COUGAR SV

Takes 2wd to the next Level

Instruction Manual v1.0

Schumacher Racing
73 Tenter Road
Moulton Park
Northampton
NN3 6AX
ENGLAND
WWW.racing-cars.com

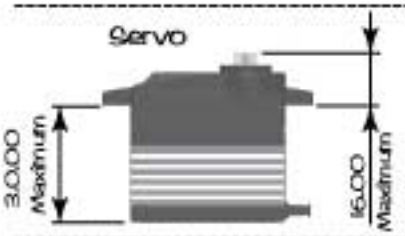
Additional Items Required

Transmitter and Receiver

Including batteries for txt

CR38
CODE 2.4G 2 Stick 30h Tx+Rx
CR39
CODE 2.4G 2 Stick 30h Receiver ONLY

Servo



Electronic Speed Control

Li-Po Battery

Maximum 25.10mm High

Motor

Pinion Gear

Battery Charger

Paint

Shock Oil

SuperGlue

Tyres and Inserts

Tools

5.5 A/F Comination Wrench

Long nose Pliers

HWDIO Wiha Precision Circlip Pliers

CRO44 Curved Body Scissors

U2789 Hex Driver - 1.5mm
U2790 Hex Driver - 2.0mm
U2791 Hex Driver - 2.5mm

U2795 M3 Nut Driver
U2796 M4 Nut Driver

ED190009 Turnbuckle Wrench 4mm

Soldering Iron

U3107 - Solder

Schumacher Racing stocks and distributes the following manufacturers products and full product listings are available on our website at www.racing-cars.com.

PLEASE NOTE THAT SOME OF THE PRODUCT RANGES BELOW ARE ONLY AVAILABLE IN THE UNITED KINGDOM.

CORE-RC
NISRAM
Speed Passion
GM
Wiha
EastCoast BodiesTune
Team Sorex
EDS
TRIX TOOLS

IMPORTANT SAFETY NOTES

- This product is not suitable for children under the age of 14 without the direct supervision of an adult.
- Select an area for assembly that is away from the reach of small children. The parts in this kit are small and can be swallowed by children causing choking and possible internal injuries.
- Exercise care when using hand tools and sharp instruments during assembly.
- Carefully read all manufacturers warnings and cautions for any additional parts used in the construction.
- In line with our policy of continuous development the exact details of the kit may vary.

PRO Spec Car (Steps 1, 2 and 3)

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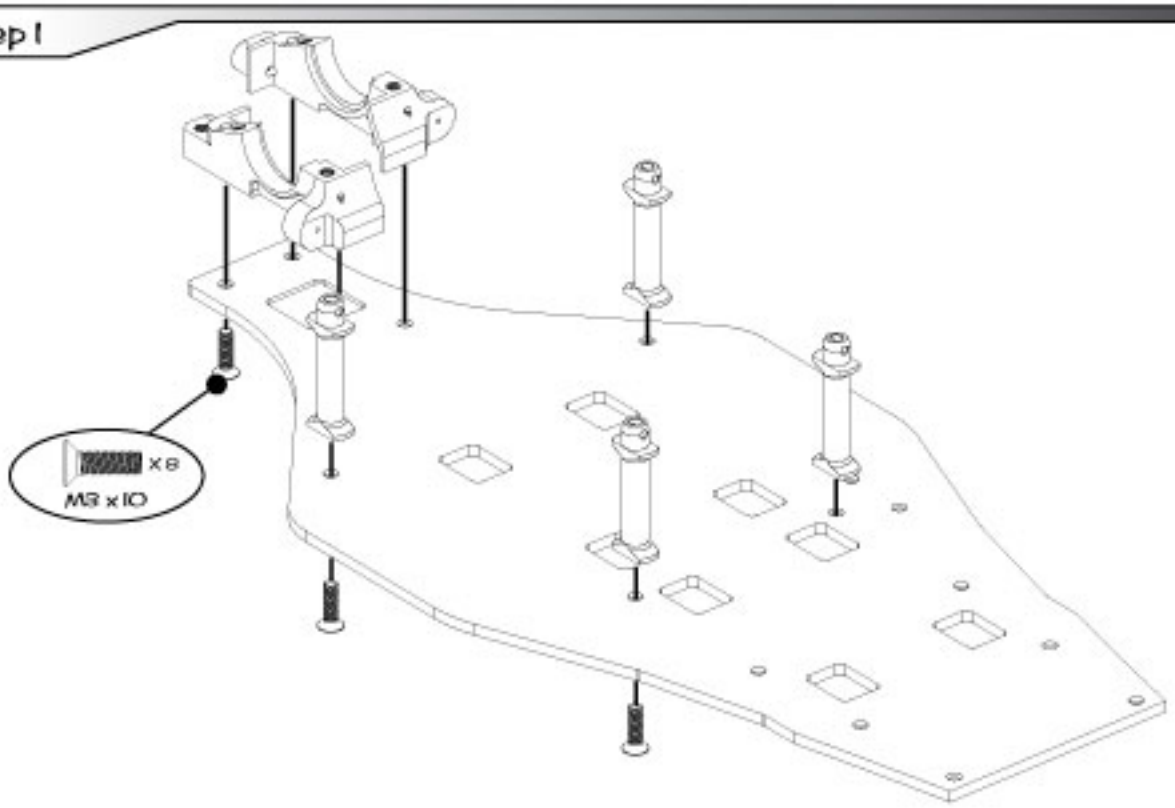
Step 1



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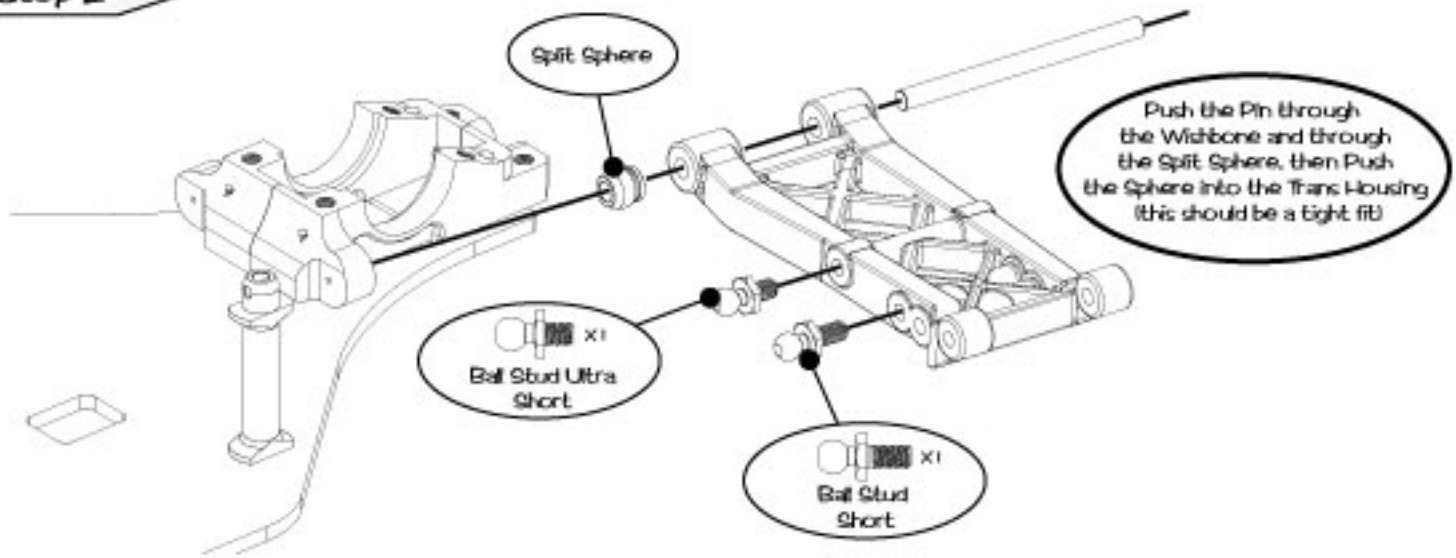

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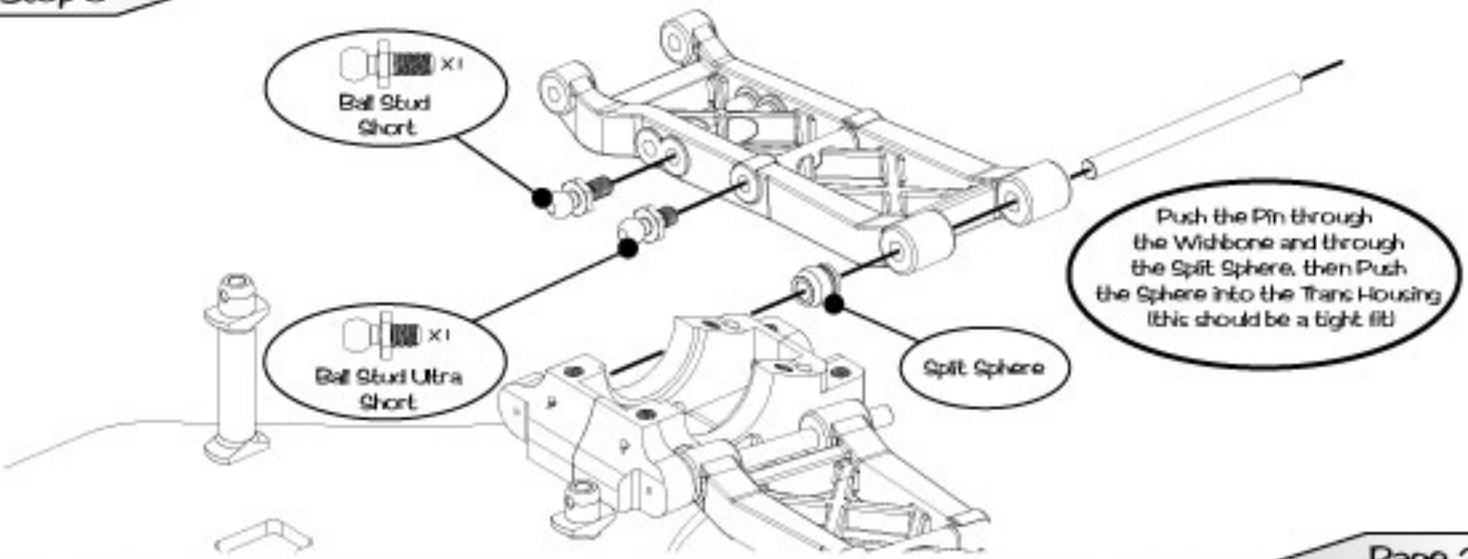

RACE Spec Car (Steps 1, 2 and 3)

COUGAR SV
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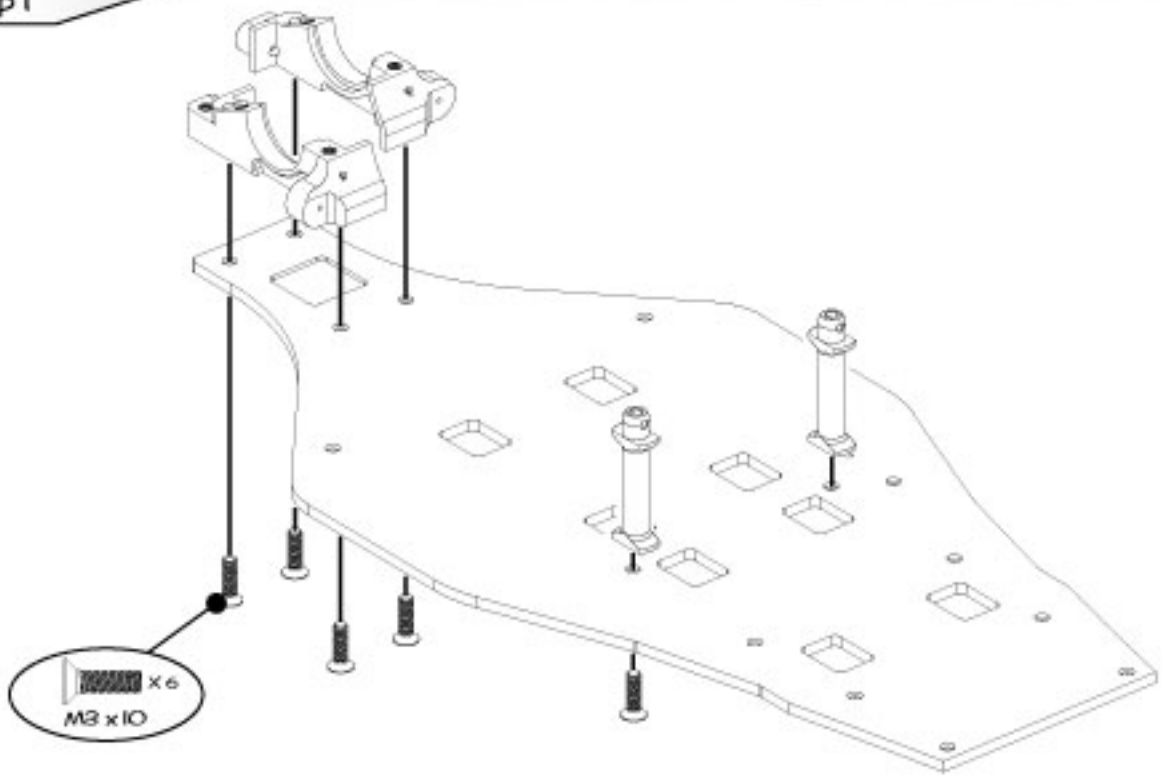
Step 1



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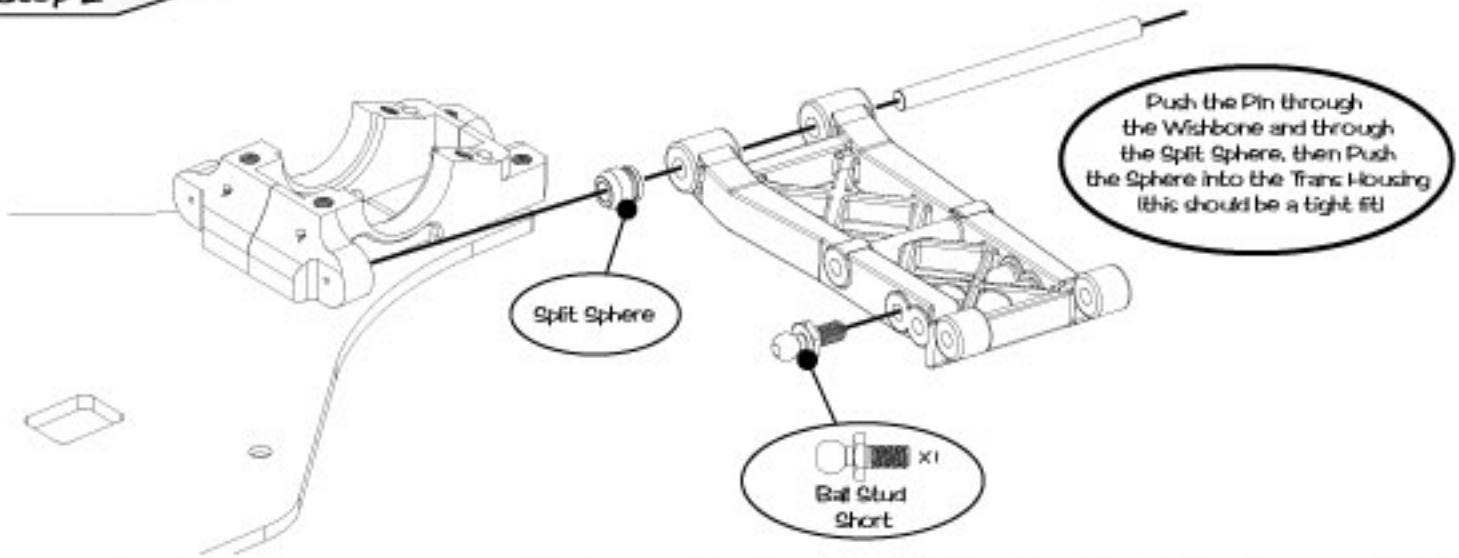

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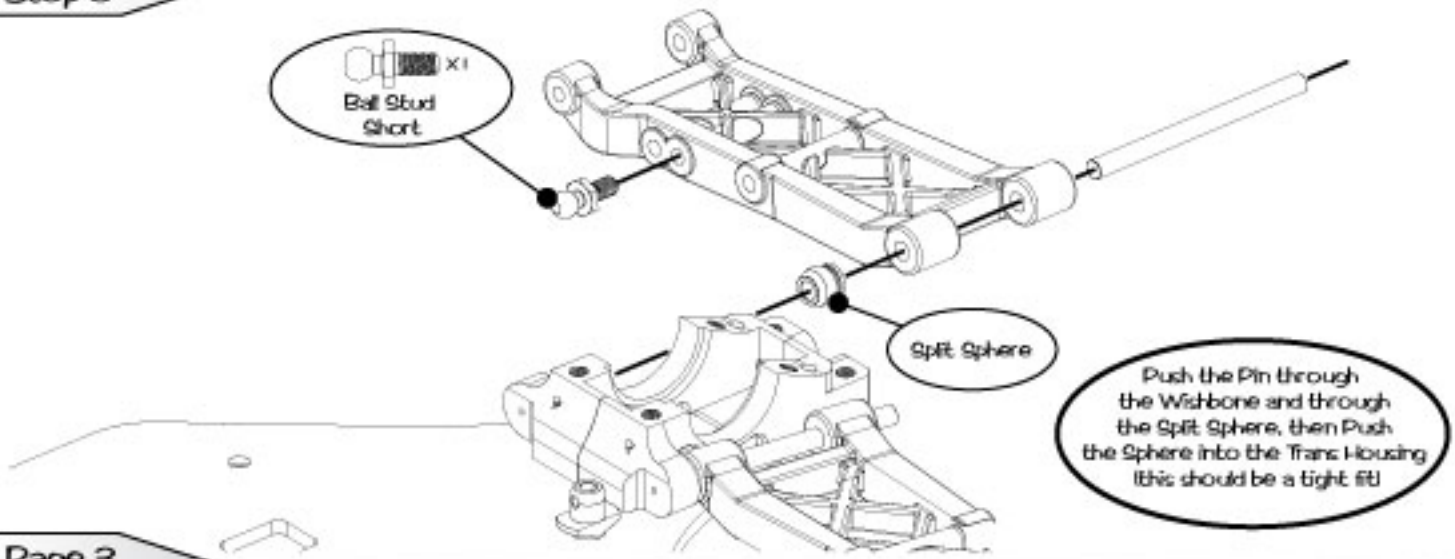

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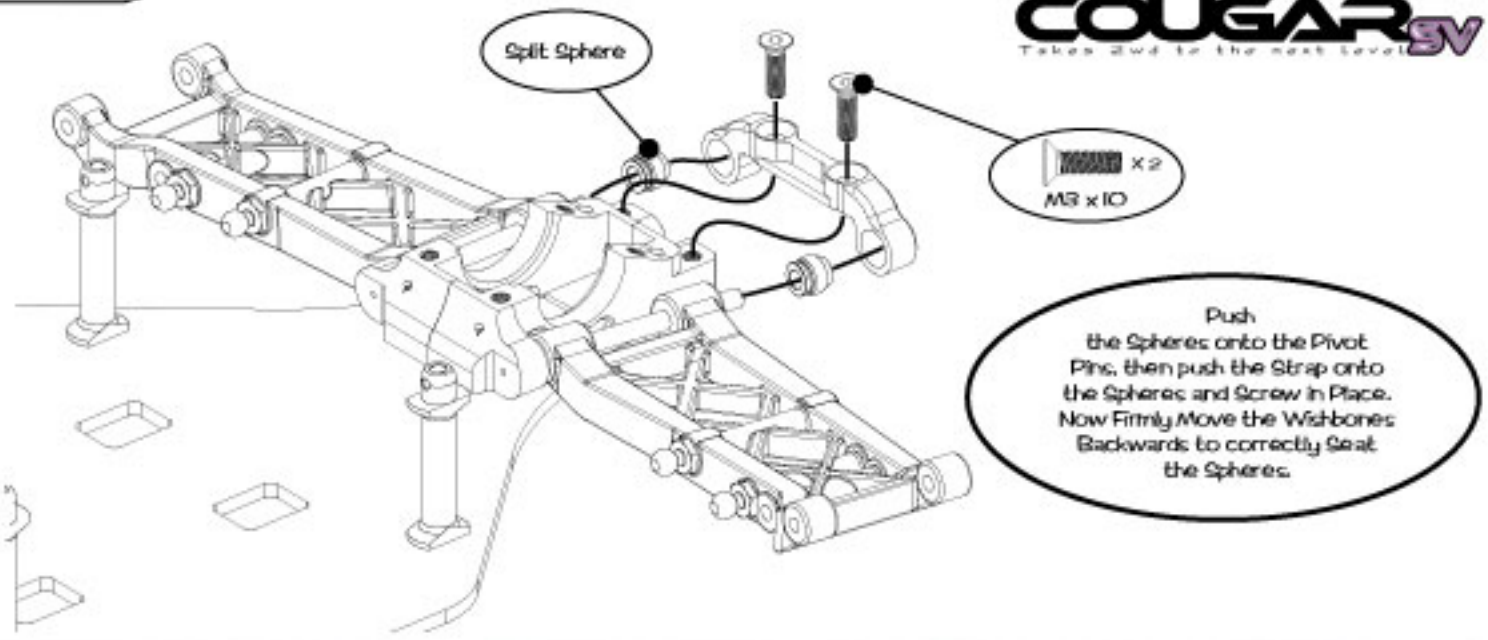

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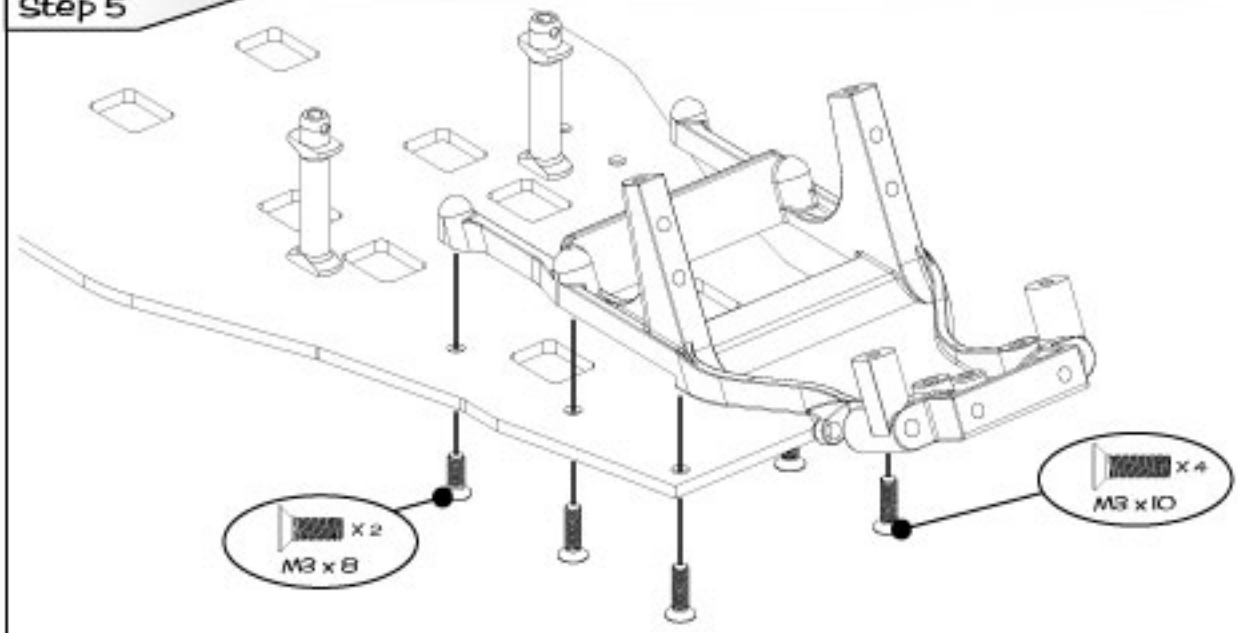

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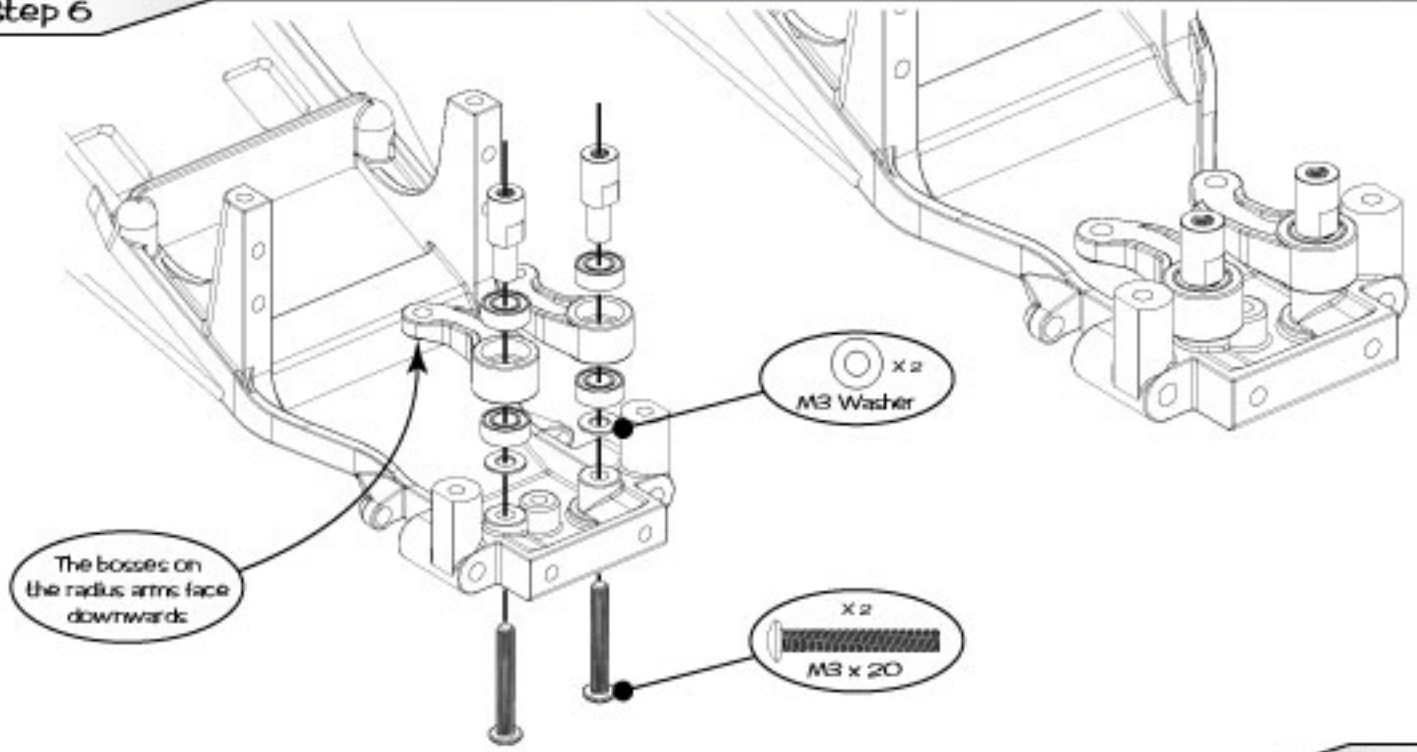

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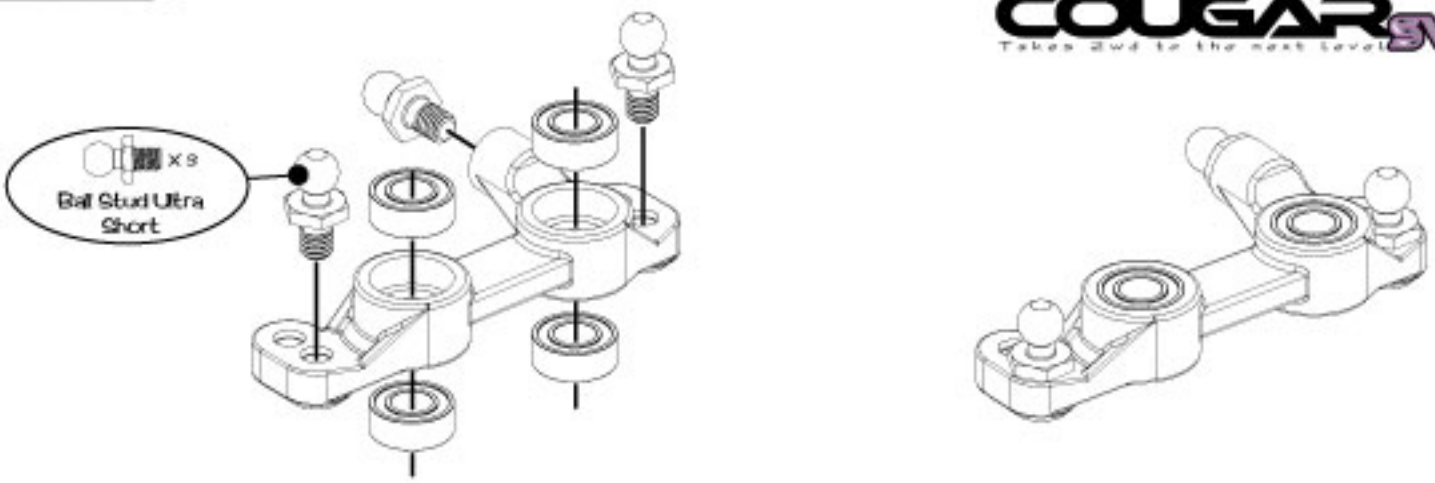

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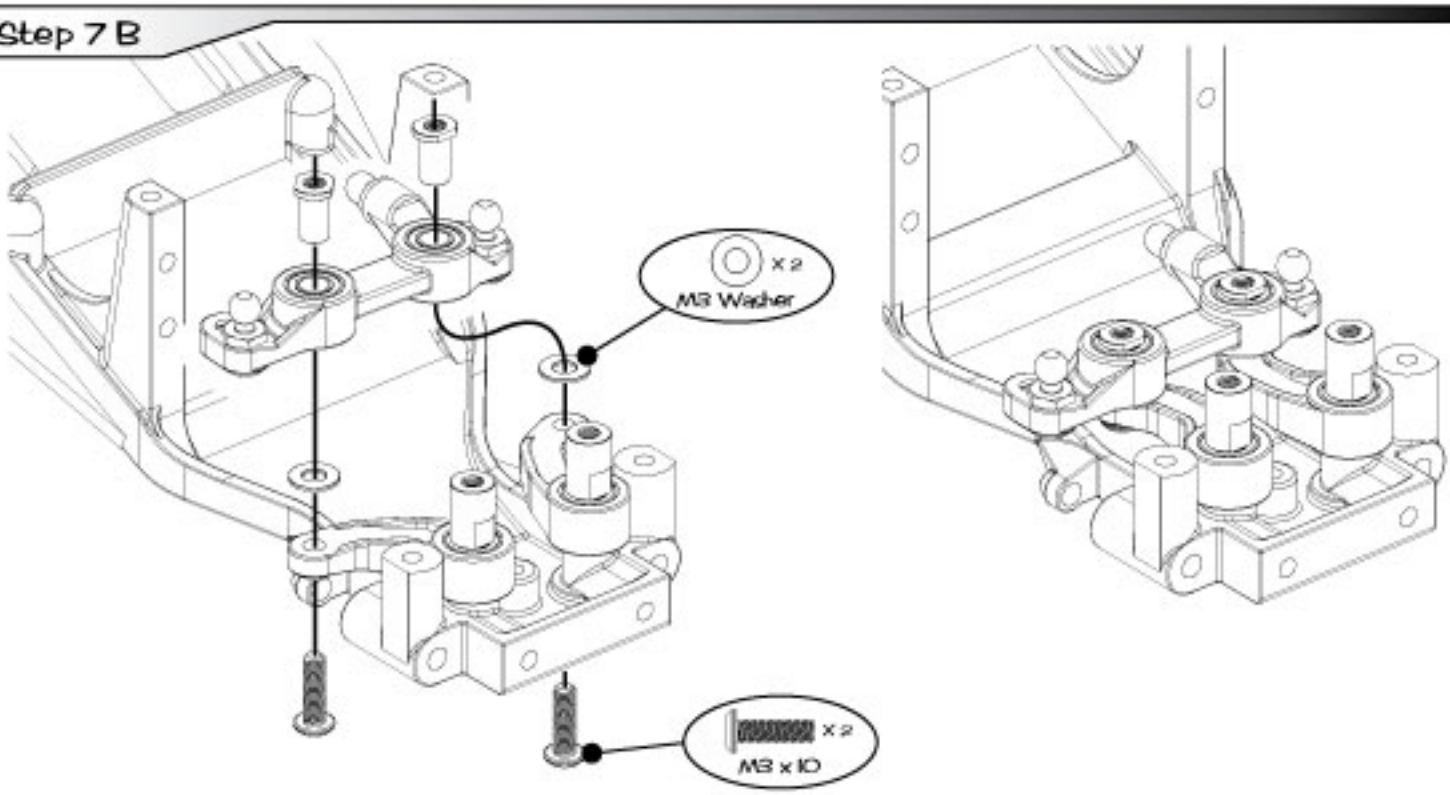

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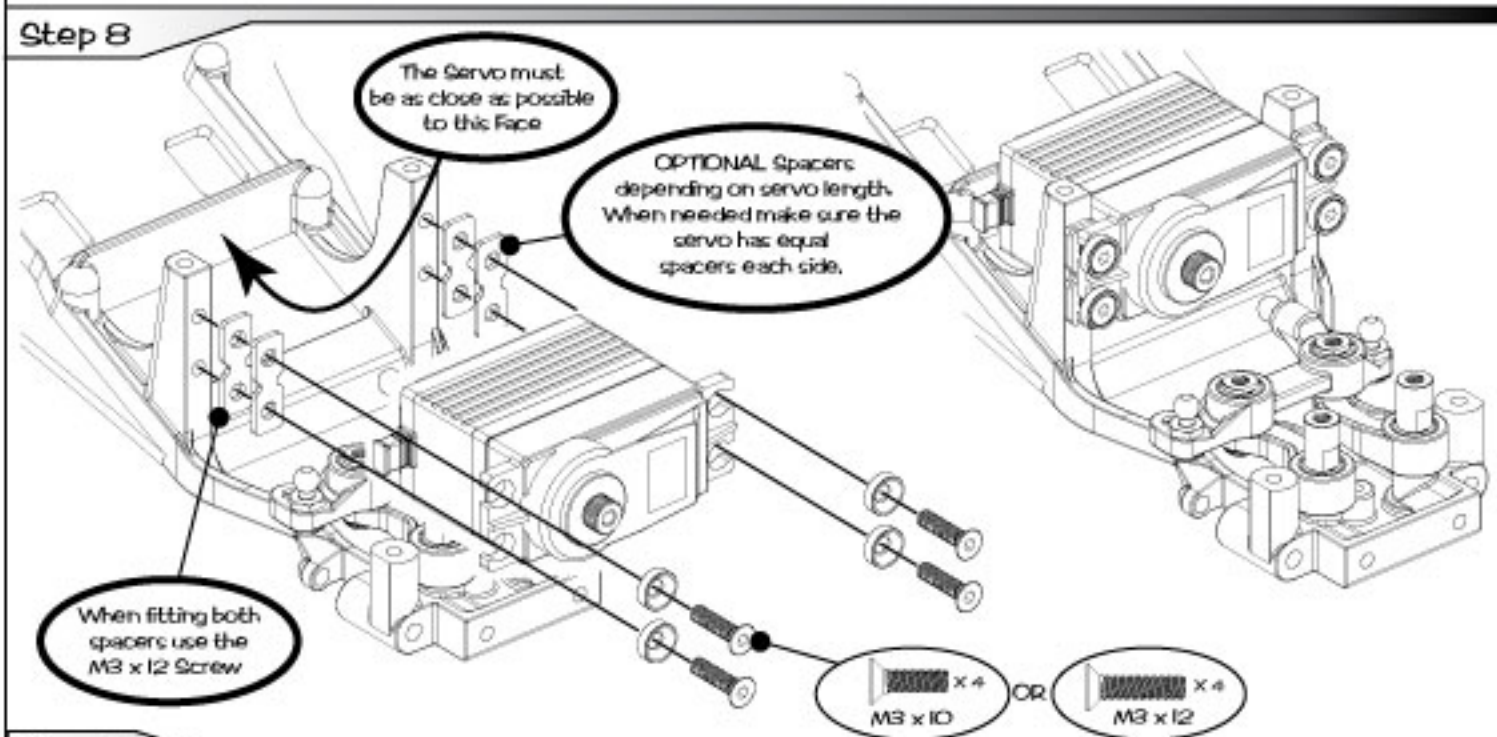
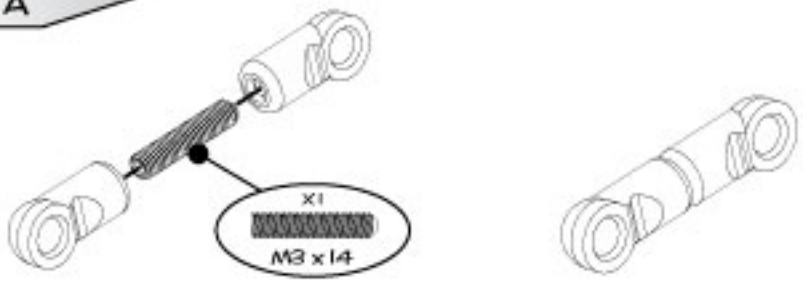


Step 9 A



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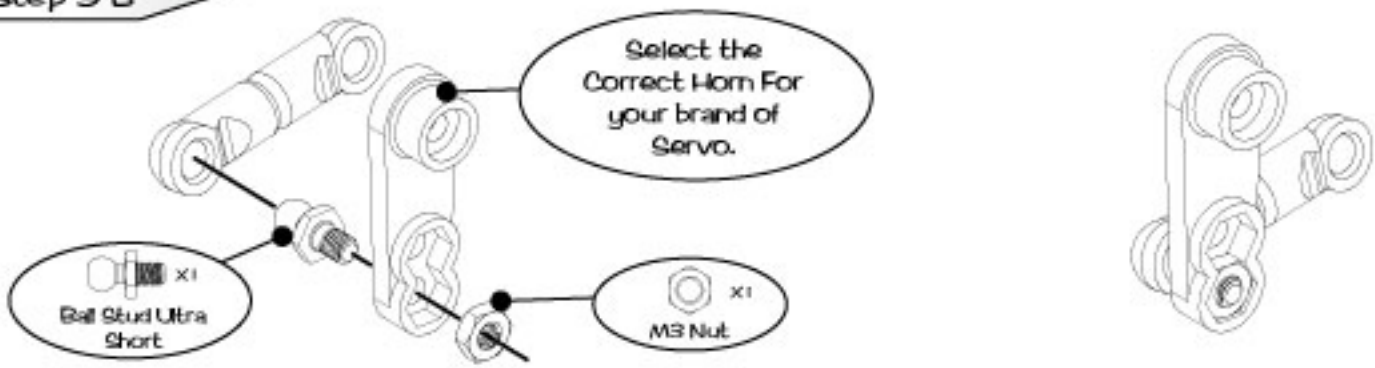

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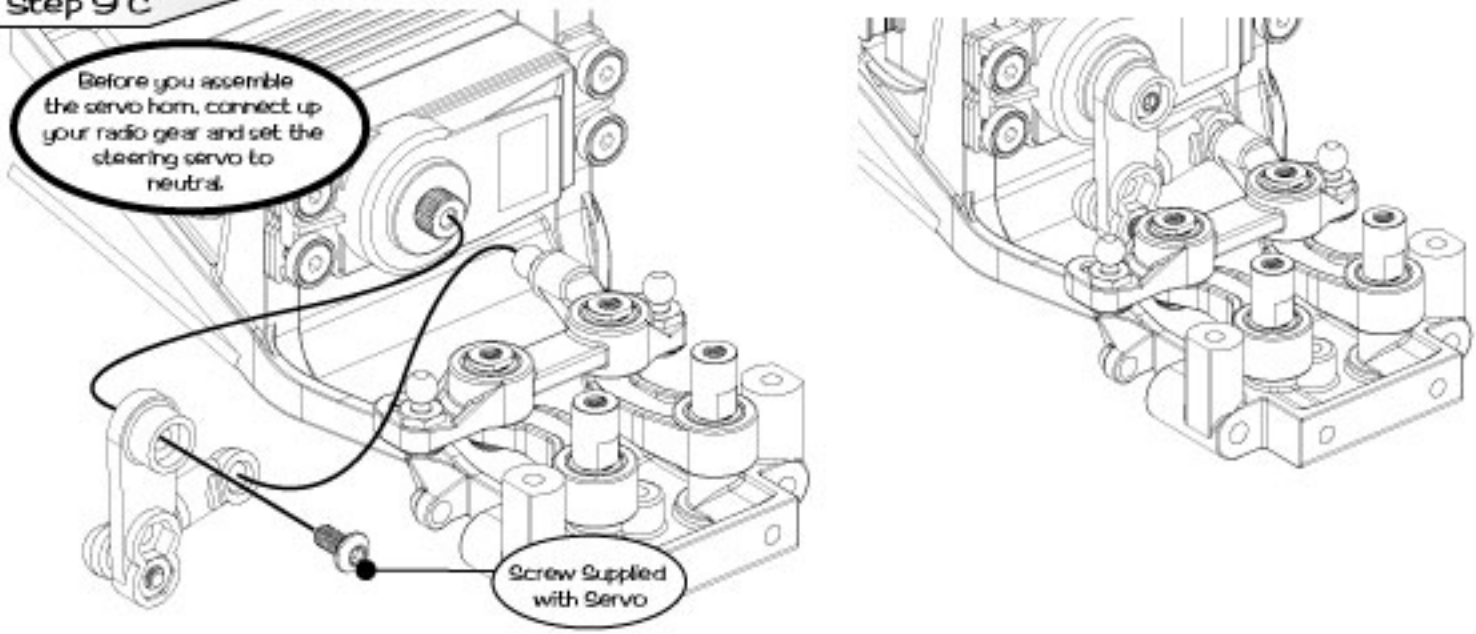
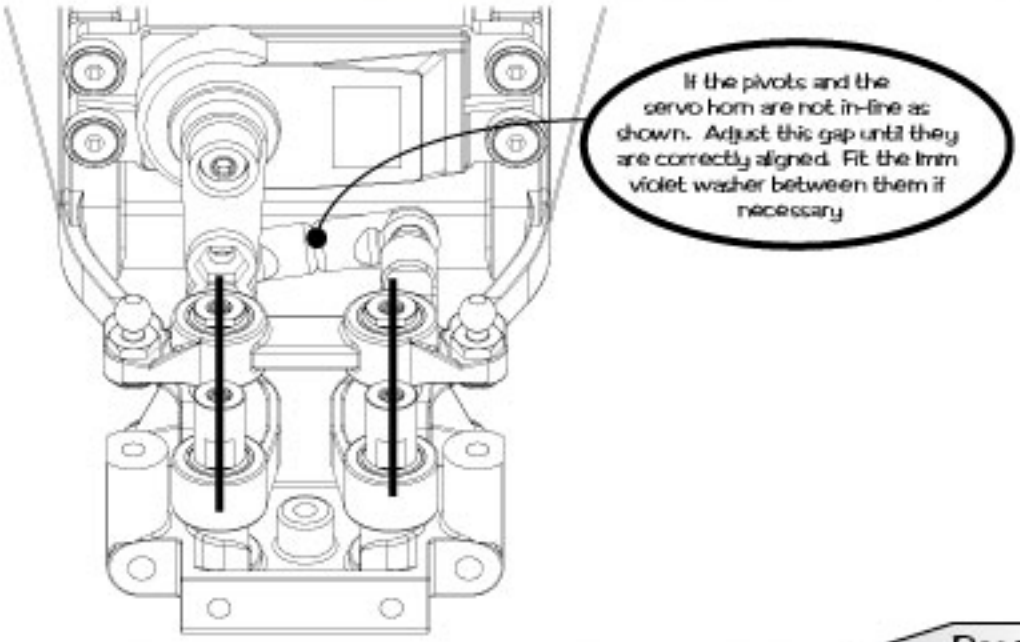


Step 9 D



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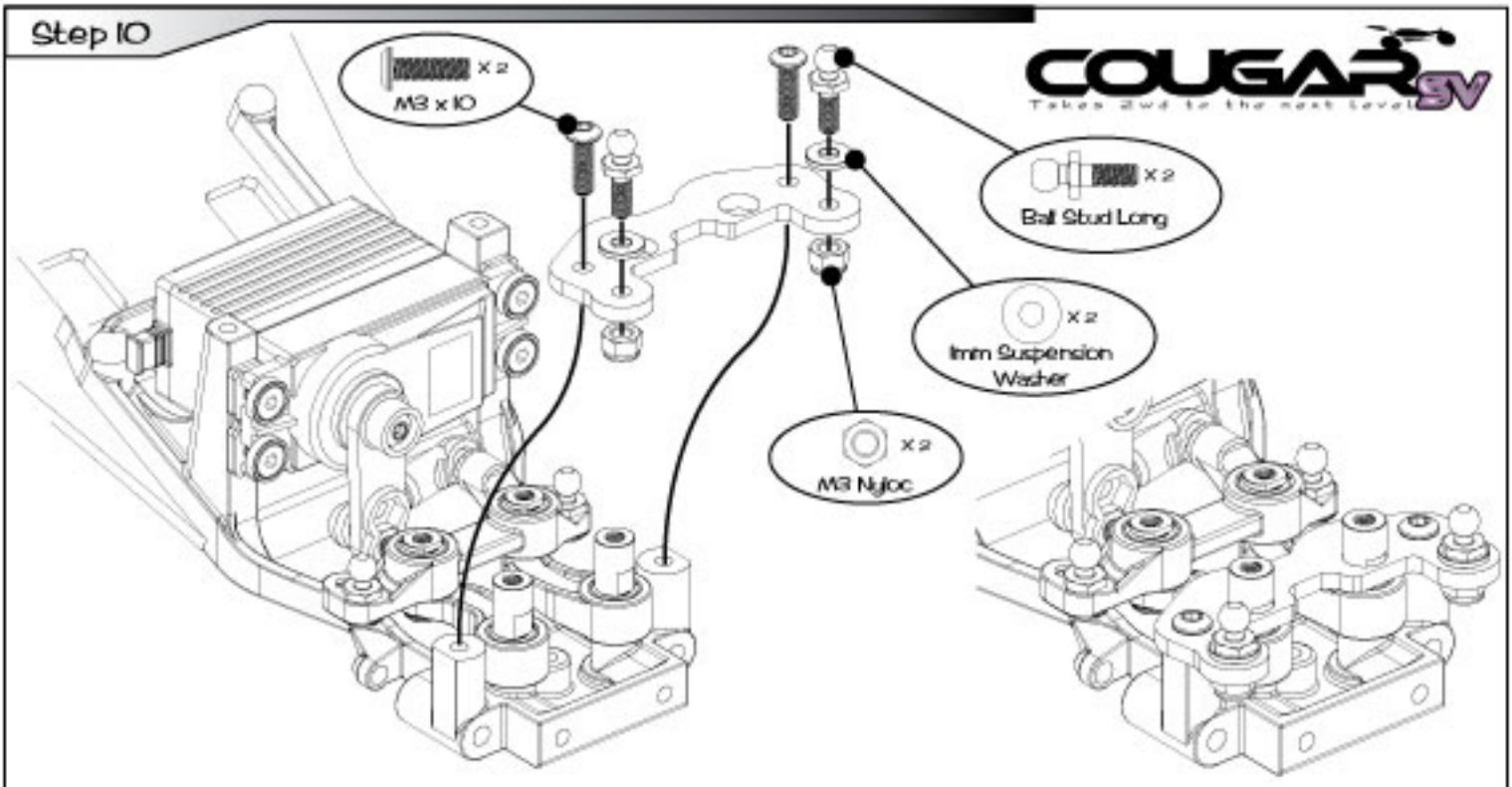

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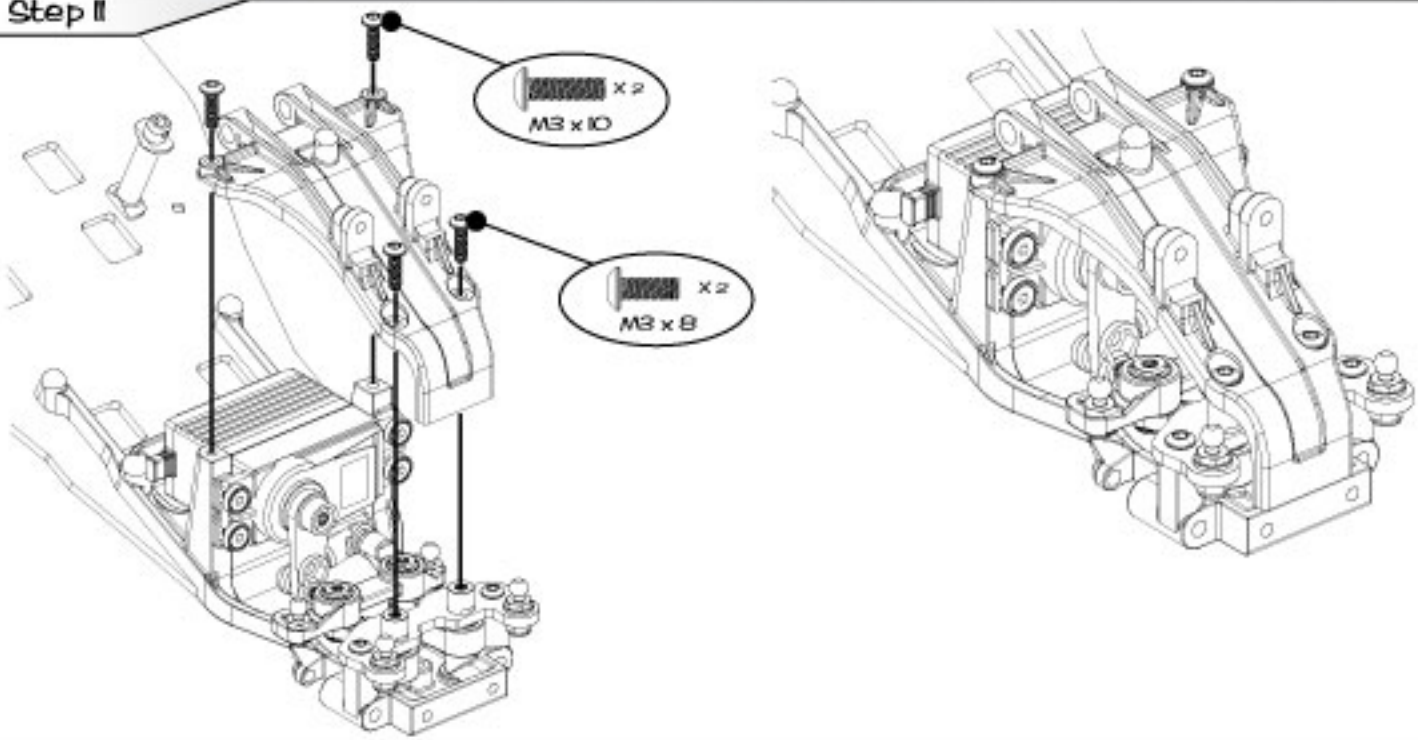

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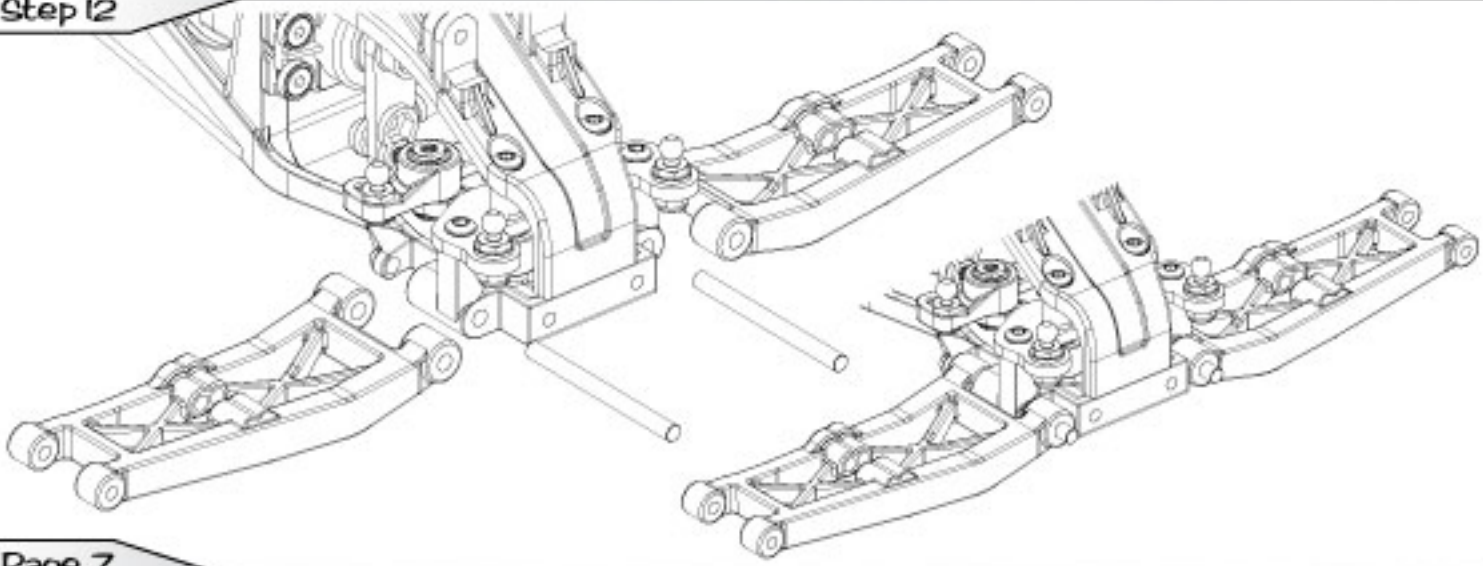

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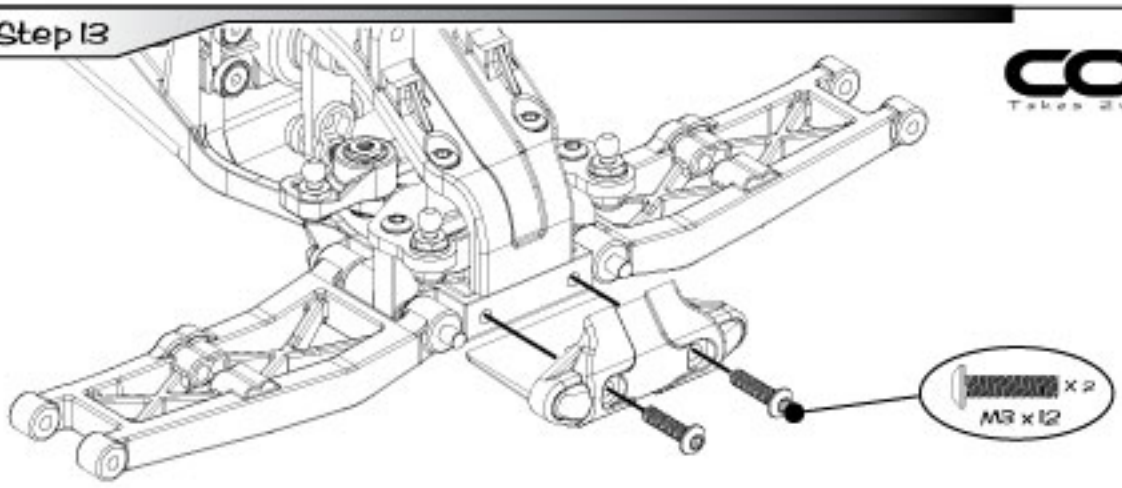
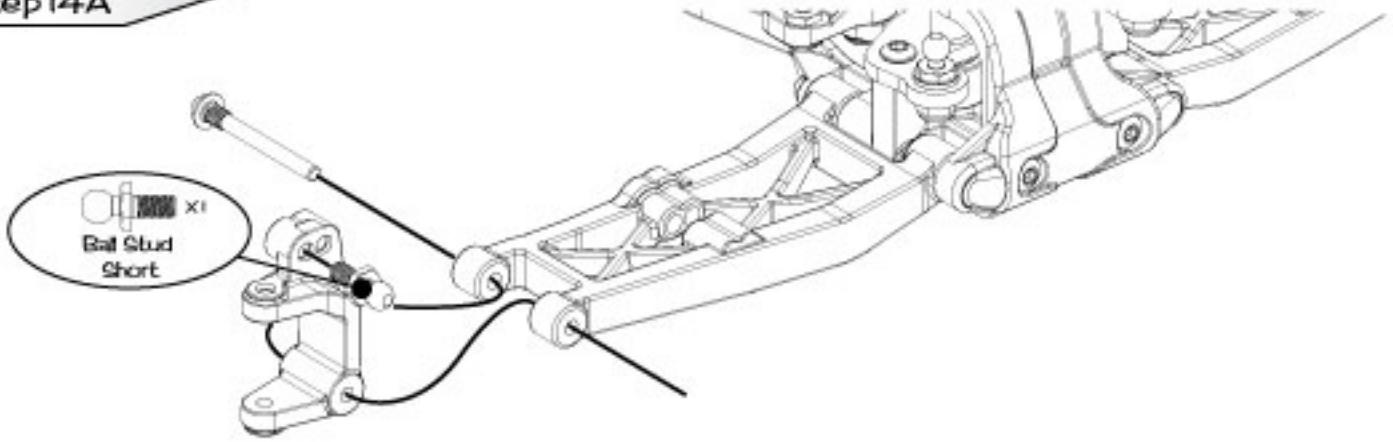
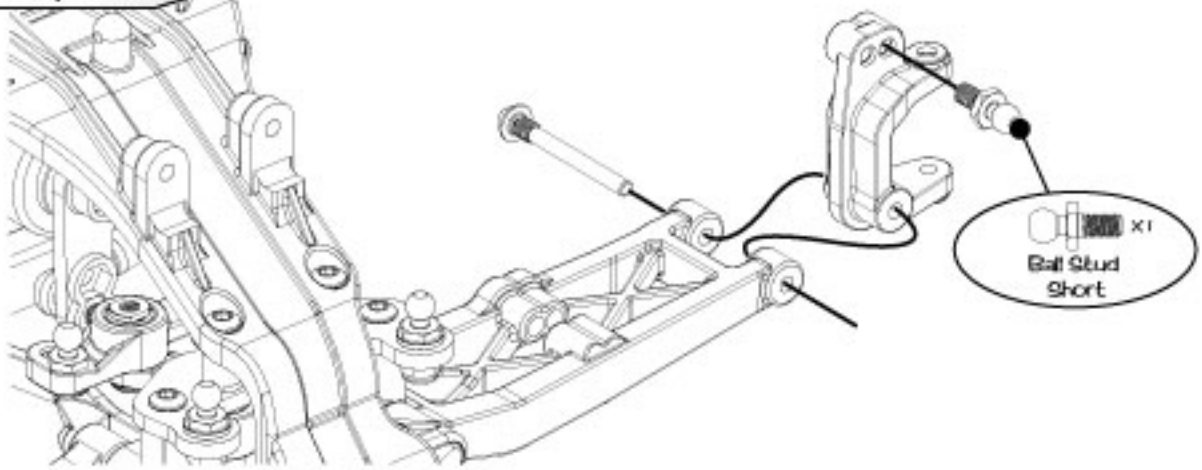


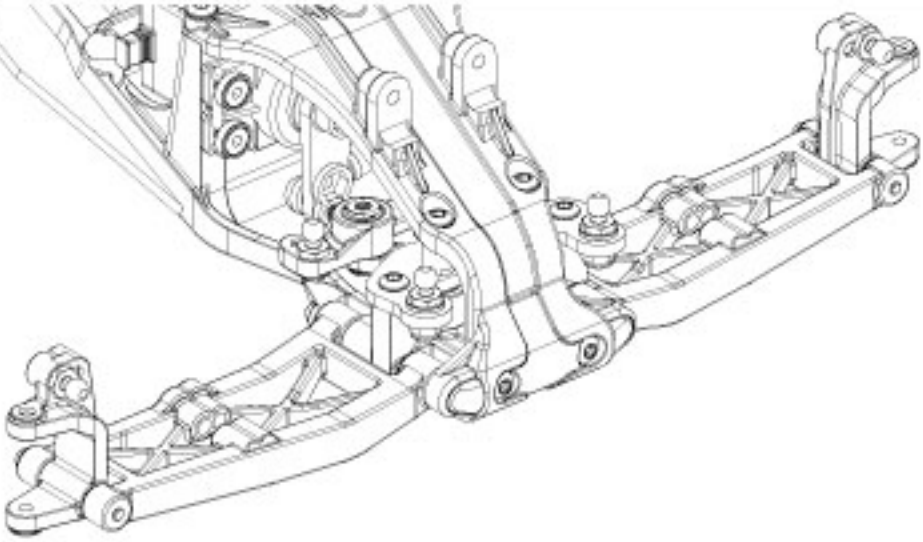
Step 14A



Step 14 B



Step 14 C



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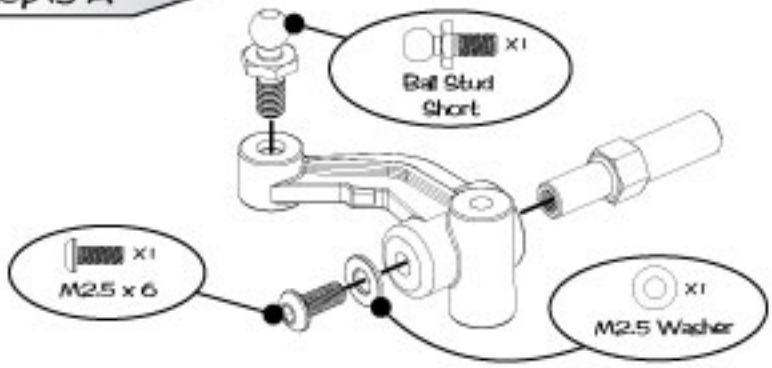

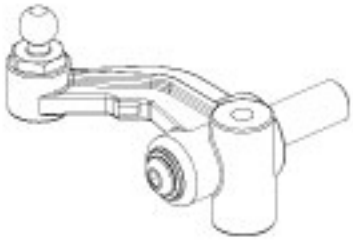

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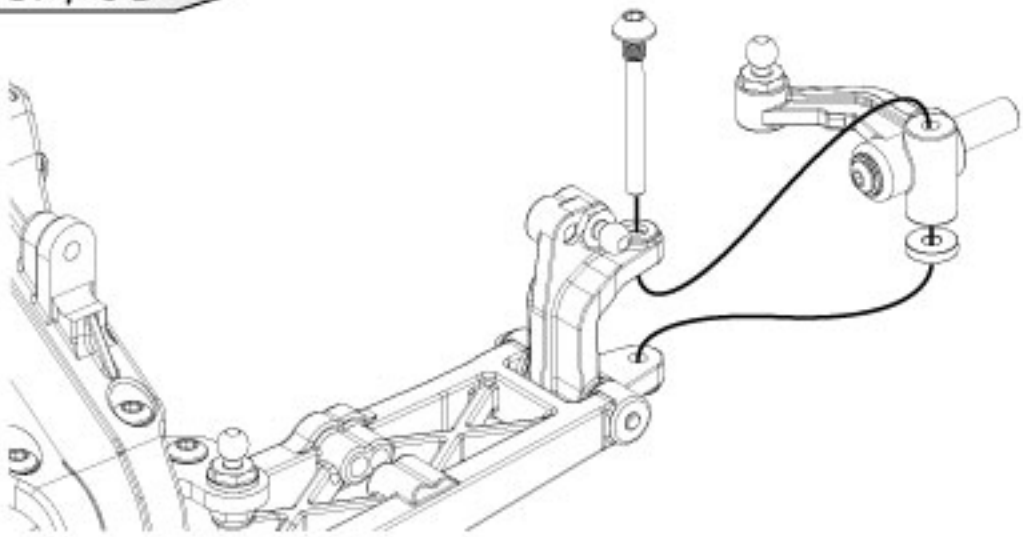

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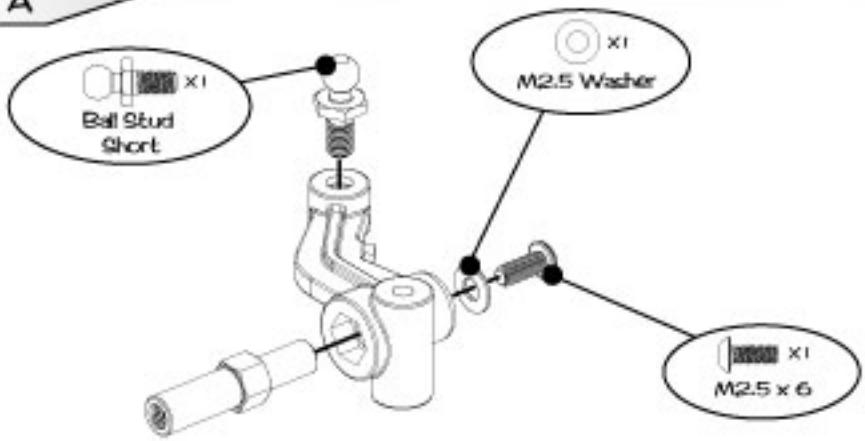

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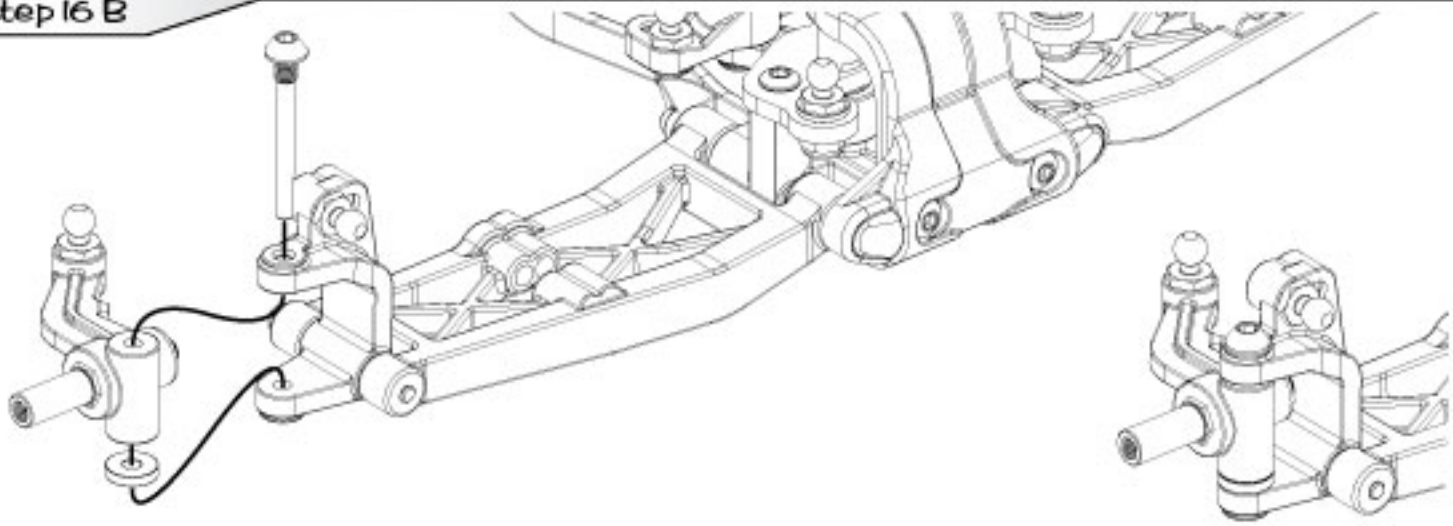

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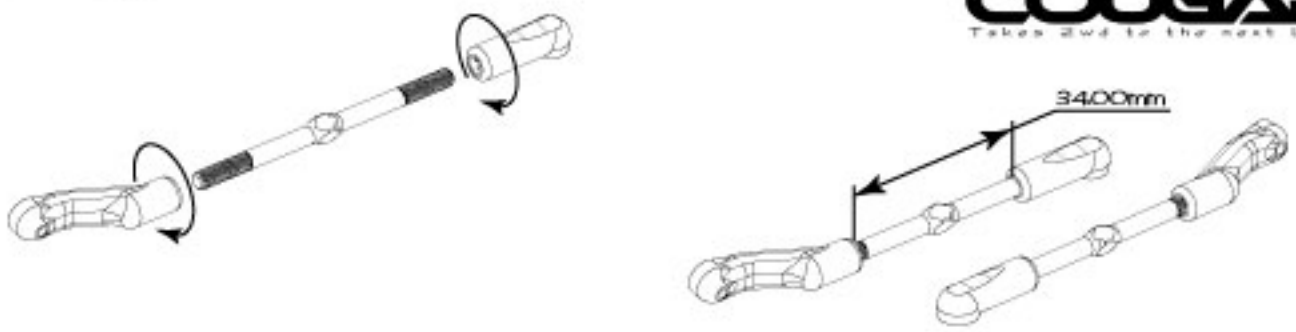
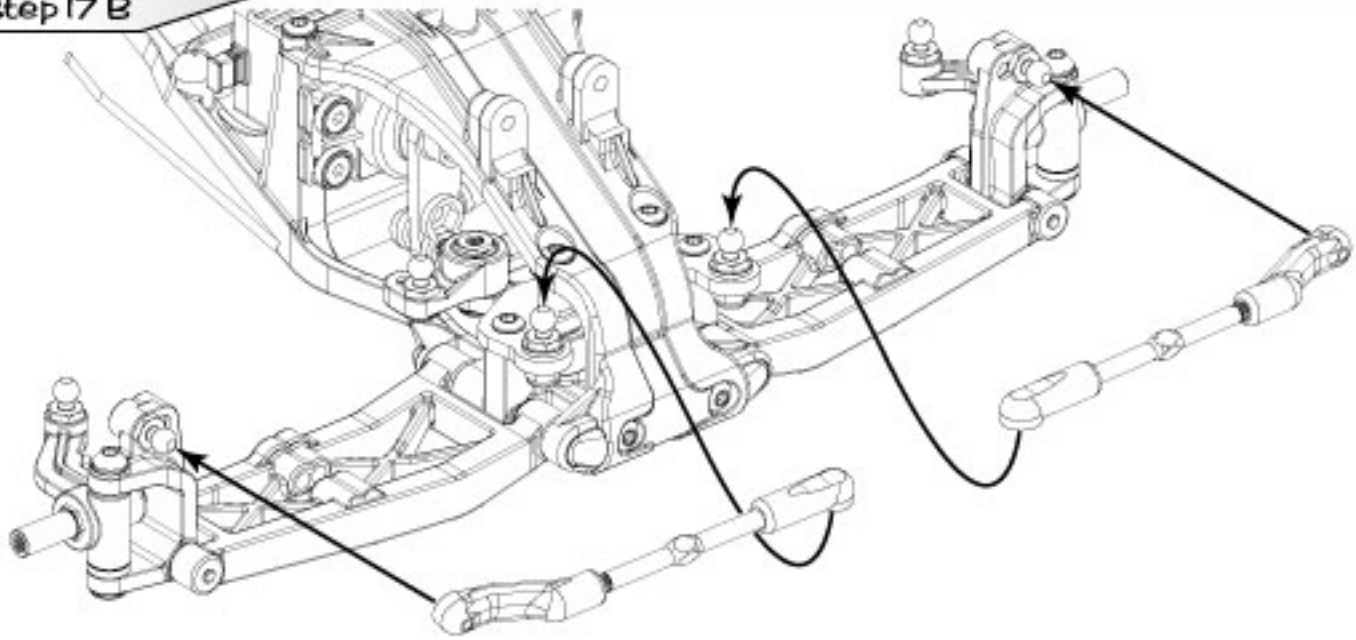
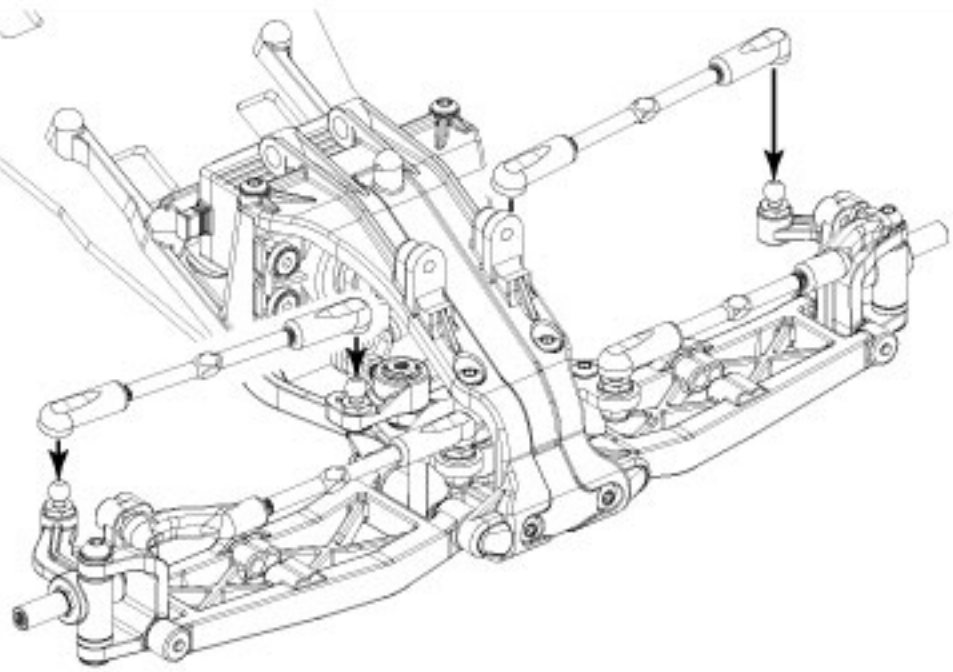


Step 17 B



Step 18 A

Step 18 A



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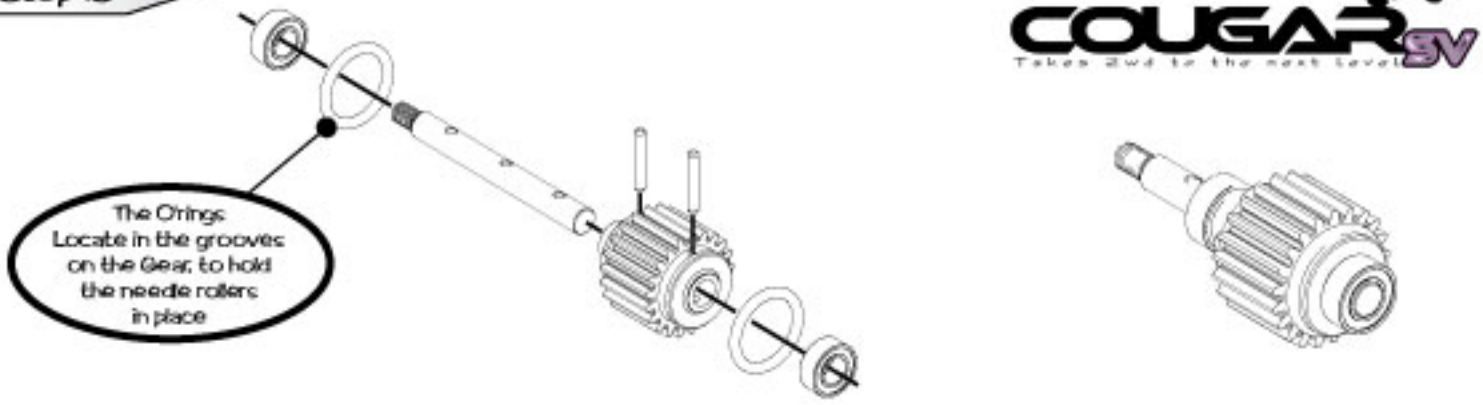

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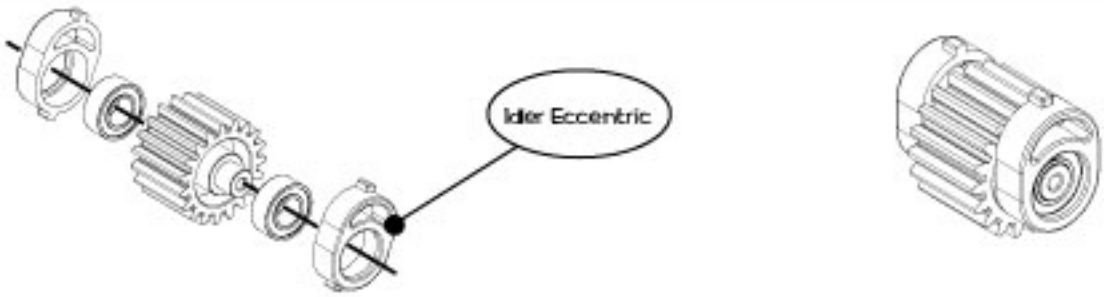

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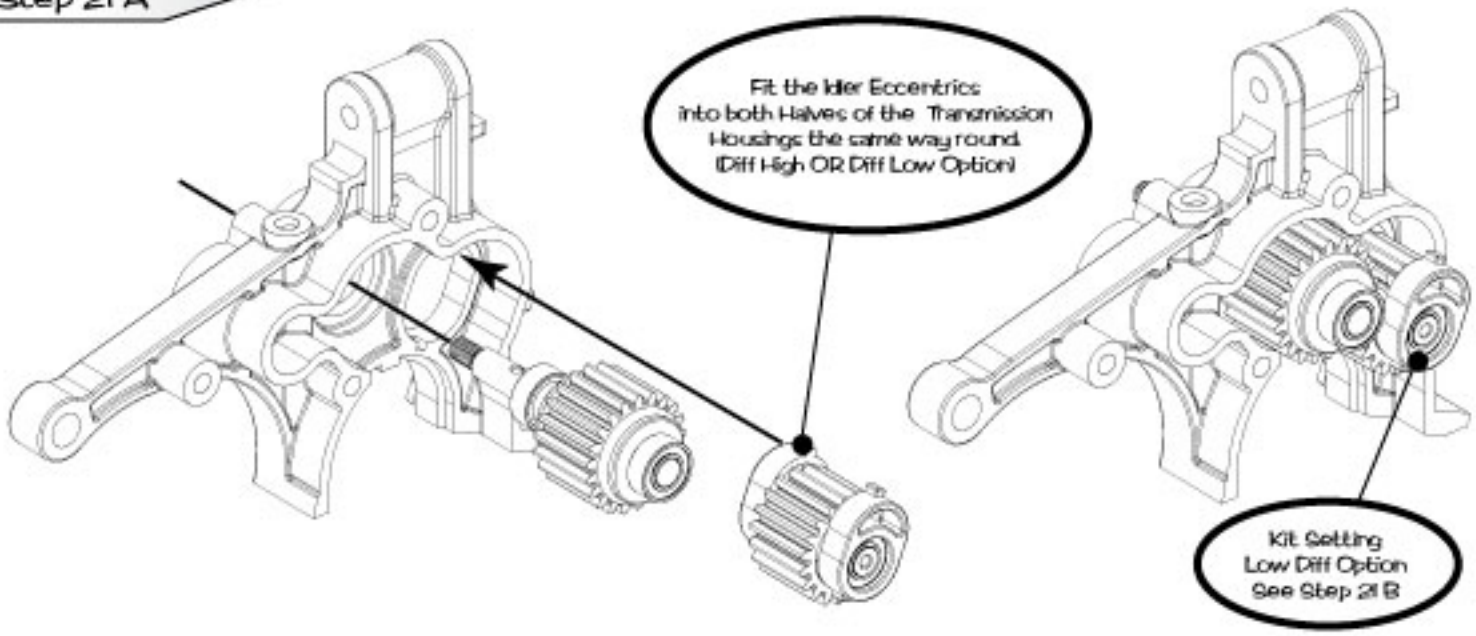

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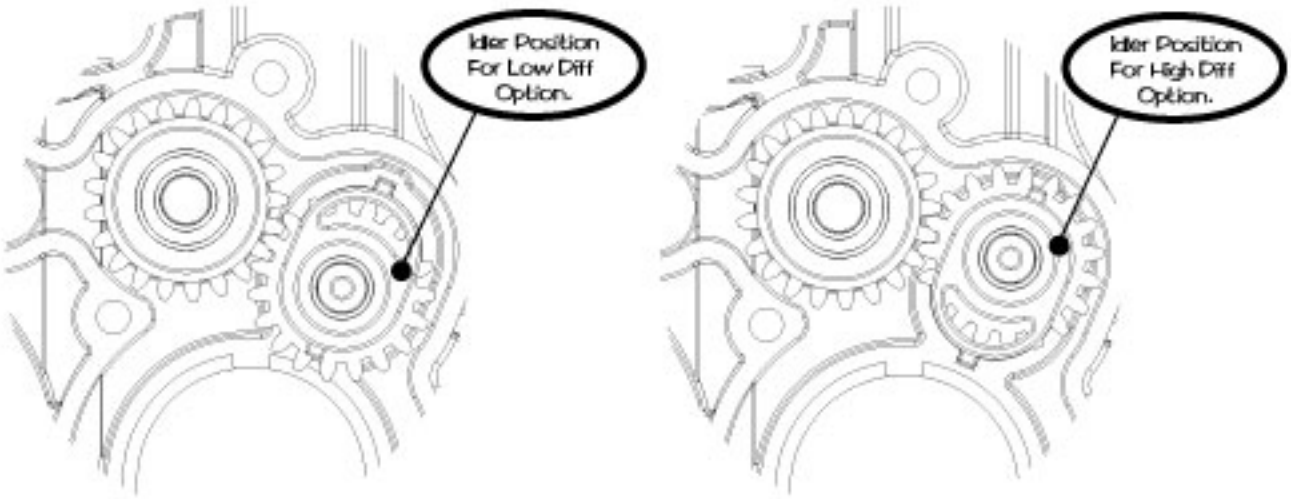

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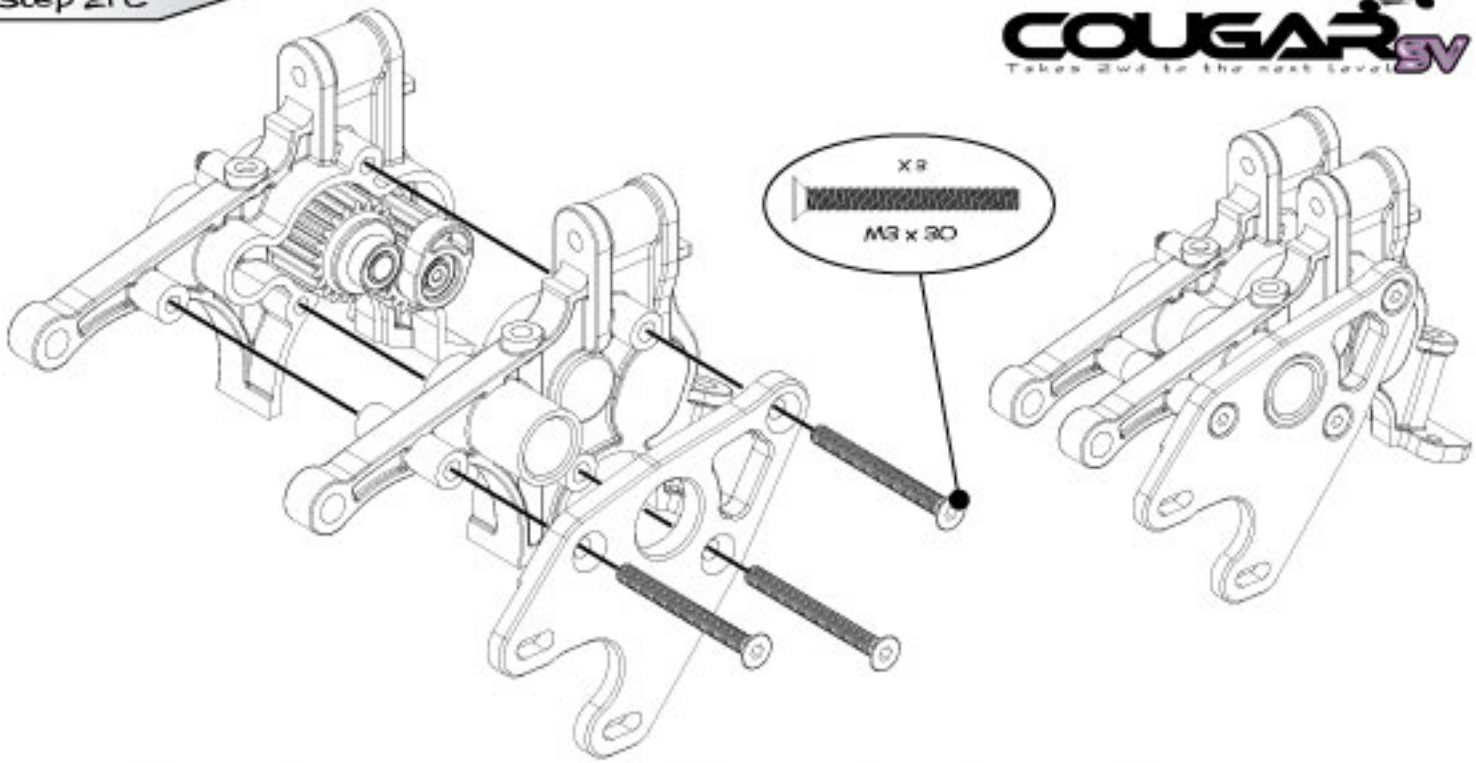

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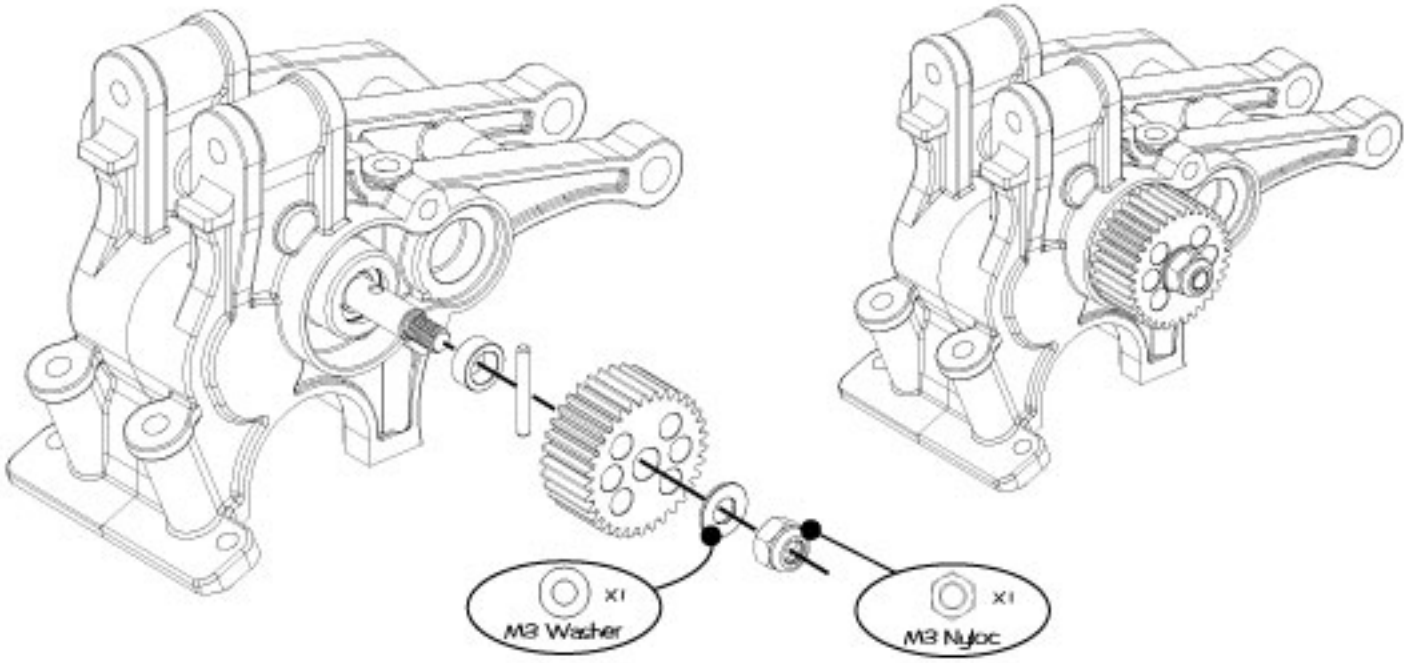

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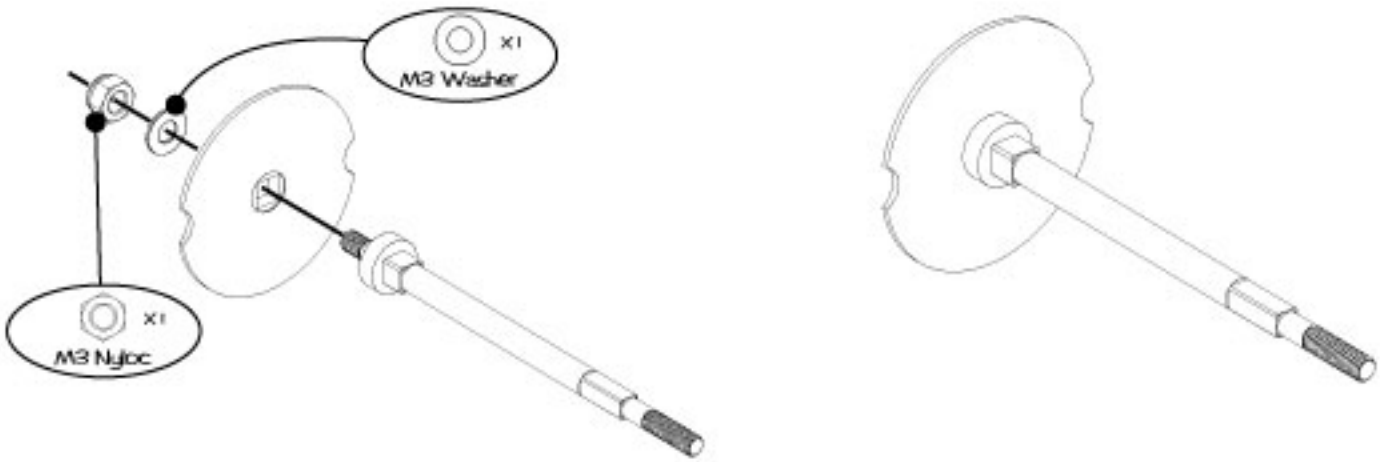

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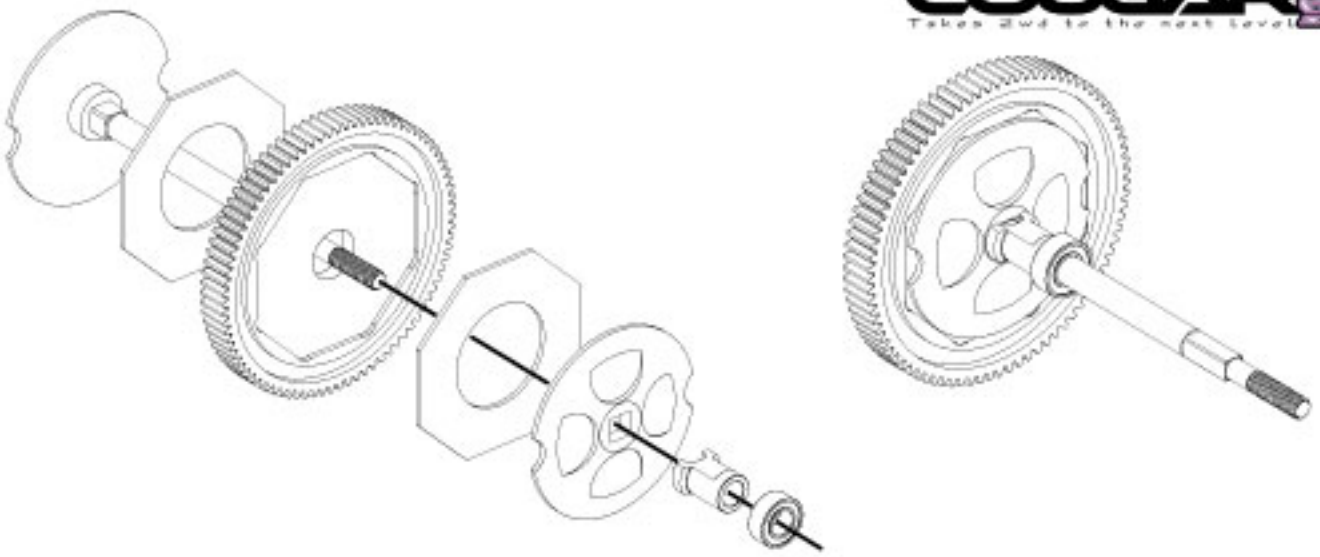

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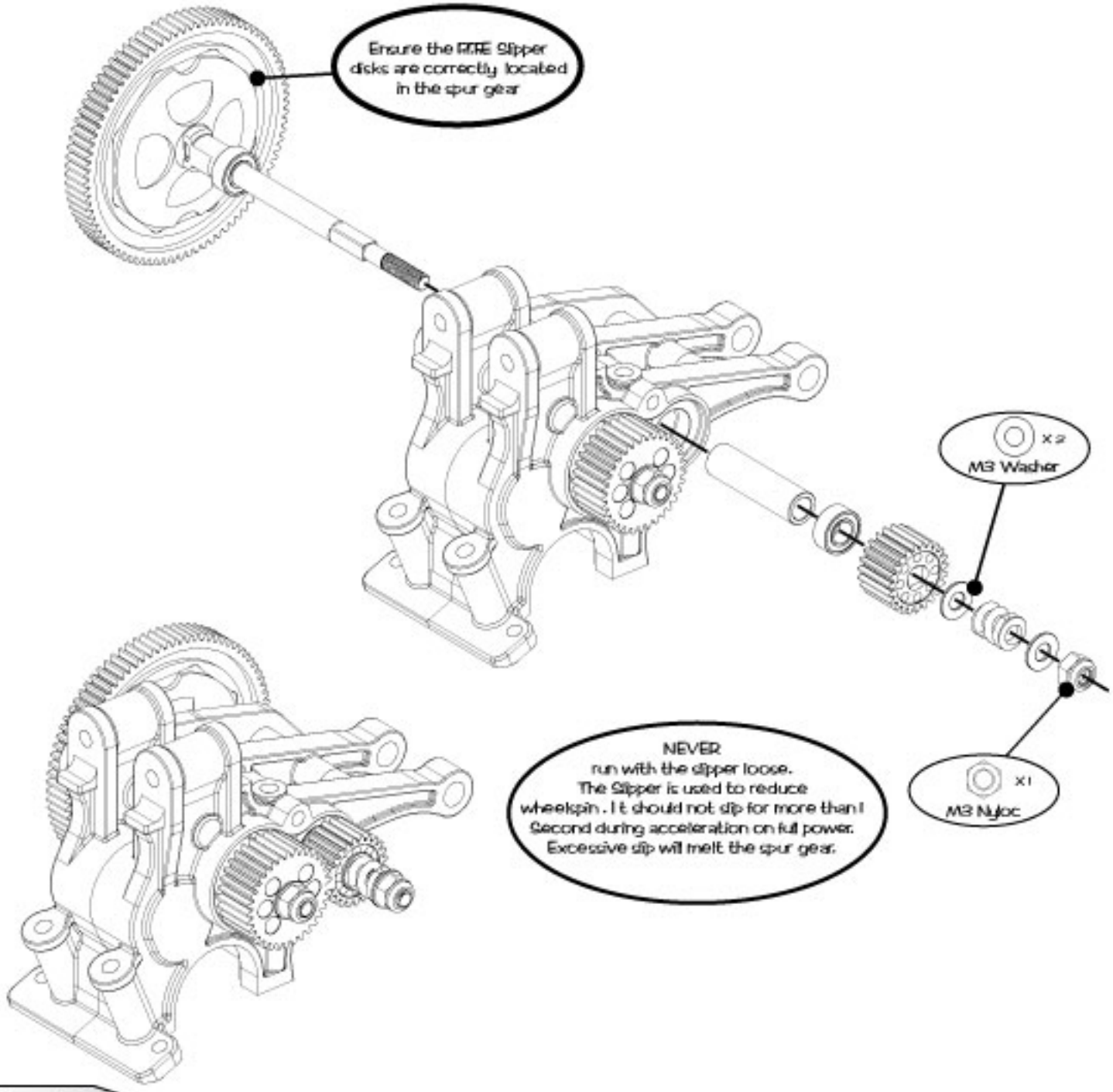
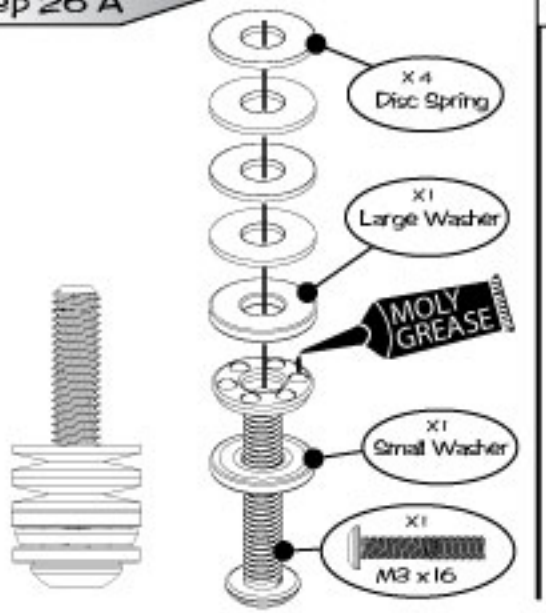
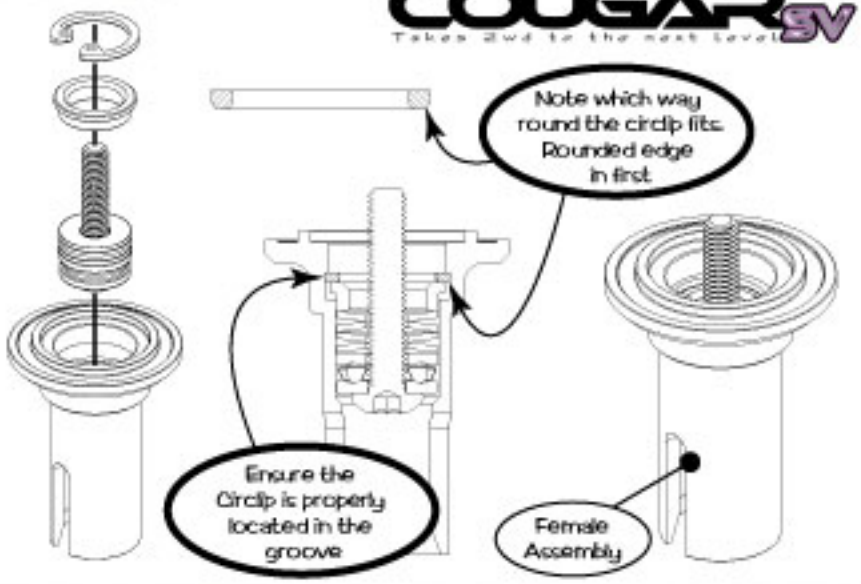


Step 26 A

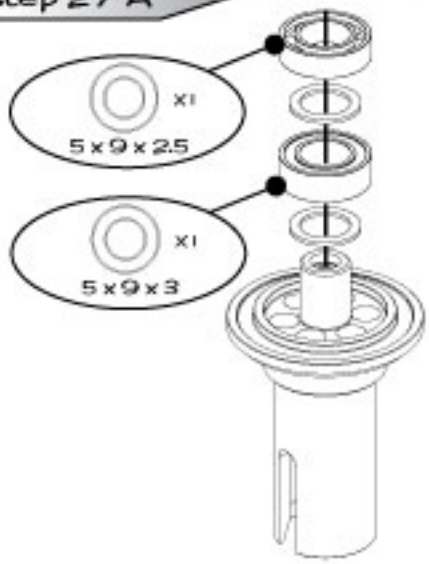


Step 26 B

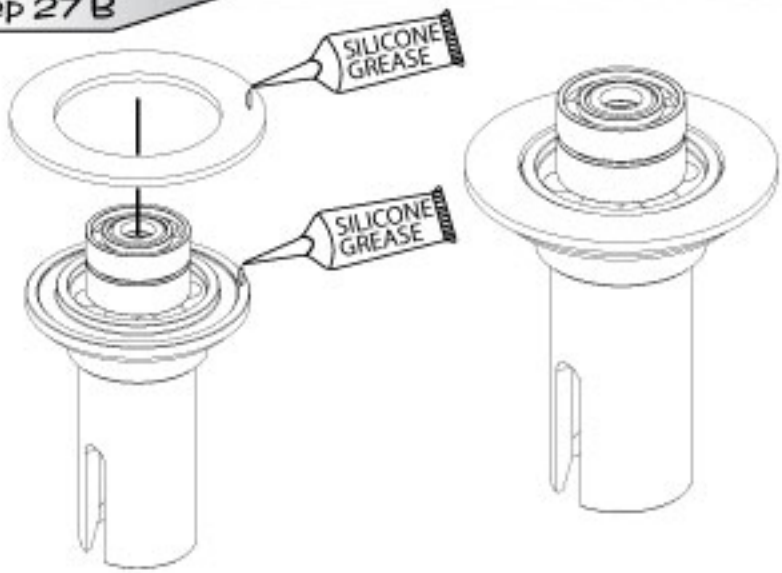
COUGAR SV
Takes 2wd to the next level



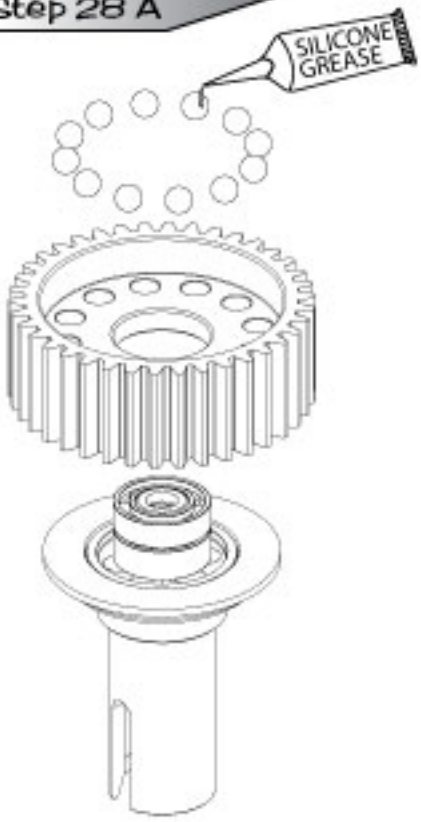
Step 27 A



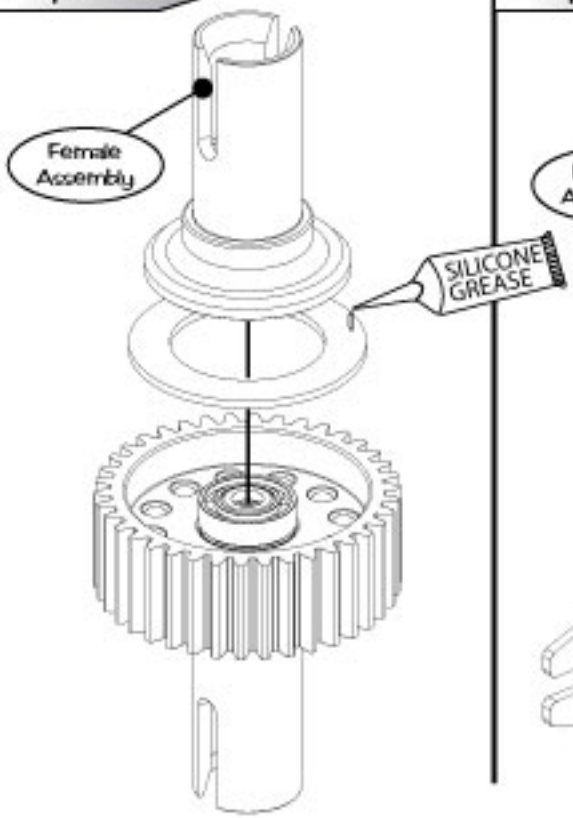
Step 27 B



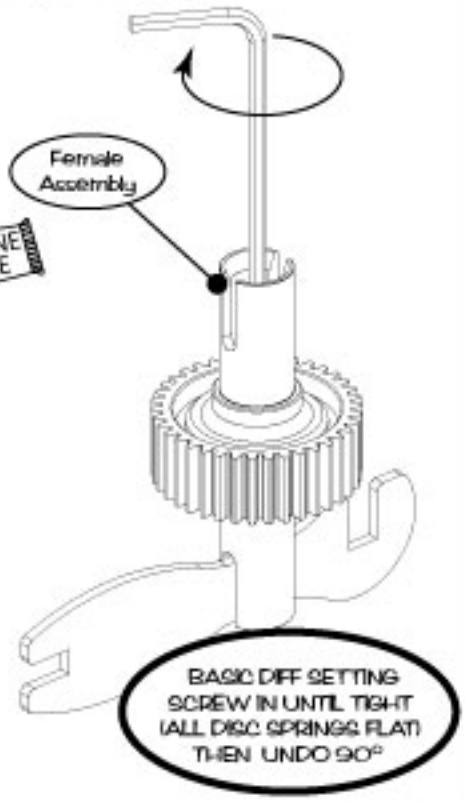
Step 28 A



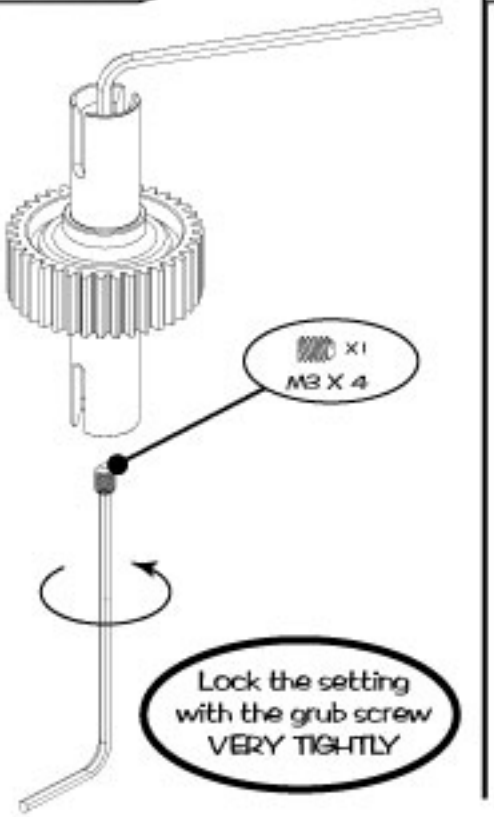
Step 28 B



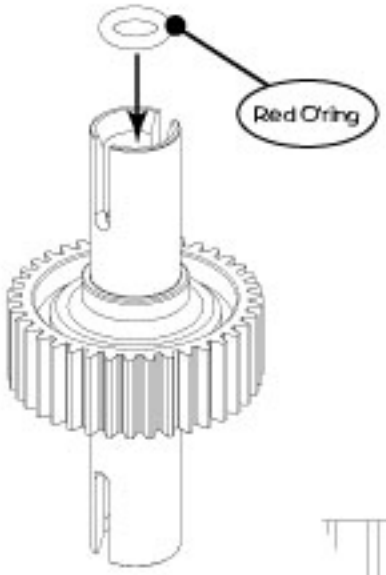
Step 28 C

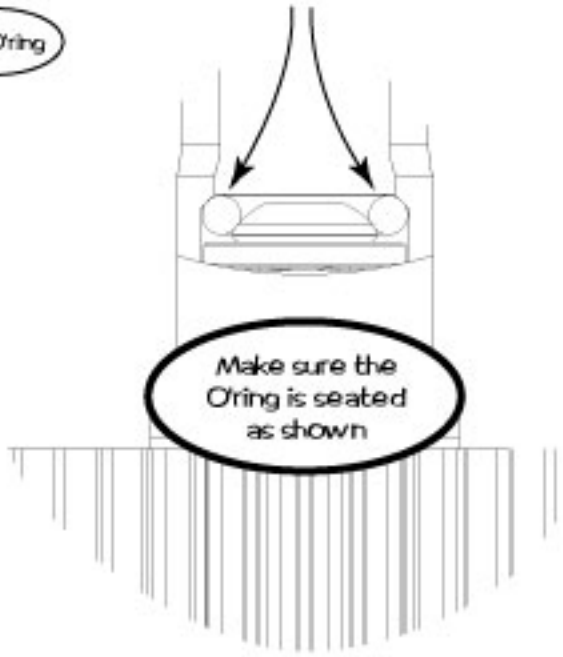


Step 28 D



Step 28 E





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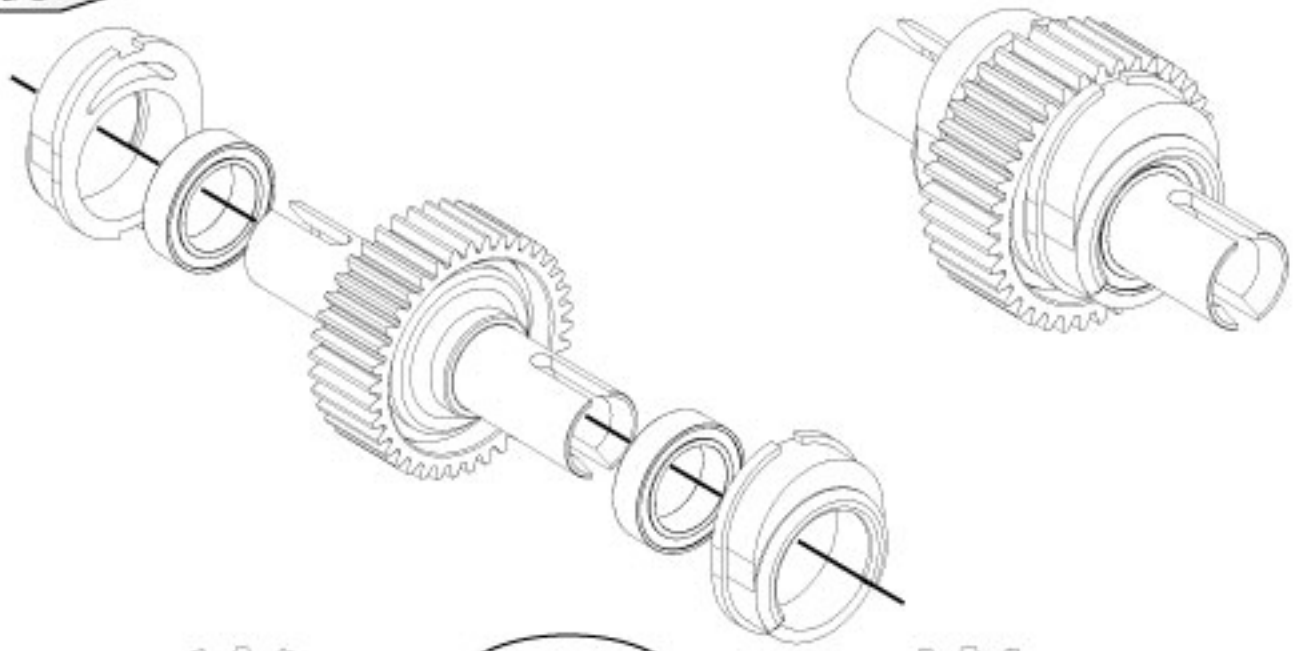

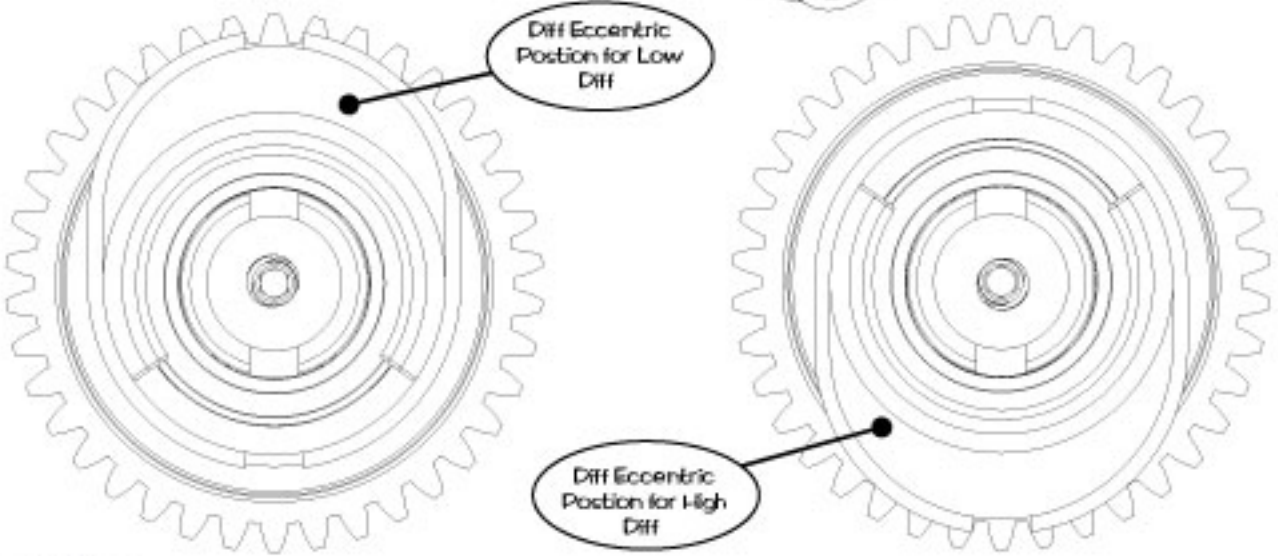

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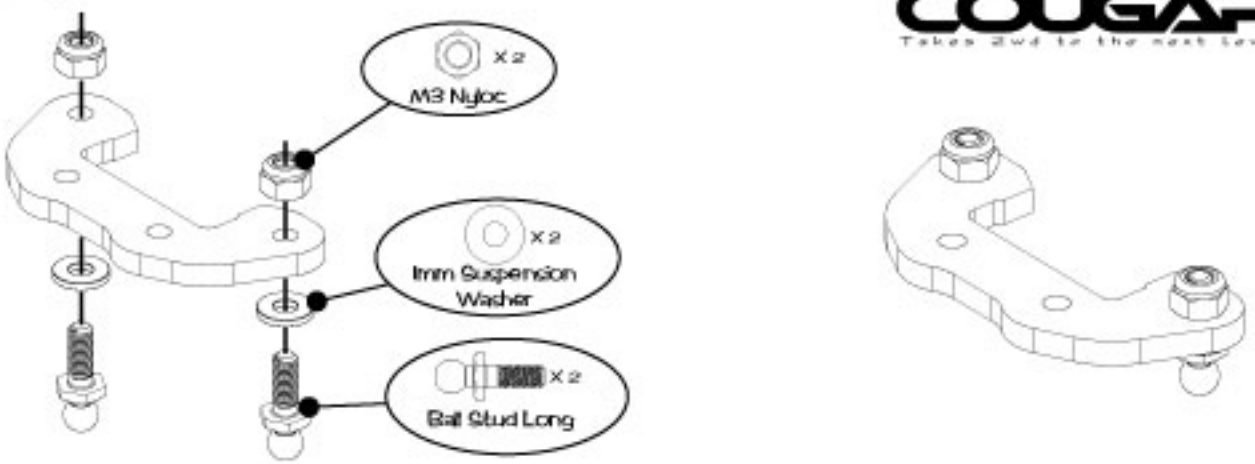
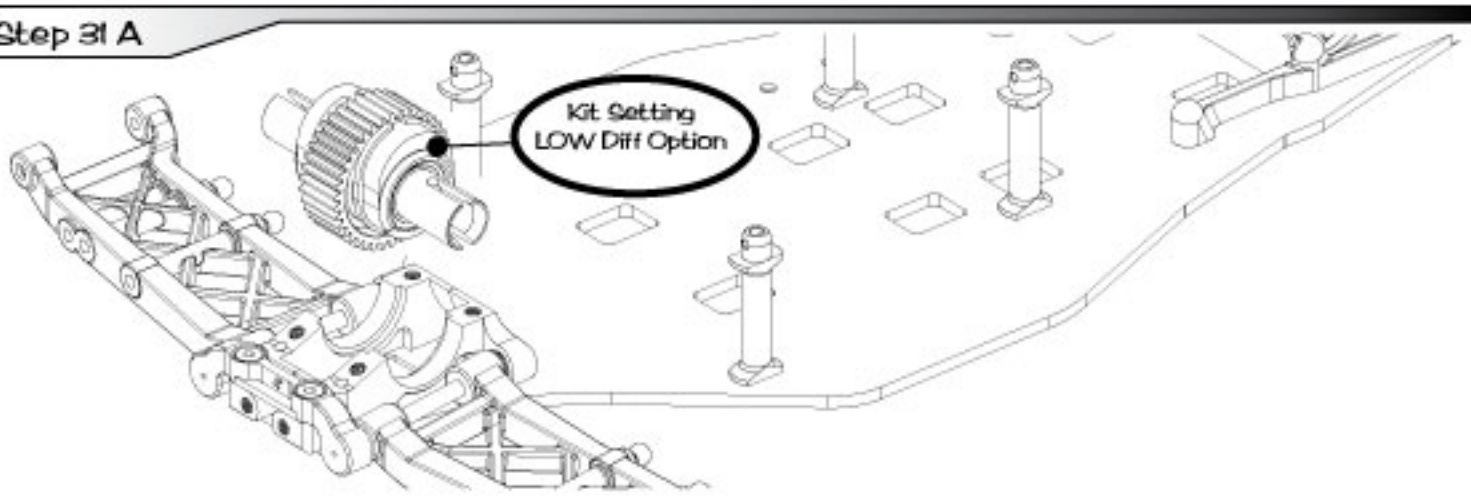
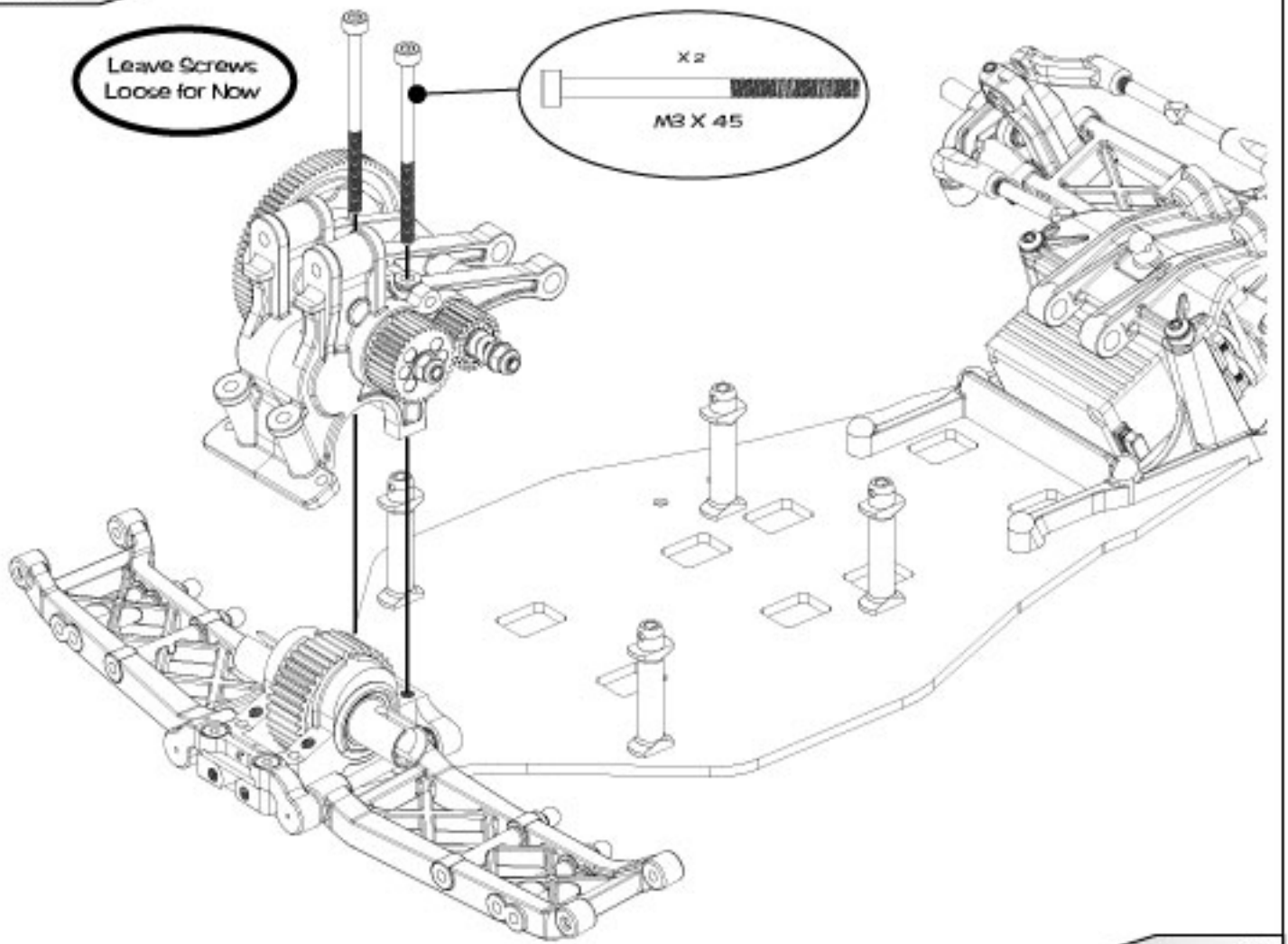


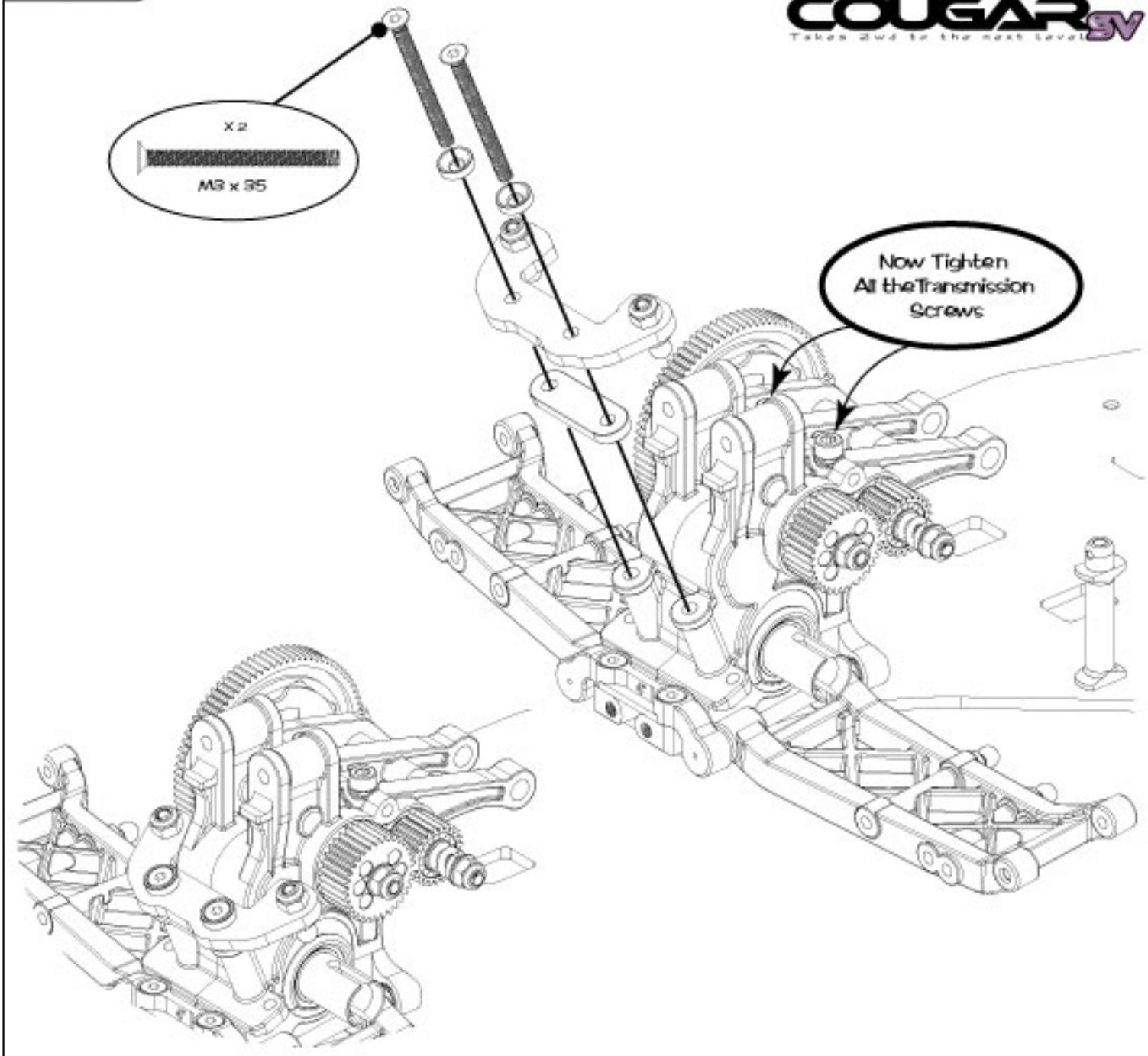
Step 31 A



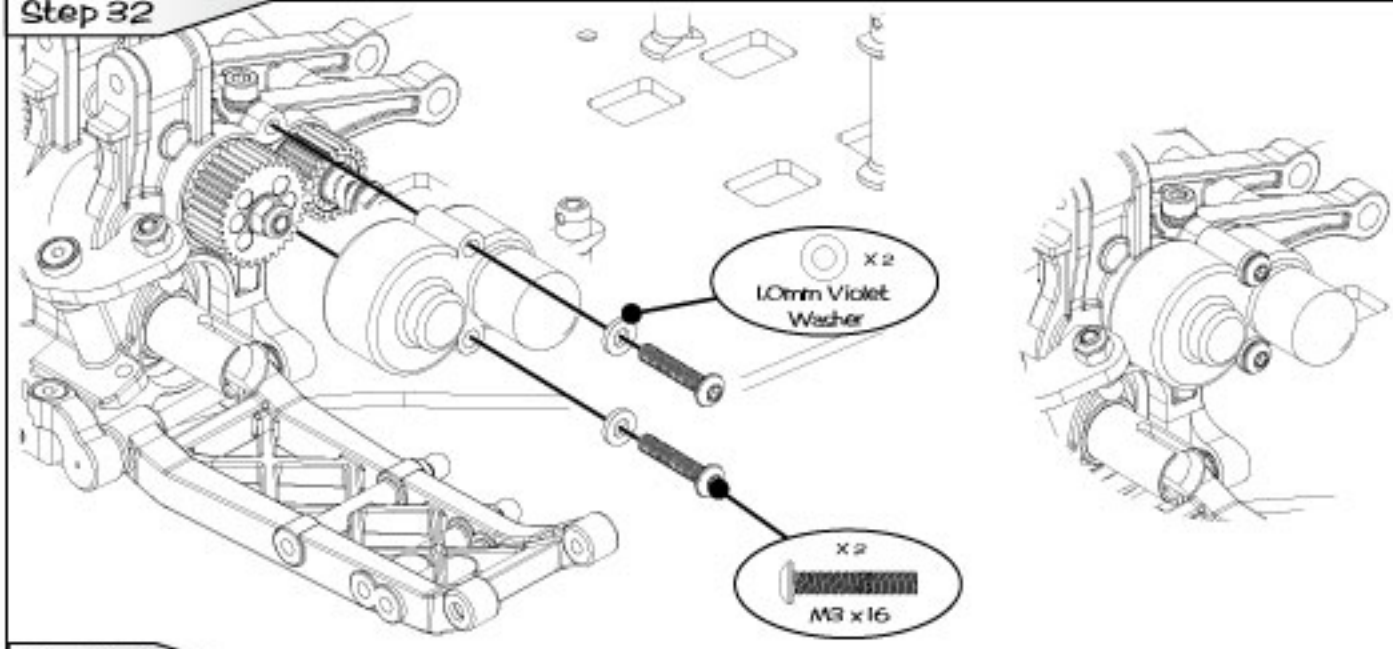
Step 31 B



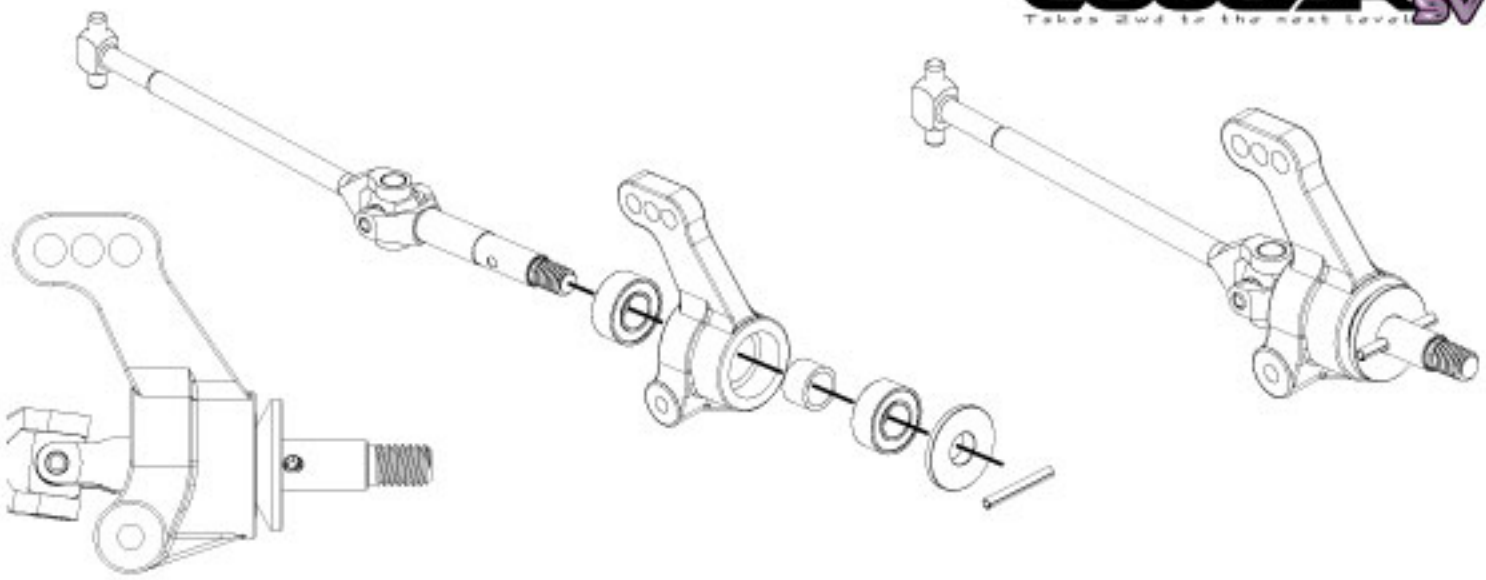
Step 31 C



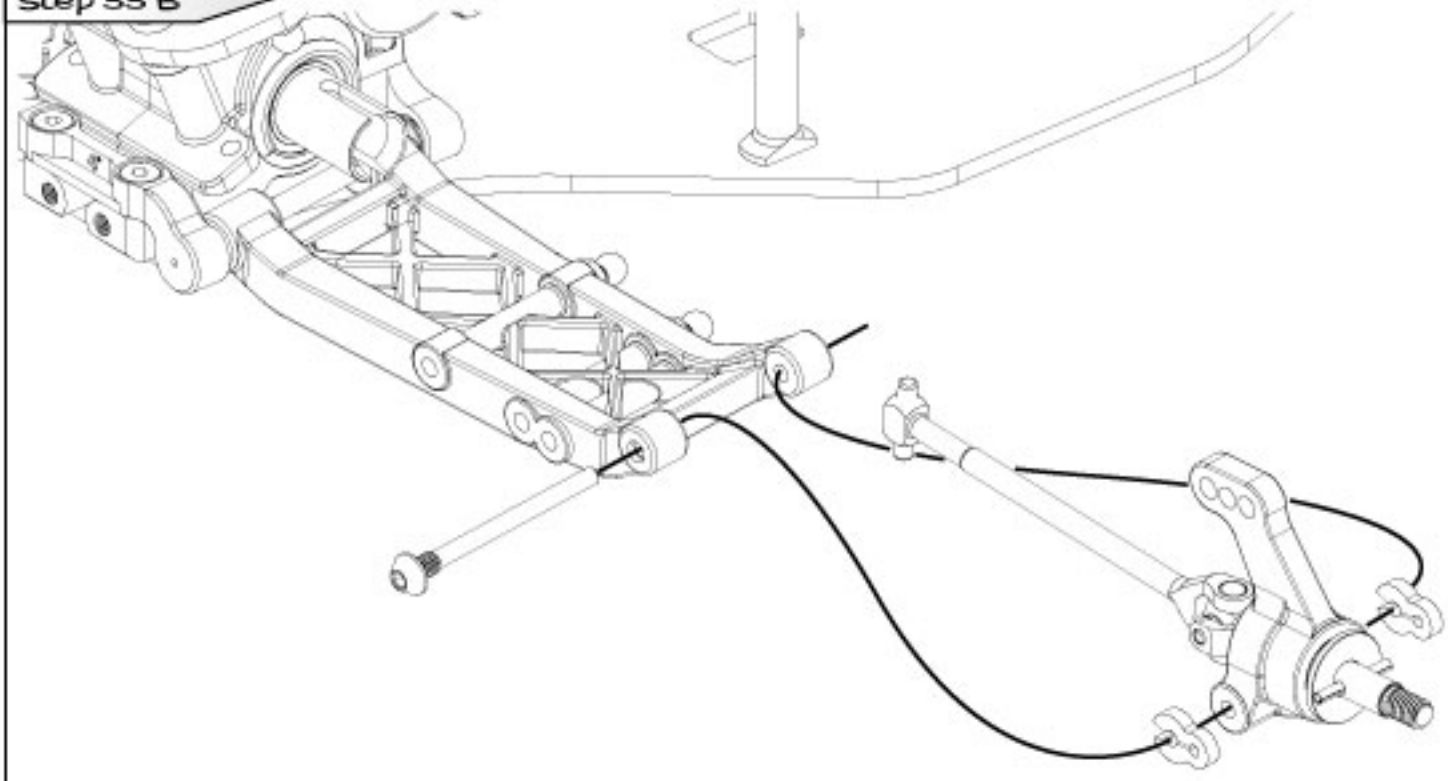
Step 32

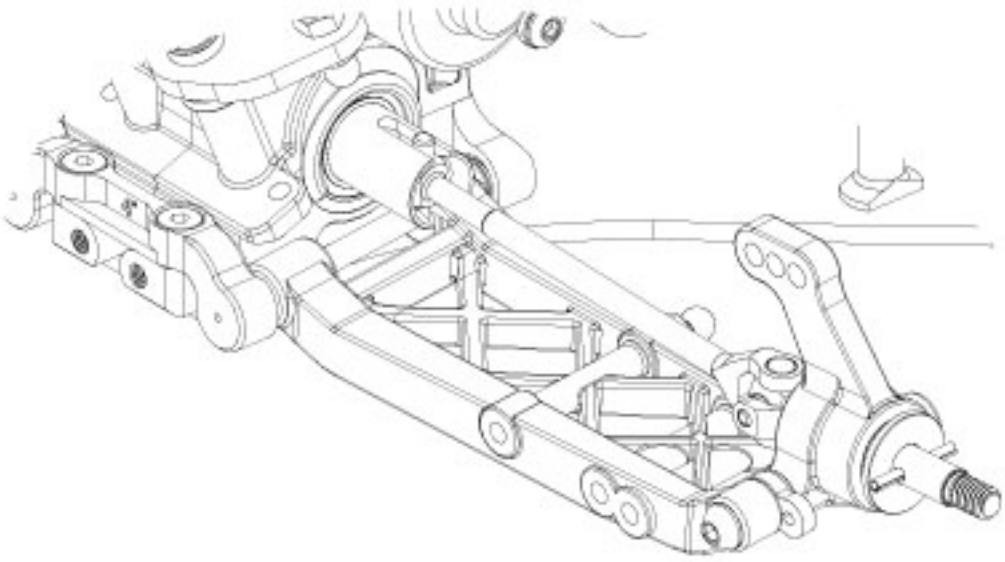


Step 33 A

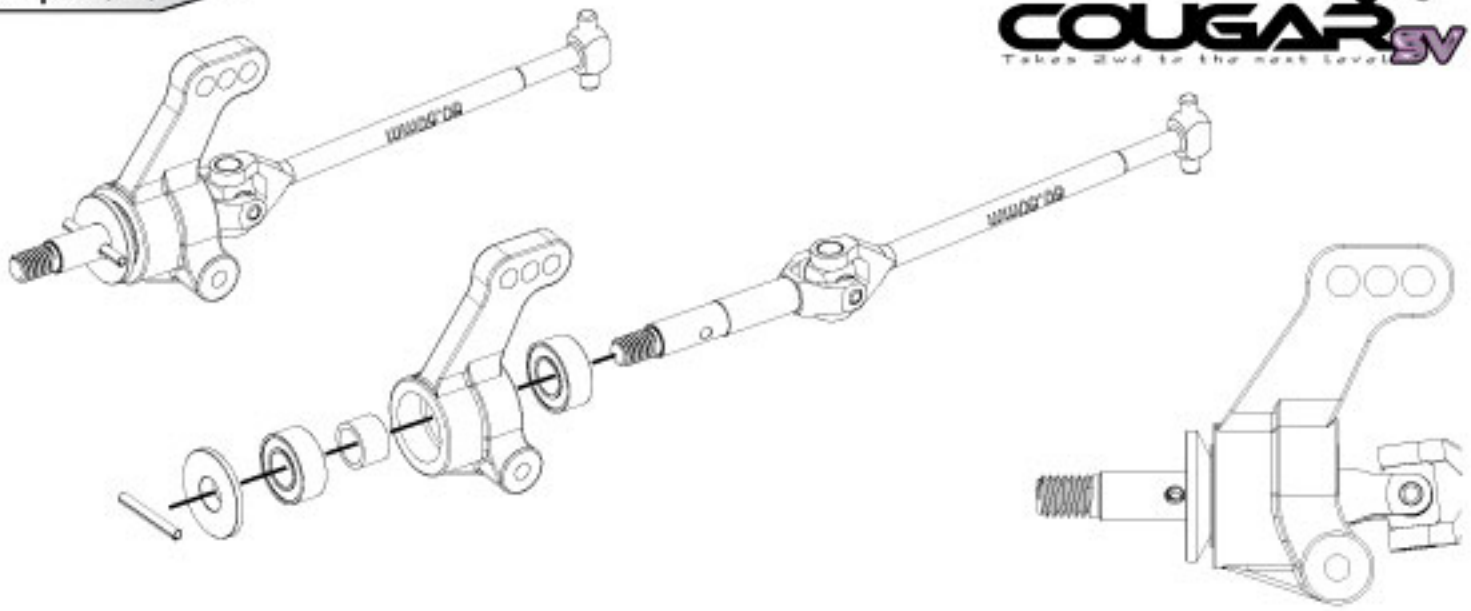


Step 33 B

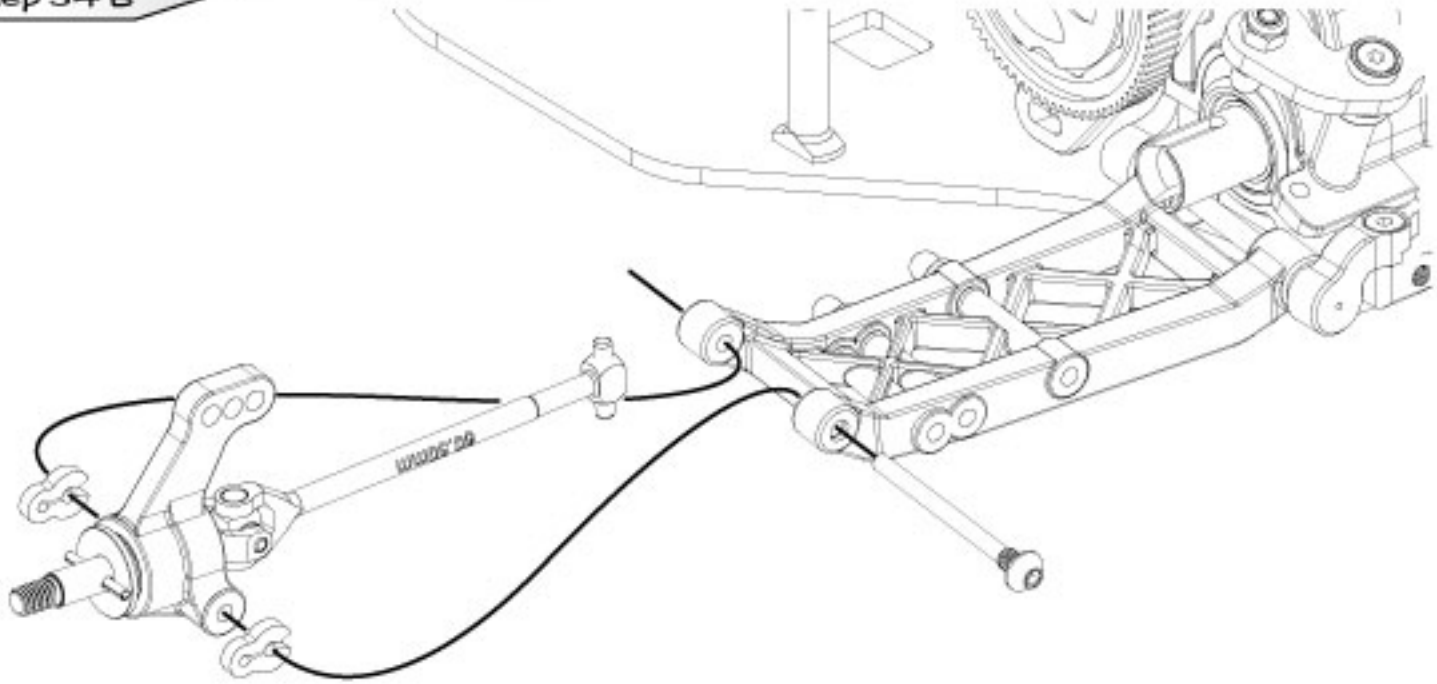


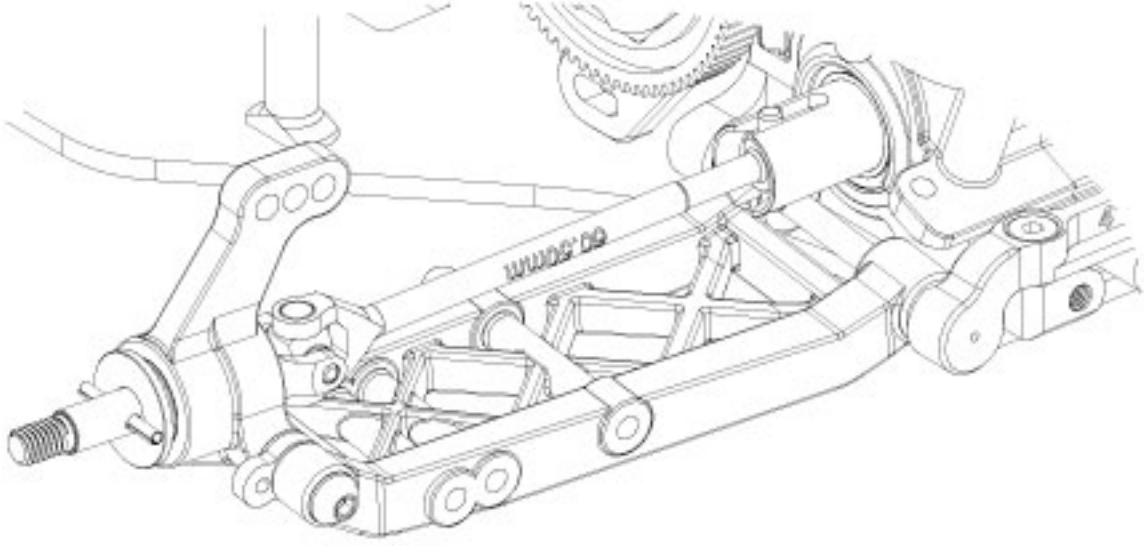


Step 34 A

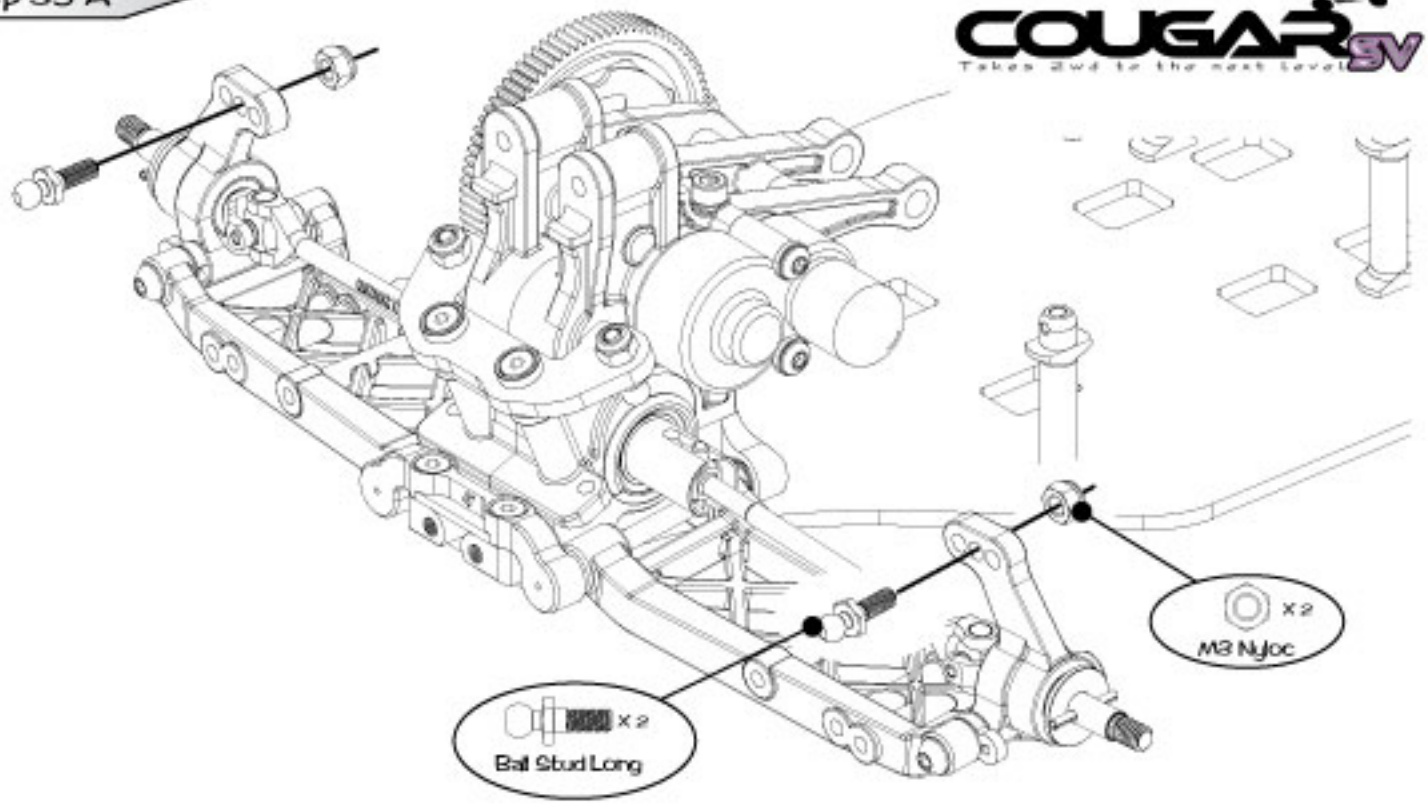


Step 34 B

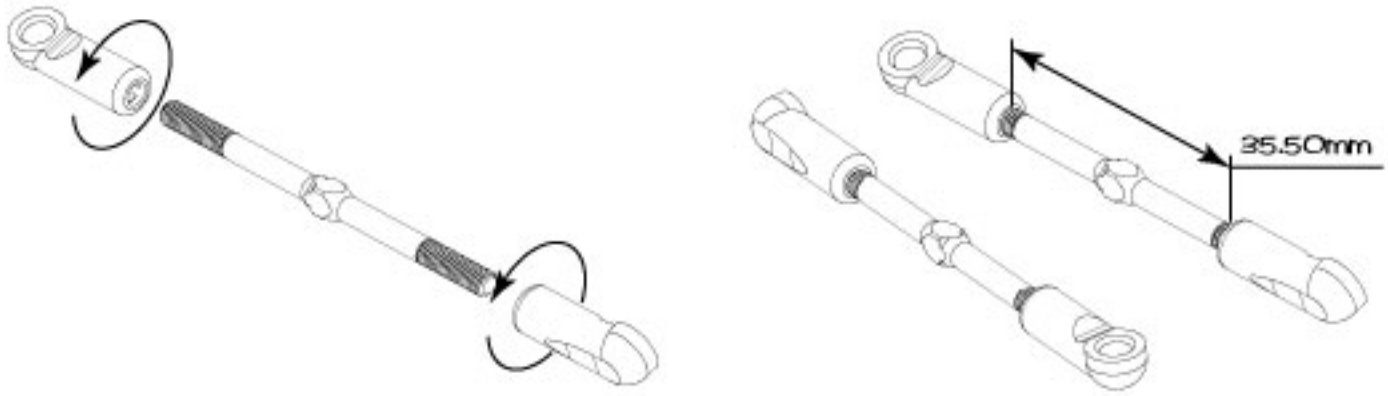




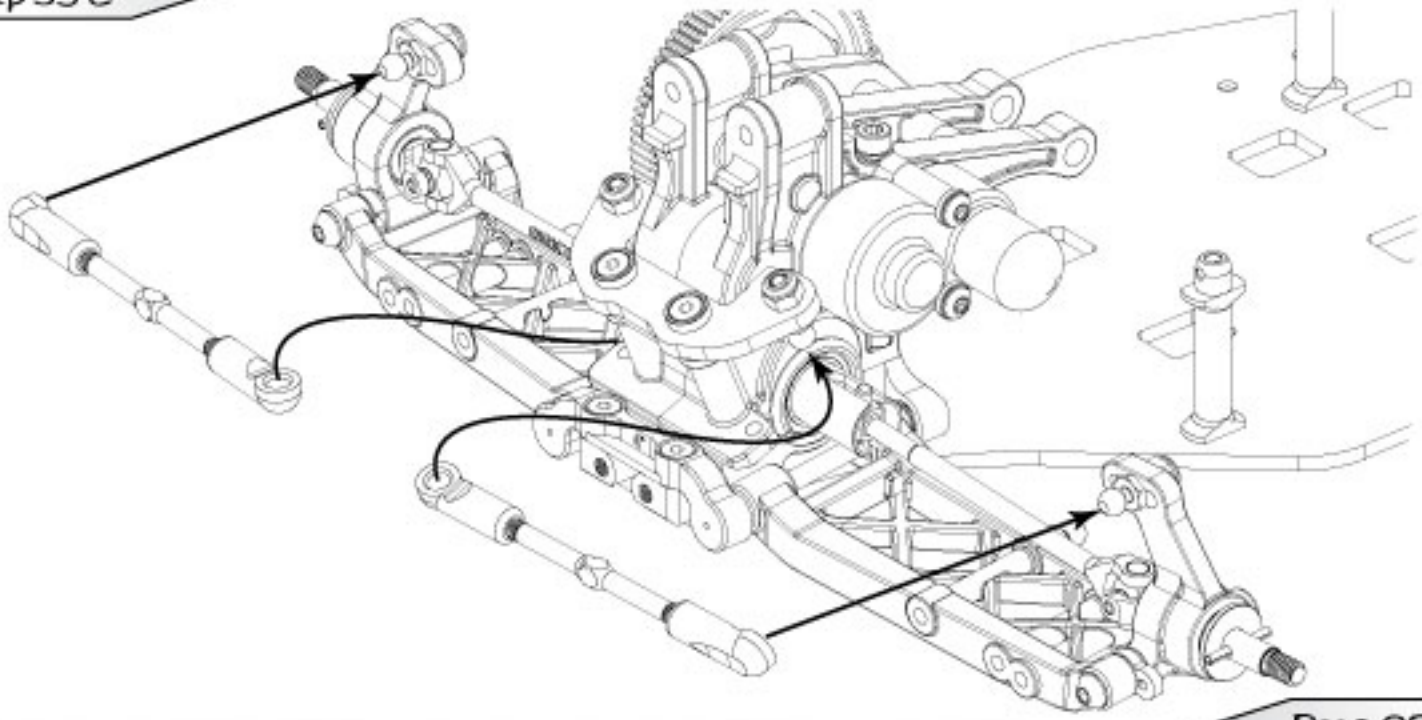
Step 35 A



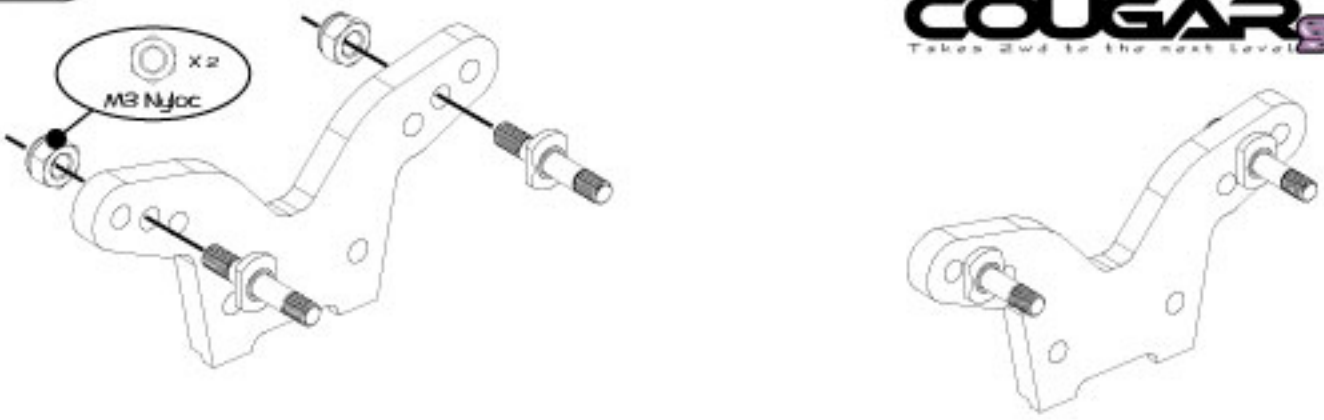
Step 35 B



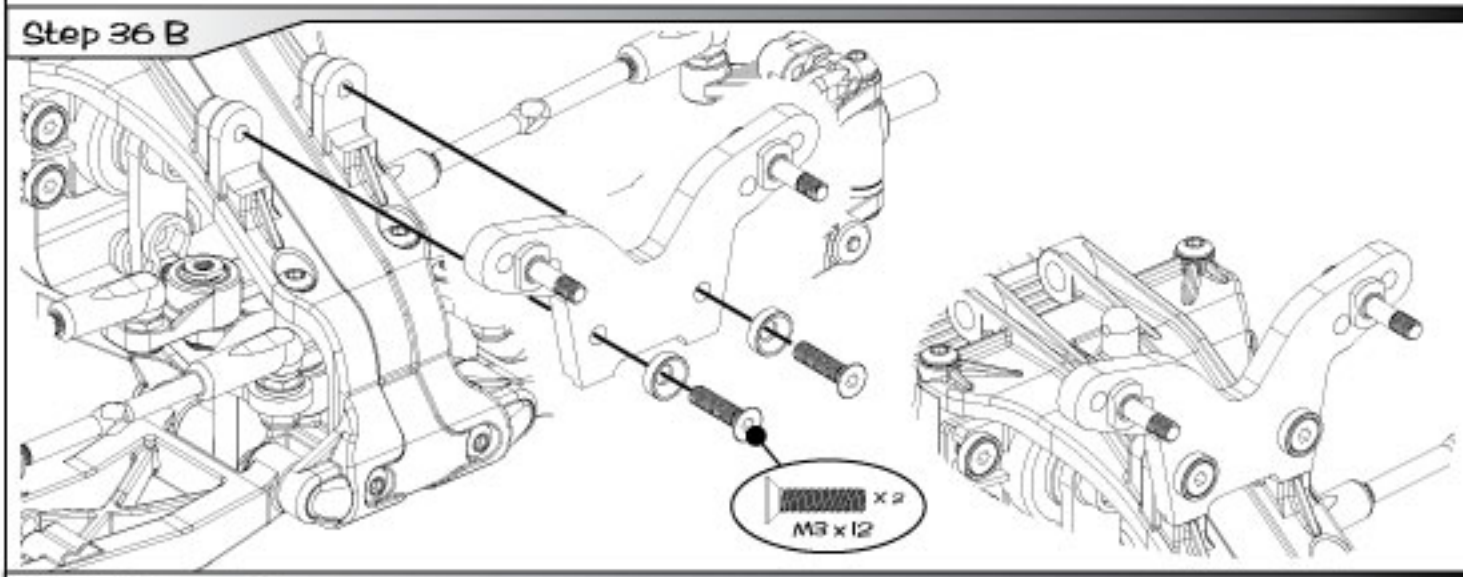
Step 35 C



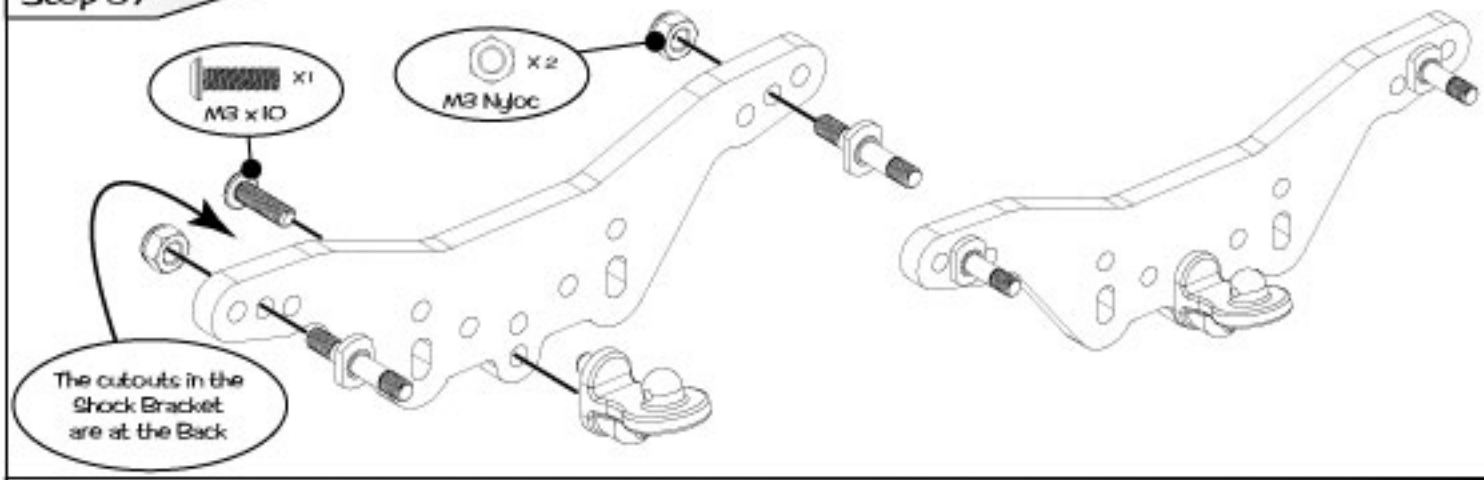
Step 36 A



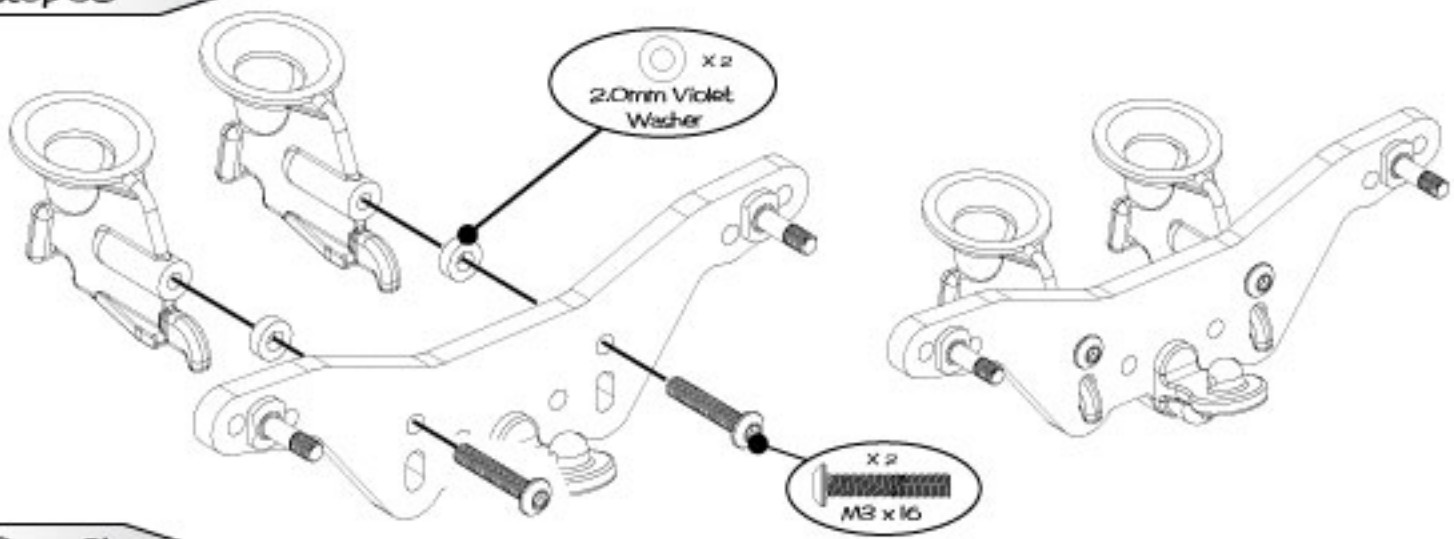
Step 36 B



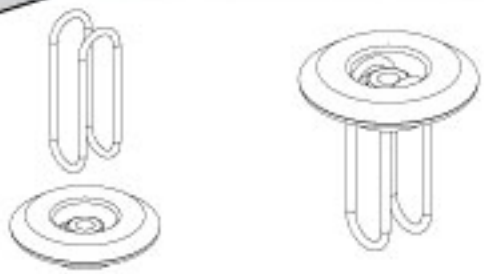
Step 37



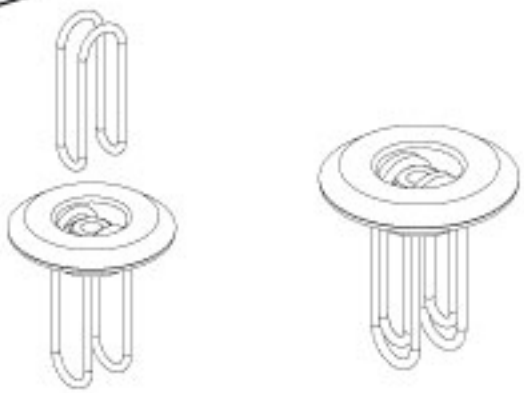
Step 38



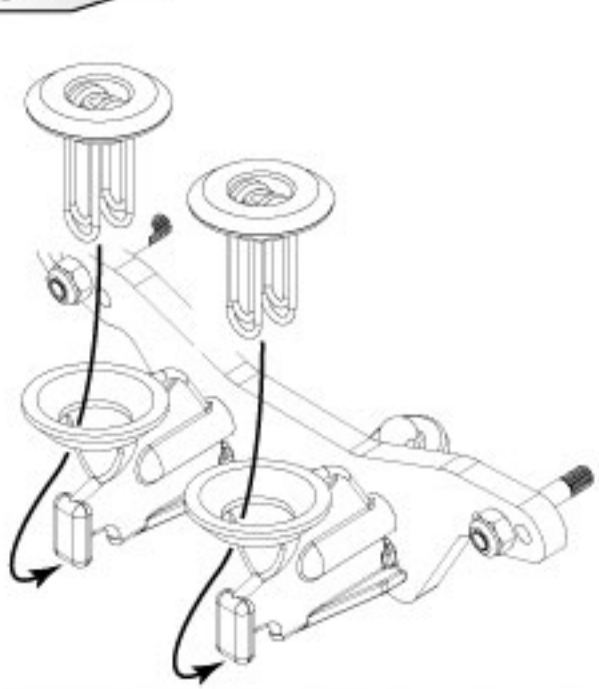
Step 39 A

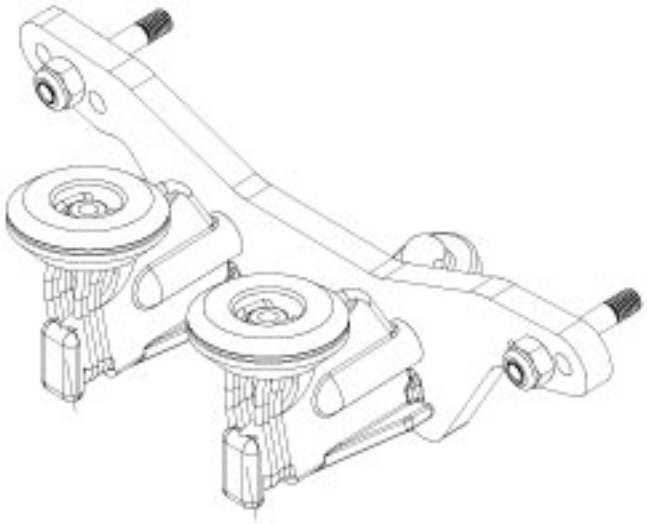


Step 39 B

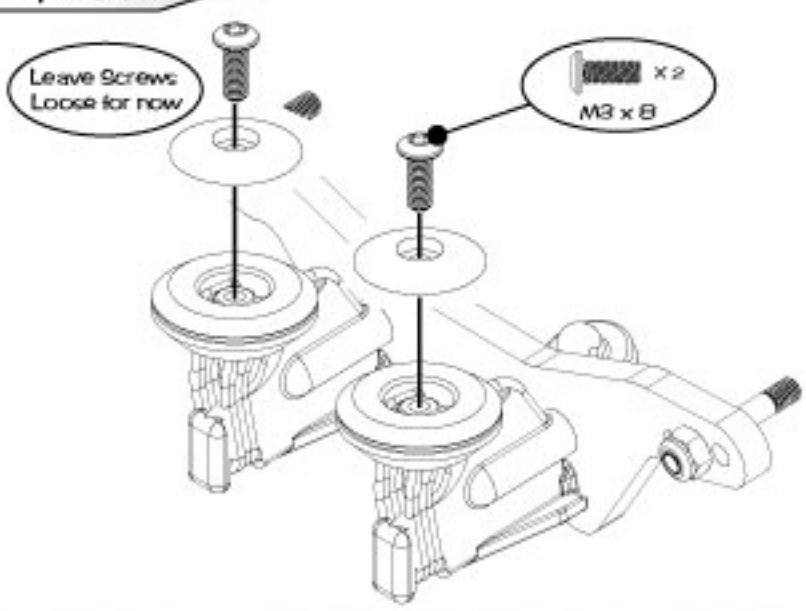


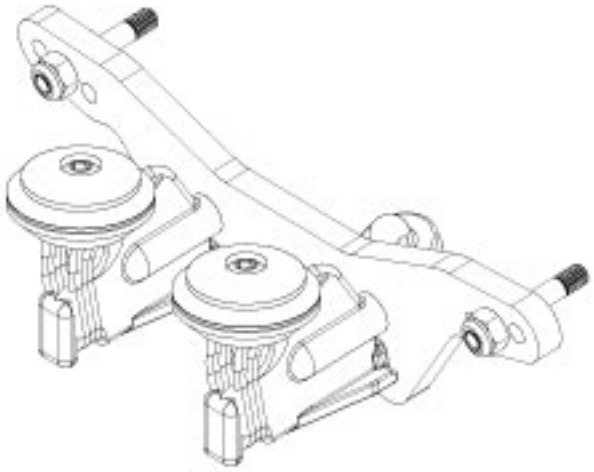
Step 39 C



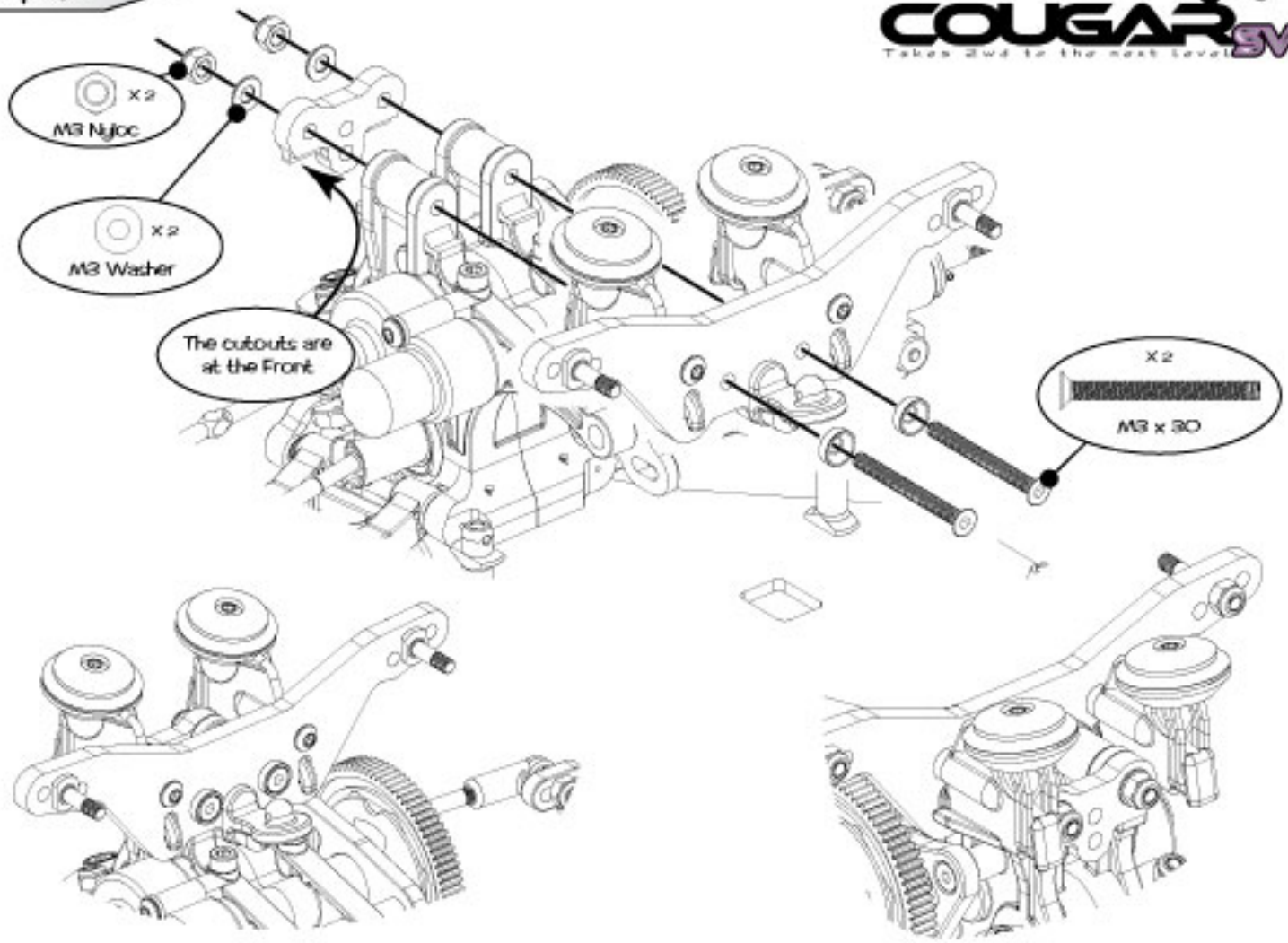


Step 39 D



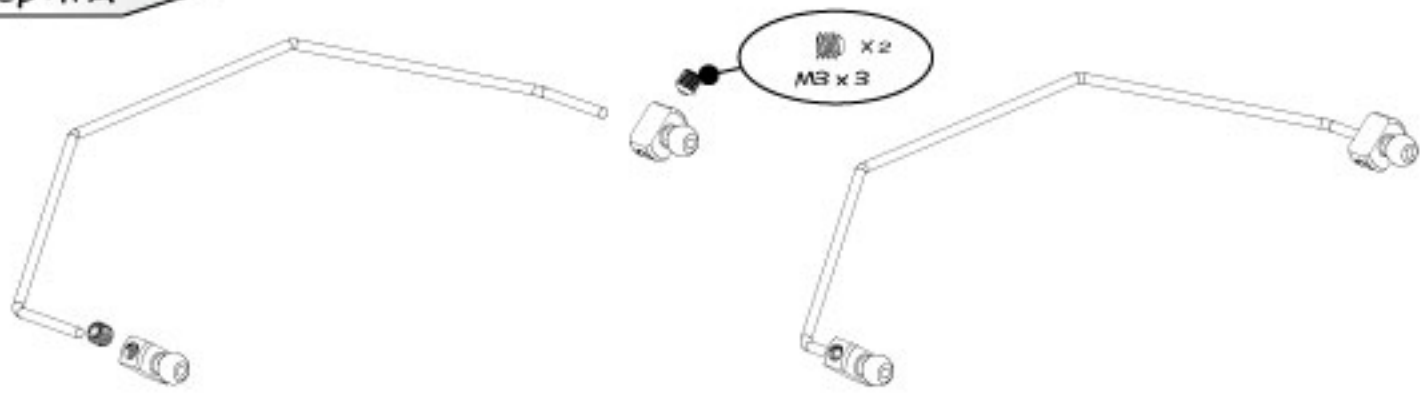


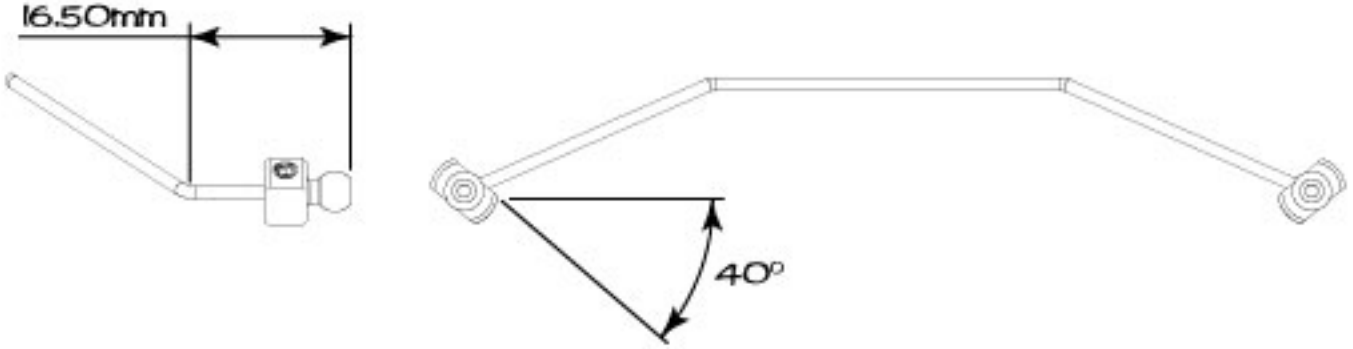
Step 40



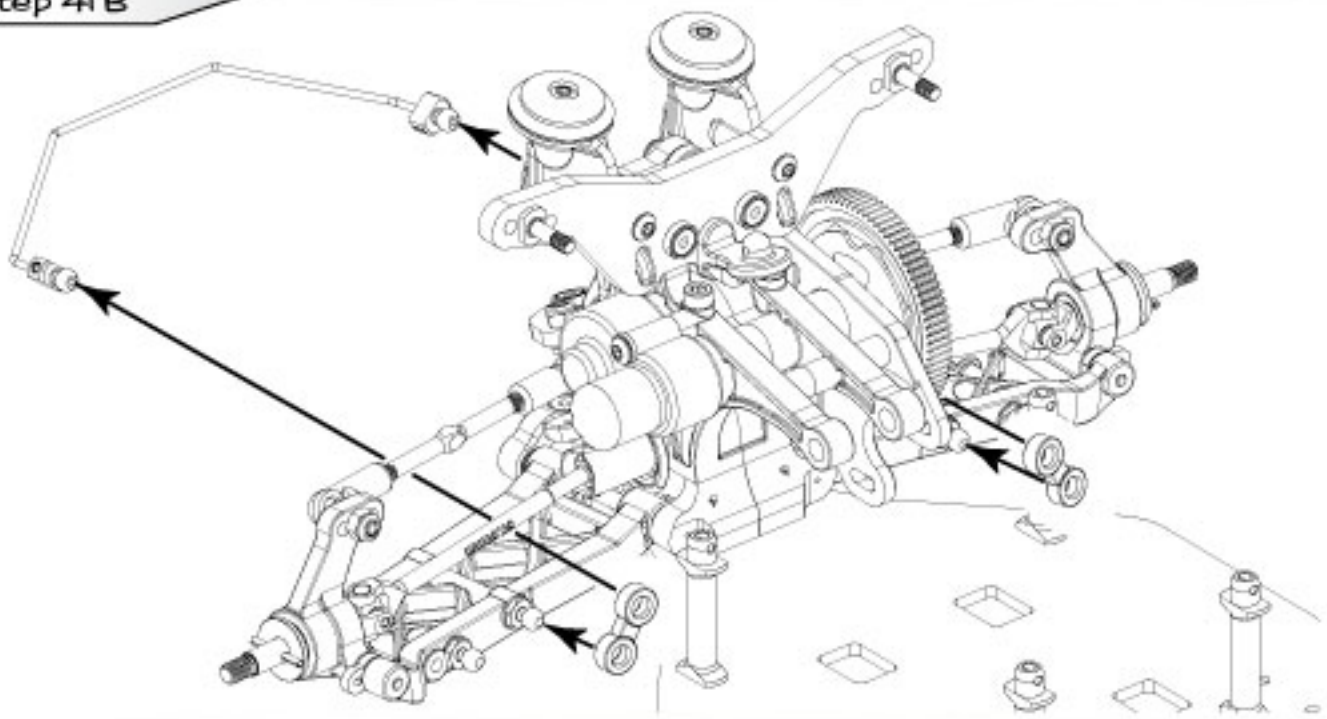
PRO Spec Car (Step 41)

Step 41 A

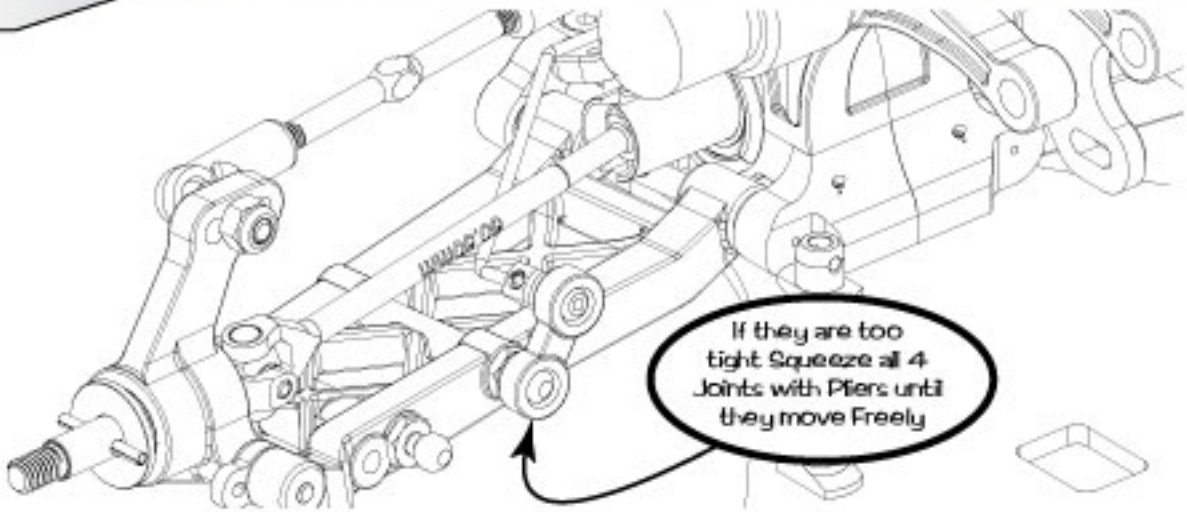




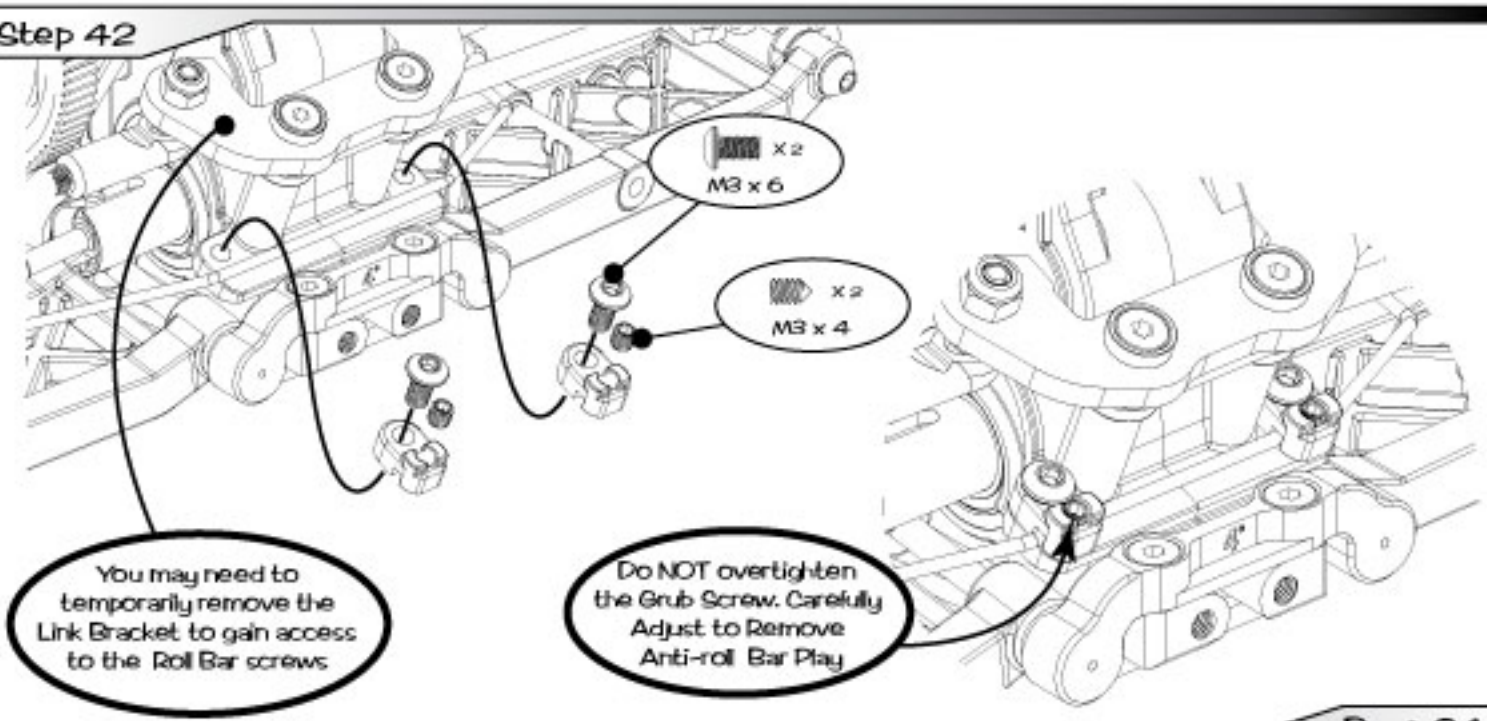
Step 41 B



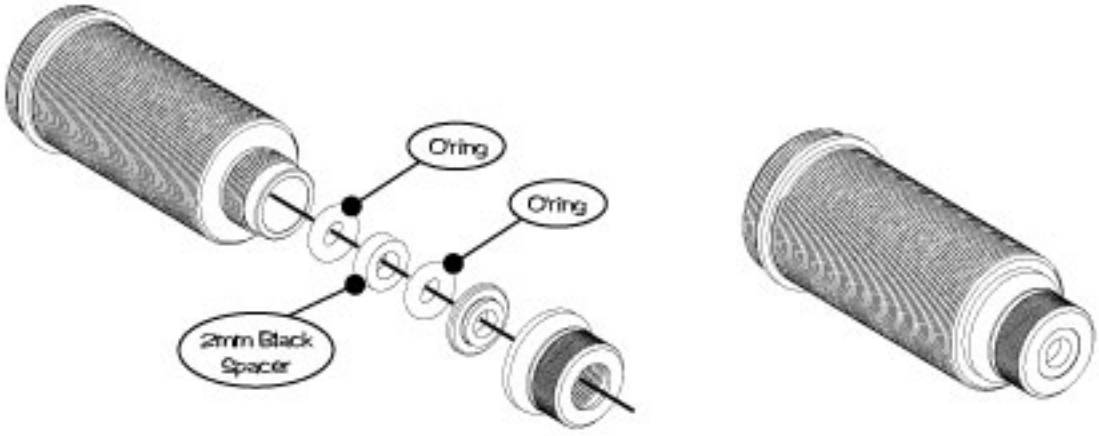
Step 41 C



Step 42

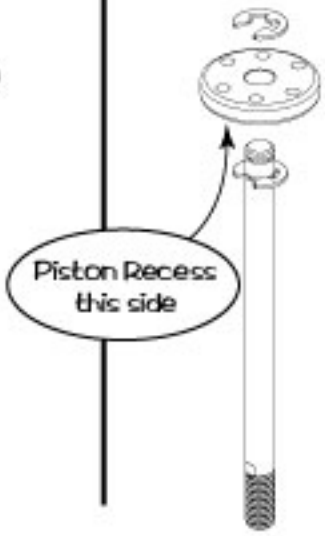


Step 43

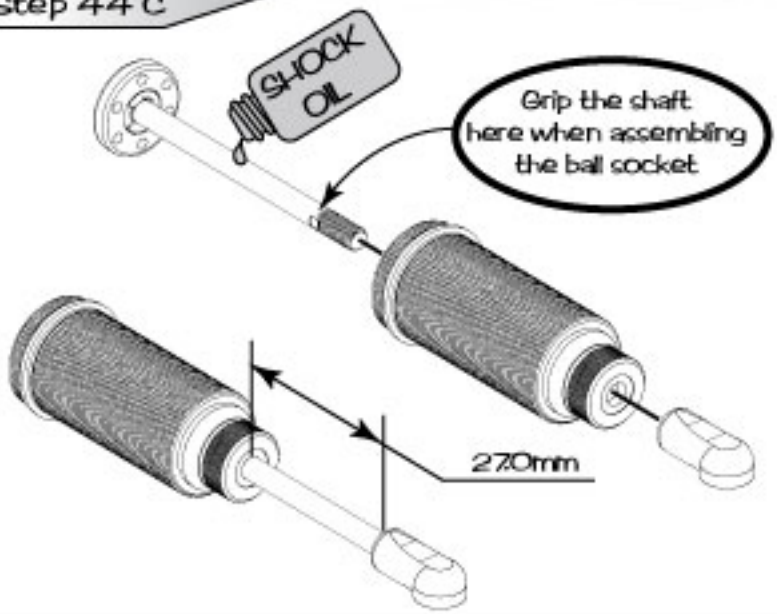


Step 44 A

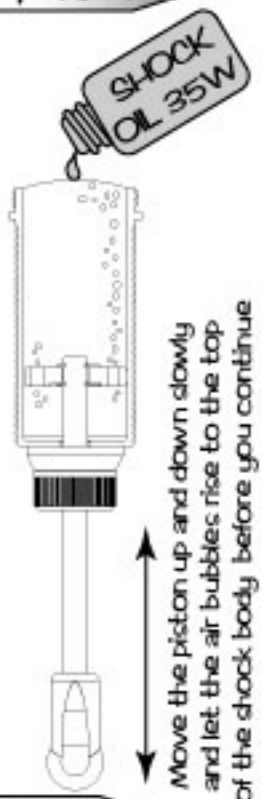
Step 44 B



Step 44 C



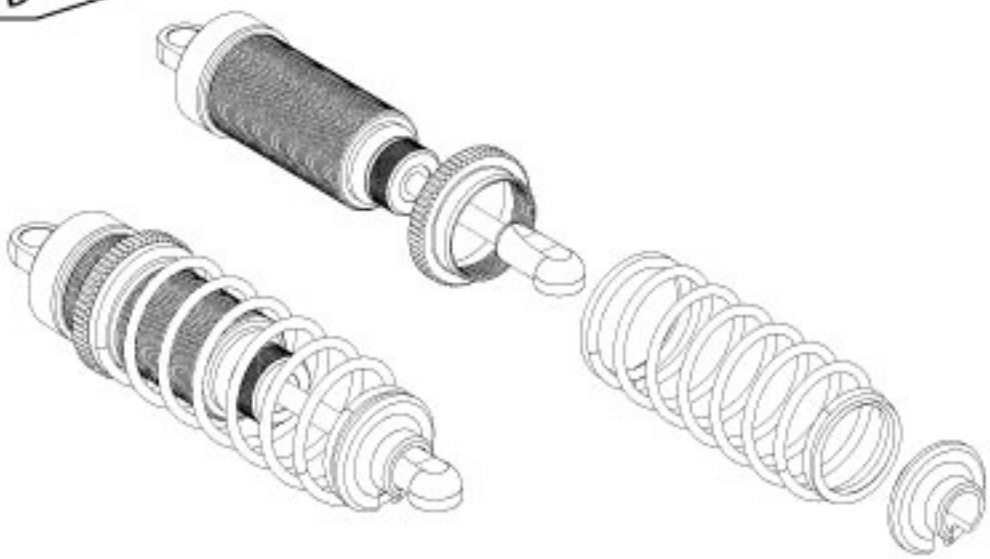
Step 45 A



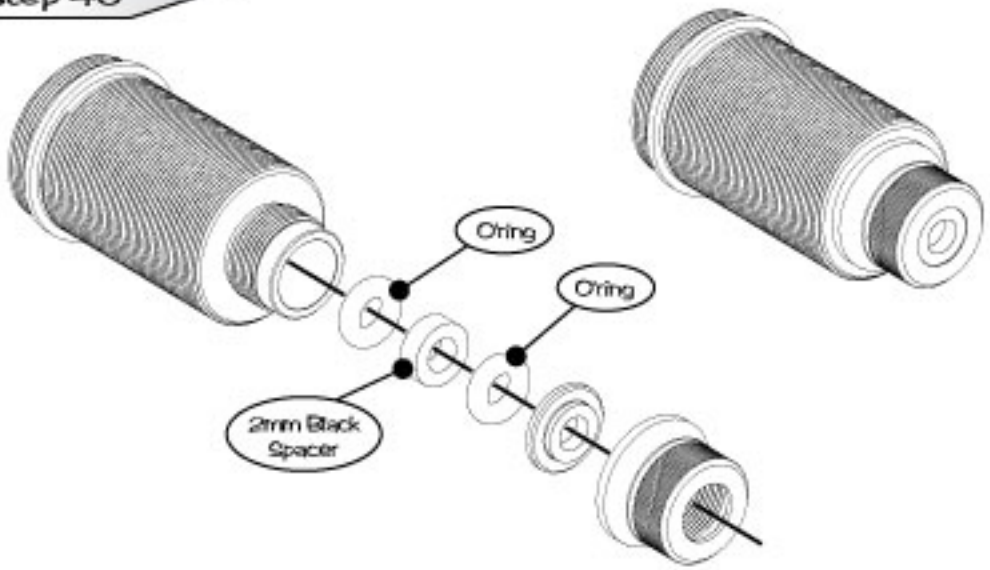
Step 45 B

Step 45 C

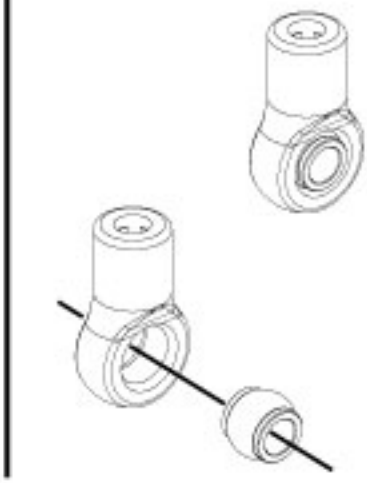
Step 45 D



Step 46

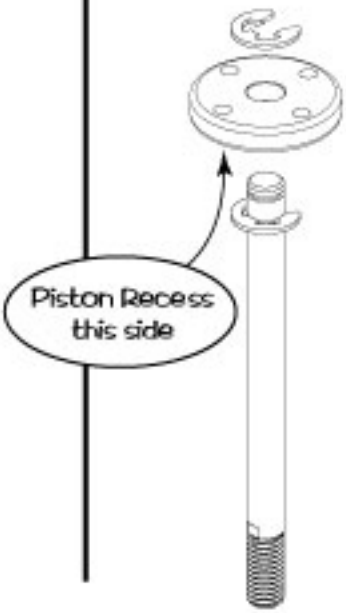


Step 47 A

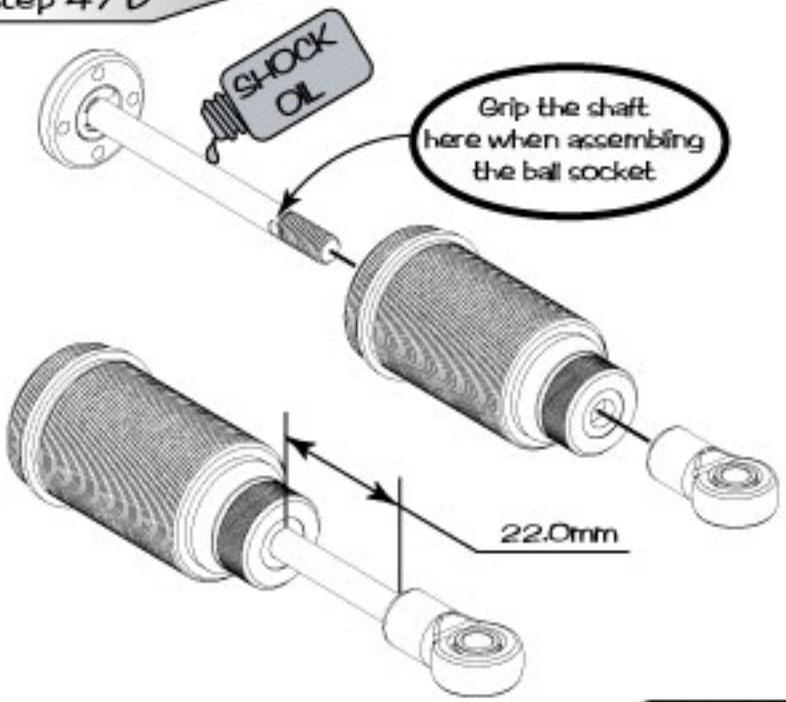


Step 47 B

Step 47 C

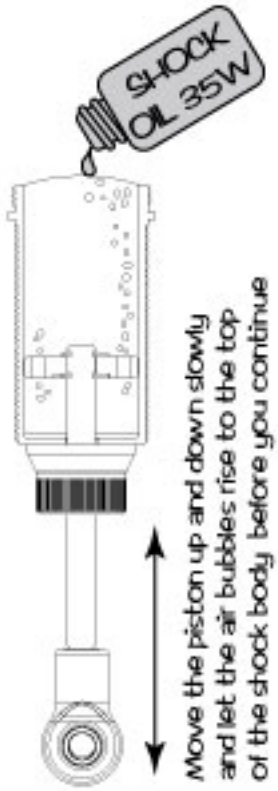


Step 47 D

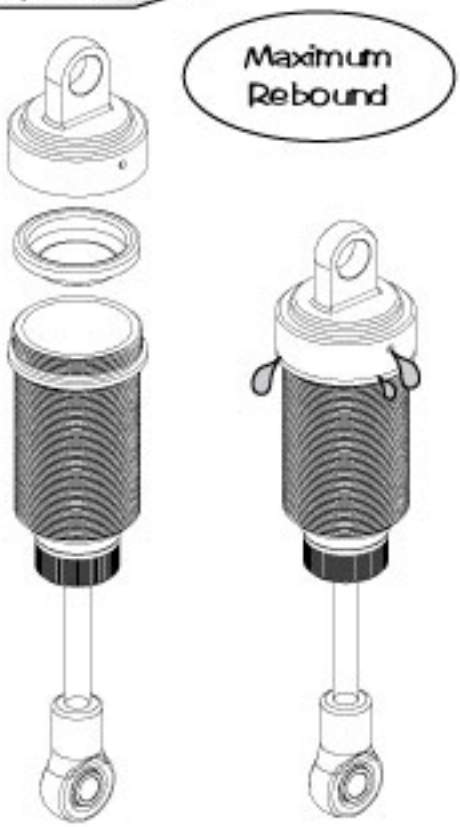


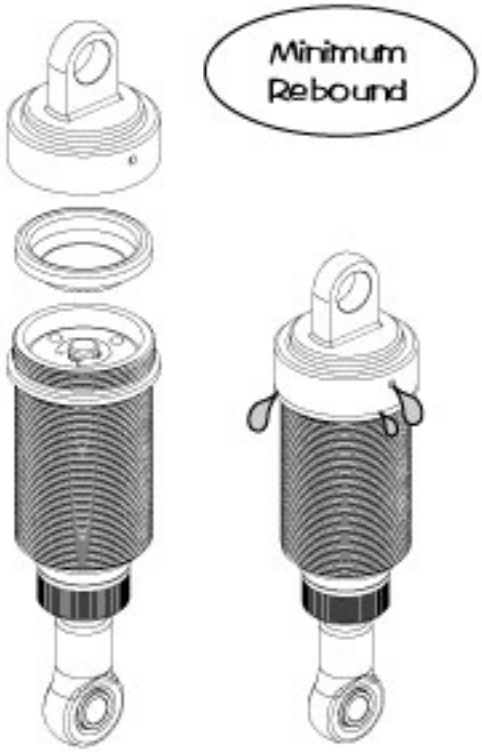
PRO Spec Shocks Assembly

Step 48 A



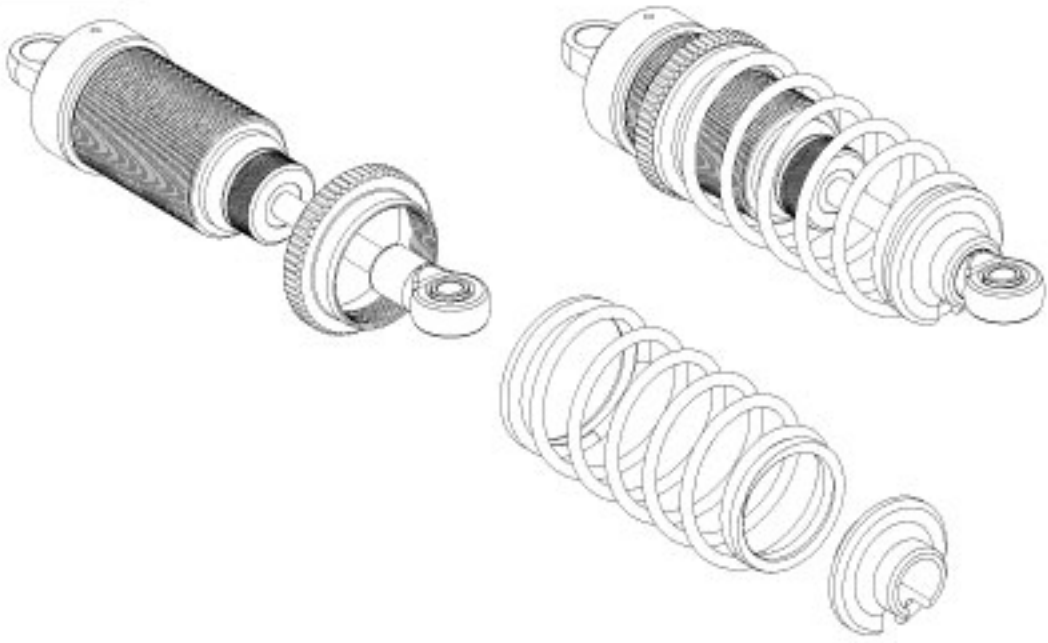
Step 48 B





Step 48 C

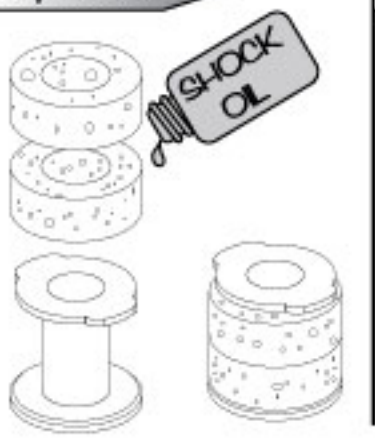
Step 48 D



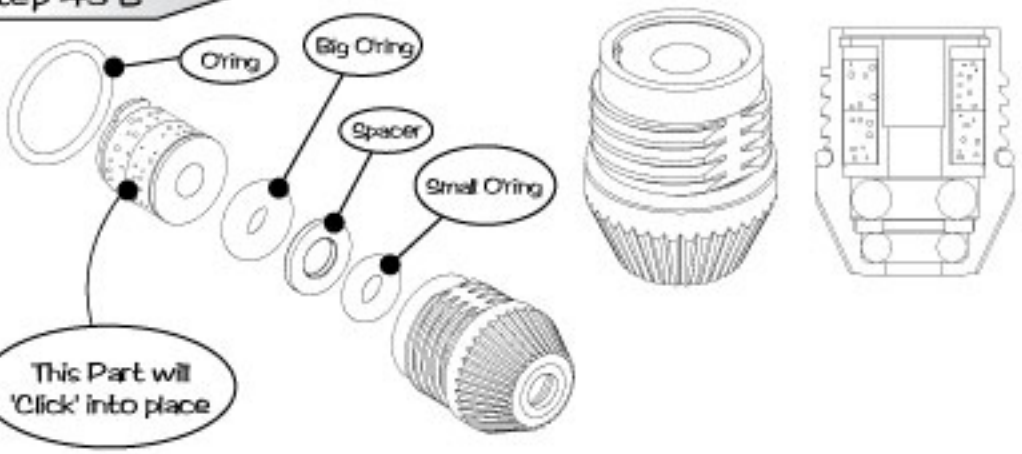
For Best Results Always Use Schumacher Silicone Oils

G010 - Pure Silicone Shock Oil - 10w
G015 - Pure Silicone Shock Oil - 15w
G020 - Pure Silicone Shock Oil - 20w
G025 - Pure Silicone Shock Oil - 25w
G030 - Pure Silicone Shock Oil - 30w
G035 - Pure Silicone Shock Oil - 35w
G040 - Pure Silicone Shock Oil - 40w
G045 - Pure Silicone Shock Oil - 45w
G050 - Pure Silicone Shock Oil - 50w

Step 43 A

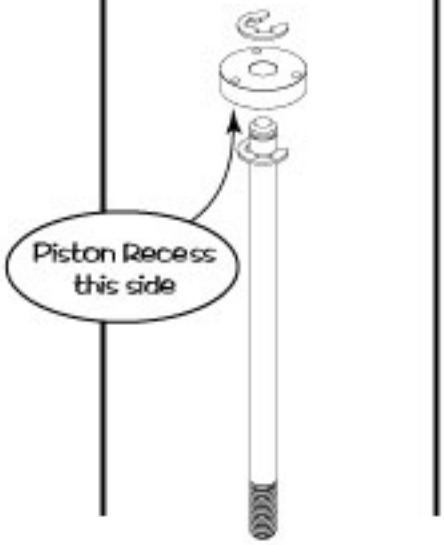


Step 43 B

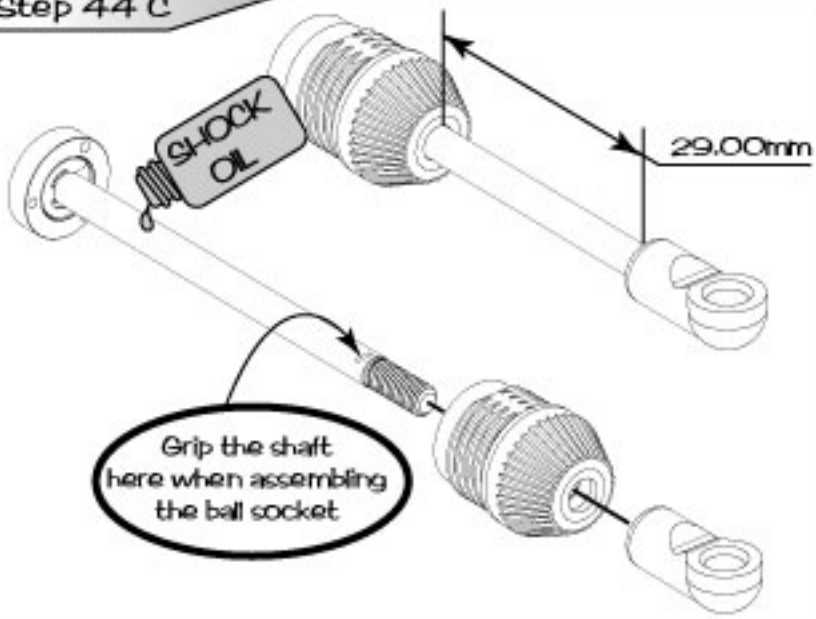


Step 44 A

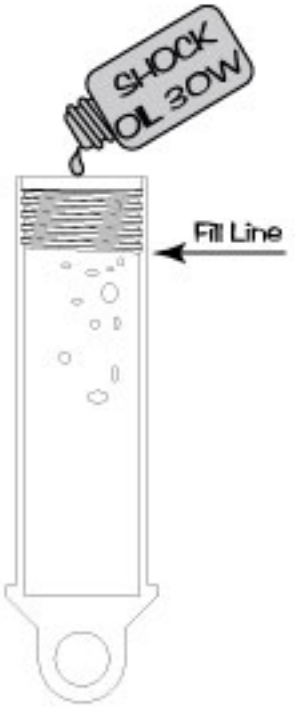
Step 44 B



Step 44 C

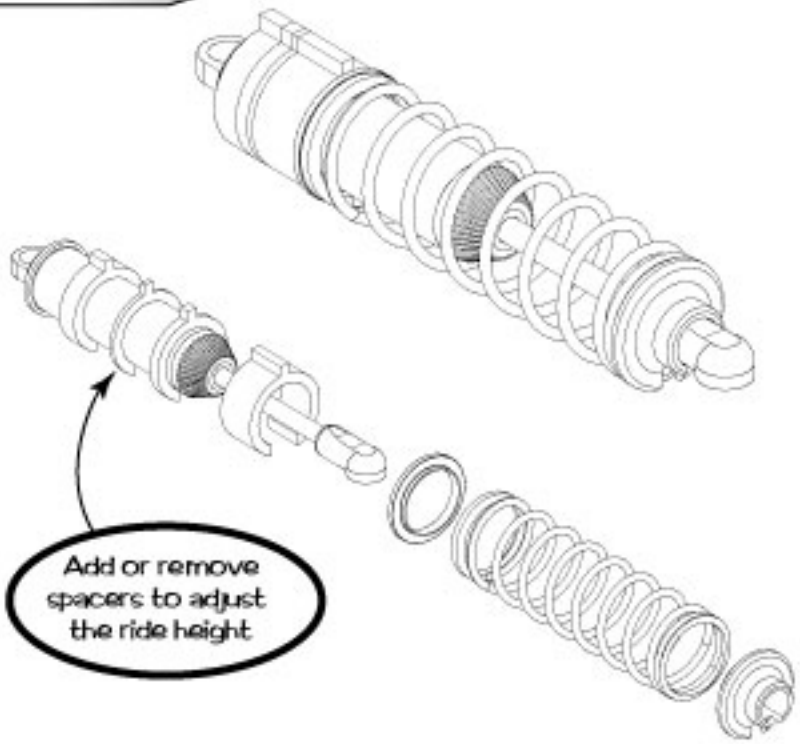


Step 45 A

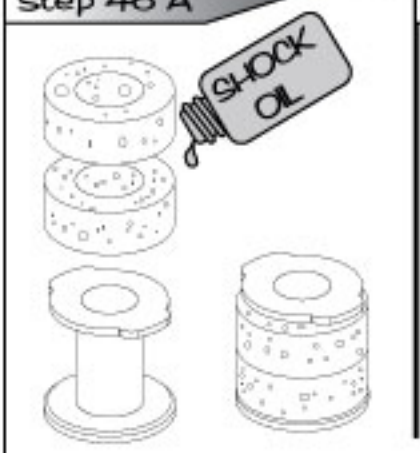


Step 45 B

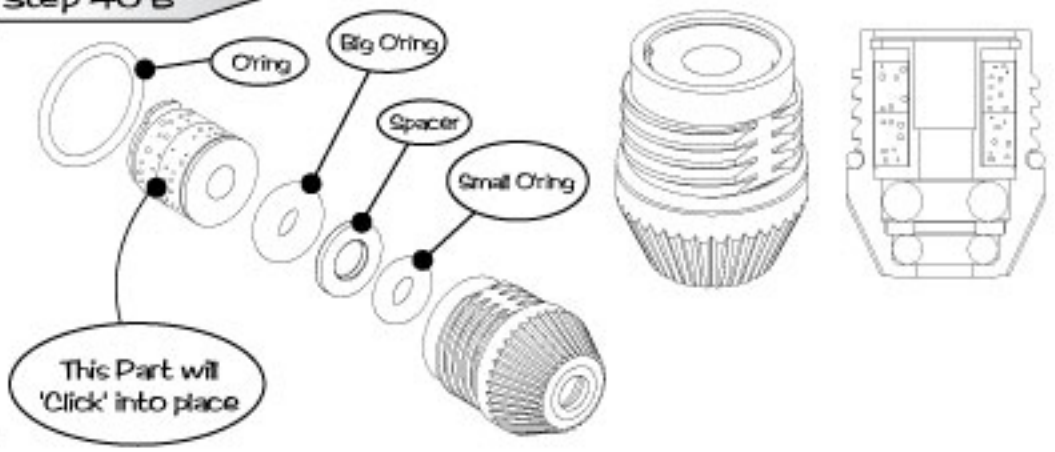
Step 45 C



Step 46 A



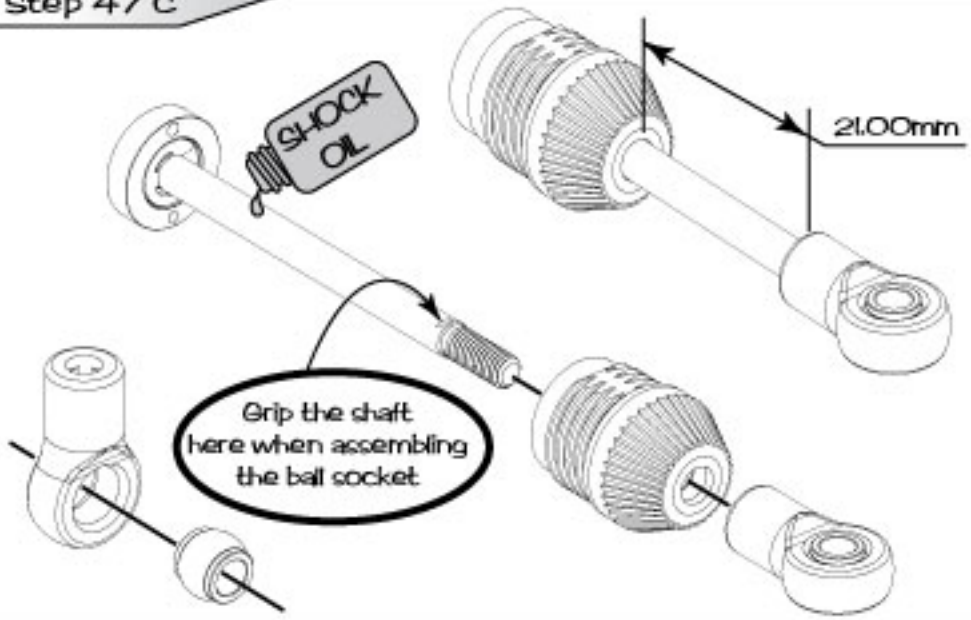
Step 46 B



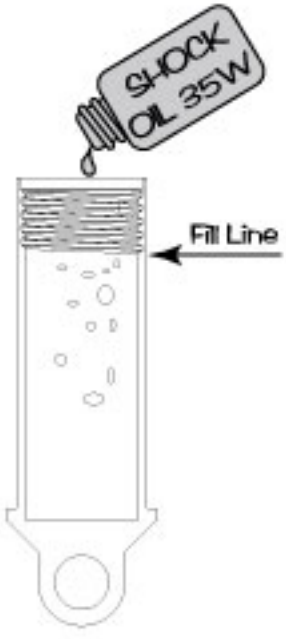
Step 47 A

Step 47 B

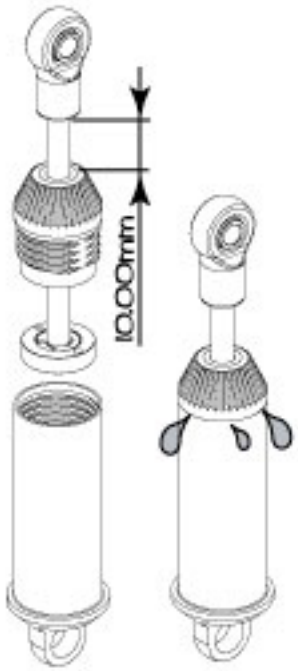
Step 47 C



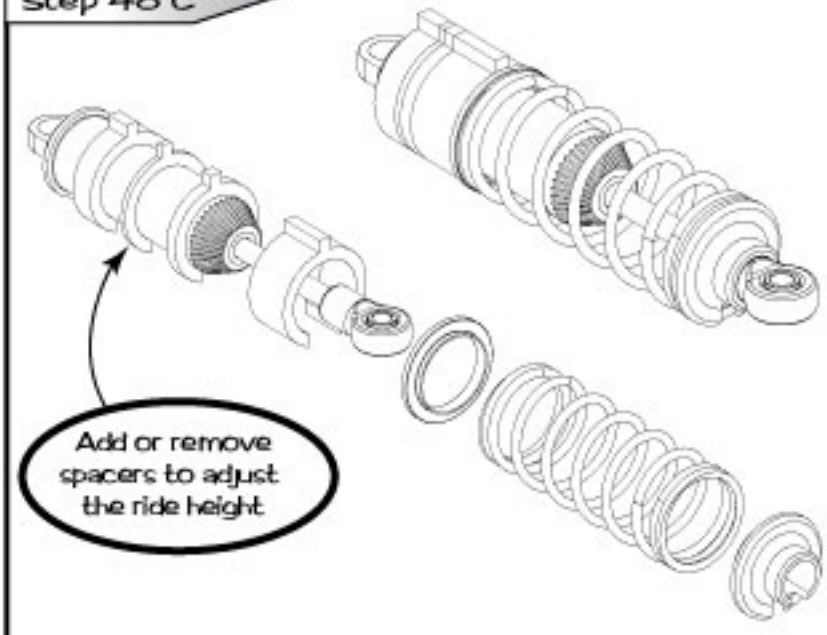
Step 48 A



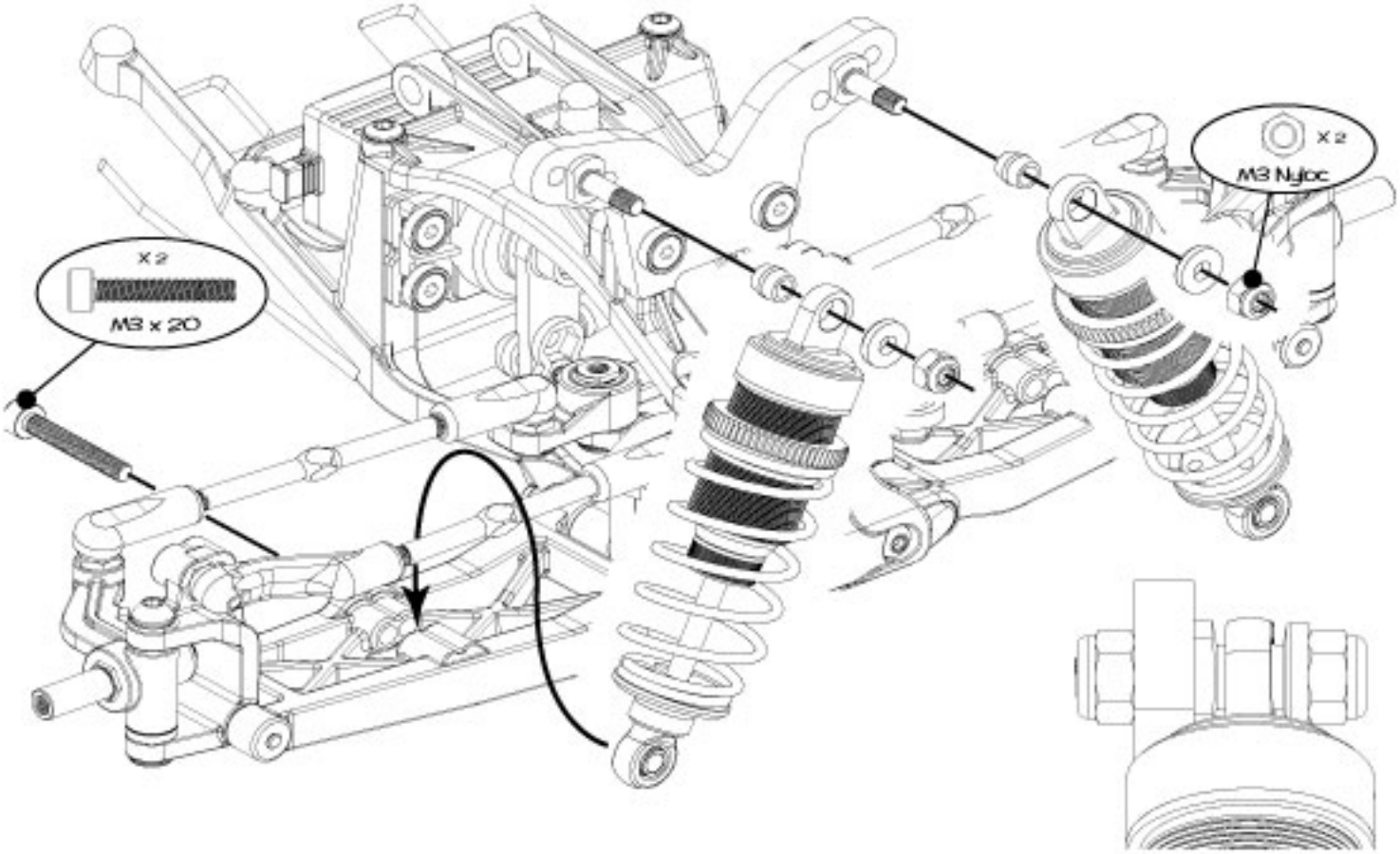
Step 48 B



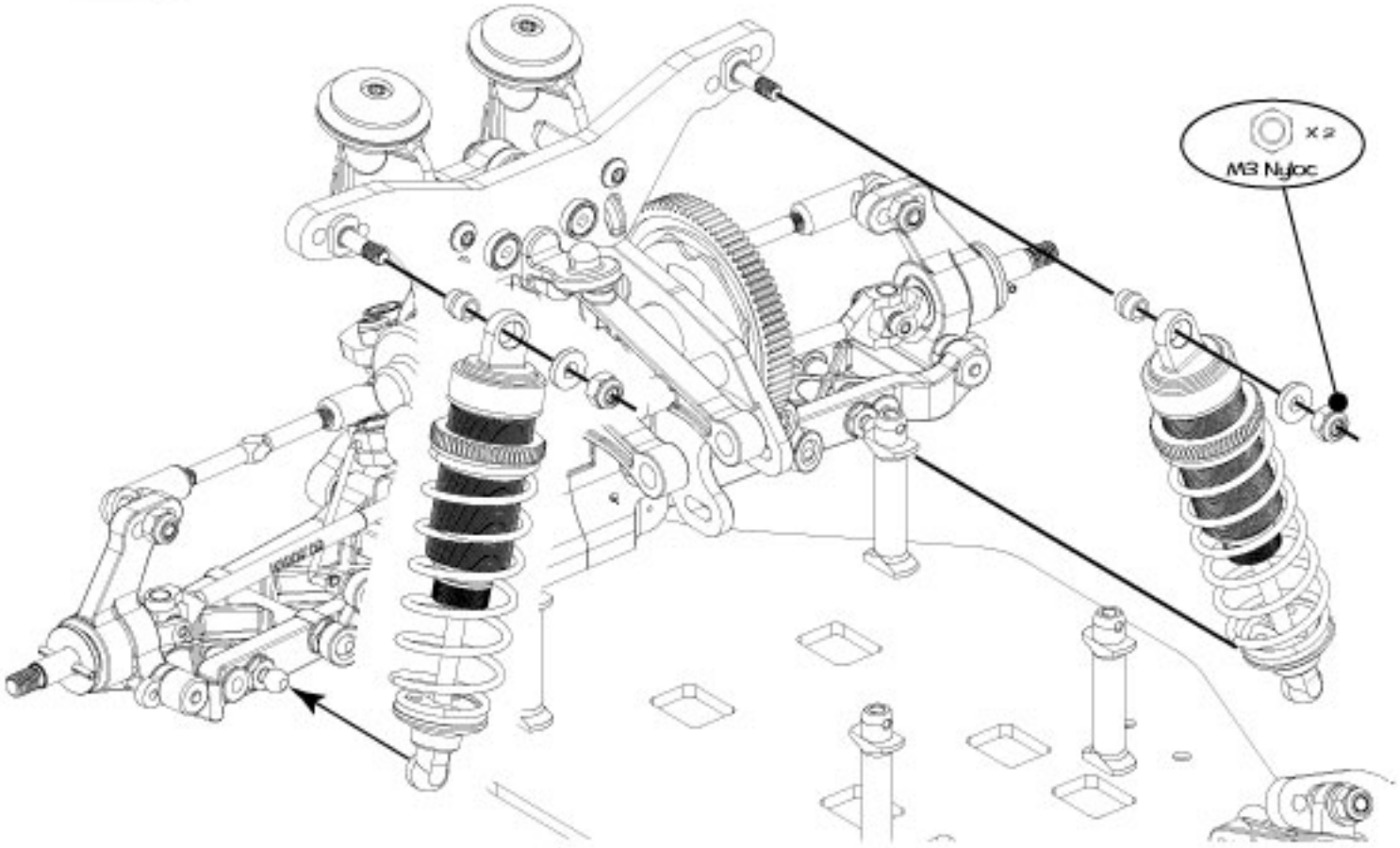
Step 48 C



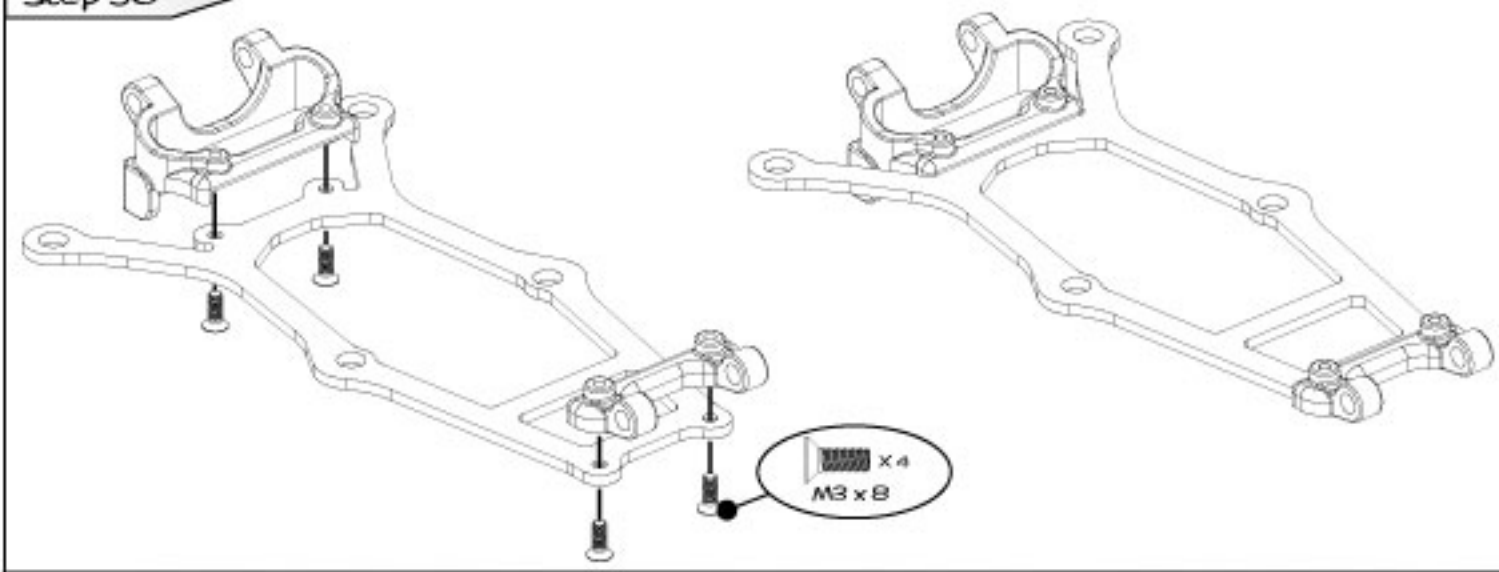
Step 49 A



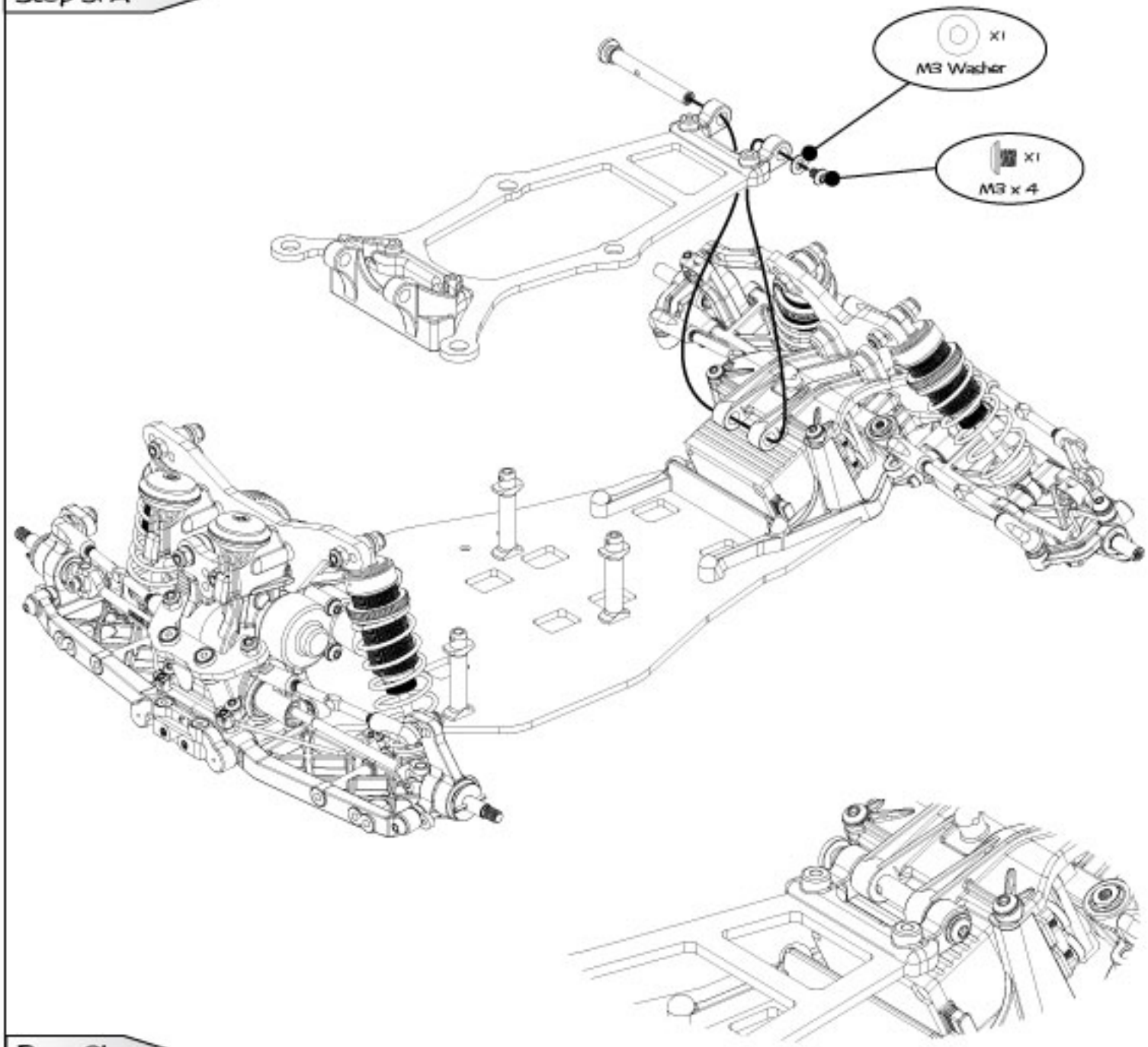
Step 49 B



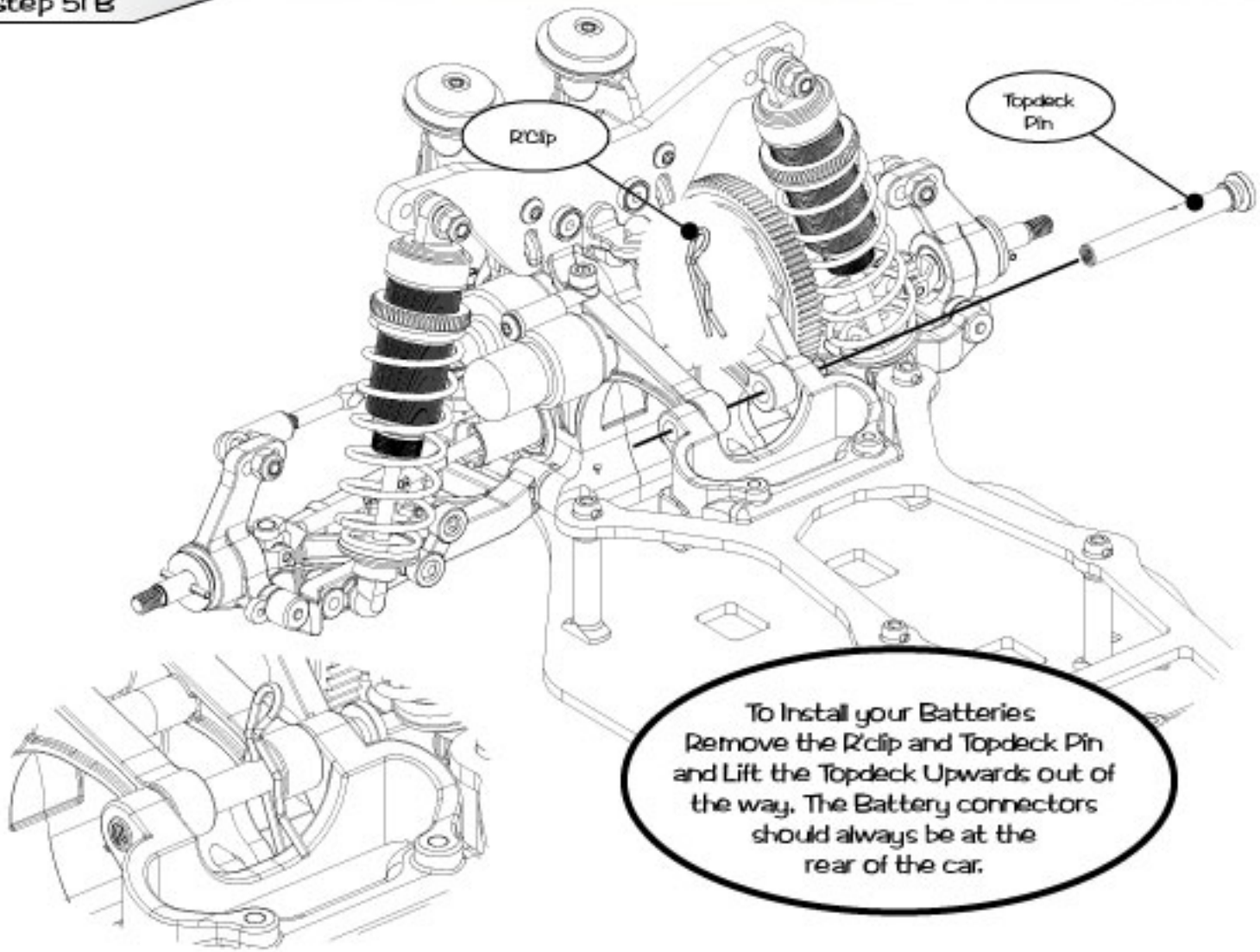
Step 50



Step 51 A

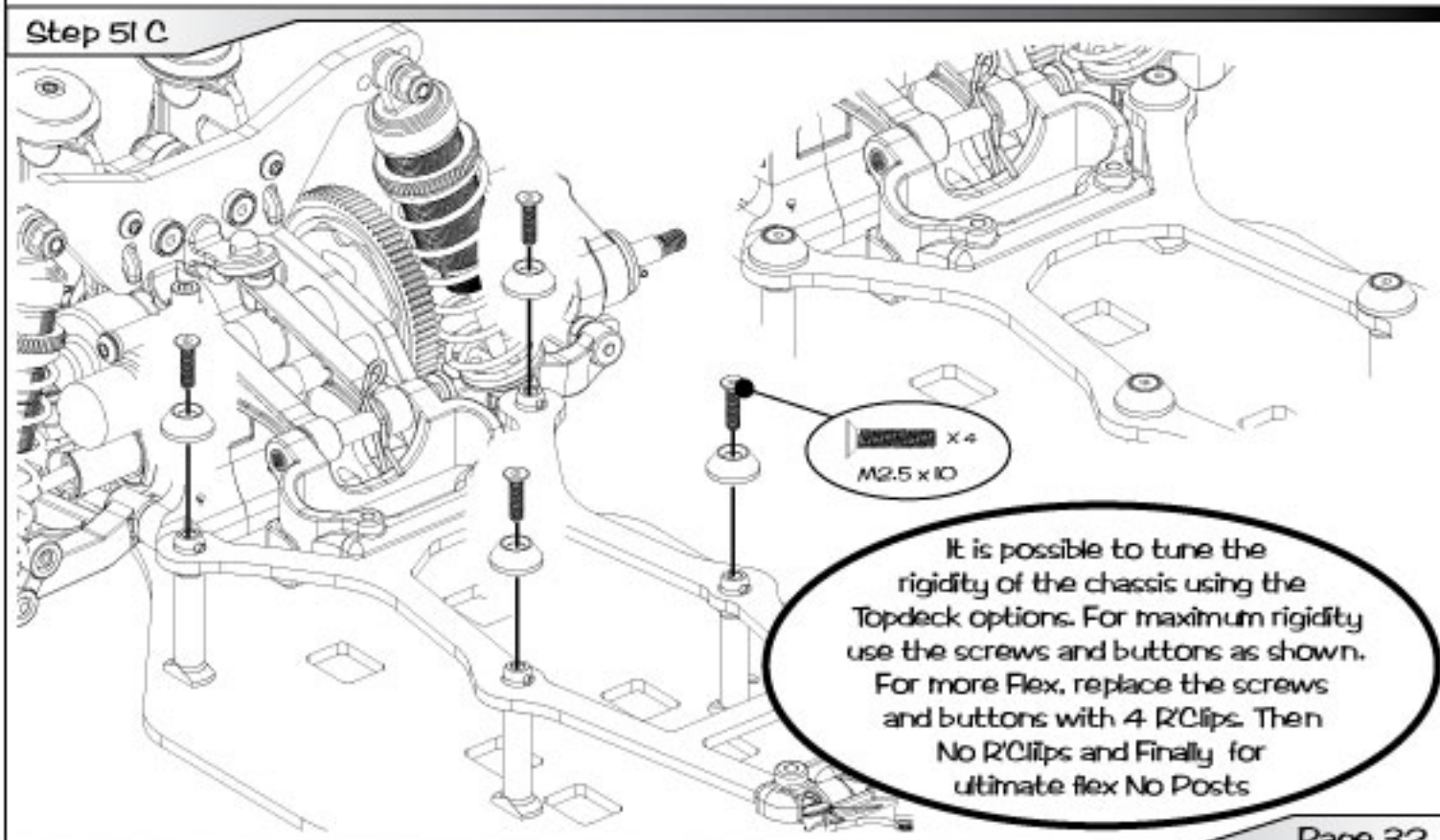


Step 51 B



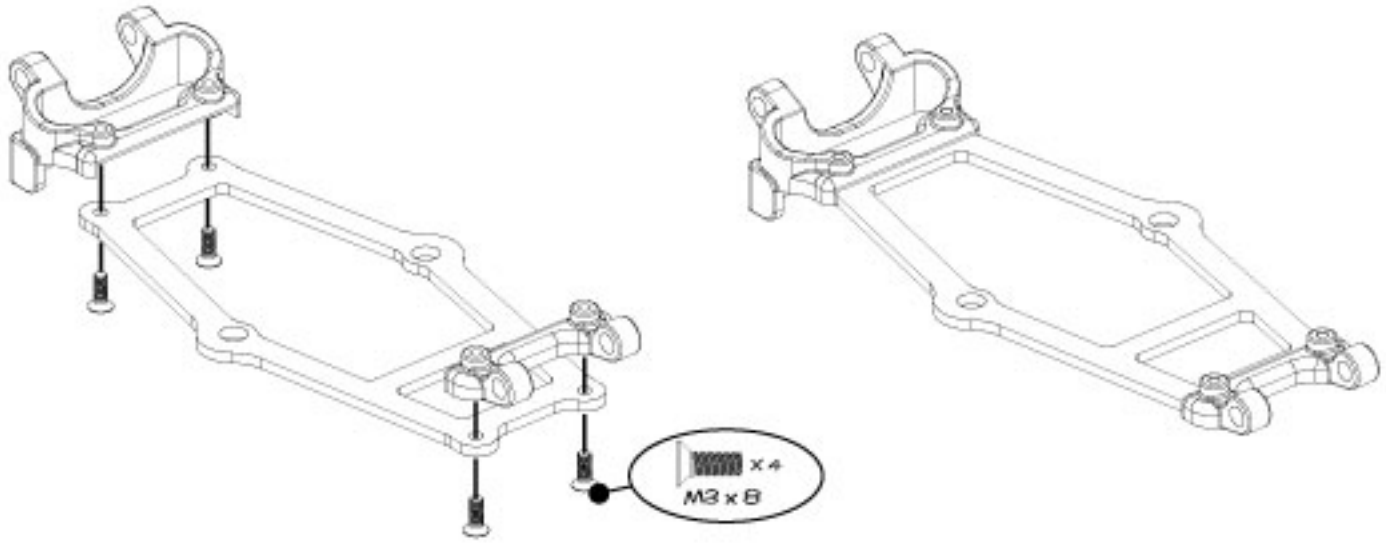
To Install your Batteries Remove the R'clip and Topdeck Pin and Lift the Topdeck Upwards out of the way. The Battery connectors should always be at the rear of the car.

Step 51 C

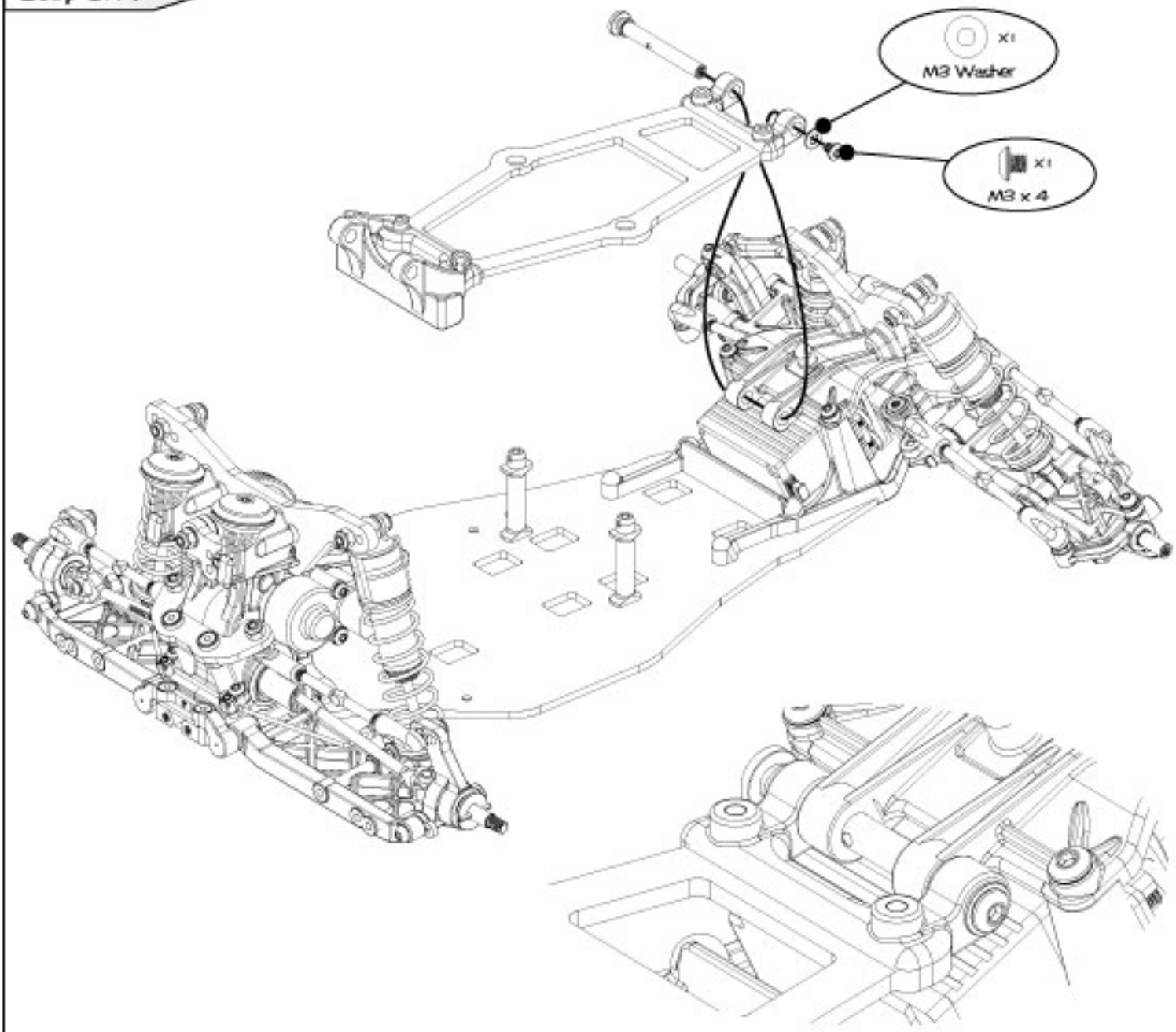


It is possible to tune the rigidity of the chassis using the Topdeck options. For maximum rigidity use the screws and buttons as shown. For more Flex, replace the screws and buttons with 4 R'Clips. Then No R'Clips and Finally for ultimate flex No Posts

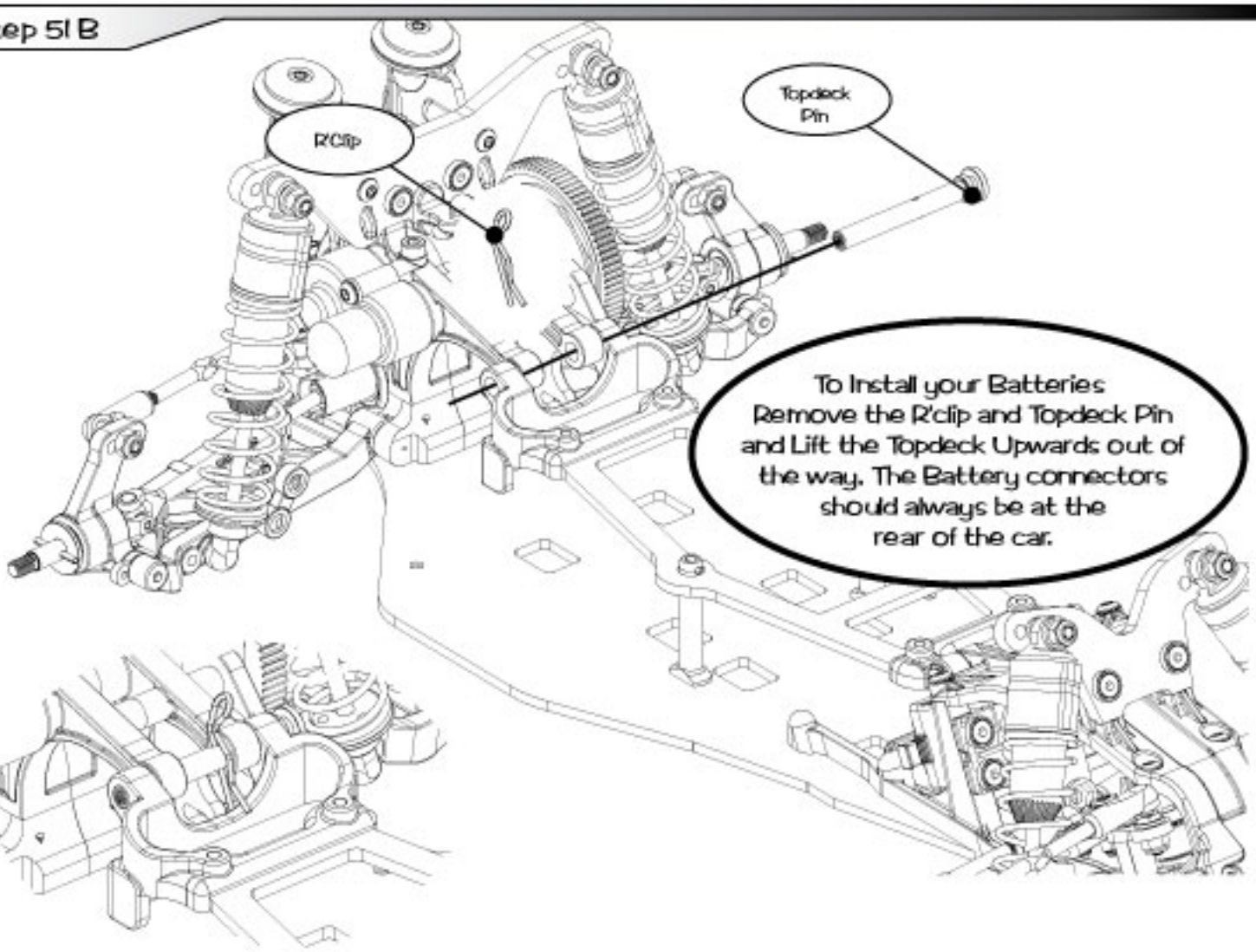
Step 50



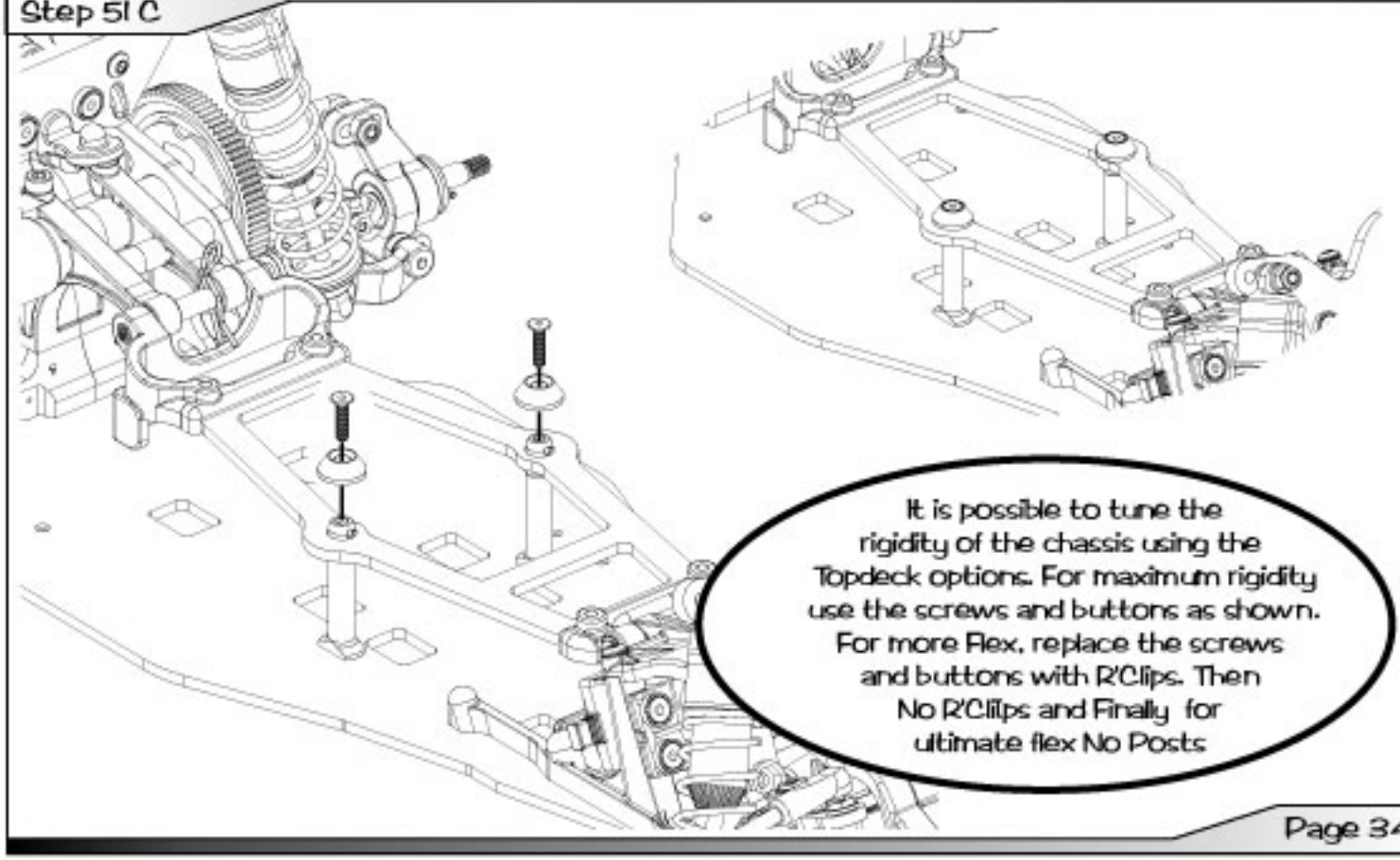
Step 51 A



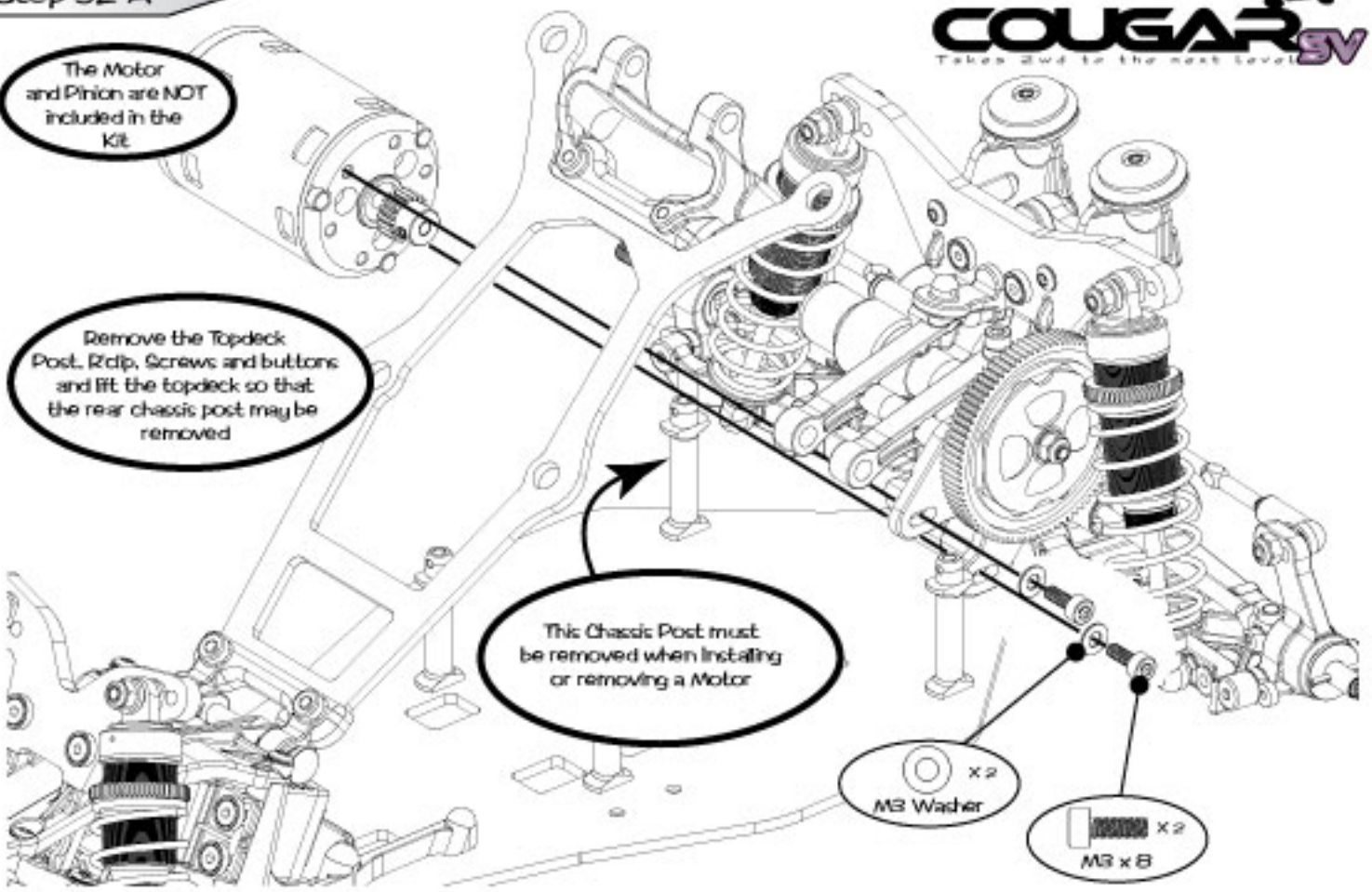
Step 51 B



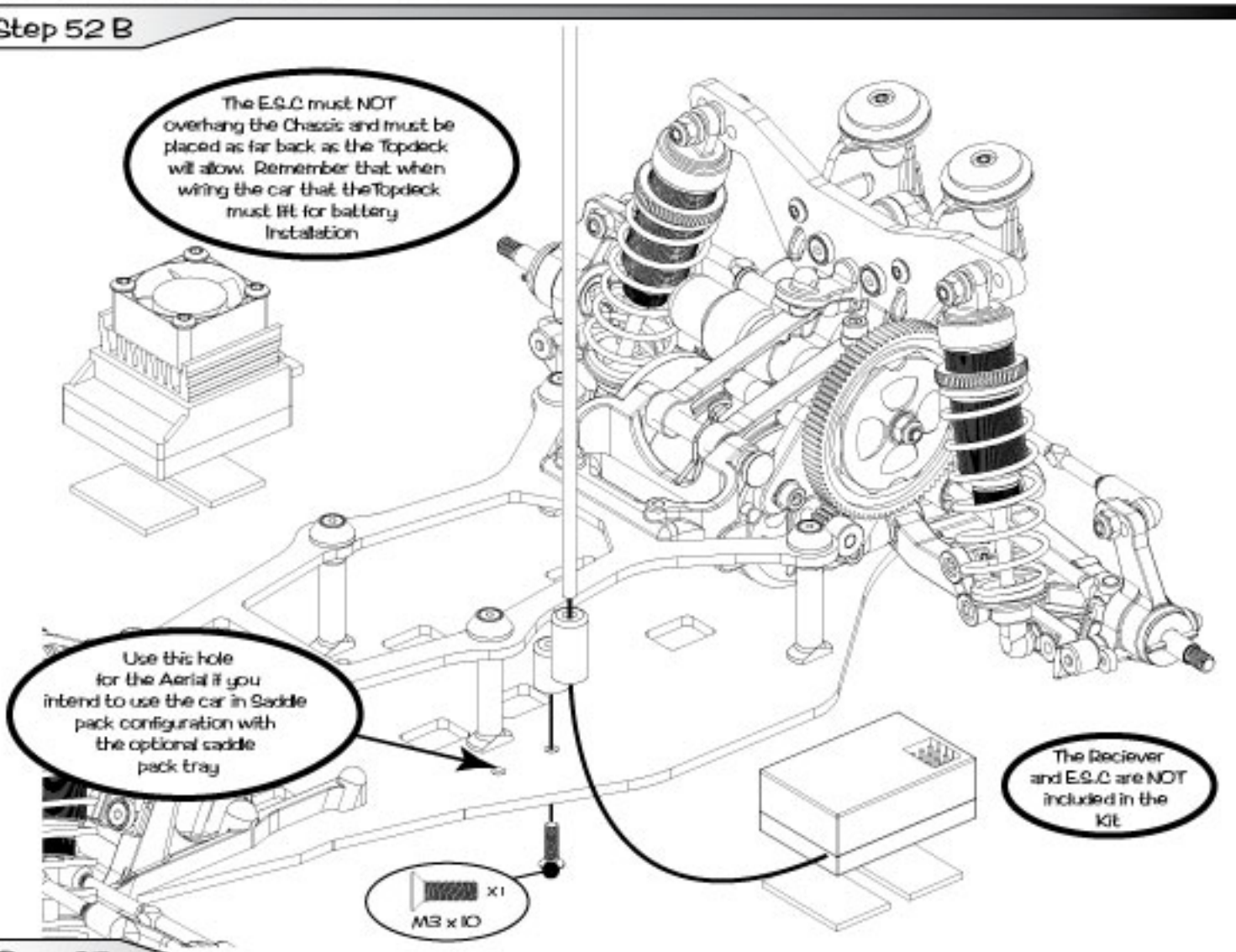
Step 51 C



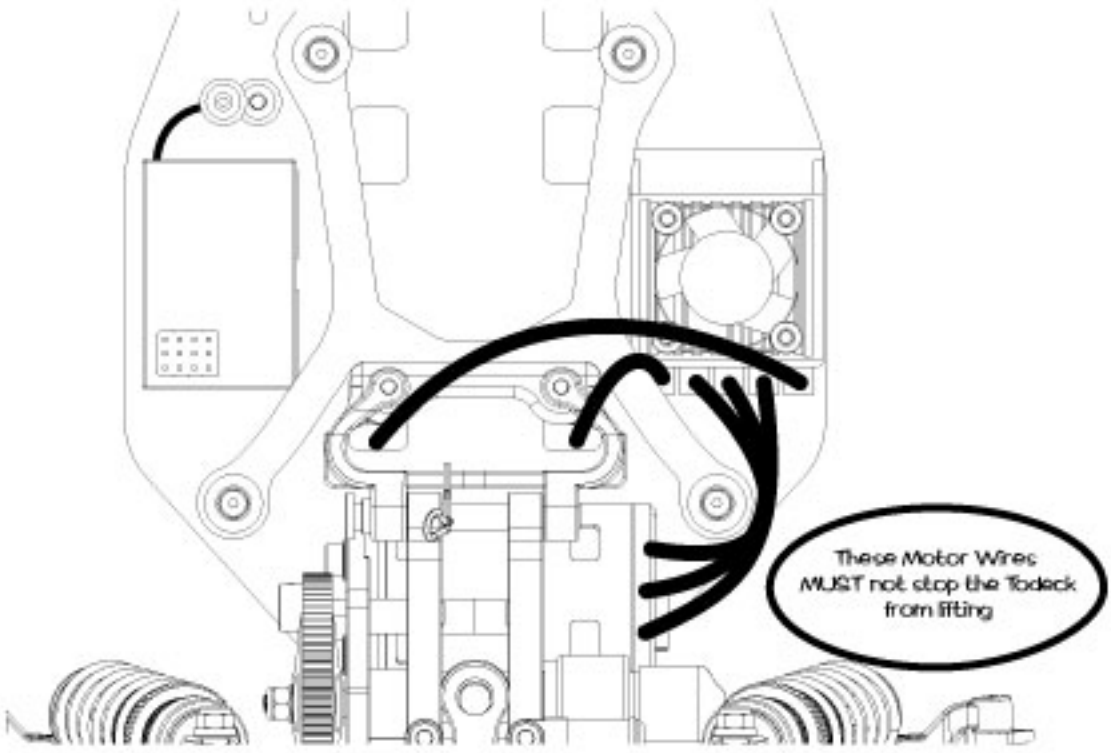
Step 52 A



Step 52 B

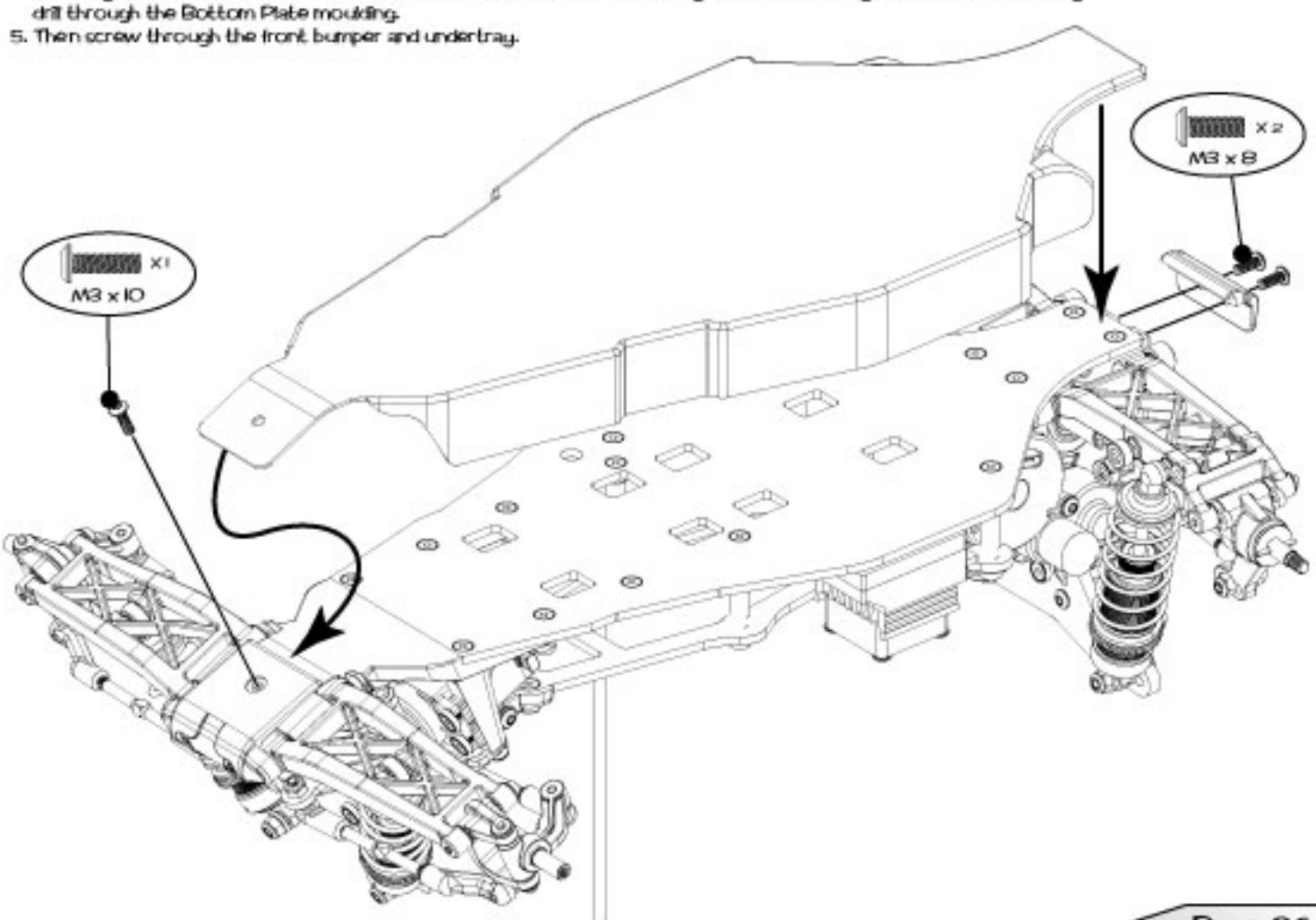


Step 52 C

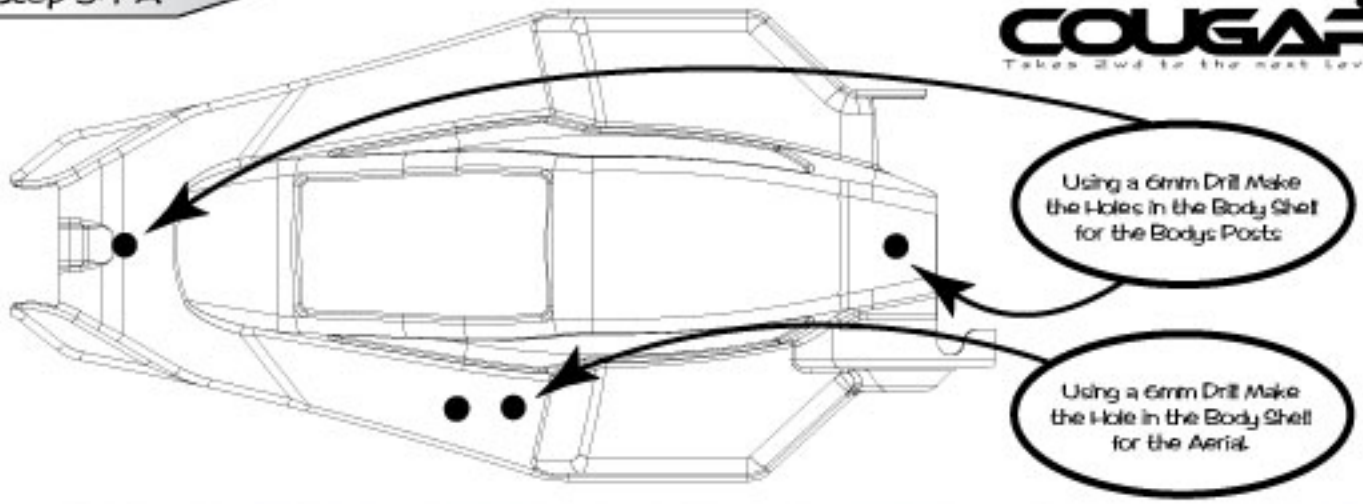


Step 53

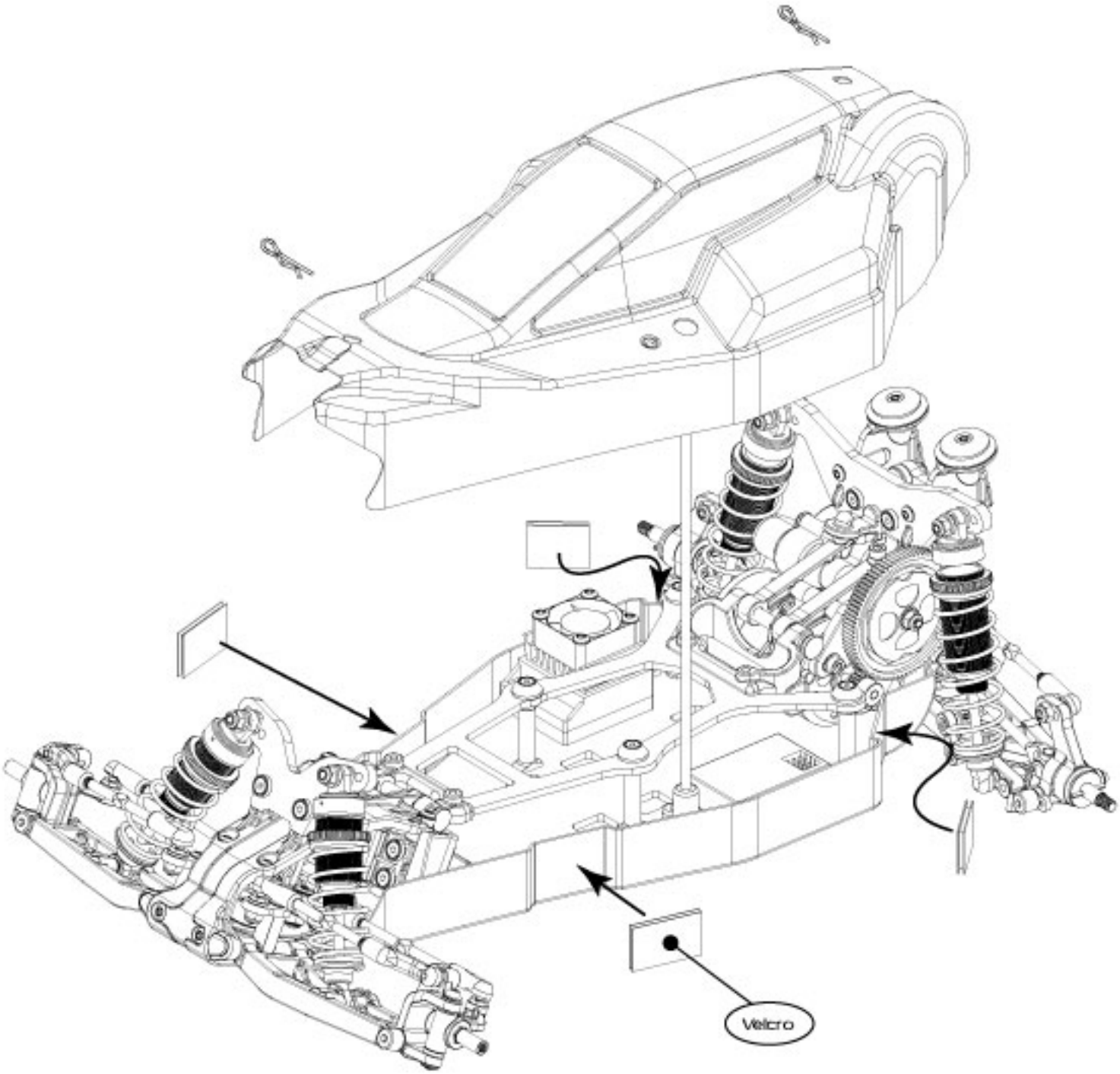
1. Slide the front of the Undertray under the front Bumper.
2. Fix the rear of the Undertray to the car using the Rear Bumber
3. Ensure that the Undertray is correctly positioned and is pressed tight towards the front of the car.
4. Using a 3mm drill, carefully make the hole in the undertray for the front screw by drilling through the hole in the front bumper, or You may want to mark the centre for the hole and remove the undertray to drill it so that you do not accidentally drill through the Bottom Plate moulding.
5. Then screw through the front bumper and undertray.



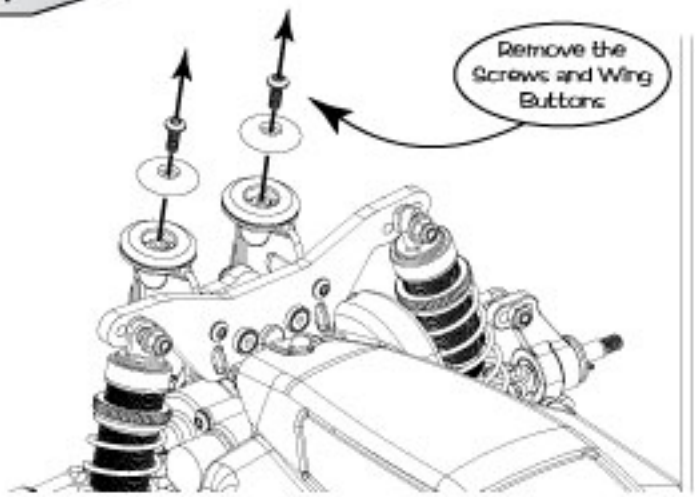
Step 54 A



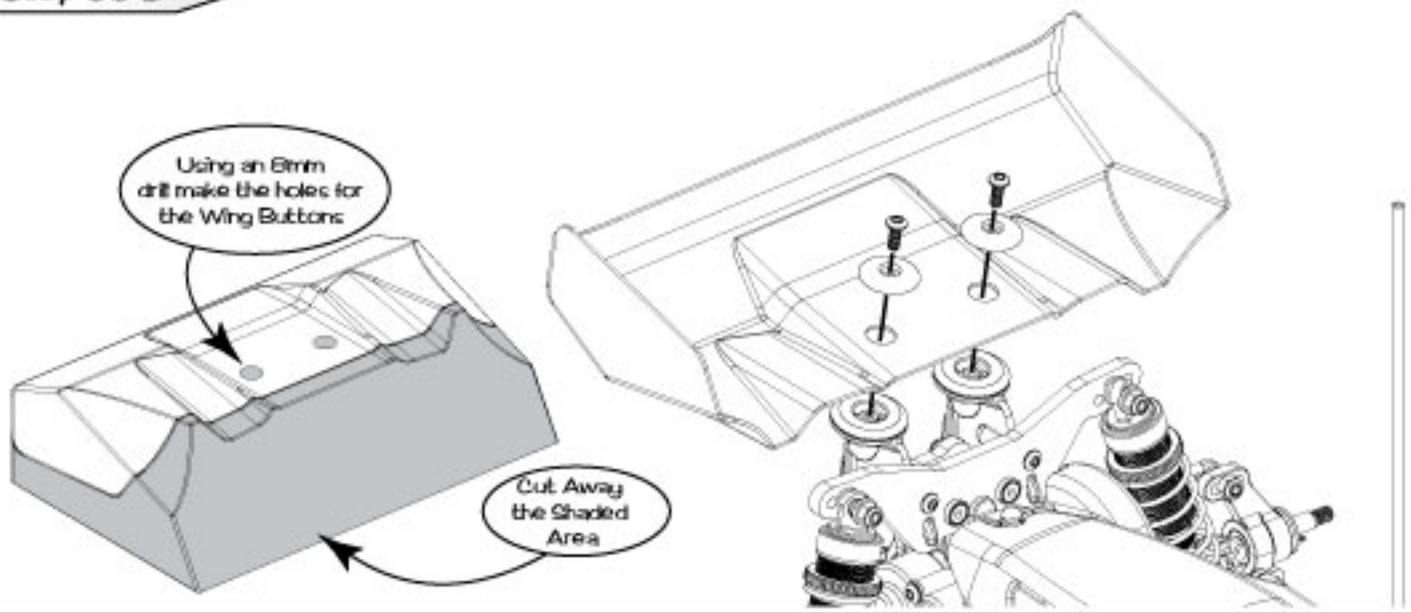
Step 54 B



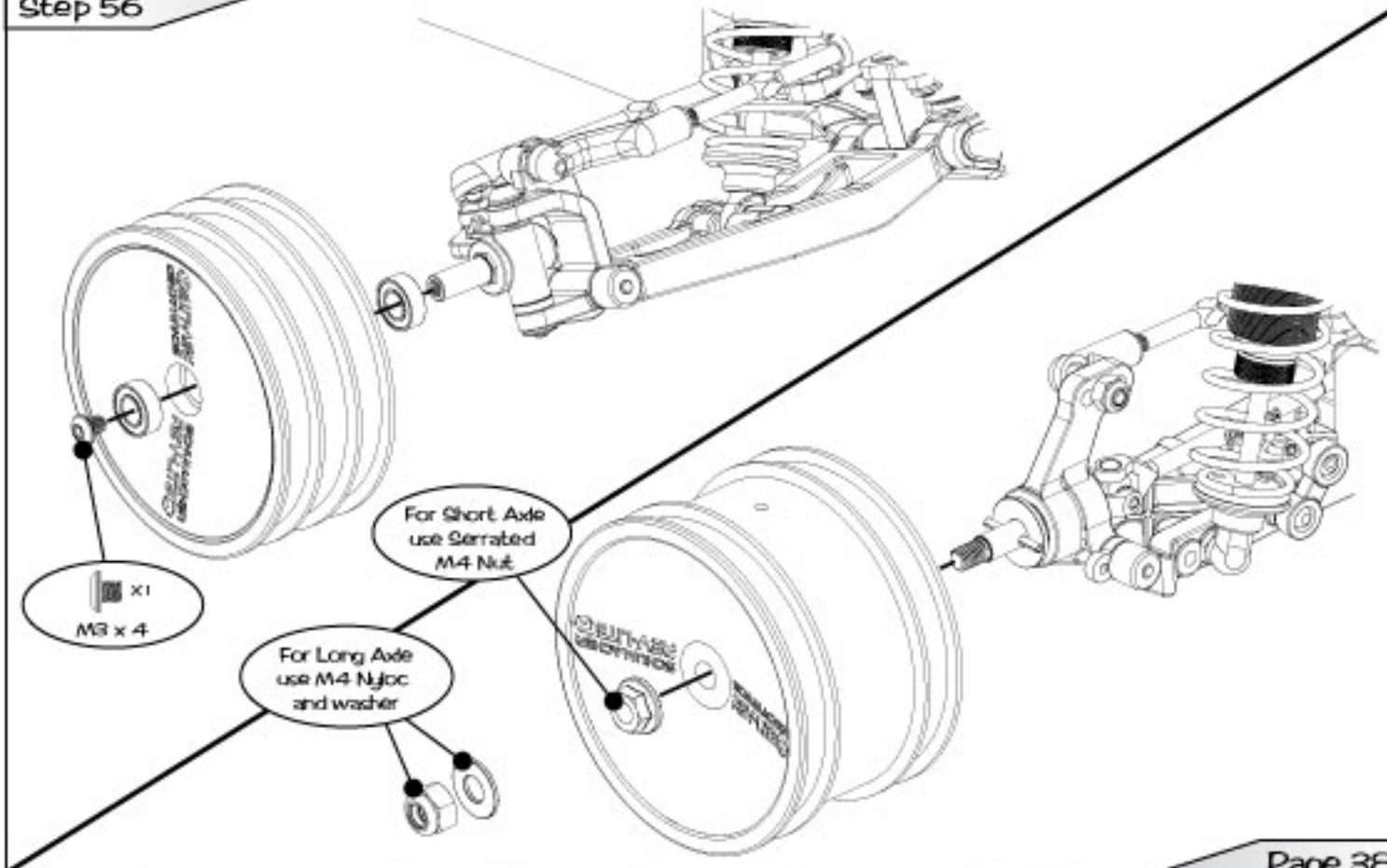
Step 55 A



Step 55 B

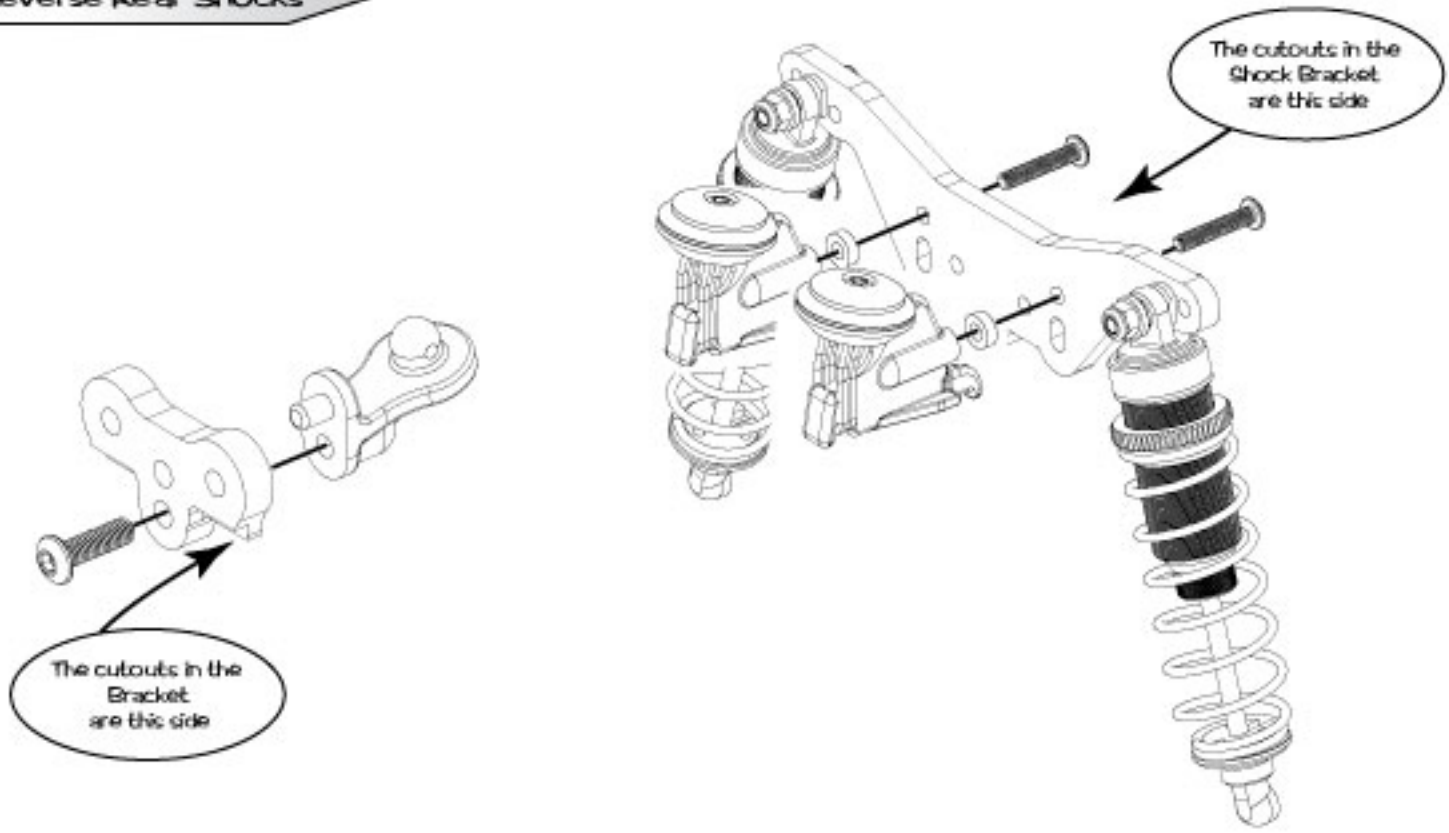


Step 56

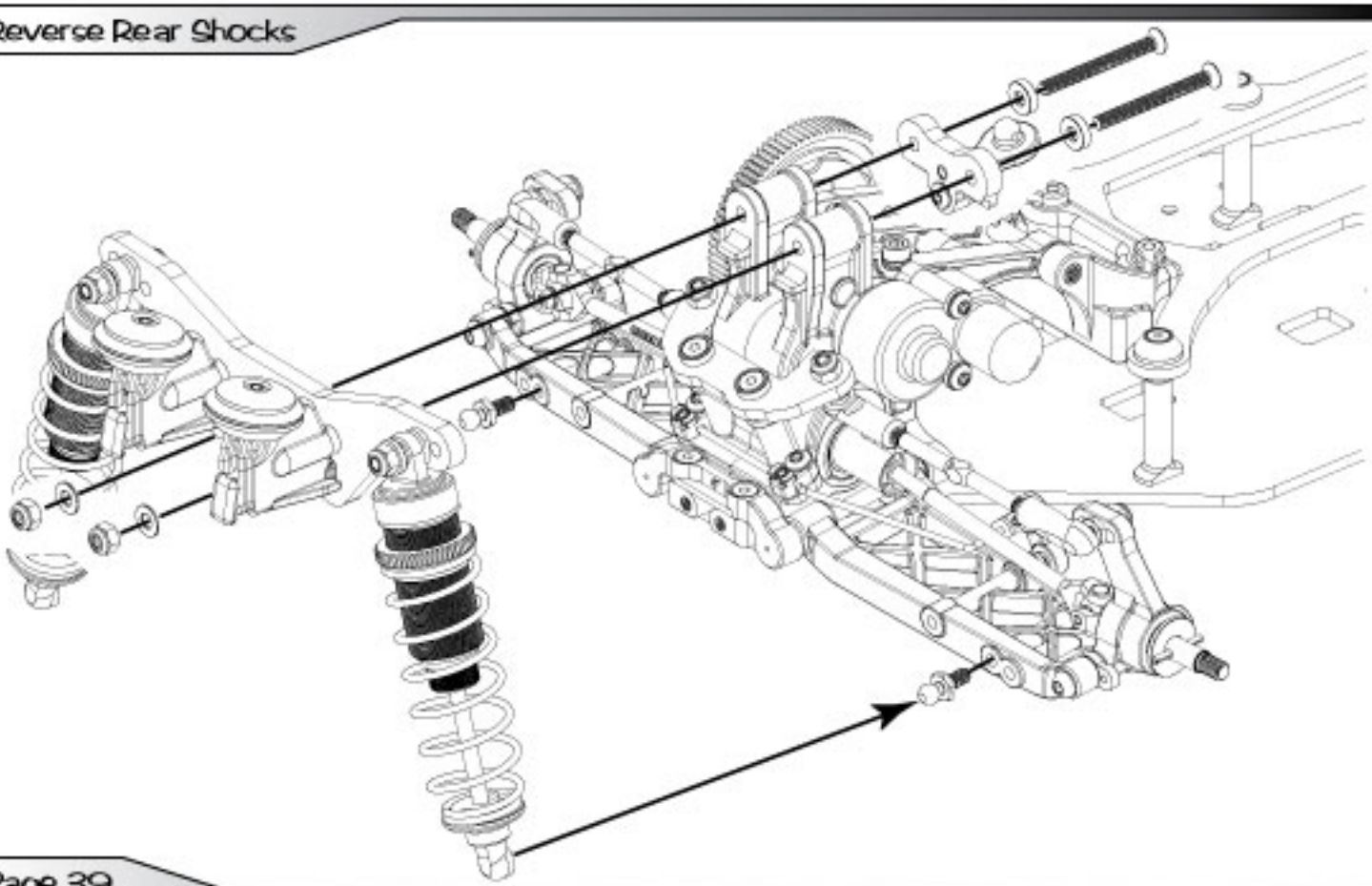


Your Cougar has the ability to run the shocks at the back of the Rear Wishbones as well as the front. This mounting position is recommended for tracks that are very Bumpy, as it will give the car extra stability. For less Bumpy tracks you should leave the shock mounting as standard.

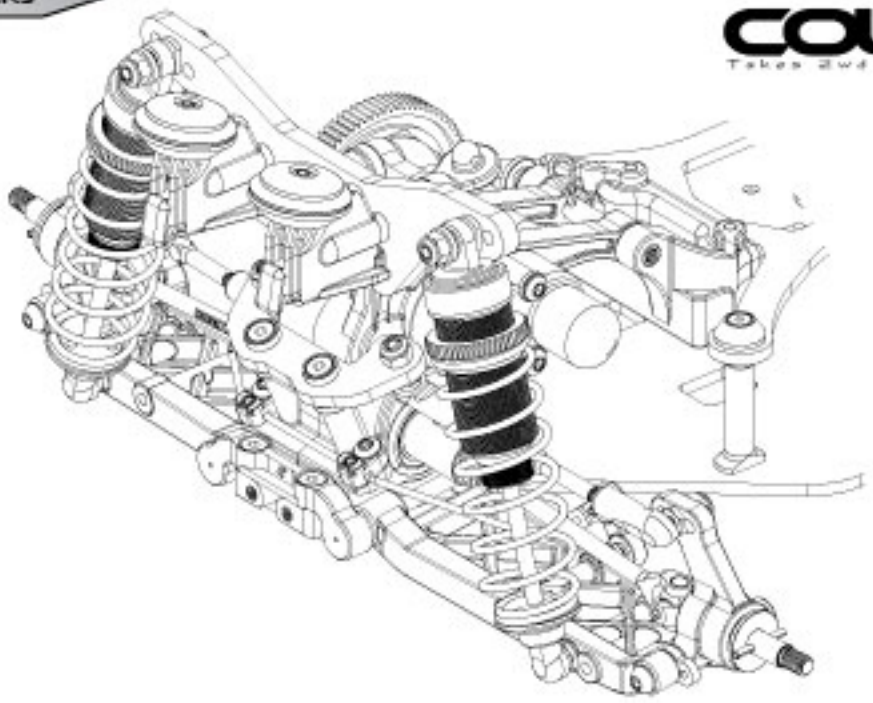
Reverse Rear Shocks



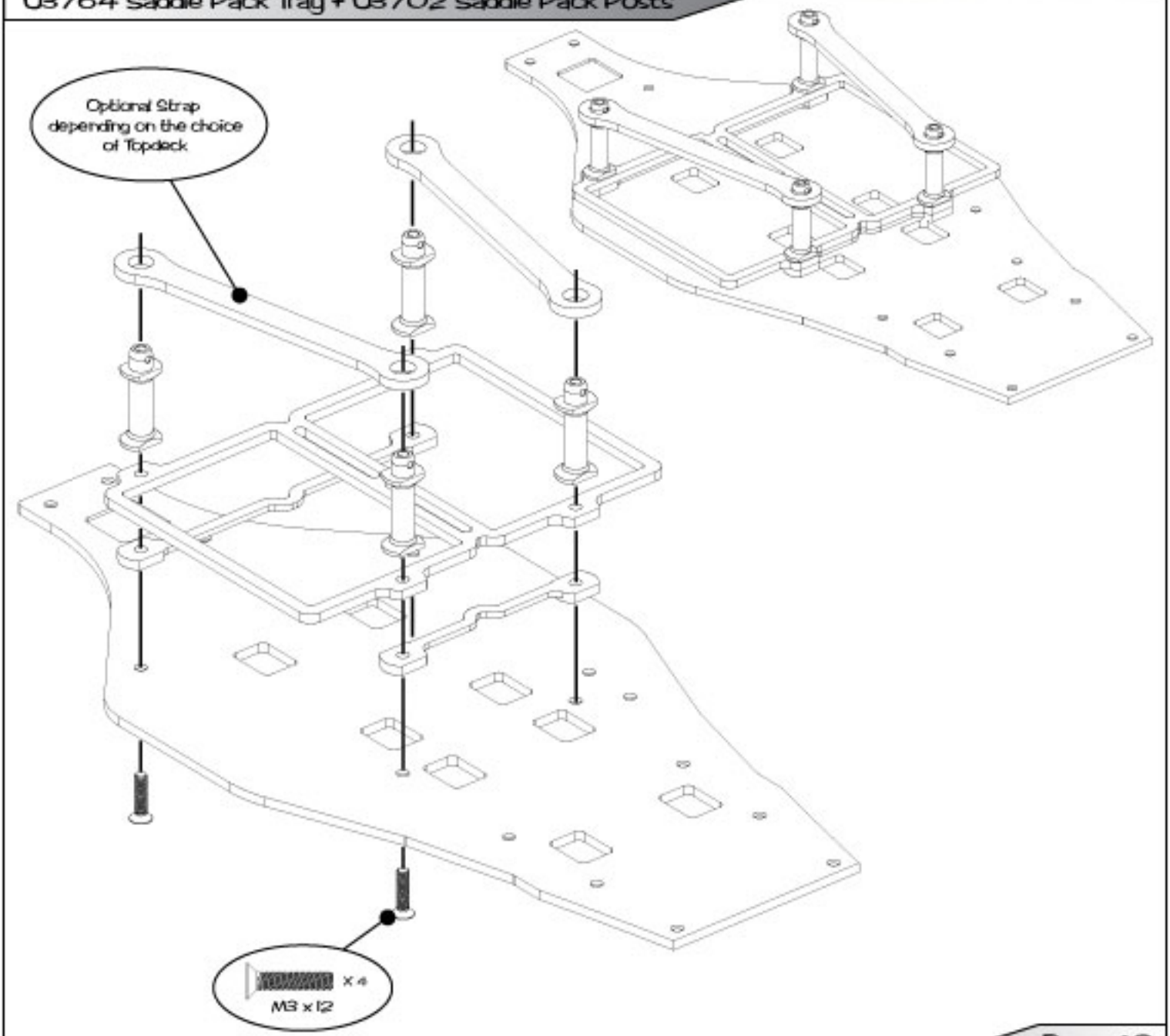
Reverse Rear Shocks



Reverse Rear Shocks

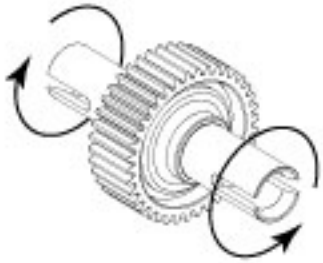


U3764 Saddle Pack Tray + U3702 Saddle Pack Posts



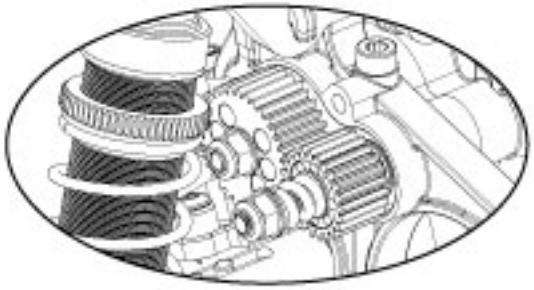
Differential

For consistent performance it is vital that the differential action should be smooth and free. The diff should be adjusted using the recommended settings in the manual. Diff adjustment is not a tuning aid and the diff should never be allowed to slip. A loose diff can usually be recognised by a 'chirping' sound when powering away from turns or landing under power from large jumps. When re building your diff we recommend using a U1954 thrust race and U3019 ceramic nitride balls for ultimate reliability and weight saving.

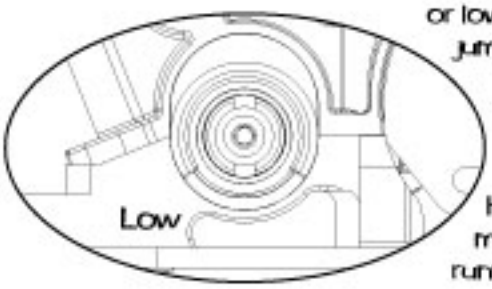


Slipper Clutch

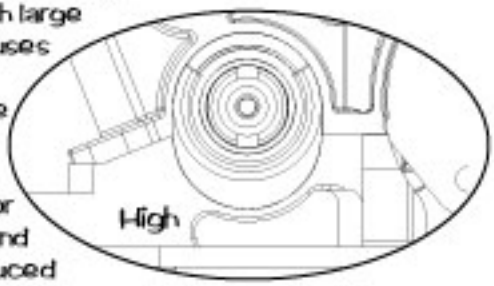
On most tracks it is best to start with the slipper on a tight setting, and gradually loosen the spring tension, until you achieve the most consistent drive away from turns without spinning the car or pulling wheelies. Make sure you still have enough drive when launching the car from the up ramps. WARNING. Do not run the slipper too loose as it could melt the plastic spur gear.



Differential height

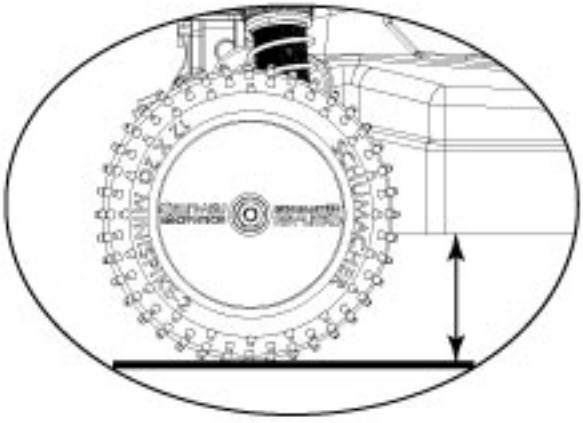


It is possible to run the Cougar with the diff in the high or low position. When running on tracks with large jumps using the diff in the high position causes the driveshaft's to plunge more. The added friction of this can help make the car more stable on landing when under power. This setting could also help with traction on loose surfaces. For most normal tracks we would recommend running the diff in the low position for reduced driveshaft friction.



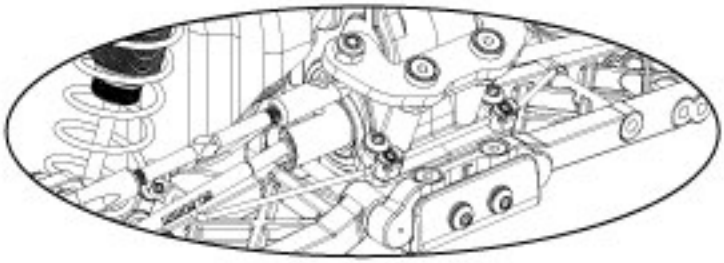
Ride height

Use the spring adjusters on the shock absorbers to adjust the front and rear ride heights. We would recommend setting the ride height to around 20 mm with the car level. This is measured between the bottom of the chassis and the ground with the car in running trim. First press the car down on to the ground and release it once or twice to settle the suspension before adjusting the ride height. The chassis should be level when viewed from the side. Adjusting the spring collars does not increase or decrease the spring stiffness only the preload. So if the suspension needs to be softer or harder change the spring.



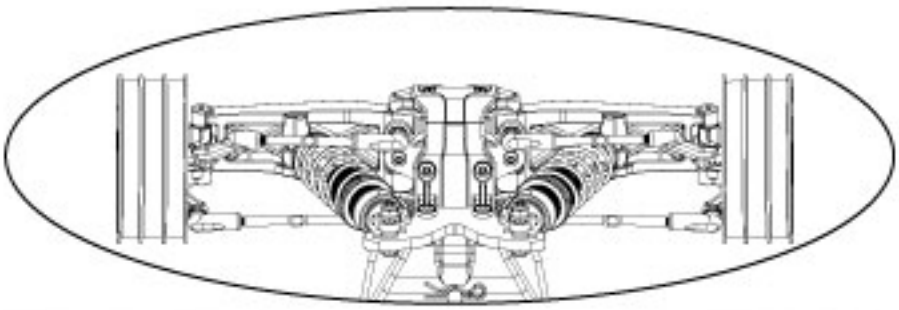
Anti Roll Bar

Anti roll bars are an often overlooked set up aid that allows fine tuning of the suspension without major changes to the shock and spring settings. They are mainly used to add roll stiffness to the car without affecting the handling on bumps and jumps. Running roll bars allows you to run softer suspension on bumpy tracks while reducing the roll in corners thus maintaining stability through the turns.



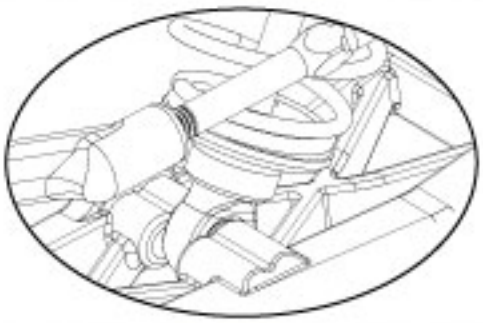
Front Toe In

Front toe in should be set to 0° (both front wheels pointing straight ahead) this will be the best setting for most track conditions. Adding slight toe out will increase initial turn in. Whereas slight toe in will make this initial turn in a little softer.



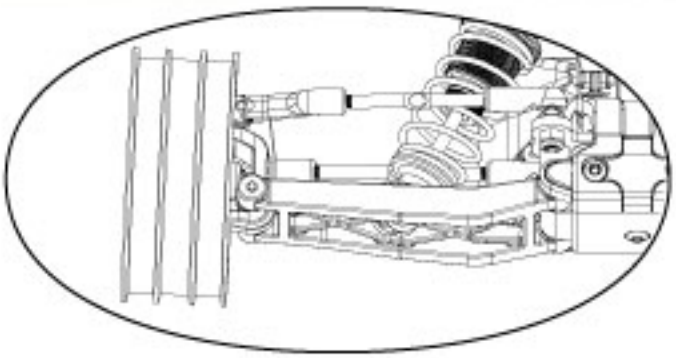
Front Wishbone Shock Mounting Hole

The inboard hole on the wishbone is the standard setting for most tracks. Moving the shock out to the outer hole makes the car less reactive. It decreases the initial turn in and keeps the front of the car flatter through the turns. This setting also makes the front end stiffer and reduces the front suspension travel.



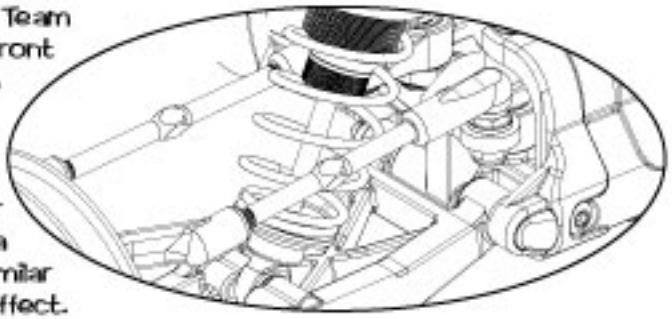
Front Camber

The usual team setting for static front camber is 1° negative at ride height (the top of the wheel is leaning inwards towards the car). Increasing the static camber will generally increase the mid corner steering, whereas decreasing the static camber usually makes the car smoother to drive by reducing the steering response.



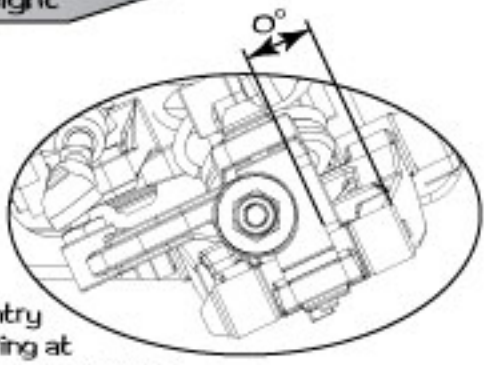
Front Camber Links

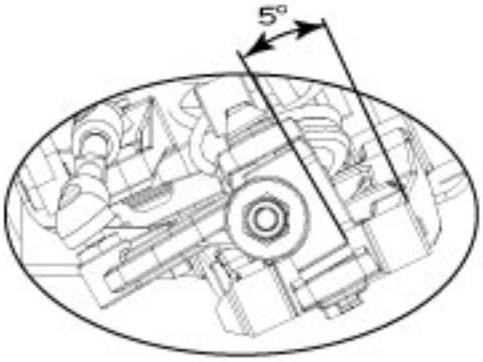
The kit front camber link position and length are what the Team recommend for most tracks. Using a long front link makes the front of the car roll more and will give less steering reaction at high speed. It is also not quite as good on very bumpy tracks. We would probably recommend this on fairly smooth high grip tracks. A shorter front link will make the car roll less and quicken the initial steering response. This is a better choice for bumpy low grip tracks. Lowering the inside ball stud will give a similar result to shortening the link, and raising it will give a similar result to lengthening the camber link, but with less total effect.



Front Yoke and Hub Carrier Height

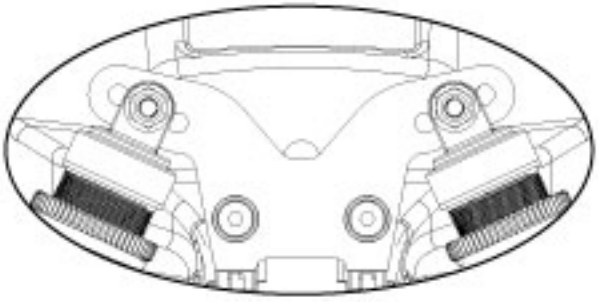
The rake angle (kick up) is 25° on the cougar and needs adding to the castor block angle to get the total castor angle. The standard car uses a 0° castor block making the standard car 25° in total: this can be increased to 30° by using the optional 5° castor block. Using more castor gives better corner entry steering but less power on steering at corner exit, and will make the steering feel a little softer than when using the standard 25° setup.





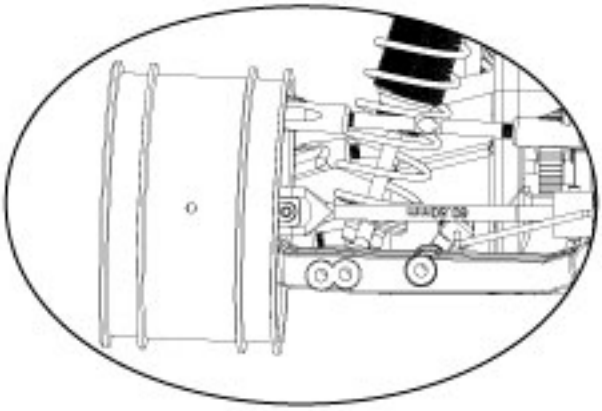
Front Shock Mount

The middle hole on the front shock mount is the most widely used position. Moving the shock to the outer position will make the car react faster and increase the initial steering response, it may however stiffen the suspension which may require an oil and spring change so that the cars suspension feels the same. By moving the shock to the inner hole will soften the suspension and slow down the steering reaction and make the car smoother on bumpy tracks. Again you may need to alter the oil and spring combination to get the suspension correct again.



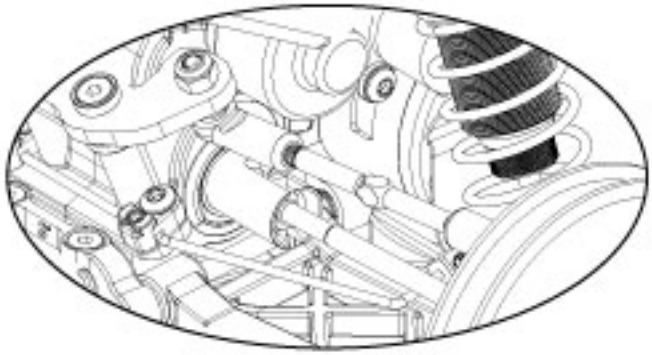
Rear Camber

The usual team setting for static rear camber is 1° negative at ride height (the top of the tyre leaning inwards towards the car). Increasing the static rear camber will increase the traction when exiting the turns, but will be less stable at high speed. Decreasing the camber will reduce stability and traction in the turns but will be more stable at high speed. (Some drivers believe that adding slight positive camber where the tyre leans out at the top away from the car, will improve straight line traction on loose surfaces)



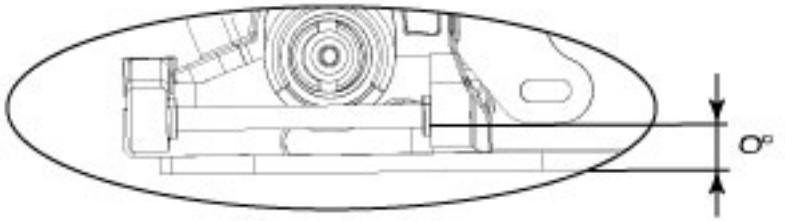
Rear Camber Links

The kit build rear camber link setting is the best compromise for most tracks. This link option gives good stability and straight line traction while allowing the rear of the car to free up on high speed turns. This reduces power on under steer on high grip tracks.
Shortening the rear camber link will make the rear of the car roll less in the corners and square up faster when accelerating away from tight turns. longer links are generally used on high grip tracks and shorter links on low grip tracks. Lowering the inside ball stud will give a similar result to shortening the link, and raising it will give a similar result to lengthening the camber link, but with less total effect.



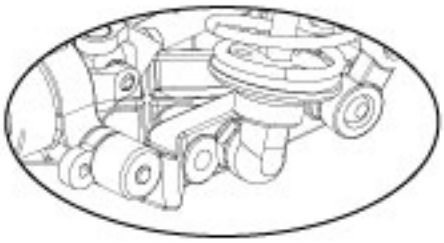
Rear Anti Squat

The standard anti squat is adjustable from 0° to 3°. 0° anti squat allows the suspension to work better over the large bumps but usually gives less power on traction. Adding more antisquat gives more forward traction up to the point where the car starts to pull wheelies. Backing off the dipper is not always an option to compensate for this as good initial bite is needed to clear big jumps. Adding antisquat seems to make the car handle better over small ripples but not so good on the tracks with large bumps. The Team have found that 3° works well on most tracks. And With optional parts this can be increased to 4.5°.



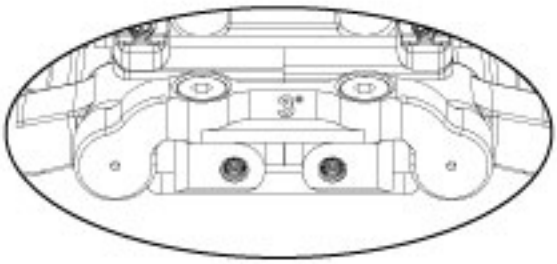
Rear Wishbone Shock mounting Hole

The inner hole works best for most track conditions giving good traction and drive through the turns whilst maintaining good stability over the bumps. Moving to the outer hole on the wishbone will decrease traction but will allow the rear to free up more in the turns. This setting would usually only get used on high grip tracks and when moving the shock out you may have to change the oil and spring settings to get the same suspension feel.

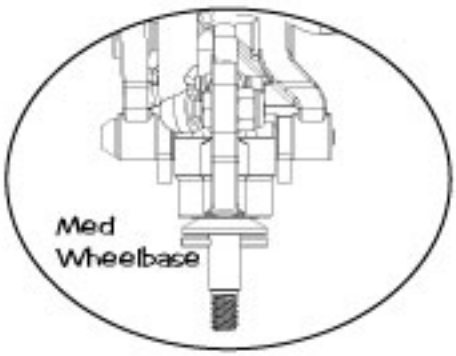


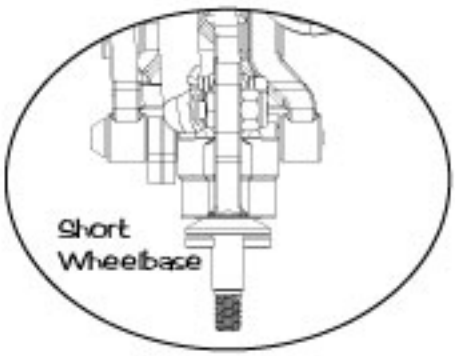
Rear Toe In

The standard rear toe in is 4° this is a good compromise between forward traction and the car binding in the turns. this setting is fine for most tracks. If you are running too much toe in your car may suffer from instability at high speeds. decreasing the toe in will reduce forward traction but will free the car up in the turns. Usually the Team use less toe in on high grip tracks and more for low grip tracks.



Wheelbase Options





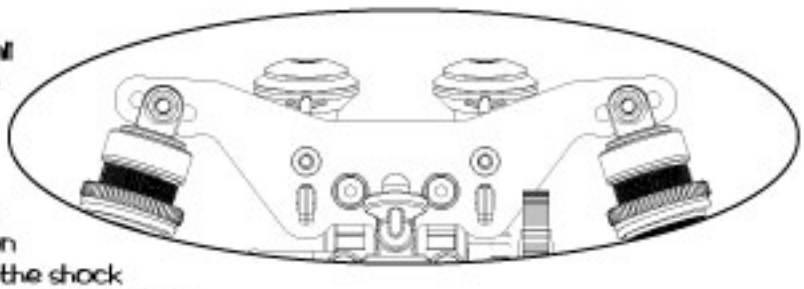
The cougar has 3 wheelbase options, short, med and long. This is adjusted by repositioning the quik clips at the rear hub carrier. Both clips at the rear move the hub forwards for short wheelbase. Both at the front for long wheelbase and one either side for med wheelbase. Running the car in short wheelbase will give more traction at the expense of stability over rough sections of the track. For better stability over the rough section run the car in long wheelbase form this will also free up the car on sweeping sections of the track.

TEAM TIP

Swapping the front wishbones from left to right gives a wheelbase increase of 1.5mm, but this also changes the steering Ackerman slightly and reduces front end grab when turning in off power.

Rear Shock Mount

The middle hole on the shock mount gives best all round results. Moving the shock to the outer hole will stiffen the suspension and increase the reaction of the steering. The downside is less compliance over bumpy sections of the track. Moving the shock to the inboard position softens the suspension and will slow the steering reaction making the car smoother over the bumps. Moving the shock to these holes may require an oil or spring change to maintain the suspension performance.



Traditionally 2WD cars from the USA have always used an internal ratio between 2.4:1 and 2.6:1.
The Standard Cougar Ratio is 2.6:1 with the option to run either 2.4:1 or 2.8:1 with optional parts.
One advantage of these interchangeable ratio's is that it is possible to adjust the motor position whilst maintaining the same overall gearing.

2.8 : 1

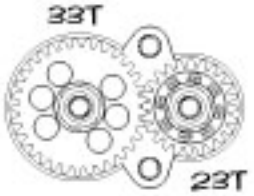
We Class this as a High inertia ratio, as the layshaft for the same overall gearing will be rotating faster than the other available ratios. This will give you a smooth driving transmission, spooling up and down without major reactions from throttle input. Good for loose surfaces.

	16	17	18	19	20	21	22	23	24	25	26	27	28
83	14.51	13.65	12.90	12.22	11.61	11.05	10.55	10.09	9.67	9.28			
82	14.33	13.49	12.74	12.07	11.47	10.92	10.42	9.97	9.55	9.17	8.82		
81		13.32	12.58	11.92	11.33	10.79	10.30	9.85	9.44	9.06	8.71	8.39	
80			12.43	11.77	11.19	10.65	10.17	9.73	9.32	8.95	8.60	8.29	7.99

Tooth Sum 98 Minimum 108 Maximum

2.6 : 1

We Class this as a Medium inertia ratio, as the layshaft for the same overall gearing will be rotating at speeds between the other available ratios. This will result in a transmission that has a good balance of sharp response and smooth transmission.
This Kit Ratio is Reccomended for most applications



	16	17	18	19	20	21	22	23	24	25	26	27	28
83	13.47	12.68	11.97	11.34	10.77	10.26	9.80	9.37	8.98	8.62			
82	13.31	12.52	11.83	11.20	10.65	10.14	9.68	9.26	8.87	8.52	8.19		
81		12.37	11.68	11.07	10.51	10.01	9.56	9.14	8.76	8.41	8.09	7.79	
80			11.54	10.93	10.39	9.89	9.44	9.03	8.65	8.31	7.99	7.69	7.42

Tooth Sum 98 Minimum 108 Maximum

2.4 : 1

We Class this as a Low inertia ratio, as the layshaft for the same overall gearing will be rotating Slower than the other available ratios. This will result in a faster reacting transmission, with sharper responses to throttle and brake input. Good for High Grip situations.

	16	17	18	19	20	21	22	23	24	25	26	27	28
83	12.52	11.78	11.13	10.54	10.01	9.54	9.10	8.71	8.34	8.01			
82	12.37	11.64	10.99	10.41	9.89	9.42	8.99	8.60	8.24	7.91	7.61		
81		11.50	10.86	10.29	9.77	9.31	8.88	8.50	8.14	7.82	7.52	7.24	
80			10.72	10.16	9.65	9.19	8.77	8.39	8.04	7.72	7.42	7.15	6.89

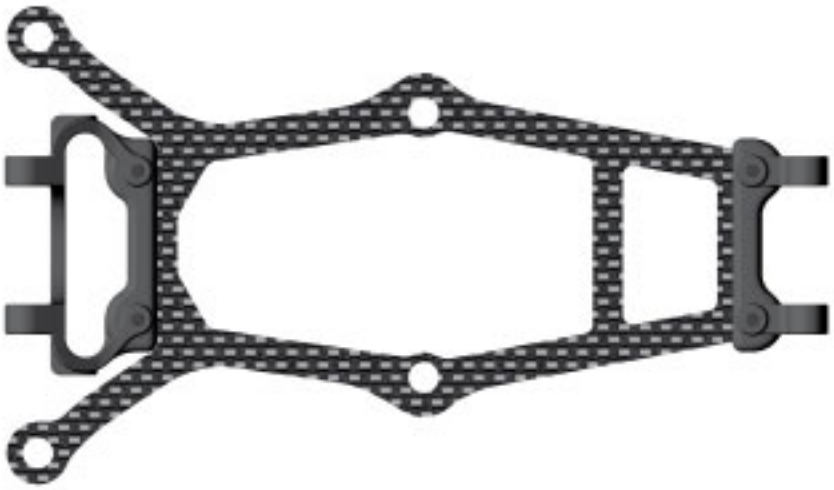
Tooth Sum 98 Minimum 108 Maximum

Speed Secrets

U3345 Gear: CNC 32T Idler
U3346 Gear: CNC 33T Idler (kit)
U3347 Gear: CNC 34T Idler

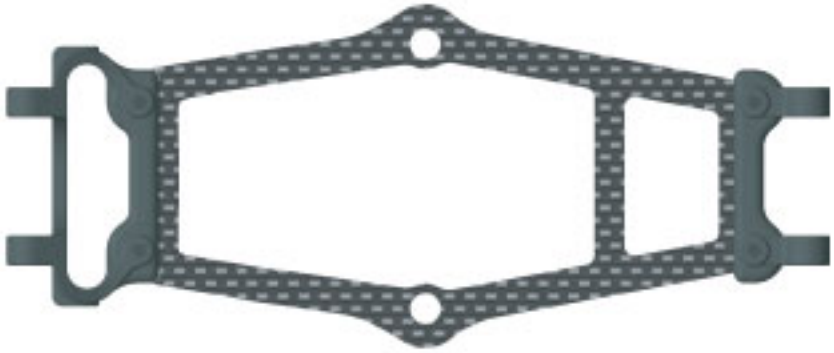
U3342 Gear: CNC 22T Layshaft
U3343 Gear: CNC 23T Layshaft (kit)
U3344 Gear: CNC 24T Layshaft

U3698 CF Top Deck: Stiff - Cougar SV



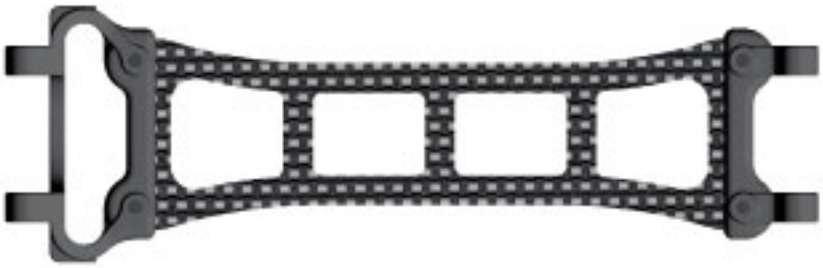
This Kit Standard Top Deck is mainly used on high grip surfaces where minimum chassis flex is desirable. This Top Deck can be retained by location only, R'clips or for maximum rigidity by screws and caps.

U3762 CF Top Deck: Med - Cougar SV



This Med Flex Top Deck works well on Medium grip surfaces, offering more flex than the Stiff Top Deck but can still be retained by location only, R'clips or screws and caps.

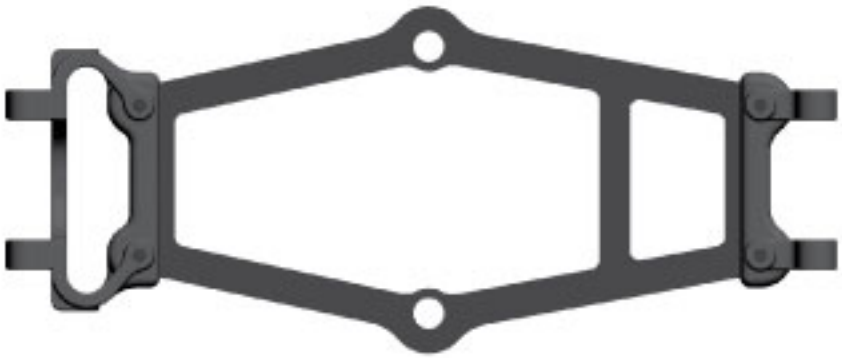
U3763 CF Top Deck: Soft - Cougar SV



This Soft Flex Top Deck has been used by the Team very successfully for indoor races, it also works well on outdoor tracks where there is low grip or on damp Astro turf tracks.

SI Topdeck Options

U3700 Top Deck SI - Cougar SV



This Kit SI Top Deck works well on Medium grip surfaces, it is stiffer than the Soft Carbon Top Deck yet more flexible than the Med Carbon Top Deck but can still be retained by location only, R'clips or screws and caps.