

## **Winch and Hoist Application Guidelines**

### **Determining Required Horsepower**

Horsepower is a measurement of the rate at which work is performed.

One theoretical horsepower is equivalent to 33,000 lbs being lifted one foot in one minute.

$$\frac{33,000 \text{ ft-lbs}}{1 \text{ minute}} = 1 \text{ Theoretical Horsepower HP(T)}$$

When applied to winches and hoists, the equation to determine the horsepower required for a given line speed and line pull is:

$$\frac{\text{Line Pull (lbs)} \times \text{Line Speed (fpm)}}{33,000} = \text{HP(T)}$$

For example, you would need 2.0 HP(T) to lift a 2,000 lbs. load a distance of 33 feet in one minute.

$$\frac{2000 \text{ lbs.} \times 33 \text{ fpm}}{33,000} = 2.0 \text{ HP(T)}$$

This equation does not account any of the inefficiencies inherent in motors, gear reductions, bearings or rigging.

### **Increasing Line Pull or Line Speed Without Changing Horsepower**

To increase line pull without increasing horsepower, line speed must be decreased.

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