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Assembly Guide

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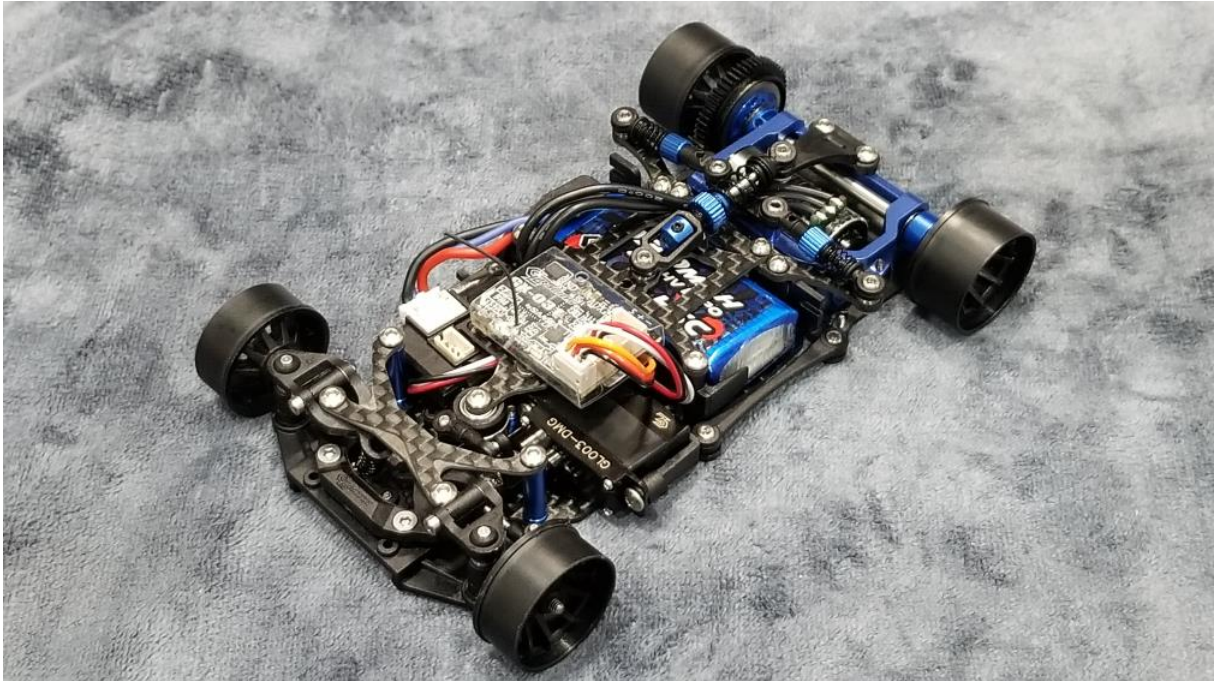
Reference Materials

1. [Gear Ratios Chart](#)
-

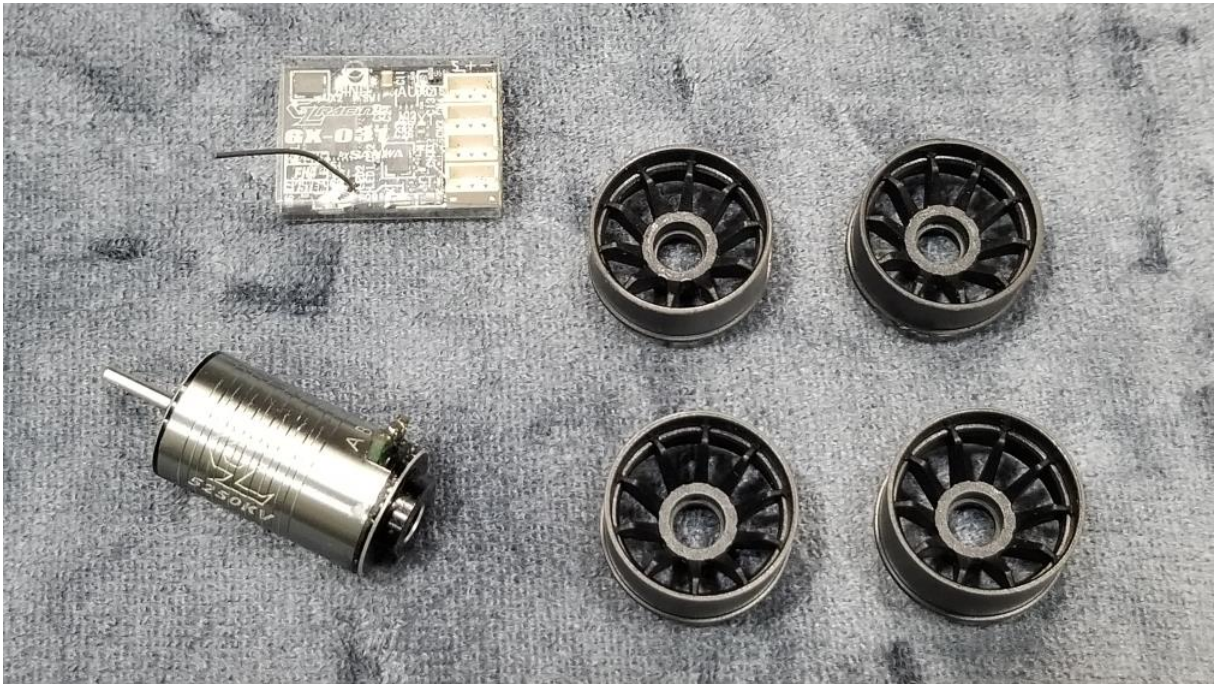
Introduction

In this assembly guide, we will show you step by step how to assemble the GLR, we will also provide any tips along the way.

Enjoy building and racing with GLR!



Components that are required that are not in the base kit: Receiver, brushless 15mm motor, wheels and tyres

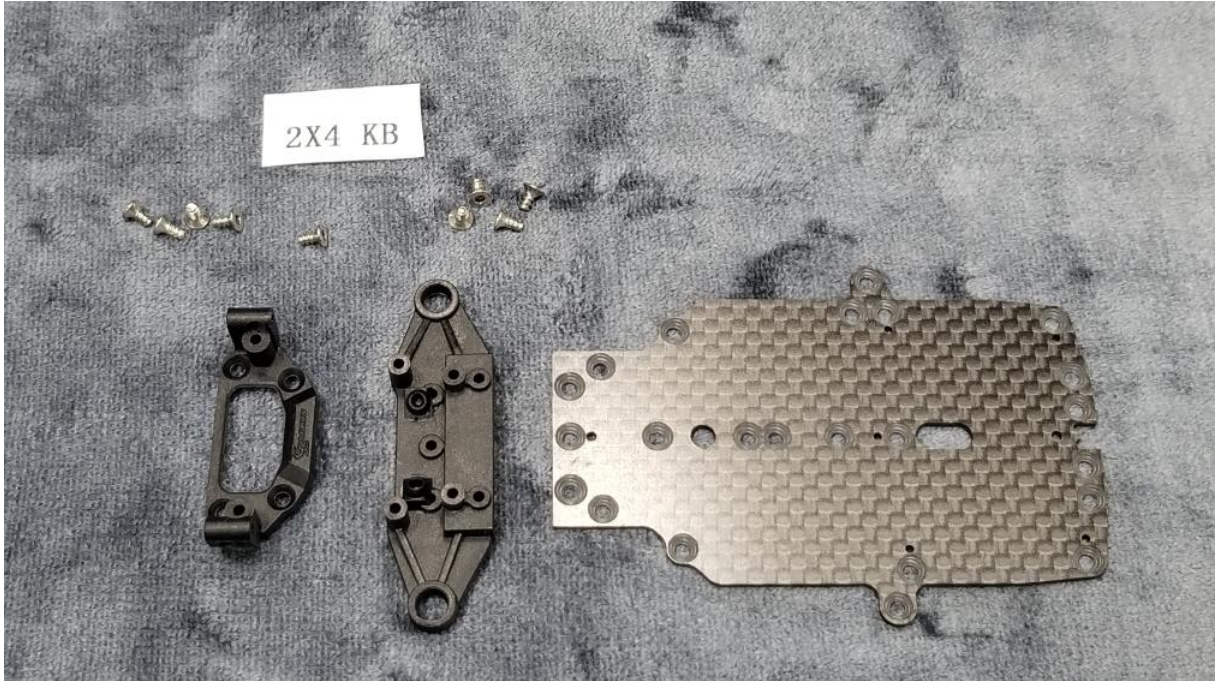


Tools required:



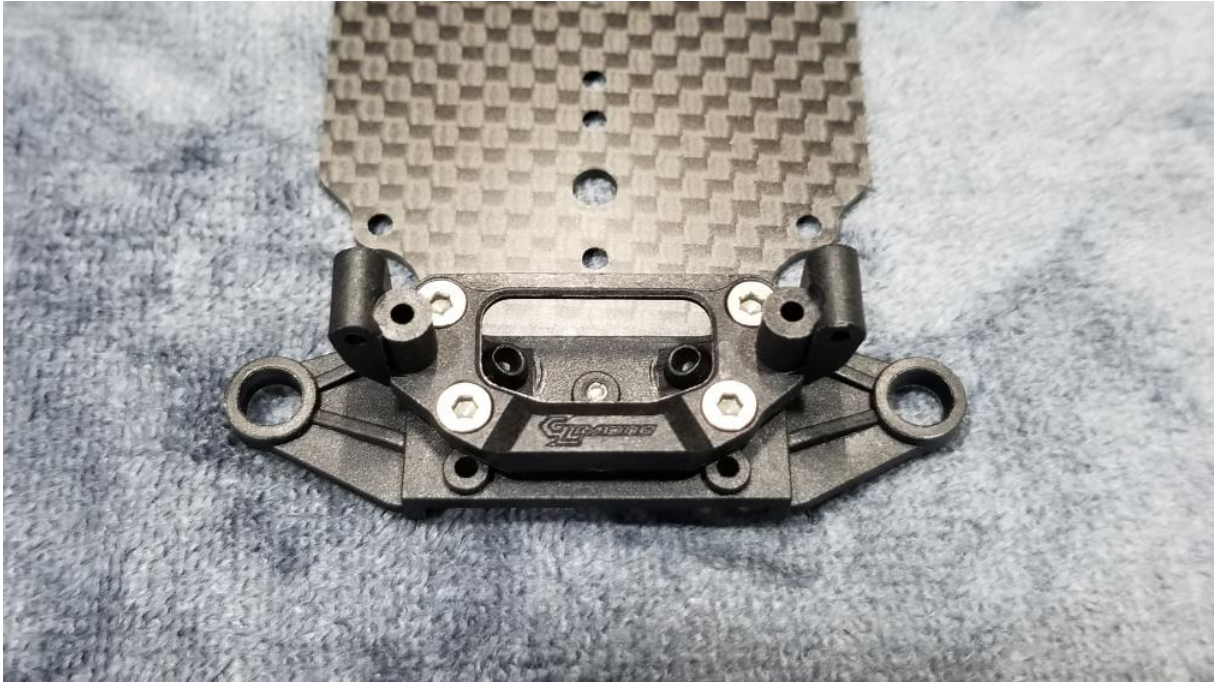
Chassis

Step 1: Front bulkhead

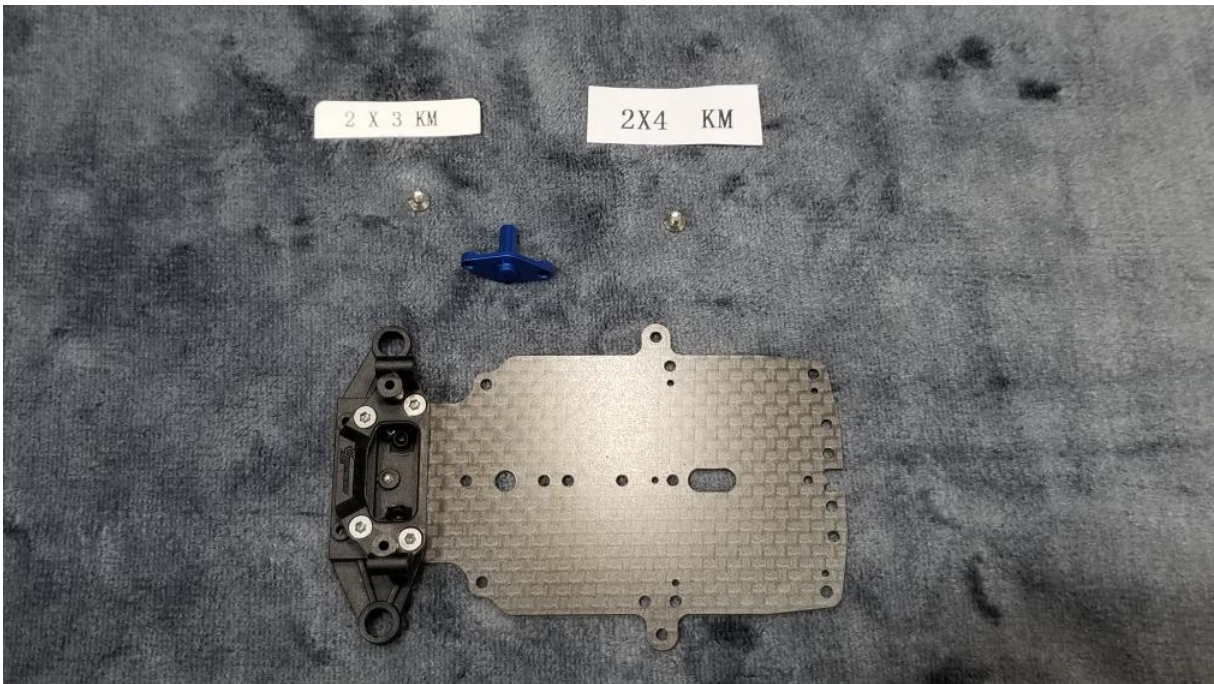


Use 9 2x4 KB screws to affix the front bulkhead as per photos below:



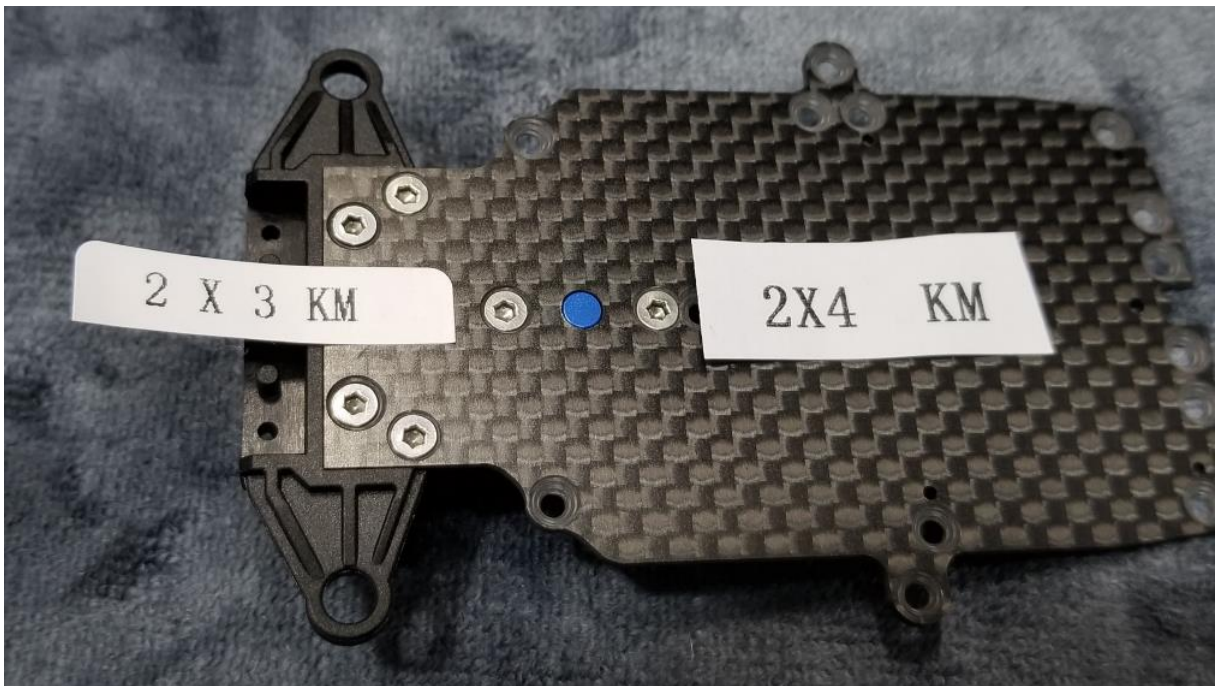


Step 2: Steering post



Please take note of the shorter 2x3 KM should be at the front

Note: Since 2018-05-01, your GLR kit is supplied with 2x3.5KM screws instead of 2x3KM screws, for better stripping of threads

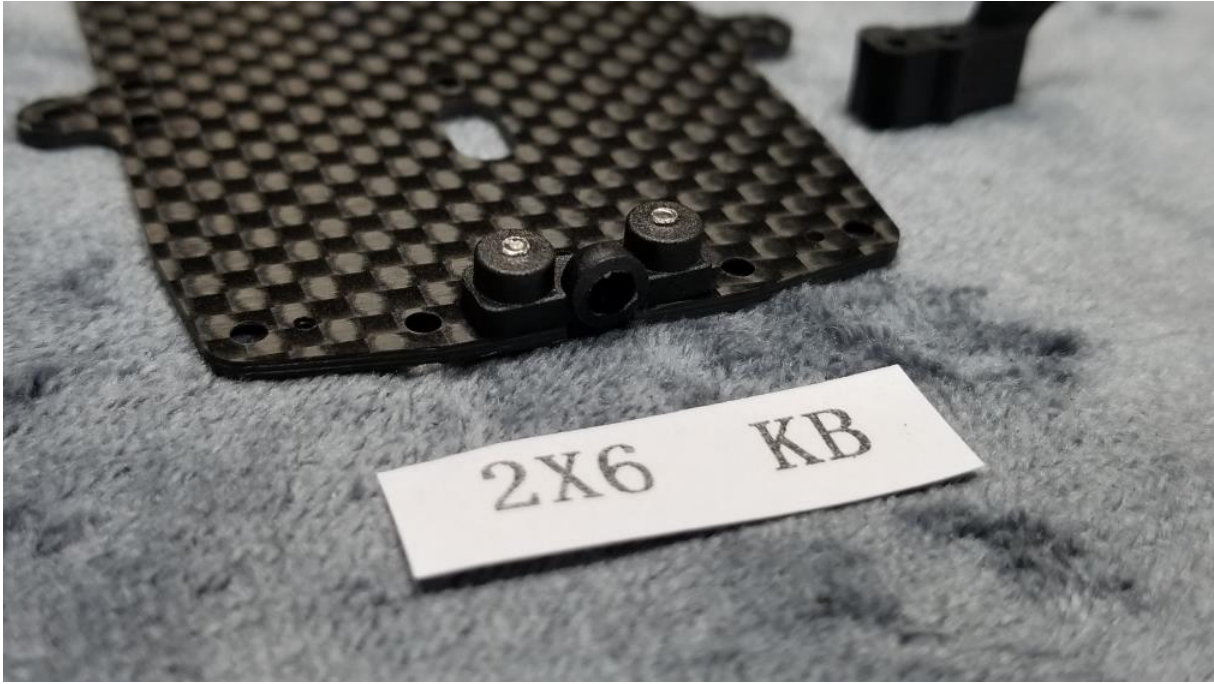




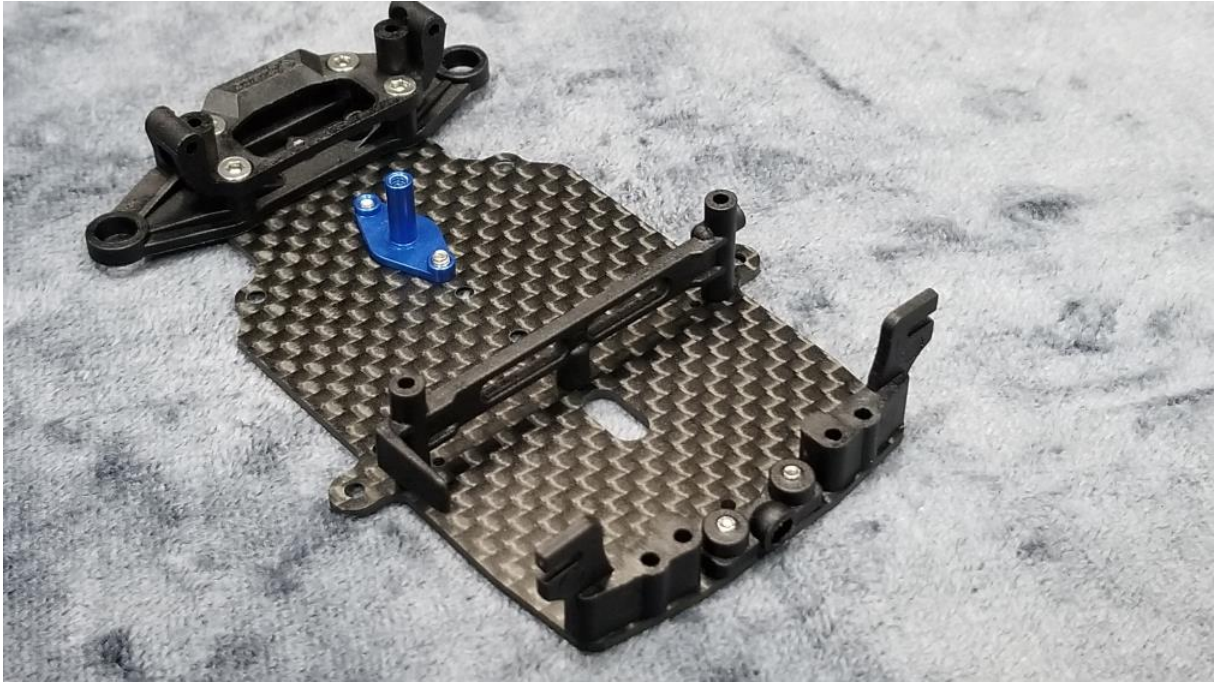
Step 3: Central chassis structures

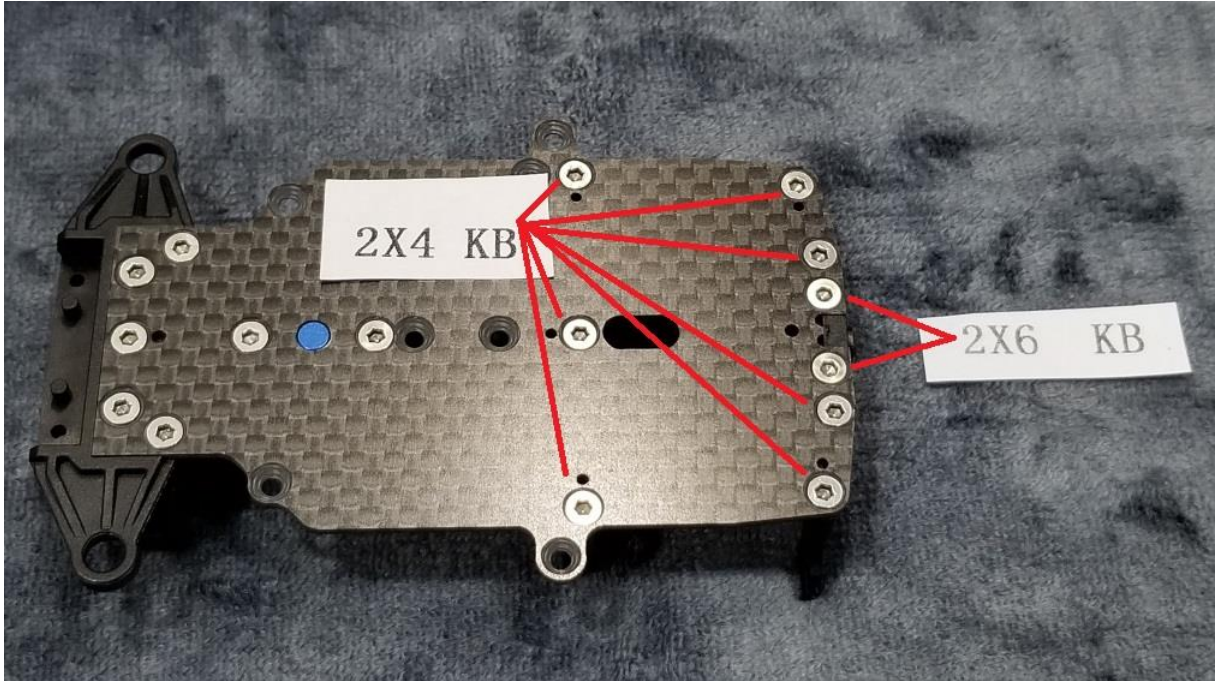


Use the longer 2x6 KB screws to secure the ball link socket

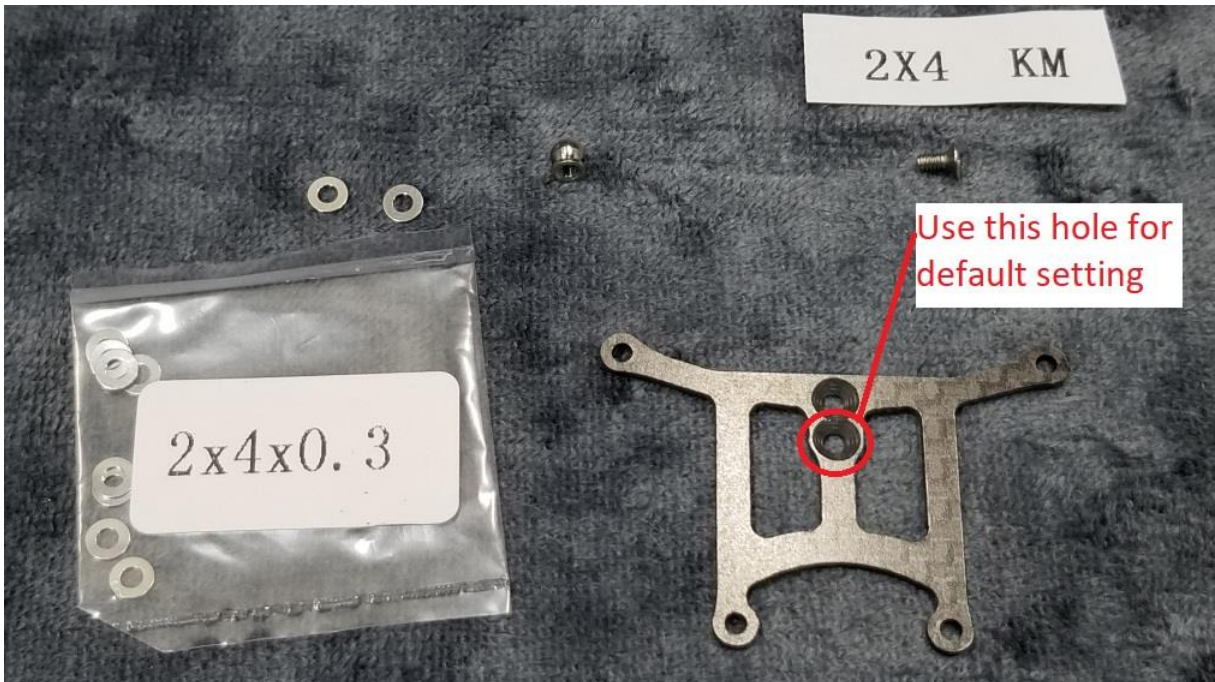


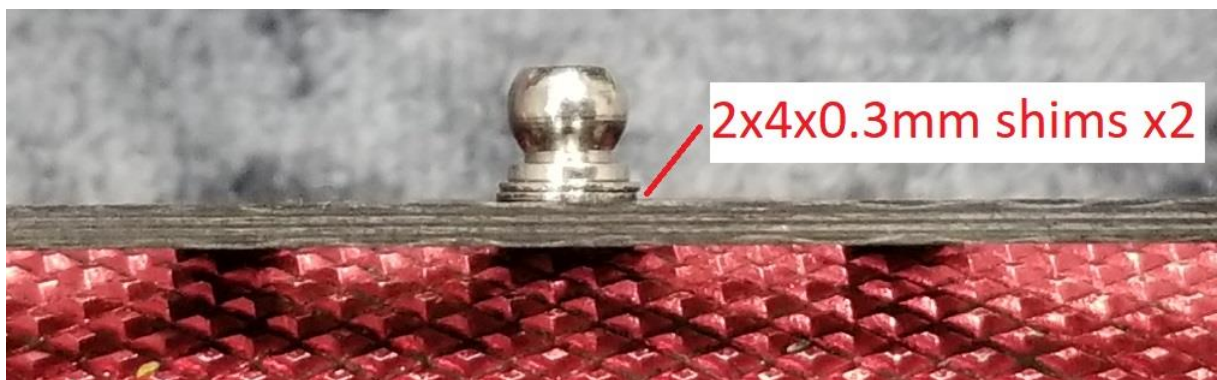
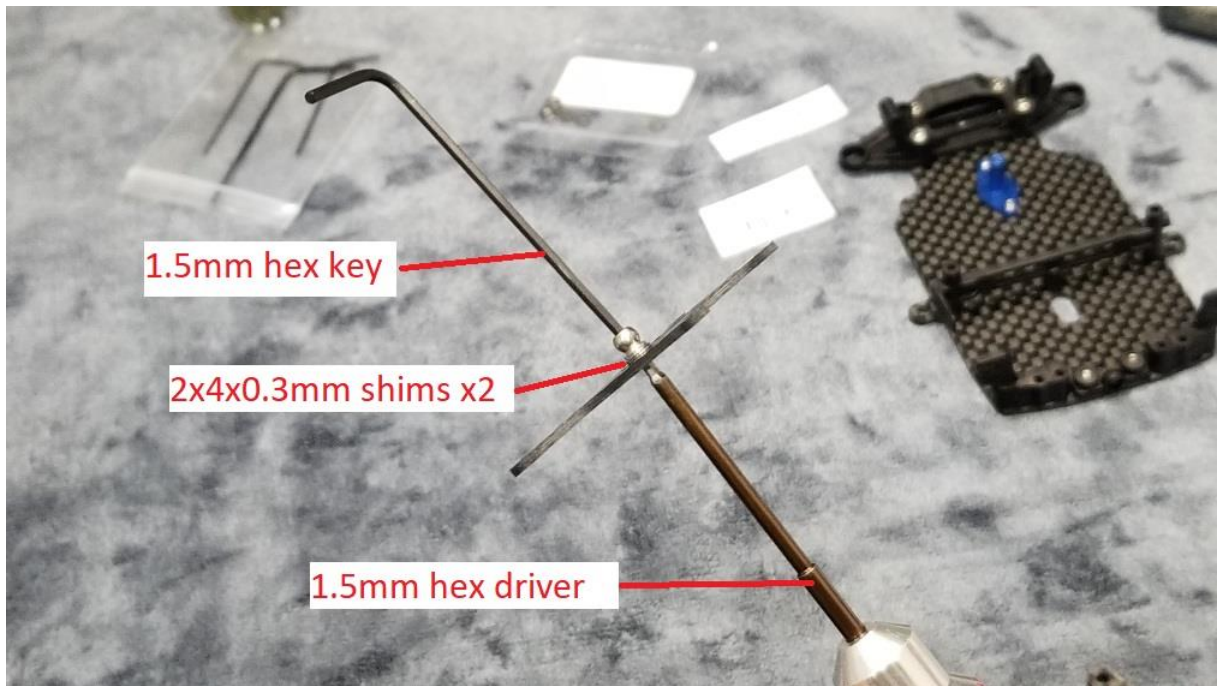
Use the shorter 2x4 KB screws to secure middle section and L-clip posts





Step 4: Central upper deck shock support

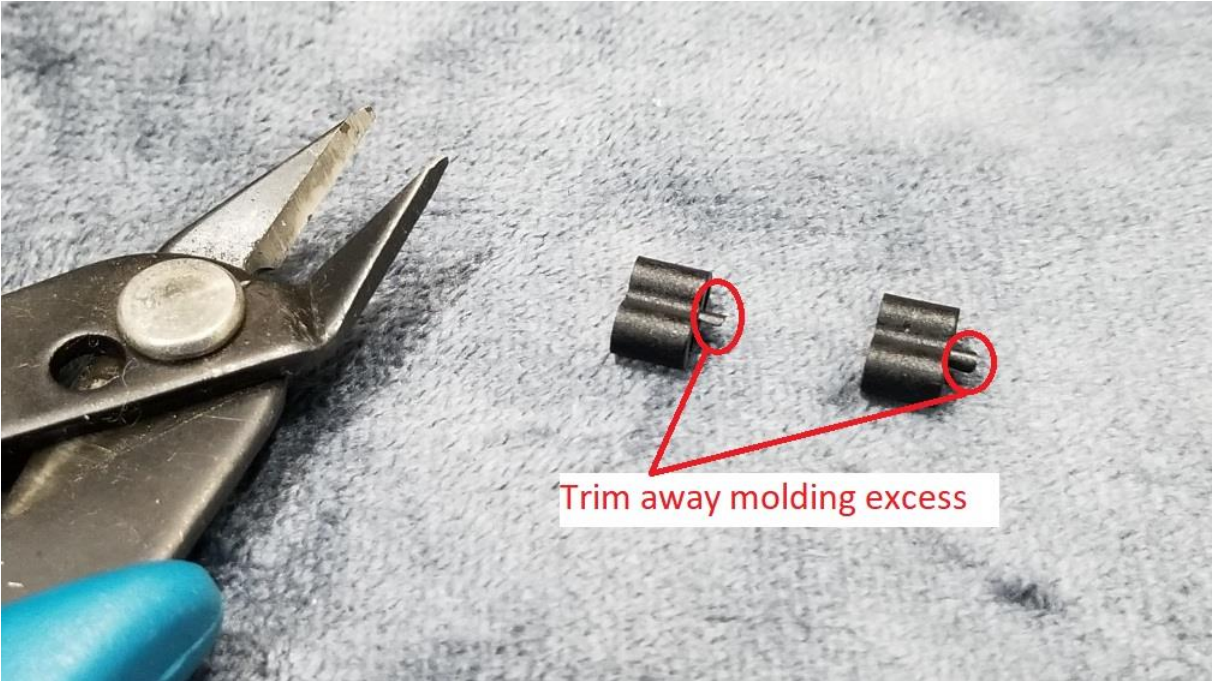




Step 5: Mounting upper deck and side dampers mount



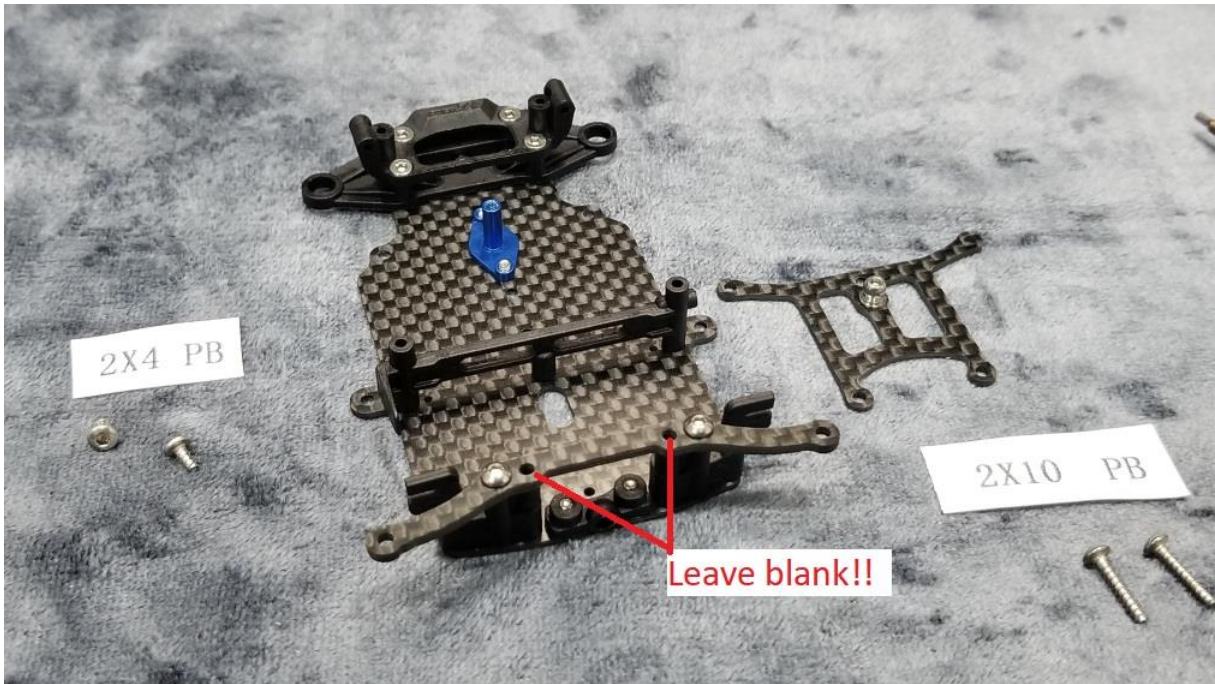
Use cutter to remove molding excess



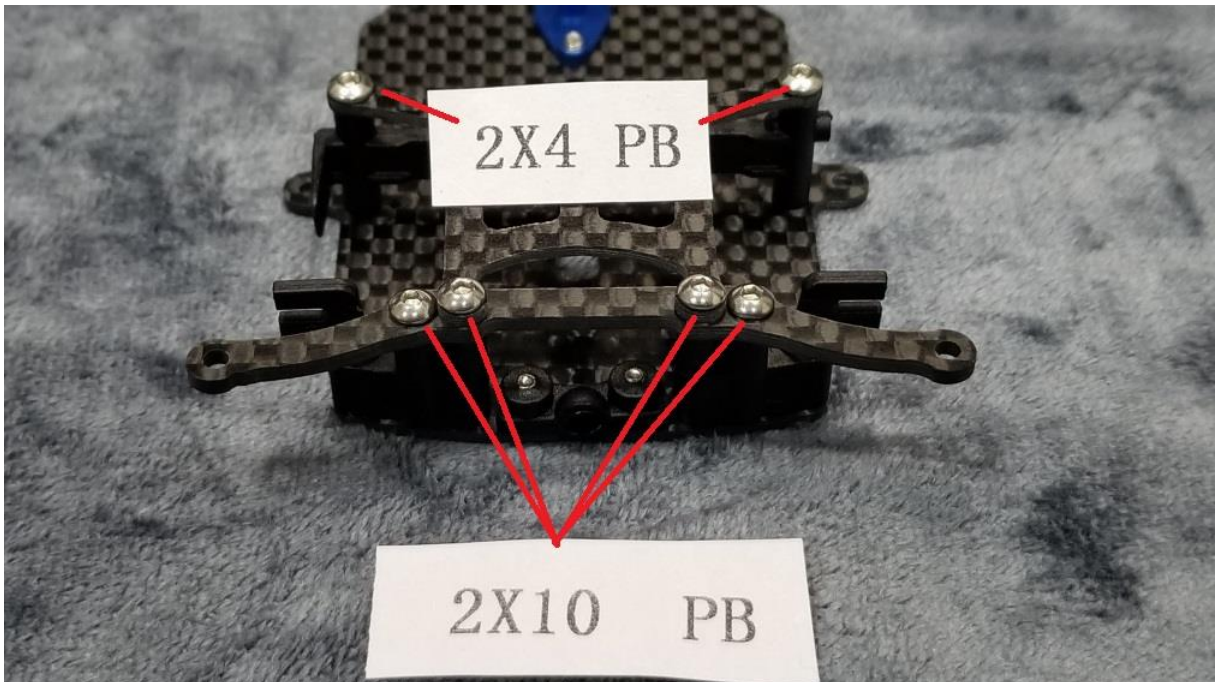
Place plastic collars on top of L-clip holders



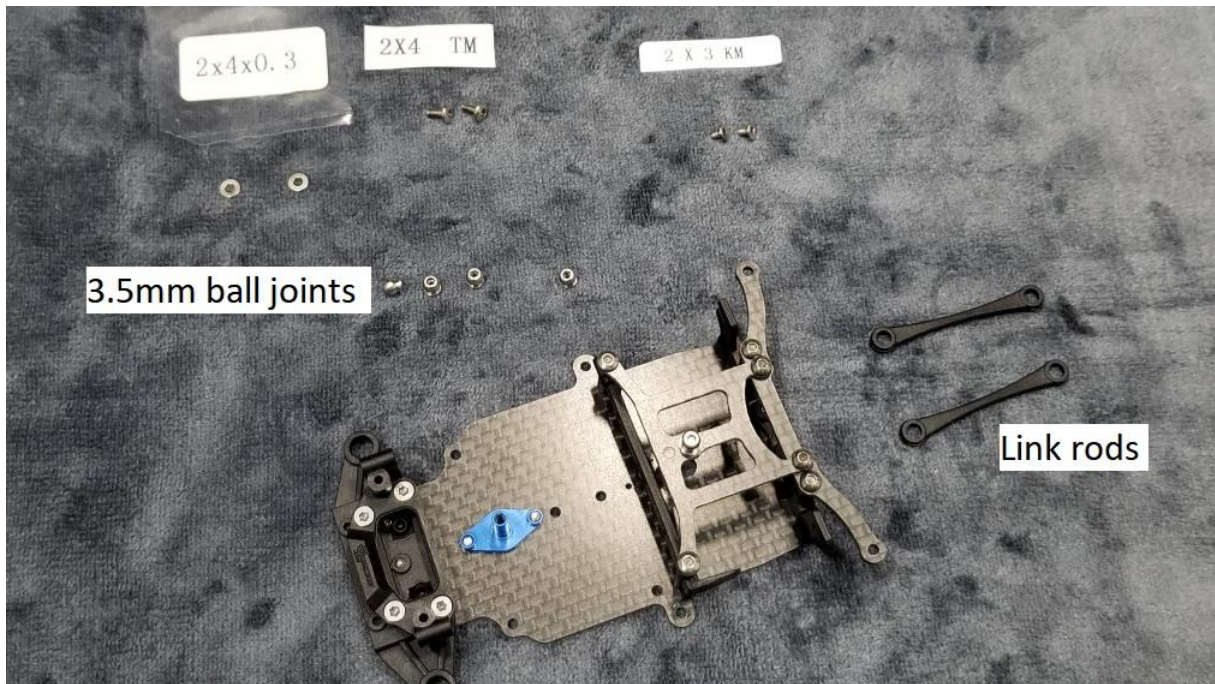
Use 2x10 PB to attach side dampers mount, but leave two holes in the middle blank



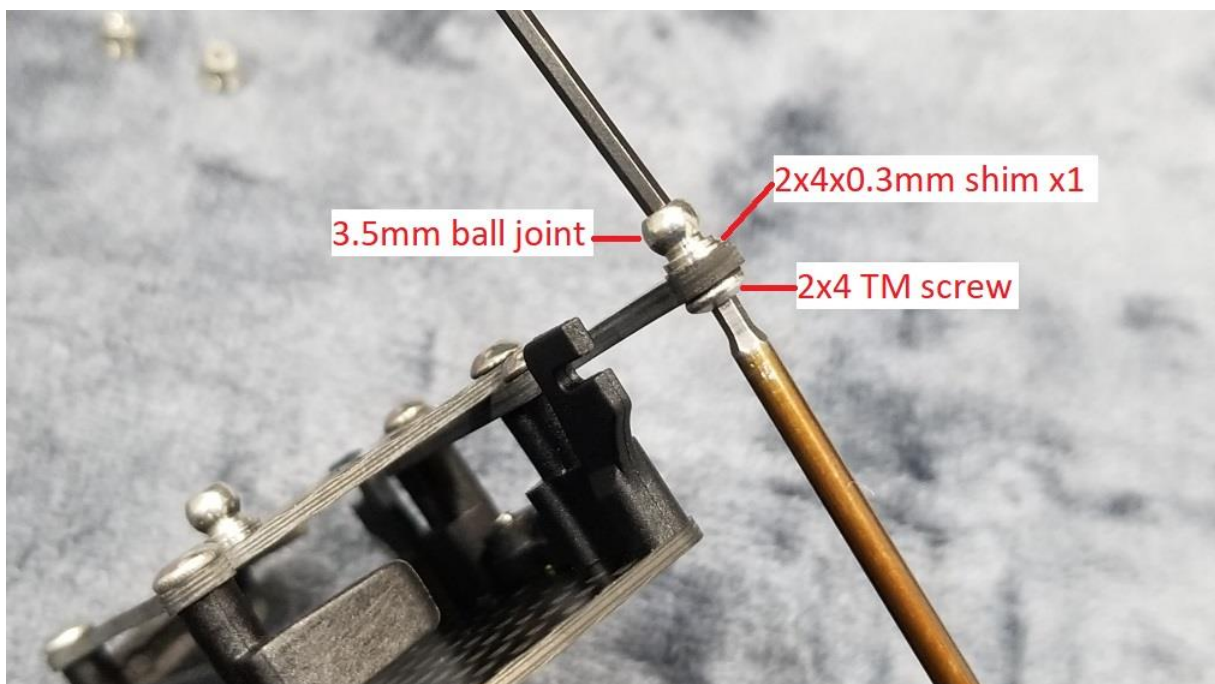
Use 2x4 PB and 2x10 PB to secure the upper deck



Step 6: Ball joints for side links and side dampers



Use 2x4 TM to affix side damper ball joints, add a 2x4x0.3 shim each side

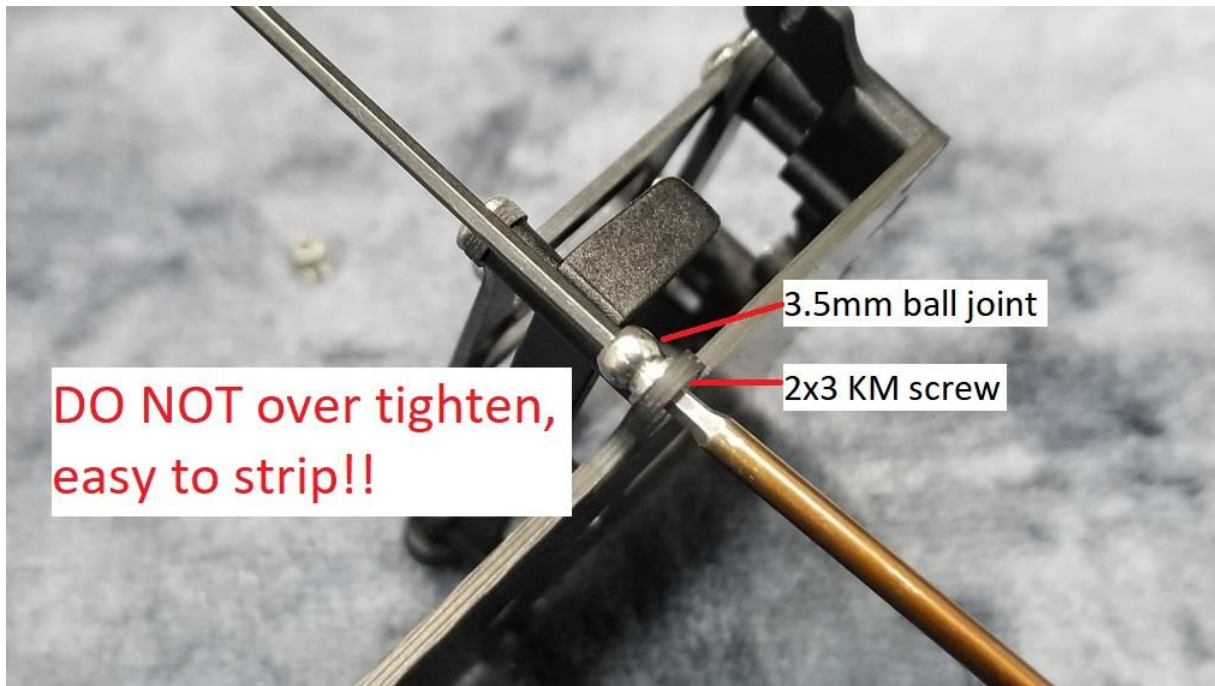


Use 2x3 KM to affix link rods ball joints, no shim both side

WARNING for kits with 2x3KM screws: Do NOT overtighten here, stop when feeling resistance, it is easy to strip the thread here!

Note: Since 2018-05-01, your GLR kit is supplied with 2x3.5KM screws instead of 2x3KM screws, for better fit to prevent stripping of threads

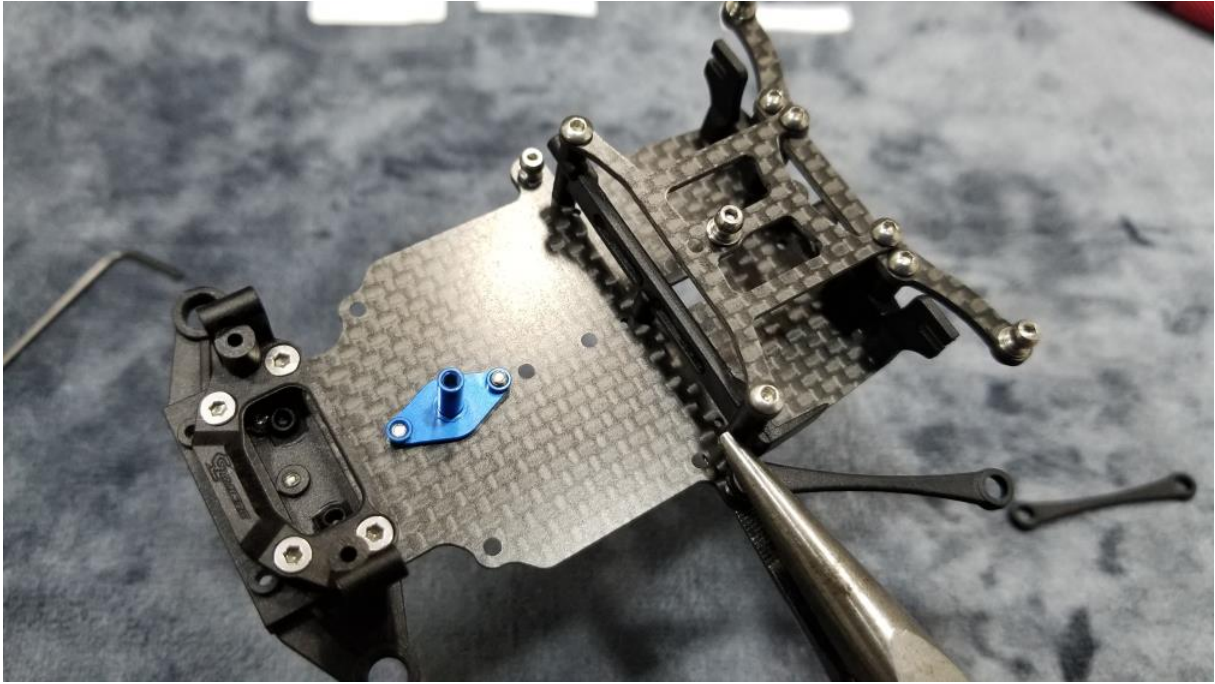
Optional: Add Thread Lock to be safe



Note the glossy side of the sockets on the link rods faces ball joints



Pop link rods onto ball joints using pliers, both left and right



Step 7: Battery gate

Use a 2x4 PB screw to affix the battery gate





Chassis DONE!!

Front suspension

Step 1: Front knuckles

Please note the orientation of the plastic knuckles, it's easy to assemble them inside out by mistake!

(The L & R lettering on the parts faces the bottom of the car)



Use pliers to screw the front shafts into knuckles

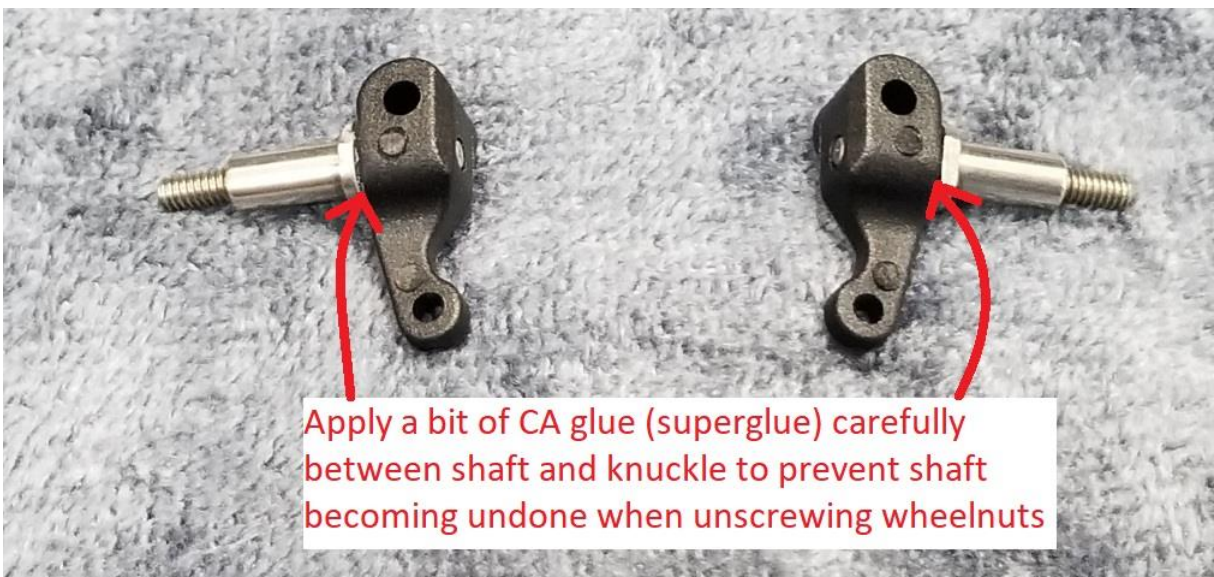


Screw shafts on the outside, not inside of the kunckles! See photos below





Optional but recommended: Apply a bit of CA glue (superglue) carefully between shaft and knuckle to prevent shaft becoming undone when unscrewing wheelnuts



Apply a bit of CA glue (superglue) carefully between shaft and knuckle to prevent shaft becoming undone when unscrewing wheelnuts

Step 2: Front knuckles ball joints

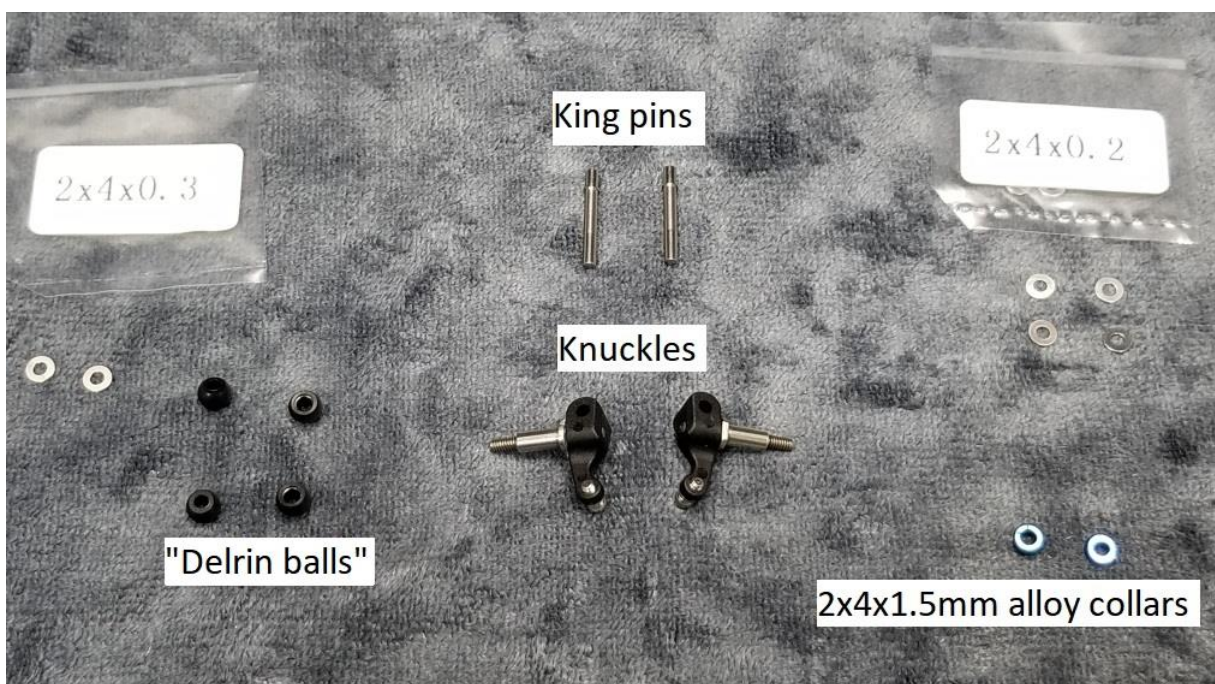
Firstly note the bigger (3mm) ball studs are for front knuckles



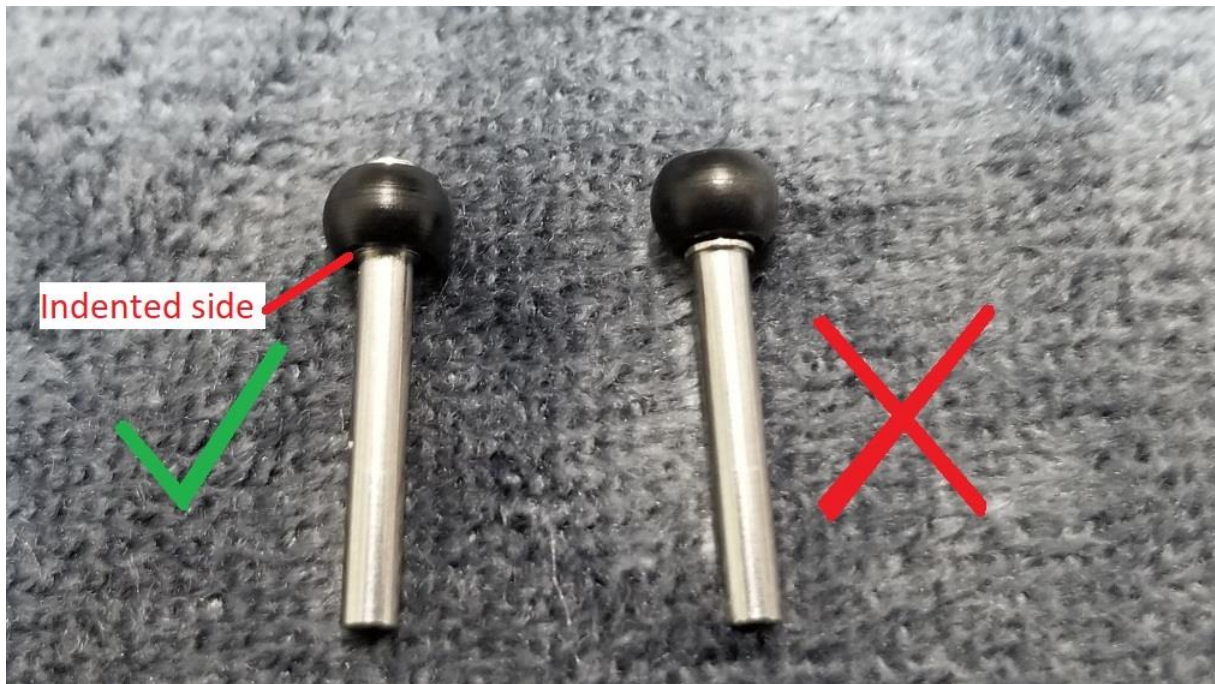
Use a 1.5mm hex to screw the 3mm ball studs into the bottom side of the knuckles with L or R lettering



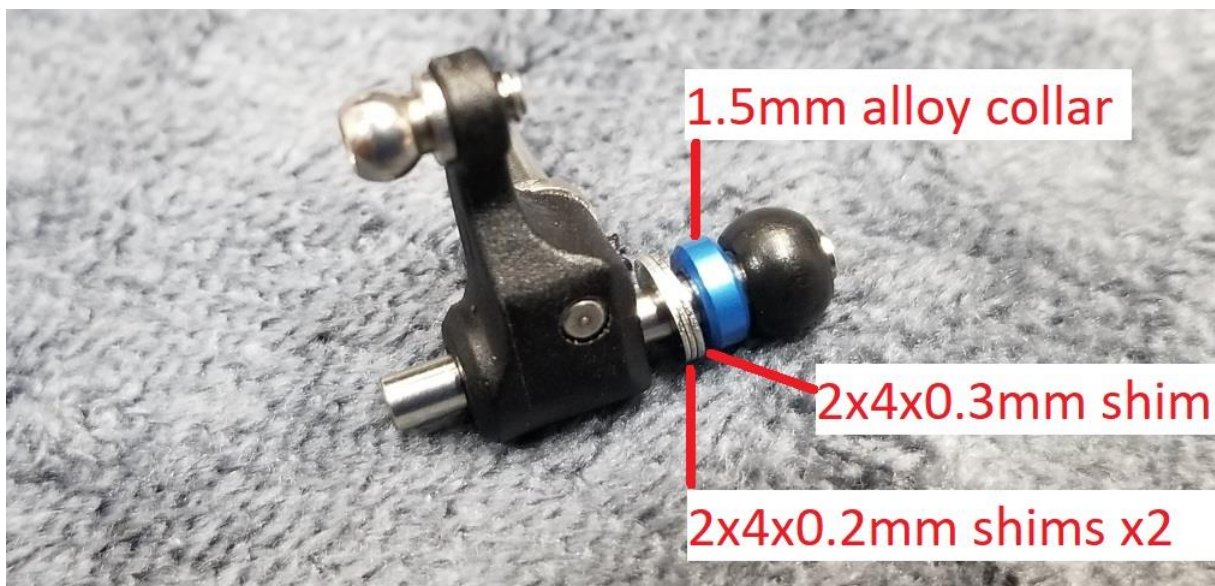
Step 3: King pins, knuckles, ride height shims



Attach the black "Delrin balls" to the king pins as follows:



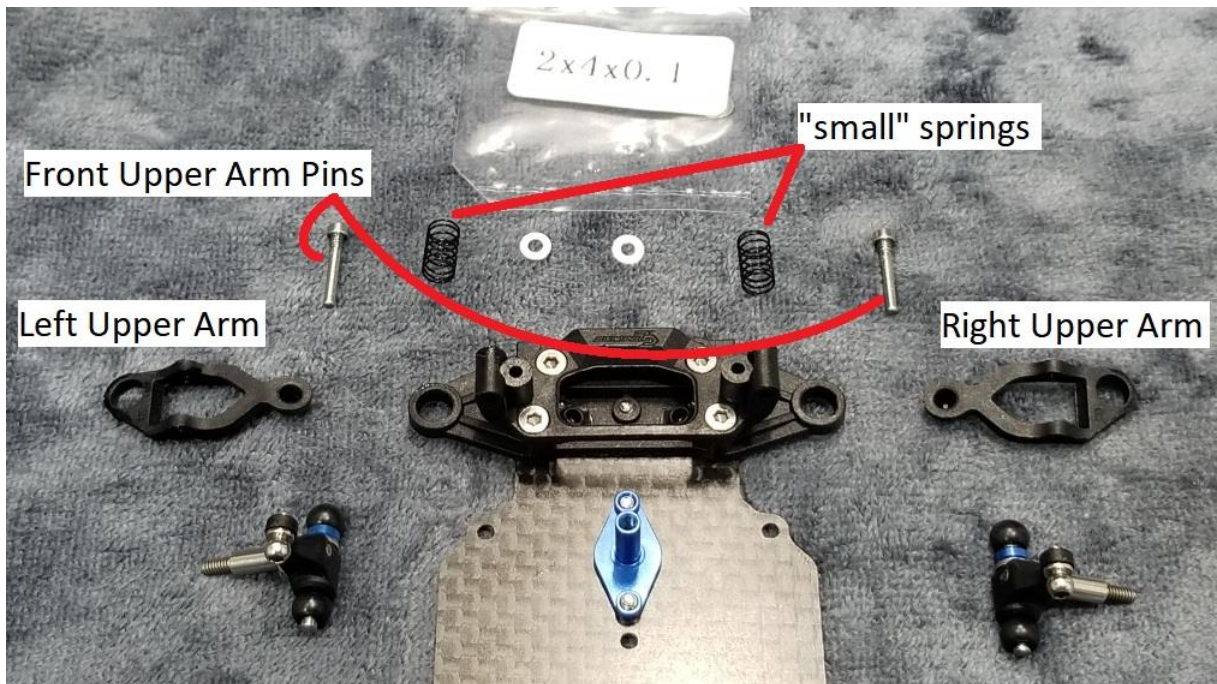
Arrange the 2x4x1.5mm alloy collar, 2x4x0.3mm shim, 2x4x0.2mm shims x2 and kunckle as per photo:



Put another "Delrin ball" to the bottom of the king pin, indent side facing downwards, repeat for the other side



Step 4: Front upper arms, springs, upper arm pins



Firstly, pop the bottom Delrin balls of the knuckle assemblies into Front Lower arm sockets



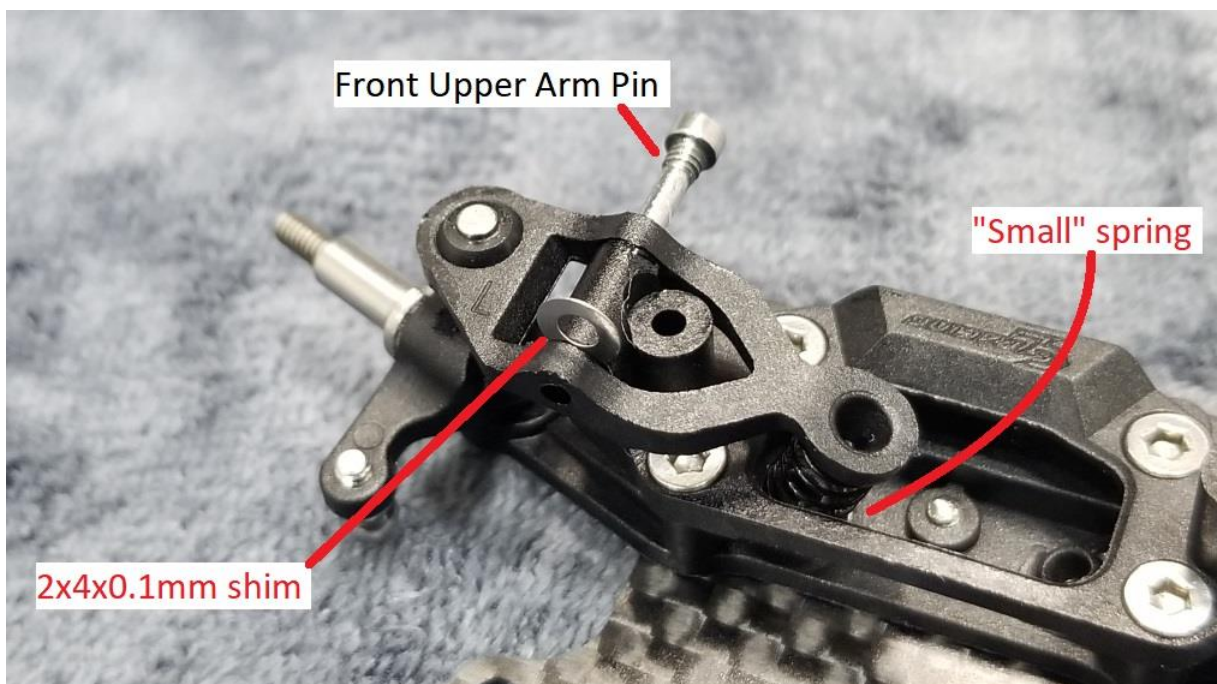
Pop the upper arms onto the top of knuckle assemblies, note orientation, L & R lettering facing sky



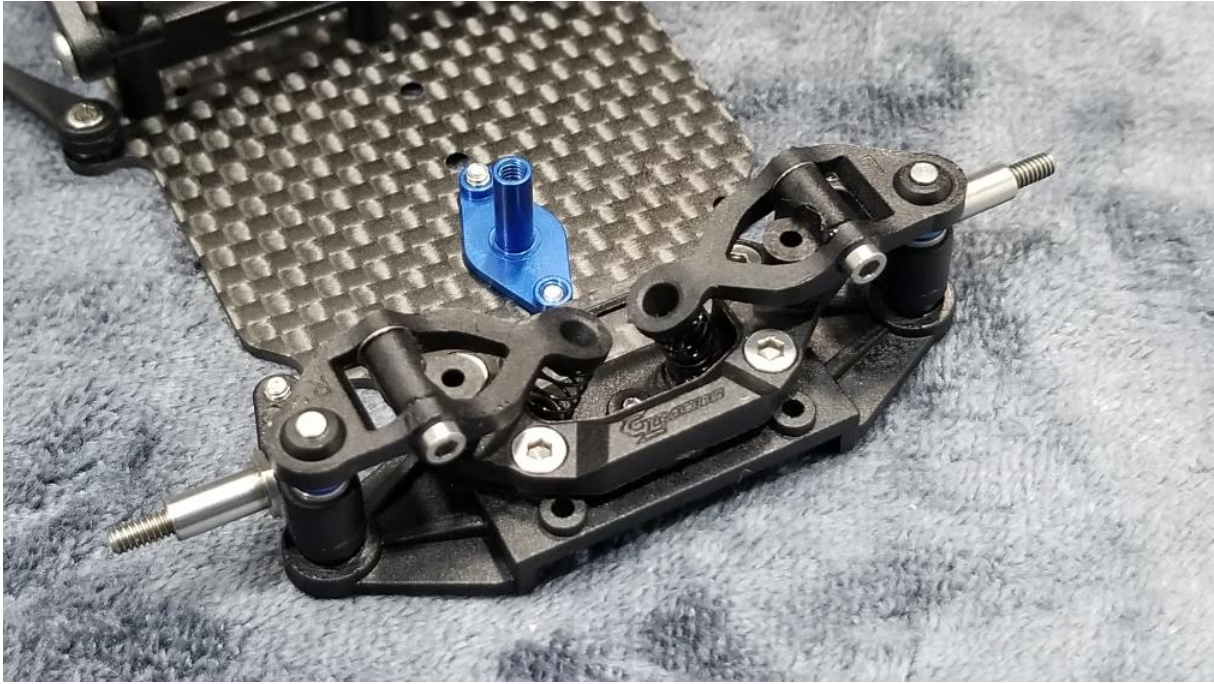
Optional but recommended, add a drop of friction grease to the upper arm pins for dampening



Assemble spring, upper arm, 2x4x0.1mm shim and upper arm pin as photo below

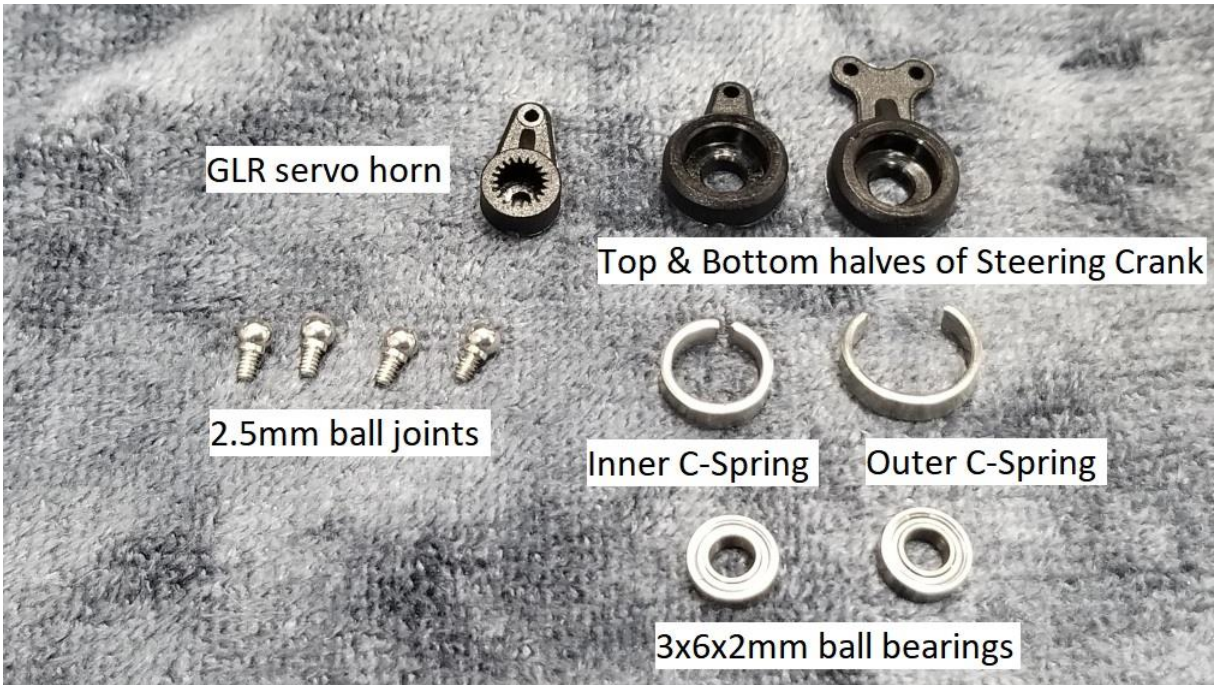


Front Suspension complete!



Steering links

Step 1: Steering Crank



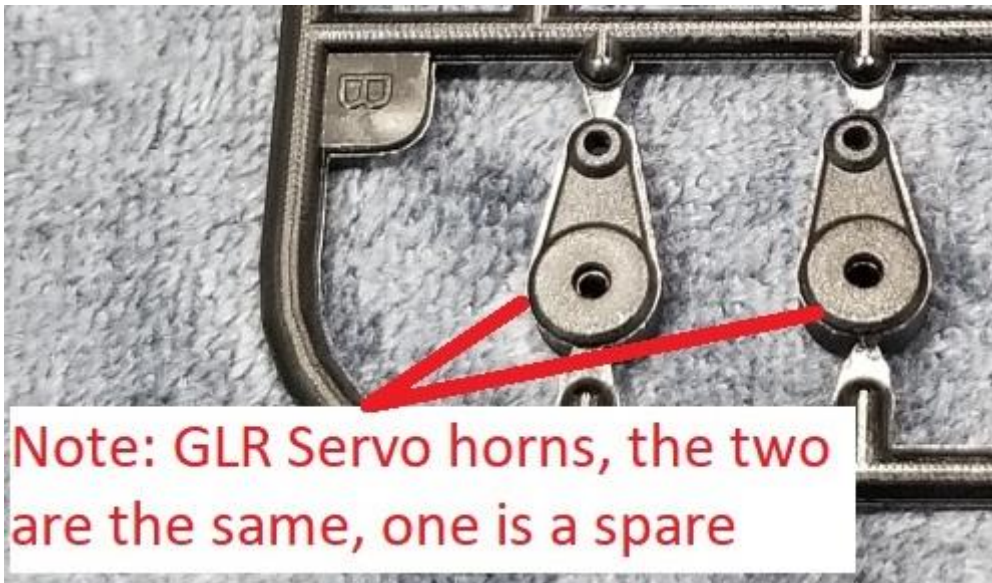
Note: the thinner 3x6x2mm ball bearing is for the Steering crank

3x6x2mm ball bearing
for steering crank

3x6x2.5mm
for wheels and rear axle



Note: there are 2 GLR Servo horns, they are the same, one is a spare



Note: GLR Servo horns, the two
are the same, one is a spare

Use a 1.3mm hex to secure a 2.5mm ball joint to the GLR servo horn





Insert the 3x6x2mm ball bearings into the top and bottom halves of the Steering crank



Screw the three 2.5mm ball joints onto the top and bottom halves of the Steering crank



Use a 1.5mm hex drive/allen key to open up the inner C-spring

Push down to open up
the Inner C-Spring



1.5mm Hex Key



Push the inner C-spring onto bottom half of the Steering crank

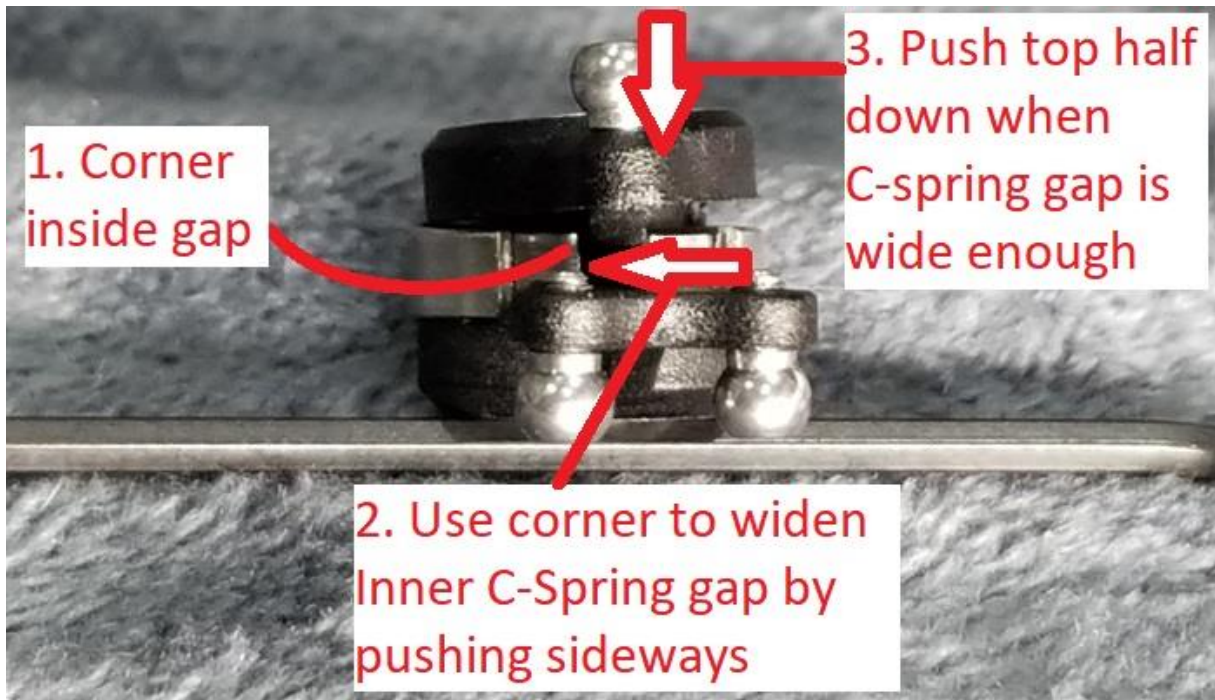


Place the outer C-Spring around the inner C-spring, check the ends of the outer C-spring don't touch the plastic "triangles" on the bottom half of the steering crank



Put the top half of the Steering Crank onto assembly by:

1. Put a corner of the plastic "cube" of the top half into the C-spring gap
2. Use the corner to widen the gap of the C-Spring by pushing sideways
3. Push top half down when C-spring gap is wide enough

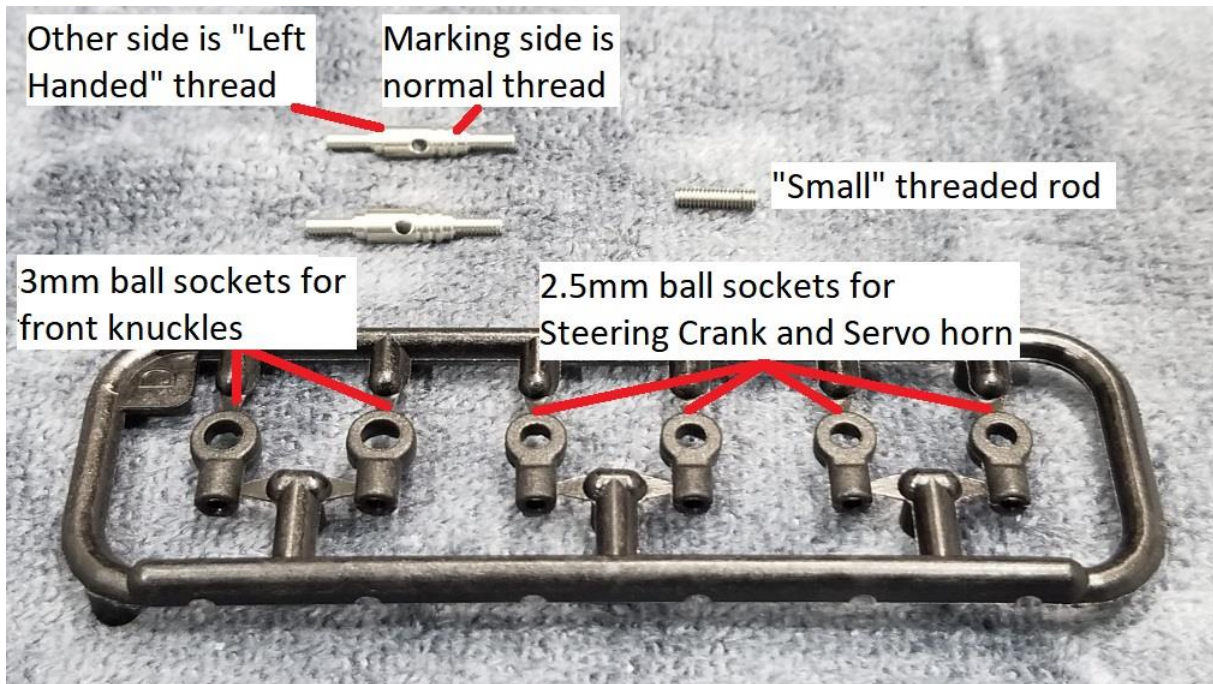


Servo horn and Steering Crank complete!

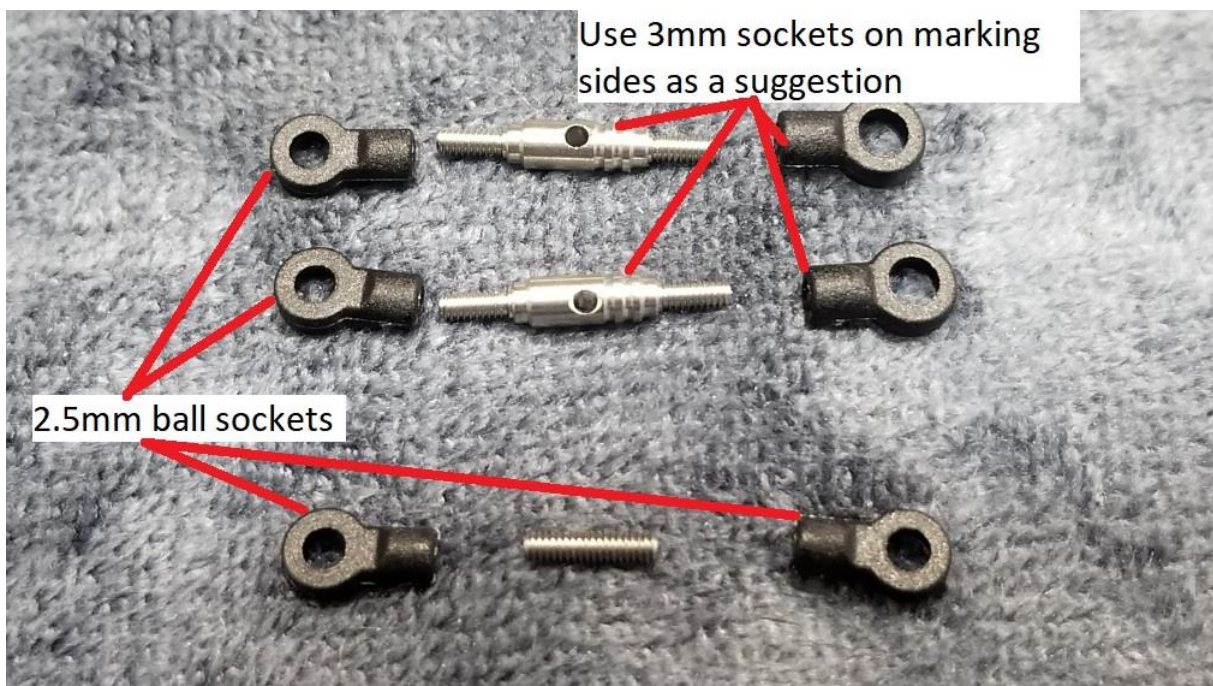


Step 2: Steering links

Firstly note the bigger (3mm) ball sockets are for front kunckles



Arrange the three links as below, suggest to put the sides with markings to the 3mm sockets, so that marking faces outside towards knuckles



The Servo Horn to Steering Crank Link is very short and the threaded rod sometimes goes deeper into one ball socket than the other, but if the threaded rod is too far in, it will damage the ball-joint or cause it not to move freely, use the servo horn link to help make sure the threaded rod is in the middle of the link



Hold the "Short" Threaded rod in the **exact middle** with a pair of Wire Cutter. Hold tight but do NOT cut it!!!

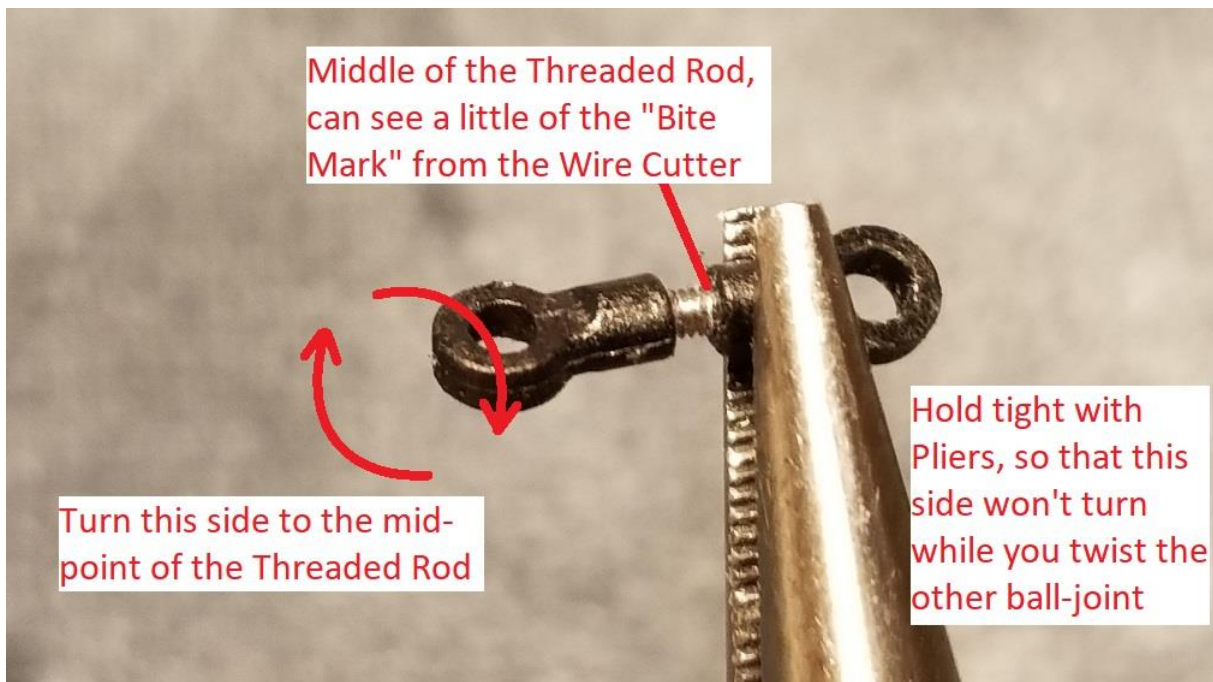


Screw in one of the ball-joint to the Threaded rod to the mid-point

Then, Screw the other ball-joint to the Threaded rod as much as possible



Use Pliers to hold TIGHT the side you do NOT want to turn, screw the Steering link to length (Ball-Joints almost touching) ~14mm

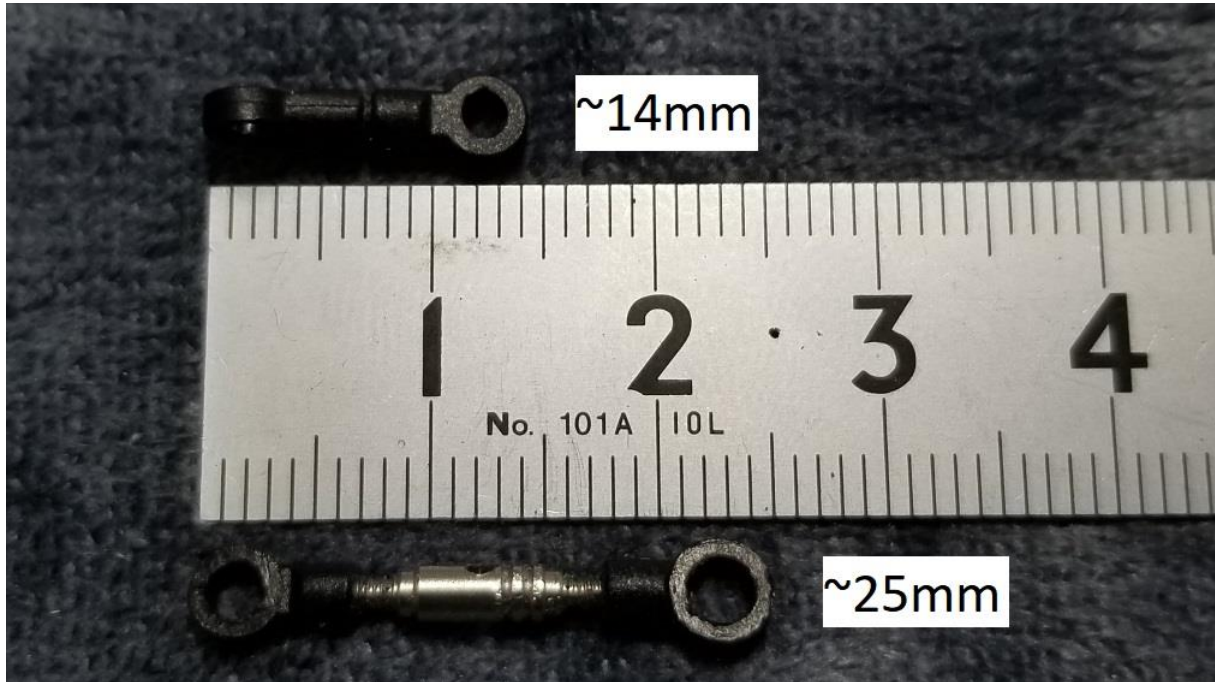


Check that both sides of the Steering Link is still smooth using the Servo Horn ball

If one side is tight, try moving the Threaded rod slightly over to the other side by:

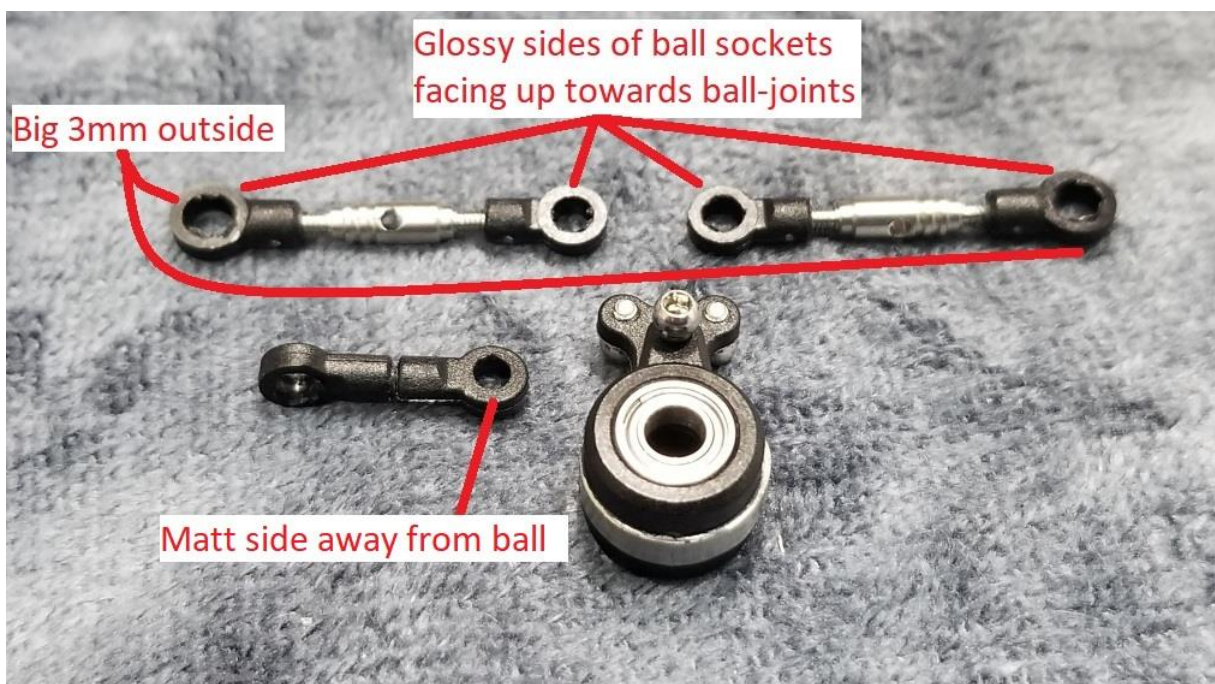
1. Hold TIGHT with pliers the "Good" side, unscrew the Link a little
2. Hold TIGHT with pliers the "Bad" side, screw together the Link to correct length again
3. Repeat 1 & 2 if needed

Screw together the Crank-to-Knuckles links to following lengths:

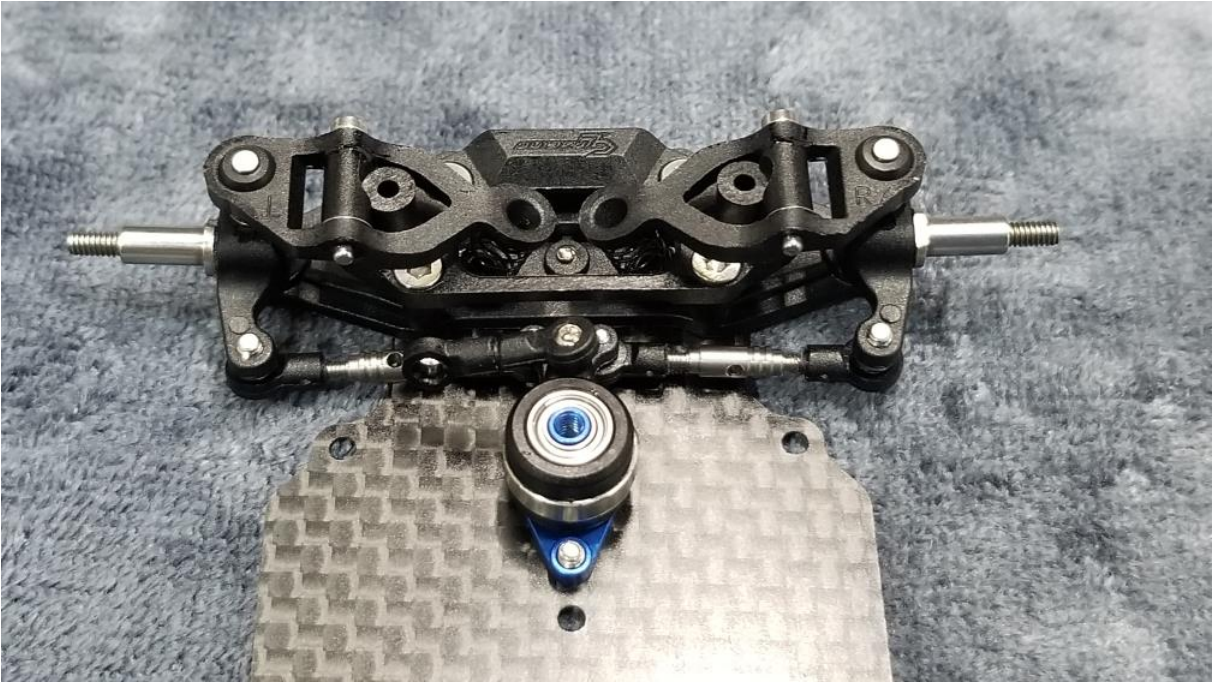


Note: The unmarked side of the tie rods are left-handed thread, i.e. anti-clockwise to screw-in

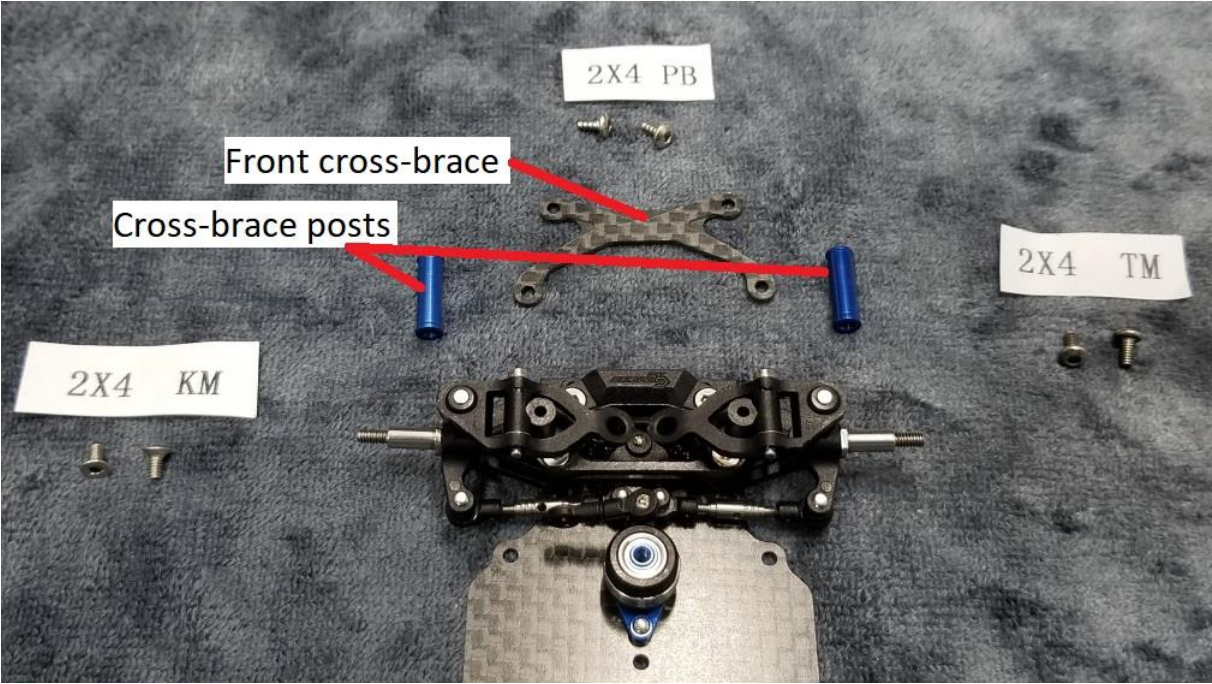
Arrange the three links as below, 3mm (larger) sockets on the outside, glossy sides of sockets facing balls



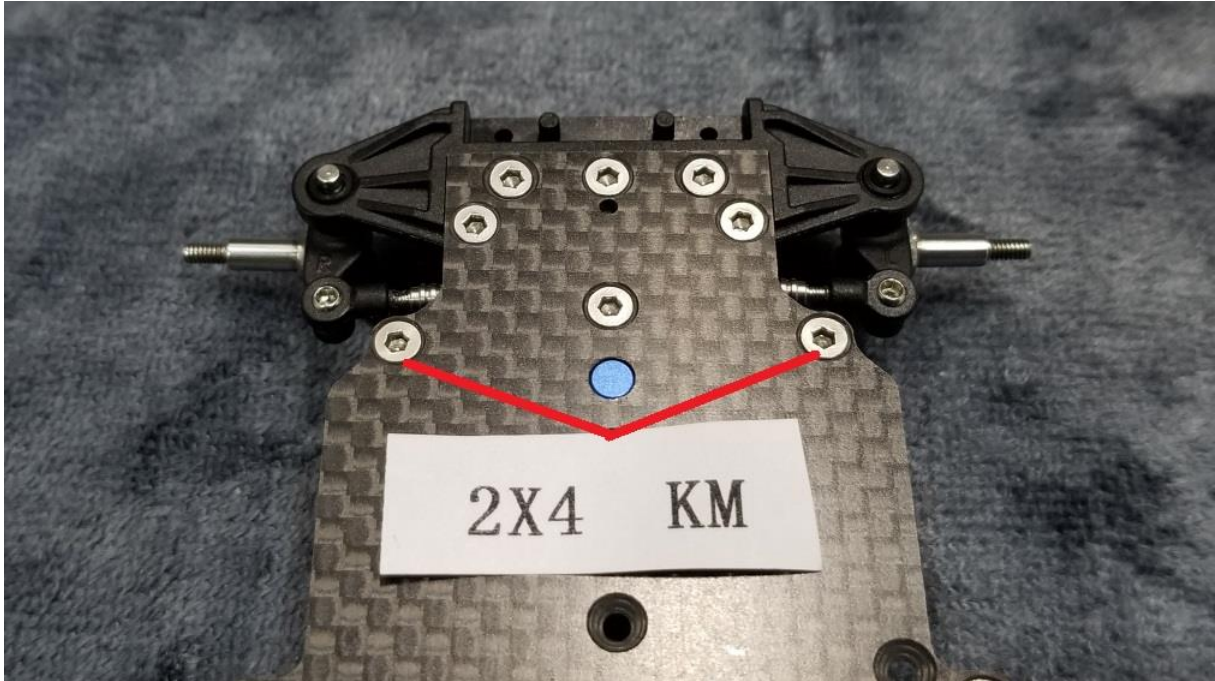
Install Steering Crank and links onto chassis as per photo below:



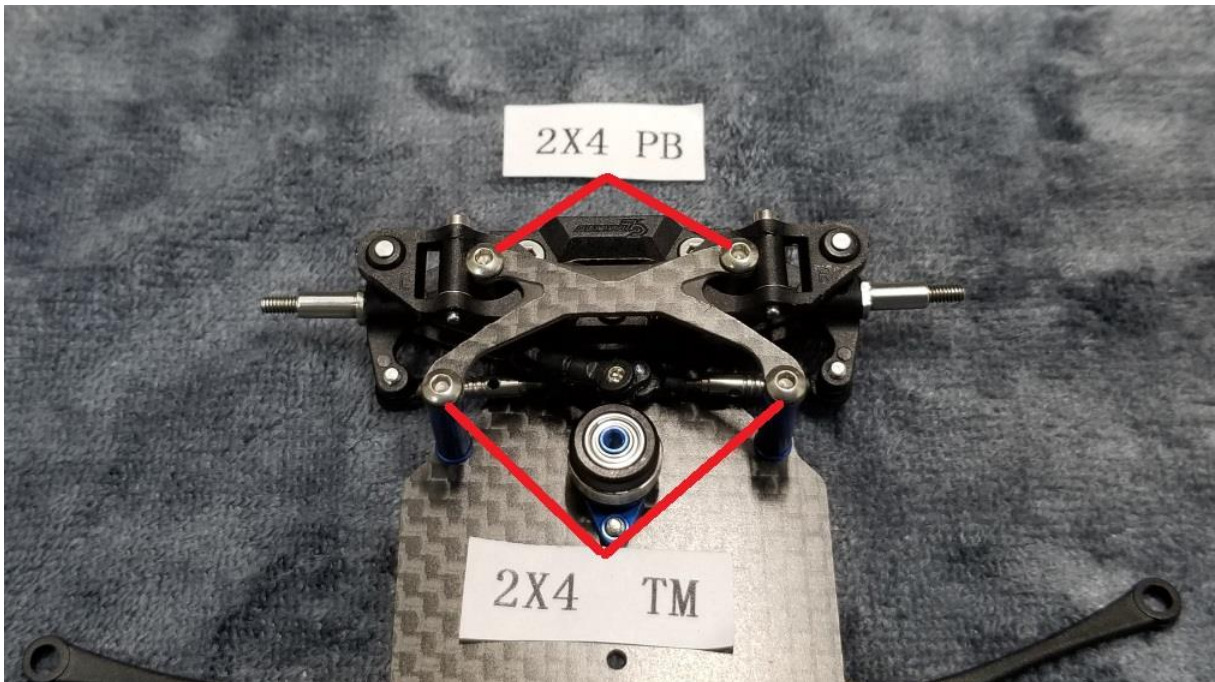
Step 3: Front Cross-brace



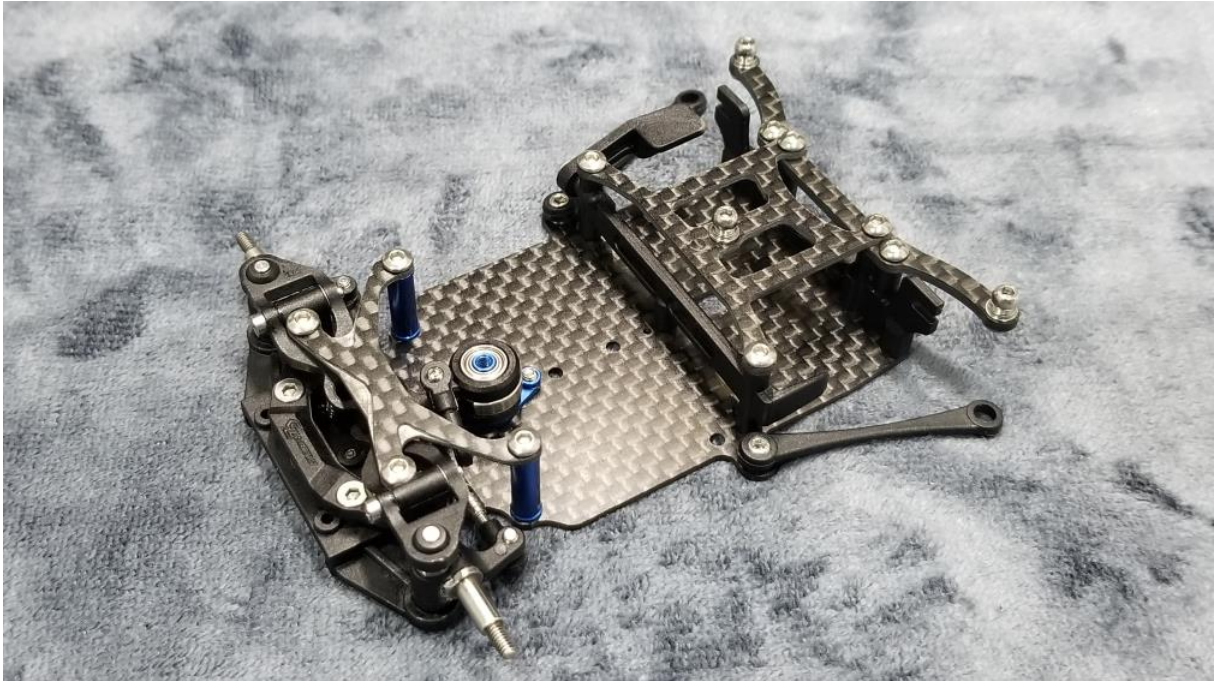
First, secure the cross-brace posts to the chassis using two 2x4 KM screws from the bottom of chassis



Use 2x4 PB for the front of brace, and 2x4 TM for the rear of brace as per photo:

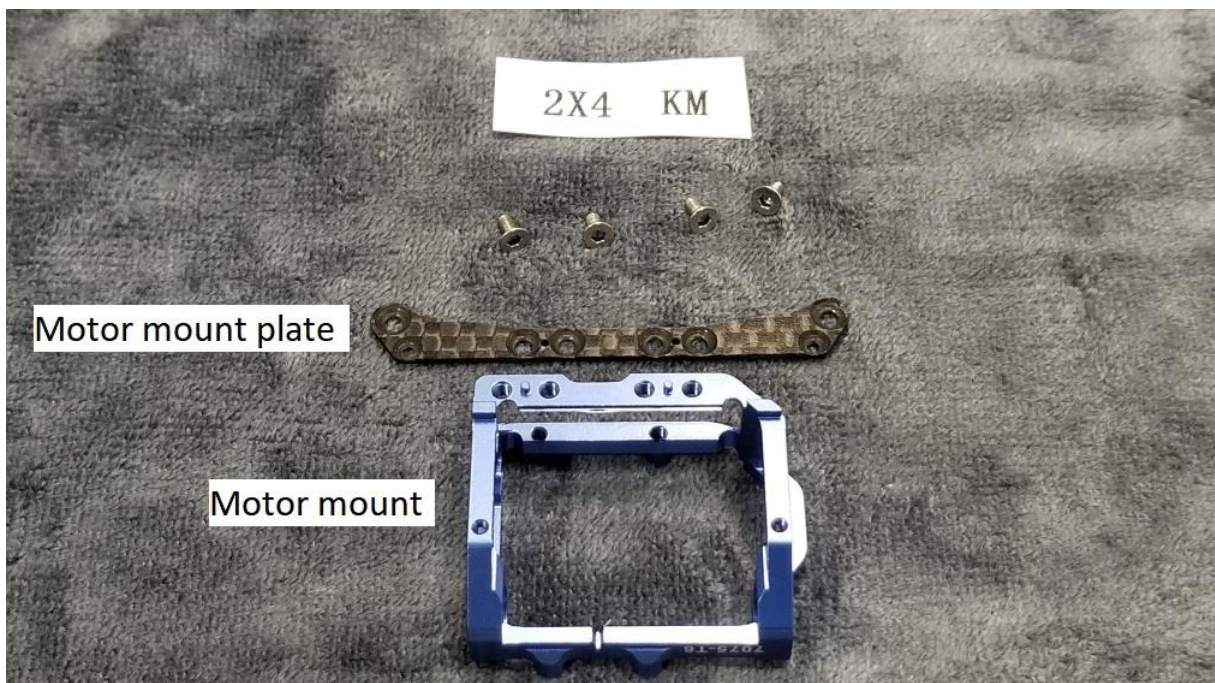


Front suspension complete!!



Rear Subframe

Step 1: Motor mount assembly



Warning: The Motor plate is delicate with a lot of holes, press onto Motor Mount carefully

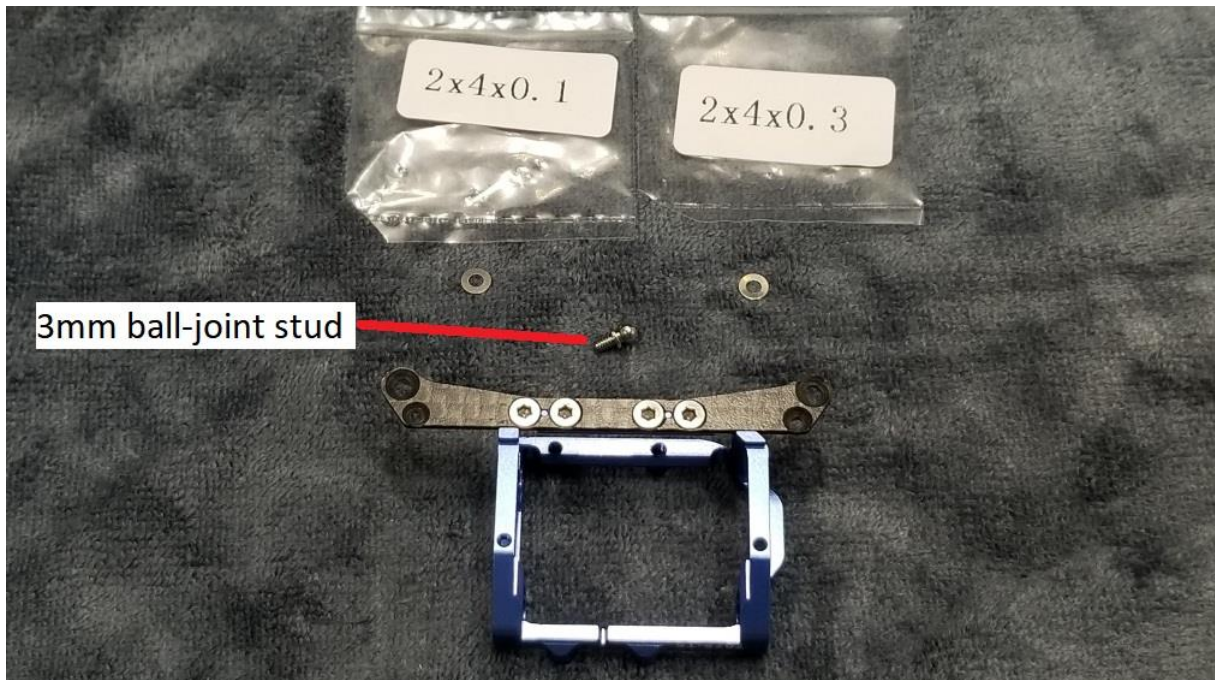
Carefully press the Motor Mount plate onto the bottom of the Motor Mount

Then, secure with four 2x4 KM screws

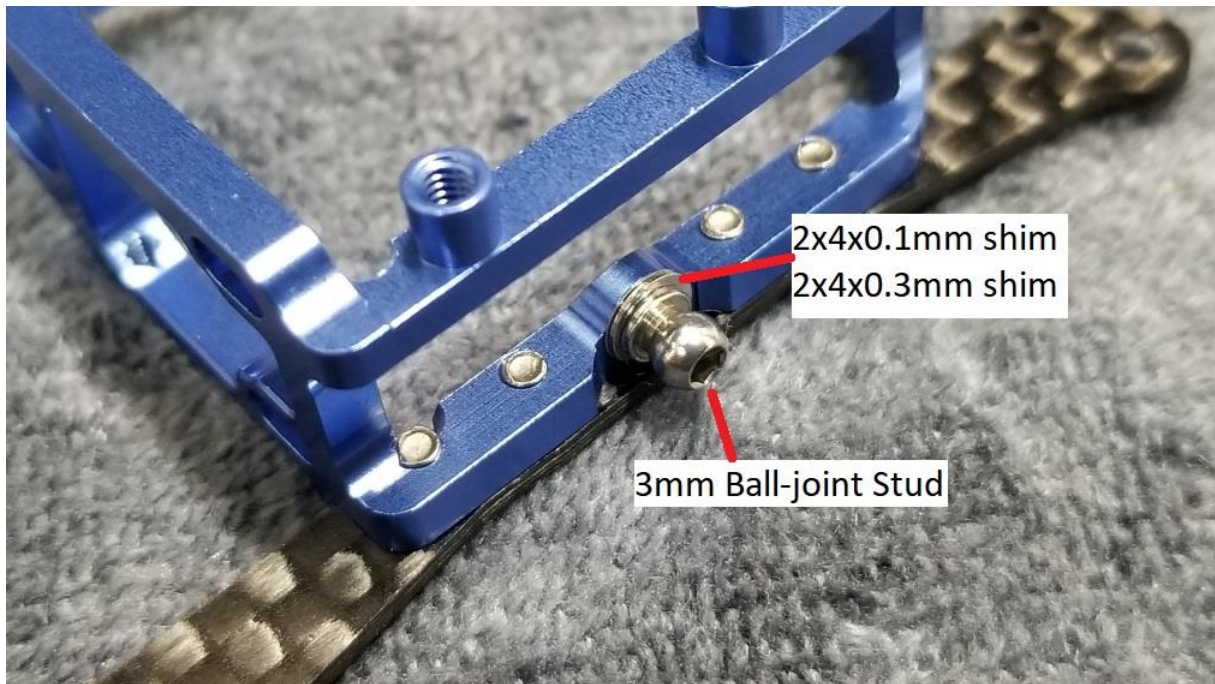


Prepare:

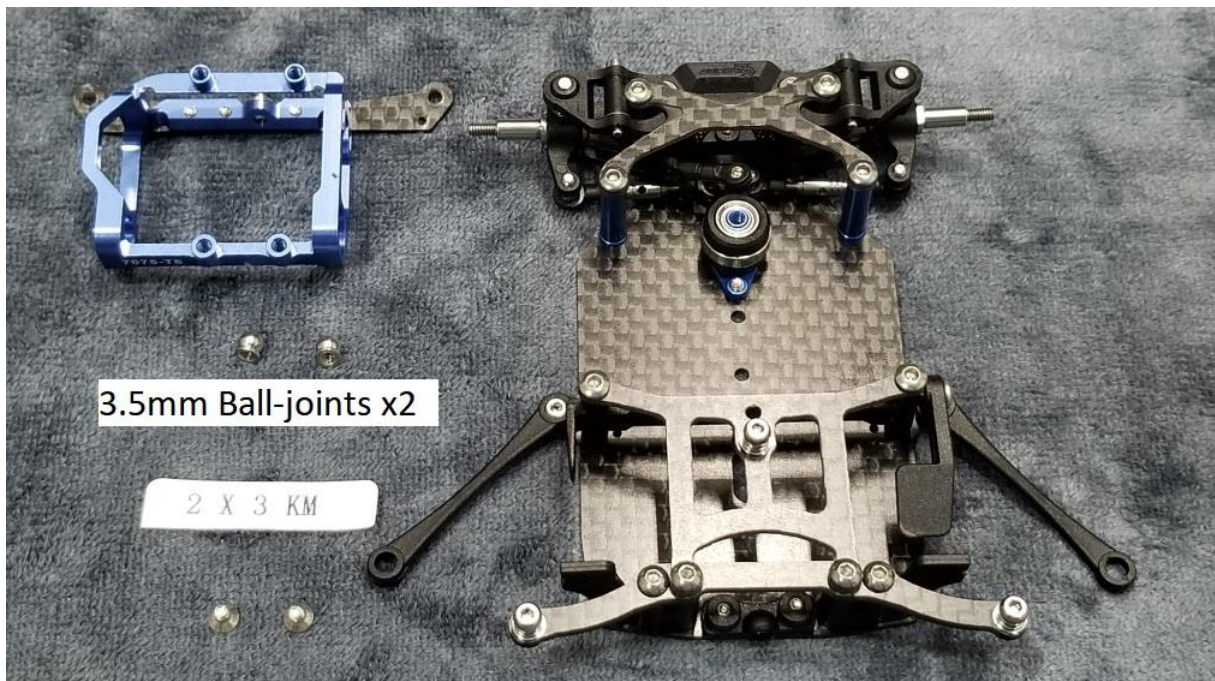
1. 2x4x0.1mm shim x1
2. 2x4x0.3mm shim x1
3. 3mm ball-joint stud x1



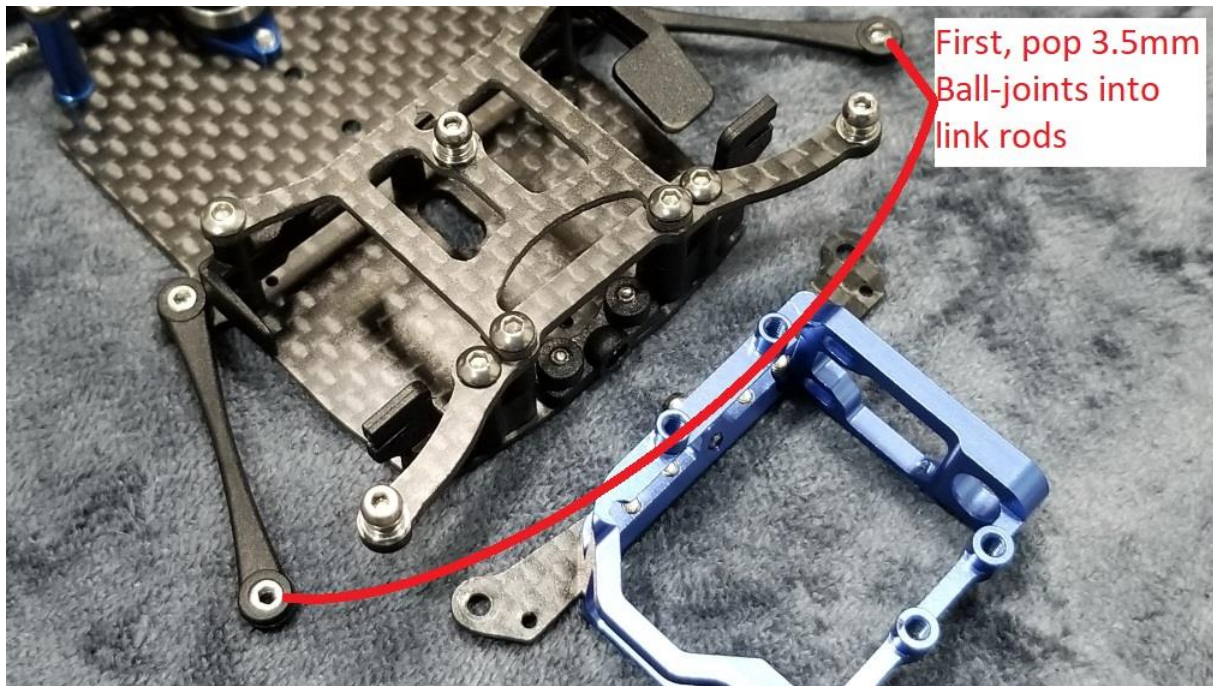
Use a 1.5mm hex drive/key to secure the 3.0mm ball joint through the shims to the Motor Mount



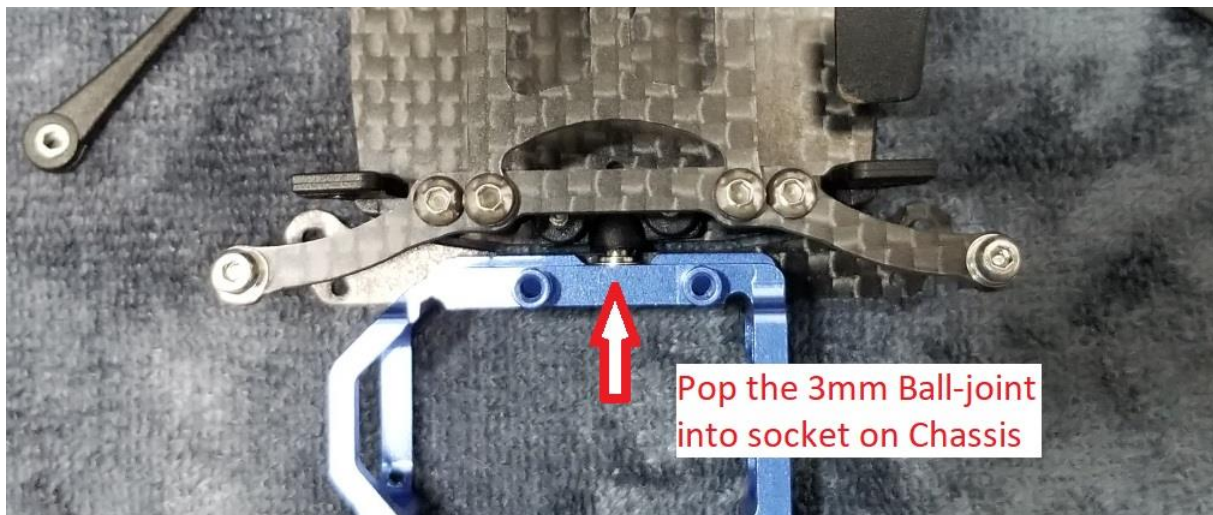
Step 2: Attaching Rear Subframe to Chassis



Pop the 3.5mm ball joints into link rods on chassis



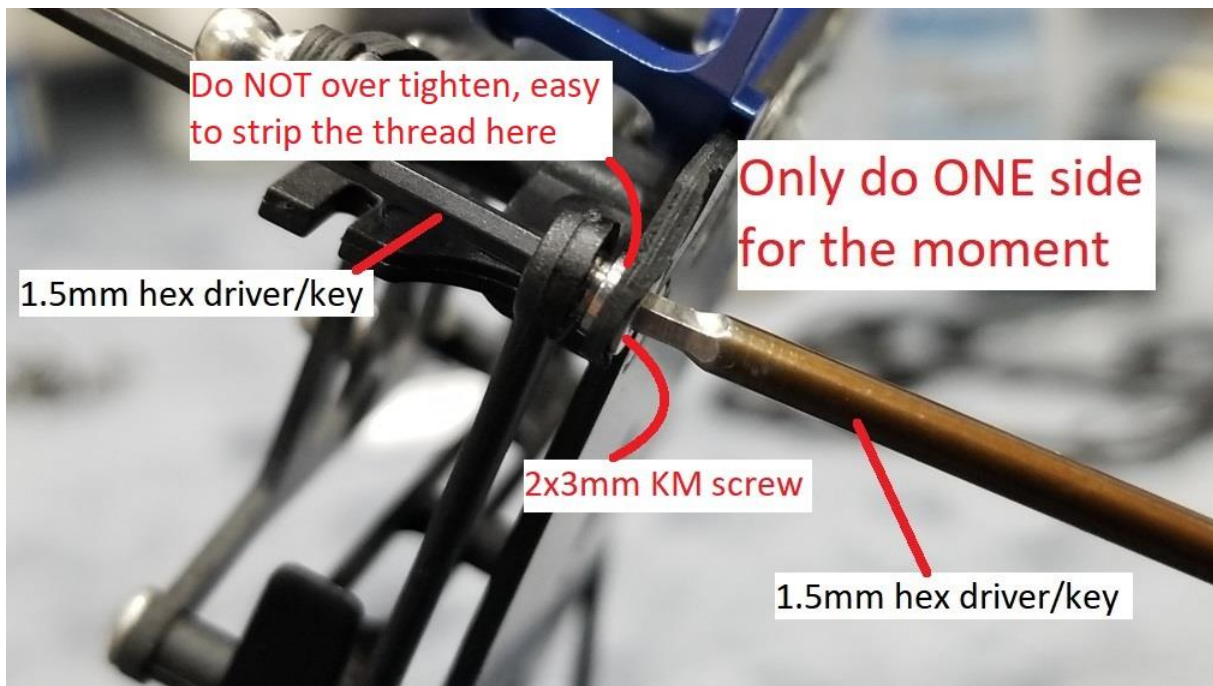
Pop the 3mm Ball-joint of the Subframe into the socket of the Chassis



Secure **ONE** side's link rod to the Motor Mount plate using a 2x3 KM screw

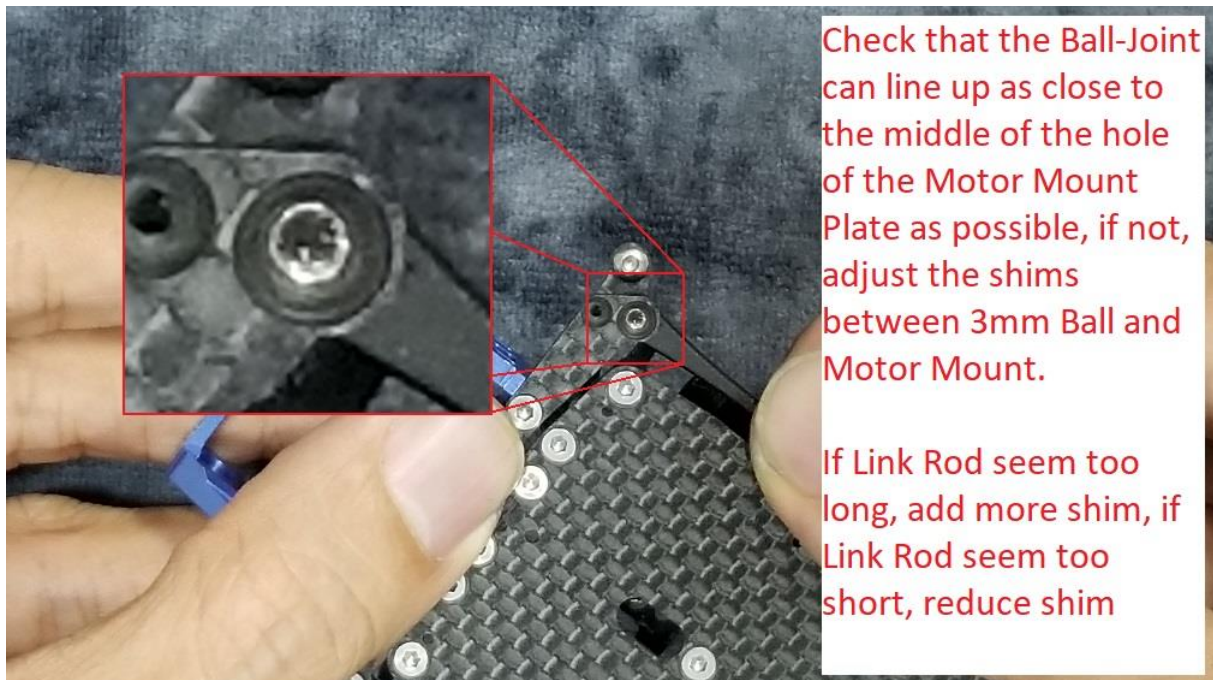
Reminder for kits with 2x3KM screws: It is easy to strip the thread on the 3.5mm Ball-Joint with 2x3mm KM NOT over tighten

Note: Since 2018-05-01, your GLR kit is supplied with 2x3.5KM screws instead of 2x3KM screws, for better stripping of threads



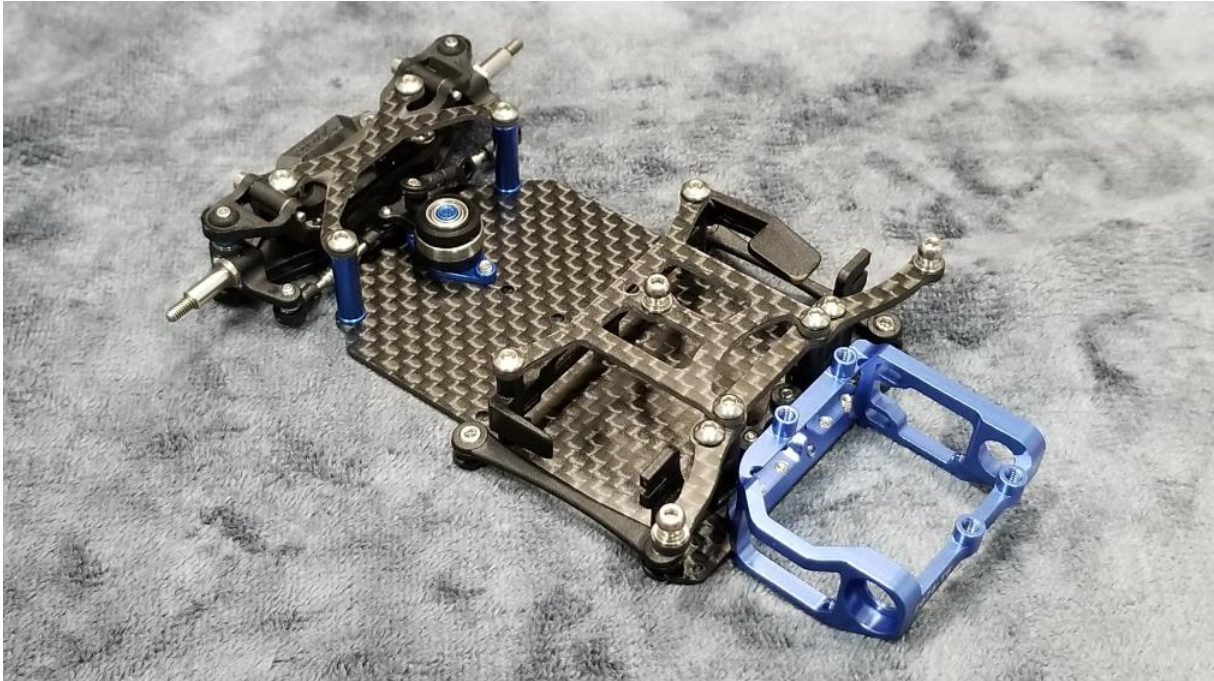
Check on the other side if the Ball-Joint can line up as close to the middle of the hole of the Motor Mount Plate as possible.

Adjust shims to get the Ball exactly middle, if Link Rod seem too long, add shim, if Link rod seem too short, reduce shim



Use a 2x3 KM screw to secure the Ball-Joint onto the Motor Mount Plate

Reminder: Again, it is easy to strip the thread on the 3.5mm Ball-Joint with 2x3mm KM screws, so do NOT
 Note: Since 2018-05-01, your GLR kit is supplied with 2x3.5KM screws instead of 2x3KM screws, for better stripping of threads



Check that the Rear-Subframe can move very freely after assembly, check shim amount for best free movement, here is a BAD example in this video:

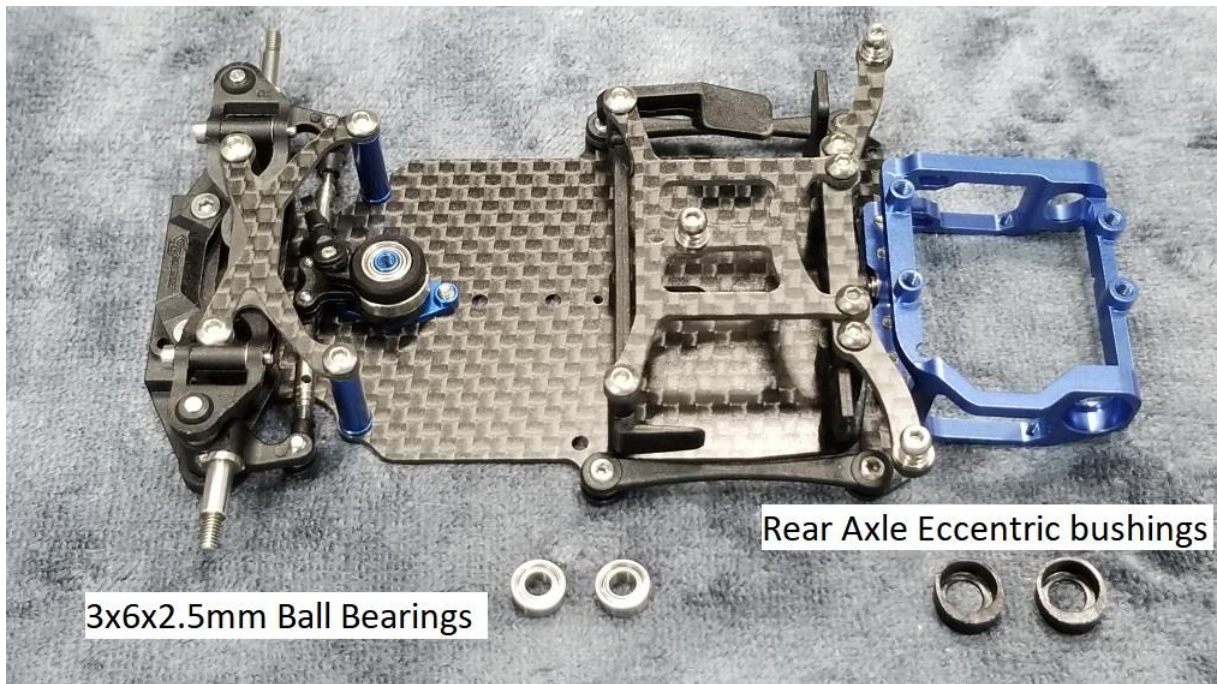
And this video shows how to fix it:

1. There was 0.2mm shim to start with, and Subframe movement was NOT free and smooth
2. Checked hole line up indicates Link-Rod too long, added 0.2mm shim, total 0.4mm
3. Rear Subframe movement is then free and smooth

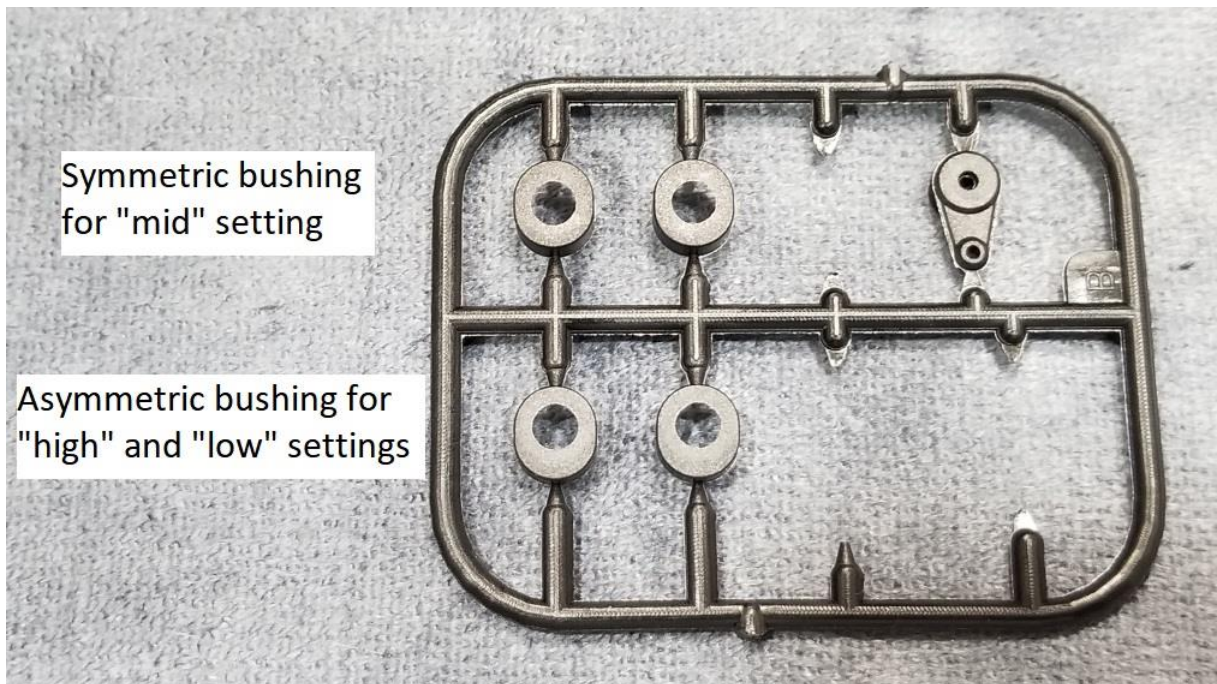
Note: Your GLR may or may not be 0.4mm shim, due to manufacturing variations, it may range from ~0.3m

Free movement is VERY important, do not proceed unless the Rear Subframe can move freely, otherwise yo

Step 3: Rear Axle bearings



There are two sets of Eccentric bushings offering 3 ride height settings with 0.5mm steps



The 3 ride height settings, it depends on the diameter of rear wheels you use and the ride height you want. If in doubt, start with "Mid":

High
Ride Height



Mid
Ride Height



Low
Ride Height

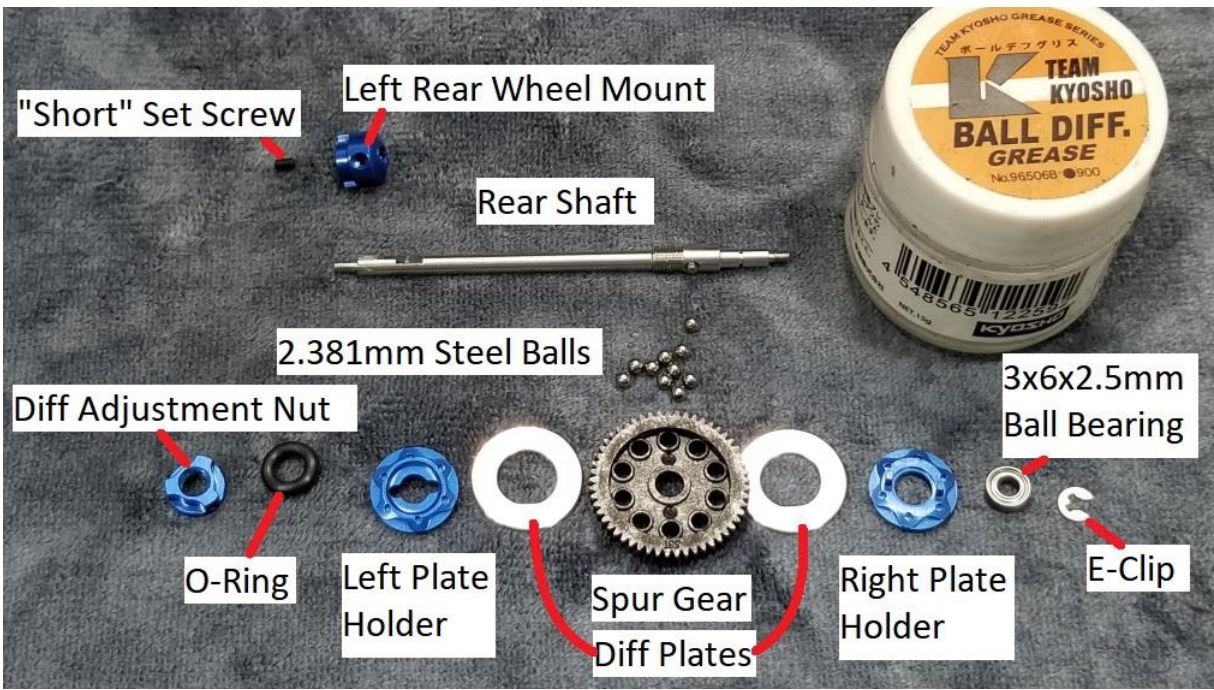


Rear Subframe DONE!!

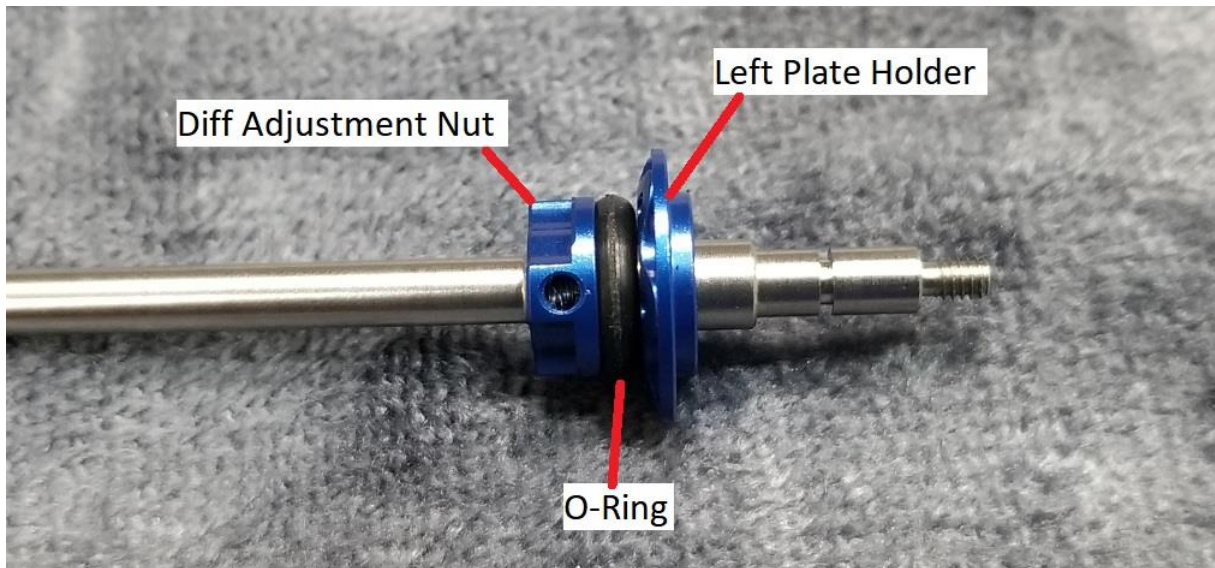


Rear Axle

Step 1: Ball Differential

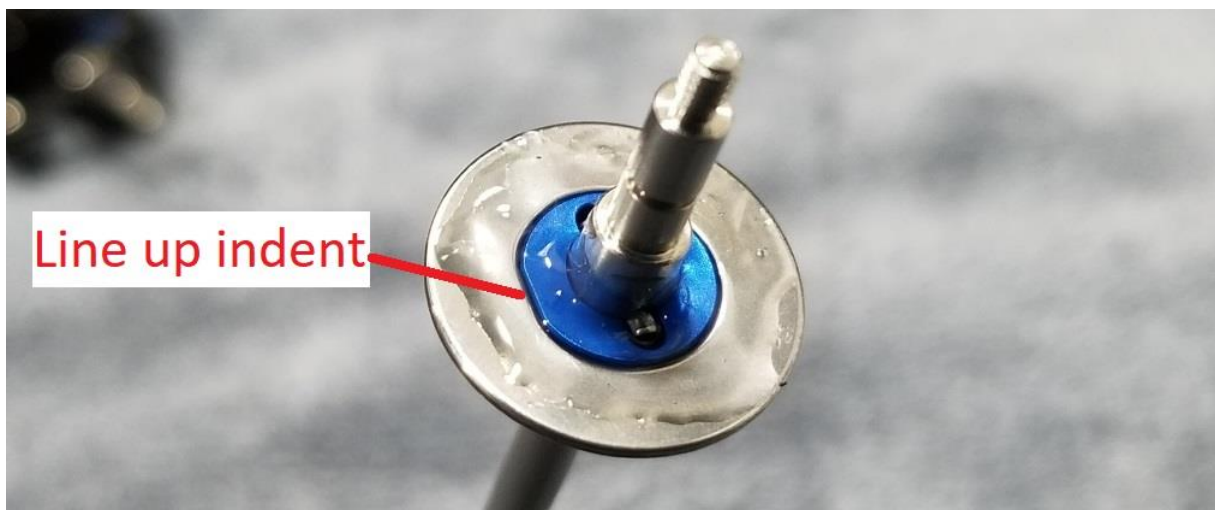


Arrange the Diff Adjustment Nut, O-Ring, Left Plate Holder as below photo:



Put a Diff Plate onto Left Plate Holder, **lining up indent**

Apply some Ball Diff Grease



Put Spur Gear onto assembly, gear side on the right, this provides best ground clearance with gear closest to wheel

Note: Currently, GLR Spur CANNOT be flipped inside out with gears on the left, otherwise the Ball Diff will not work. We may change this in future as we know some users prefer gear on the inside.

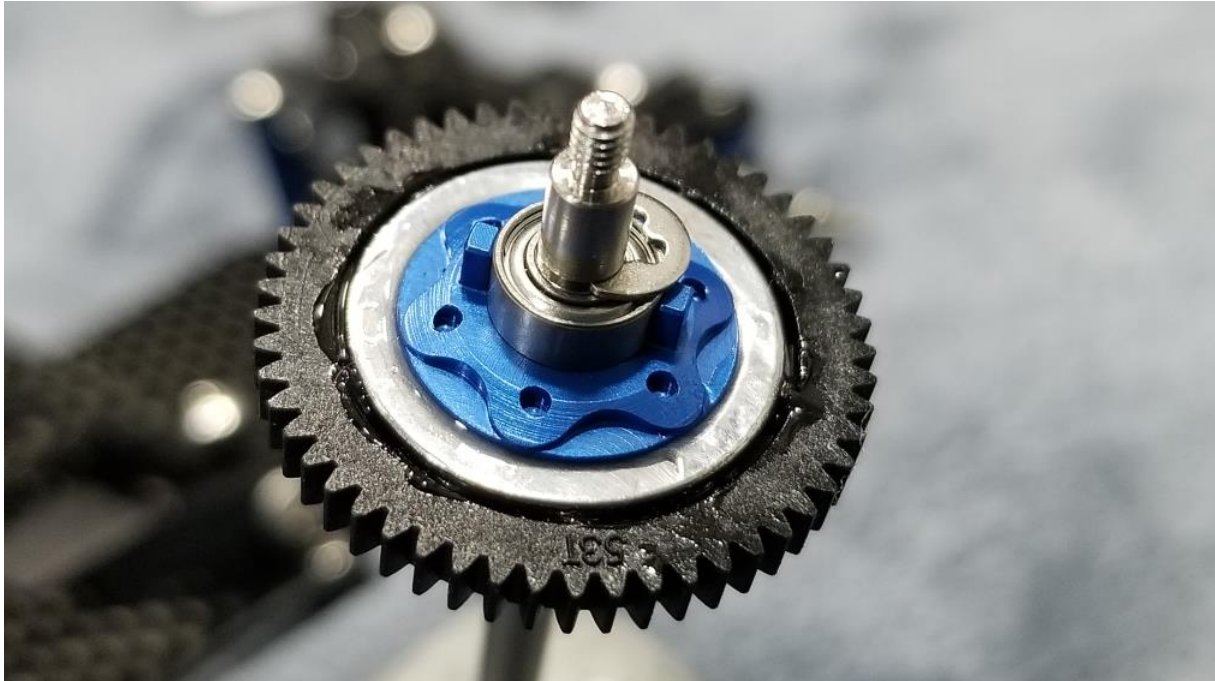


Put ten 2.381mm Steel Balls into Spur Gear

Apply some Ball Diff Grease

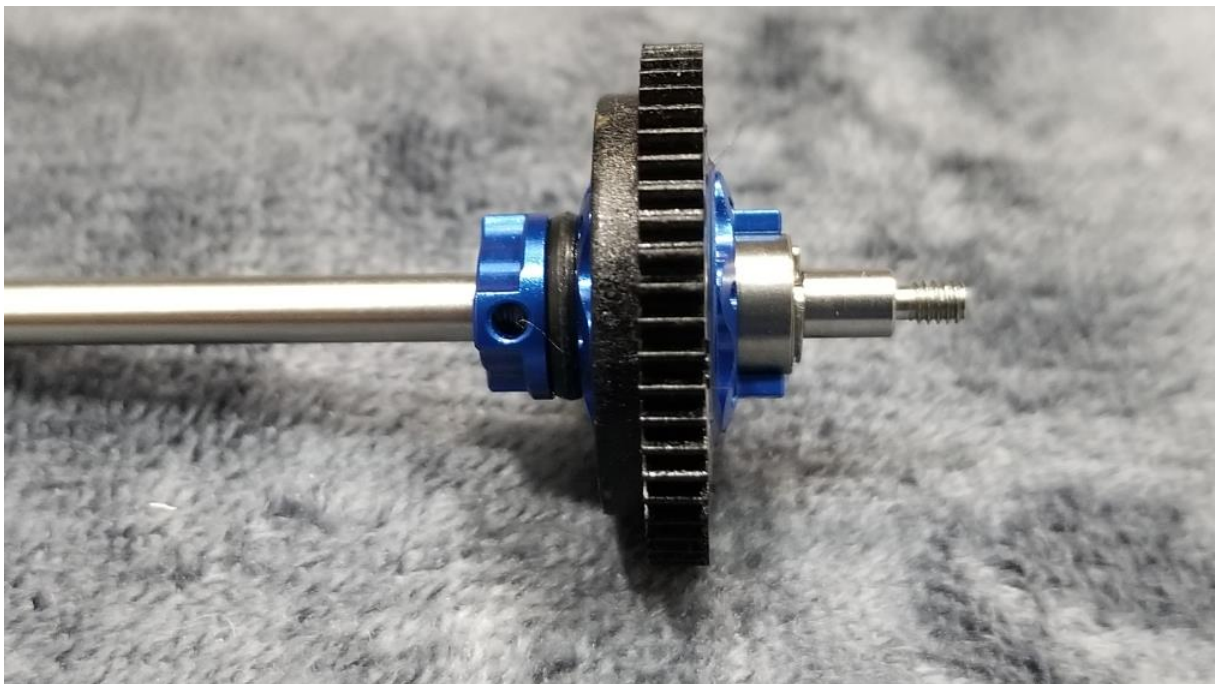


Put the other Diff Plate, Right Plate holder (line up indent), 3x6x2.5mm Bearing and E-Clip as photo below:



Click E-Clip onto Shaft, loosen Diff Adjustment Nut if needed

Tighten Diff Adjustment Nut to your preferred tightness, a good guide is: "No slip but smooth"



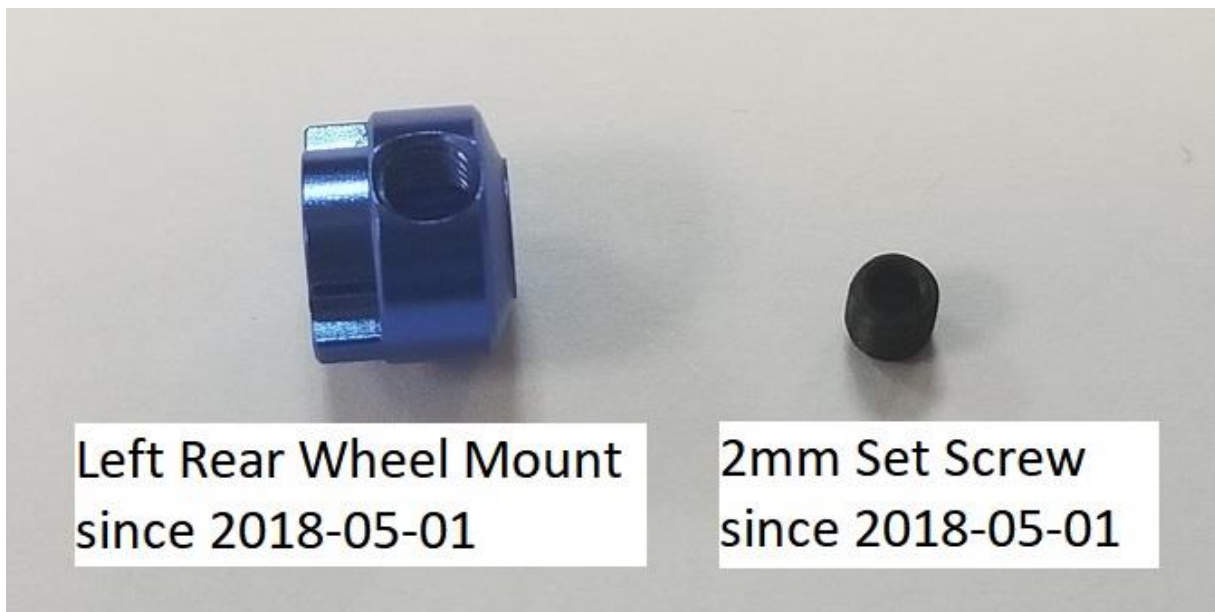
Step 2: Mounting Rear Axle to Motor Mount

Use a 0.9mm hex driver/key and the "short" Set Screw to lock the Left Rear Wheel Holder onto the Rear Shaft, **leaving ~0.2mm gap to the Motor Mount**

Note: The ~0.2mm gap ensures left rear wheel is free to turn even when the Motor Mount expands a little wi

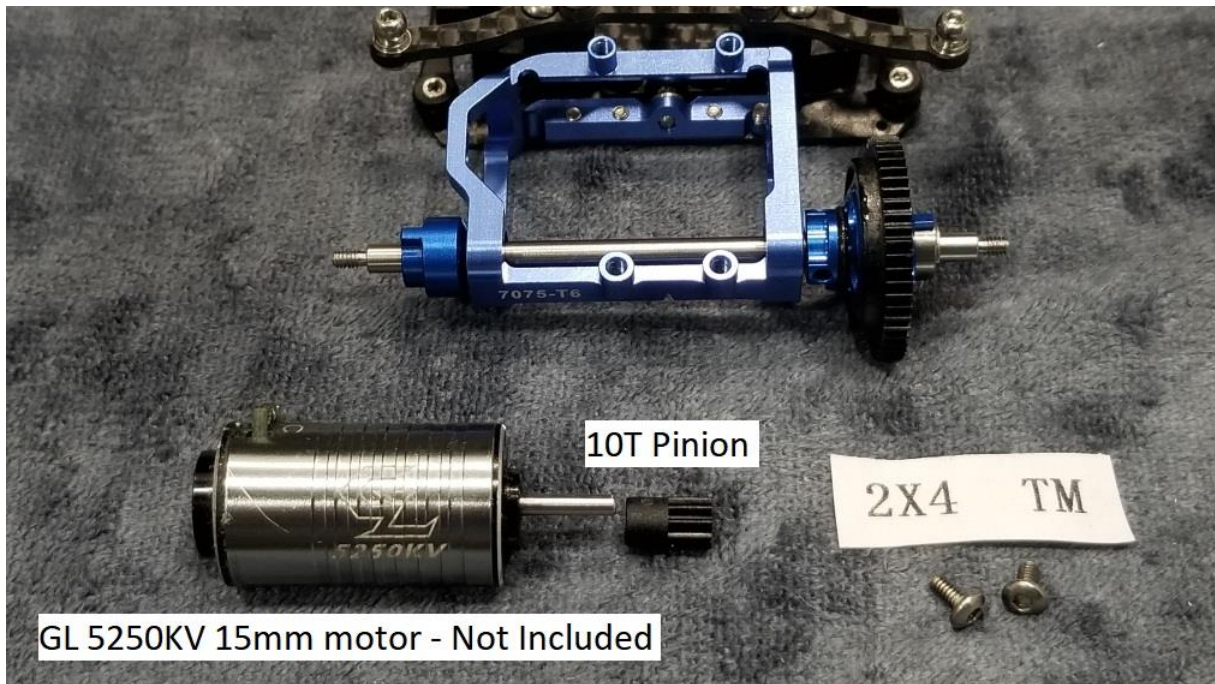


Note: Since 2018-05-01, your GLR kit is supplied with a left rear wheel mount that takes a 2mm set screw, p
1.5mm Hex driver or allen key instead



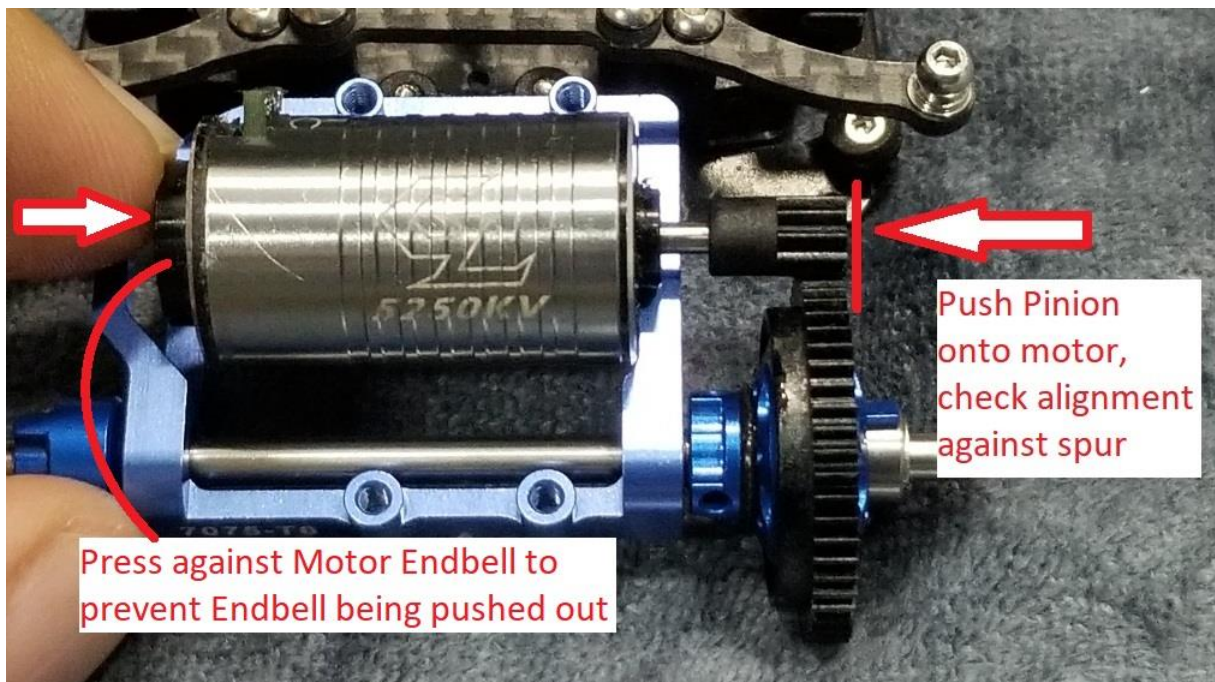
Step 3: Mounting Motor

Use a 15mm brushless motor such as GL5250KV, PN motors are also 15mm



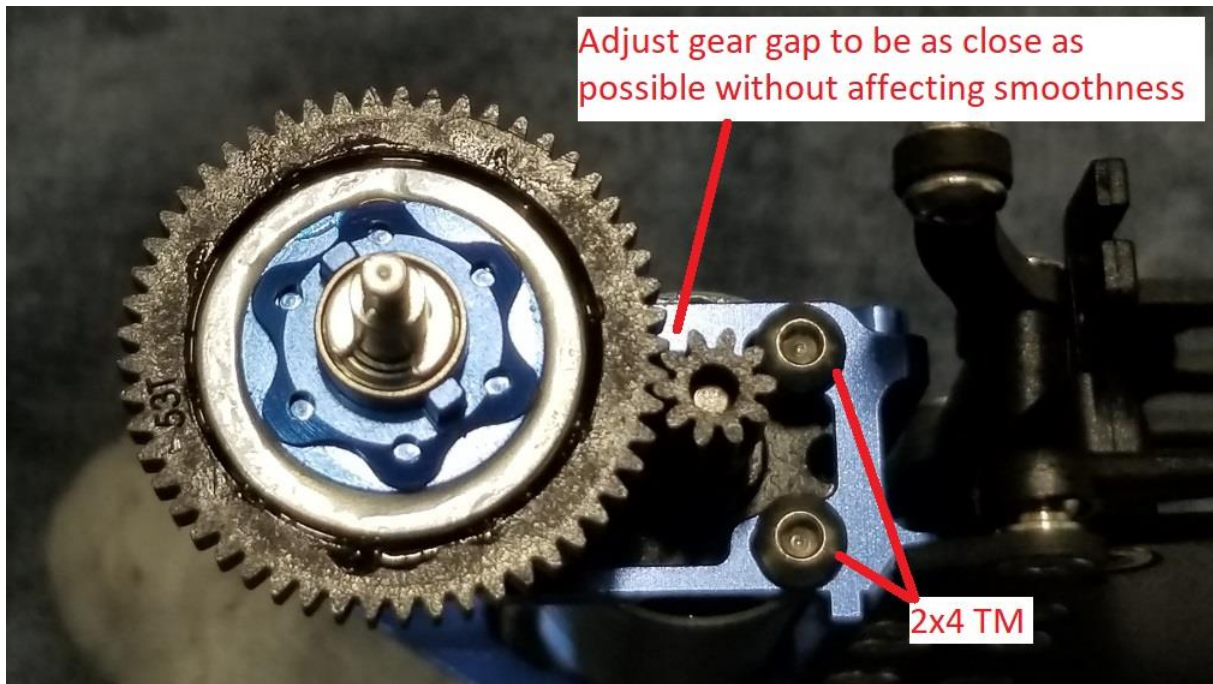
Push Pinion gear onto Motor shaft

TIP: Press against Motor Endbell to prevent accidentally popping out the Endbell!

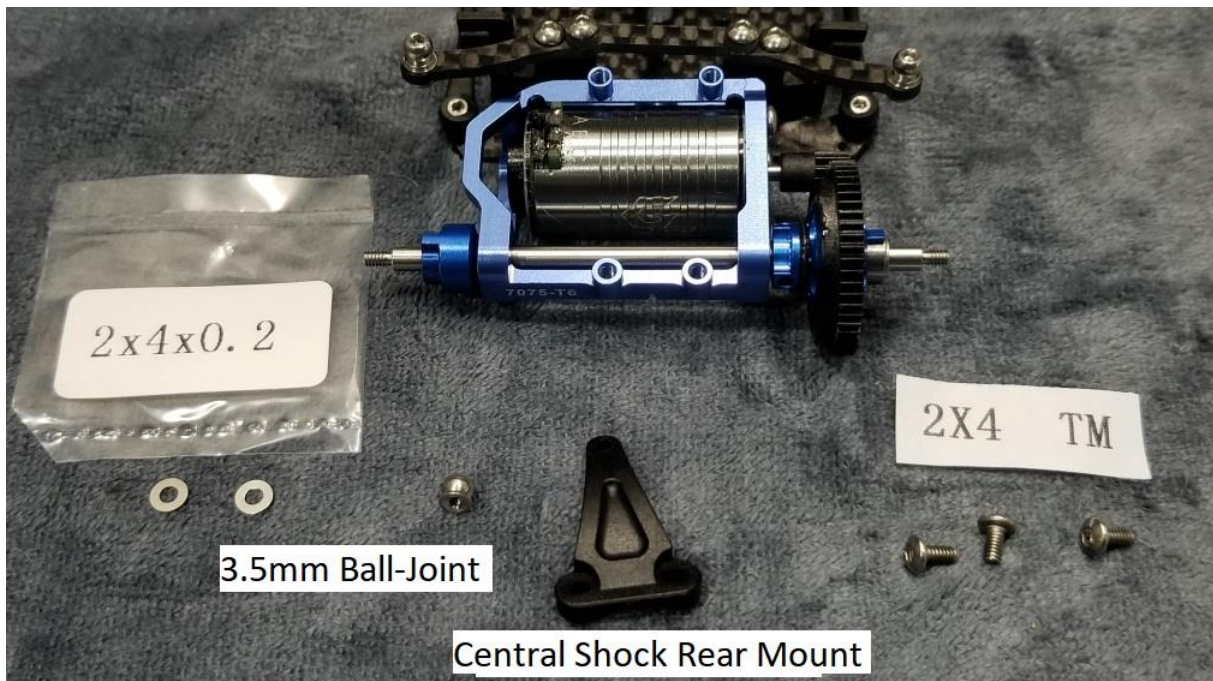


Use 2x4 TM screws to fix Motor onto Motor Mount

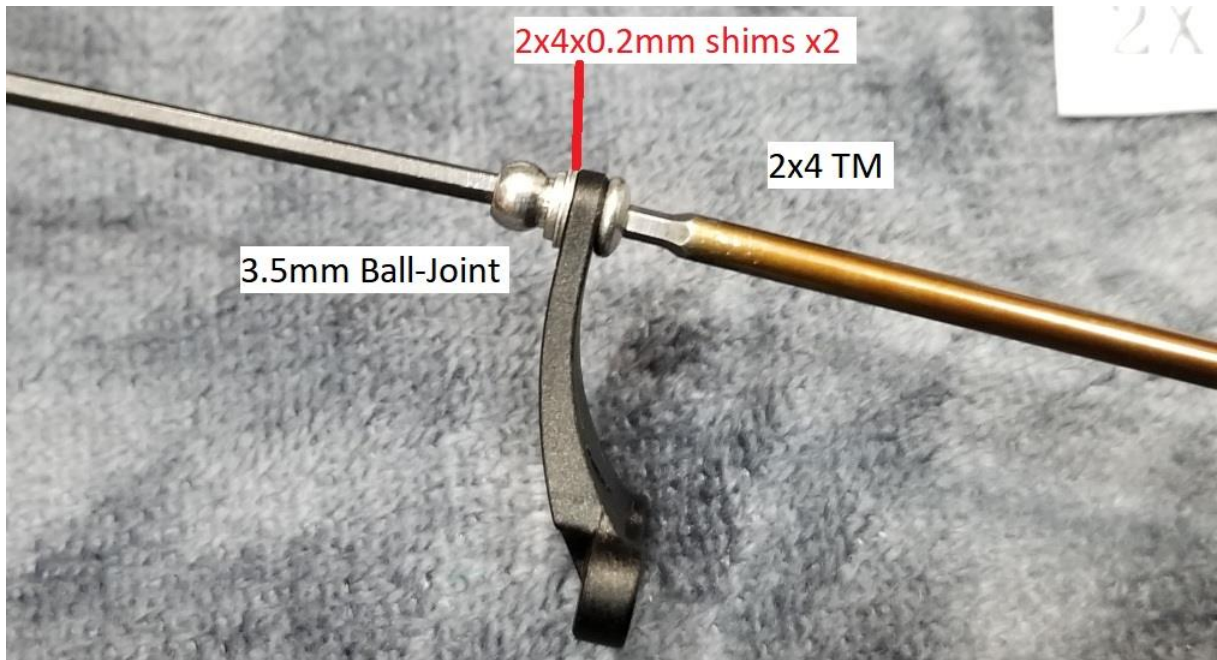
Adjust gear gap to be as close as possible but still smooth



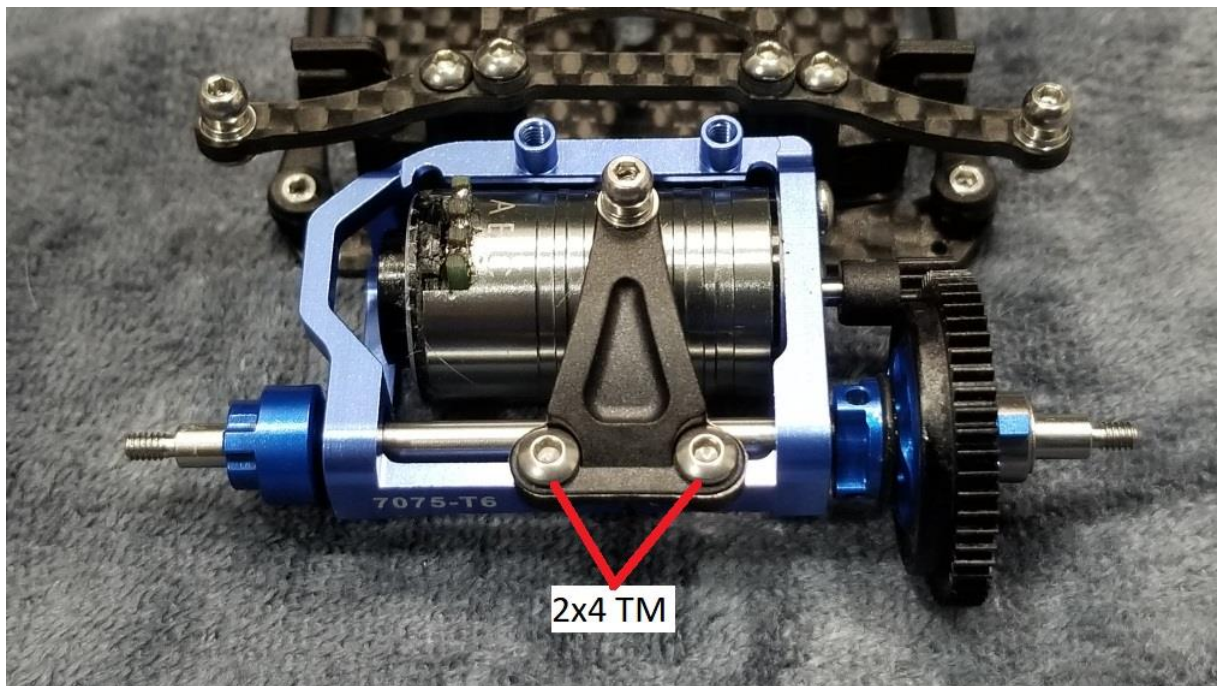
Step 4: Central Shock Rear Mount



Fix the 3.5mm Ball-Joint onto the Central Shock Rear Mount with 2x4x0.2mm shims x2 using a 2x4 TM screw



Use 2x4 TM screws to fix Central Shock Rear Mount onto Motor Mount



Rear Subframe complete!!

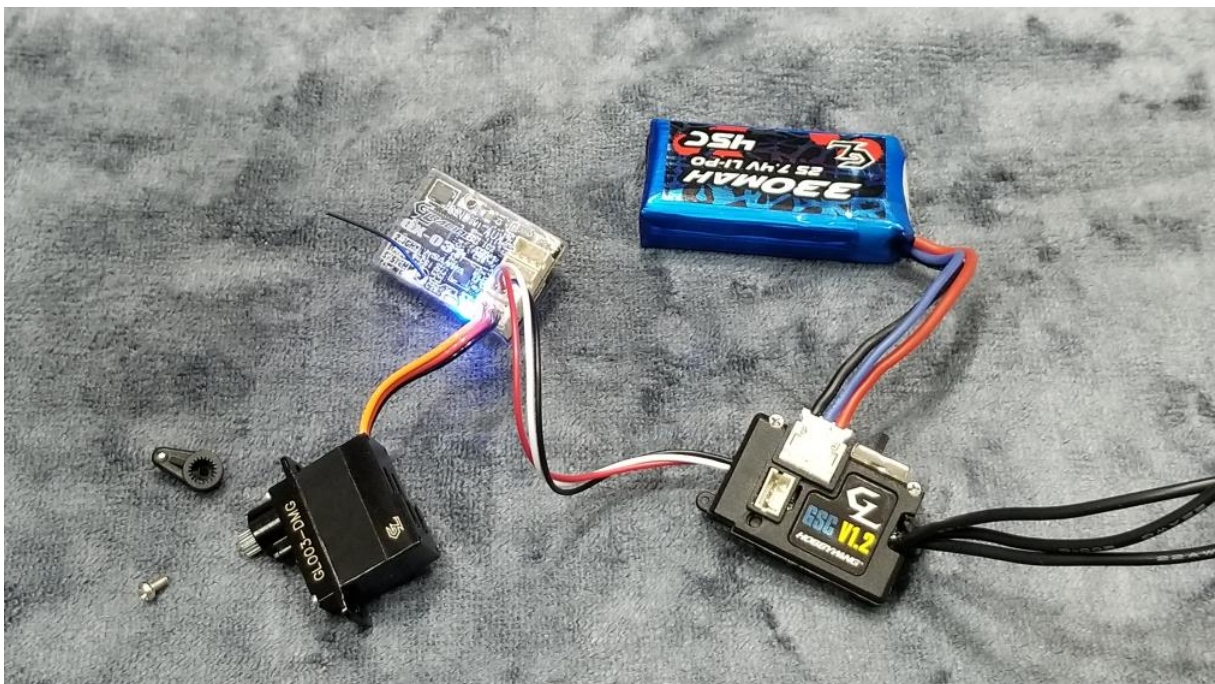
Electronics



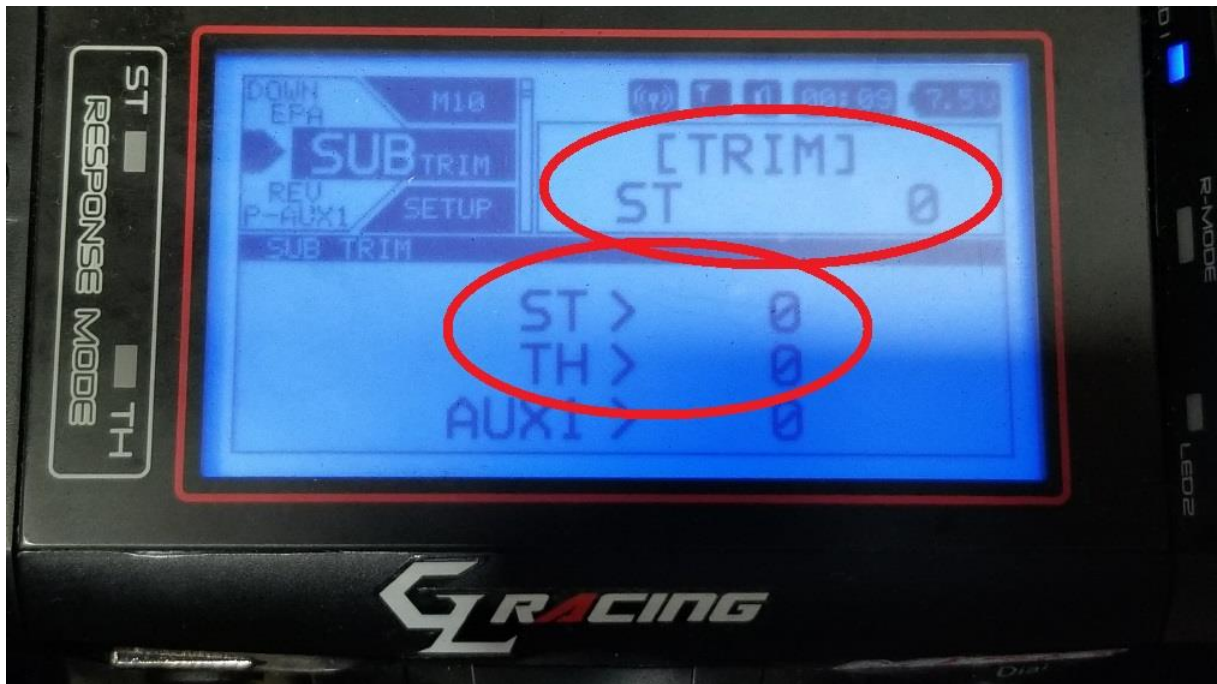
Micro Receiver not included, we recommend the [GX-031 receiver](#), made by Sanwa for GL, based on Sanwa
 GL 2S Lipo not included, recommend GL 2S 330mAh 45C, but shipping restrictions means it may not be available in all countries, please check with your dealer or with us at GL

Step 1: Connect components, bind Transmitter with your receiver, please refer to your Transmitter's manual

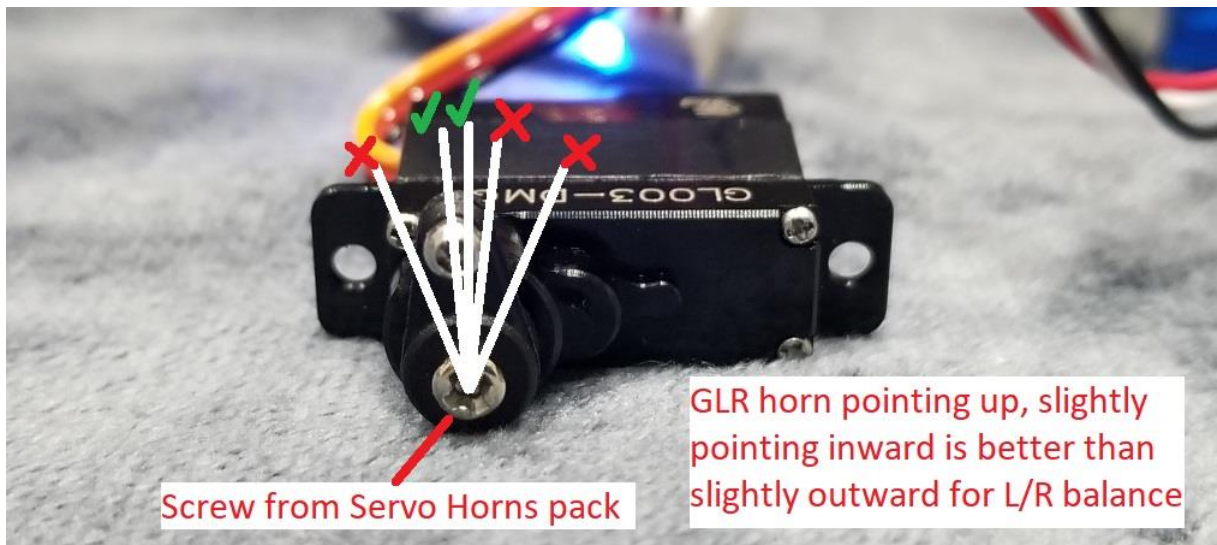
Check Servo is operational and direction of movement is correct, if not, set channel to Reverse on your Transmitter



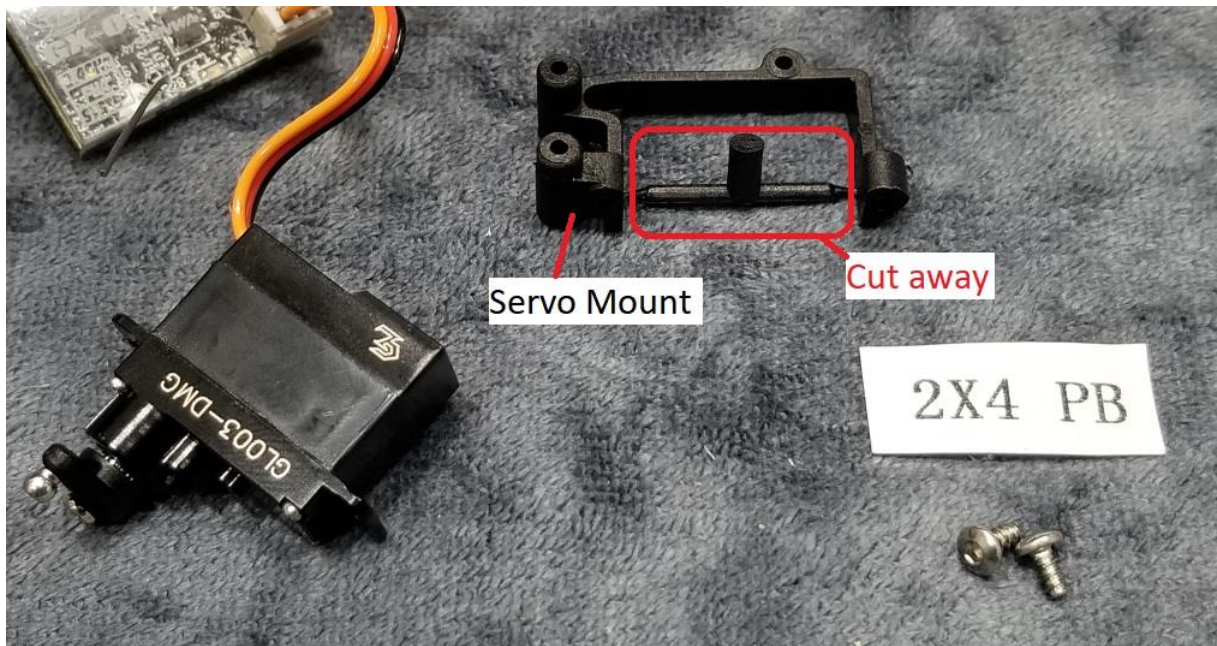
Step 2: Zero all your trims on your transmitter



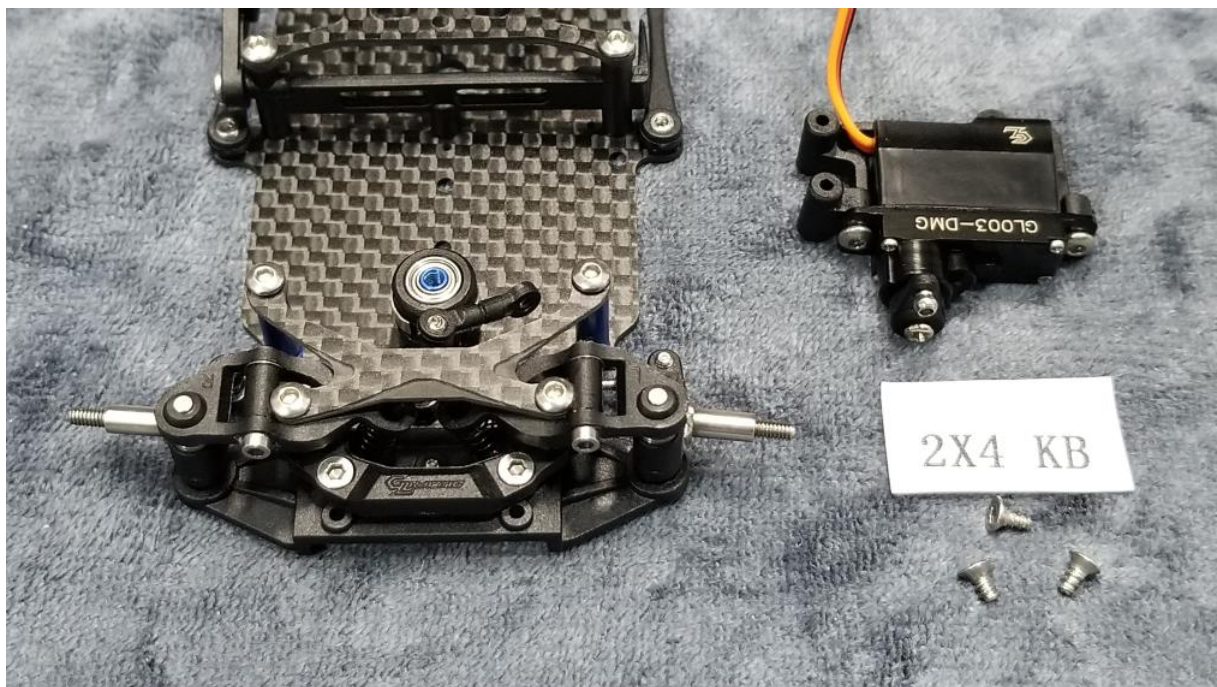
Step 3: Mount Servo horn pointing up vertically, adjust Subtrim if needed to get near vertical, slightly inward is best for L/R balance, see photo:

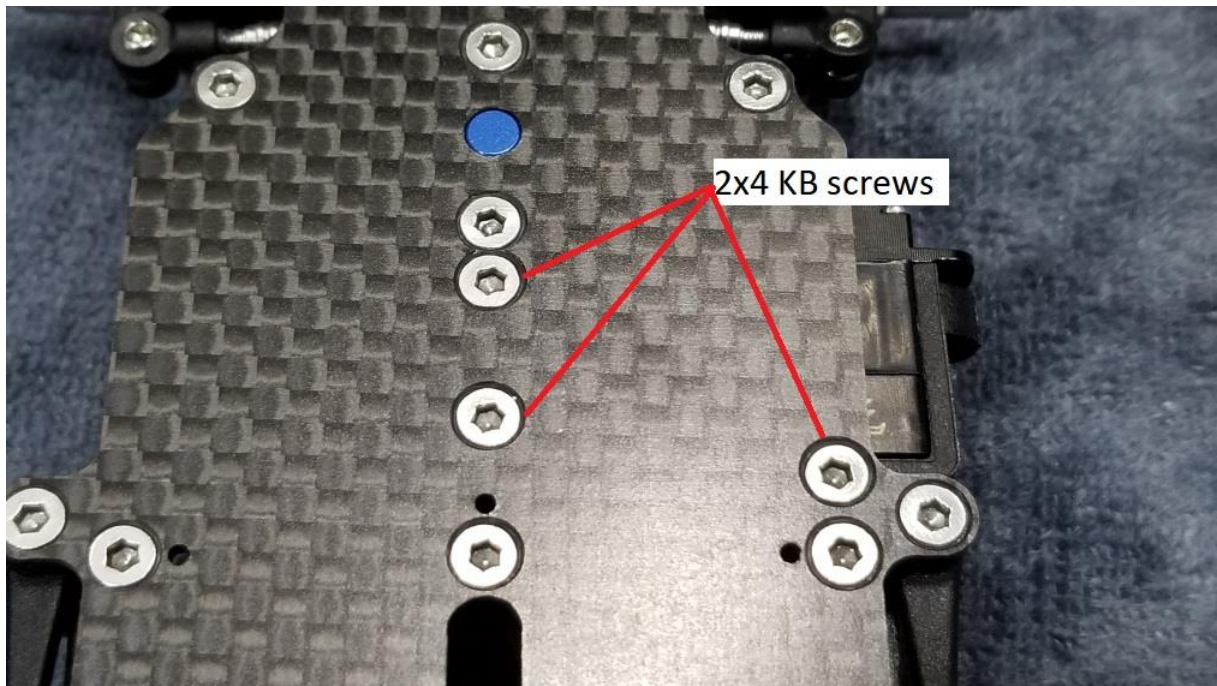


Step 4: Mount Servo to Servo Mount using two 2x4 PB screws



Step 5: Mount Servo Assembly to Chassis using three 2x4 KB screws

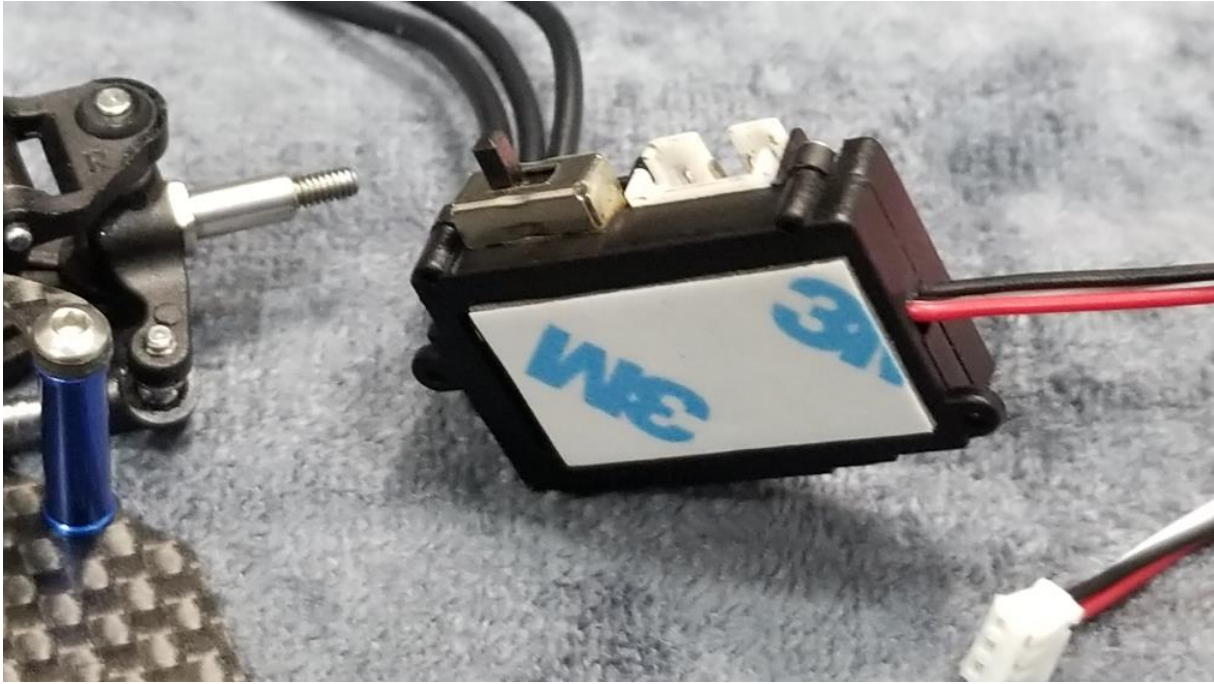




Pop Steering link onto Servo horn 2.5mm Ball-Joint

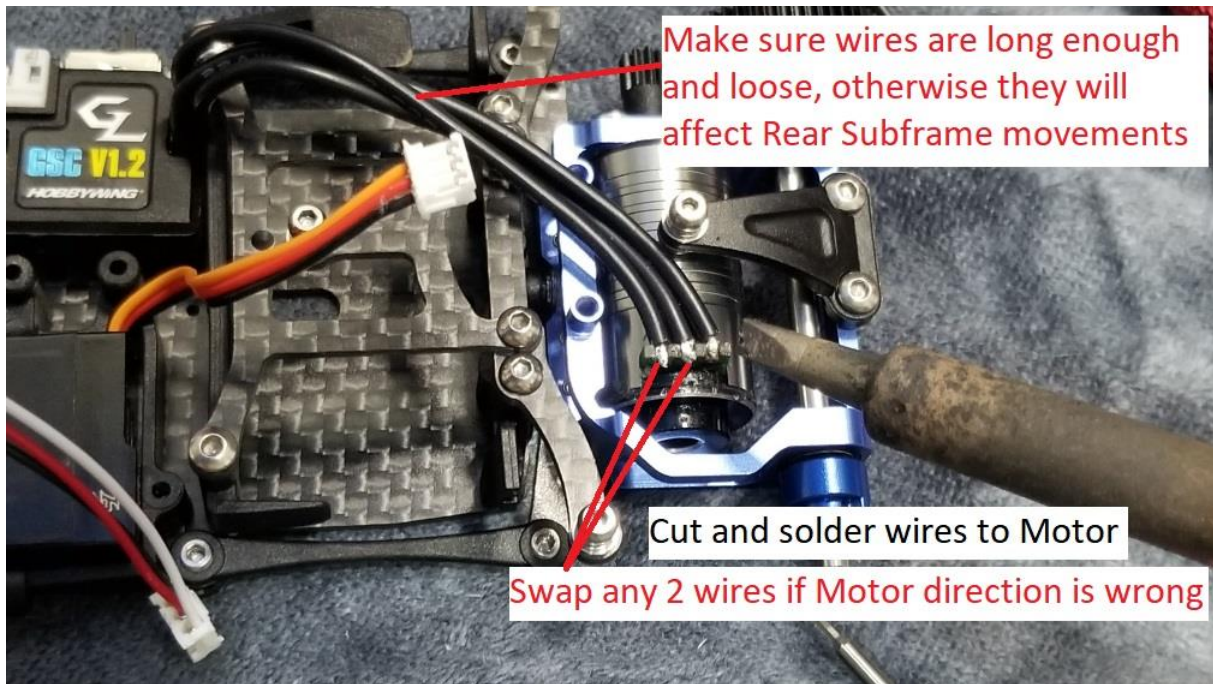


Step 6: Mount ESC with double-sided tape or glue, **avoid touching Steering Crank and Link rod!**



Cut ESC motor wires to length with some spare, make sure wires are long enough so that they do NOT affect Rear Subframe movements

If motor runs in the wrong direction, swap any of the 2 of 3 wires



Step 7: Calibrating ESC

Before using the Esc, it is best to calibrate the neutral point, throttle range and brake range with the Transmitter:

1. Turn On Transmitter
2. Set Transmitter Throttle Trim and Subtrim to 0
3. Set Throttle Hi-Point to 100
4. Set Brake Hi-Point to 100
5. Hold Esc Calibration button with Hex driver or Allen key while turning on Esc
6. The Motor will be beeping indicating that Esc is in calibration mode, release calibration button
7. While Transmitter throttle is at neutral, press Calibration button once, the motor will beep once
8. Hold Transmitter throttle at full throttle, press Calibration button once, the motor will beep twice
9. Hold Transmitter throttle at full brake, press Calibration button once, the motor will beep three times
10. Return Transmitter throttle to neutral, the motor will beep twice, calibration is done

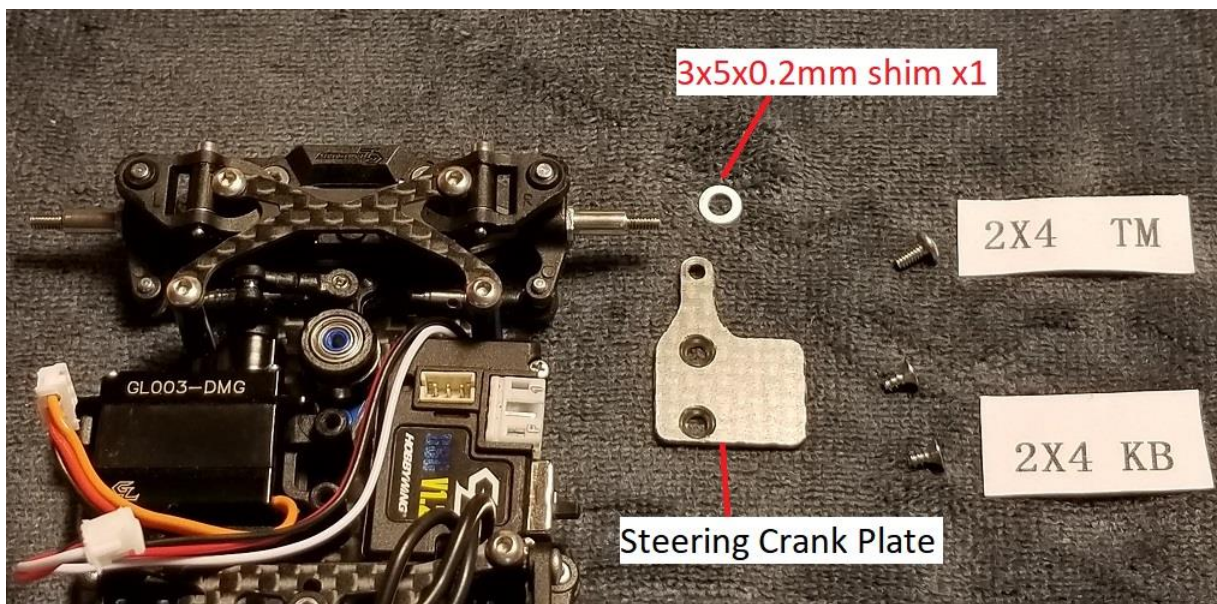


See Video on Esc calibration:

IMPORTANT Check Motor direction:

Apply throttle, check if car running forwards or backwards, if running backwards, **swap ANY 2 of 3** motor wires:

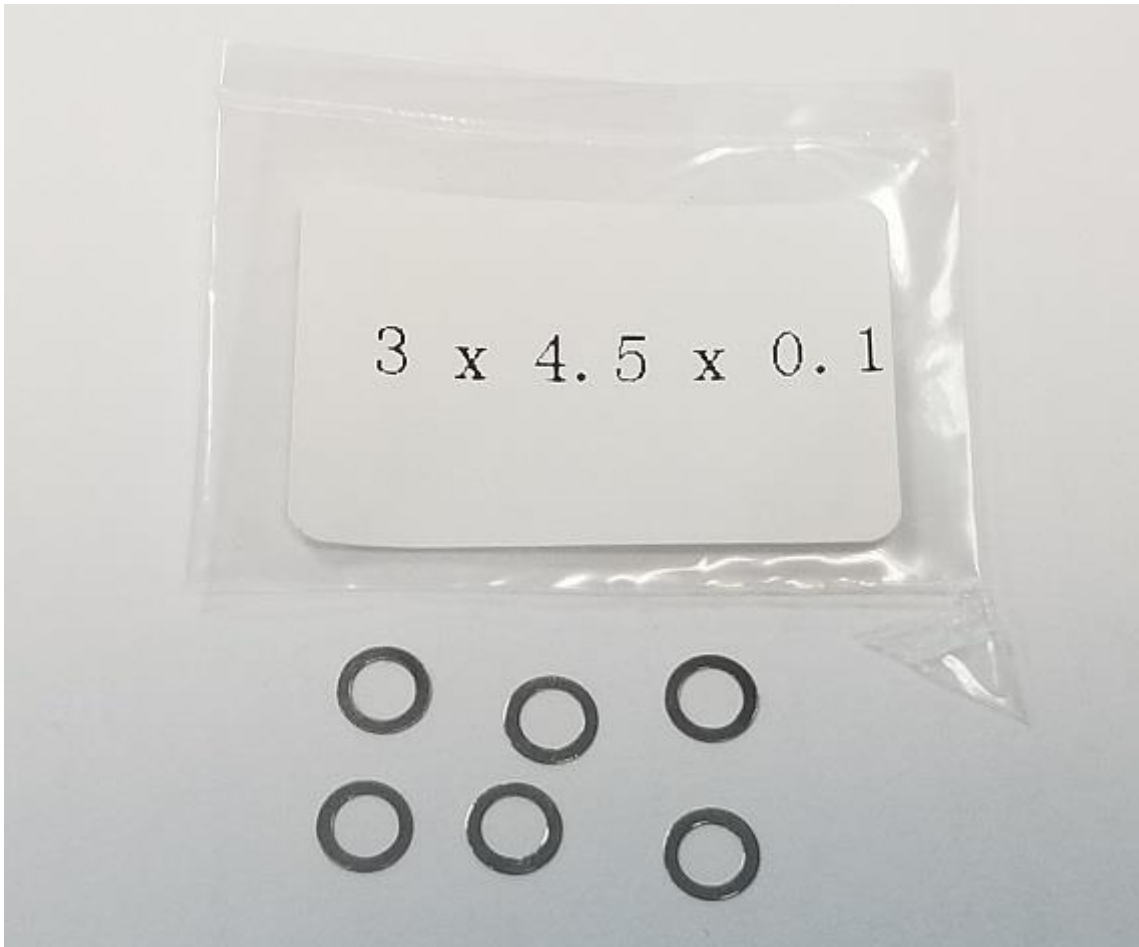
Step 8: Steering Crank Plate



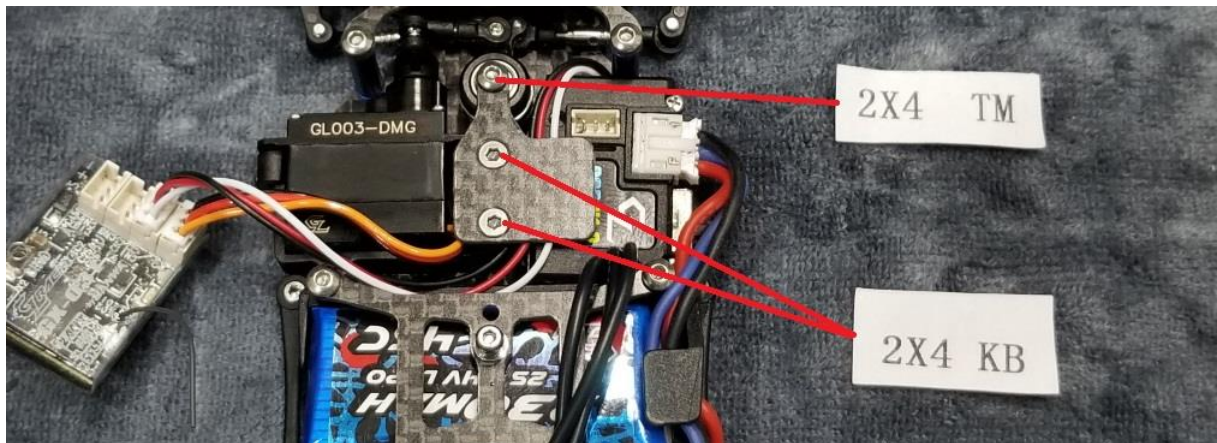
Place the 3x5x0.2 or 3x4.5x0.2mm shims onto the top of Steering Crank

Note: Your GLR kit may be supplied with 3x5x0.1mm shims, if so, use 2x to make 0.2mm in total

Note: Since 2018-05-01, your GLR kit is supplied with 3x4.5x0.1mm shims, use 2x to make 0.2mm in total



Secure Steering Crank Plate with 2x4 TM and 2x4 KB screws



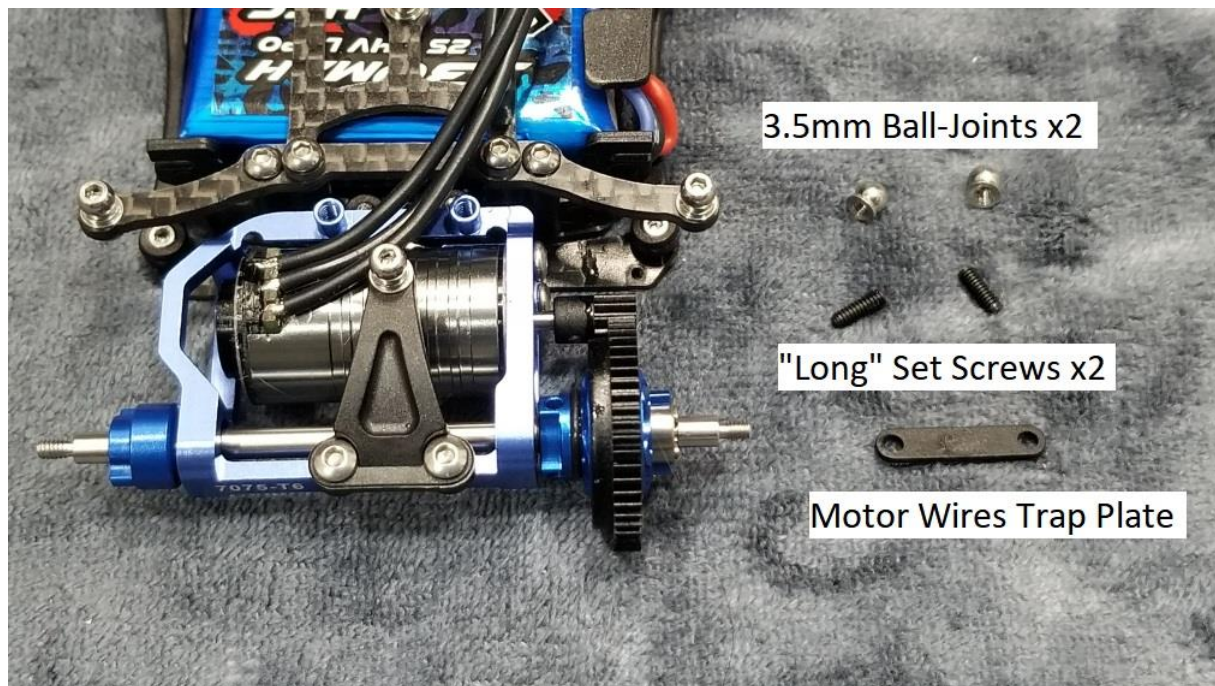
Step 9: Mount Receiver with double-sided tape



Electronics Setup COMPLETE!!!

Tri-Dampers

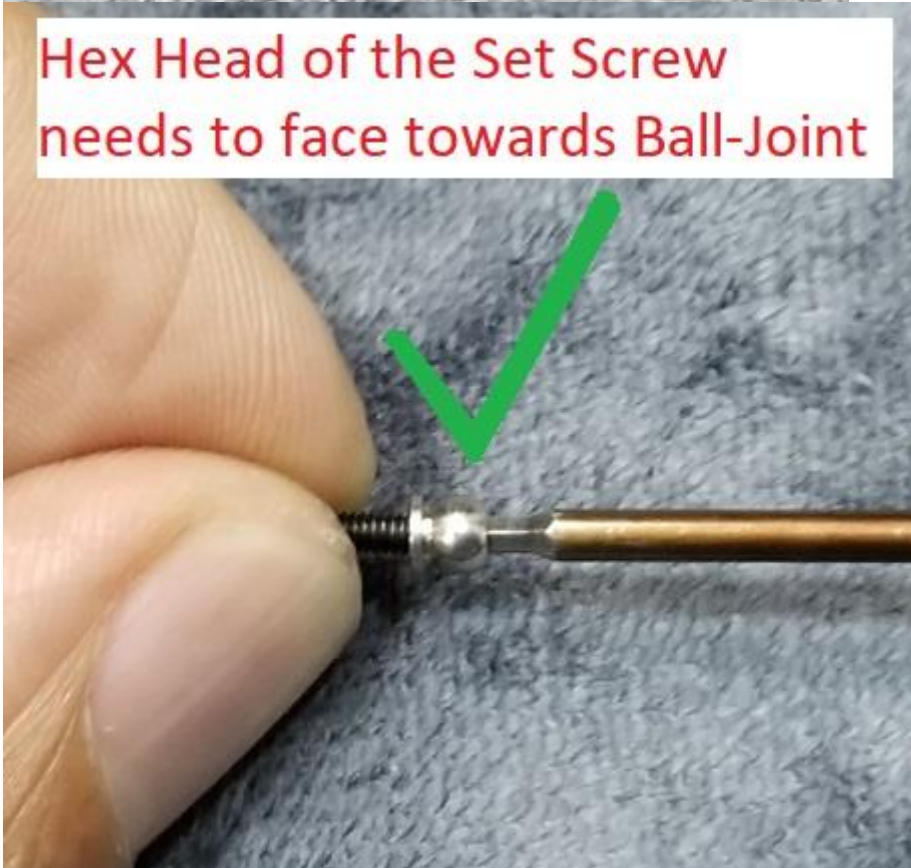
Step 1: Motor Wires Trap Plate



Screw the Set Screw into the 3.5mm Ball-Joints



Hex Head of the Set Screw
needs to face towards Ball-Joint



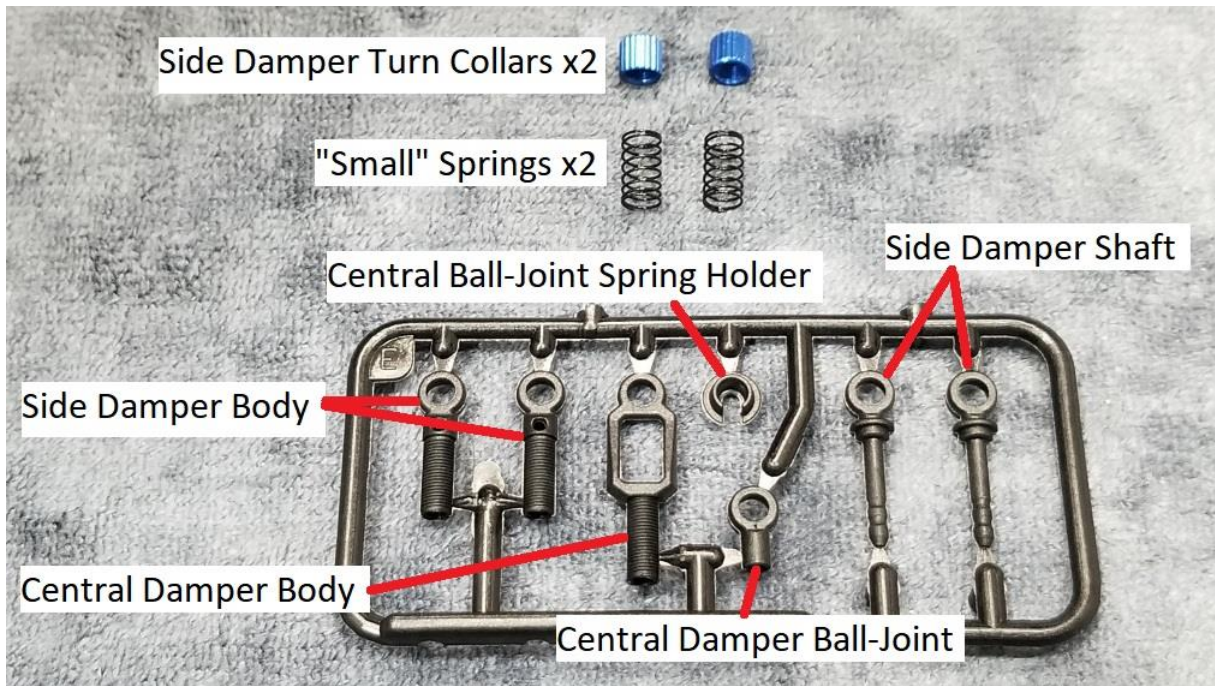
Arrange the components as photo below:



Screw assembly onto Motor Mount on top of motor wires



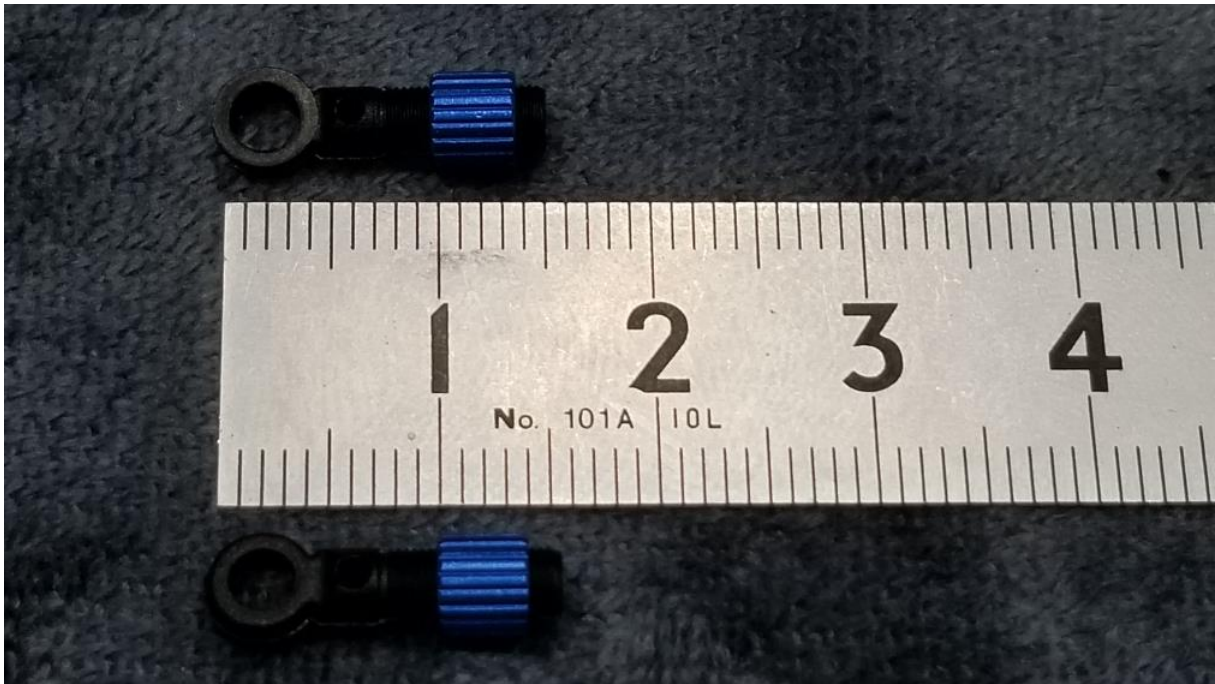
Step 2: Side Dampers



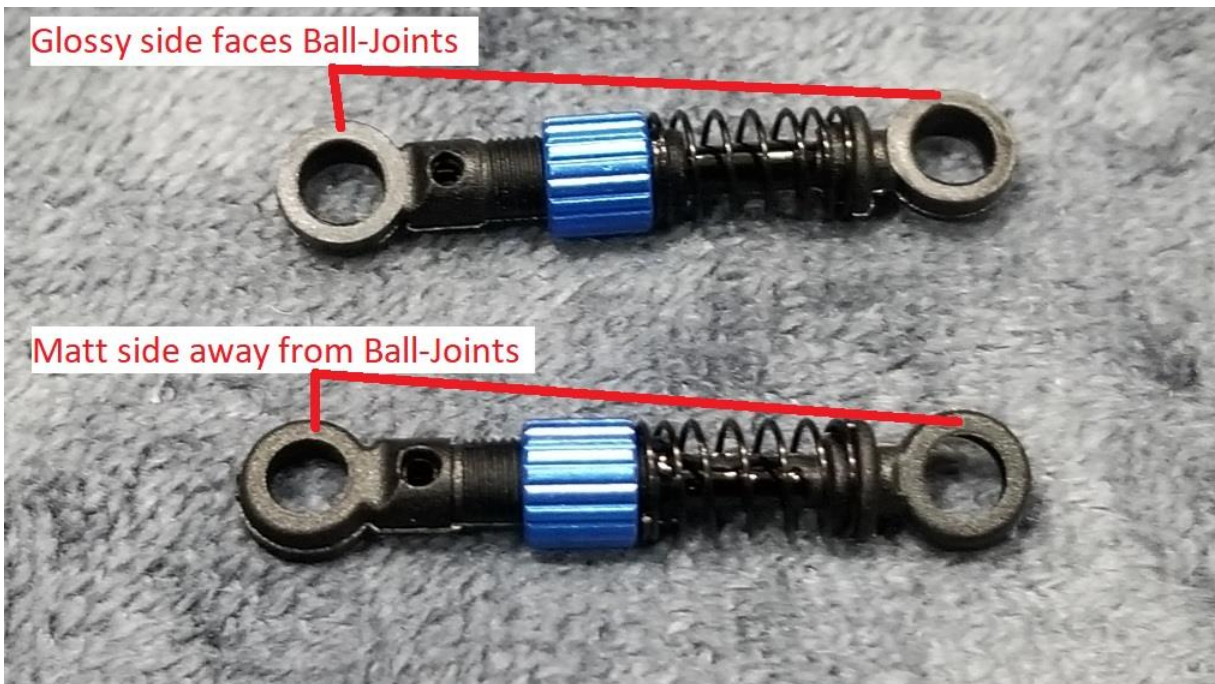
Dip the ends of the Side Damper Shafts with Friction Grease



Screw the Turn Collars onto the Side Damper Bodies at position indicated below:

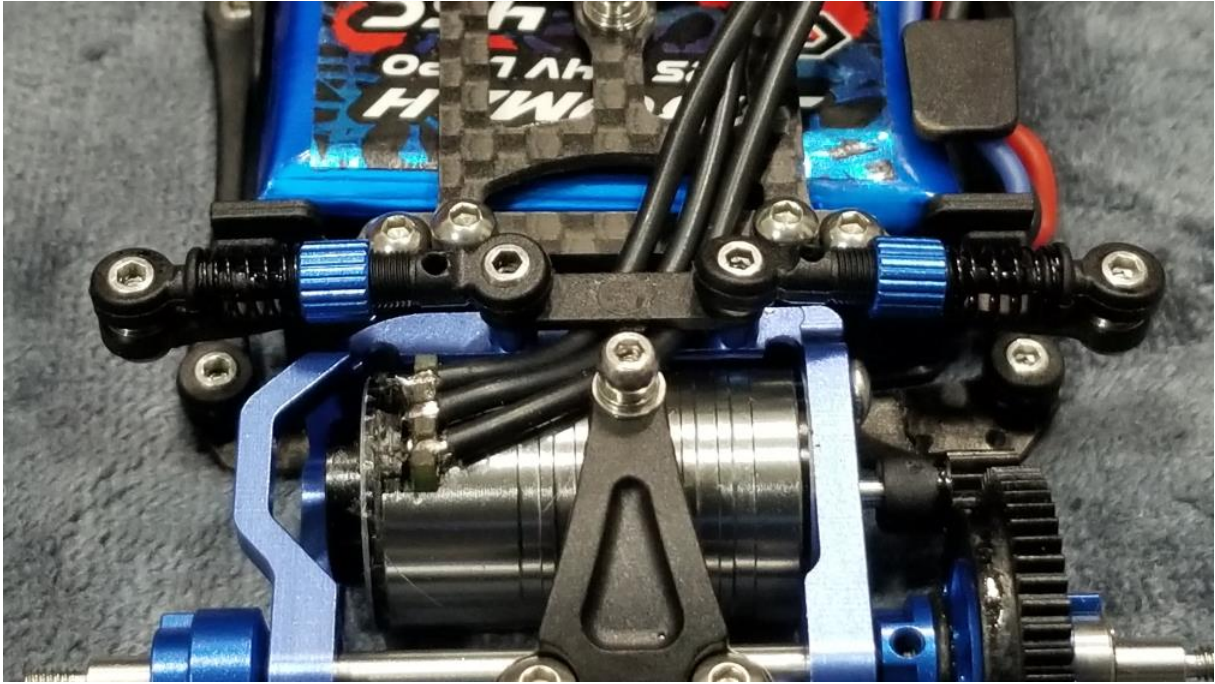


Assemble the Bodies, Springs and Shafts

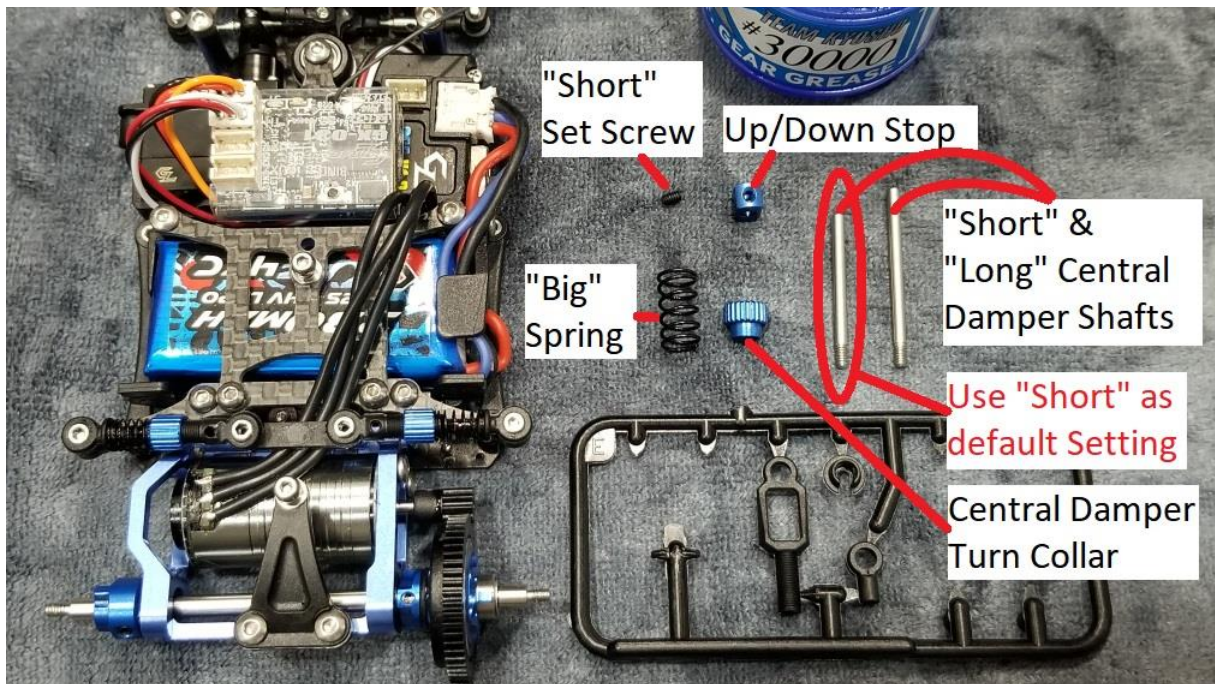


Install onto Chassis

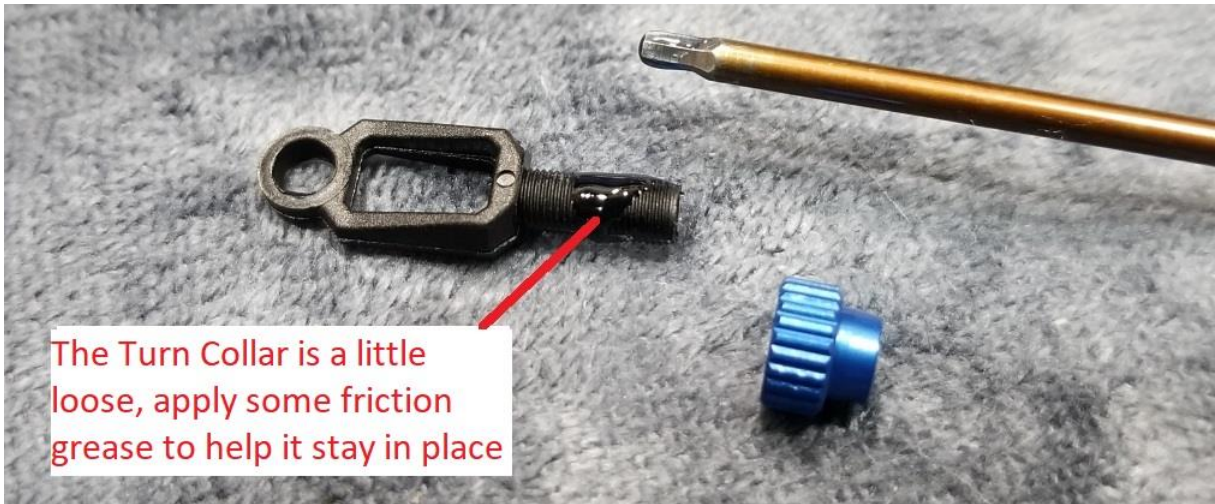
Note: It is normal that the Side Damper Springs are pre-loaded (pushing against each other), this provide cen
the Rear Subframe to center after a corner



Step 3: Central Damper



Note: The Central Damper Turn Collar is a bit loose, apply a little friction grease to help it stay in place



Screw on the Turn Collar onto Damper Body



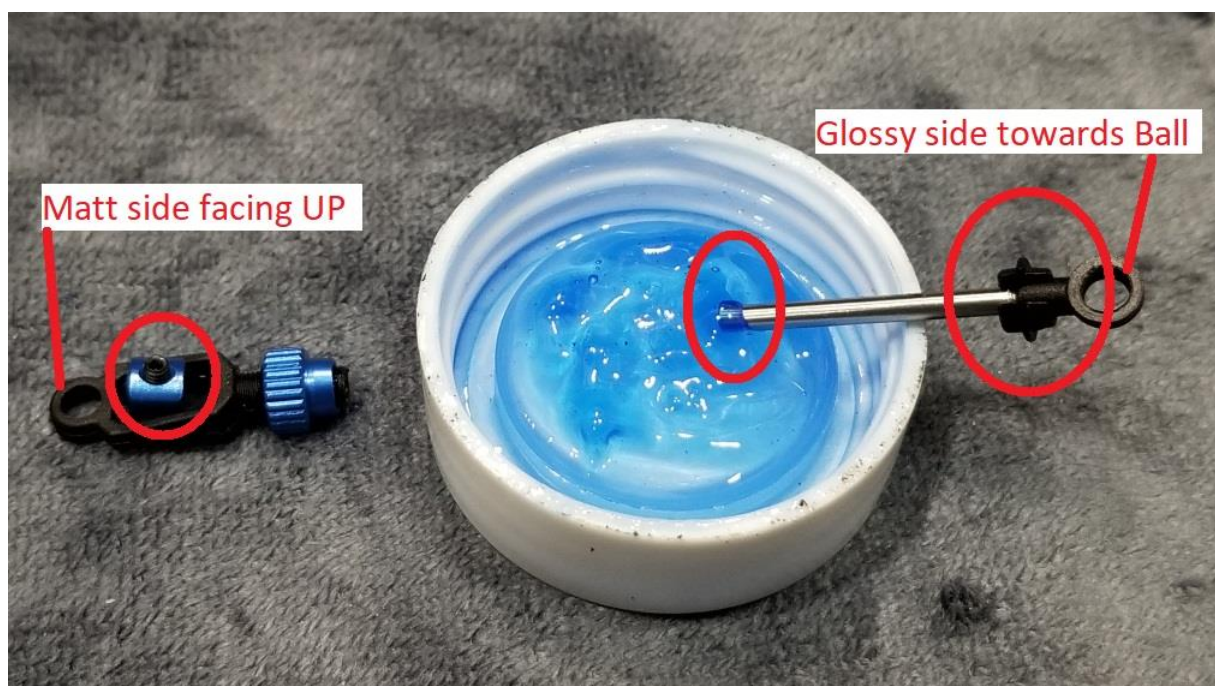
Screw the "Short" Damper Shaft into Ball-Joint

Short Central Damper is angled more, giving a more progressive geometry
Long Central Damper has less angle thus more linear



Attach Spring Holder onto Shaft, Dip end of Shaft with friction grease, Set Screw into Up/Down Stop

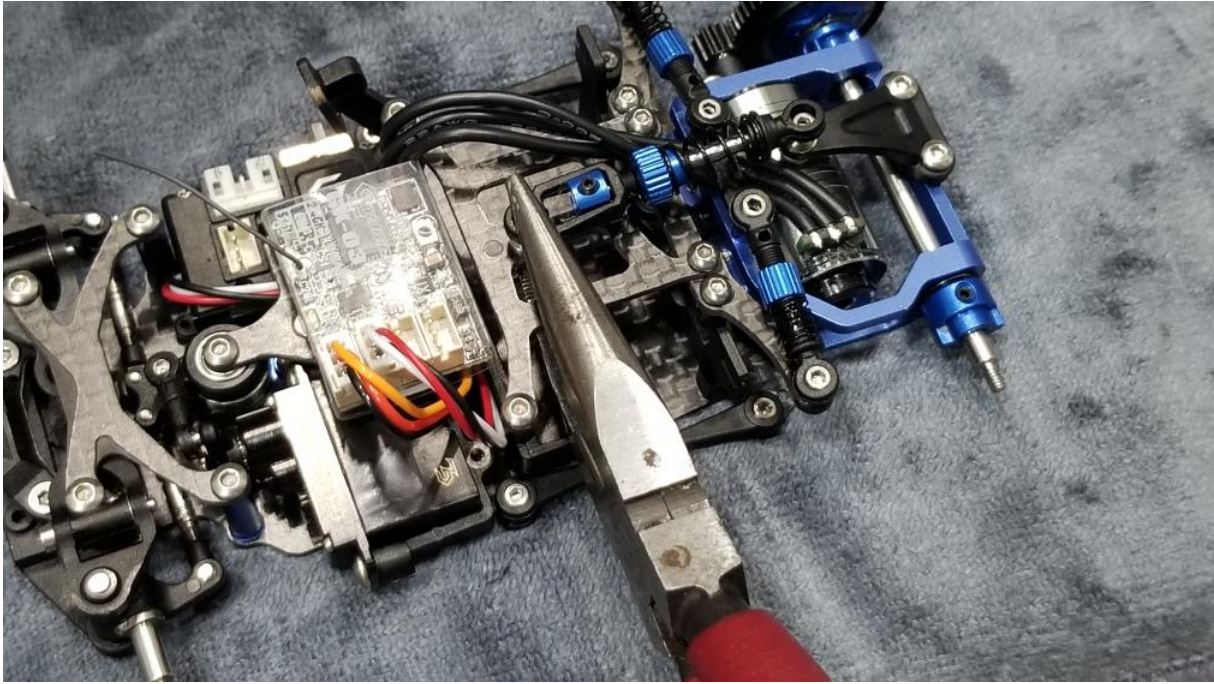
Note: Since 2018-05-01, your GLR kit is supplied with a Up/Down Stop that takes a 2mm set screw, please use a 2mm set screw driver or allen key



Assemble the Bodies, Springs and Shafts



Install onto Chassis

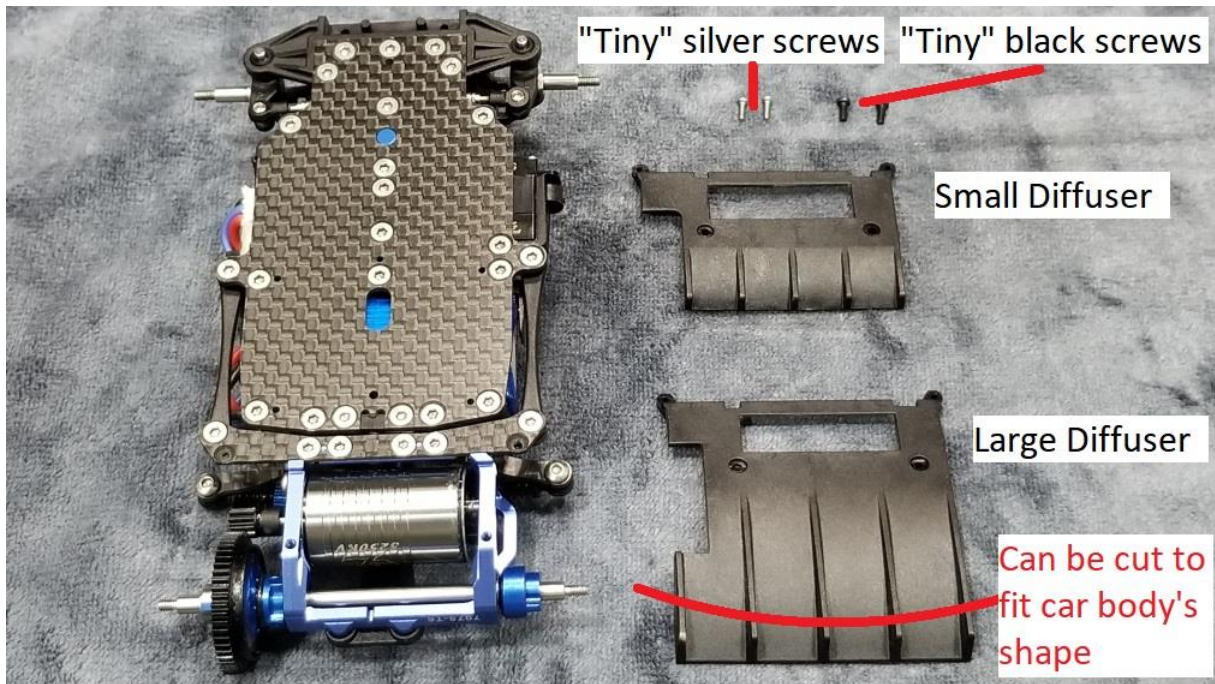


Fix Set Screw for wanted range of Up Down movement of the Rear Subframe



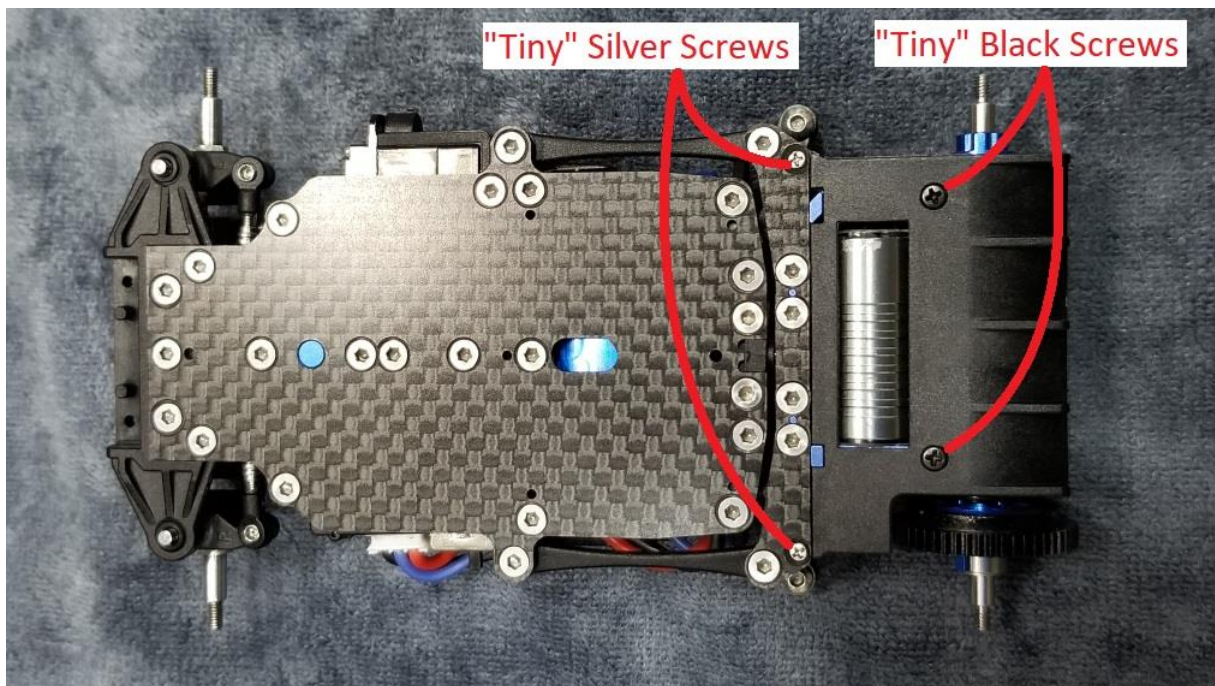
Tri-Dampers DONE!!

Diffuser

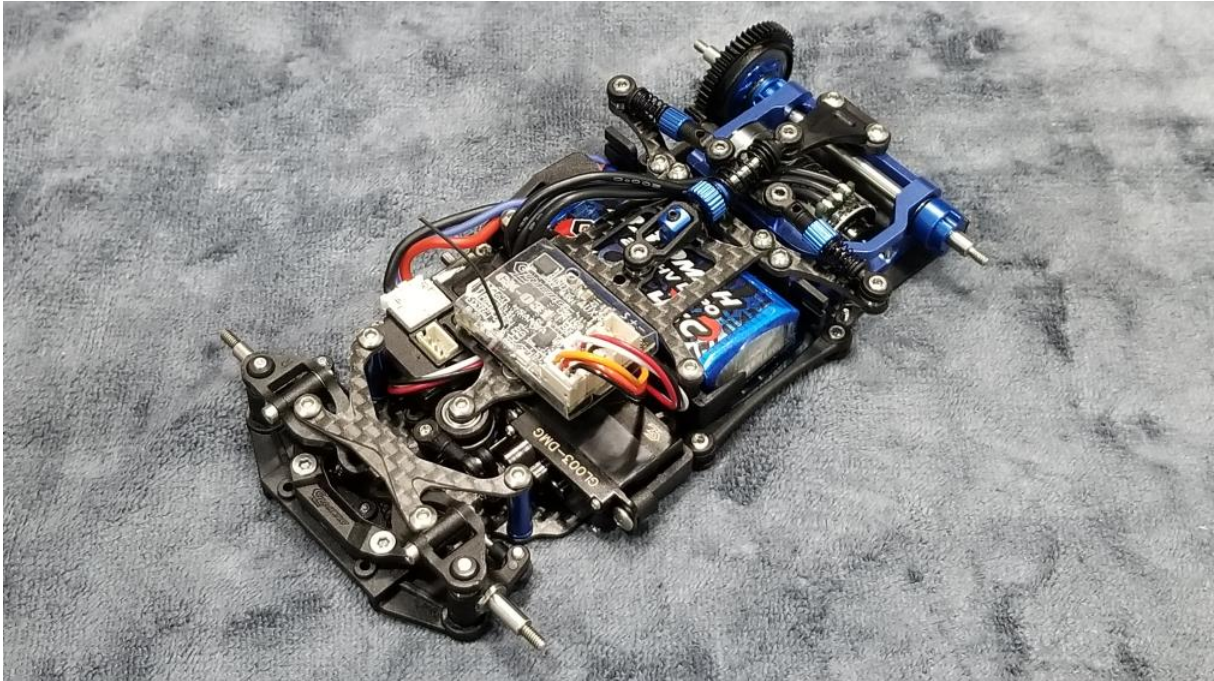


Select which Diffuser you would like to install, if in doubt, start with Small

Note: The Large Diffuser might hit your car body, check that Diffuser does not touch car body with a good range of Subframe movement, the Large Diffuser can also be cut to fit a particular body.



Diffuser Complete! Car almost ready!

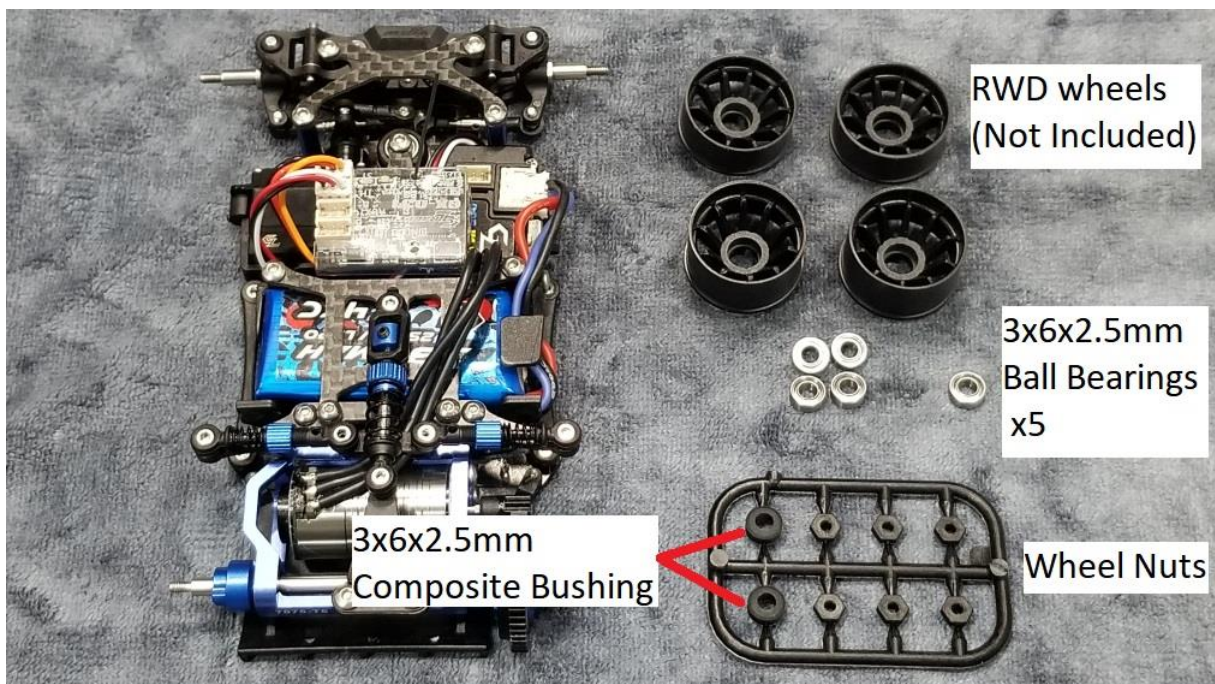


Wheels

Wheels are not included, different bodies require different offsets, the GLR has the same track widths as a MR-03W

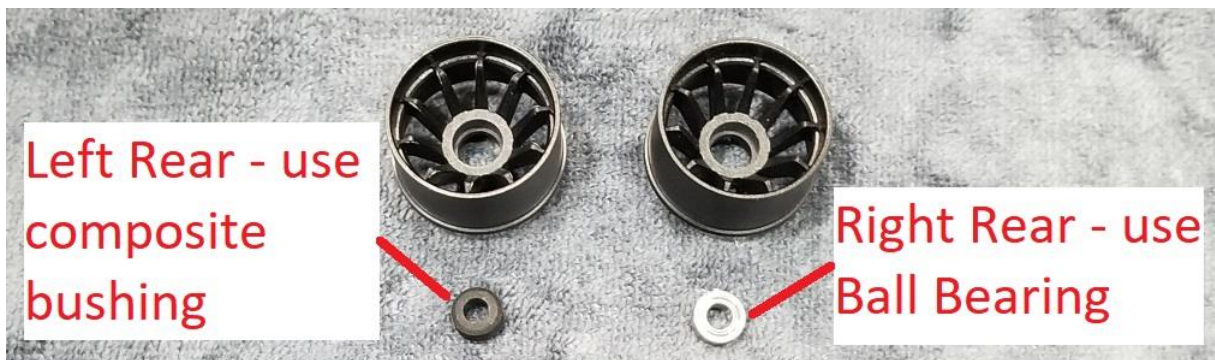
We recommend our Machine Cut Carbon Wheels for RWD

- [RWD R10 Machine Cut Carbon Rim - Narrow](#)
- [RWD R10 Machine Cut Carbon Rim - Wide](#)



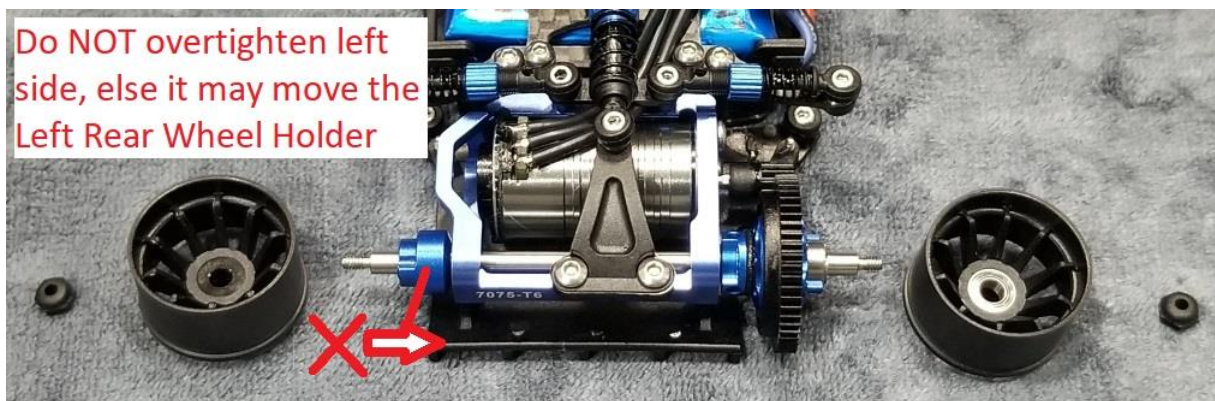
Step 1: Rear Wheels

Left - use Composite Bushing, Right - use Ball Bearing



Use wheel nuts to secure the rear wheels

Important: Do NOT tighten left Wheel Nut too much, else the Left Wheel Holder may move and this will affect ~0.2mm play for the Rear Axle



Step 2: Front Wheels

Install 3x6x2.5mm Ball Bearings on the inside and outside of the Front Wheels



Use wheel nuts to secure the front wheels

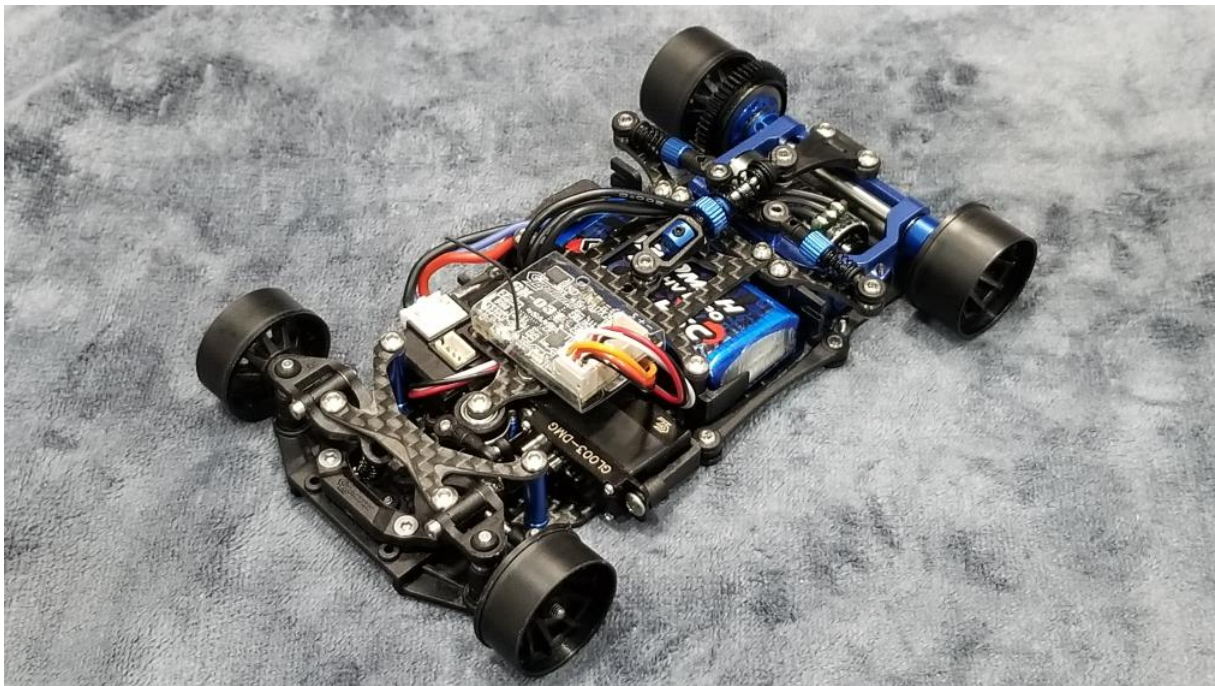
Note: Use 3x5mm shims to shim the Front wheels so that they are free to rotate but with minimum play, adjust different rims. GL Carbon Rims require ~0.2mm shims

Note: Your GLR kit may be supplied with 3x5x0.1mm shims, if so, use 2x to make 0.2mm in total

Note: Since 2018-05-01, your GLR kit is supplied with 3x4.5x0.1mm shims, use 2x to make 0.2mm in total



GLR Assembly Complete!! Congratulations!



Before First Run

Step 1: Check Battery cable is not touching Link Rod

This is the suggested way to install the GL Lipo battery

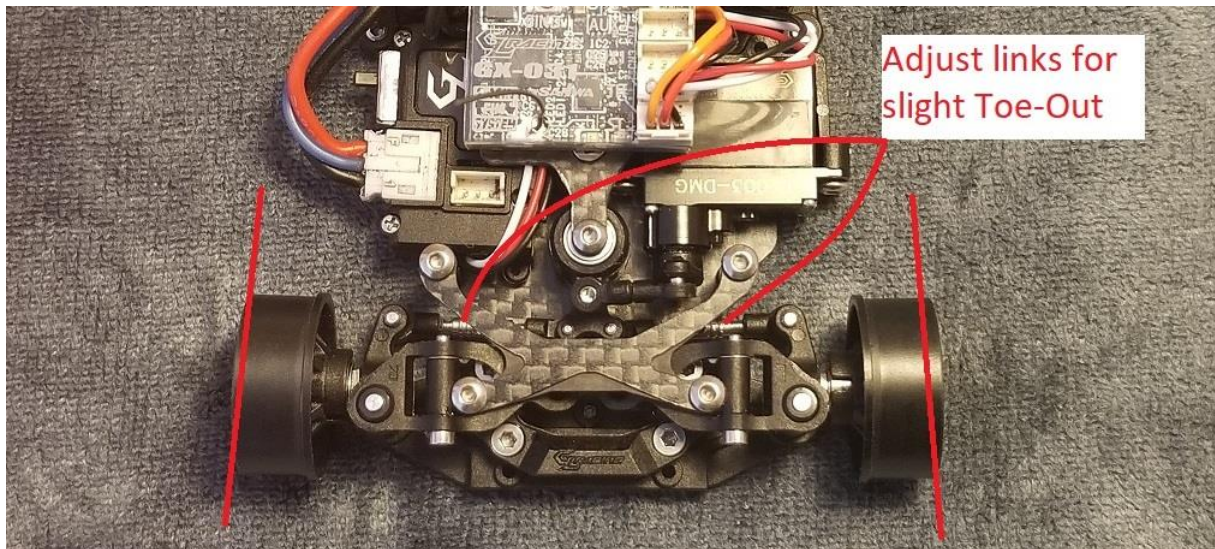


Check that the Battery cable does not affect the movement of the Link Rod



Step 2: Adjust Max Steering angle and/or Sub-Trim on Transmitter to make sure Servo horn does not hit Cross-brace Post

Step 3: Check Steering is centered, and adjust Crank-to-Knuckle links so that front wheels are slightly Toe-out



Step 4: Run in the Ball Diff and adjust tightness before use, this will make the Ball diff function better and last longer

Enjoy your first ride with your GLR!

Gear Ratio Chart

Recommended Motors and gear ratios:

- GLR will fit both 15mm and 16mm motors, but we recommend 15mm motors for correct ground clearance.
- GL-Racing makes [5250KV](#), [6800KV](#) and [8600KV](#) motors for GLR, they are designed with great power, controllability and efficiency
- 9T-14T Pinions and 53T Spur are included with GLR kit, 51,52 & 54T spurs are available as options
- 5000~5500KV try ~4.5 gear ratio, recommended power for racers at small/medium tracks
- 6500~7500KV try ~5.5 gear ratio, for expert racers at large High-grip tracks
- 8500~9500KV try ~6.0 gear ratio, when you just want the fastest car... :-)

GLR Gear Ratios				
			Kit	
	51	52	53	54
9	5.67	5.78	5.89	6.00
10	5.10	5.20	5.30	5.40
11	4.64	4.73	4.82	4.91
12	4.25	4.33	4.42	4.50
13	3.92	4.00	4.08	4.15
14	3.64	3.71	3.79	3.86

End of GLR Assembly Guide

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