

Computer Aided Design

Kyle Edwards

Scott Anderson

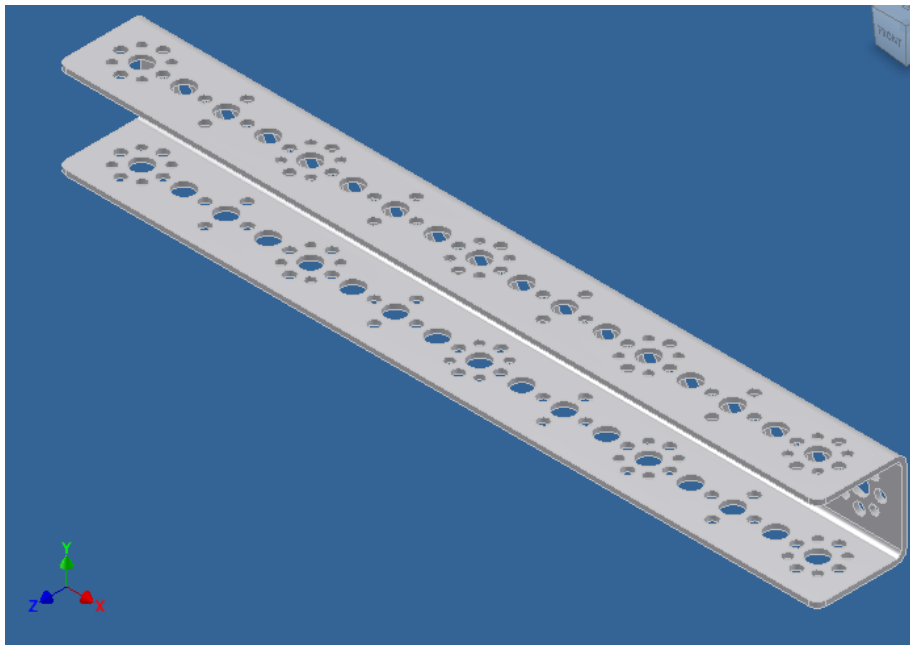
Andy Dessie

Abdul Kassamali




Christian MacMillan

Connor Stobart

The CAD team has FINALLY received the Tetrax pieces we needed!

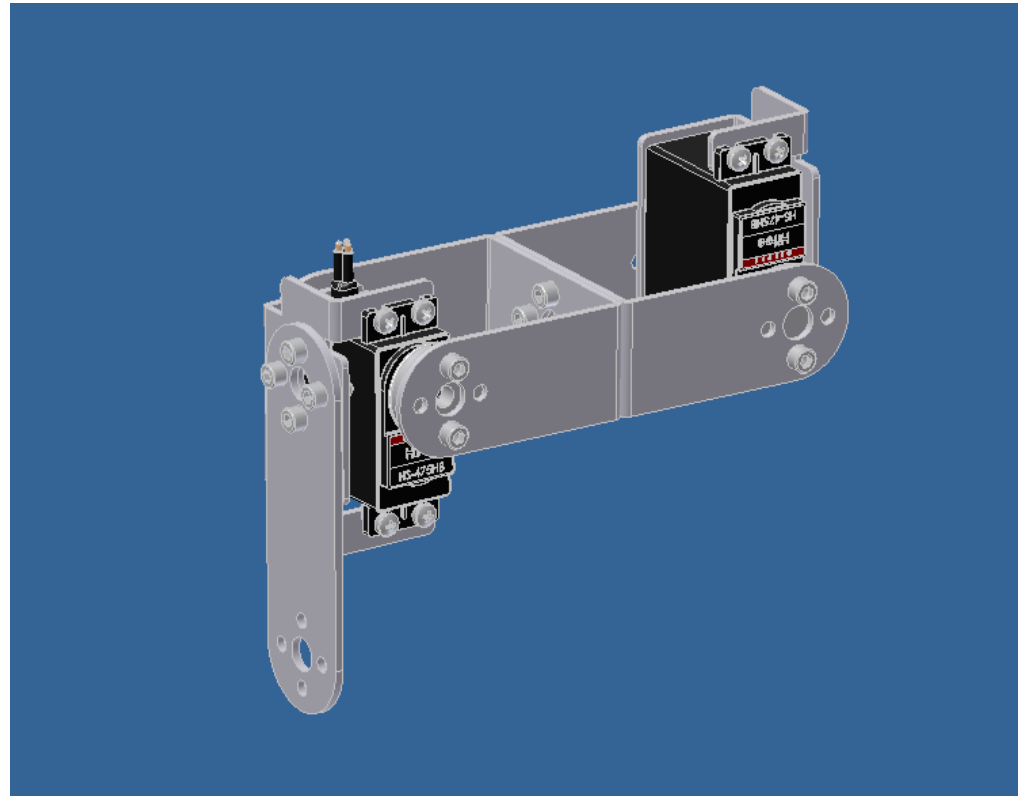
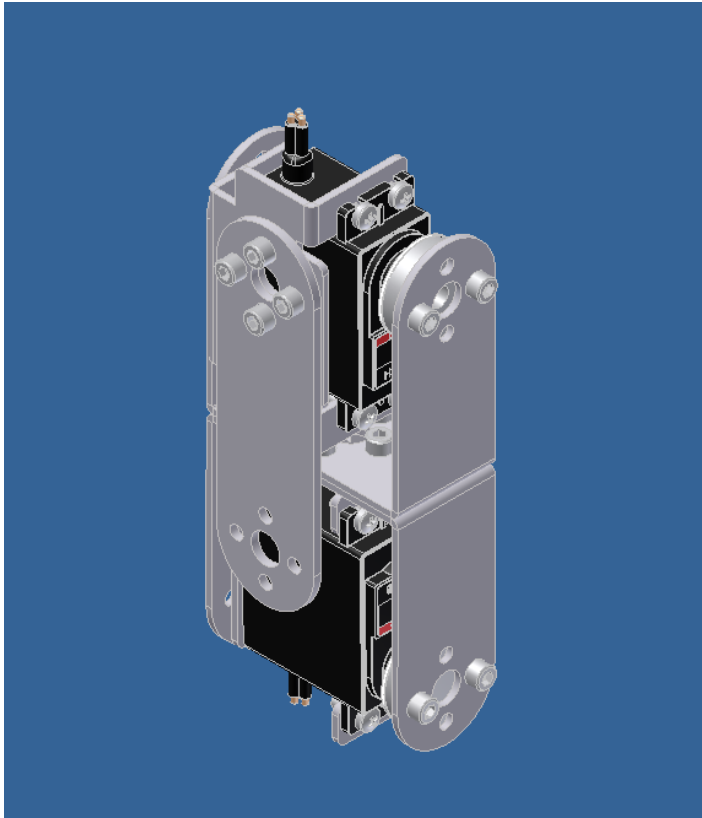


An example of a downloaded Tetrax railing

	Tetrax Name: TX 160 MM Channel Part Number: 739067 Description: 160 MM Channel 160 MM Channel Category: Robotic Accessories Tags: ftc, robotics, tetrax Contributed by: Bernie Henze	Configurations? No Downloads: 113 Added on: 28 Sep, 2009 Average rating: ☆☆☆☆☆ (TBD)
	Tetrax Name: TX 288 MM Channel Part Number: 739068 Description: 288 MM Channel 288 MM Channel Category: Robotic Accessories Tags: ftc, robotics, tetrax Contributed by: Bernie Henze	Configurations? No Downloads: 113 Added on: 28 Sep, 2009 Average rating: ☆☆☆☆☆ (TBD)
	Pitsco Name: Omni wheel joining hub Part Number: unknown Description: Omni Wheel Joining Hub for 2009kop FTC Tetrax Category: Robotic Accessories Tags: 2009kop, ftc, hub, omniwheel, tetrax Contributed by: Marie Planchard	Configurations? No Downloads: 89 Added on: 14 Sep, 2009 Average rating: ☆☆☆☆☆ (TBD)

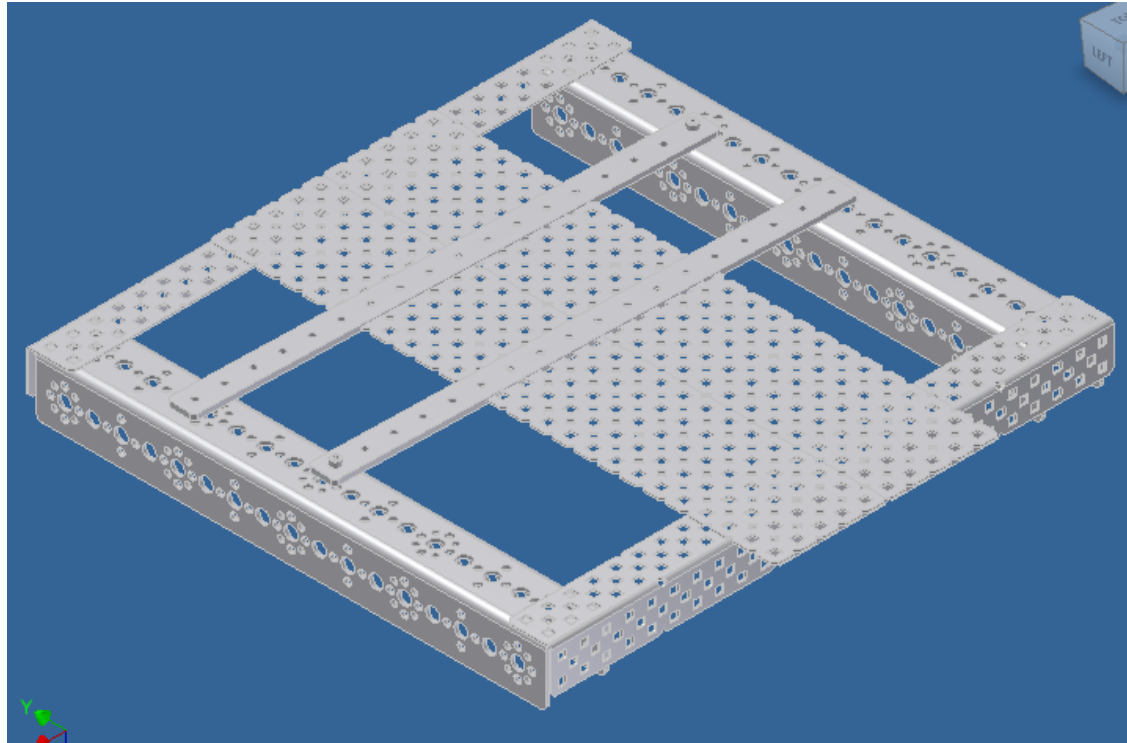
3dcontrolcenter.com has all of the Tetrax pieces that we need to use to construct the robot

With the new Tetrax parts we constructed a model of the arm.



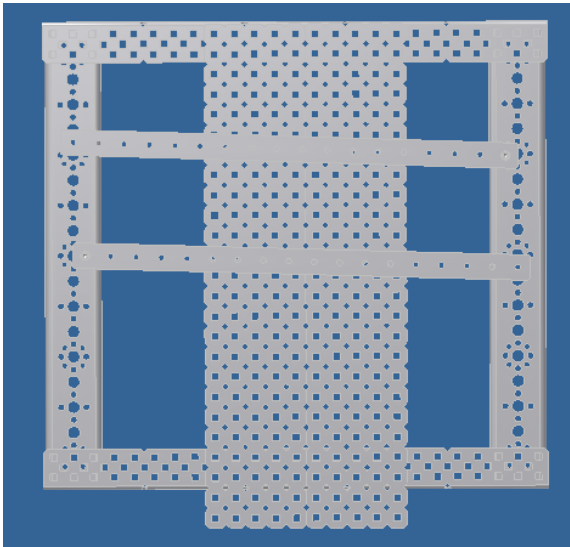
The CAD model arm has the same range of motion as the actual arm

We also spent time constructing the drive base of the robot, which is incomplete due to problems outlined in the following slides

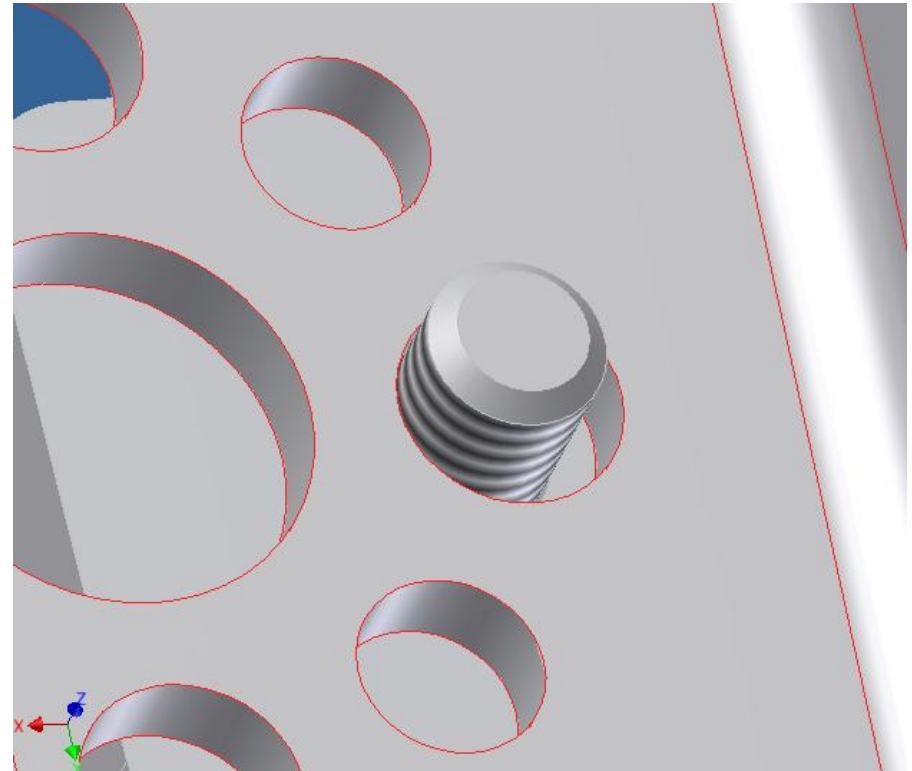


The framework for the robot drive base

The bars are crooked on the robot design, meaning that the holes don't actually line up. This required clever use of constraining to get the bar to stay in place

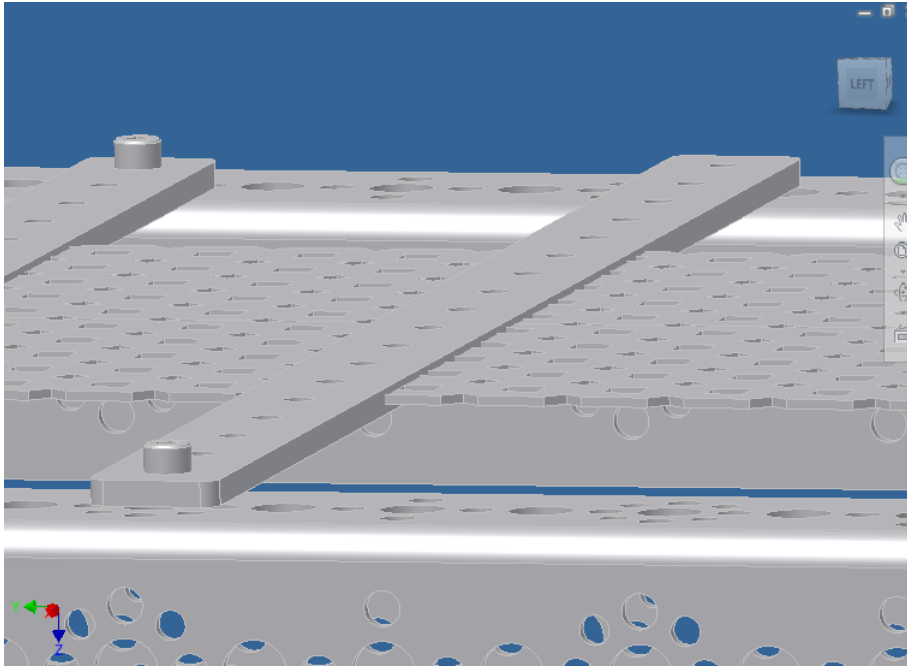


Crooked bars (above) cause the connecting holes (below) to not line up

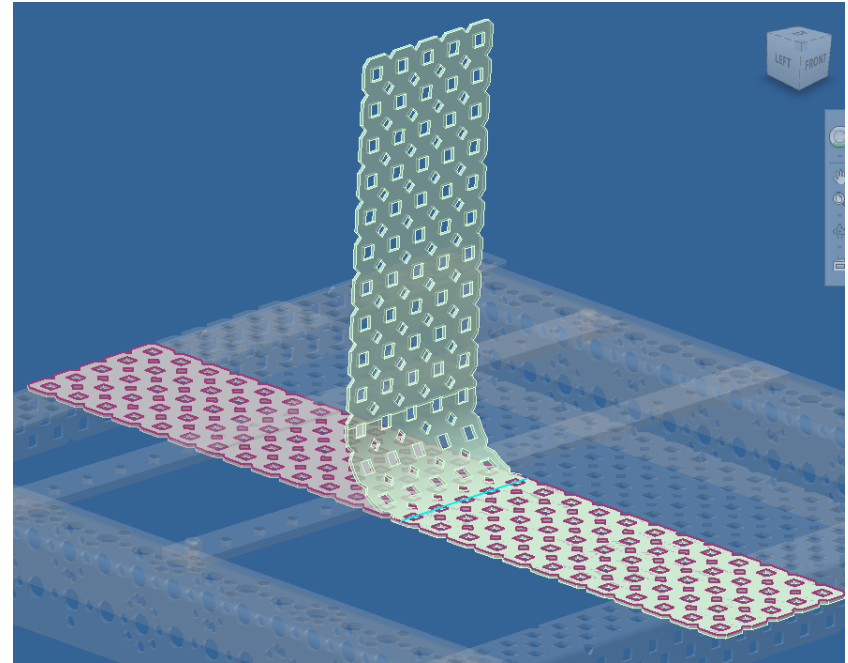


Normally in CAD we can constrain two parts together and throw the screws in for accuracy, but we actually had to use the screw to constrain the parts around

The crossbars also phase through the plate a bit, in real life bending the part to fit is easy, in CAD bending the part is a lot more complicated

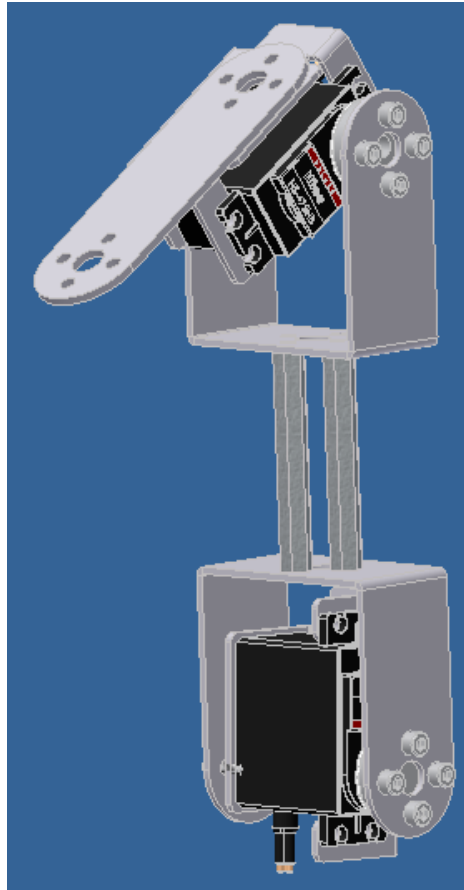


The bars phase through the plate above it, which is bad



Using the bend part function, which we will need to bend each plate four times to make it look realistic as it goes over the bars

The last problem we tend to encounter is that the build team is not giving us consistent updates as to the design changes in their robot, and we have to discover changes for ourselves



This is an old model of the arm which we realized had changed about an hour after the change occurred, to get an accurate model of the arm ready for this presentation we needed to finish it out of class

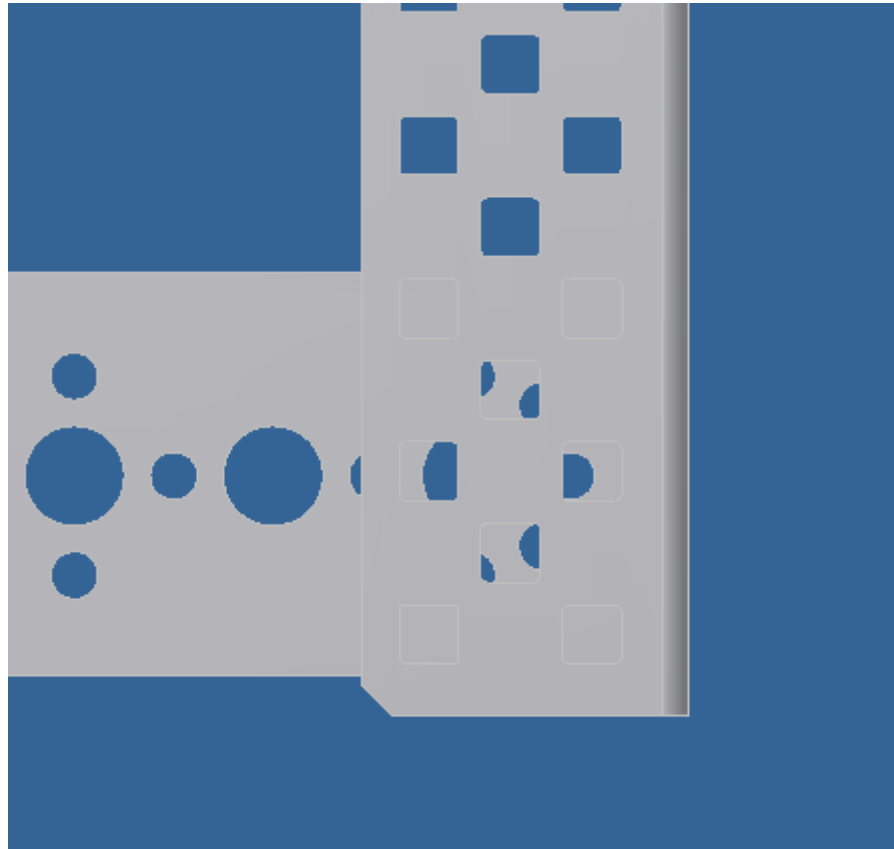
The End

Any Questions?

FAQ

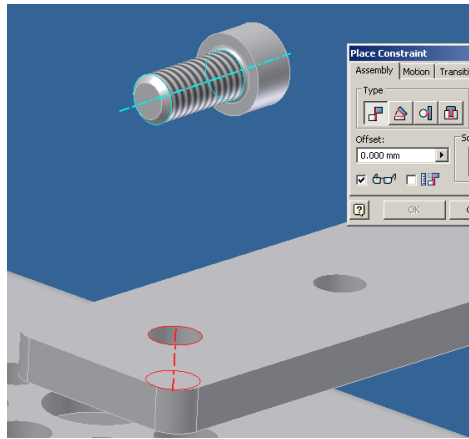
The following slides exist for the sole purpose of answering questions, these are useful in case you wanted to know a bit more information than we felt was needed for the presentation

Why did you need to download new parts?
I thought you were trying to model them

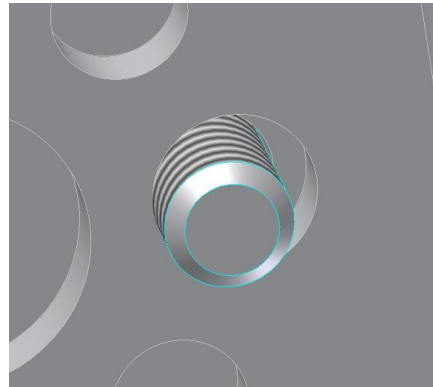


We attempted to model the Tetrix pieces on our own, but our measurements were not as exact as theirs, and thus the pieces were slightly off, and thus unusable

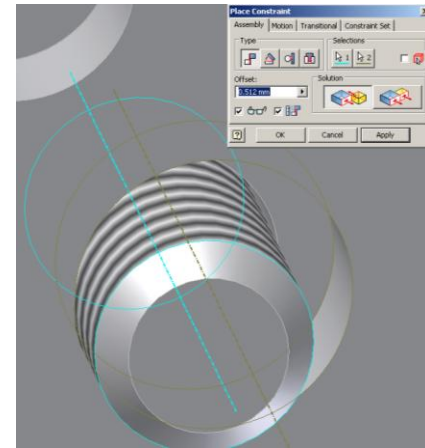
What exactly did you need to do to get the crossbars to stay?



Constrain the screw into the rail

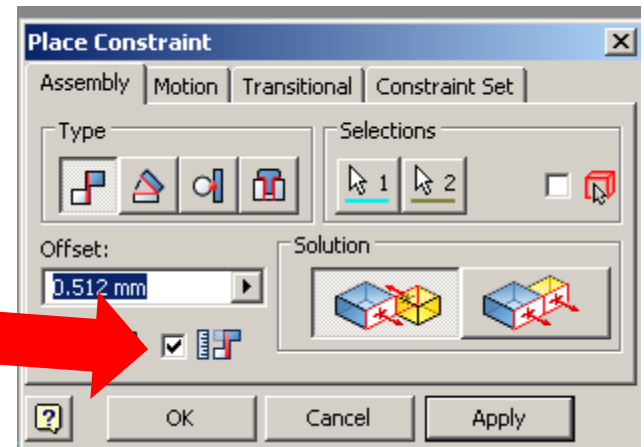


Move the bar so that the screw looks like it is about where it needs to be

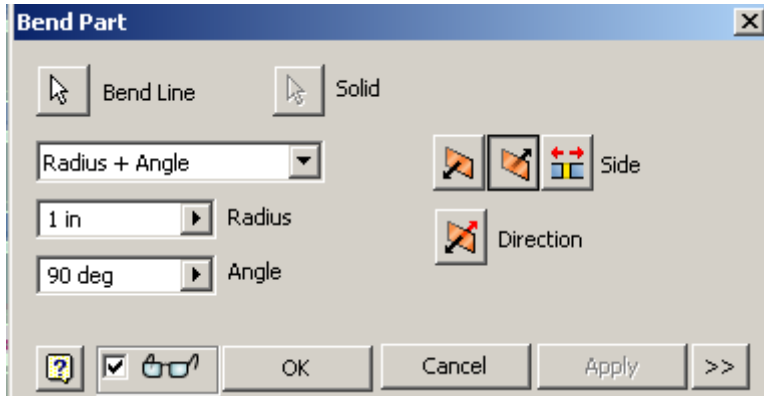


Constrain it to the second hole with "Predict offset and orientation" checked

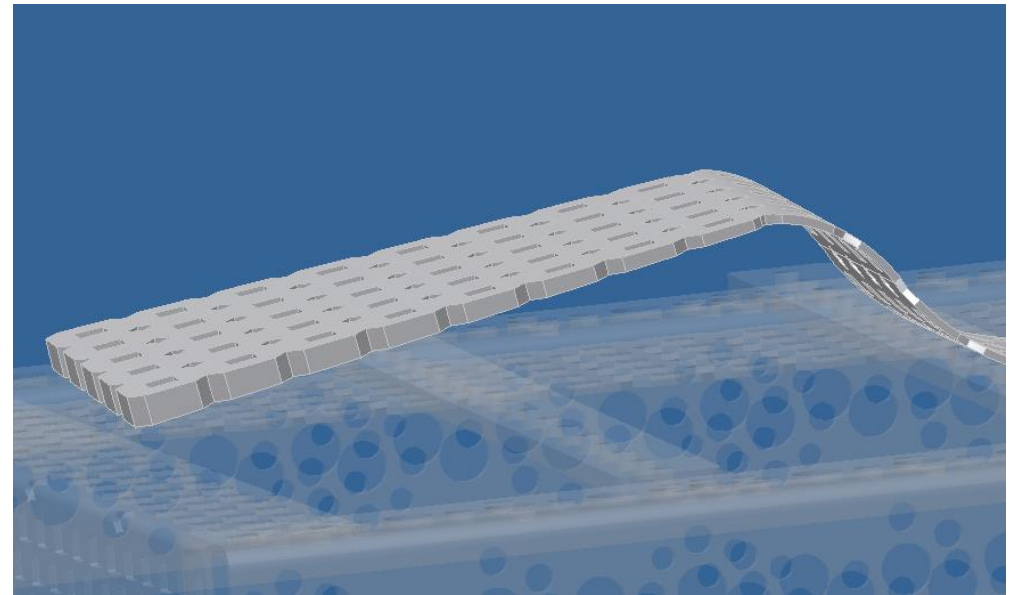
The predict offset button should constrain it to the spot that you moved it to, thus holding it there



Why is bend part so complicated to use?



So, the buttons you need to click aren't all that complicated, set the degrees you want it to curve and then set the radius of the curve



But sometimes instead of making a curve like you asked for it violently warps the part into something illogical, note how the part actually got wider at the end.