

3S Trailer Suspension

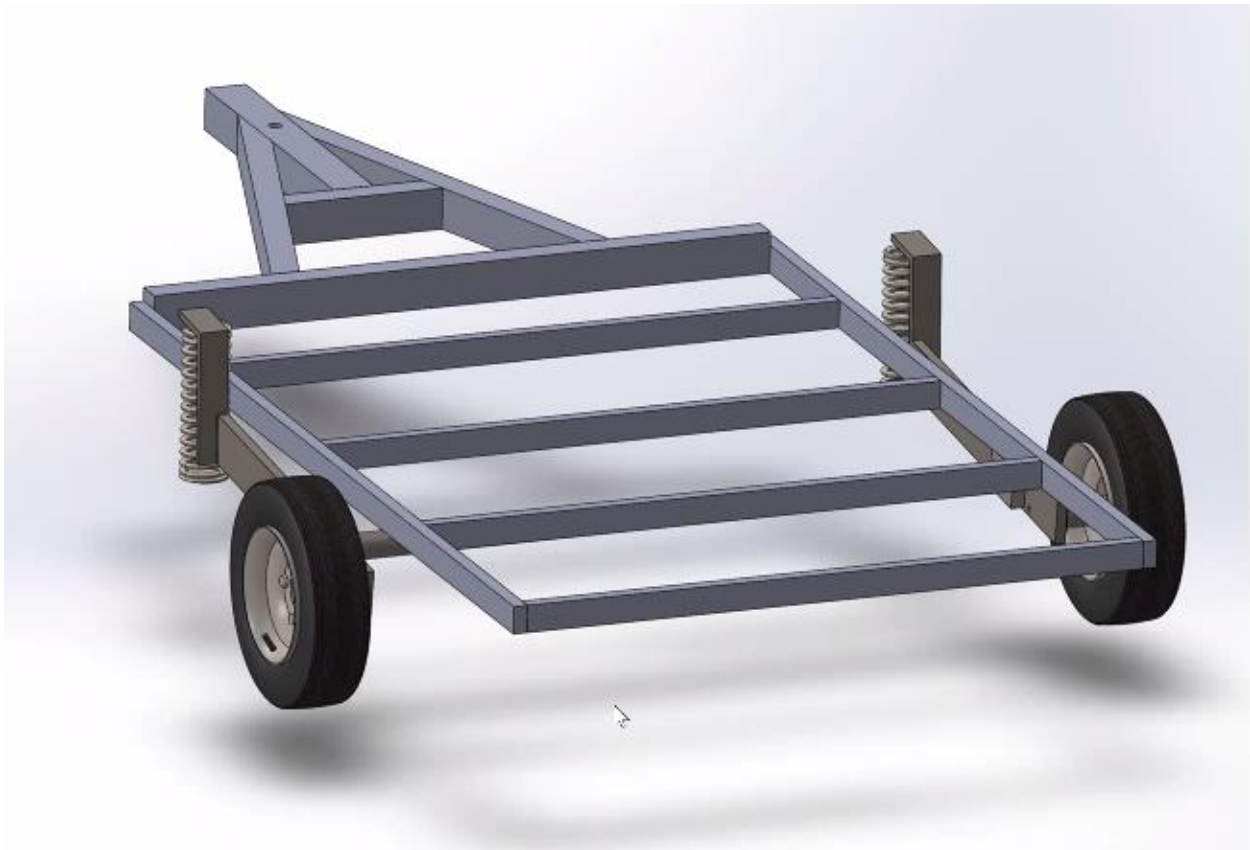
Meeting # 10

Start Date & Time: Thursday, 7/2/2020, 12:00pm

Members Present: Anson, Robert, Kirk, Caitlin

End Time: 12:40pm

Last Meeting:



- Should people send us the measurements – we press fit everything for them?
- Or we just mark all the things on the axle
- Assuming that all trailers are square steel material
- Assuming 1X2 1/8" square bar
- 3D modeled a basic trailer bed and basic trailer tongue
- How do we attach 3D printing parts to it? the axle?
- We were trying to save money and 3D printing time
- We are not actually designing the trailer - just the suspension
- For the OneDrive page – Upload – Sync button – so that we can all look at the solid works models

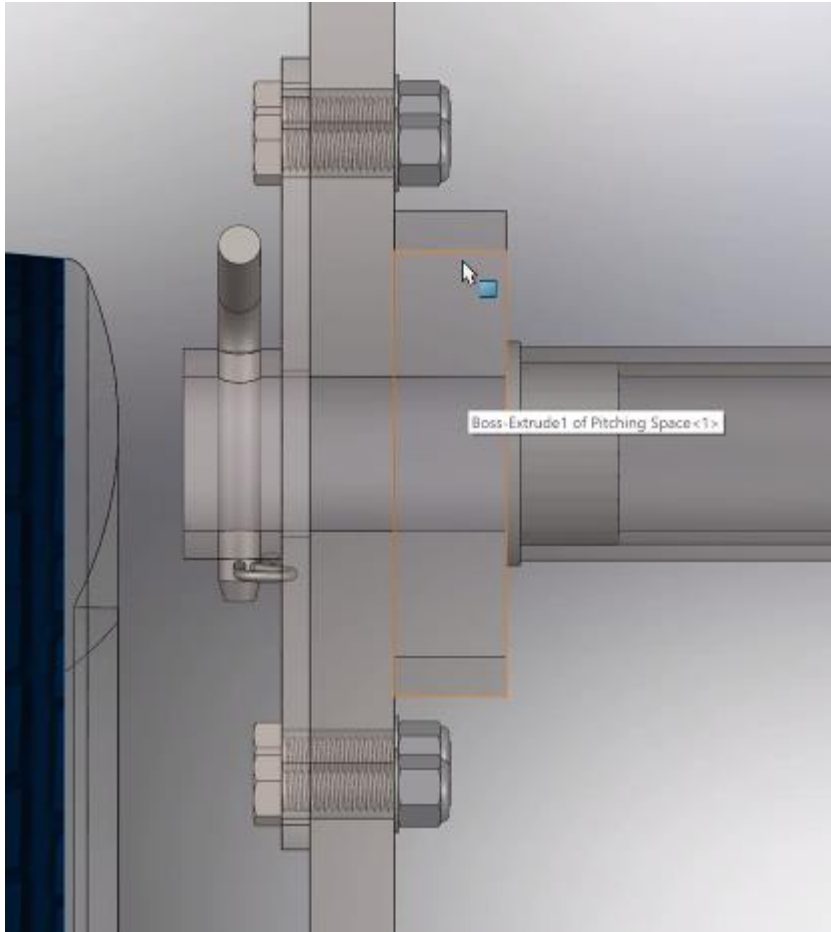
- Updating the budget
- Idea of mounting brackets
- Order the PLA, springs, and bearings.

Today's Objectives:

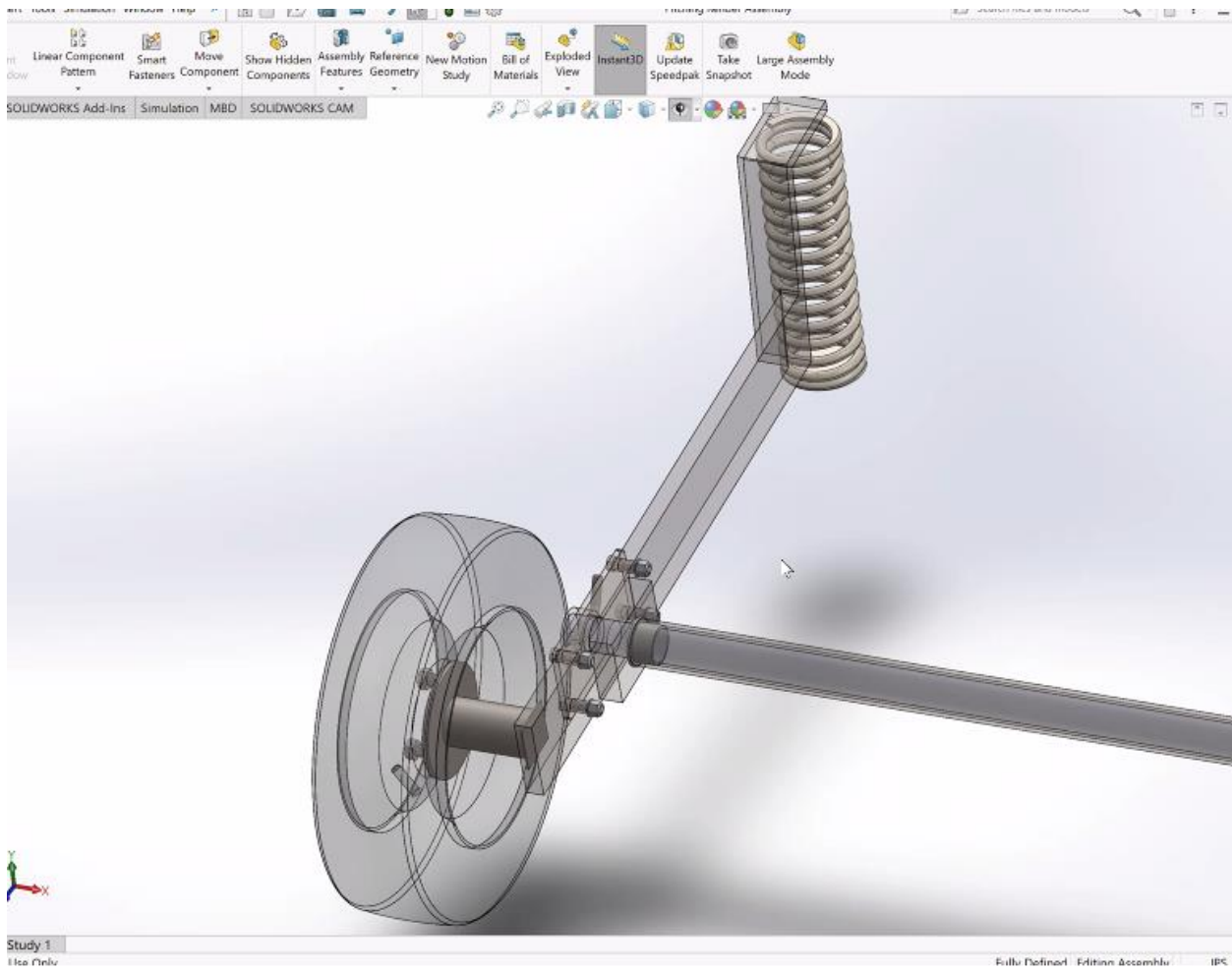
- Ask Swenson Questions that we have
 - Press fittings? Kit to buyer?
 - Purpose of spacer box inside the suspension
 - Where is the bushing?
 - Is the tube welded to another bearing so that it can rotate?
 - Tubing is welded to the sleeve bearing and where is the sleeve bearing connected to?
- Calculations with 3500lb model
- Sizing with 3500lb model
- Discuss with Swenson about our 3D representation
- Order parts/materials

Notes:

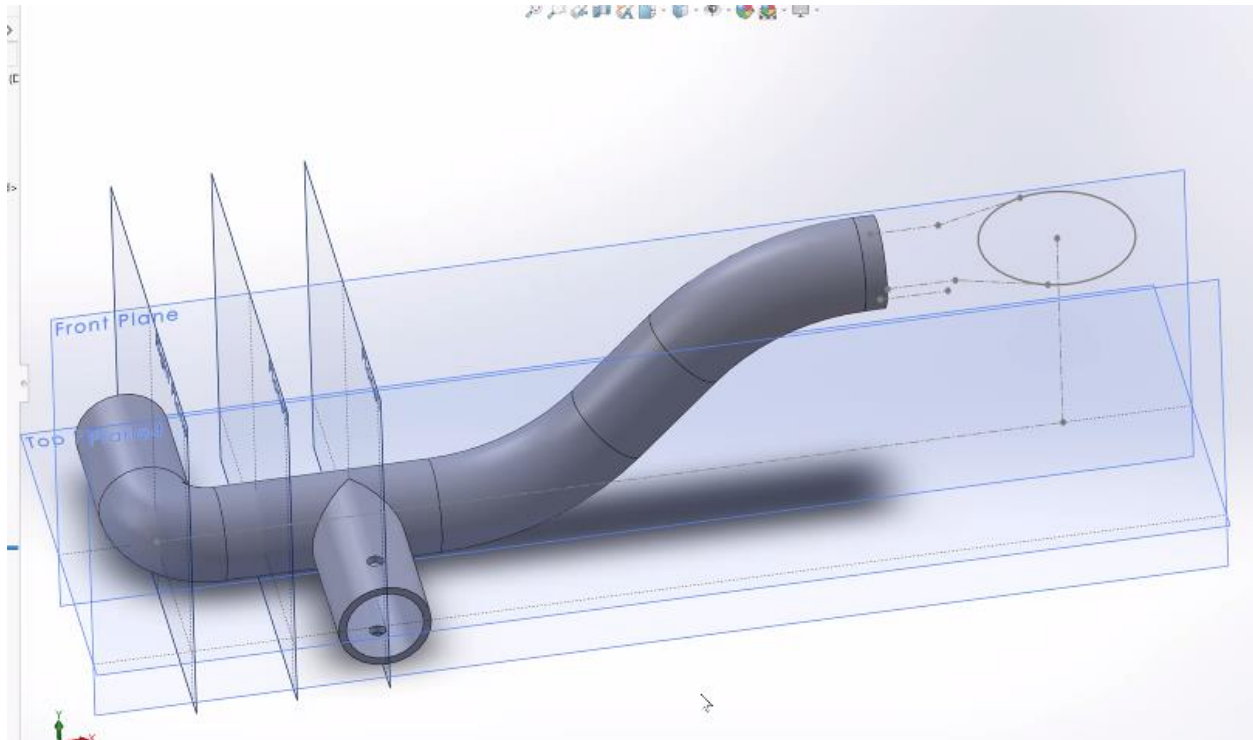
- Look at the wiki-page
- Scrap wood - revised budget
- Calculations for scaling 8:1
- Rims and springs picked out from both scaling
- Order form to Swenson
- Sleeve bearing is press fit into cover pipe
- Inner axle - inside diameter of sleeve bearing
- Flange is not welded to anything
- How does axle not fly off the road? - it does
- How do we do independent suspension then?
- End of solid shaft - weld on a flat washer that would be a retention
- If you pull the pin it still wouldn't fly off
- Must add that feature - not on it currently - weld on
- Make it big enough and thick enough
- Not actual washer - made piece



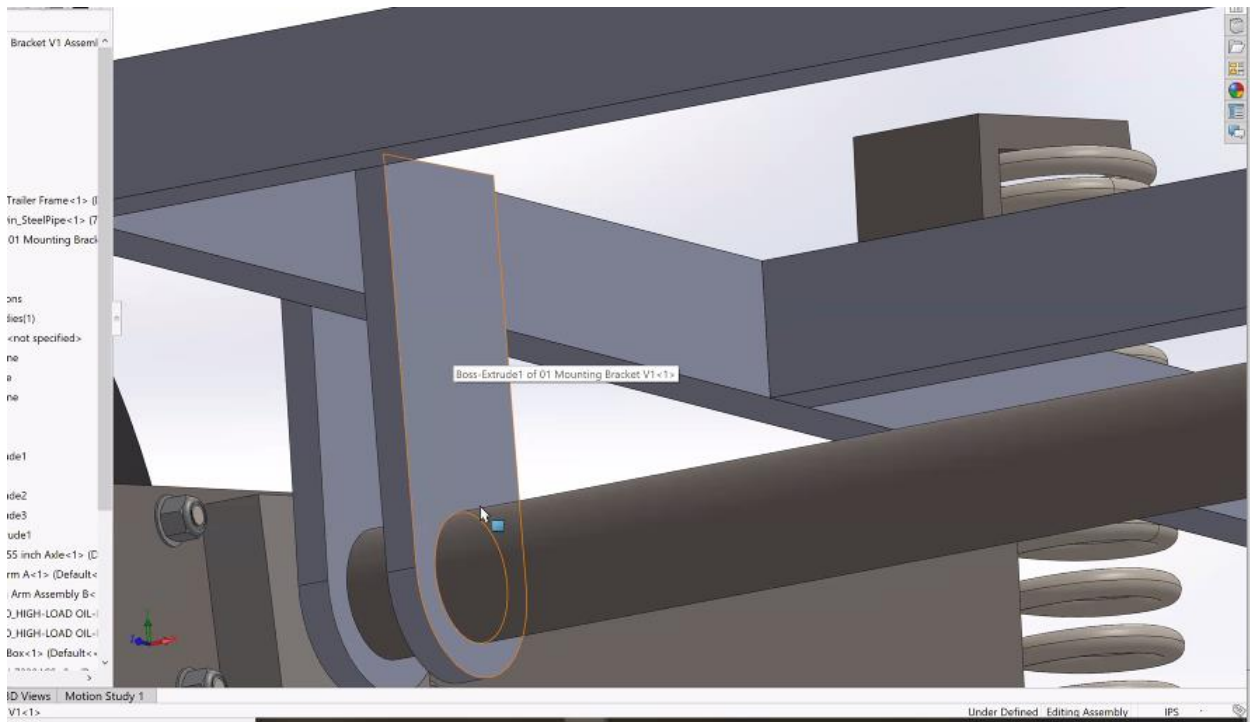
- That piece is left over from previous project - actual prototype don't need it in our actual design
- That piece mates to the flange bearing - still worthwhile to have
- Make sure it doesn't rub against the frame
- Must use a flange bearing
- Pick correct lever ratio selecting spring



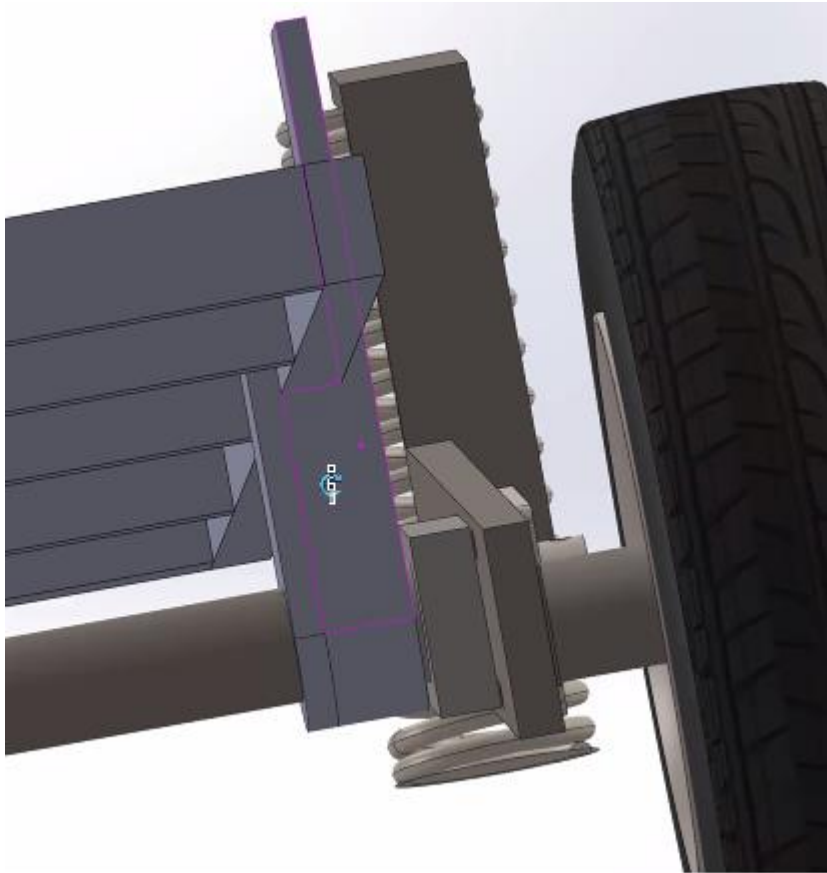
- Settle on a lever ratio
- Finite element analysis - to resolve stresses

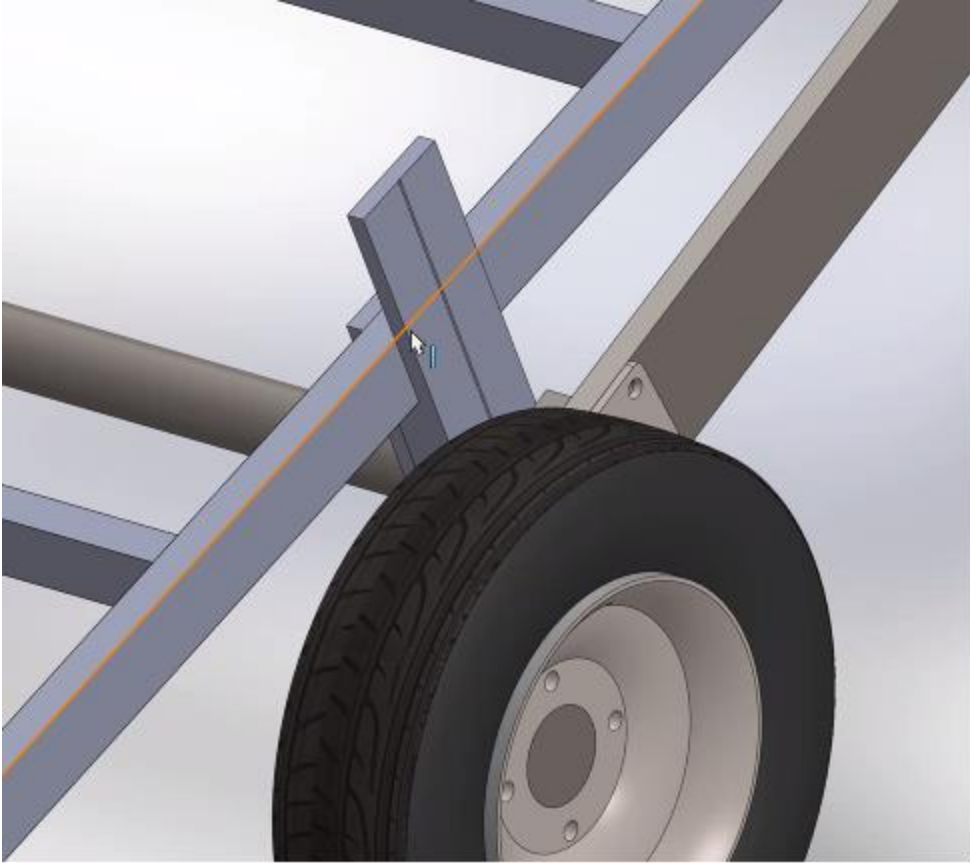


- Rob came up with this bent bar

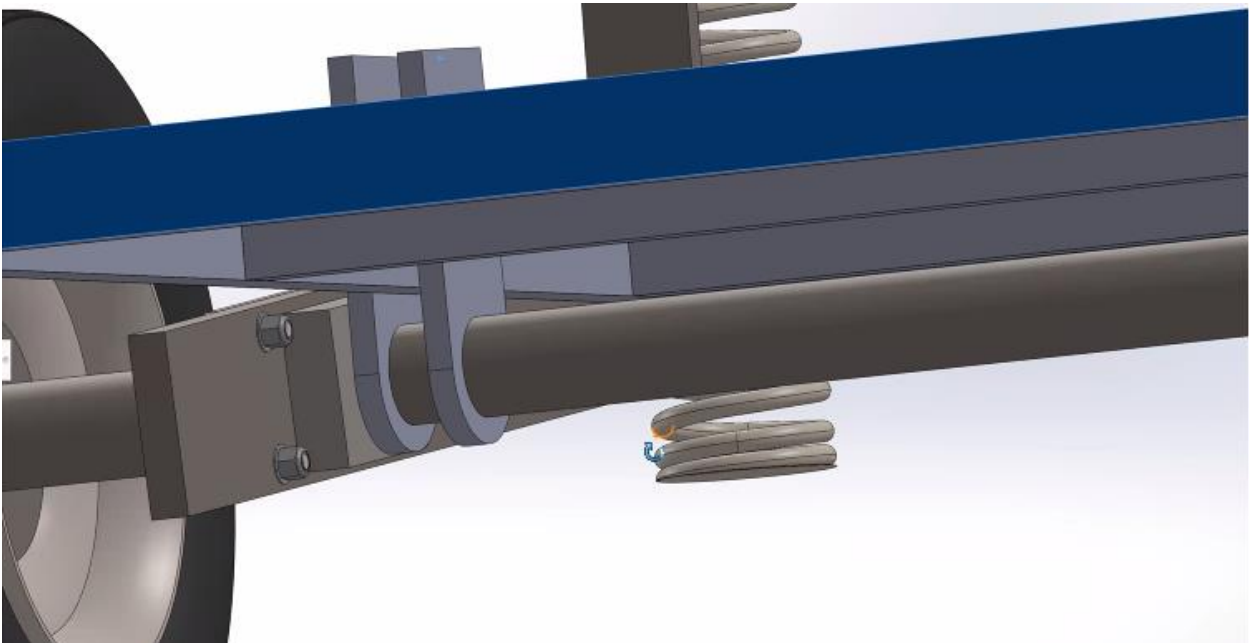


- Possible mount for trailer?





- Could cut the top off and reuse it in a different part
- Move the axle up as close to the bottom of the frame as possible



- Revised and Swenson likes this way more
- No rubbing will be happening
- Could possibly have them touch?
- Tubing that covers the axle doesn't need to be the whole way over just for the mounting
- Would save a bunch of material!
- Scaling of the prototype - 1:8 1:16
- Parts are readily available - most are

Scale	Base	Height	Spring	Tongue
1:1	4 ft	8 ft	12 in	40 in
1:2	2 ft	4 ft	6 in	20 in
1:4	1 ft	2 ft	3 in	10 in
1:8	.5 ft	1 ft	1.5 in	5 in
1:16	.25 ft	.5 ft	.75 in	2.5 in

- Leaning towards the 1:8 scale
- 4X6 - 0.75 - 9inchs long on the bed - 13in

1:8 scale is chosen!

- Spring will be the same
- Find grounded ends - so it's easier to capture
- Didn't want too big or too small
- Wheels and tires - what size are they starting from because they have a scale
- From the budget we have found a 1:10 scale



- Smaller the tire - doesn't cover up the axle or anything
- Our design is still not good enough we need to rework the design
- Wants lever ratio changed!

For Next Time:

- Robert/Kirk - Work on Finite element
- Caitlin/Anson - Change and test lever ratios – 3 choices

Comments/Concerns/Reflections from Today:

- Need to have exactly what we want for Tuesday meeting to send out the purchase list.

Next Meeting Time & Date: **Monday, 7/06/2020 @ 12:00pm**