion and crushing.

DRUM FLANGES.

Flanges should be perpendicular to the drum face and not worn, deformed or spread outward. These conditions can cause spooling problems at the change-of-layer point as additional layers are spooled.

IMPROPER INSTALLATION.

When a rope has been installed in such a way that twist has been introduced into the rope, spooling problems can result. (See installation guidelines for details.)

RISER STRIPS AND KICK PLATES.

If spooling problems persist after you've considered the above conditions, try using riser strips and kick plates. For details on these accessories, check with your crane manufacturer or call Union for technical service.

Rope unbalance: a problem of unequal proportions.

Also called “wavy rope,” unbalance is an indication or result of abnormal movement of strands in an operating rope. It usually involves two or more outer strands of rope rising out of position, standing higher than remaining strands with no apparent cause or evidence of external physical force.

Anytime you see an unbalanced rope, you should increase your rope inspection frequency. Find out the cause and correct the problem before you install your next rope.

The causes.

Unbalance often shows up in the middle of a rope system where you don't expect it. It's usually caused by “milking” of the rope – in other words, a lay change in the rope. The causes are many: swivels, small diameter sheaves, improper-sized or worn sheave grooves or sheave misalignment, to name a few.

Standard 6-strand regular lay ropes are generally more resistant to unbalance than other ropes.

How to correct unbalance problems.

There are several practices you can implement to minimize rope unbalance problems. These include:

ELIMINATE SWIVELS AT DEAD ENDS. A swivel

end termination will lengthen the lay in the rope when loaded, which can cause an unbalance in the rope.

REMOVE WELDED ENDS OF ROPES. Where a rope has been torch cut, make sure the strands are free to adjust before the rope is clamped or seated in an end termination. However, this does not apply to Flex-X 35. Leave the welded ends on Flex-X 35

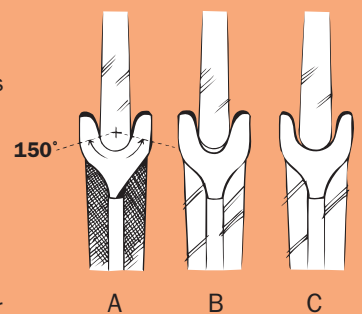
LOOK FOR ANY SHEAVE MISALIGNMENT. Misalignment of sheaves in multi-part reevings and improperly aligned idler sheaves can also contribute to unbalance problems.

ASSURE PROPER GROOVE CONTOURS. Use a groove gauge to inspect sheave and drum grooves for proper contour. If sheave grooves are too small or are worn deeper and narrower by an old rope, they're too tight for new ropes. If grooves are too wide, the ropes tend to flatten out and become oval-shaped. Any of these conditions can restrict strand movement and cause twist to build up in the rope.

CONSIDER A 6-STRAND ROPE CONSTRUCTION. Standard 6-strand regular lay ropes are less susceptible to unbalance than other ropes.

REMOVE ANY TWIST IN ROPE. See rope installation guidelines for details.

CROSS-SECTION VIEWS OF THREE SHEAVE GROOVE CONDITIONS.



Using a gauge, A is correct, B is too tight and C is too loose.