Line Speed =
$[19 \times(11.75+.75)] \div 1.50=158.3$ FPM ALLOWABLE
(BV) (Tread Dia. + Rope Size) $\div$ (Shaft Dia.)
If the application required a line speed equal to 200 FPM, then another calculation would be necessary. Trying another 14 in. sheave (stock \# 4104828) under the same loading conditions, the results are as follows:

$$
\begin{aligned}
& B P=(4,600 \text { lbs. } \times 1.53) \div(2.75 \times 2.31)=1,108 \mathrm{PSI} \\
& B V=55,000 \div 1,108=50 \mathrm{FPM}
\end{aligned}
$$

Line Speed $=$
$[50 \times(11.75+.75)] \div 2.75=\mathbf{2 2 7 . 3}$ FPM ALLOWABLE

## COMMON (PLAIN) BORE -

Very slow line speed, very infrequent use, low load.

## ROLLER BEARING -

Faster line speeds, more frequent use, greater load.
Refer to manufacturer's rating. Reference appropriate bearing manufacturer's catalog for proper bearing selection procedure.

## Loads on Blocks

The Working Load Limit (WLL) for Crosby Group blocks indicates the maximum load that should be exerted on the block and its connecting fitting.
This total load value may be different from the weight being lifted or pulled by a hoisting or hauling system. It is necessary to determine the total load being imposed on each block in the system to properly determine the rated capacity block to be used.
A single sheave block used to change load line direction can be subjected to total loads greatly different from the weight being lifted or pulled. The total load value varies with the angle between the incoming and departing lines to the block.
The following chart indicates the factor to be multiplied by the line pull to obtain the total load on the block.


| Angle Factor Multipliers |  |  |  |
| :---: | :---: | :---: | :---: |
| Angle | Factor | Angle | Factor |
| $0^{\circ}$ | 2.00 | $100^{\circ}$ | 1.29 |
| $10^{\circ}$ | 1.99 | $110^{\circ}$ | 1.15 |
| $20^{\circ}$ | 1.97 | $120^{\circ}$ | 1.00 |
| $30^{\circ}$ | 1.93 | $130^{\circ}$ | .84 |
| $40^{\circ}$ | 1.87 | $135^{\circ}$ | .76 |
| $45^{\circ}$ | 1.84 | $140^{\circ}$ | .68 |
| $50^{\circ}$ | 1.81 | $150^{\circ}$ | .52 |
| $60^{\circ}$ | 1.73 | $160^{\circ}$ | .35 |
| $70^{\circ}$ | 1.64 | $170^{\circ}$ | .17 |
| $80^{\circ}$ | 1.53 | $180^{\circ}$ | .00 |
| $90^{\circ}$ | 1.41 | - | - |

## Example A

(Calculations for determining total load value on single line system.)
A gin pole truck lifting 1,000 lbs.


There is no mechanical advantage to a single part load line system, so winch line pull is equal to 1,000 lbs.or the weight being lifted.
To determine total load on snatch block A:
$A=1,000 \mathrm{lbs} . \times 1.81=1,810 \mathrm{lbs}$.
(line pull) (factor $50^{\circ}$ angle)
To determine total load on toggle block $B$ :
$B=1,000$ lbs. $\times .76=760$ lbs.
(line pull) (factor $135^{\circ}$ angle)

