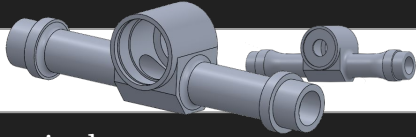


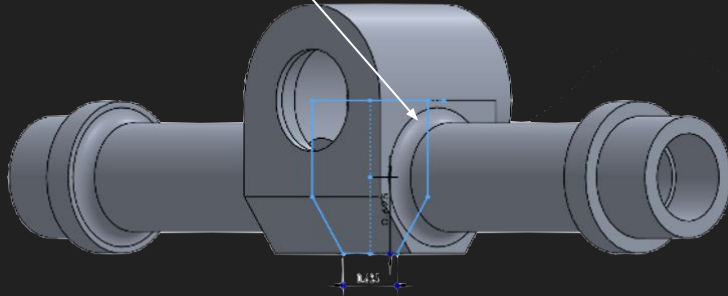
Steering Rack Housing

SR23

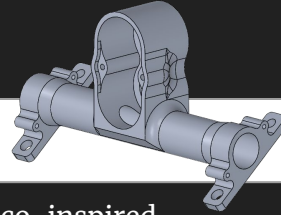


NARRco-inspired

- Bottom section in the middle juts out
- Weak fillets (too small \rightarrow big stress concentrations)

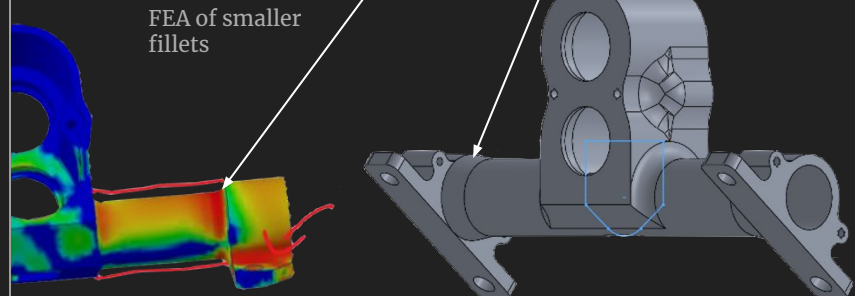


SR24



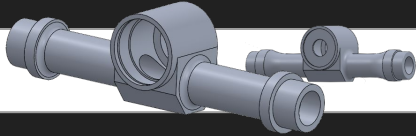
Less NARRco-inspired

- Bottom section is tangent to curve of rack housing
 - Saves stock
 - More machinable
- Bigger fillets/lofts for better support and lower stress concentrations (based on FEA)



Steering Rack Housing

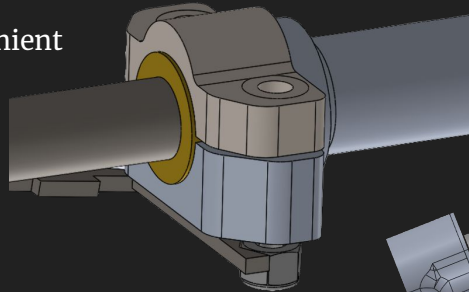
SR23



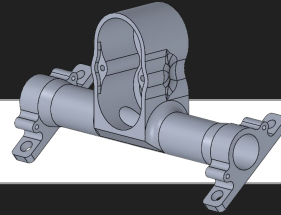
One pinion

Clamps separate

- Mounting was inconvenient



SR24

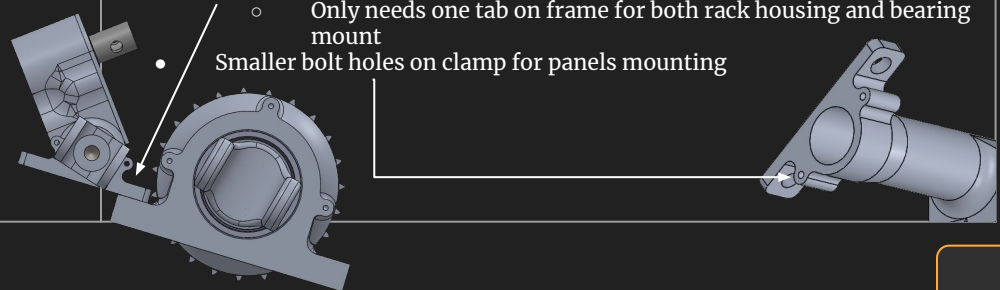


Two pinions

- Steering rack moved to front so directions are opposite
 - Ergonomics
 - Chain moved to center
 - Tie rods now get pulled when wheels are impacted
 - Tie rods stronger in tension than in compression

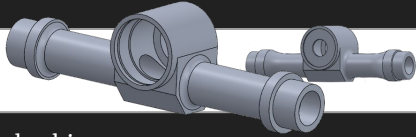
Clamps integrated

- Fixes issue of implementing in overall assembly
 - Easier to mount as the clamps are at a stable angle relative to the housing
- More efficient use of stock
 - Stock around the ends of the housing no longer need to be taken off
- Also mates directly with bearing mount of the front output shaft
 - Only needs one tab on frame for both rack housing and bearing mount
- Smaller bolt holes on clamp for panels mounting



Steering Rack Housing

SR23

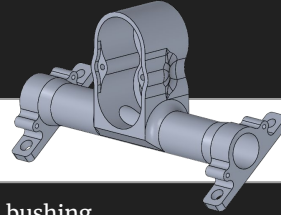


Thinner brass bushing

- Sizing based on NARRco
- Thinner walls
 - Harder to machine

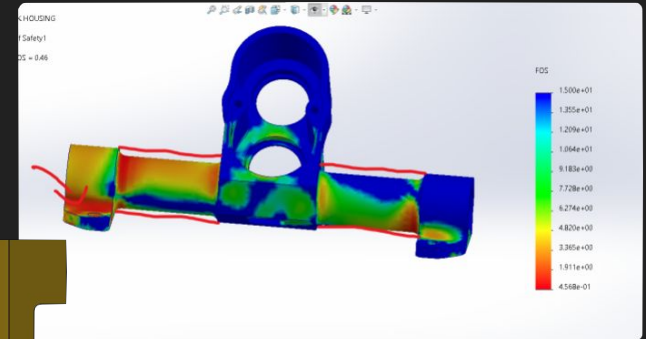


SR24



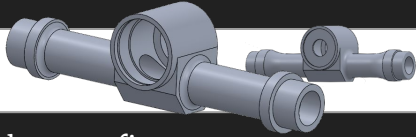
Thicker brass bushing

- Changed from last year's bushing because of FEA results
 - Results showed that the filleted internal corner on the left had a huge stress concentration, so that corner needs to be better reinforced
 - In order for that to happen, the walls need to be thicker for there to be more space to fillet



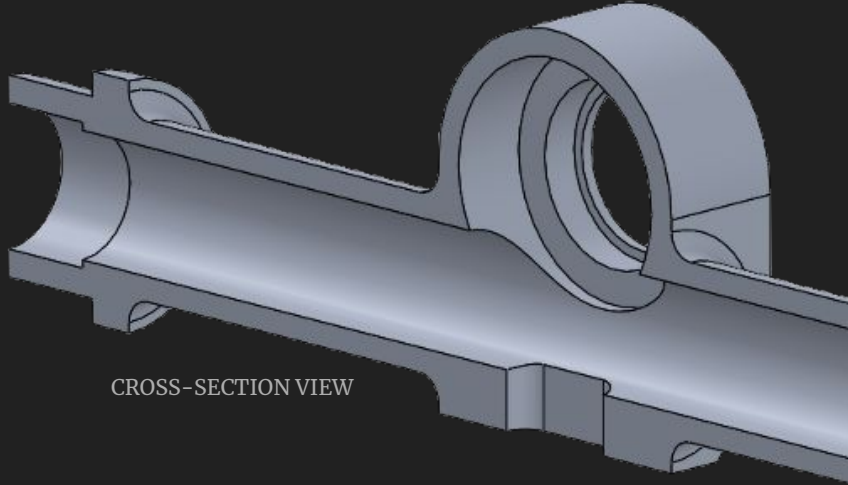
Steering Rack Housing

SR23



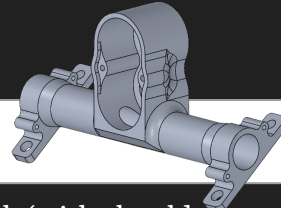
Pillow block press-fit

- Pillow block slips out of the bottom over time due to compression stresses that bend the rack in the middle



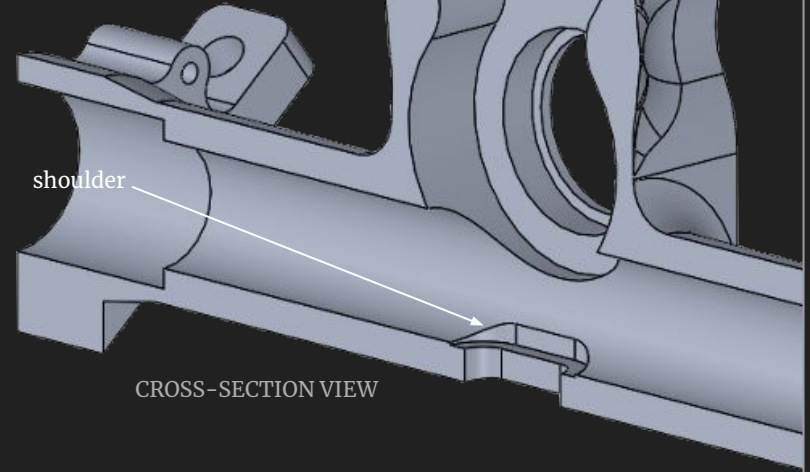
CROSS-SECTION VIEW

SR24



Pillow block (with shoulder) press-fit

- More secure way to keep pillow block in and therefore keep the rack straight
- Machined on CNC with undercut end mill



CROSS-SECTION VIEW