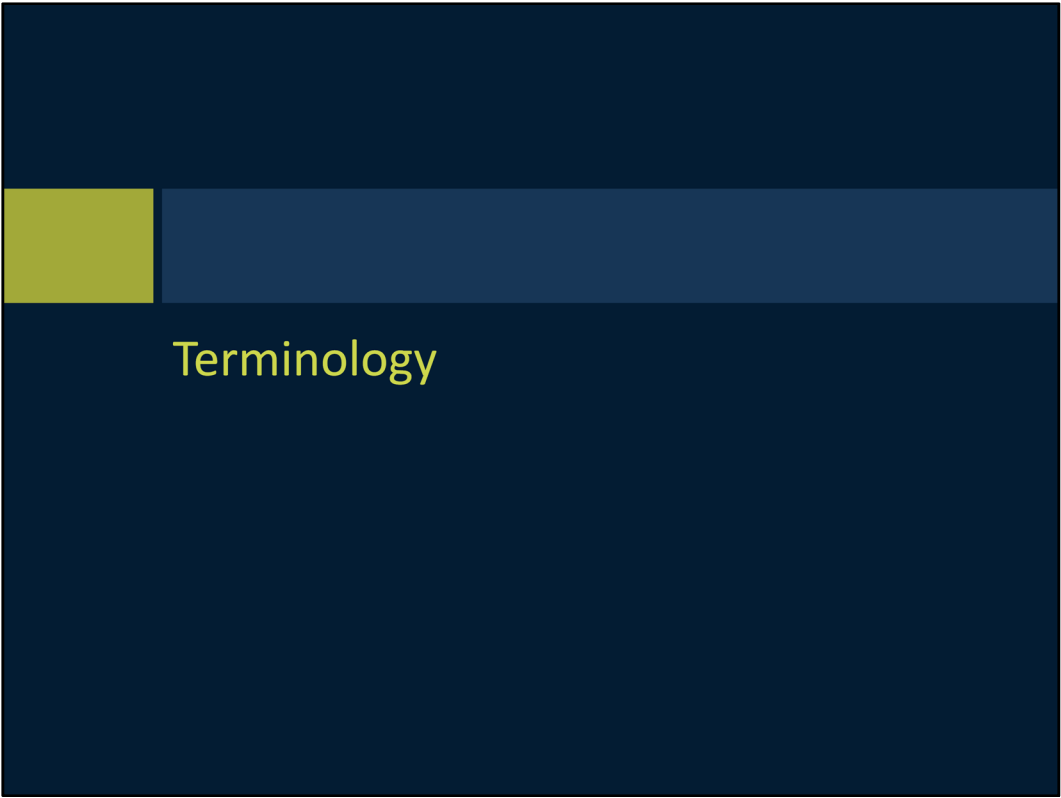


# SPOOLING TECHNIQUES, OBSERVATIONS, AND DISCUSSION

Joshua Eaton

UNOLS East Coast Winch Pool

This is to allow for a discussion experiences and pass on best practices.



This section is to familiarize everyone to the same set of terms.

# Terminology

3

Grooved Drum



Smooth Drum



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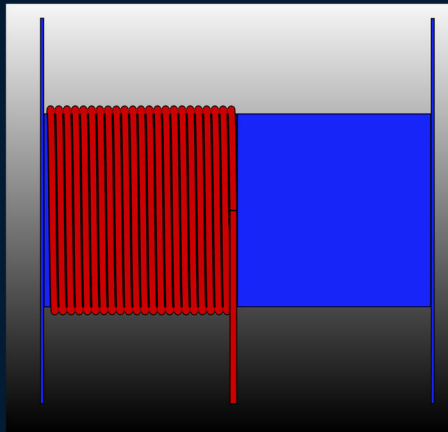
Grooved drums or shells are typically called LeBus Shells or LeBus drums. The patent has expired so generic shells and drums are available. Most shells, especially large units are from LeBus International.

Smooth drums can accept shells or be spooled directly. The shell and drum pictured are a matched set.

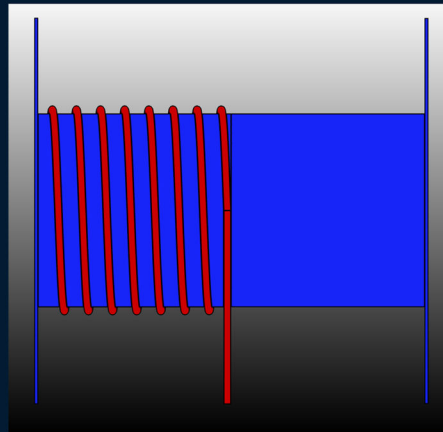
# Terminology

4

Thread Lay



Open Lay



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Thread lay keeps the wire or cable relatively tightly packed. The pitch of the wire is a single wire diameter.

Open lay is also called scramble wind. The pitch can be anything significantly larger than a single wire diameter. This is a function of the level wind.

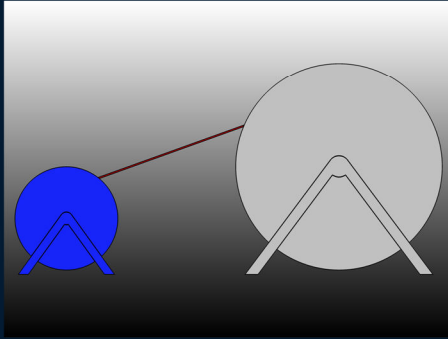


Methods involved in spooling

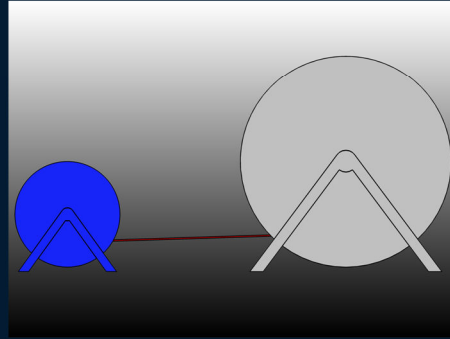
# Methodology – Reel to Reel

6

Over to over



Under to under



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There should be no reverse bending. This can introduce unwanted twists and stress into the tension member.

# Methodology – Tensioning

7

Trailer Mounted



Skid Mounted



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Tensioning can be accomplished by many different types of equipment, large, small, old, and new.

# Methodology – Tensioning

8

Old Equipment



Tension Cart



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Tension carts are not suitable for tensioning for spooling. They can not develop enough tension for a proper tension profile.



# Methodology – Tensioning

9



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A storage reel can not take the pressure induced during spooling if attempting to directly tension from the spool. Wooden or steel storage reels are only storage purposes.

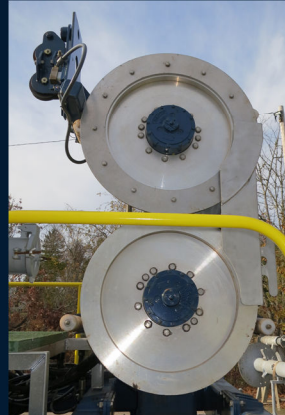
# Methodology – Tensioning

10

Disc Brake Bull Wheels



Driven Traction Heads



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Bulls wheels or traction heads are the best way to get the proper tension. A spooling cart can be used in conjunction with a traction multiplier such as those pictured. By passing over a set of bull wheels or traction heads the tension is evenly increased. It is critical that the sheaves be at least proper D:d ratio or larger to not damage the tension member.

# Methodology – Tension Profile

11

## Proper Profile

- Check Manufacturer
- 45% to 60% of MAOT is typical
- 80% of MAOT recommended for >2000 meters
- Ramp up to highest tension
- Ramp down Halfway

## Acceptable

- As much as reasonable
- 1000 lbf for .322
- True tension profile will occur on first cast

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If a proper tension profile can't be created a true tension profile should be created on the first cast. Line should be paid out slow and recovered slow.

# Methodology – Grooved Drum

12

- Thread lay only
- Proper tension profile
  - ▣ High Tension Spooler
  - ▣ First deployment
- Proper levelwind placement
- Good time to apply lubricant
- Highest stress at cross over points
- Two cross overs per drum revolution

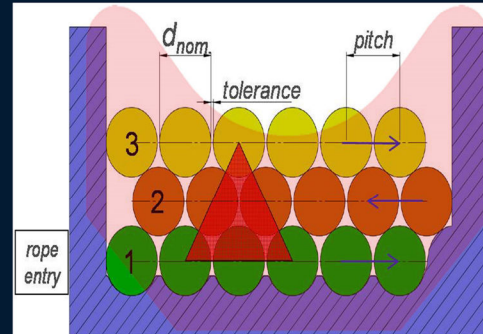
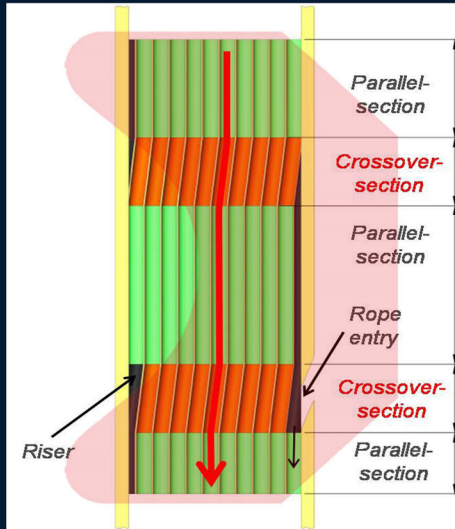
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A grooved drum provides the cable support at the base layer and guides the cable into a certain path for spooling

# Methodology – Grooved Drum

13



Images from LeBus International

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A grooved drum is made up two types of sections cross overs and parallels. The parallels dictate that a drum needs to be an integer or an integer and a half of cable diameters wide. There are typically two cross over sections to minimize the stresses.

# Methodology – Smooth Drum

14

- Thread lay or open lay
- Constant helix angle
- Two dollar kicker
- Proper tension profile
  - ▣ High Tension Spooler
  - ▣ First deployment
- Proper levelwind placement
- Good time to apply lubricant

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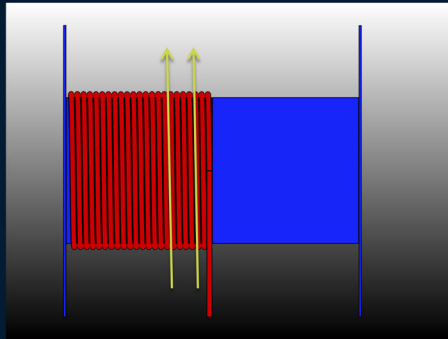
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A smooth drum shouldn't be in the same way as a grooved drum is. A constant helix angle is preferred.

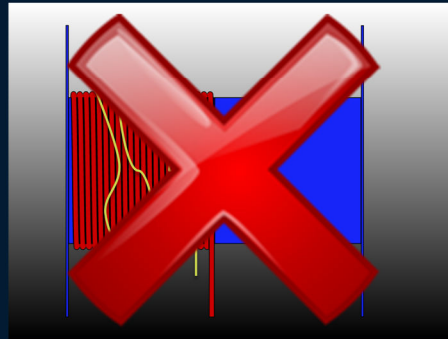
# Methodology – Smooth Drum

15

Nice Even Lays



No zig zags or waves



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The wraps on the drum should be parallel to each other not the flanges. The gaps at the flanges should be filled with a filler (rope or other suitable material). The wraps should not be hammered in such a way that the wraps have warps or waves. This will lead to poor spooling on the upper layers.

# Methodology – 3x19 Wire Rope

16

- Triangular!
- Tension is a must
- Air gap between wraps needs to be larger than for cable
- Leave it alone



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“The black art of 3x19” by Michael Markey lays out a good description of what happens with 3x19.

The biggest thing to remember is the gap between each wrap should be slightly larger than other cables. This means that the level winch should be moving a little faster than a diameter per revolution. A grooved shell should force this larger gap. It doesn't always look perfect. If you micromanage the levelwind while spooling you will always need to micromanage it.





## Observations

# Observations

18

- Providing the best tension profile possible is better than no tension profile
- Before spooling is the best time to check for wear or “invisible” issues
- Verify correct drum and levelwind placement

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Check for wear on all components. Lube bolts and screws that are not normally accessible (EX Lebus shell bolts).



## Discussion