

JETWORKS

Eurofighter
TYPHOON
MAXX



Photograph shown is the real aircraft.

Landing Gear



Multi-Role Fighter

Construction Guide

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Scratchbuilt Landing gear

This guide will take you step by step through the process of creating some landing gear, specifically suitable for the Typhoon Maxx. It will introduce the tools and equipment you will need at each stage. Apart from a 3D printer, all other parts can be fashioned with hand tools. Fixings and base materials should be easy enough to source online.

Initially hand tools, and minimum batches of parts could be more expensive than purchasing an off-the shelf set of retracts, but as the MAXX range grows, the relative costs will become lower and lower the more models you make.

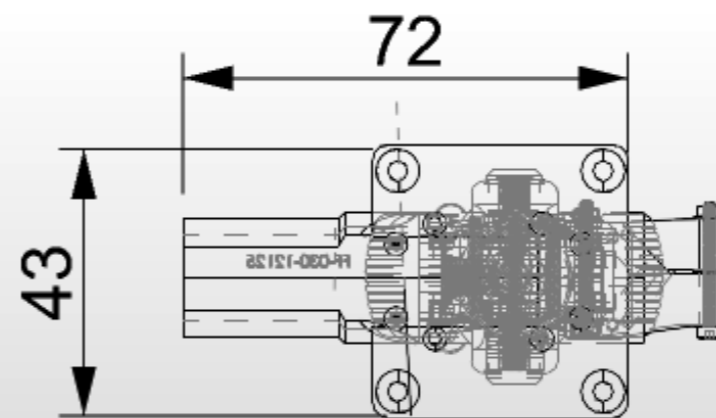
Please note : Parts may be refined over time and look different to those shown in this guide. With any significant changes, the guide will be updated. Happy Engineering!



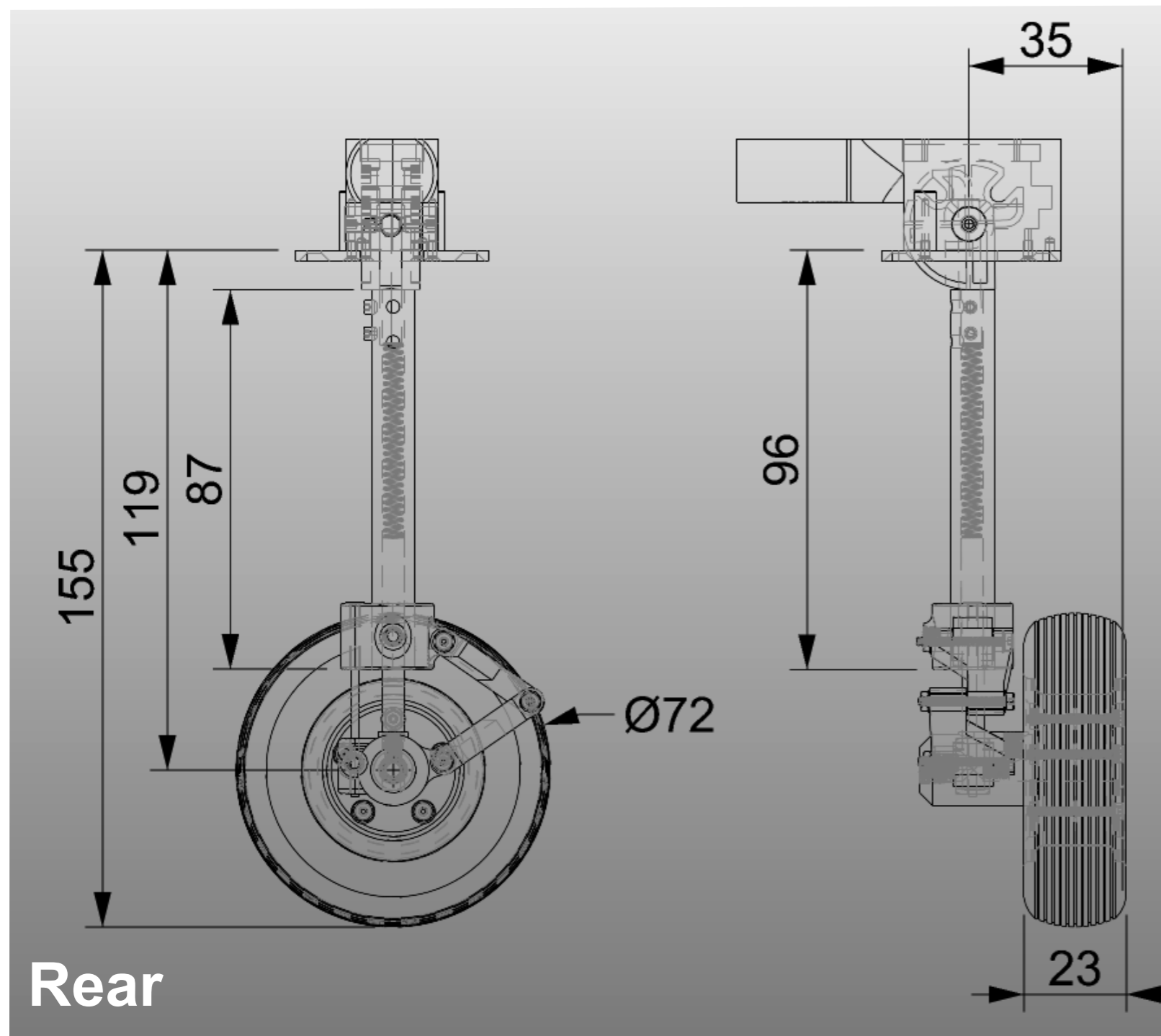
General arrangement

These are the critical dimensions of the finished parts (mm)

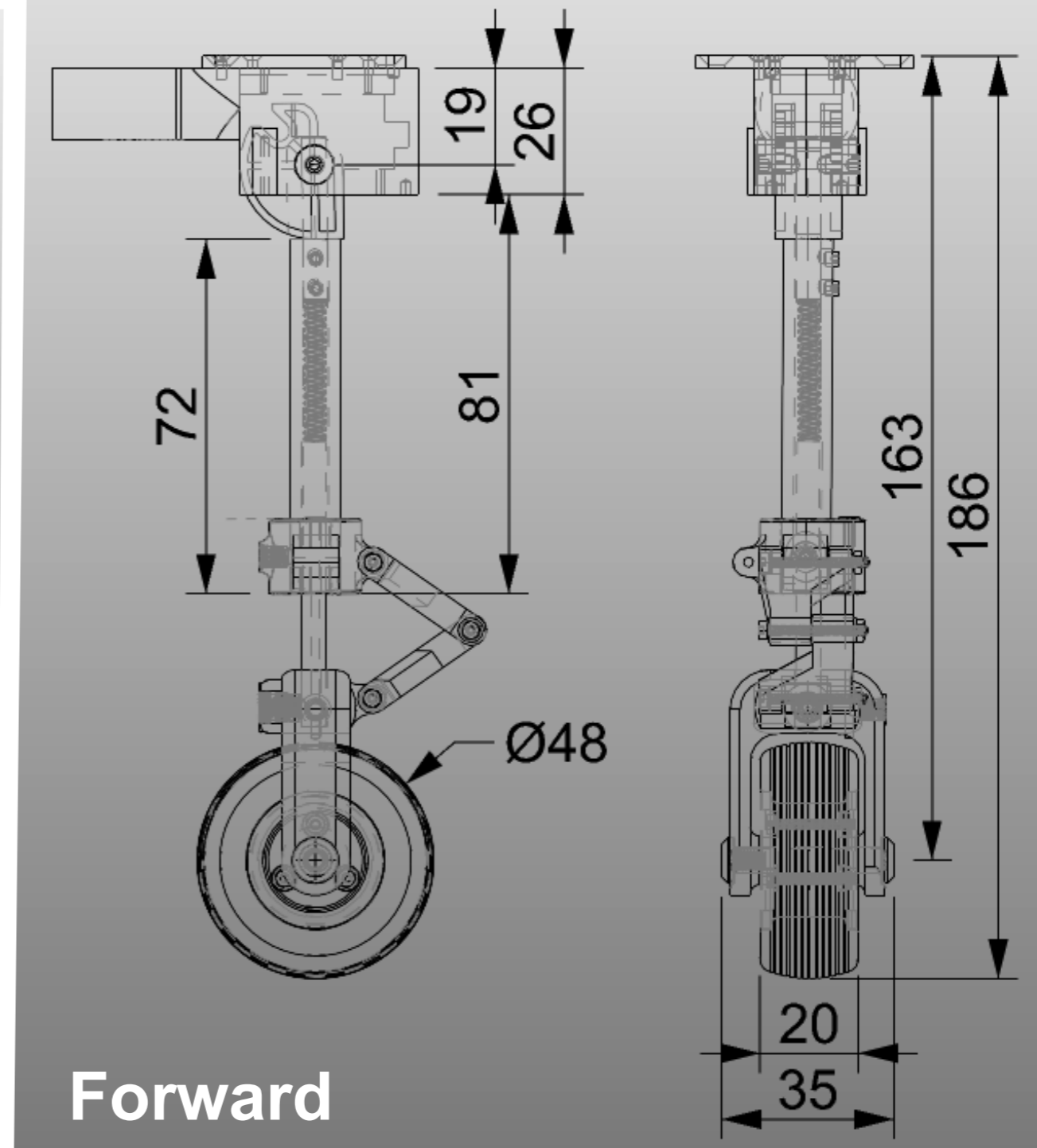
If you look at the next page briefly, In comparison with the rear retracts, the steering arm mechanism on the forward retract may push the strut lower down, making the strut longer than desired. If this is the case then, you can shorten the strut and 5mm shaft accordingly. Each retract manufacturer has a different design so it is difficult to standardise.



5mm pin



Rear



Forward

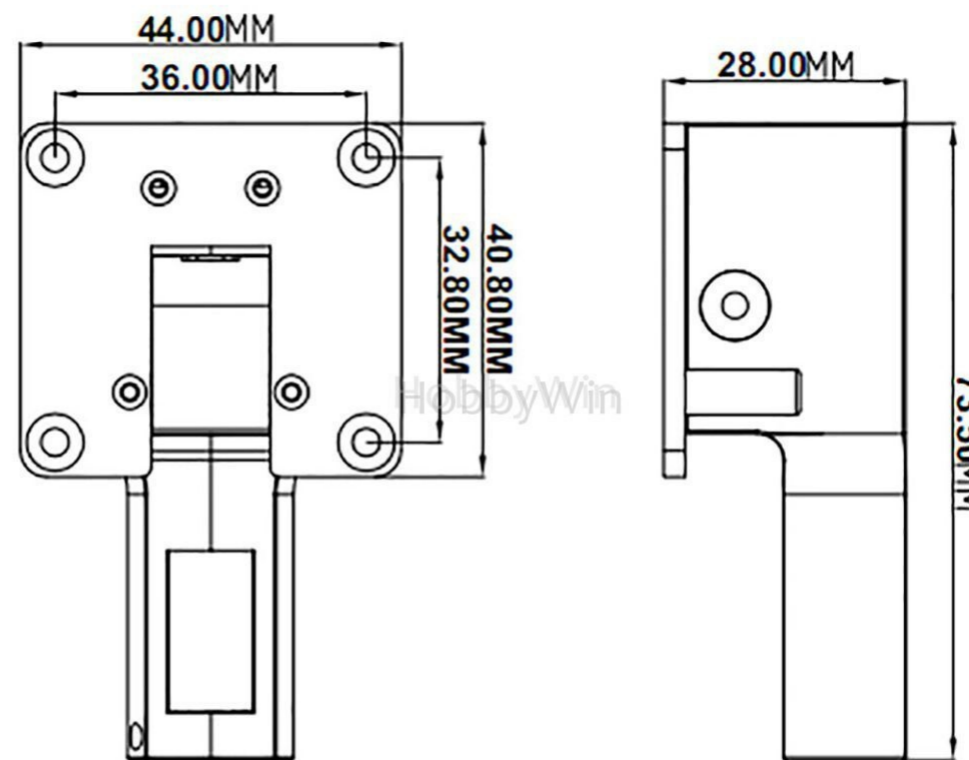


Purchase Retracts



Steering Arm Mechanism

Top Fix Mounting bracket



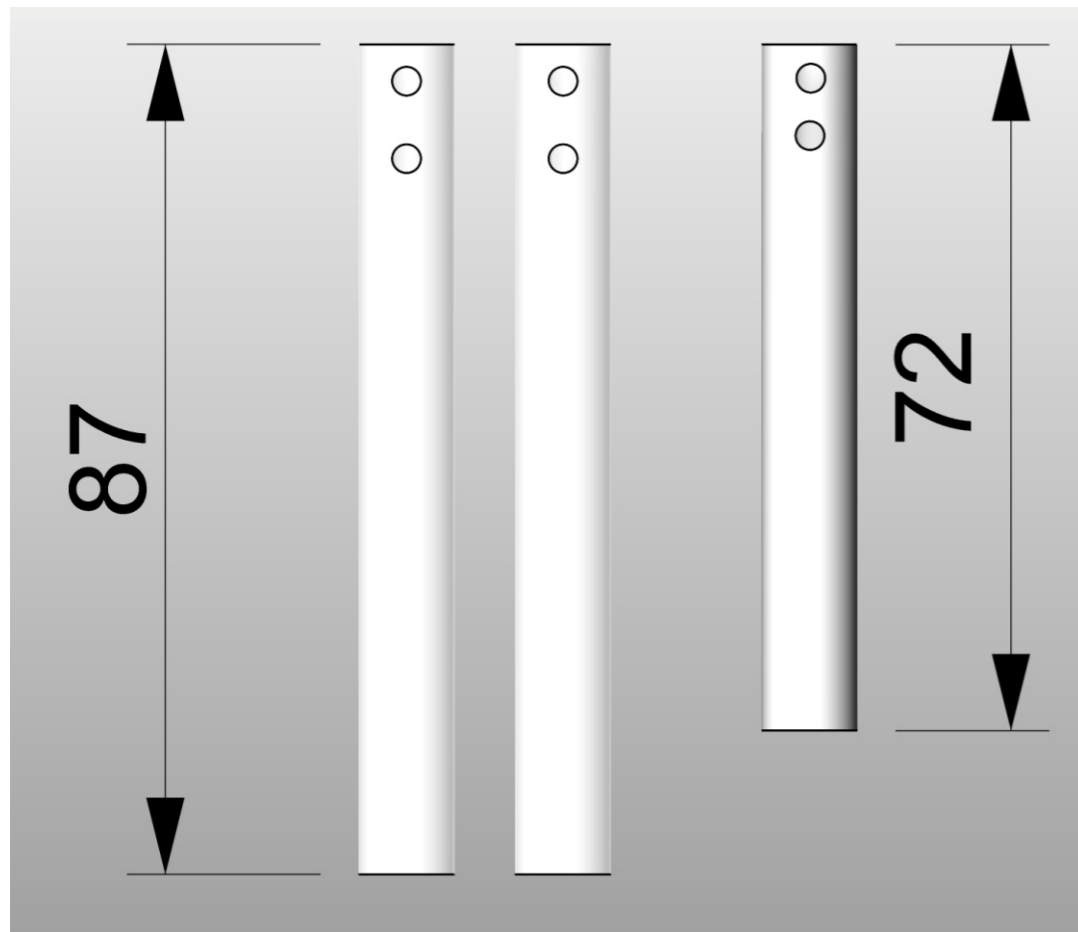
Purchase the Three Retracts such as these shown opposite with **5mm Dia Shaft**. The model will weigh around 3kg.

Pay careful attention to the sizes - anything much larger will not fit..

The Nosewheel should have the steering arm mechanism on it.

They should also have the option fixing the mounting bracket on either the top or bottom face of the retract unit.





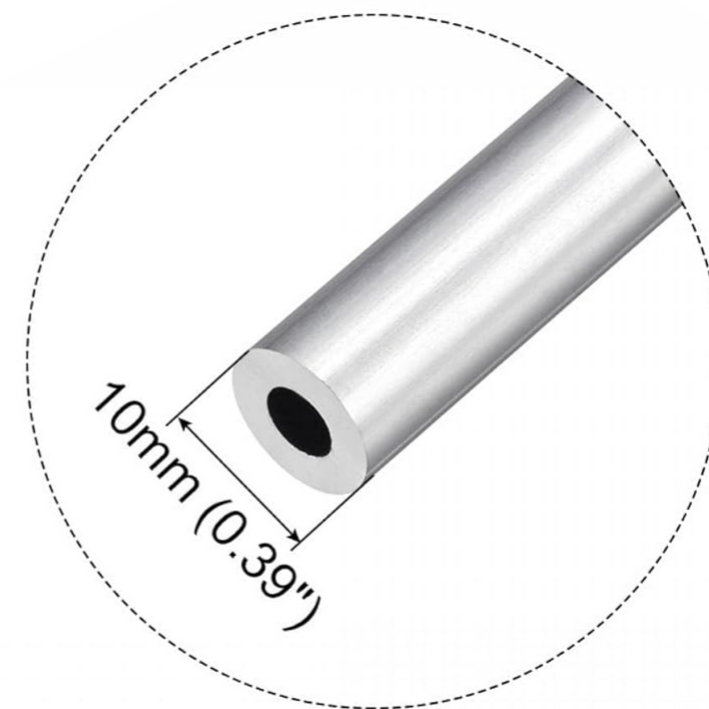
Using cardboard to protect the aluminium from marking, support each retract leg in a vice. Cut some 10mm dia(5mm inner dia) shaft to the correct lengths and file the cut edges and faces smooth. (reminder - read previous page regarding forward retract length)

measure the flats on the retract shaft and carefully mark the location of the one or two grub screw locations and mark in place using a fineline permanent marker. Using a hammer and centre punch, mark the centre point with the centre punch - which will prevent the drill slipping off centre when drilling.

Using a 3.3mm drill, drill into the legs to the centre.

Using a 4mm tap, along with cutting oil (WD-40 or 3-1 Oil will work) steadily cut threads into the aluminium, back and forwards a little at a time (suggest you watch a few youtube videos on the subject beforehand).

Screw the 4mm grub screws into the strut leg



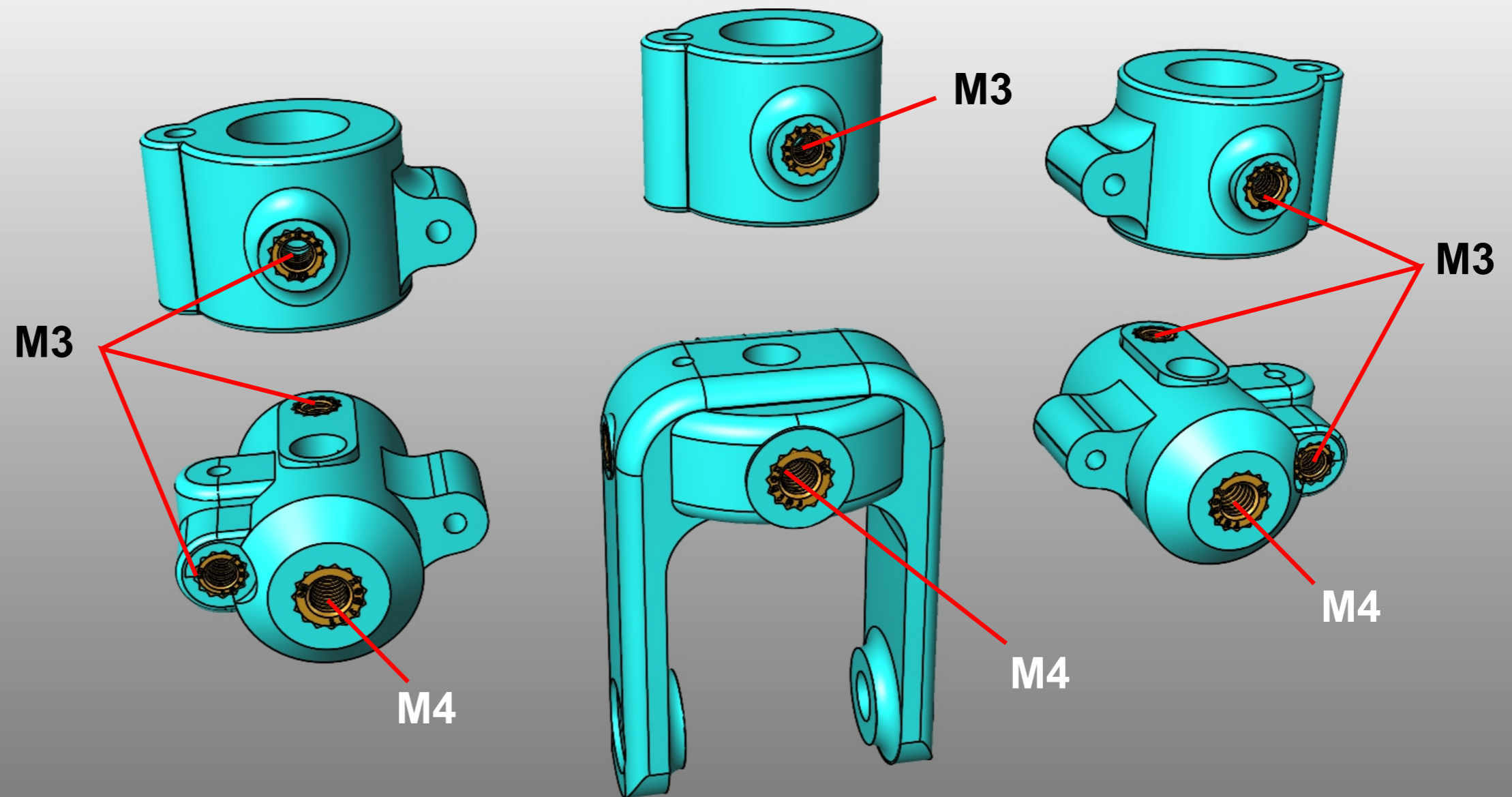
Inner Diameter: 5mm (0.2")



Using high quality 3D printed inserts, (recommend Ruthex), using a soldering iron tip (or soldering iron dedicated heating tips) heat the various inserts into the 3D printed parts.

I recommend you watch a few video's on the subject to learn the process, to save you having to reprint the parts.

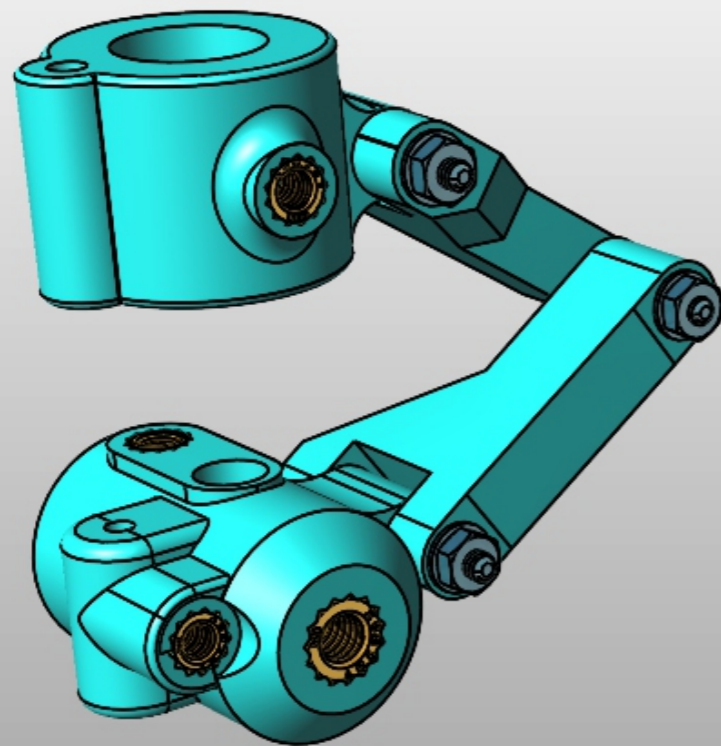
In order to insert them straight and not on an angle, when they have sunk 90% of the way down remove the soldering iron and use a metal flat surface such as a knife blade to push them the rest of the way - this will help keep them perpendicular to the outer surface.



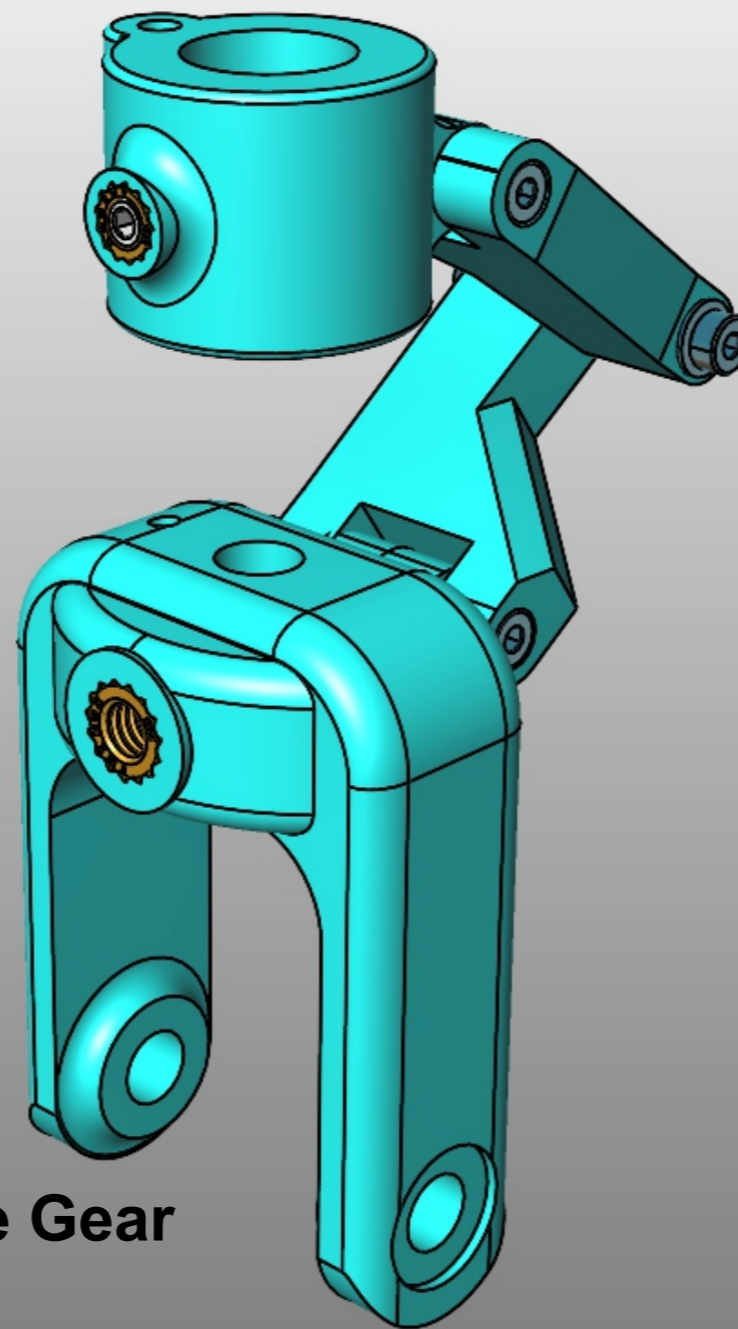
Assemble the three lower suspension assemblies as shown.

Use M2 x 20mm C/sunk Socket Screws, along with M2 washers as shown.

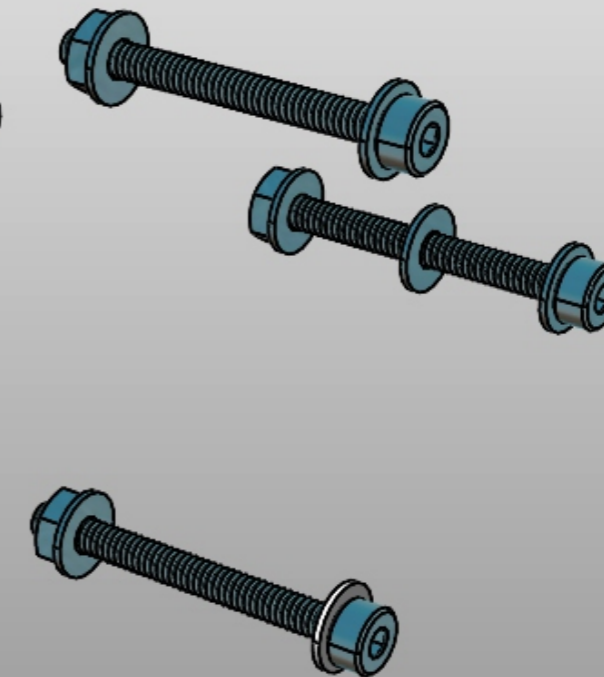
Use M2 Nylock nuts on the end, do not tighten - leave enough room for the mechanism to work.



Aft Gear (PORT)

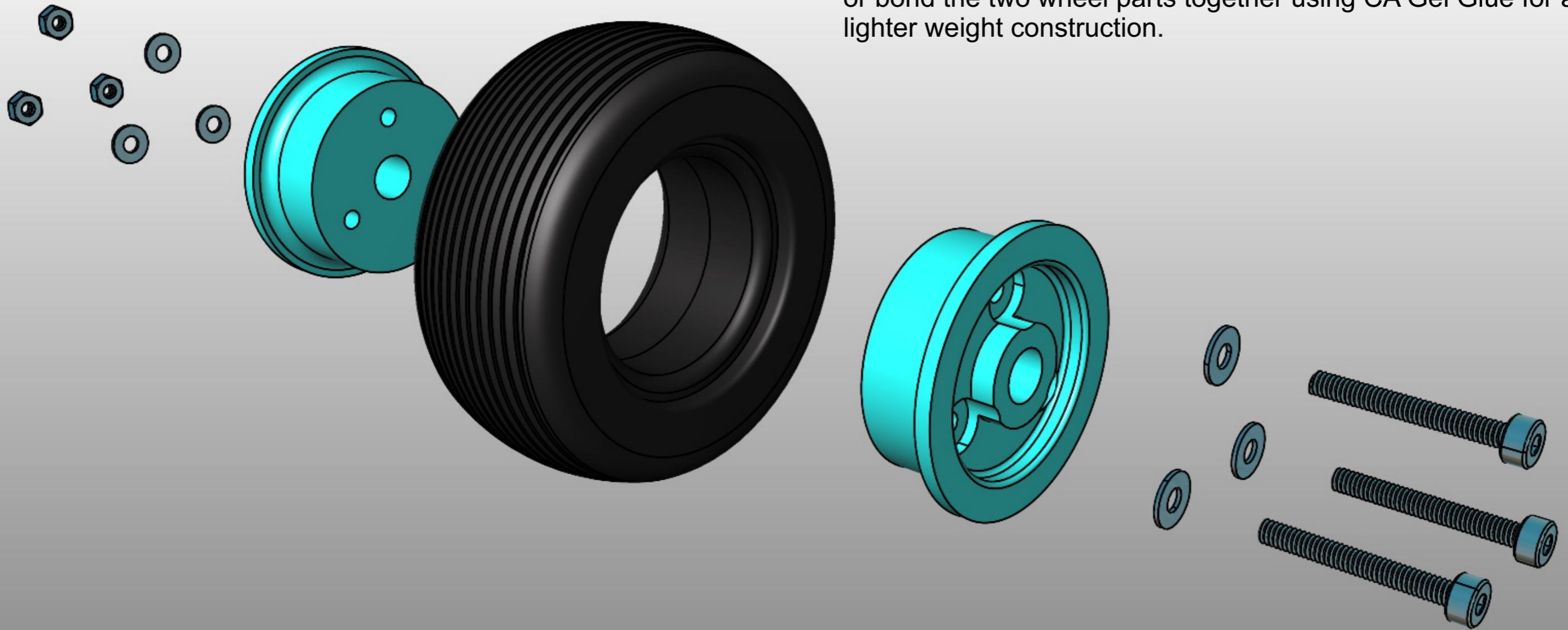


Nose Gear



Assemble the Nosewheel assembly. Either use the 3 fixing groups to allow tyre replacement

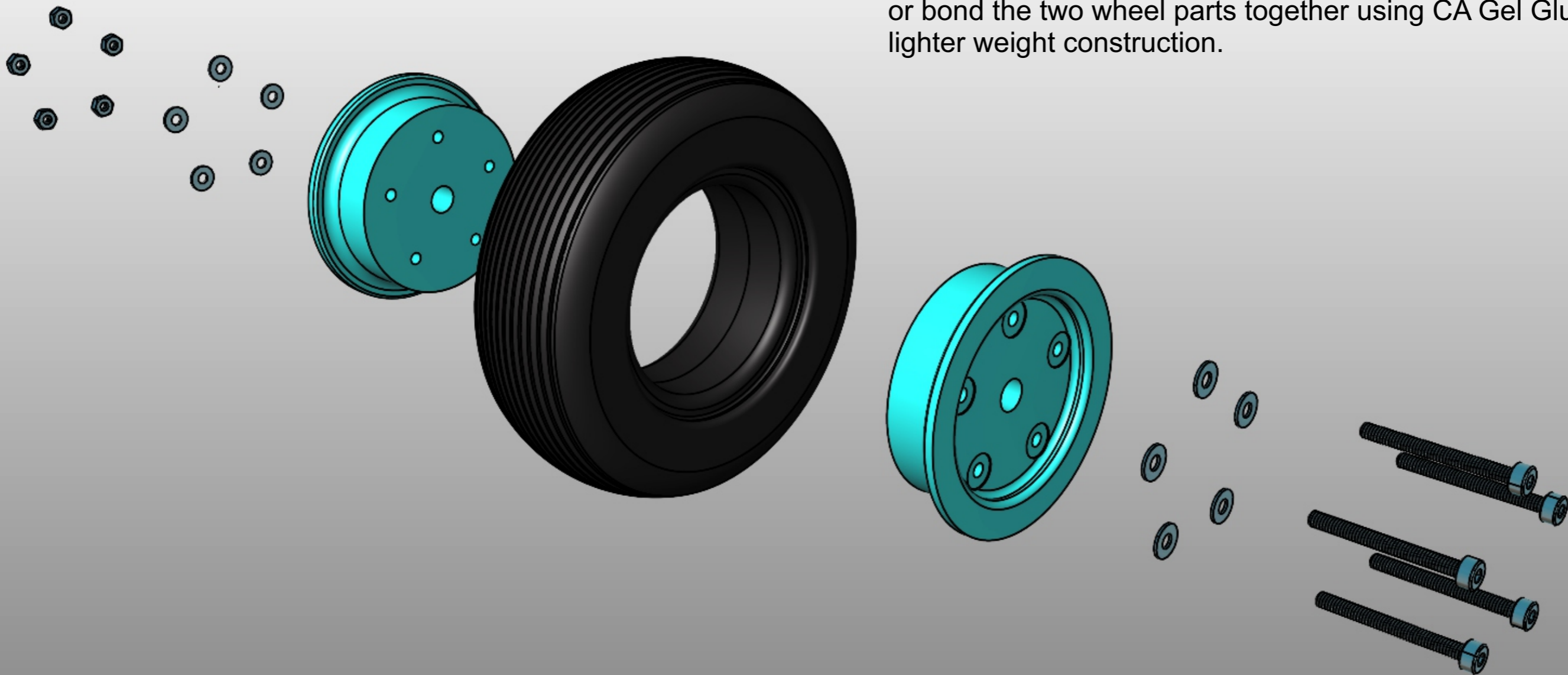
or bond the two wheel parts together using CA Gel Glue for a lighter weight construction.



Assemble the two aft wheel assemblies.

Either use the 5 fixing groups to allow tyre replacement

or bond the two wheel parts together using CA Gel Glue for a lighter weight construction.



Slide the 5 x 60mm shaft into the Wheel Block as shown. If it is too tight to go in, use a 5mm drill to open it up a little. Secure using a 4mm Grub screw.

Slide the Binder screw into the side of the wheel block, again using the drill if required. Secure using the 3mm Grub screw.

Slide the nail through the Lower part, into the Wheel block. Secure using 3mm grub screw - adjust the height later.

1.8 x 50mm
Common Nail
Trimmed to 45mm
(filed smooth)

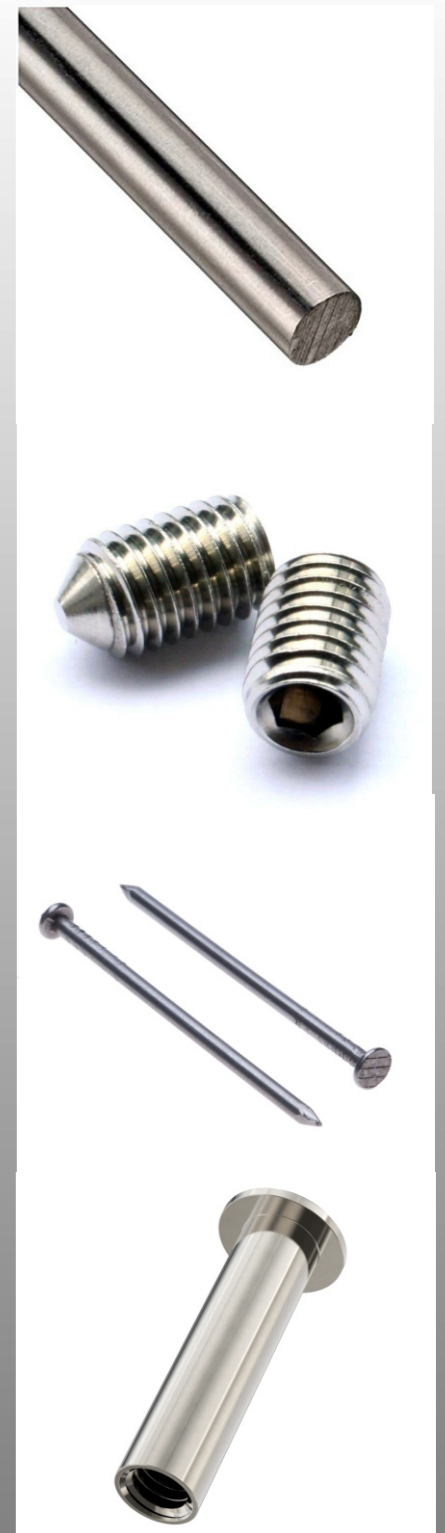
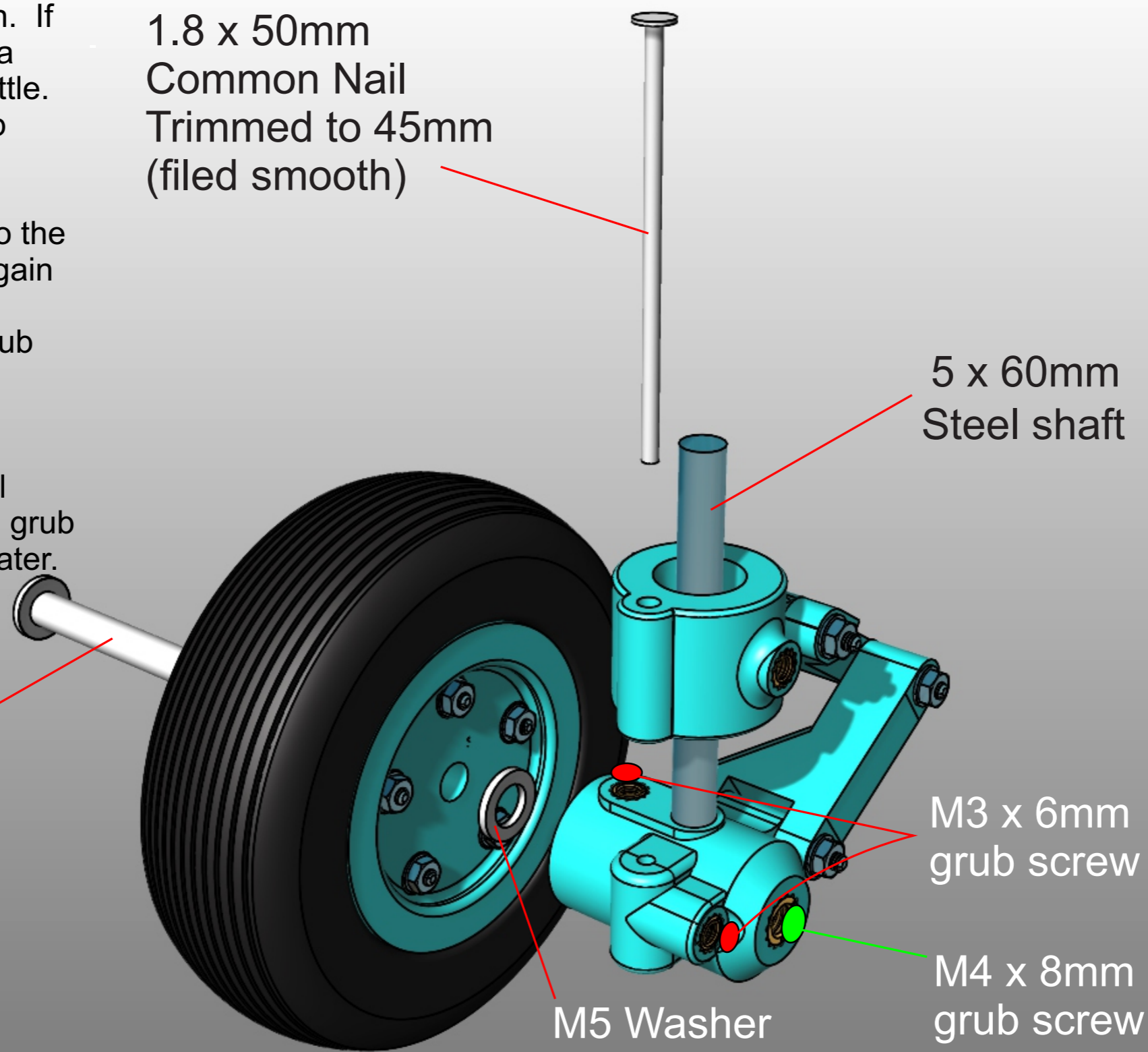
5 x 60mm
Steel shaft

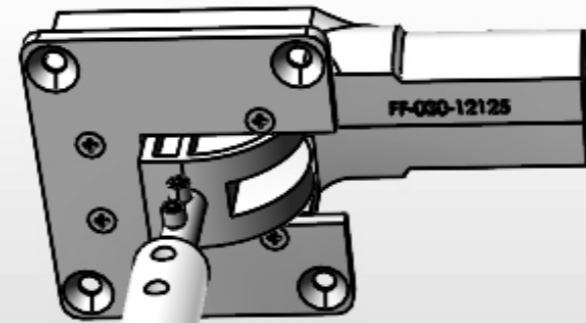
M5 x 30mm
binder screw

M3 x 6mm
grub screw

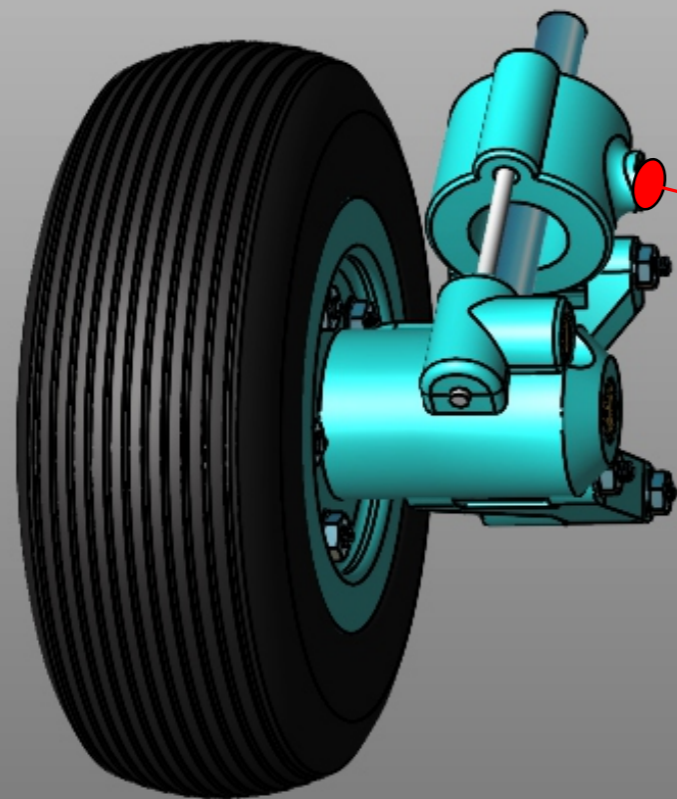
M4 x 8mm
grub screw

M5 Washer





COMPRESSION SPRING
O.Diameter < 5mm
Free Length : 43-45mm
Rate: 12 Nmm
Wire Dia : 0.7-0.9mm
Material : Music Wire
Active coils :27-29



M3 x 6mm
grub screw

Test fit the aluminium tube over the shaft. If it is a tight fit, drill out using a 5.1mm drill bit, to open up the tolerance and make it slide freely.

Attach the tube to the retract mechanism and tighten the grub screw to hold it in place.

Push the spring into the tube, then slide the tube down the shaft and into the Lower bracket until it is flush with the bottom of the bracket. Put a 6x3mm grub screw into the bracket and tighten until it holds the parts together well.

Test the suspension system. Some parts might need sanding in order to loosen up the mechanism.

Adjust the limiter nail, so that the slack is taken up to the spring, but remains under no tension.

If you struggle to find springs on places like Amazon/ebay etc. Try a spring manufacturer, who will be happy to make a small batch for you. I found LeeSpring in the UK to be helpful.



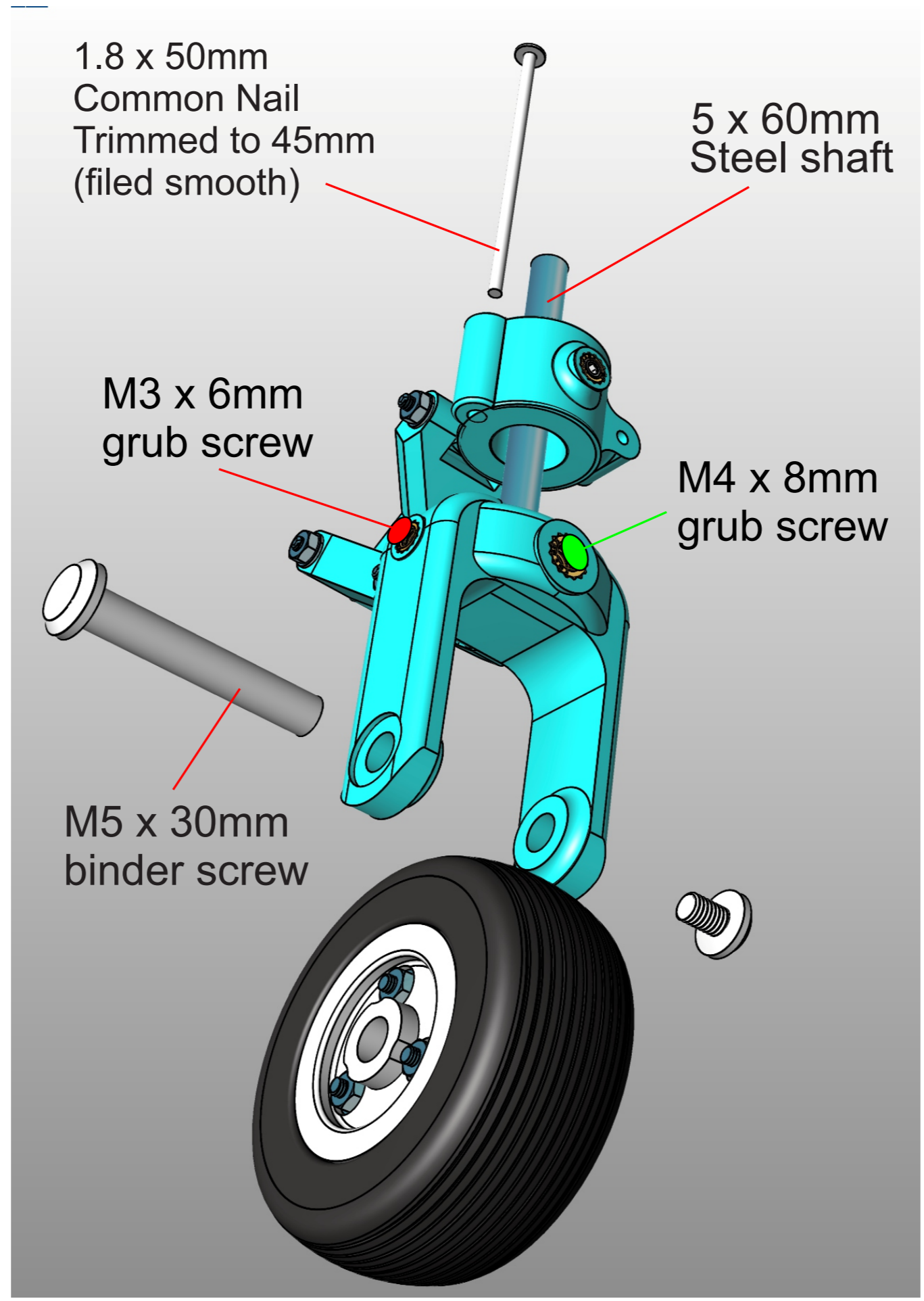
5.1mm Drill

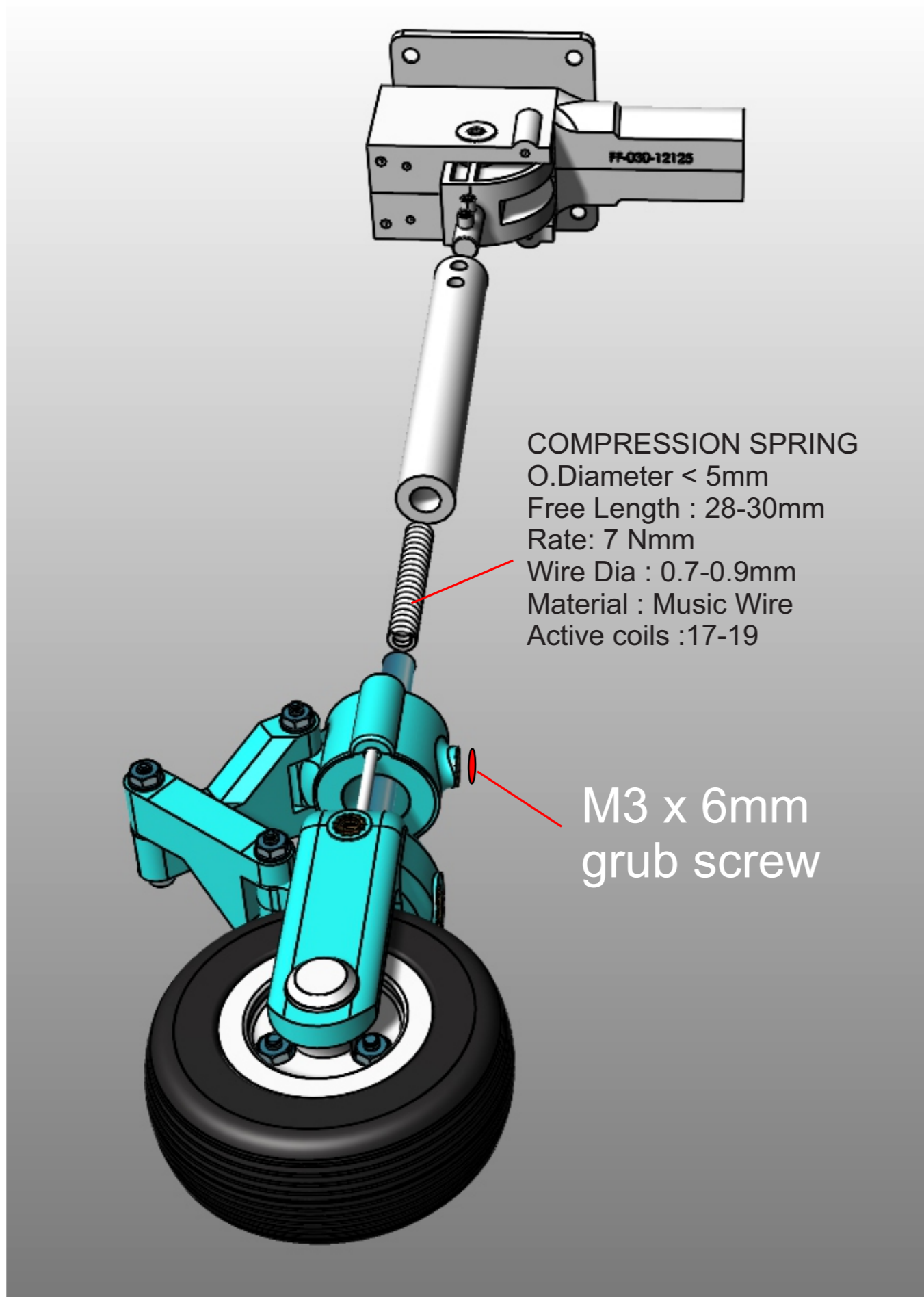


Slide the 5 x 60mm shaft into the Stirrup block as shown. If it is too tight to go in, use a 5mm drill to open it up a little. Secure using a 4mm Grub screw.

Slide the binder screw into the side of the Stirrup block, and through the wheel - using the drill if required. Use the Binder end screw with a few drops of CA glue on the thread to hold in place.

Slide the nail through the Lower part, into the Stirrup block. Secure using 3mm grub screw - adjust the height later.





COMPRESSION SPRING
O.Diameter < 5mm
Free Length : 28-30mm
Rate: 7 Nmm
Wire Dia : 0.7-0.9mm
Material : Music Wire
Active coils :17-19

M3 x 6mm
grub screw

Test fit the aluminium tube over the shaft. If it is a tight fit, drill out using a 5.1mm drill bit, to open up the tolerance and make it slide freely.

Attach the tube to the retract mechanism and tighten the grub screw to hold it in place.

Push the spring into the tube, then slide the tube down the shaft and into the Lower bracket until it is flush with the bottom of the bracket. Put a 6x3mm grub screw into the bracket and tighten until it holds the parts together well.

Test the suspension system. Some parts might need sanding in order to loosen up the mechanism.

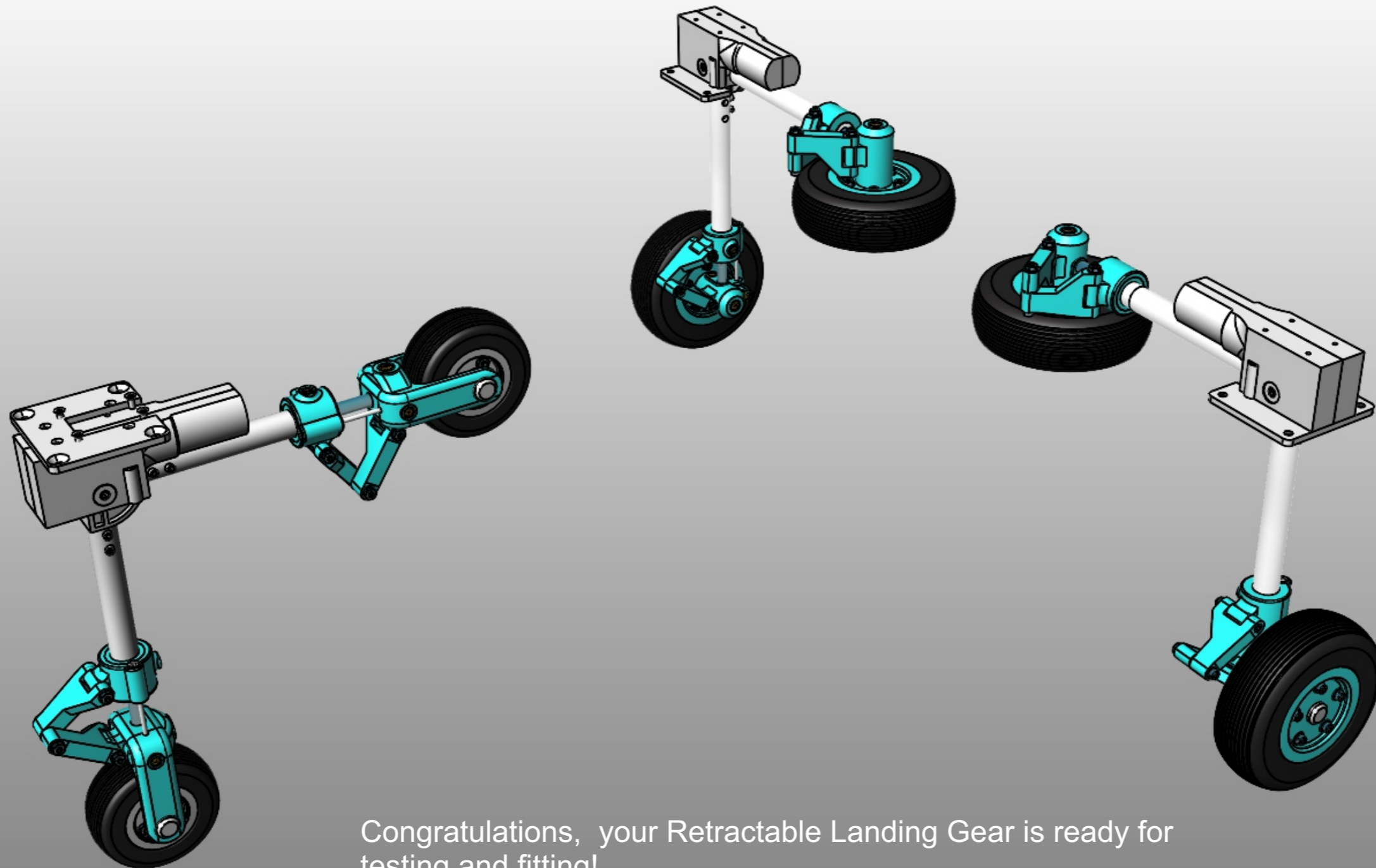
Adjust the limiter nail, so that the slack is taken up to the spring, but remains under no tension.

If you struggle to find springs on places like Amazon/ebay etc. Try a spring manufacturer, who will be happy to make a small batch for you. I found LeeSpring in the UK to be helpful.



5.1mm Drill





Congratulations, your Retractable Landing Gear is ready for testing and fitting!

