

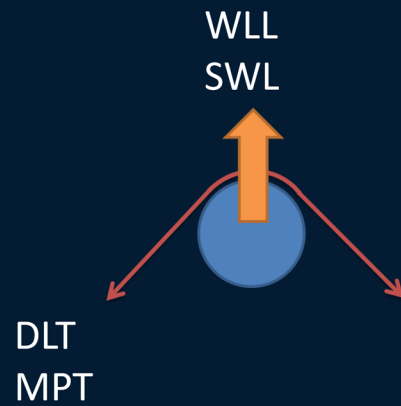
MCD DEVELOPMENT – MORE PAPERWORK ON YOUR DESK

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UNOLS East Coast Winch Pool

Simple Sheave

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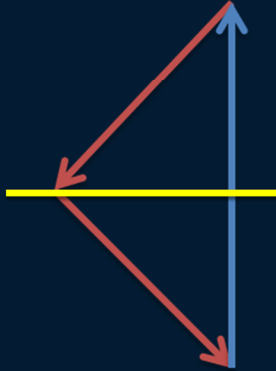
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Typically SWL is the load at the shackle. This should be verified before proceeding. MPT translates the SWL at the shackle into a tension. It often times includes a specific wrap angle.

Sheave Calculation

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Vector/Geometric Calculation



Mathematical Calculation

- $A = (180 - \text{wrap angle}) / 2$
- $\text{MPT} = \text{SWL} / [2 * \cos(A)]$
- For DLT multiply SWL by the FS

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The SWL and MPT (two because the wire enters and exits) vectors have a sum of zero.

The formulas provided here are for a static idealized case. Typically the wire angle varies during a cast. You will want to use the worse case. MPT is the working tension. Multiply the SWL by factor of safety to calculate the DLT for the Sheave. DLT should be greater than the breaking strength of the tension member.

These equations can be solved for the angle to find the maximum angle acceptable.

Sheave Example Calculation

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Application Variables

- SWL = 20,000 lbf
- FS = 5:1
- Wrap Angle= 90

Calculations

- $A = (180 - 90) / 2 = 45$
- $MPT = 20,000 / [2 * \cos(45)]$
- MPT = 14,142 lbf
- DLT = 70,710 lbf

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This example clearly exceeds the needs of .322. It is suitable for .681 cable

MCD Of Block

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- Previous diagram
- What tension member(s)?
- What is the groove?
- What Appendix A safety factor Applies?
- What deployment types
- What is the FS of the sheave
- MPT, DLT, and reactions at both

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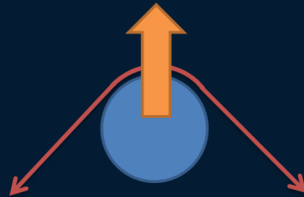
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Include all pertinent information about the sheave.

Completed Calculation

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Reaction at MPT
SWL = 20,000

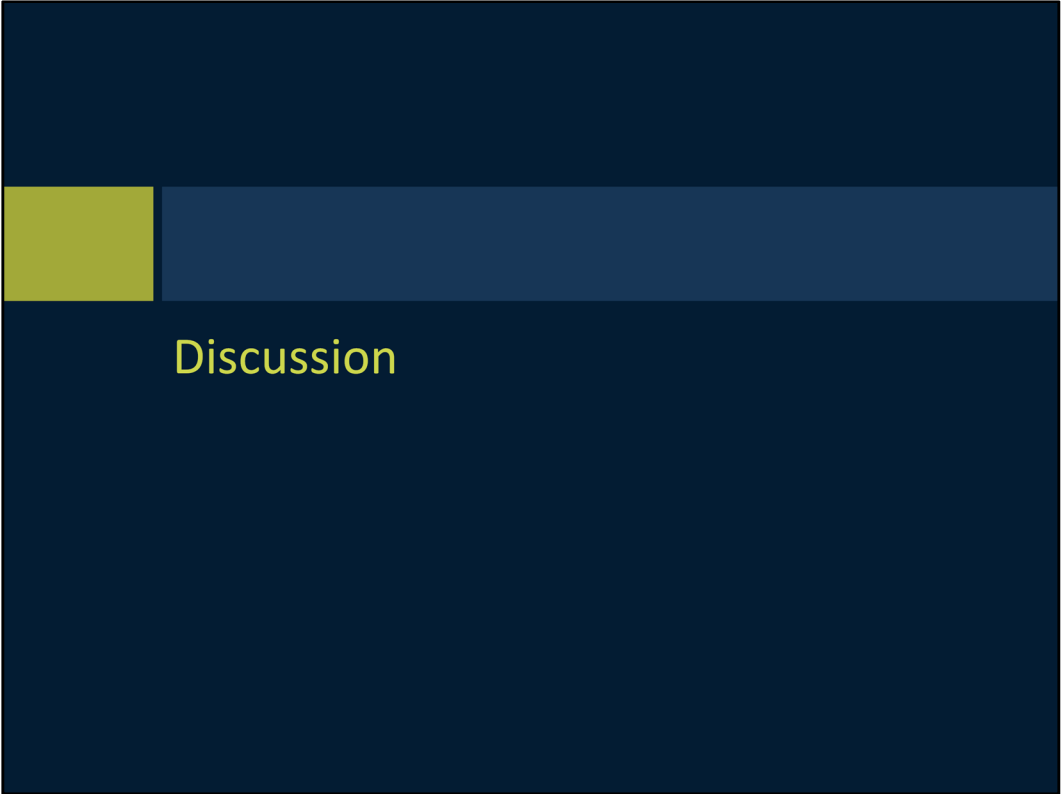


MPT = 14,140

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Include geometry with forces and reactions in MCD



Discussion