1/64 Drift RC Car

DKM64 V5

Build Guide

[Drift video of DKM64 V5 in action]

Main Improvements of V5 vs V4:

- New rear Gearbox with CVD and Gears.
- New rear independent suspension system.
- New 0610 motor.
- New H-sliding bar for rear Gearbox.
- Tuned front arm, servo horn and linkage lengths for less binding with linear servo.
- Shorter front chassis-A for new rear gearbox size.
- New Rear V5 wheels (only suitable for Gearbox system, which has a bigger hub bearing).

A. Chassis dimensions:

- Wheel-base: 38.7 to 41.3 mm
  - H-bar slider: +/- 2.6mm
- Front wheel width: 31.6 mm
- Rear wheel width: 32.0 mm

B. 3D Print files:

- 13 files to complete a V3.4 car kit
  - Front: 12 files
  - Rear gearbox with independent suspension: 18 files
  - V5 Wheels: 5 files (print 2x for left and right side)
- Optional Files:
  - 2 files for 3D Linear Servo (Tool for ensuring the front steering linkage is smooth).
  - 2 files for V3 Rear no suspension
  - 2 files for V4 Rear rolling suspension system
  - **Optional files** for **Rear Magnet Mount [car's body mounting height]:**
    - 6.5mm [optional]
    - 7.3mm [default]
    - 8.0mm [optional]

C. Front Screw Type Knuckle joints

- **Screw's head size:** 0.5mm thick, 1.65 to 1.7mm diameter, Philips (cross). Should be quite standard for M1.0 screw type.
- **Top screw size:** M1.0 x 2.5mm tread length
- **Bottom screw** size: M1.0 x 2.0mm tread length
- **Steering linkage screw size:** M1.0 x 2.5mm tread length
- **Do not overtighten when installing the screws.**

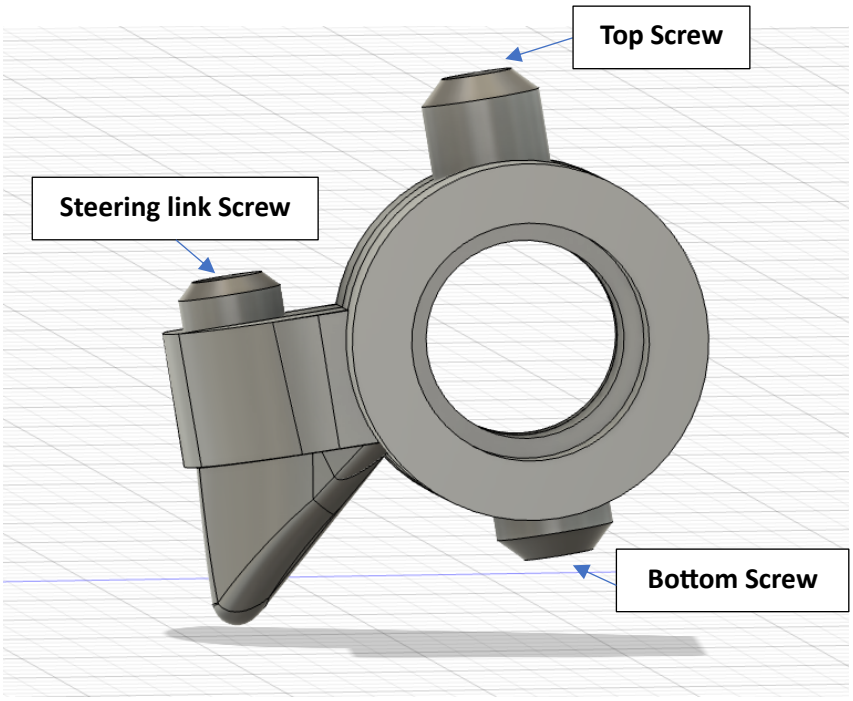


Fig1: Front Steering Knuckle

Build Video: DKM64 V4 preparing screw joint knuckles

D. Build Video: DKM64 V4 wheel installation to knuckles

E. Build Video: DKM64 V4 preparing main Chassis-A

F. Rear Gearbox with Independent Suspension System

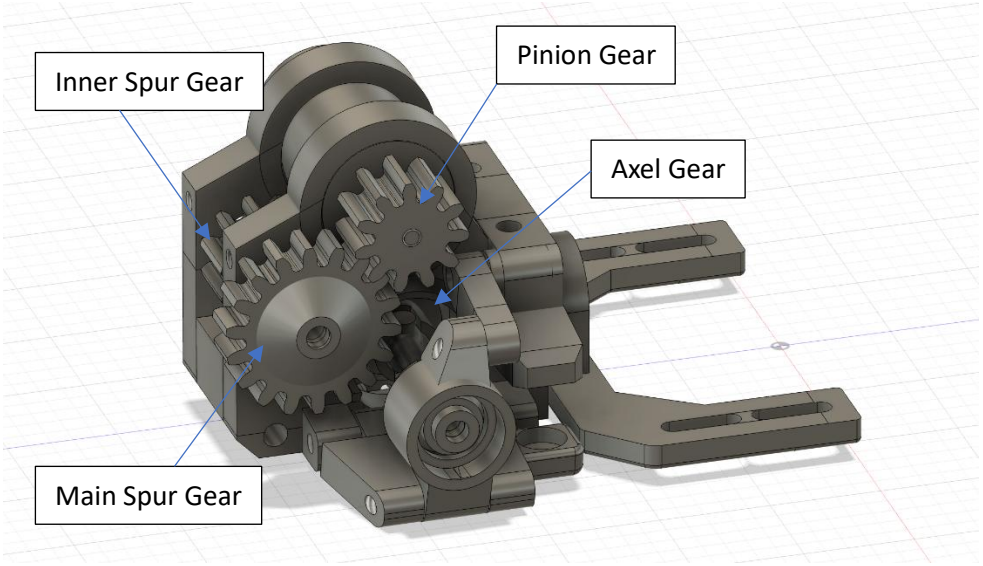
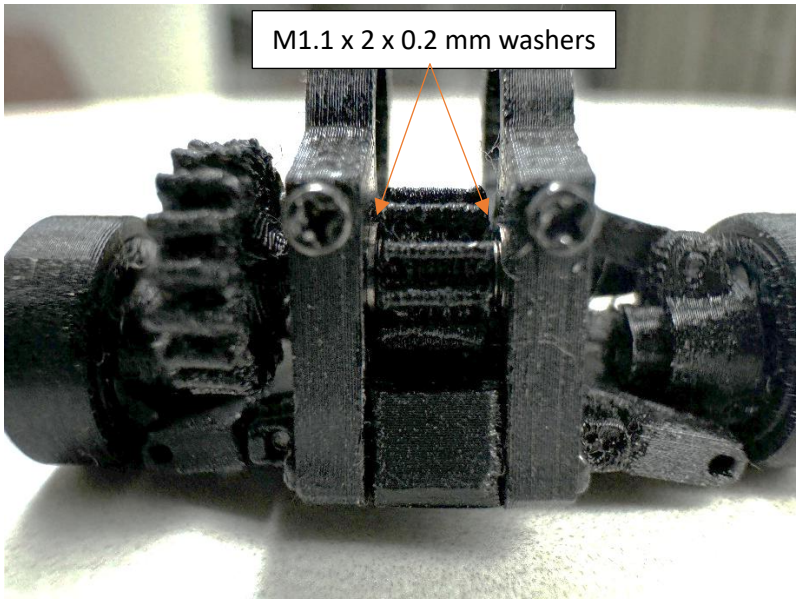


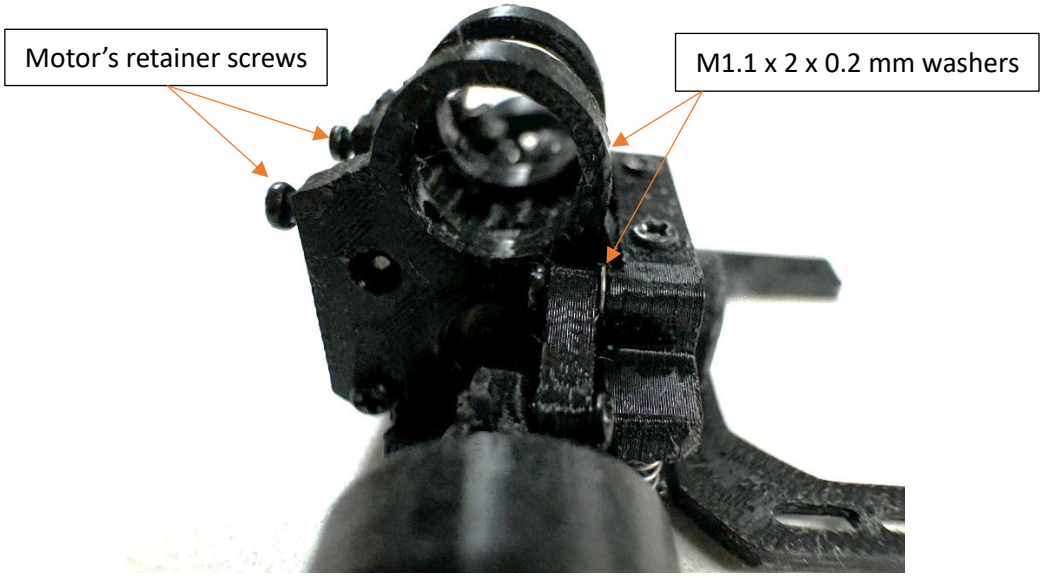
Fig2: Rear Gearbox with Independent Suspension

- **Motor:** 1pc of **0610** Mini 6mm*10mm Tiny Coreless Motor DC 1.5V 3V 3.7V 61000RPM High.
- **Screws:** M1.0 size with lengths ranging from 2mm to 10mm (suggest to buy a box of various lengths)
- **Suspension Spring:** 2pcs (same size as Front suspension):
  - Wire diameter 0.2mm
  - Outer Diameter: 2mm
  - Length: 5mm
- **Axle Gear's Bearings:** 2pcs of 3x6x2 (Hole: 3mm, OD: 6mm, Thick: 2mm)
- **Wheel Hub's Bearings:** 2pcs of 2x4x1.2 (Hole: 2mm, OD: 4mm, Thick: 1.2mm)
- **Inner Spur Gear Bearings:** 2pcs of 1x3x1 (Hole: 1mm, OD: 3mm, Thick: 1mm)
- **Inner Spur Gear Shaft:** 1pcs of stainless-steel shaft, diameter: 1mm, length: 11.0 – 12.0mm.

- **Inner Spur Gear Washer:** requires 1pc of M1.1 x 2 x 0.2 mm washers on each side.



- **Rear Top Sway Arm Washer:** requires 1pc of M1.1 x 2 x 0.2 mm washers on each side.



- **The motor's retainer screws** can be used to adjust the amount of bite between the pinion and main-spur gear, by tightening or loosening the screws.

- **Note:**
  - Do not overtighten the screws, especially the arms else it will bind.
  - Pinion gear tends to loosen from 0.7mm motor shaft after prolong use especially when running on rough surfaces, recommend to print additional pieces for replacement.

G. Required Parts:

- 2x Front Suspension Springs and 2x Rear Gearbox Suspension Springs: AliExpress
  - Wire diameter 0.2mm
  - Outer Diameter: 2mm
  - Length: 5mm
- Front suspension arms screws: AliExpress
  - Top arms: 2pcs M1 x 8mm
  - Bottom arms: 2pcs M1 x 7mm
- 1x Motor: 0610 Mini 6mm*10mm Tiny Coreless Motor DC 1.5V 3V 3.7V 61000RPM High. from AliExpress
- 1x ESC: DM-Racing NEZ ESC from AliExpress
- 1x Servo: DM-Racing Linear Servo from AliExpress
- 1x Nano Receiver with Gyro: up to your controller protocol, as long it is not bigger than 19mm x 12mm, and has a drift capable Gyro.
  - Futaba T-FHSS
  - Futaba F-4G
  - Sanwa FH5
  - FLYSKY NB4
- Rear Gearbox axle: M1 (OD: 1mm) stainless-steel rod cut to 11-12mm length. AliExpress
- Bearings:
  - **Front 2x Hub bearings** (ID: 1mm x OD:3mm x Thickness: 1mm) 681ZZ Miniature Mini Ball. AliExpress
  - **Rear 2x Gearbox inner spur gear bearings** (ID: 1mm x OD:3mm x Thickness: 1mm) 681ZZ Miniature Mini Ball. AliExpress
  - **Rear 2x Gearbox axel gear bearings** (ID: 3mm x OD:6mm x Thickness: 2mm) MR63ZZ-2 3x6x2 mm Deep groove ball bearing. AliExpress
  - **Rear 2x Hub bearings** (ID: 2mm x OD:4mm x Thickness: 1.2mm) 2x4x1.2mm Deep groove ball bearing Miniature bearing. AliExpress
- M1 Screws & Nuts: AliExpress
  - Servo lock screws: 2pcs M1 x 2mm screw
  - Top deck mounting: 4pcs M1 x 3mm screw
  - V4: Rear Chassis-B mounting to bearings: 1pc M1 x 6mm screw + 1pc M1 washer (add more if required to increase length to fit body)
  - V5: Rear Gearbox screws are M1 size with lengths ranging from 2mm to 10mm (suggest to buy a box of various lengths)
  - Front Arm (Top) mounting to chassis: 2pcs M1 x 7mm screw
  - Front Arm (Bottom) mounting to chassis: 2pcs M1 x 6mm screw
  - Front Wheel (per wheel): 1pcs M1 x 5mm or 6mm screw + 1pc M1 washer between wheel and bearing + 1pcs M1 nuts.
  - Knuckles: 1pc M1 x 2mm screw and 2pc M1 x 2.5mm screw
  - H-Bar: 4pcs M1 x 2mm screws
- **Washers:** M1.1 x 2 x 0.2 mm. AliExpress

- Magnets for body mounts:
    - **1x Front:** OD:3mm x Thickness:2mm, N35 Round Magnet 3x2 mm Neodymium Magnet Permanent. From AliExpress
    - **2x Back:** OD:3mm x Thickness:2mm, N35 Round Magnet 3x2 mm Neodymium Magnet Permanent. From AliExpress
    - **Spacer Magnets** (to increase height to fit taller car bodies and also to be mounted on car body): OD:3mm x Thickness:1mm, N35 Round Magnet 3x1 mm Neodymium Magnet Permanent. From AliExpress

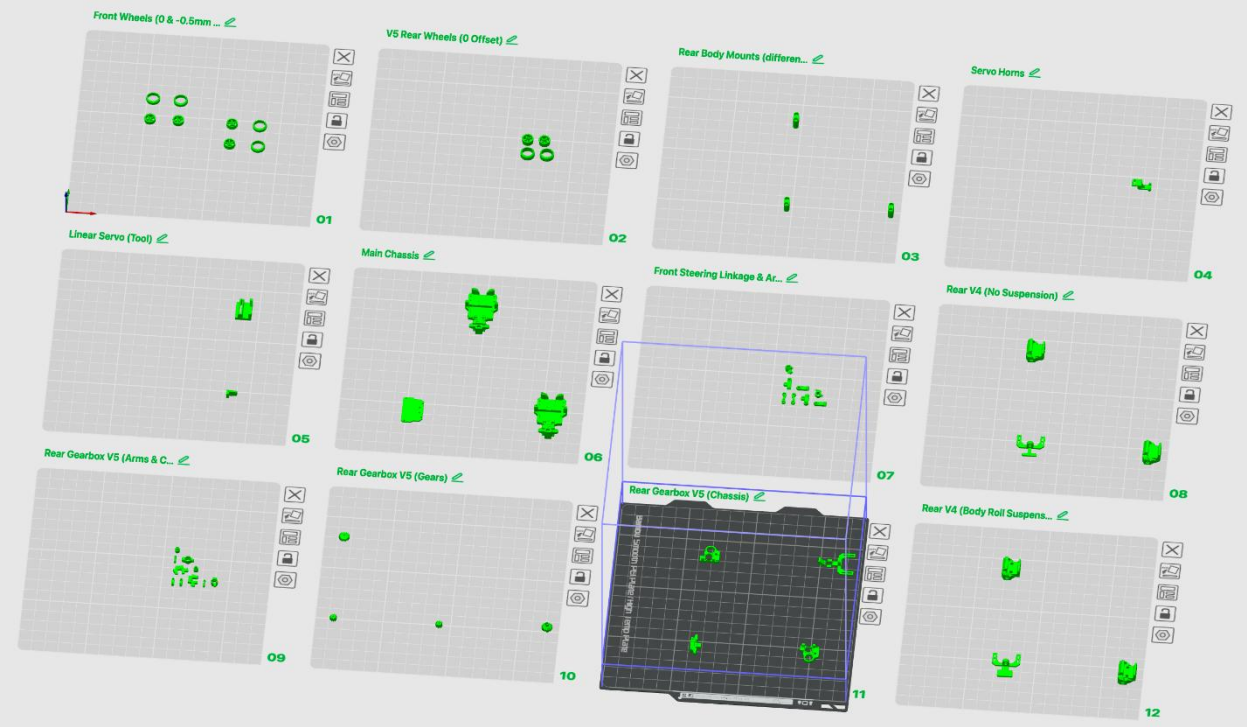
H. 3D Printer and recommended settings:

- Printer: Bamboo A1 mini
- Filament: PETG
- Nozzle: 0.2mm
- Layer height: 10mm of lower
- Infill: 50%

  Support Settings:
    - Support line width: 20 (set in the Quality section)
    - Type: Normal / Snug / 45deg
    - Initial Layer Expansion: 2mm
    - Support Wall Loop: 0
    - Top Z distance: 0.1mm
    - Bottom Z distance: 0.1mm
    - Base Pattern: Hollow
    - Base Pattern Spacing: 0.35mm
    - Pattern Angle: 45deg
    - Top Interface layers: 0 (do not use support interface layers)
    - Bottom Interface layers: 0 (do not use support interface layers)
    - Normal Support Expansion: 0mm
    - Support/object xy distance: 0.35mm
    - Support/object first layer gap: 0.2mm

- Others: “Inner Brim only” for printing **tires only**.
- Print Sequence: by Object (not Layer)
- **Rear Chassis-B to be printed with Outer Brim and without support.**
- **Chassis-A rear bearing hole to be printed without support.**
- **Steering Arms Top and Bottom to be printed without support.**

- Important! Please note the Individual parts orientation on print bed. And print each part individually by “Object”. Do not print all parts at the same time.



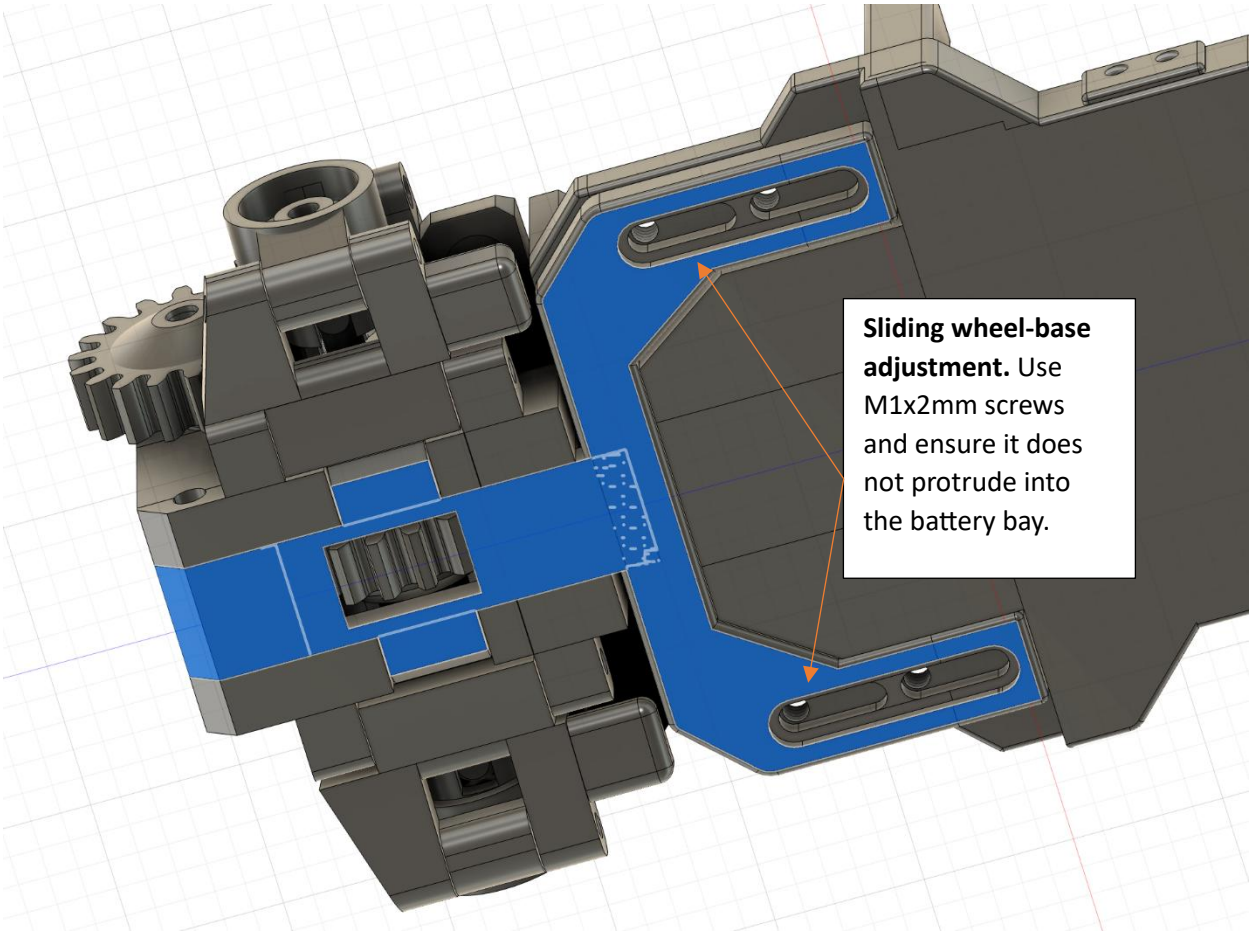
I. Assembly Tips:

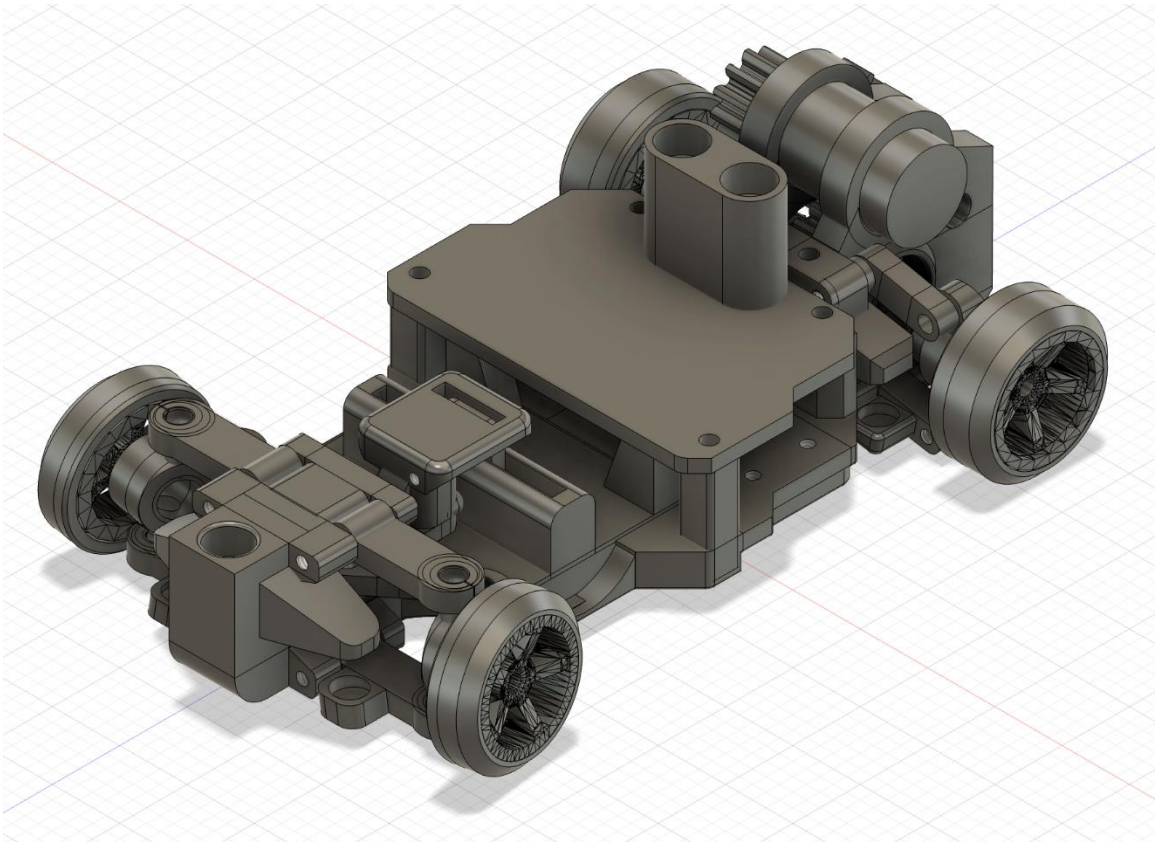
- Ensure ball-joint’s ball are as round and smooth as possible, use a small fine file to gently remove excess filaments.
- Use CA glue to glue the Spur gear and rear wheels to the rear drive axle. Be careful not to get CA glue on the bearings.
- Use another spur gear (same size and type) on the opposite side of the rear drive wheel as a spacer to achieve equal weight distribution and spacing with the main drive wheel. Also allows for easy flipping of the rear chassis to fit different body lengths.
- Important! Please use Silicon Oil on all ball joints. I’m using 300 Silicon shock oil.
- Printed parts with screw holes: Open-up the screw holes and Pre-screw all screw holes before assembly. I use a sharp tweezer to poke into the screw holes to open-up the screw holes, then screw in a 1mm screw, to ensure the screw hole thread is straight before assembling it to the chassis, as printed part’s screw holes are usually smaller than the required M1 screws size.
- Ensure all parts are moving smoothly and easily, especially the steering linkages and knuckles as the linear servo’s torque is not strong enough. If the servo starts jamming, means there’s binding &/or rubbing in the linkage and knuckles, or your transmitter &/or gyro end-points are over extended beyond the length of the steering arm length, so the servo horn is tilted at the ends.

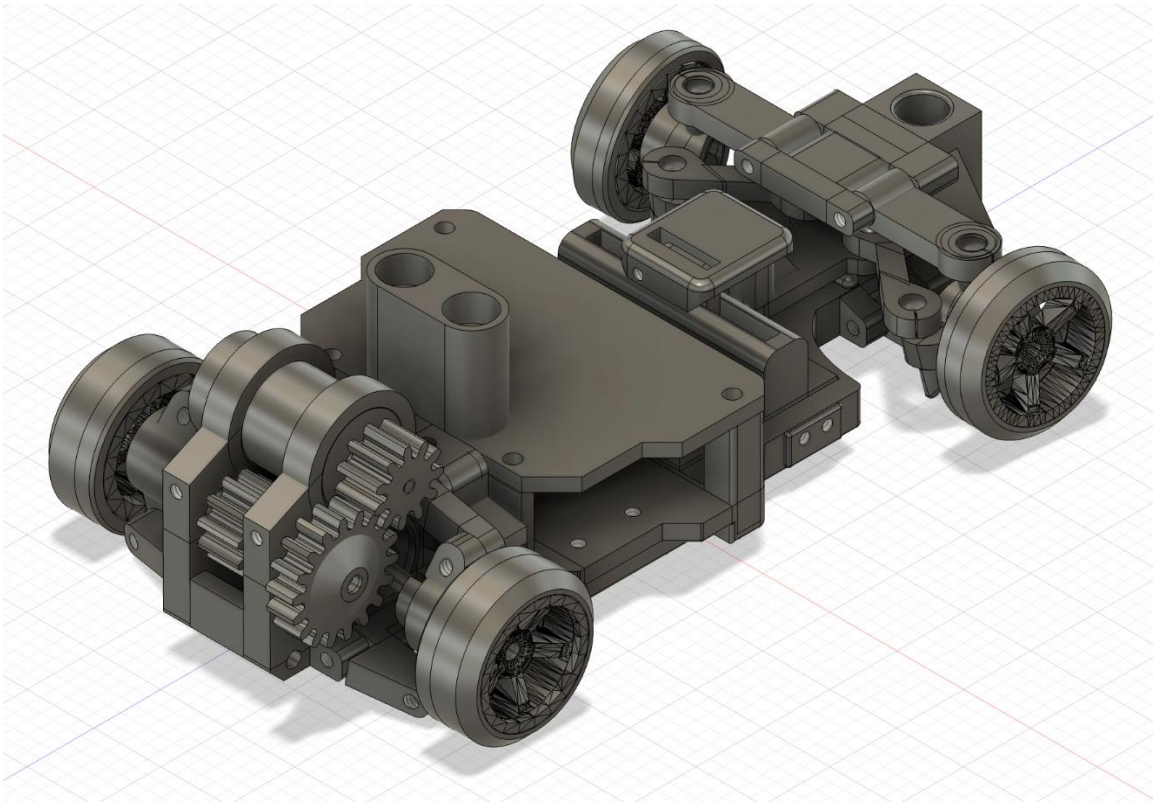
- The 3D printed servo horn has 2 balls at the back which helps prevent the horn tilting at the end of the servo travel. Due to manufacturing variables of the linear servo, if the space between the servo horn back and servo body is too small thus the balls are causing binding of linear servo sliding as it's too tight, then use a small file to file down the balls.
- Use the 3D Linear Servo to test that there's no binding in your Steering linkage and front suspension movement before installing electronics.
- Rear Gearbox:
  - Do not overtighten the screws, especially the arms else it will bind.
  - The motor's retainer screws can be used to adjust the amount of bite between the pinion and main-spur gear, by tightening or loosing the screws.
  - Pinion gear tends to loosen from 0.7mm motor shaft after prolong use especially when running on rough surfaces, recommend to print additional pieces for replacement.

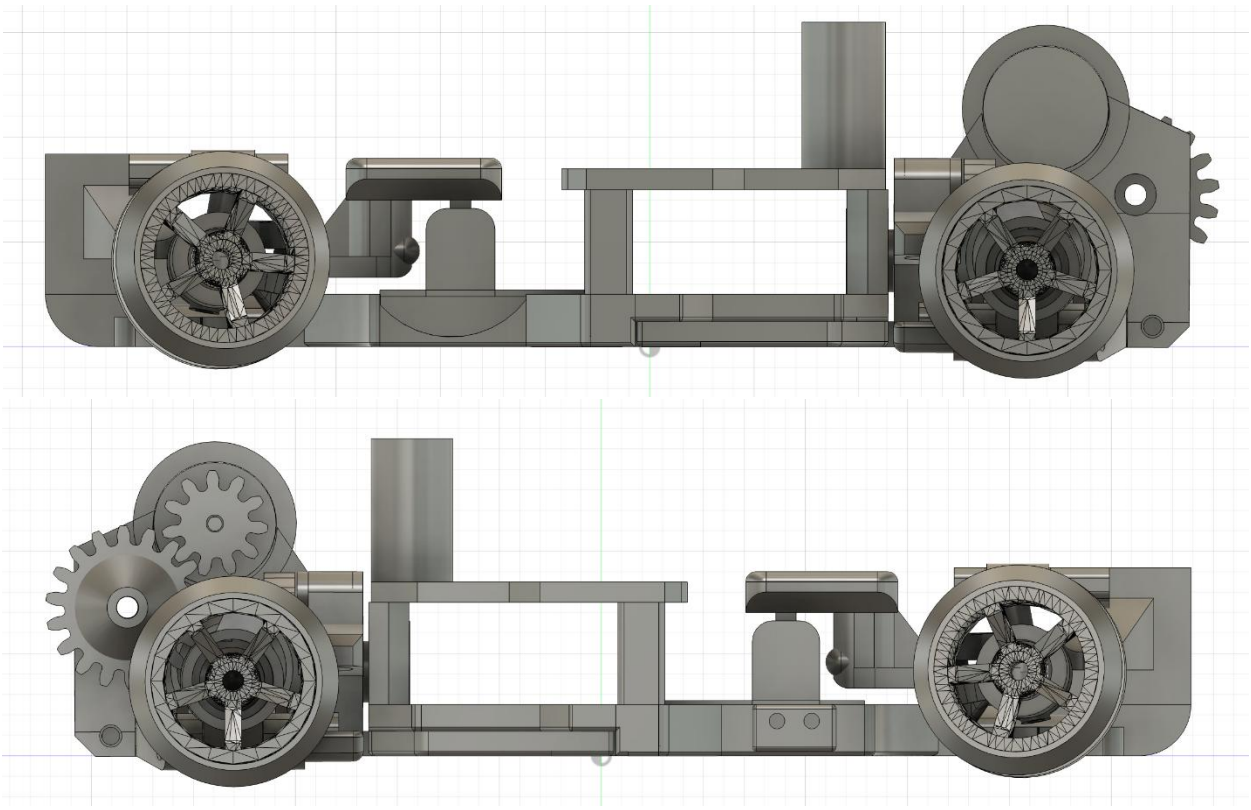
J. Images for assembly reference:

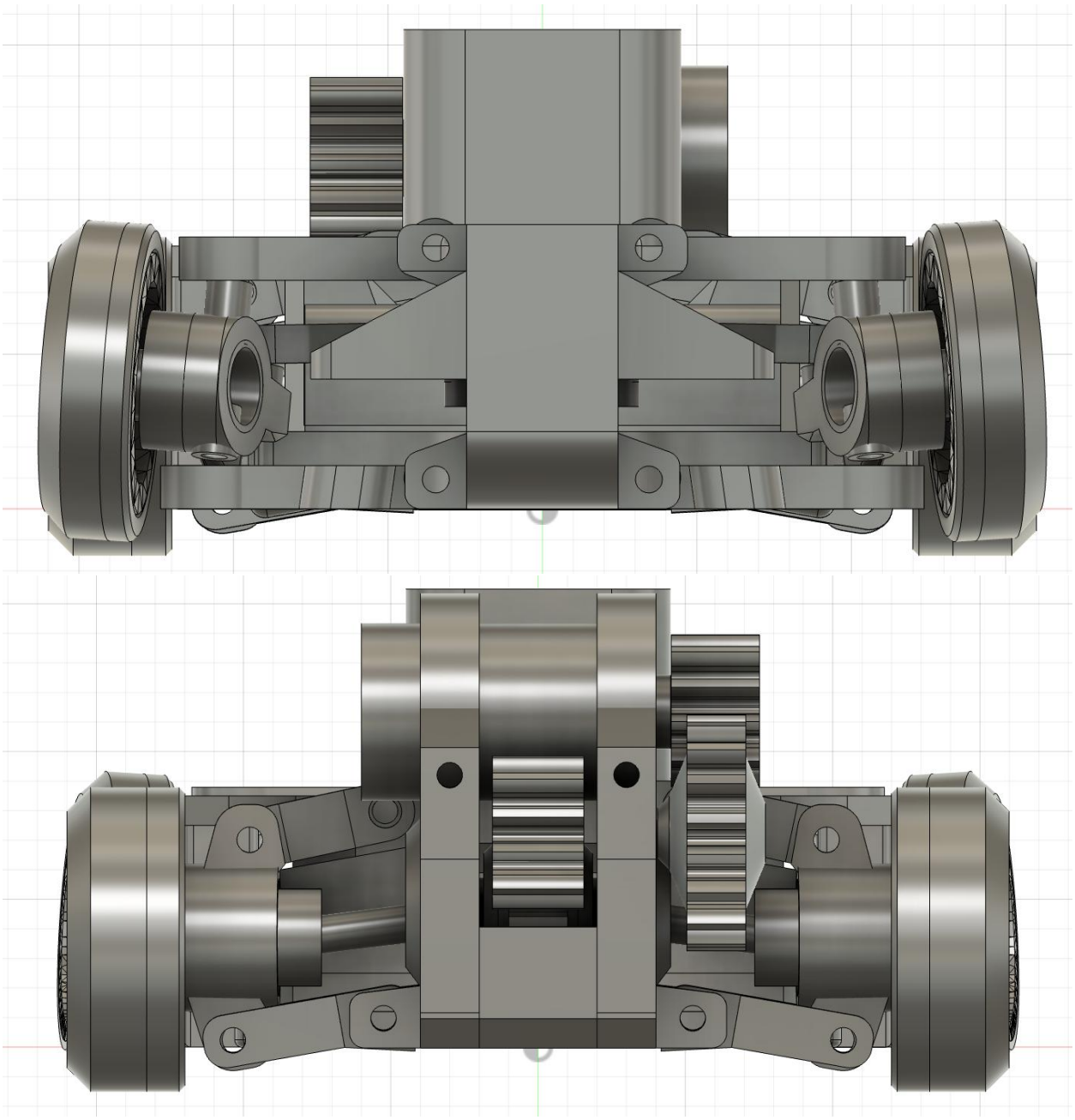
H-Bar for sliding adjustable wheel base (+/- 2.6mm)



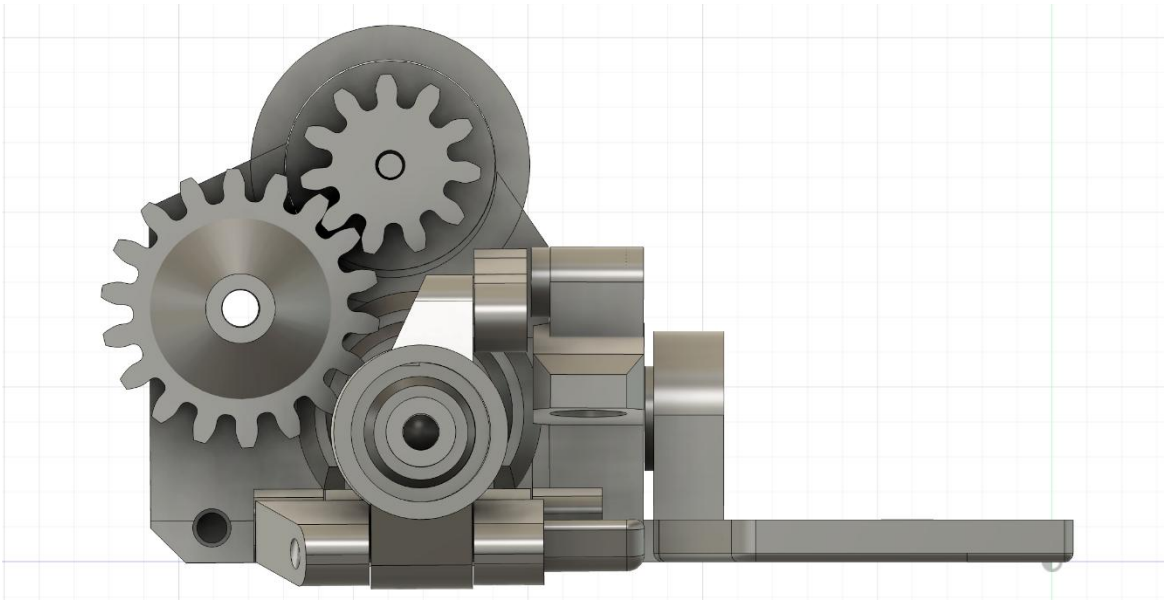


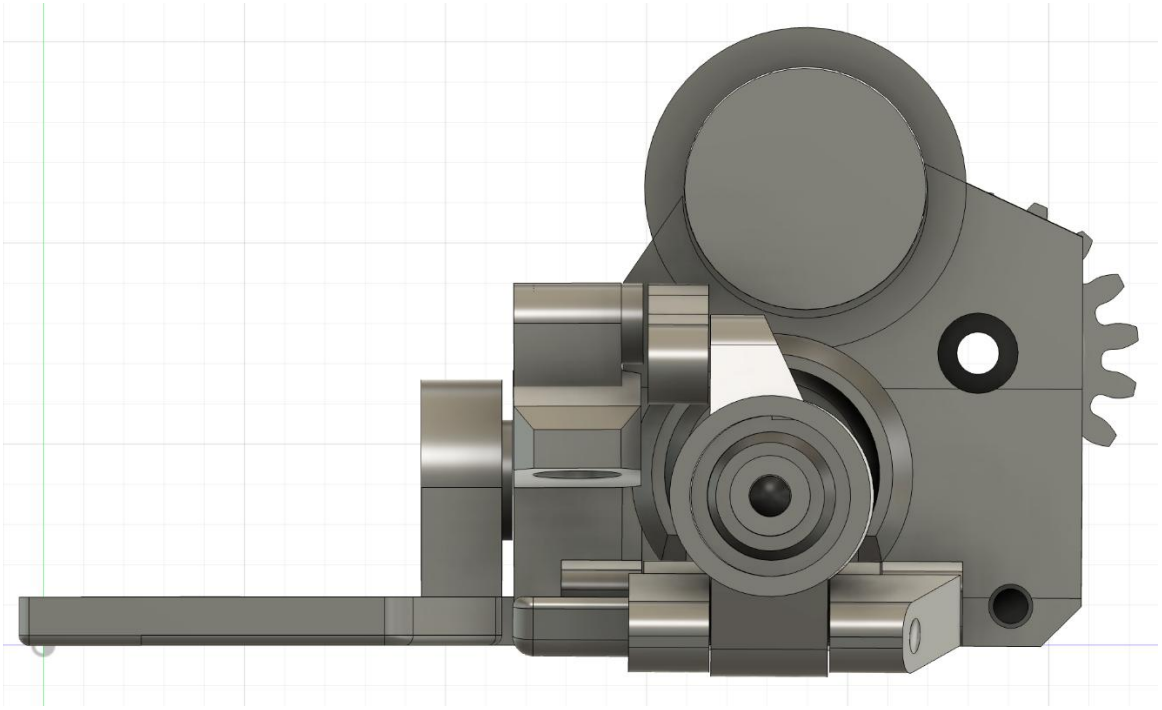


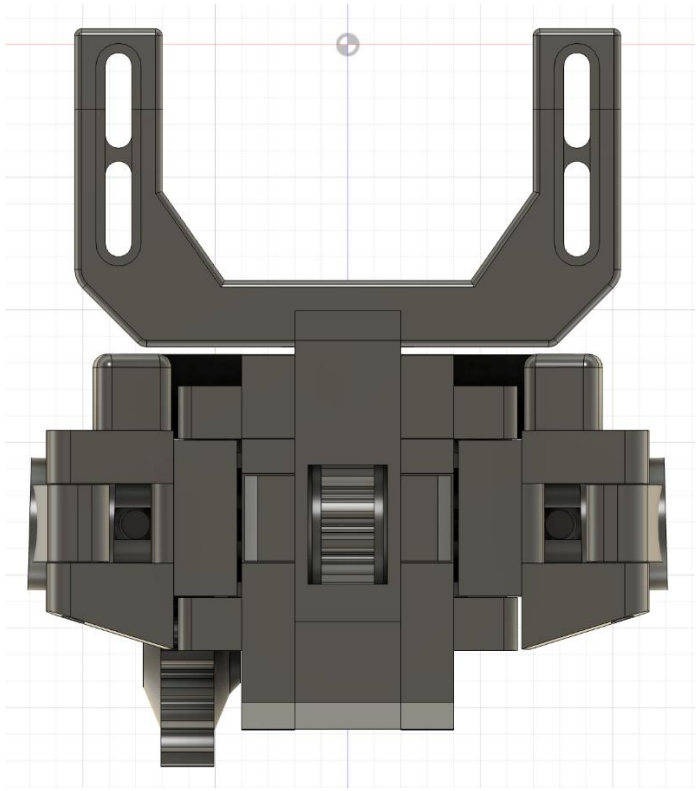


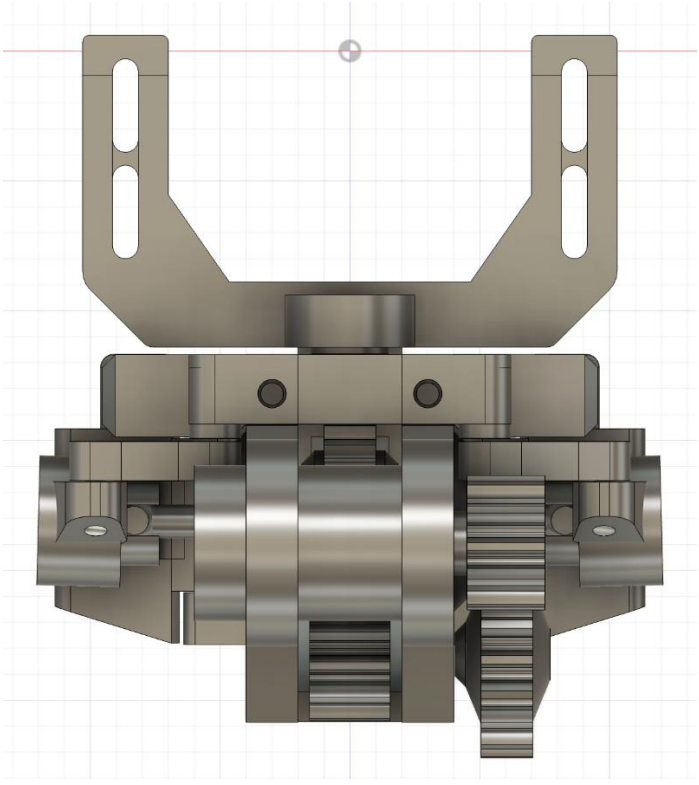


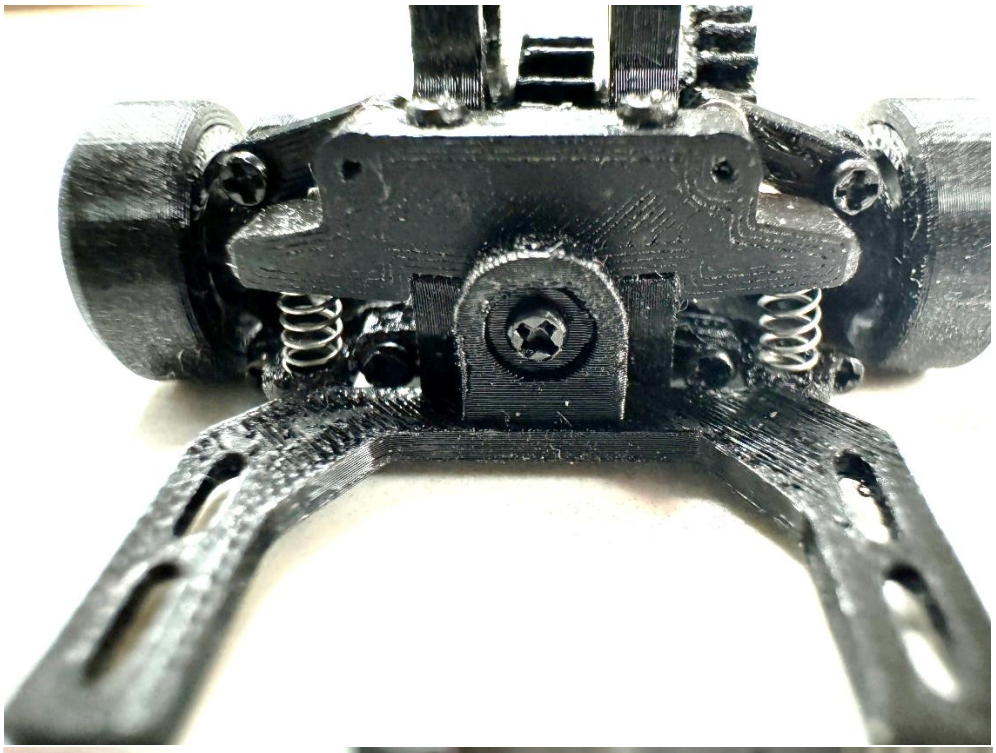
V5 Rear Gearbox with Independent Suspension

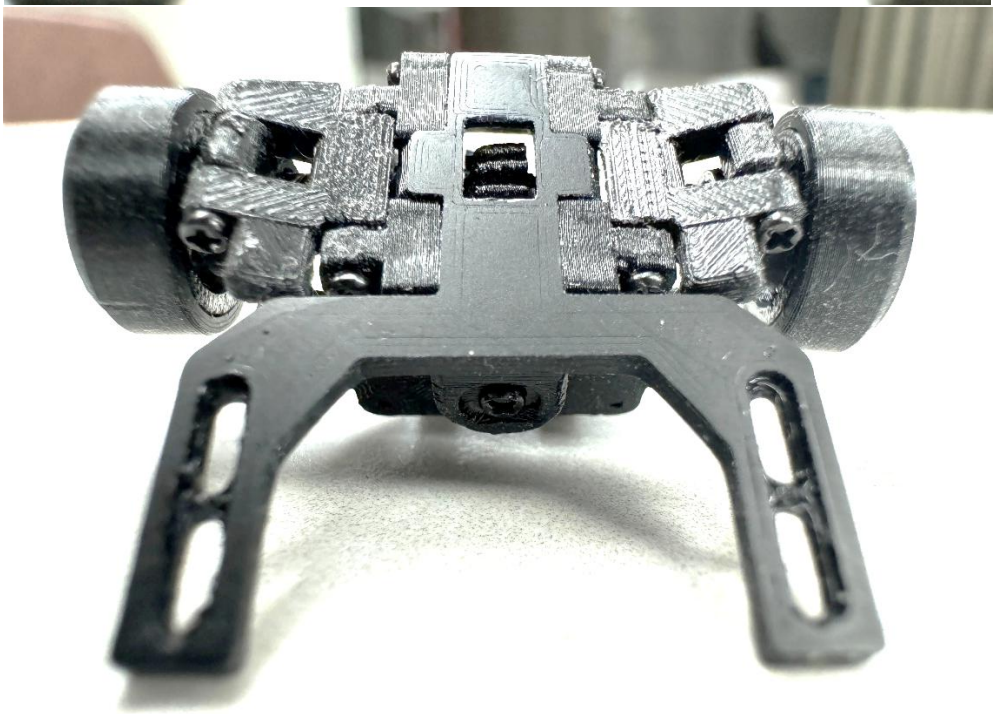


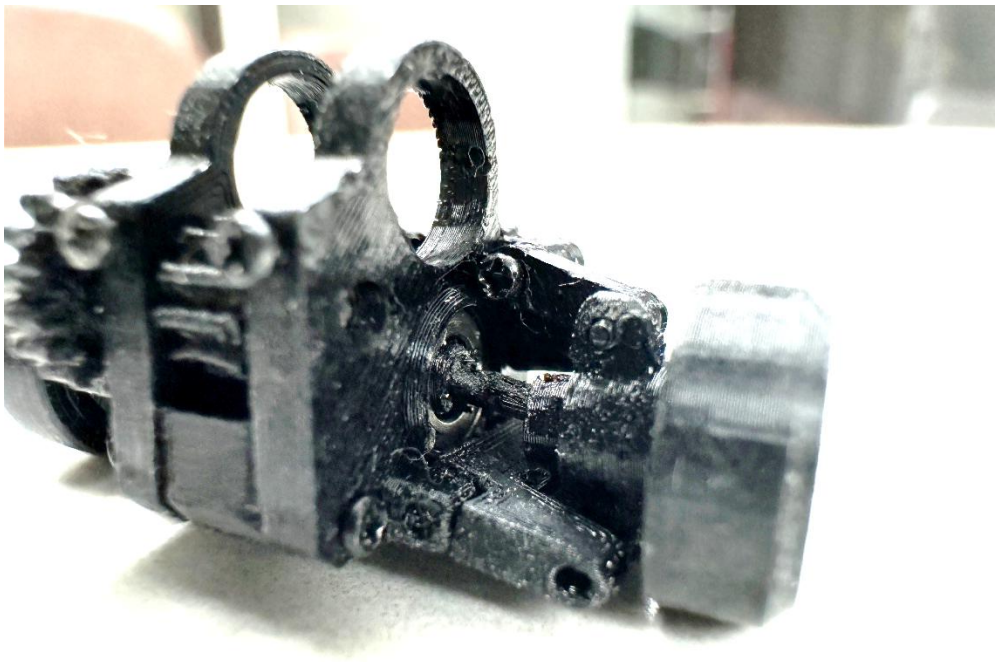


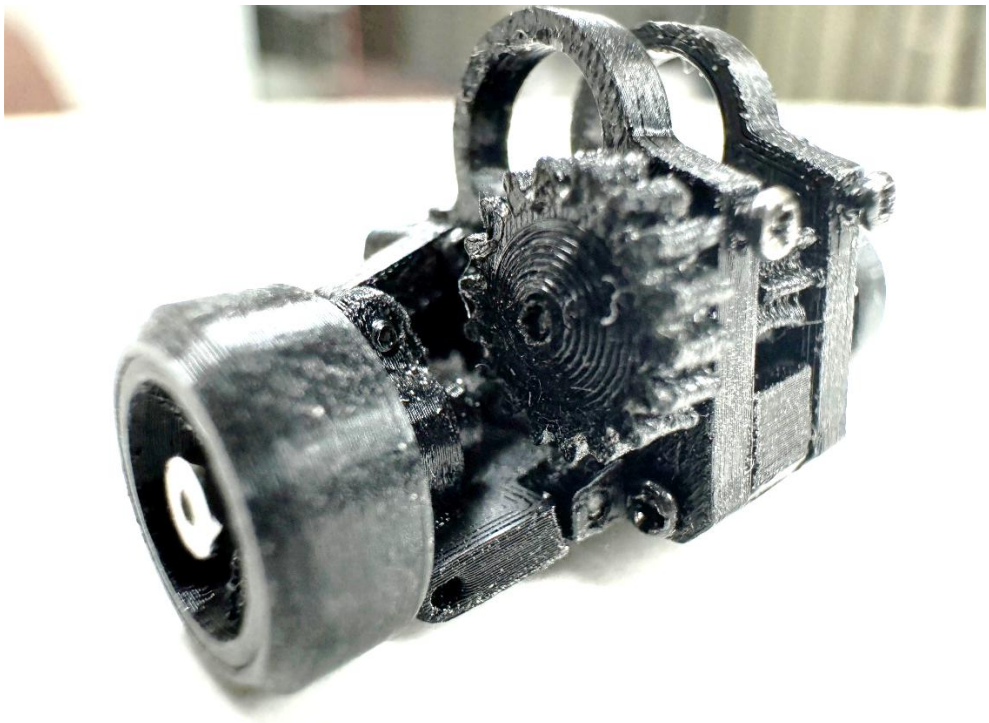


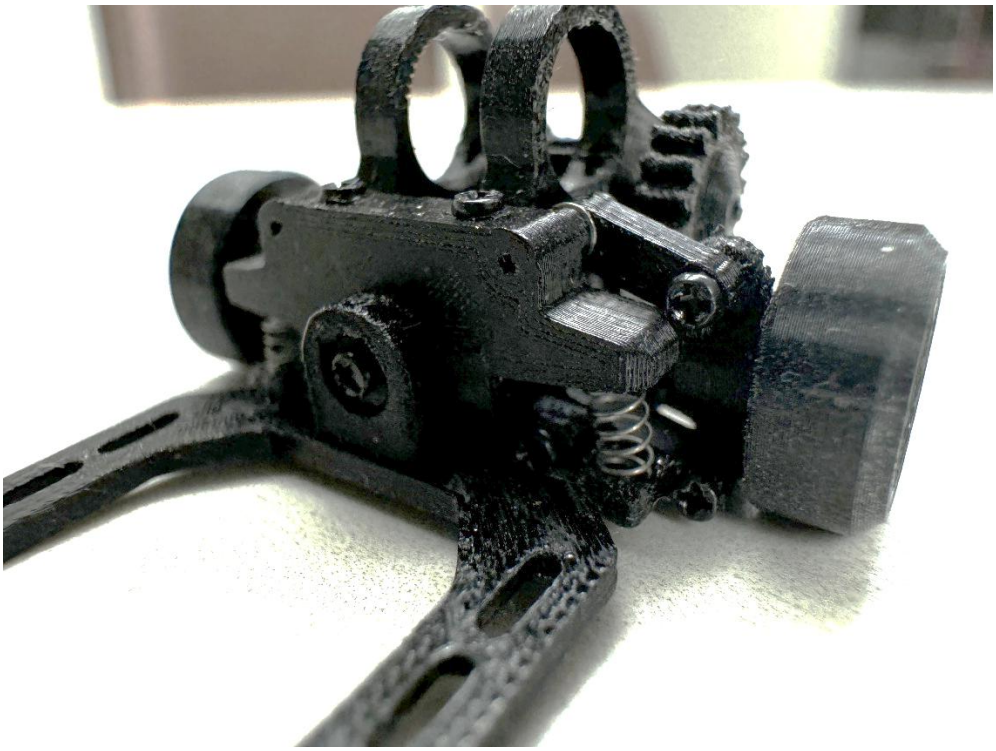












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