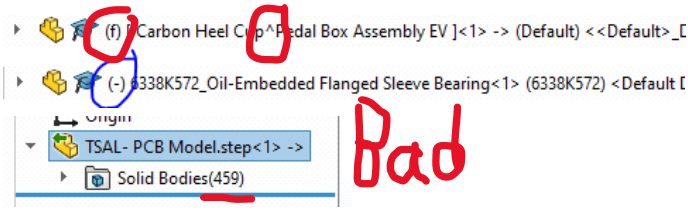
CAD Guidelines

Sunday, October 1, 2023 7:34 PM

- Suppress/delete threads on fasteners (delete preferred) except for critical fasteners
- Make configuration for assemblies and subassemblies with fasteners suppressed for main static
- Create folders for things that there are many within an assembly of like fasteners or hardware items (this also makes it easier to suppress and unsuppress fasteners in configurations)
- Do not mate your parts by relying on the fasteners - when they are suppressed, you will lose them
- No fixed mates **(f)** , no parts that aren't fully defined **(-)** , and no nested parts **^** - save them externally
- No blue sketches
- No parts files in Main Static - only the main subassemblies should be in there
- Check parts in when not being edited
- Make sure to 'get latest' when editing a part/assembly
- Use professional names that describe what the part/assembly is
- Make a copy of each part for each successive car
- Add parts to PDM and respective assemblies before presenting your CAD in a design review
-



Working in SolidWorks PDM

Tuesday, November 28, 2023 1:29 PM

This will be a guide explaining how to use PDM and how to integrate CAD into our CAD structure

Note: As of now this guide is incomplete

The Basics/Getting Started:

- Any file needs to be in PDM
    - i.e.; open file explorer, open PDM, copy the file into the appropriate PDM file
- Any part/assembly you're working on needs to be checked out, your changes will not be saved if it is not checked out
    - There are many ways to tell if a part is checked out or not, SolidWorks generally warns you multiple times that a part is not checked out if you try to edit it
    - If someone has the part checked out, you cannot work on it
        - Often times the part is just checked out on the adjacent computer
- When you are done with a part/assembly, it needs to be checked back in
    - Your changes will not be saved unless you do so, again there are multiple ways to check a part in

Aero CAD

Sunday, October 1, 2023 9:02 PM

Rules:

- Maintain an updated aero box in the aerodynamics assembly
- Have a separate part file for the base geometry that may be used in CFD than the structural assembly
- Break references when making structural CAD
- Undertray shall be co-located
- FW and RW do not need to be co-located, however, their structural parts shall be co-located to the FW and RW assemblies
- I used to like the idea of referencing the aero assembly for the CFD assembly but I learned that in practice it make more sense to keep them separate - Nathan Fairlie

Current Issues:

EV CAD

Sunday, October 1, 2023 9:02 PM

- Suppress all but 1-2 modules for main static (leave the edge case in)
- Suppress all but 1-2 segments for main static (leave the edge case in)
- CAD HV cables with allowable bend radius

LV CAD (Including ACCU)

Sunday, October 1, 2023 9:02 PM

- NO STEP FILES - save PCBs as SLDPRTs with 1 body
- Make a configuration suppressing
- Wire CAD not needed unless bend radius is a concern

Issues:
IC:

- [ ] Dash
  - [ ] Needs to be updated to newest version

VD/SUSPENSION CAD (Chassis, Static, Dynamic)

Sunday, October 1, 2023 9:03 PM

Left side suspension only in Main Static
Mirror Suspension at Chassis assembly level not subassembly level

Current Issues:

IC:

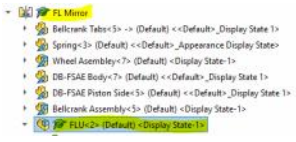
- [x] Wheel Assemblies
  - [x] Need to be mirrored
    - [x] Errors during mirror for uprights? (Have to be extraordinarily specific) (Seems to work if sub-assemblies are gone thru component by component in the mirror component function, minimizing the number of Opposite Hand Version mirrors)
  - [x] Needs Right Side Uprights
  - [x] Bolts and Nuts
  - [x] Front
    - [x] Missing Hub
      - [x] Bearings
      - [x] Tension Cap
    - [x] Missing Brake Assembly
      - [x] Caliper
      - [x] Rotor
      - [x] Rotor Buttons
  - [x] Rear
    - [x] Missing Hub
      - [x] Bearings
      - [x] Tension Cap
    - [x] Missing Brake Assembly
      - [x] Caliper
      - [x] Rotor
      - [x] Rotor Buttons
- [x] Steering
  - [x] Bolts and nuts
  - [x] Missing
    - [x] Steering Rack Clevis
    - [x] Steering to Wheel Connection
    - [x] Bushing
    - [x] Steering Wheel Assembly
- [x] Pneumatics
- [ ] Firewall
- [ ] Floorpans
- [ ] Pedal Box

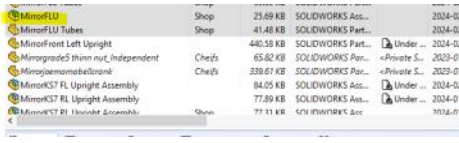
EV:

- [x] Static Kinematics not lining up with steering, control arms, & uprights?
- [x] Wheel Assemblies
  - [x] Will need mirroring
  - [x] Nuts and Bolts
  - [x] Not transferred to EV CAD from IC
- [x] Steering Assembly
  - [x] Missing
  - [x] Needs to be modified to fit EV chassis
- [x] Front Left Outboard Assembly
  - [x] Missing Pushrod mounting tab and box
- [x] Hardware for Rear
- [x] Replace RLL and RLU assemblies with KS7-C (currently referencing KS5-E)

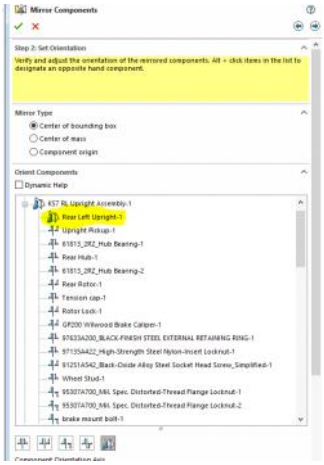
FOR MIRRORING PARTS

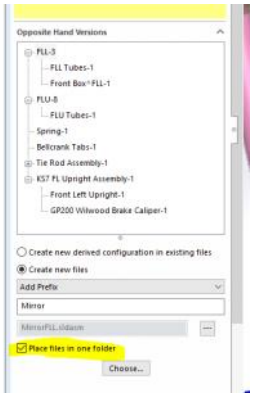
MUST DELETE OLD MIRROR FILES IF THEY ARE THE SAME PART NAME! PDM REFUSES TO OVERWRITE FILE NAMES AND WILL CAUSE THE MIRRORS TO FAIL EVEN IF THEY LOOK RIGHT IN THE PREVIEW. The resulting mirror will take the normal part file, and attempt a mirror. This will lead to a non-mirrored part, like the FLU highlightled in the feature manager. It is an opposite hand mirror, so it should be called MirrorFLU, not FLU in the feature manager tree. But because there is already a file called MirrorFLU in the PDM, it will refuse to overwrite the file. This will cause it to mirror in the wrong spot regardless of which mirror type you choose.





When you mirror opposite hand ASSEMBLIES, only choose the parts that need to be opposite hand. These are typically 3D sketch tubes and tabs that do not want to mirror properly. Things like Uprights and Control Arm Boxes actually need to be opposite hand version. Then when saving the parts, make sure to check "Place files in one folder". Save to the Mirrored Parts folder in the proper sub assembly. THIS ALL HAS TO BE DONE IN ONE STEP OR ELSE IT WILL SCATTER THE MIRROR PARTS THROUGHOUT THE VARIOUS SUBFOLDERS .





FRAME CAD

Sunday, October 1, 2023 9:03 PM

EnD CAD

Friday, December 8, 2023 8:28 PM

Issues:

- [ ] Cooling
  - [ ] Needs to be rerouted to not interfere with headers
- [ ] Driveline
  - [ ] Axles not in proper spots
- [ ] Items in following image not in proper sub-assembly

a

Instruments and Wiring

Wednesday, December 13, 2023 5:34 PM

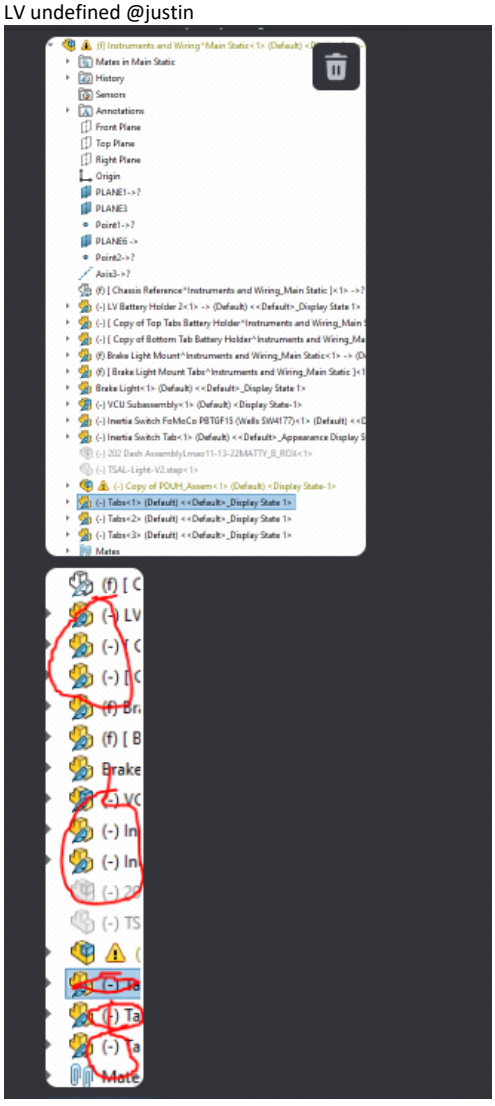
Drawings

Wednesday, October 11, 2023 12:37 AM

2023 winter CAD issues

Wednesday, December 20, 2023 12:56 AM

LV undefined @justin



Kennesaw Motorsport Computers Today at 12:23 AM

List of major things missing from E-Car Assembly: (edited)

1

Seat

Headrest

Steering

Pedal Box

Outboard assemblies

FW Mount

yoke plate inserts

floor tabs

@Sam Yang | Garnet Guzzler @Grayson Legg | Fancy Footwork @Josh Bray - Secret Chef These parts are mainly y'alls scope

List of major things missing from IC:

Firewall (actually EV as well)

pedal box

Kennesaw Motorsport Computers Today at 12:31 AM

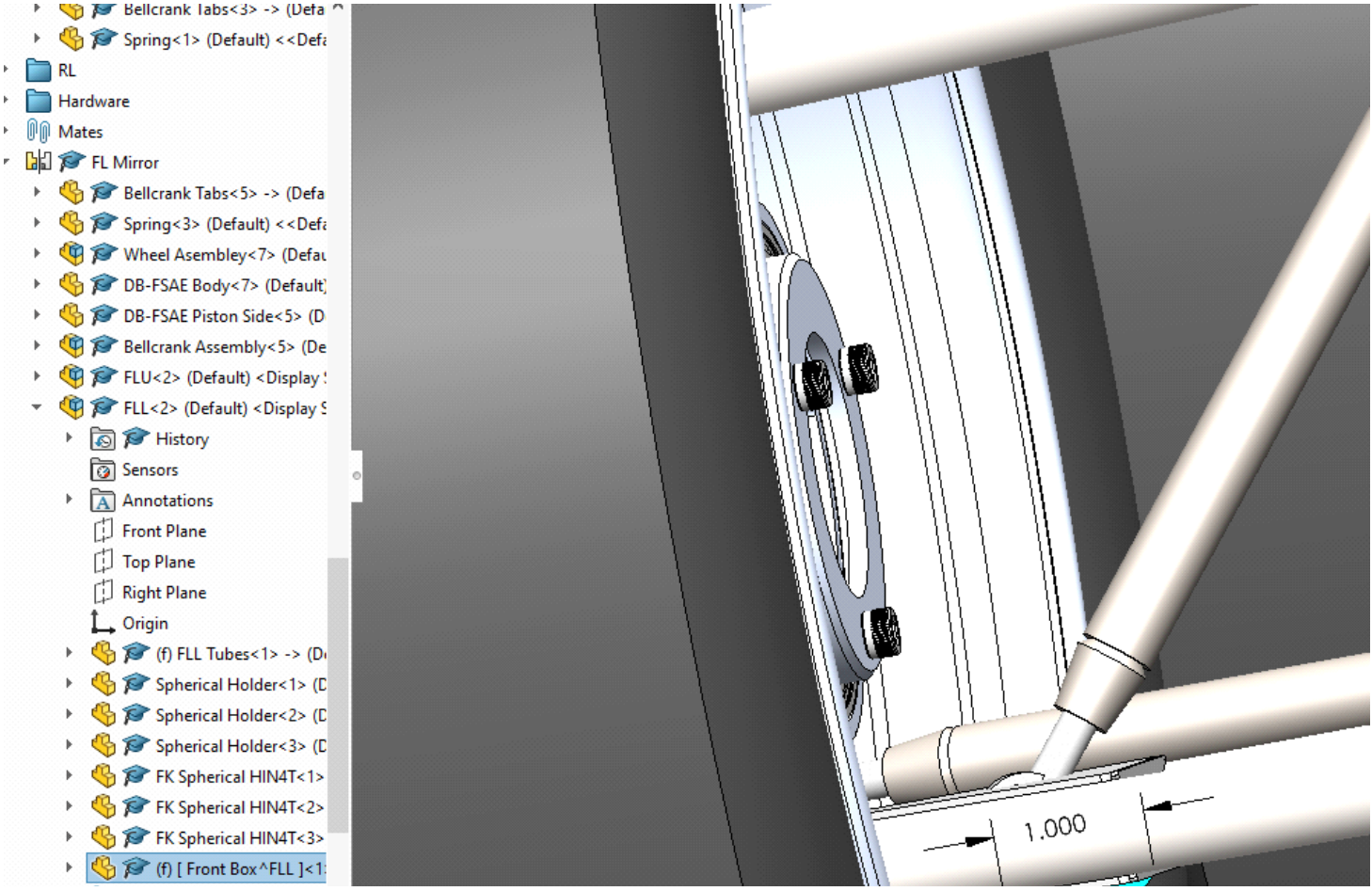
pneumatic shifting

rear axle not in right place

rear suspension messed up

fuel cap

@Brenden Mitchell | BONK



Tie rod tab flipped and tie rod collides