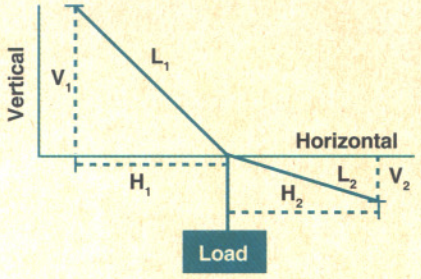
horizontal ($H_2$). Therefore:

Tension in bridle leg #1:

$$T_1 = \frac{(1{,}000)(36.1)(21)}{[(30)(21)]-[(10)(20)]} \approx 1{,}763 \text{ pounds}$$

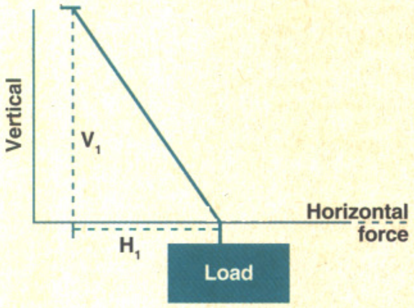
Tension in bridle leg #2:

$$T_2 = \frac{(1{,}000)(23.3)(20)}{[(30)(21)]-[(10)(20)]} \approx 1{,}083.7 \text{ pounds}$$




## Horizontal force

Horizontal force= $(H_1/V_1)L_{load}$




**Example**

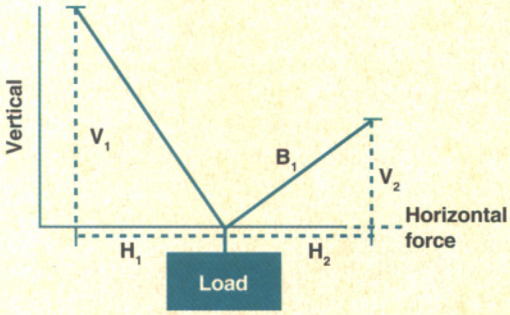
Find the horizontal force necessary to move a 1,000 pound load ($L_{load}$=1,000 pounds) off-vertical by 10 foot. Leg #1 originates at 50 foot vertical ($V_1$) and terminates at 10 foot horizontal ($H_1$).

Horizontal force = (10/50)1,000=200 pounds

## Breastline force

Breastline force=$(B_1/H_1)Force_{horizontal}$

(See previous formula for $Force_{horizontal}$.)




**Example**

Find the breastline force necessary to move a 1,000 pound load ($L_{1(load)}$=1,000 pounds) off-vertical by 10 foot. Leg #1 originates at 50 foot vertical ($V_1$) and terminates at 10 foot horizontal ($H_1$). Breastline #1 originates at 30 foot vertical ($V_2$) and terminates at 20 foot horizontal ($H_2$).

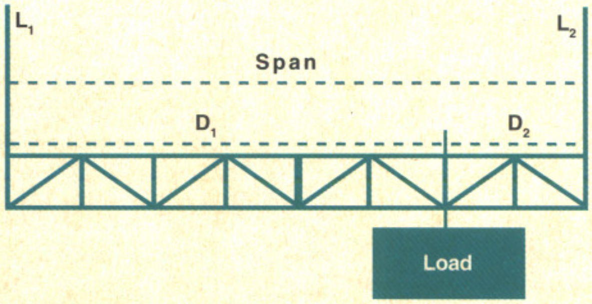
Breastline force=(~36.1/20)200≈362 pounds

This breastline force is perpendicular to the load, making it a horizontal force.

## Simple load distribution

$Force_{Leg1}=(D_2/Span)L_{load}$

$Force_{Leg2}=(D_1/Span)L_{load}$




**Example**

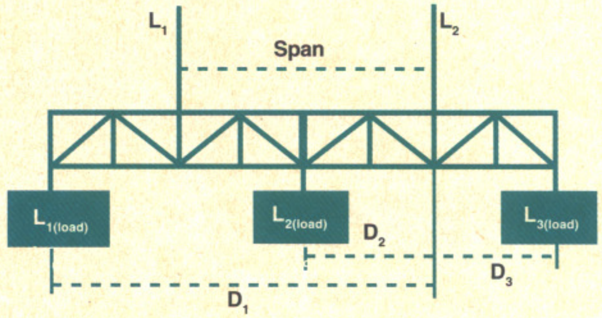
A two-legged vertical deadhang of a truss has a 1,000 pound load ($L_{load}$=1,000 pounds). The load is located 15 feet ($D_1$) from the left suspension leg and 5 feet ($D_2$) from the right suspension leg. The total span between the suspension legs is 20 feet (Span). Therefore:

$Force_{Leg1}$=(5/20)1,000=250 pounds

$Force_{Leg2}$=(15/20)1,000=750 pounds

## Complex load distribution

$$Force_{leg1} = \frac{[(L_{1_{load}})(D_1)]+[(L_{2_{load}})(D_2)]-[(L_{3_{load}})(D_3)]}{Span}$$

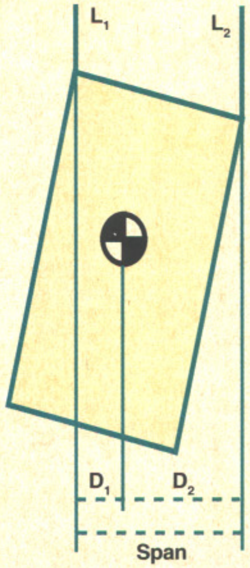



**Example**

A two-legged vertical deadhang of a truss has three 1,000 pound loads ($L_{x(Load)}$=1,000 pounds). Load #1 is on the left edge; load 2 is in the center; load 3 is 20 feet from the left edge. The total span of the truss is 20 feet; the total span between the suspension legs is 10 feet (Span). Therefore, $D_1$=15 feet, $D_2$=5 feet and $D_3$=5 feet.

$$Force_{leg1} = \frac{[(1{,}000)(15)]+[(1{,}000)(5)]-[(1{,}000)(5)]}{10}$$

$Force_{leg1}$=1,500 pounds




## Load stability

$Force_{Leg1}=(D_2/Span)L_{load}$

$Force_{Leg2}=(D_1/Span)L_{load}$

**Example**

For a two-legged vertical deadhang of a loudspeaker weighing 250 pounds ($L_{load}$=250 pounds), leg #1 is 6 inches ($D_1$) behind the center of gravity, and leg #2 is 14 inches ($D_2$) in front of the center of gravity. Therefore:

$Force_{Leg1}$=(14/20)250

$Force_{Leg1}$=175 pounds

$Force_{Leg2}$=(6/20)250

$Force_{Leg2}$=75 pounds S&VC