

PowerPoint Slides



ARTICULATED BOOM TRUCK OPERATOR SAFETY TRAINING



HARD HAT

TRAINING

ARTICULATED BOOM TRUCK

SAMPLE

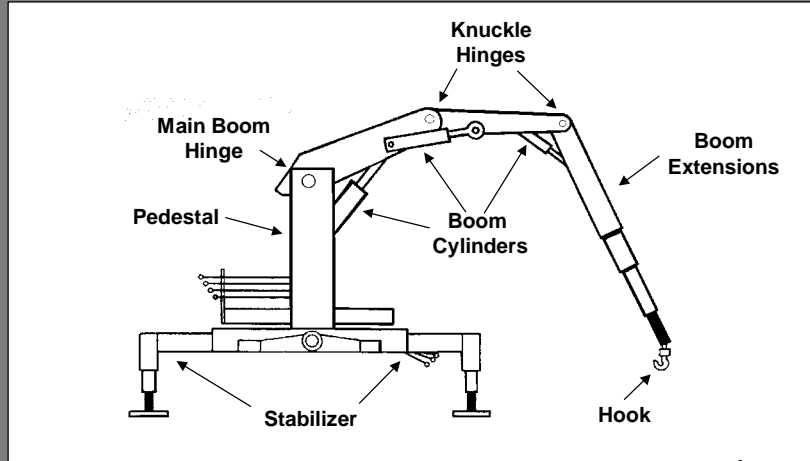


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CRANE COMPONENTS



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SAMPLE

STABILIZER SECTION

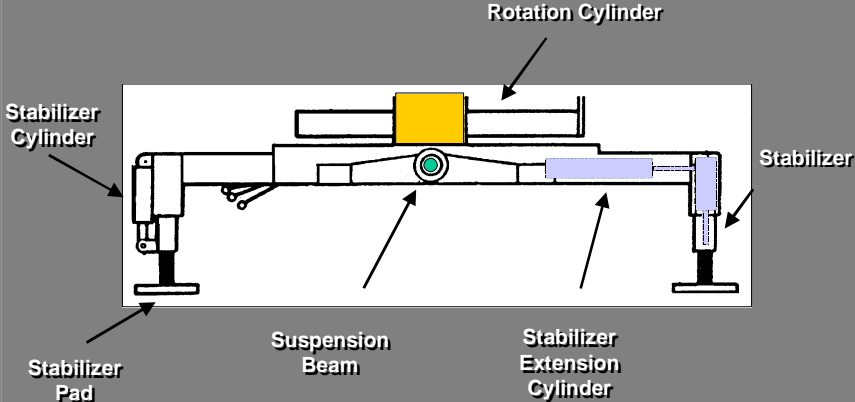


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STABILIZER SECTION



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SAMPLE

BOOM & TOWER INSPECTION

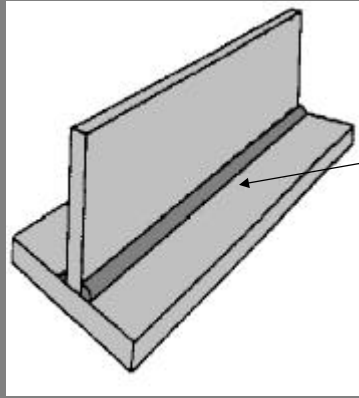


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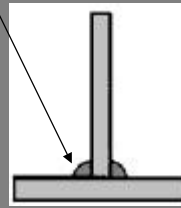
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CRACKED WELDS



Inspect Welds
For Cracks



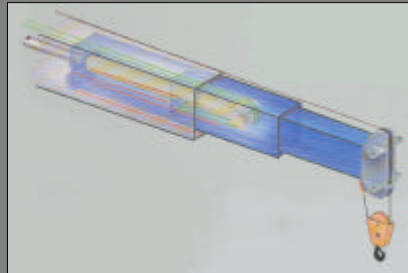
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SAMPLE

BOOM TRUCK INSPECTION

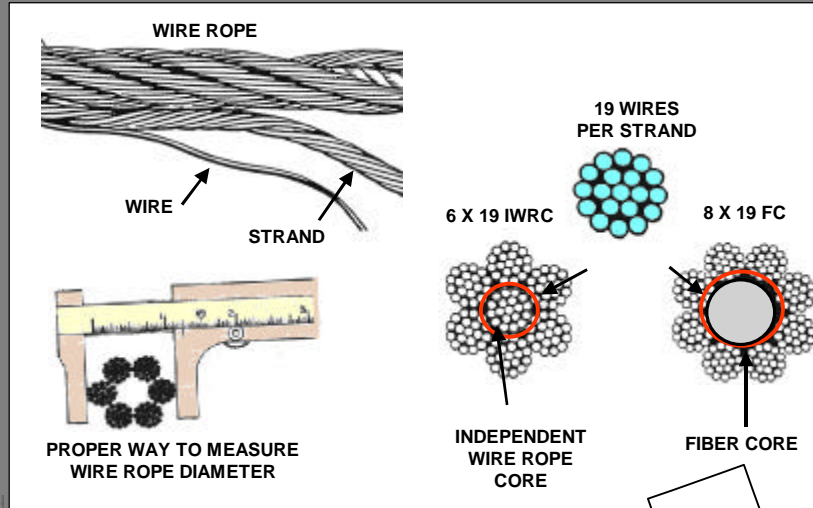


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WIRE ROPE CONSTRUCTION



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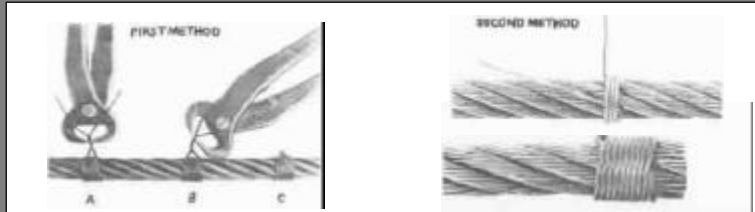
ARTICULATED BOOM TRUCK

ROTATION OF WIRE ROPE

Rotation of wire rope is a very careful handling prior to, during and after installation. When a non-rotating rope is cut, bent around a thimble or wedge socket, or attached to any fitting, care must be taken to prevent **core slippage**.

Core slippage can happen quite easily. When the rope is twisted in one direction, one layer of strands will tighten up and shorten, while the other layer of strands loosens, or becomes longer. As a result the shorter layers of strands carry the majority of the load.

To ensure that core slippage does not take place, always apply **wire seizings** to bind the inner and outer cores together before the rope is cut or attached to any fitting.



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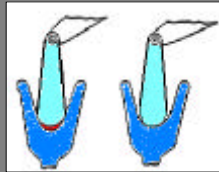
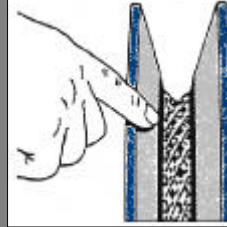
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INSPECTING SHEAVES

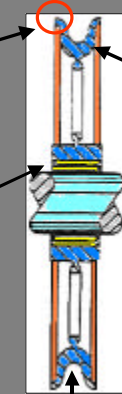
CHECK FLANGES FOR CHIPS, CRACKS, WEAR

CHECK GROOVE WEAR

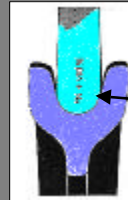
CHECK BEARINGS FOR WOBBLE, GREASE, EASE OF ROTATION



WORN GROOVES



MEASURE GROOVE



PROPER SIZE GROOVE



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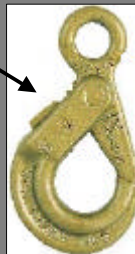
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SAMPLE

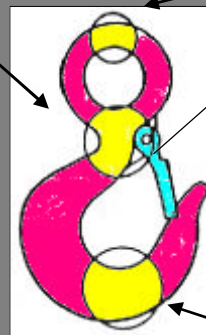
- Wear
- Deformation
- Cracks
- Modification
- Safety Latches
- Swivel Wear & Lubrication
- Hook Shackle Housing

Check Safety Latch & Spring



Wear & Deformation

Cracks & Twisting



"Opening Up"

Wear & Cracks



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BOOM TRUCK SETUP



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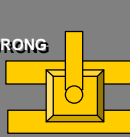
Select a Suitable Site

Avoid slopes



Avoid recent fill areas

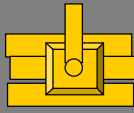
WRONG



WRONG



RIGHT



NEVER block
under stabilizer

Do not set up
over buried
objects
that could
collapse

Shortened
Radius



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ESTIMATED OUT OF LEVEL CAPACITY REDUCTIONS

BOOM LENGTH AND RADIUS	CAPACITY REDUCTION WHEN OUT OF LEVEL (Deg)		
	1	2	3
Short Boom, Minimum Radius	10%	20%	30%
Short Boom, Maximum Radius	8%	15%	20%
Long Boom, Minimum Radius	30%	41%	50%
Long Boom, Maximum Radius	5%	10%	15%



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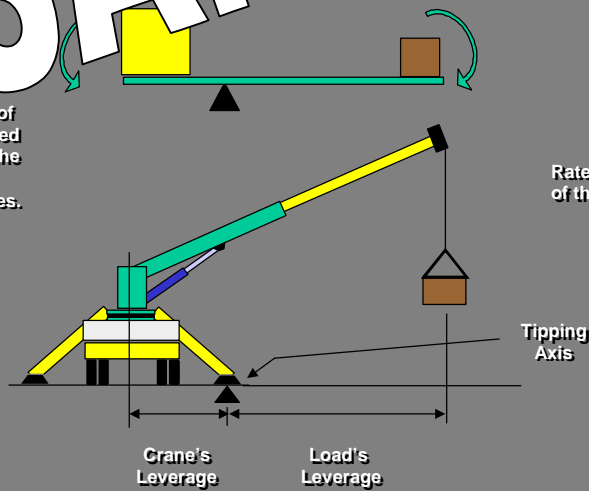
ARTICULATED BOOM TRUCK

SAMPLE

BOOM TRUCK STABILITY

The principle of leverage is used to determine the boom truck's rated capacities.

Rated capacity is 85% of the tipping load.

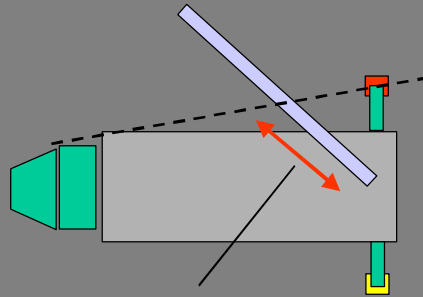


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STABILITY



STABILITY INCREASED
TIPPING POINT IS FARTHER
FROM CENTER OF ROTATION



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SAMPLE

IMPLEMENT OPERATIONS

The Big Picture

- Assessing the Load
- Rigging Requirements
- Assessing the Pick Area
- Assessing the Placement Area



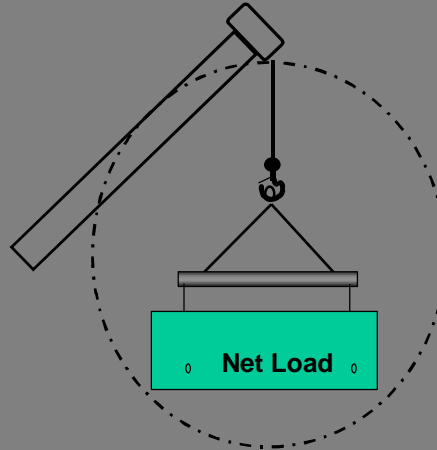
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GROSS LOAD

Gross Load =
Net Load +
Rigging +
Wire Rope +
Block +
Boom Attachments



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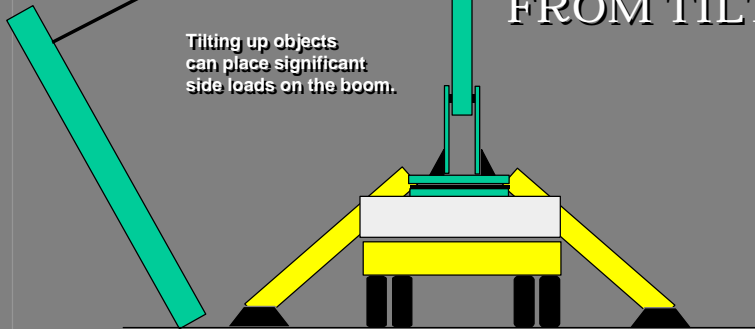
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SAMPLE

AVOID SIDE LOADING FROM TILTING

Tilting up objects
can place significant
side loads on the boom.

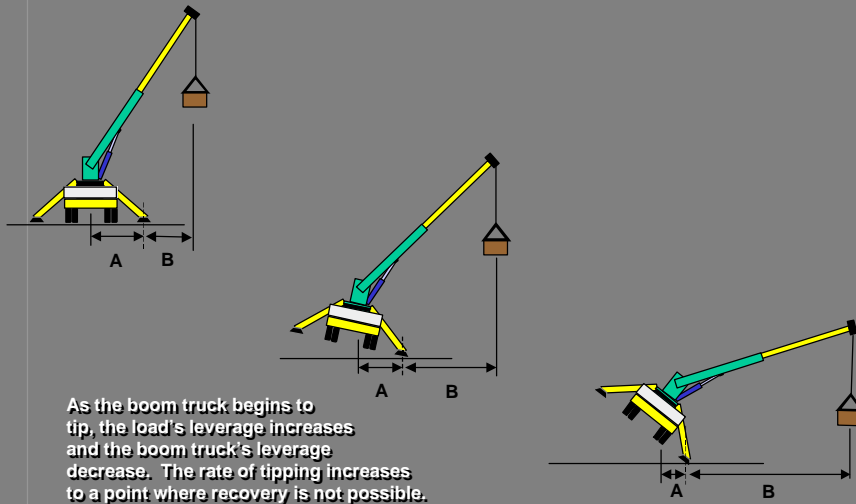


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RATE OF TIPPING



As the boom truck begins to tip, the load's leverage increases and the boom truck's leverage decrease. The rate of tipping increases to a point where recovery is not possible.



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SAMPLE

Avoid blocking the crane, use an anti-two blocking device

Do not leave the crane with a suspended load

Rig the crane with sufficient parts of line for the load

Always have a minimum of three wraps of cable on the drum

Monitor the winch to make sure that it is spooling correctly

Do not lift loads over personnel

Lift one load at a time

Maintain correct electrical clearance

Never use the hoist line as a sling



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HAND SIGNALS



DOG EVERYTHING



EXTEND BOOM



EMERGENCY STOP



**LOWER THE LOAD
RAISE THE BOOM**



RETRACT BOOM



**RAISE THE LOAD
LOWER THE BOOM**



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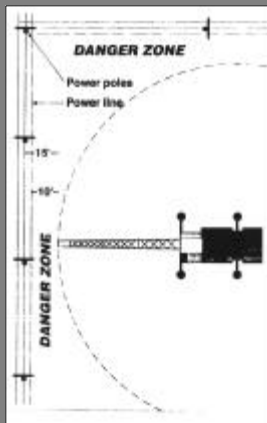
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POWER LINE CONTACT

Required Clearances

50kV	10 ft.
50 to 200kV	15 ft.
200 to 350kV	20 ft.



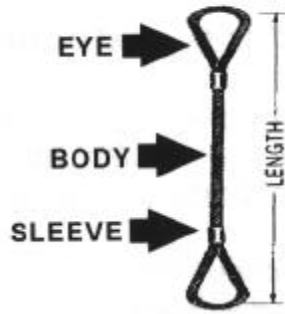
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WIRE ROPE SLING INSPECTION

KINKING
CRUSHING
UNSTRANDING
BIRDCAGING
STRAND DISPLACEMENT
CORE PROTRUSION
CORROSION
BROKEN OR CUT
STRANDS
BROKEN WIRES

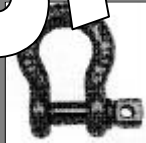


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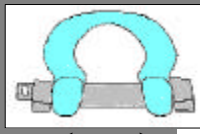
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SAMPLE



TWO TYPES OF SHACKLES USED FOR LIFTING.



DEFORMATION



BOLT SUBSTITUTION



WEAR

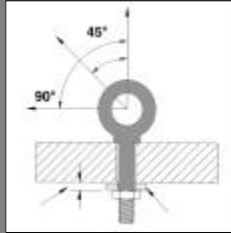


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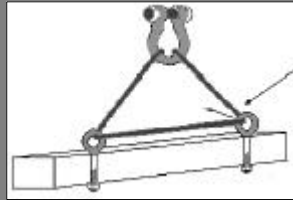
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EYE BOLTS



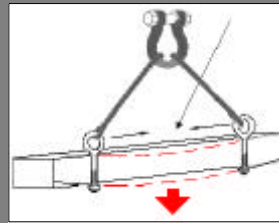
DIRECTION OF PULL	ADJUSTED WORKING LOAD
In-Line	Full Rated Working Load
45 Degrees	30% of Rated Working Load
60 Degrees	60% of Rated Working Load

WRONG!



DO NOT REEVE SLINGS ONE EYE BOLT TO ANOTHER. LOAD ON BOLT IS ALTERED.

CAUTION!



STRUCTURE MAY BUCKLE FROM COMPRESSION FORCES.



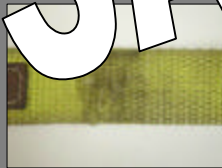
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SAMPLE

NYLON SLINGS INSPECTION



SCUFFING



RED THREADS



NICKS



MANUFACTURER TAG

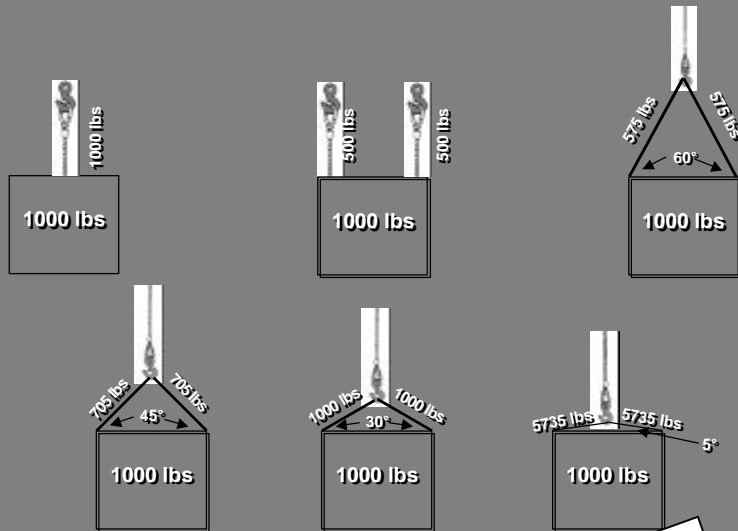


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SLING ANGLES



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ESTABLISHING WEIGHTS

Acceptable methods of determining weight

You may find the weight from:

- Data on manufacturing label plates.
- Manufacturer documentation.
- Blueprints or drawings.
- Shipping receipts.
- Weigh the item.
- Bill of lading (be careful)
- Stamped or written on the load
- Approved calculations

Never use word of mouth to establish the weight of an item!



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ESTIMATING WEIGHTS

Here are some examples of common materials and their unit weight:

(POUNDS PER CUBIC FOOT)

METALS		TIMBER	
Aluminum	165	Cedar	34
Brass	535	Cherry	36
Bronze	500	Fir, seasoned	34
Copper	560	Fir, wet	50
Iron	480	Hemlock	30
Lead	710	Maple	53
Steel	490	Oak	62
Tin	460	Pine	30
MASONRY		Poplar	30
Ashlar masonry	160	Spruce	28
Brick, soft	110	White pine	25
Brick, pressed	140	Railroad ties	50
Clay tile	60	LIQUIDS	
Rubble masonry	155	Diesel	52
Concrete, cinder, haydite	110	Gasoline	45
Concrete, slag	130	Water	64
Concrete, stone	144	EARTH	
Concrete, reinforced	150	Earth, wet	100
MISC.		Earth, dry	75
Asphalt	80	Sand and gravel, wet	120
Glass	160	Sand and gravel, dry	105



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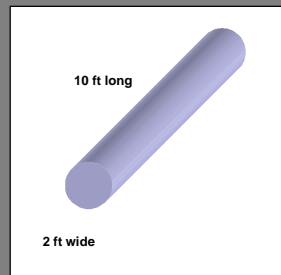
CALCULATING VOLUME

Volume of a cylinder

$\text{Pi} \times \text{Radius Squared} \times \text{Length} = \text{Volume}$

$\text{p} \times \text{Radius}^2 \times \text{Length} = \text{Volume}$

$3.14 \times 1^2 \text{ ft} \times 10 \text{ ft} = 31.4 \text{ cubic ft.}$



If the material was reinforced concrete, then all we would have to do to determine it's weight would be to multiply the unit weight of reinforced concrete x 31.4.

150 lbs. X 31.4 cubic ft. = 4,710 lbs.



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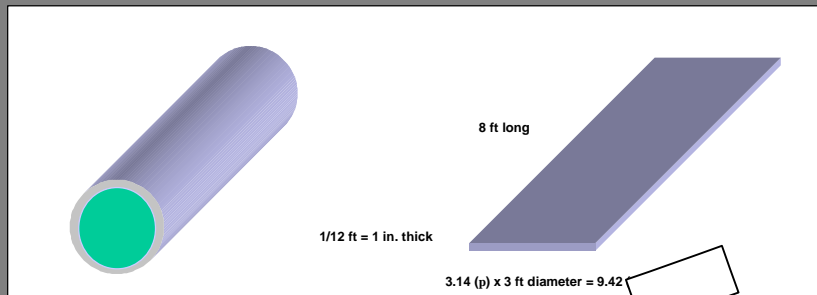
CALCULATING VOLUME

For thin pipe a quick way to *ESTIMATE the volume is to split the pipe open and calculate the volume like a cube. The formula would be:

$\pi \times \text{diameter} = \text{width}$, so:

$\pi \times \text{diameter} \times \text{length} \times \text{thickness} \times \text{unit weight} = \text{weight of object}$

$3.14 \times 3 \text{ ft} \times 8 \text{ ft} \times 1/12 \text{ ft (or .08 ft)} \times 490 \text{ lbs} = *3,077.2 \text{ lbs}$



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WEIGHT TABLES

Weight tables are an excellent way to calculate load weight. If you are handling certain materials often, then having a chart that gives you the weight per cubic foot, cubic yard, square foot, linear foot or per gallon. Here are a few examples:

METAL PLATES

STEEL PLATES weigh approximately 40 lbs per sq. ft. at 1 inch thick. 1/2 inch thick would then be about 20 lbs. per sq. ft.

A steel plate measuring 8 ft. x 10 ft. x 1/2 inch would then weigh about 3,200 lbs. (8 x 10 x 40 lbs = 3,200 lbs.)

BEAMS

Beams come in all kinds of materials and shapes and lengths. STEEL I-BEAMS weigh approximately 40 lbs a linear ft. at 1/2 inch thick and 8 inches x 8 inches. If it were 1 inch thick then it would be 80 lbs a linear ft. If it were 20 feet long at 1 inch thick then it would weigh about 1,600 lbs. (20 ft. x 80 lbs. = 1,600 lbs.)



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