Safety for Lifting Devices 135

To ensure compliance with OSHA standards, lifting devices must have a rated load test to check lifting capacity. The test loads must exceed 125% of the rated load.

To work a percent problem, it is best to identify the three parts associated with every percent problem so the known values can be substituted into the general percent formula.

Amount = Rate x Base

A = R x B

The base (B) is the whole or original amount the problem is based on. For test load problems, the base is the rated load of the lifting device.

The rate (R) is part of the base in percent form. The percent form must be changed to a decimal before being substituted into the formula.

The amount (A) is the numerical part of the base that the rate also represents. For test load problems, the amount is the test load.

A portable hoist has a rated lifting capacity of 500 pounds. When a load test is performed, the test load must exceed 125% of the rated lifting capacity. What must be achieved for the hoist to meet OSHA standards?

SOLUTION:

Base (B) = 500 lbs

Rate (R) = 125%

First, change the 125% to a decimal value. Since percent (%) means "parts per hundred," the rate of 125% must be divided by 100 which moves the decimal point two places to the left.

$$125\% = \frac{125}{100} = 1.25$$

Now substitute the known values into the percent formula

Amount = Rate x Base

$$A = R \times B$$

$$A = 1.25 \times 500 \text{ lbs}$$

$$A = 625 \text{ lbs}$$

A test load must exceed 625 pounds.

A hoist with a rated load capacity of one ton (2000 pounds) is tested. The test load is 2400 pounds. Did the hoist exceed the 125% OSHA standard?

SOLUTION:

Base (B) = 2000 lbs

Amount (A) = 2400 lbs

Amount = Rate x Base

A = R x B

2400 lbs = R x 2000 lbs

To solve for the unknown rate (R), each side of the equation must be divided by 2000 lbs.

$$R = \frac{2400 \text{ lbs}}{2000 \text{ lbs}} = 1.2$$

To change the decimal form of the rate back to a percent, multiply by 100.

R = 1.2 x 100 = 120%

120% does not exceed the 125% OSHA standard.

EXERCISES:

1. A hoist has a 2 ton rated lifting capacity. If a load test is performed, what load must be exceeded for the hoist to meet the 125% OSHA standard?

2. A portable hoist has a rated load capacity of 300 pounds and achieves a test load of 385 pounds. Did it meet the OSHA standard?

3. A load test was performed on a hoist. A test load of 1875 pounds is 125% of the rated load capacity. How much is the rated load of the hoist?