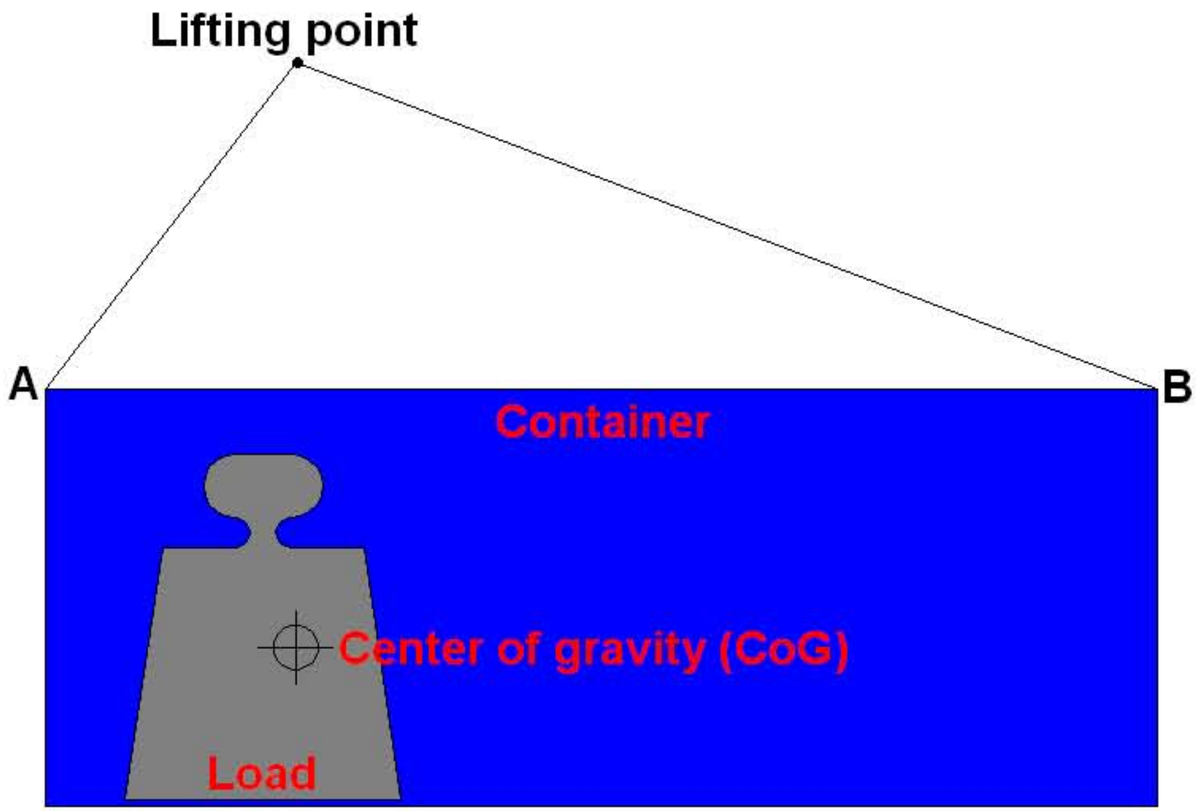

Start making a simple drawing of the item that you are lifting. This example are just to explain how to make an easy overview of all forces in lifting-equipment and attachment lug's.

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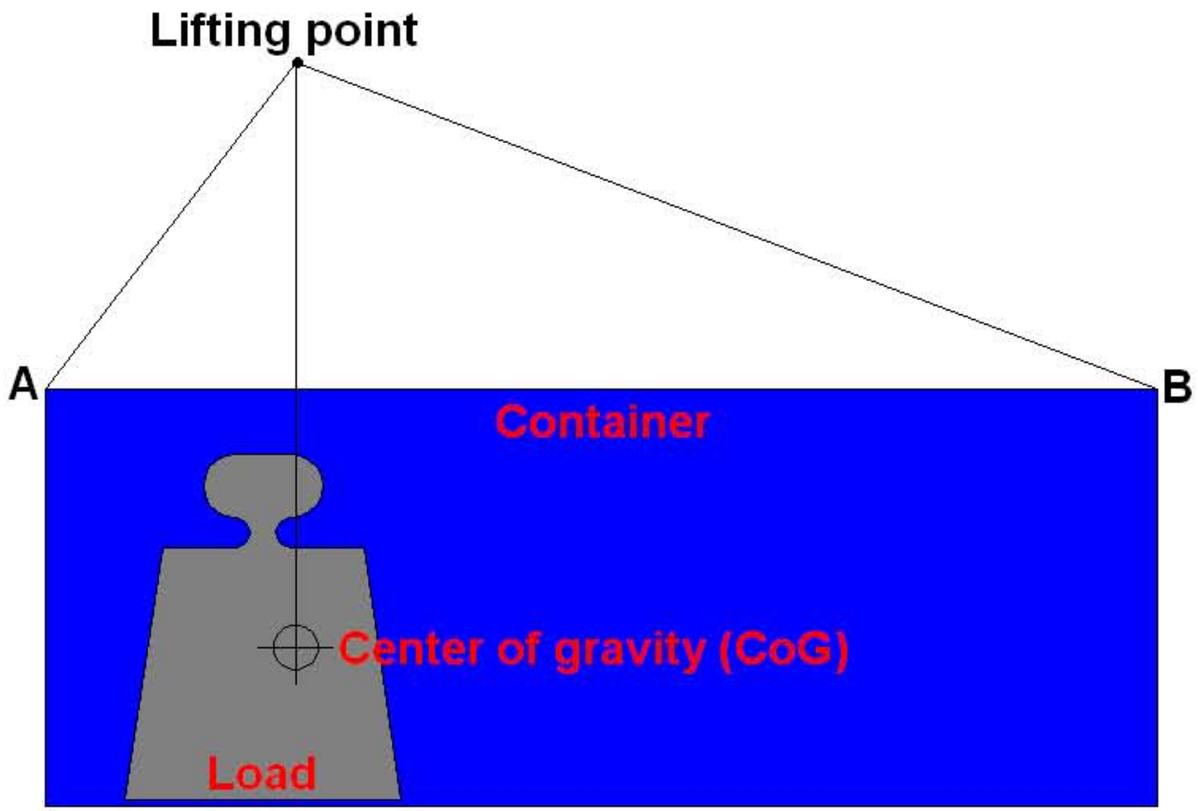

The first step is to make a line from the lifting point and down to the center of gravity. This line will always be a vertical line.

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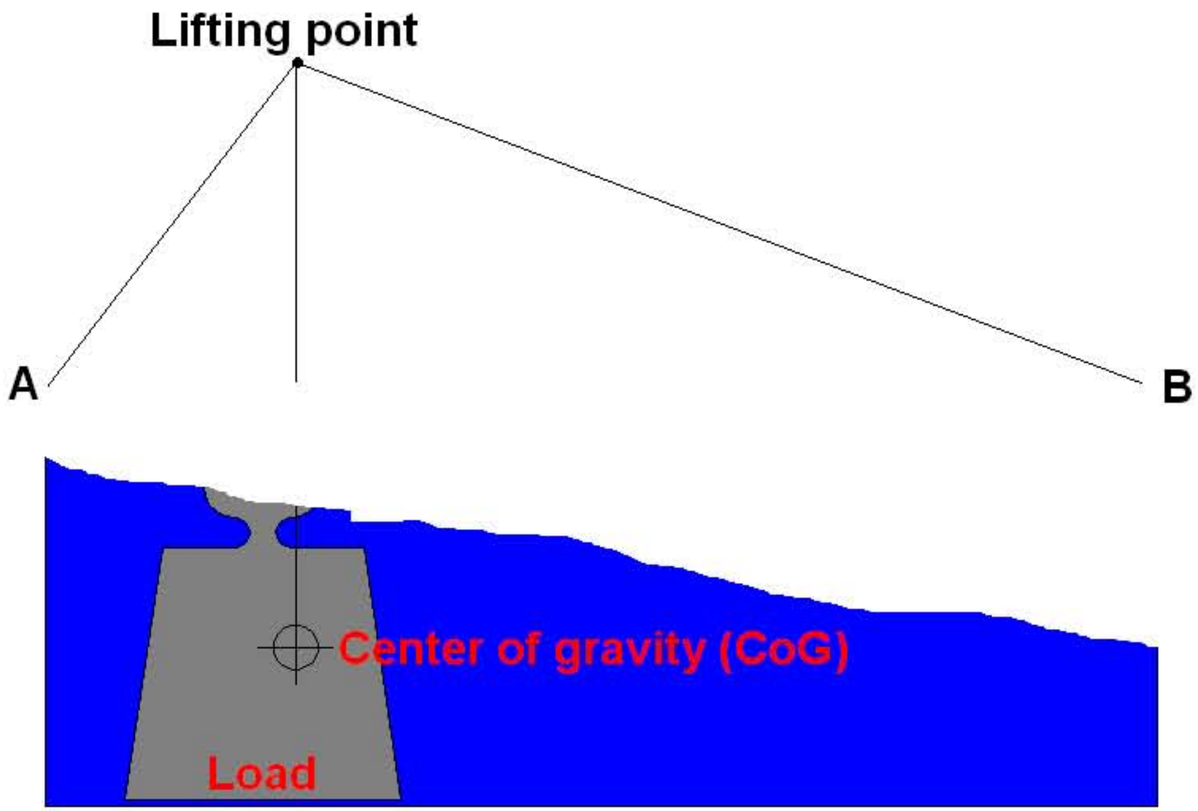

The container was just to illustrate how to make the lines, and we just erase it. (Or just don't draw it in first place) It's the three lines that are interesting. Be sure to make the angle's as accurate as possible.

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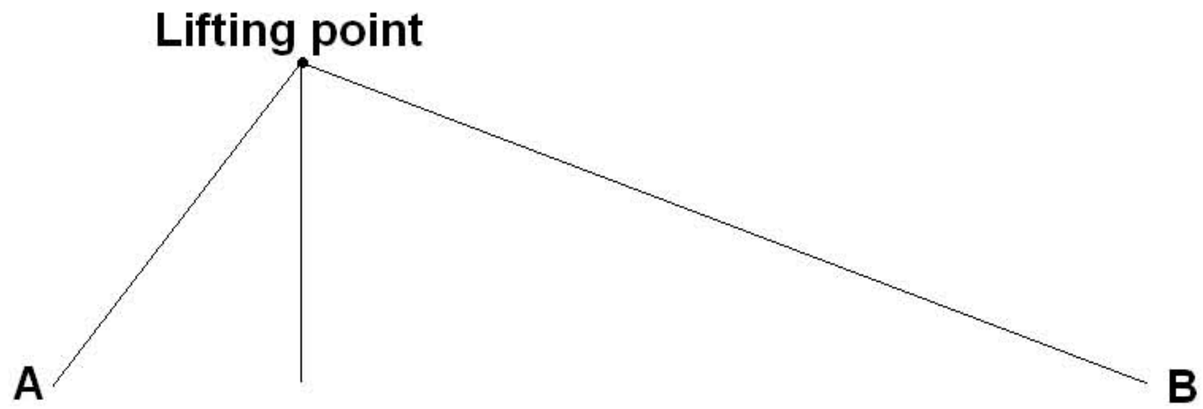

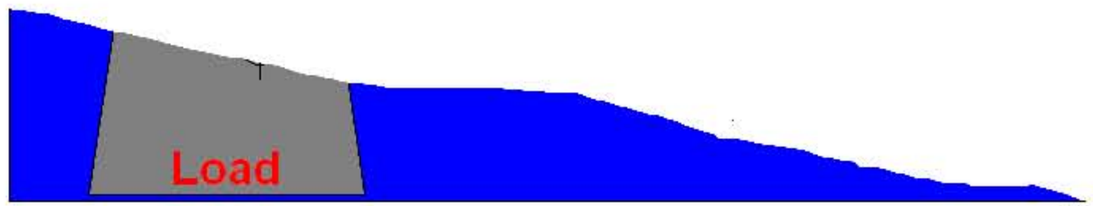

Allmost there, just keep on erasing.....

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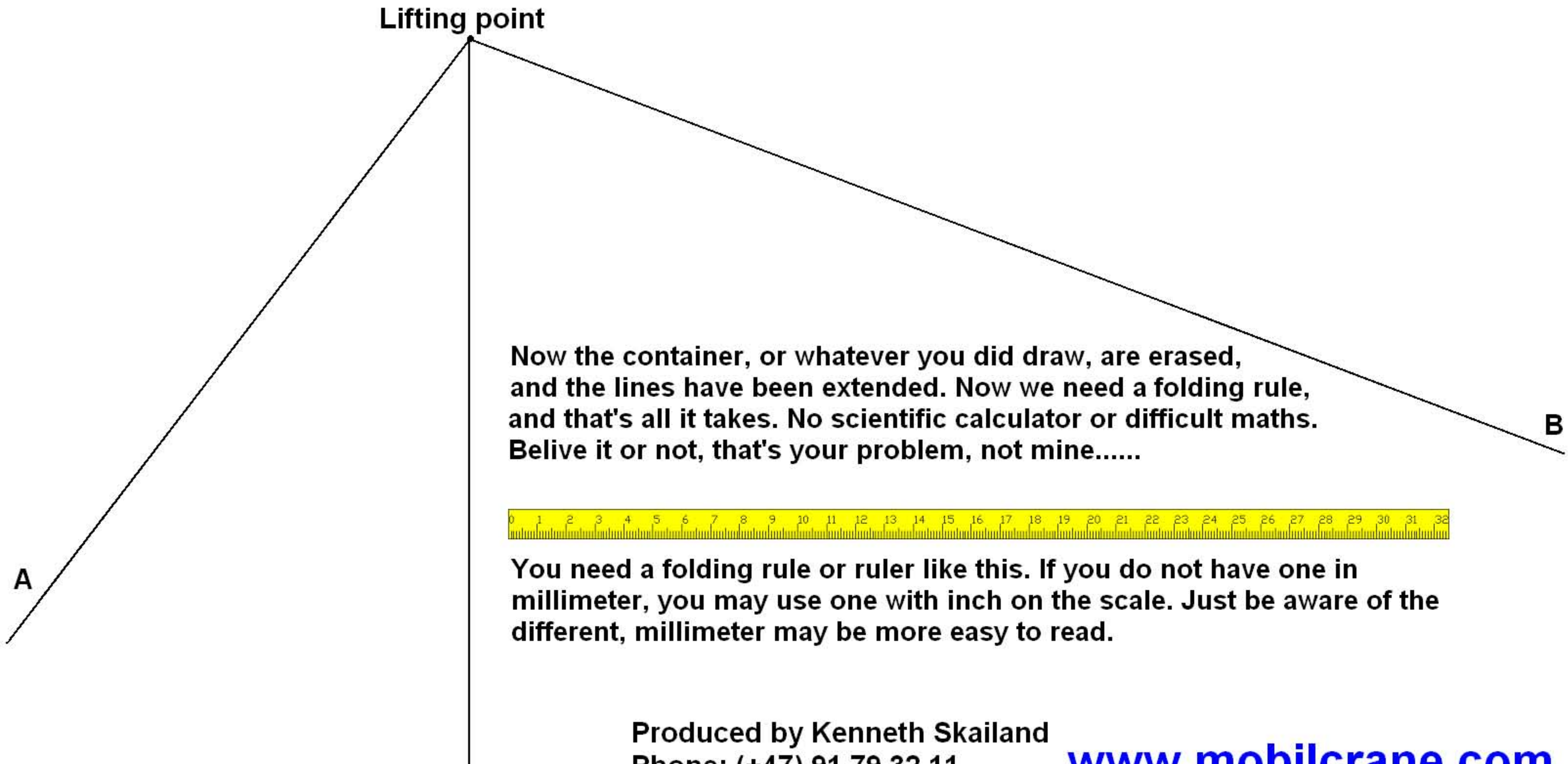

Now the container, or whatever you did draw, are erased, and the lines have been extended. Now we need a folding rule, and that's all it takes. No scientific calculator or difficult maths. Belive it or not, that's your problem, not mine.....

You need a folding rule or ruler like this. If you do not have one in millimeter, you may use one with inch on the scale. Just be aware of the different, millimeter may be more easy to read.

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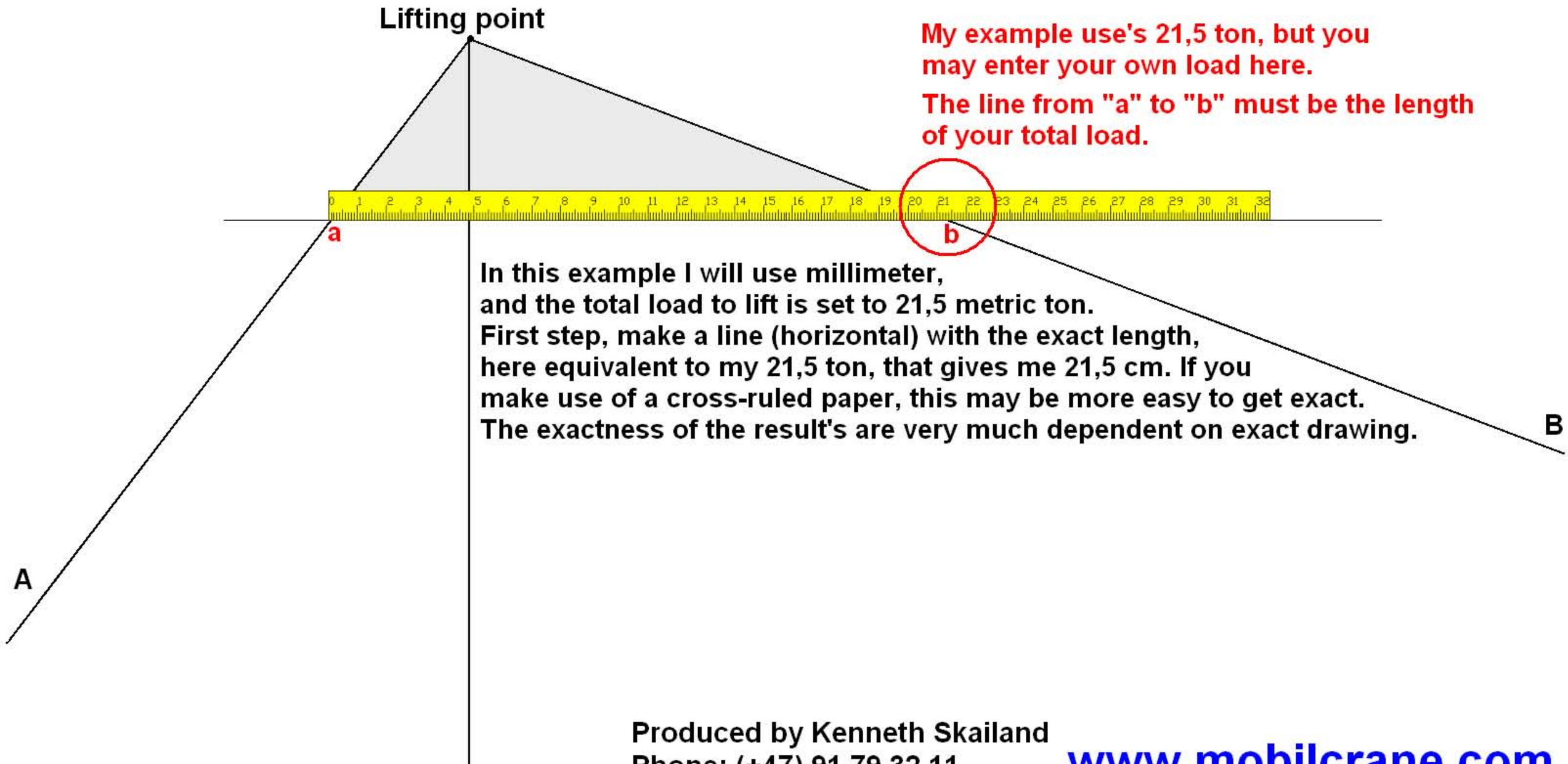

In this example I will use millimeter,
and the total load to lift is set to 21,5 metric ton.
First step, make a line (horizontal) with the exact length,
here equivalent to my 21,5 ton, that gives me 21,5 cm. If you
make use of a cross-ruled paper, this may be more easy to get exact.
The exactness of the result's are very much dependent on exact drawing.

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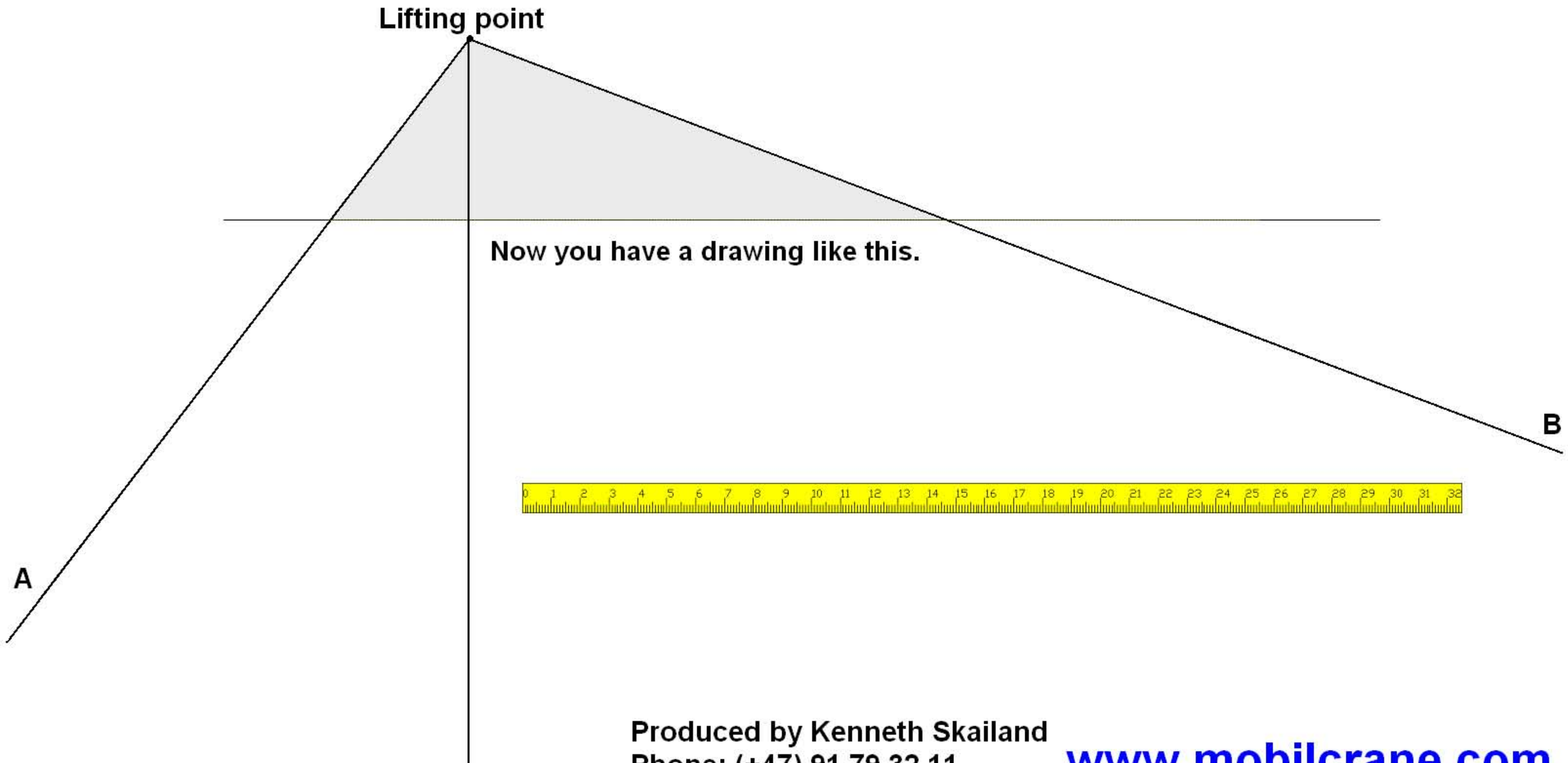

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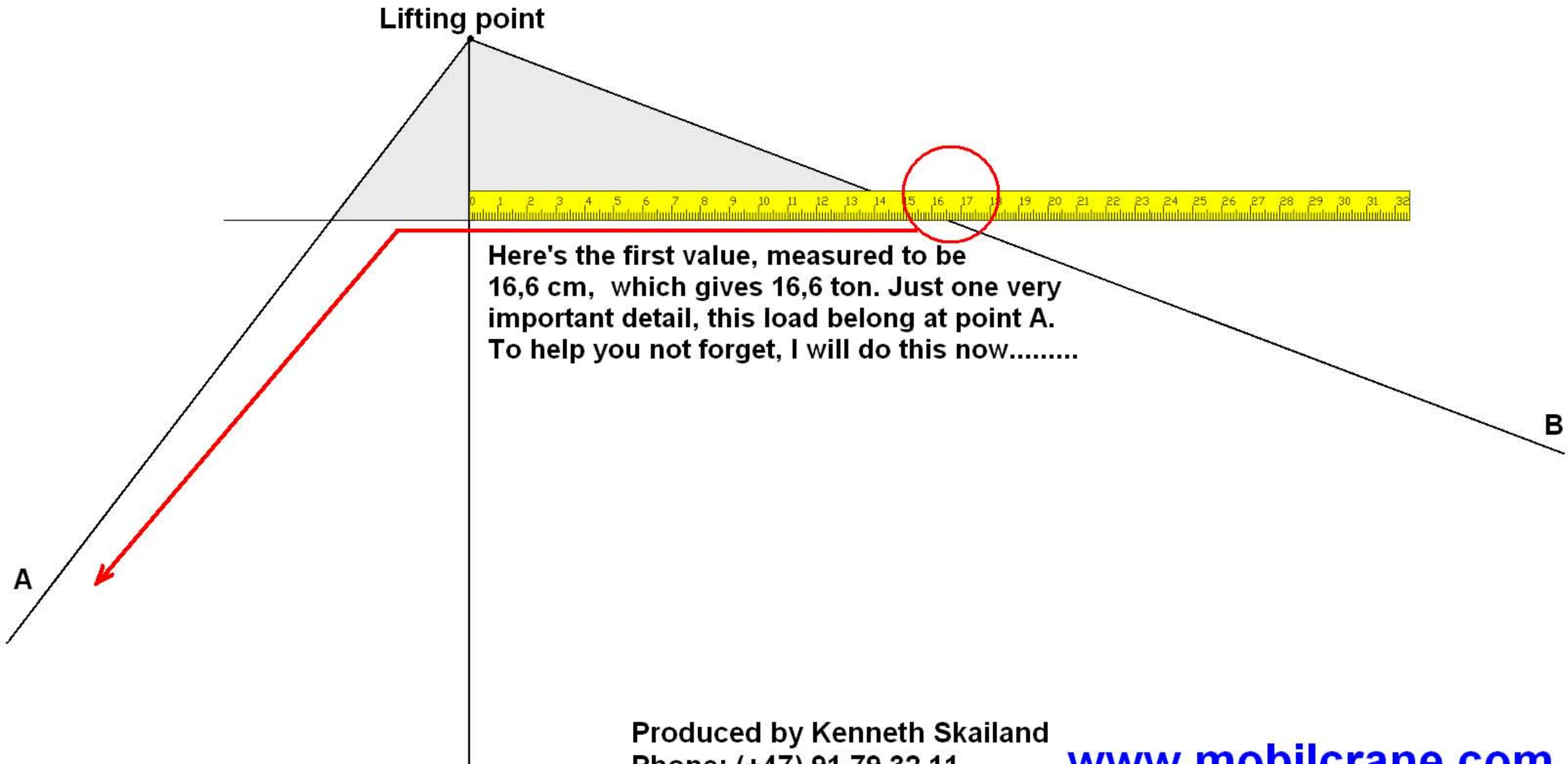

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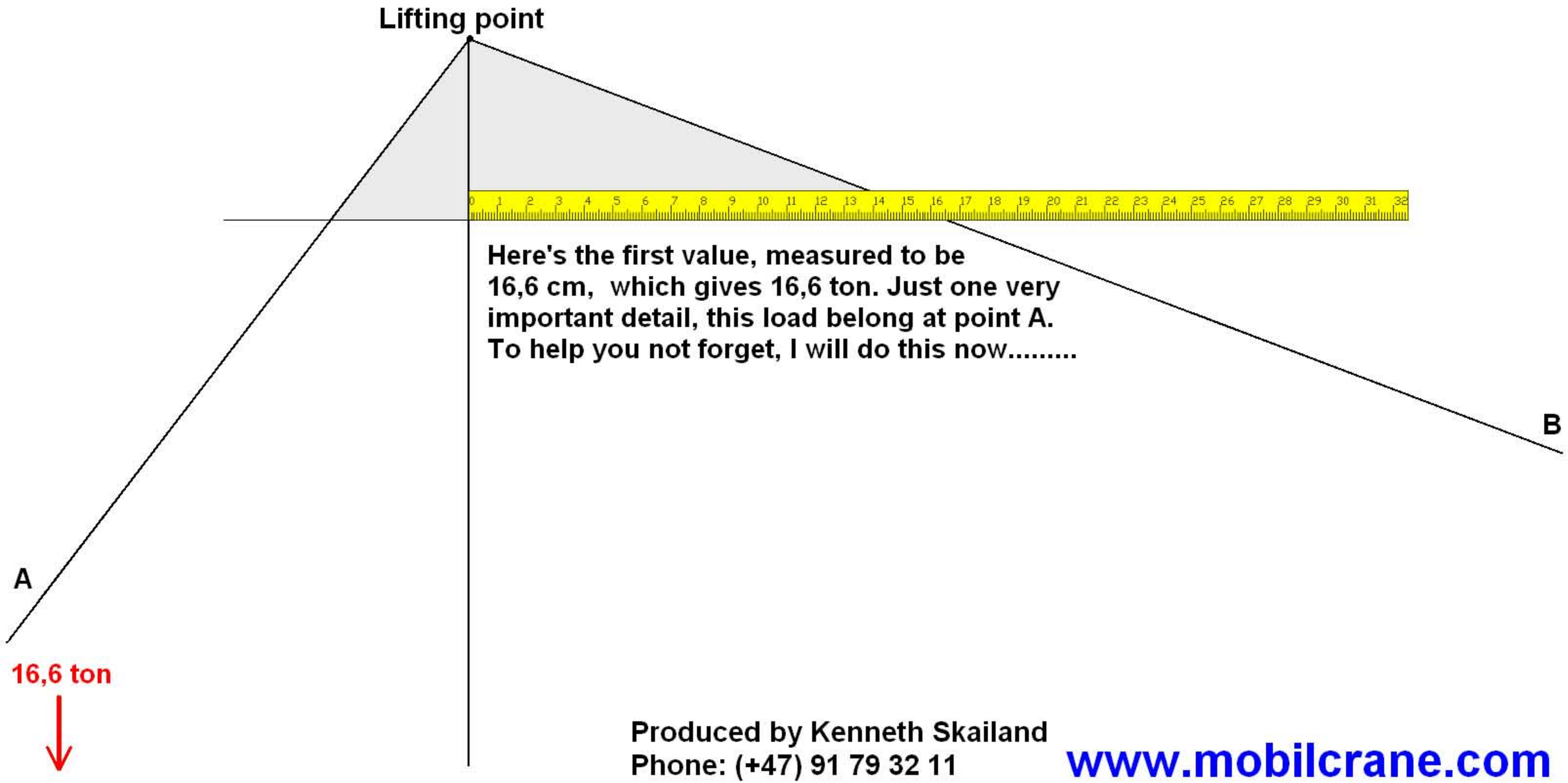

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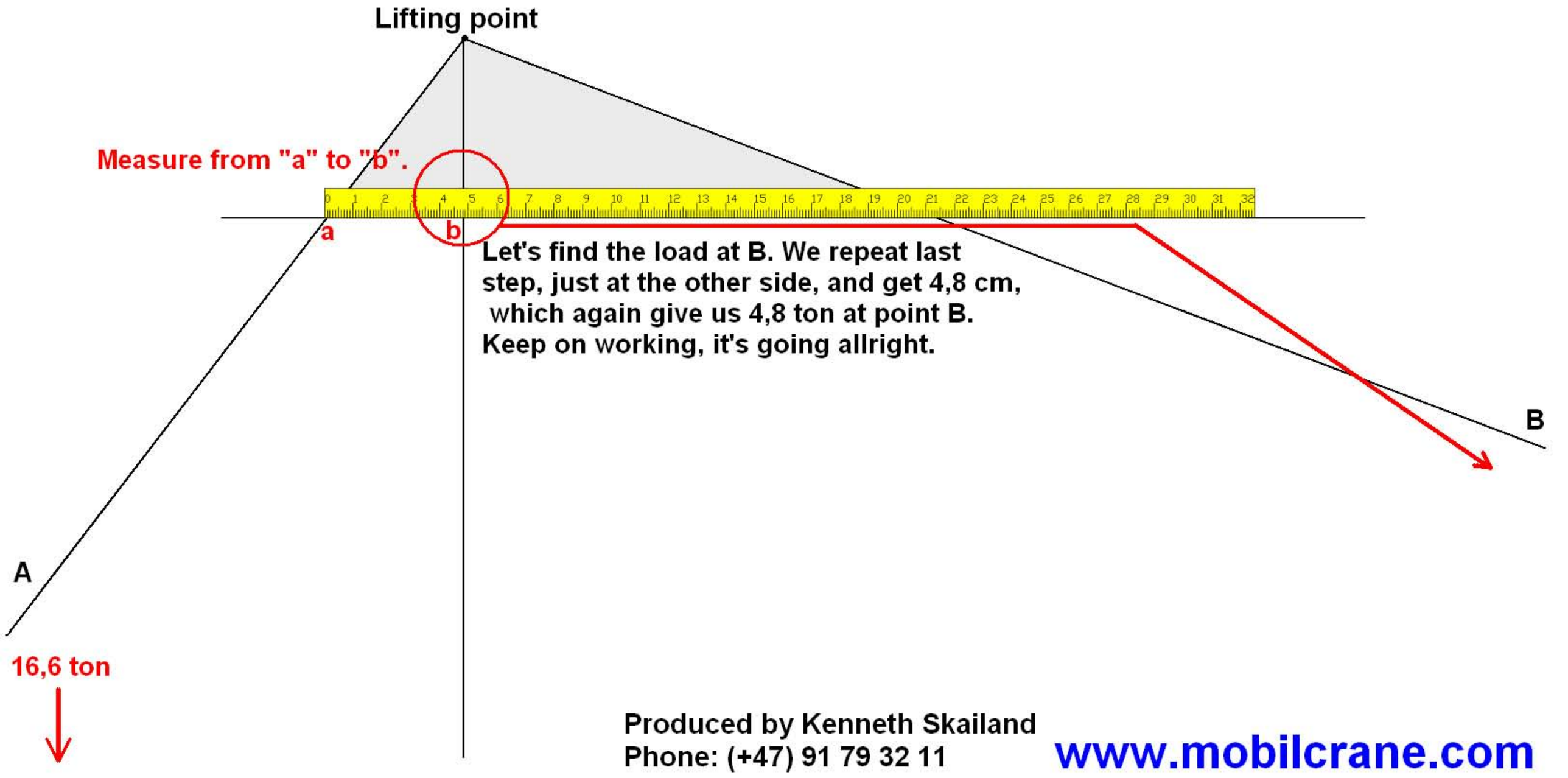
Lifting point
Measure from "a" to "b".
a
b
Let's find the load at B. We repeat last step, just at the other side, and get 4,8 cm, which again give us 4,8 ton at point B. Keep on working, it's going allright.
B
A
16,6 ton
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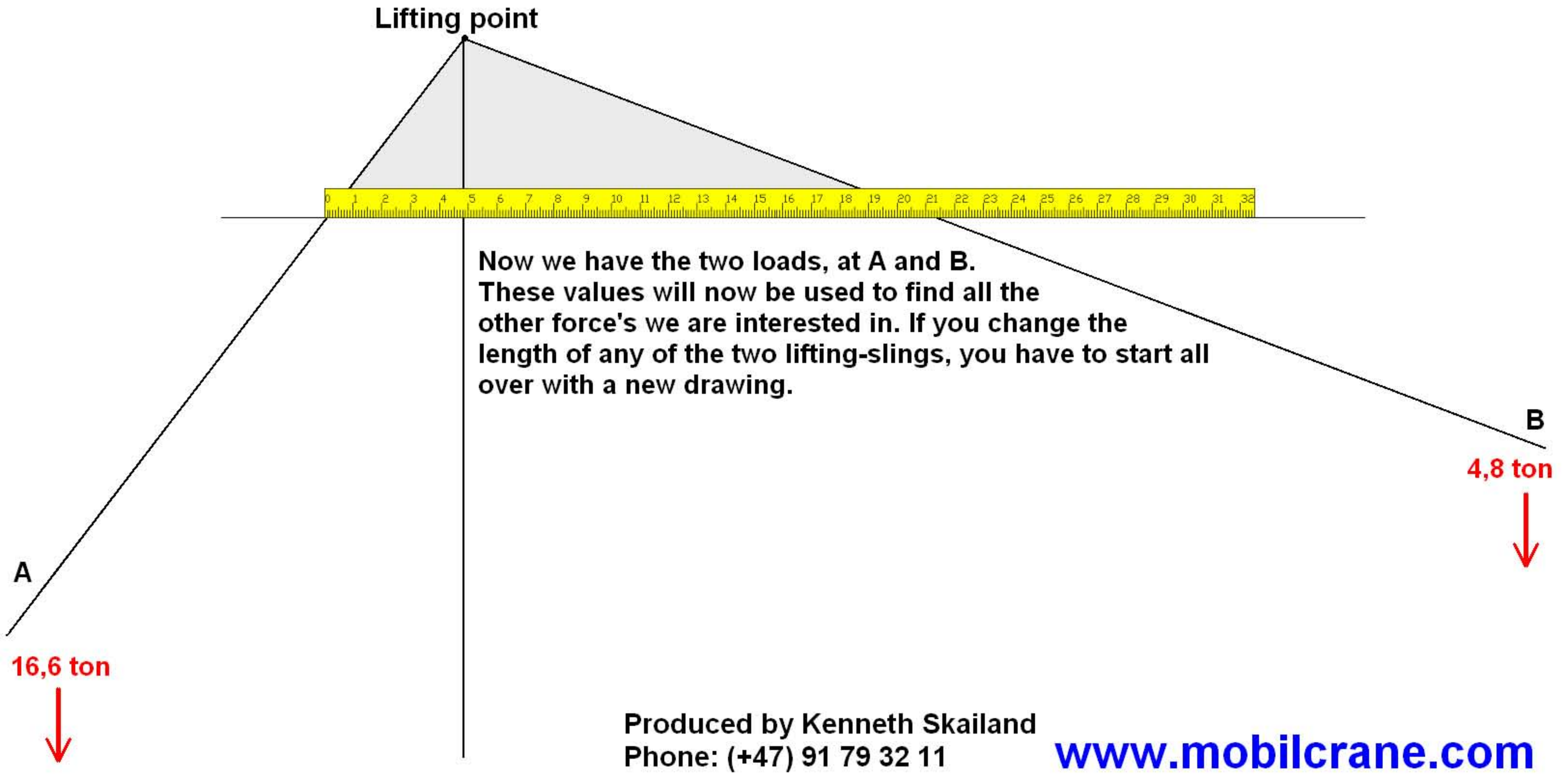

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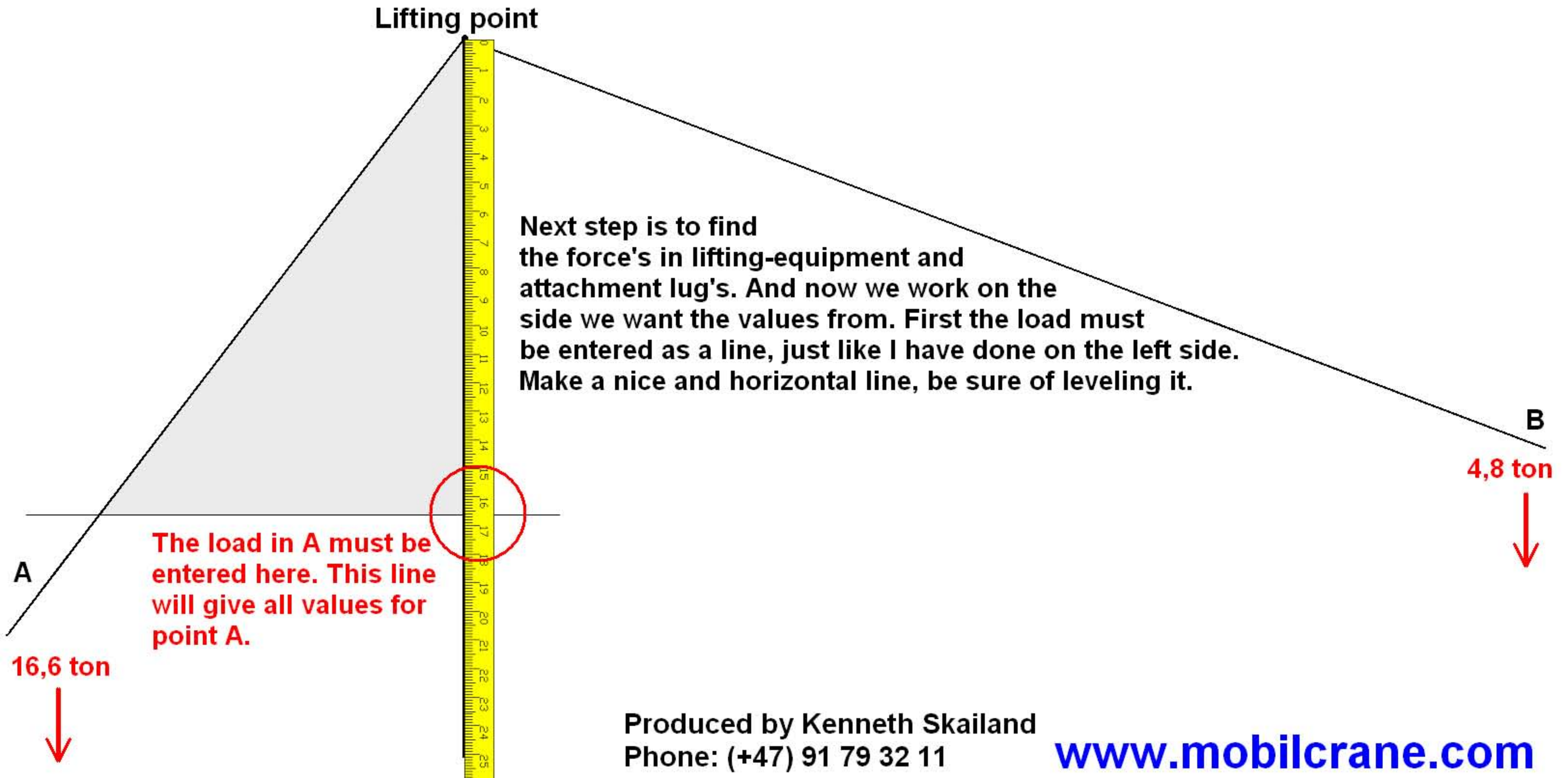
Lifting point
Next step is to find
the force's in lifting-equipment and
attachment lug's. And now we work on the
side we want the values from. First the load must
be entered as a line, just like I have done on the left side.
Make a nice and horizontal line, be sure of leveling it.
B
4,8 ton
A
The load in A must be
entered here. This line
will give all values for
point A.
16,6 ton
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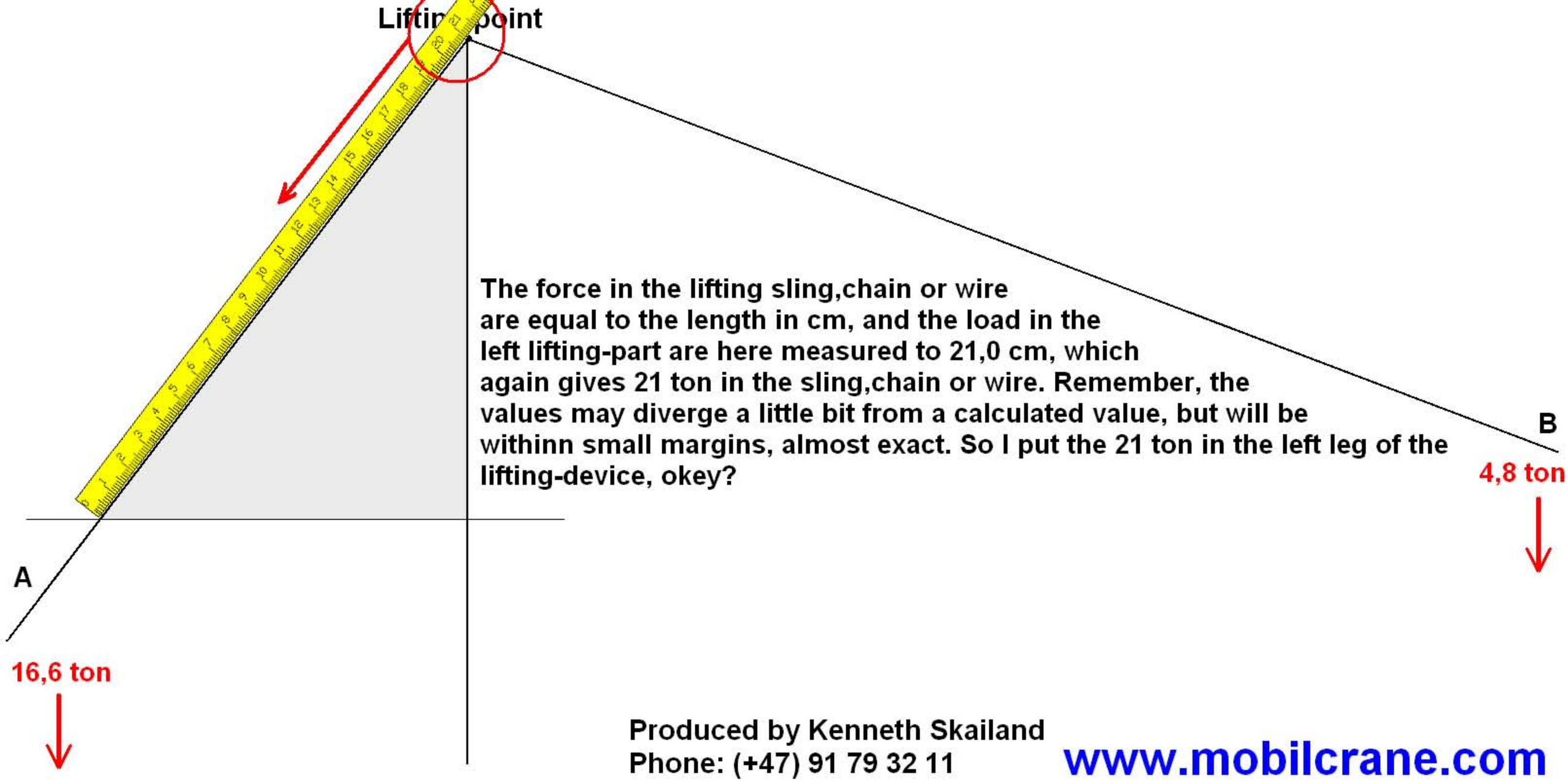

The force in the lifting sling,chain or wire are equal to the length in cm, and the load in the left lifting-part are here measured to 21,0 cm, which again gives 21 ton in the sling,chain or wire. Remember, the values may diverge a little bit from a calculated value, but will be withinn small margins, almost exact. So I put the 21 ton in the left leg of the lifting-device, okey?

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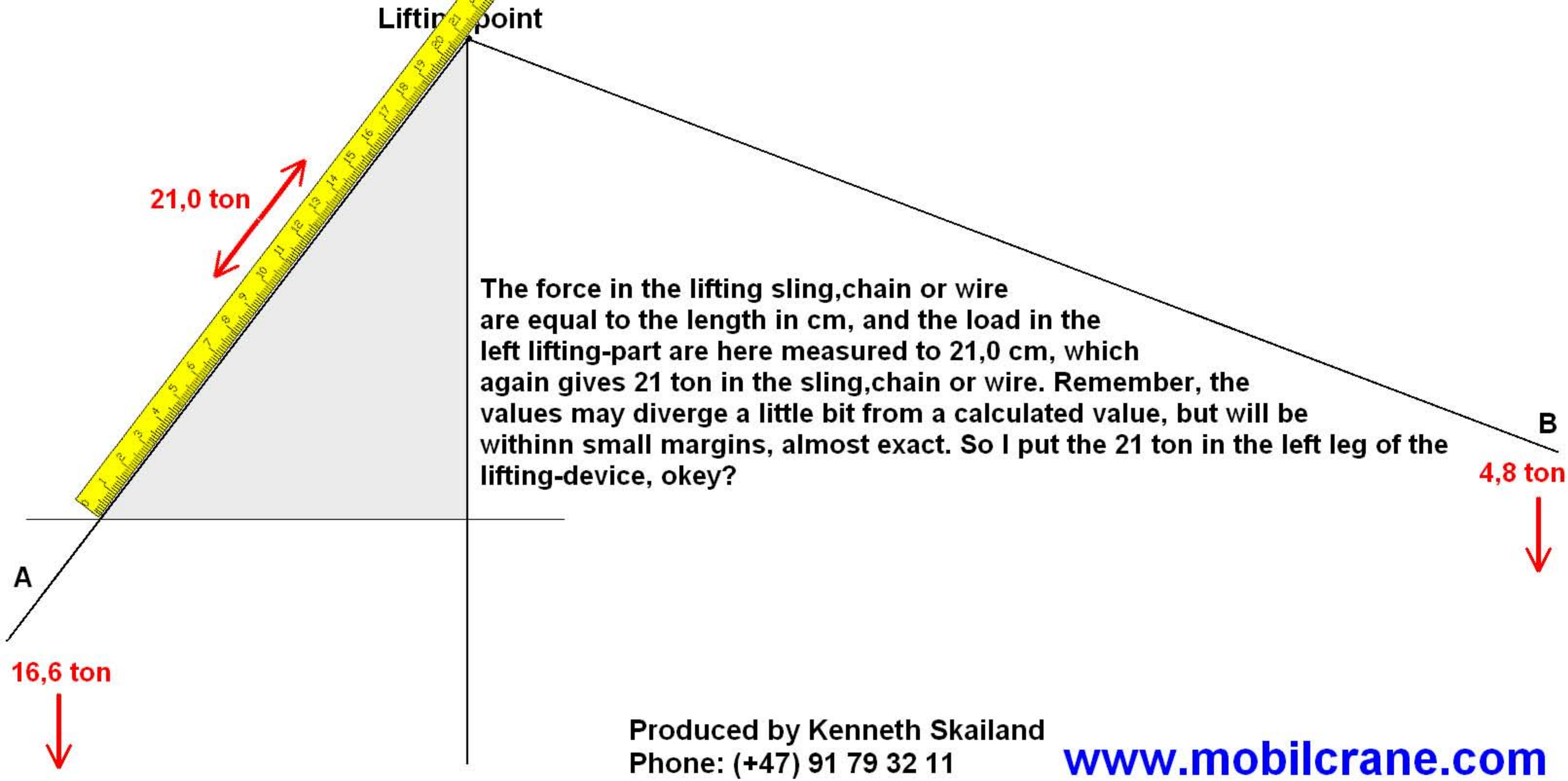

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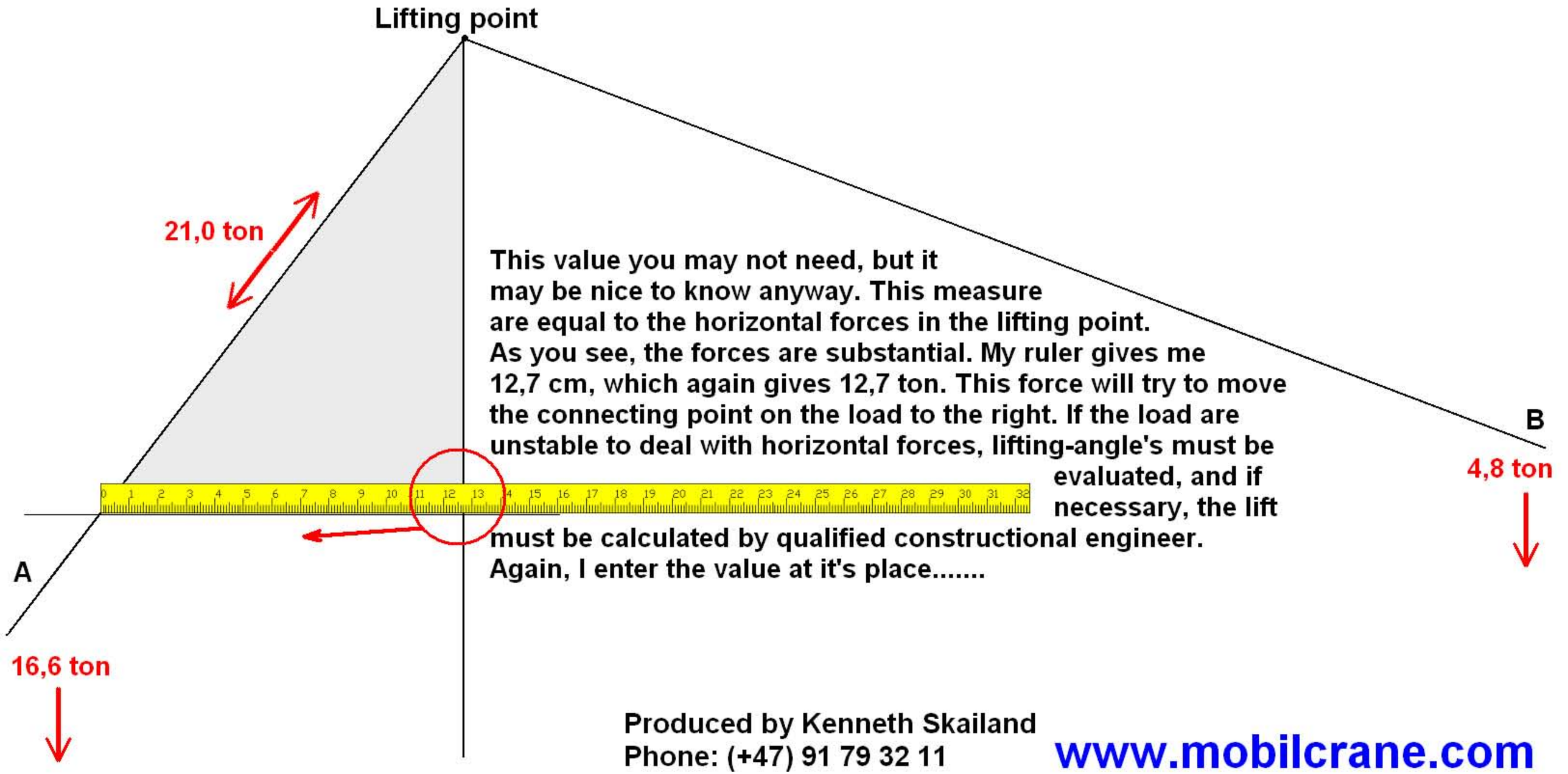

This value you may not need, but it may be nice to know anyway. This measure are equal to the horizontal forces in the lifting point. As you see, the forces are substantial. My ruler gives me 12,7 cm, which again gives 12,7 ton. This force will try to move the connecting point on the load to the right. If the load are unstable to deal with horizontal forces, lifting-angle's must be evaluated, and if necessary, the lift must be calculated by qualified constructional engineer. Again, I enter the value at it's place.....

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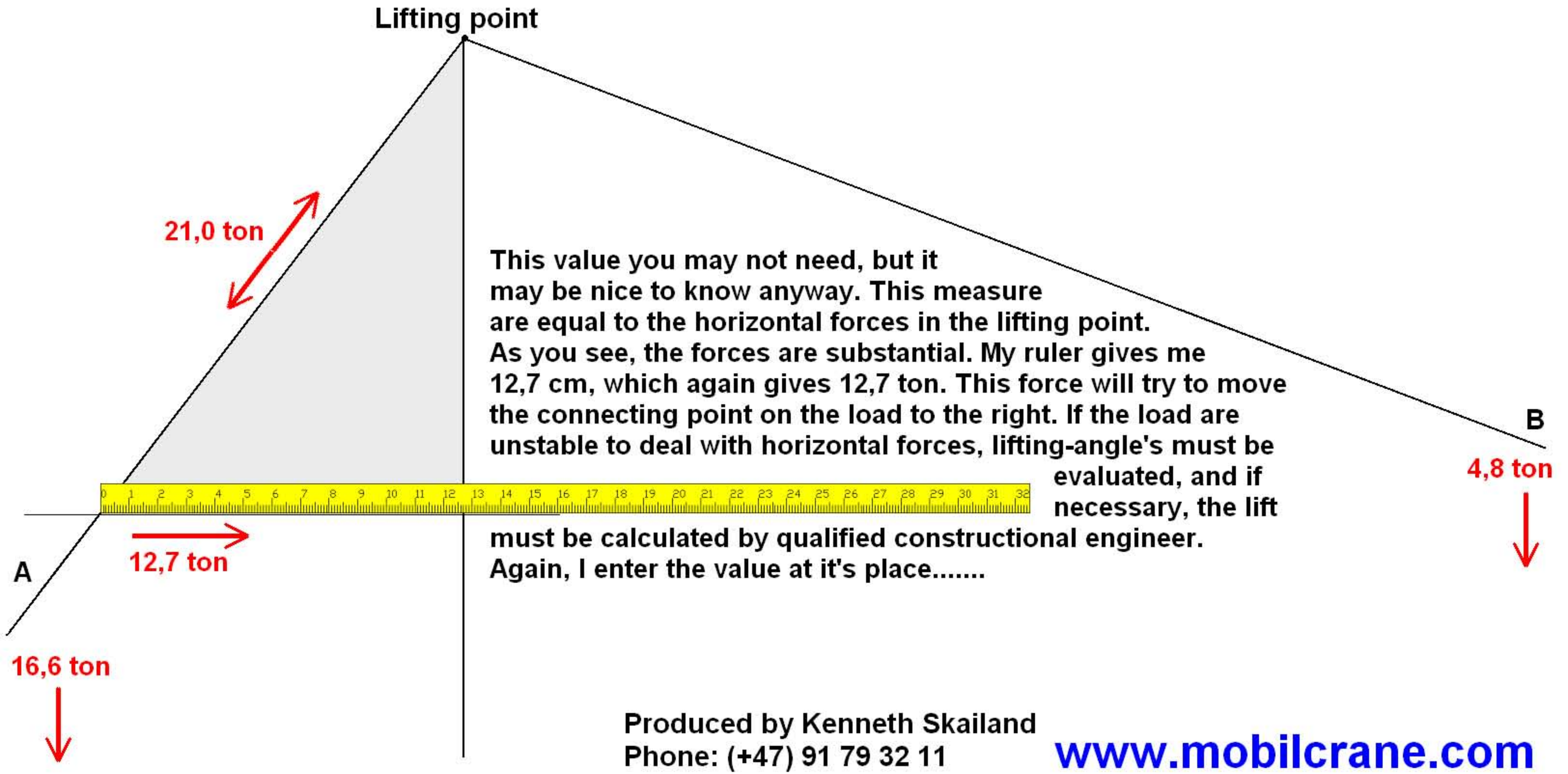

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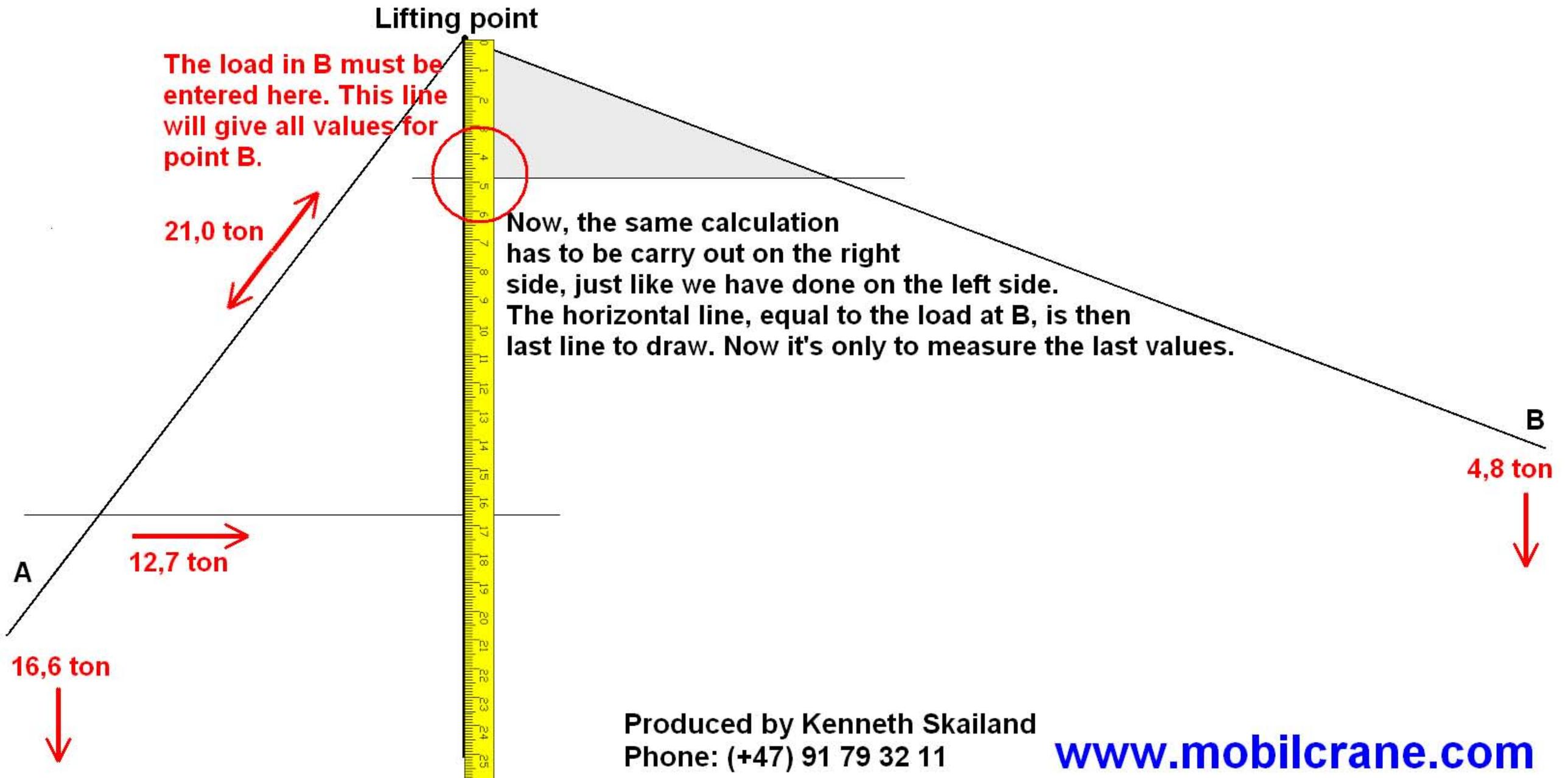

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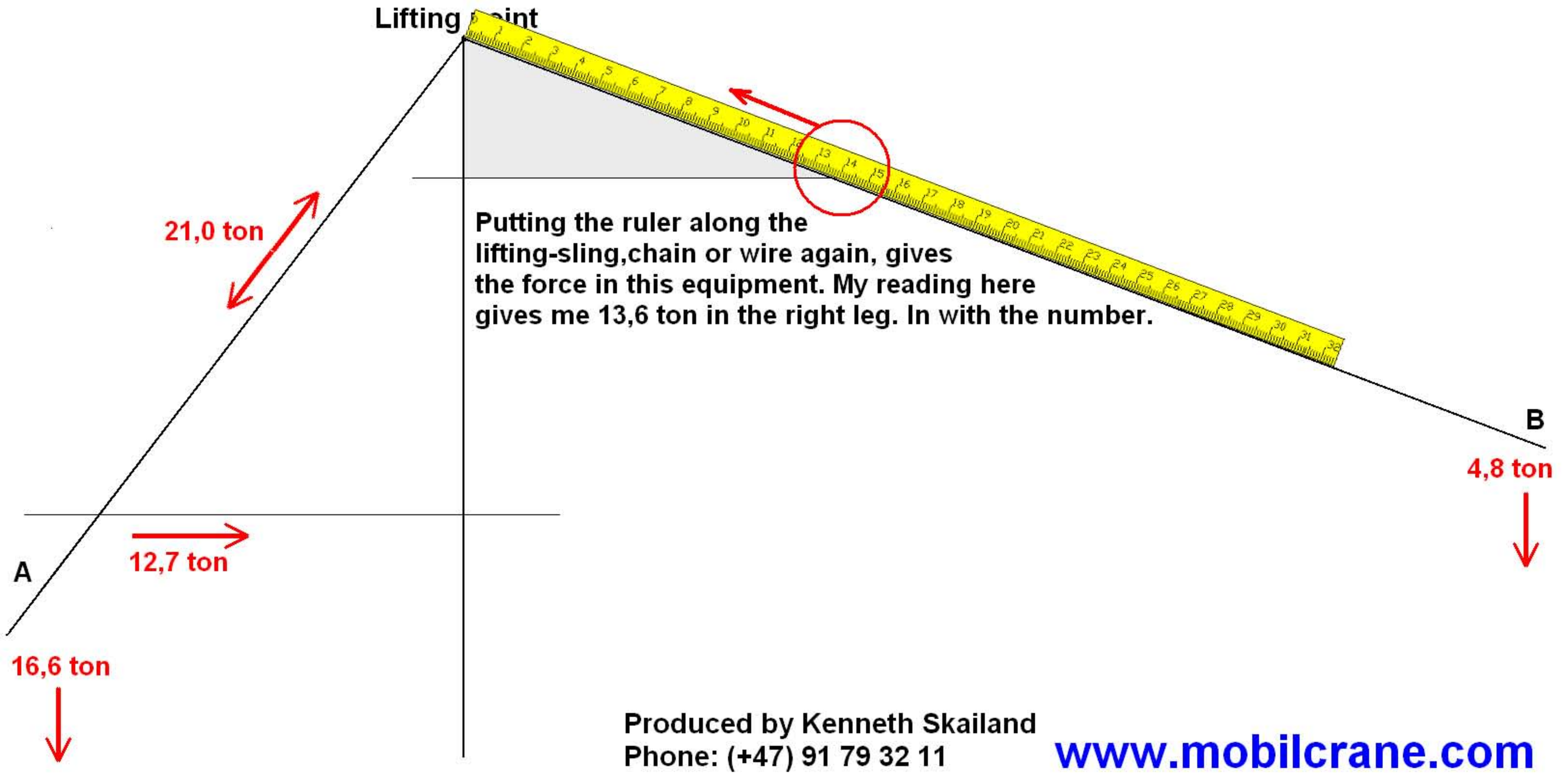

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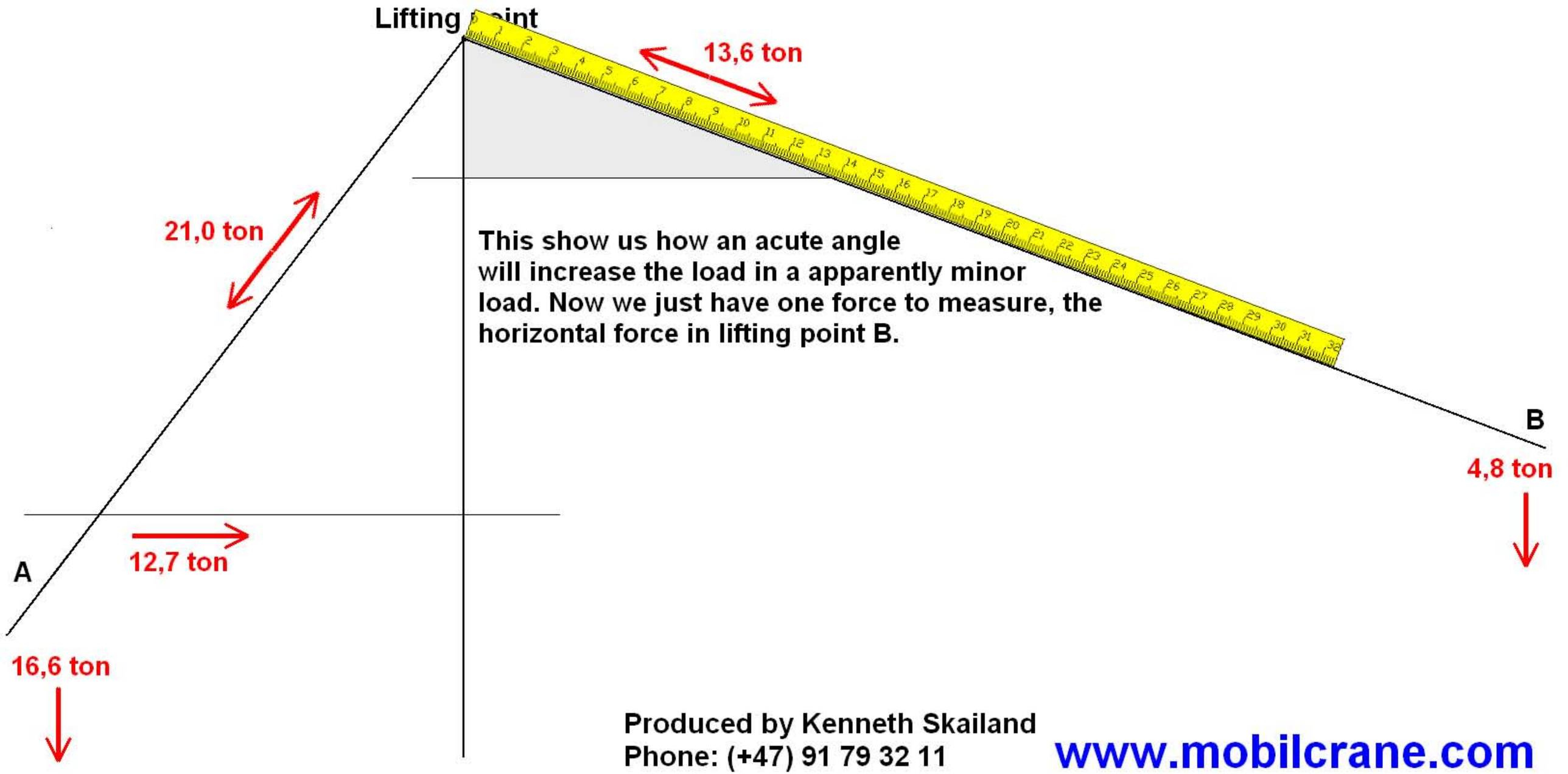

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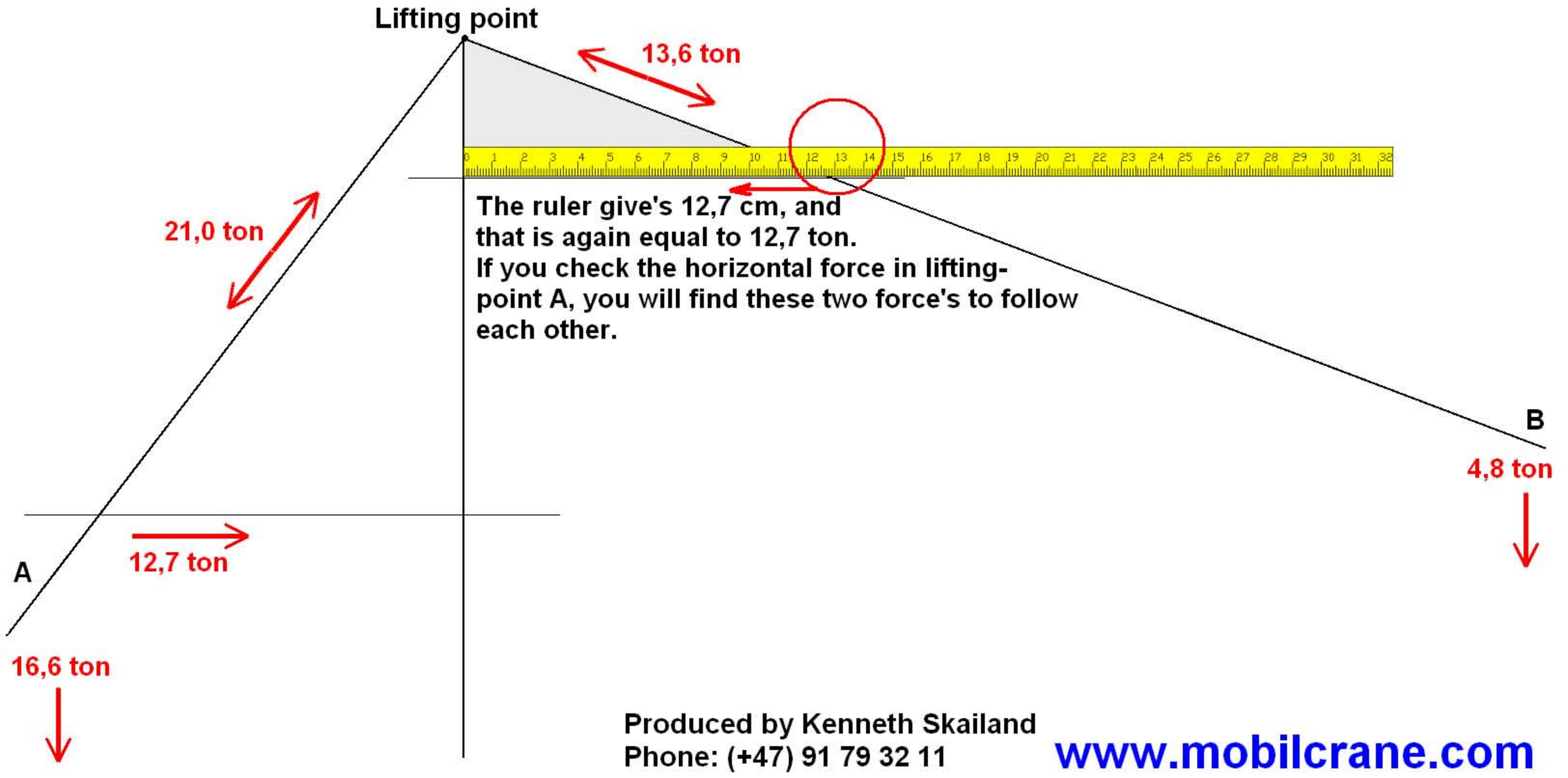

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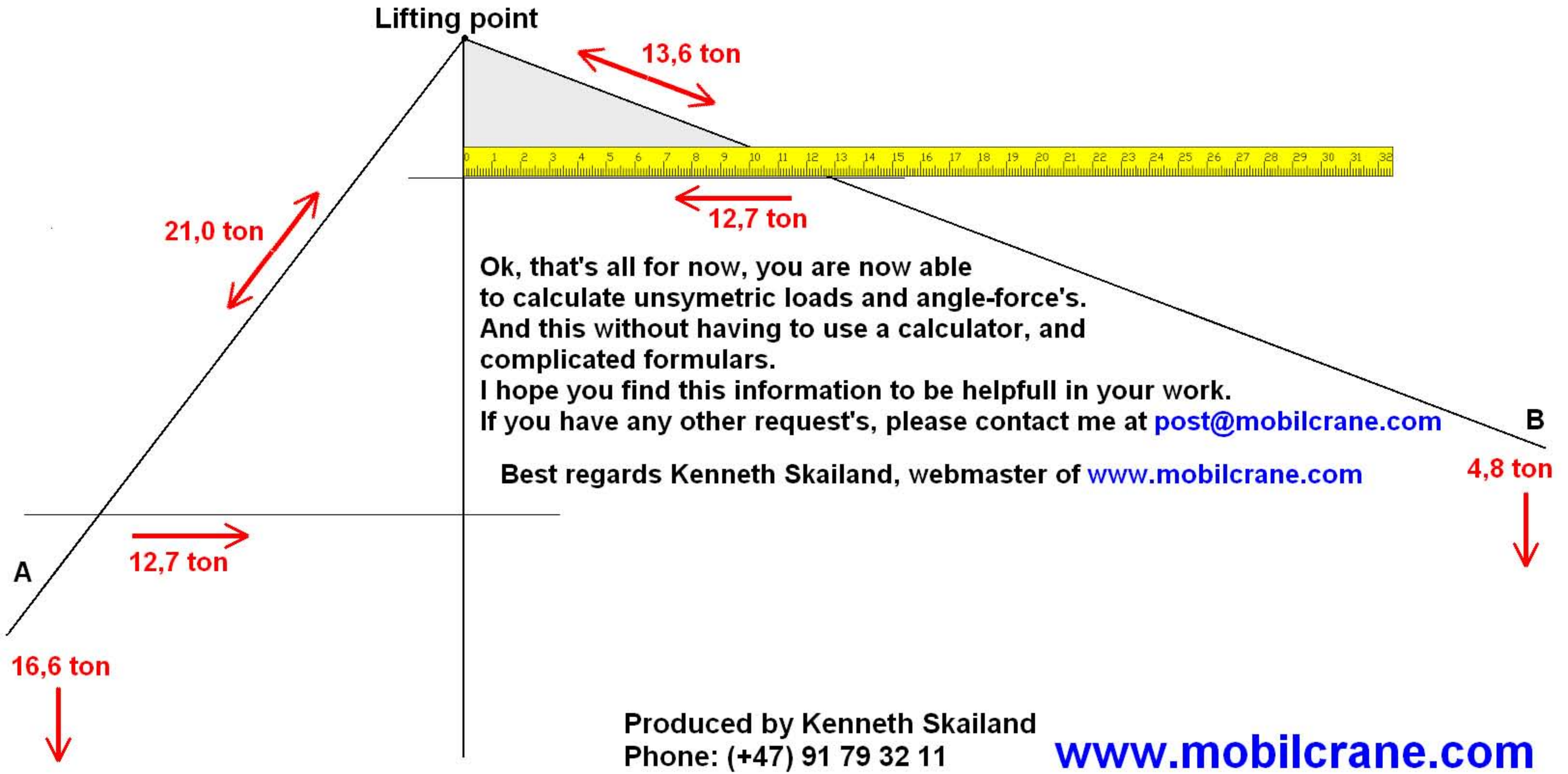

Ok, that's all for now, you are now able
to calculate unsymetric loads and angle-force's.
And this without having to use a calculator, and
complicated formulars.
I hope you find this information to be helpfull in your work.
If you have any other request's, please contact me at post@mobilcrane.com

Best regards Kenneth Skailand, webmaster of www.mobilcrane.com

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