

750 MATRIX

GP 1/10 scale onroad

INSTRUCTION
MANUAL



SERPENT
INNOVATIONS

INTRODUCTION

Thank you very much for selecting this Serpent rc car and thus become a member of the ever growing worldwide Serpent racing family. Serpent started in 1980 and has been growing its product-line and fan-base ever since.

The Serpent Matrix 750 is a state of the art gaspowered 1/10 scale onroad racing car. The assembly manual will guide you through all the steps to complete the car, so you can hit the track with a good base-set-up soonest. The Serpent design department succeeded to create a superbly performing car combined with ease of assembly and maintenance. The high quality standards of all parts and hardware will make racing your Serpent car a very rewarding activity !

Through our team, website and social media we will keep you up-to-date on all developments of the Serpent cars. We hope to meet you on the track and through our various media!
Enjoy the drive !

Team Serpent
Multiple World Champions

INSTRUCTIONS

Serpent's long tradition of excellence extends to the instruction manuals, and this instruction manual is no exception. The easy-to-follow layout is richly illustrated with 3D-rendered full-color images to make your building experience quick and easy. Following the instructions will result in a well-built, high-performance race-car that will soon be able to unleash its full potential at the racetrack. The kit includes bags, with bag numbers, which refer to the same step in the manual. Open only the indicated bag(s) per step and finish that part of the assembly. Remaining parts will be needed later on in the assembly process.

PLASTIC PARTS

The Serpent moulded parts are very durable and hard. When assembling longer screws in new composite parts, make sure to use new hex bits in your (power) tools. Pre-threading also helps to avoid screw damage.

SETUP

In certain assembly steps you need to make basic adjustments, which will give you a good initial setup for your Serpent Matrix 750. Fine-tuning the initial setup is an essential part of building a high-performance racecar like your Serpent Matrix 750.

EXPLODED VIEWS AND PARTS LIST

The exploded views and parts lists for the Serpent Matrix 750 are presented in the Reference Guide section in the back of this manual. The exploded views show all the parts of a particular assembly step along with the Serpent part number and hotlink to the Serpent website. Part numbers in orange indicates that this part is an optional. Optionals part names and numbers are showed below.

CUSTOMER SERVICE

Serpent has made a strong effort to make this manual as complete and clear as possible. Additional info may be published in our website: www.serpent.com or you may ask your dealer or the Serpent distributor for advice, or email Serpent direct: info@serpent.com. The Serpent Facebook, Twitter and Youtube pages give additional means of support and communications.

SAFETY

Read and take note of the 'Read this First section' before proceeding to assemble the car-kit. This car-kit is intended for persons aged 16 or older.

READ THIS FIRST!

- This is a highly technical hobby product, intended to be used in a safe racing environment. This car is capable of speeds in excess of 80 km/h or 50mph. Please follow these guidelines when building and operating this model.
- Parental guidance is required when the builder/user of this car is under 16.
- Follow the building instructions. If in doubt, contact your dealer or importer.
- Be sure to use the proper tools when assembling the car. Always exercise caution when using electric tools, knives and other sharp objects.
- Be careful when using liquids like lubrication oil, fuel or glue. Do not swallow.
- Follow the manufacturer's instruction in case you experience irritation after using the product.
- Be careful when operating the car. Stay away from any rotating parts such as wheels, gears and transmission. Stay away from motor, engine and exhaust pipe system or speedo during and immediately after use, as these parts may be very hot. We advise to use protective hand gloves.
- Only operate this car in a safe environment, like a special racing track or a closed parking lot. Avoid using this car on public roads, crowded places or near infants.
- Before operating this car, always check the mechanical status of the car. Also check that the transmitter and receiver frequencies correspond and are not used by any other racer at the same time. Check that the batteries of the transmitter and receiver- are fully charged.
- After use, always check all the mechanics of the car. We advise to clean the car immediately after use, and inspect the parts for wear or fractures. Replace when necessary. Do not use water, methanol, thinner or other solvents to clean the car.
- Empty the fuel tank (depending on model) if needed and disconnect the receiver battery.
- Store the car in a dry and heated place to avoid corrosion of metal parts.
- Avoid using this car in wet conditions as the water will cause corrosion on the metal parts and bearings and these parts will cease to function properly. If driven in the wet, ensure that all the electric equipment is waterproofed and after use, that all moving parts are dried immediately.

CONTENTS

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750
MATRIX

LINES DESCRIPTION

Each step contains a variety of numbers, lines, and symbols. The numbers represent the order in which the parts should be assembled. The lines are described below.



Step number; the order in which you should assemble the indicated parts



Length after assembly



Assembly path of one item into another



Group of items (within lines) should be assembled first



Direction the item should be moved



Glue one item to another



Press/Insert one item into another



Connect one item to another



Gap between two items

ICONS DESCRIPTION

Each step contains a variety of symbols described below.



Carefull, read and check very well.



Apply a small amount of cyano glue. Use protection for eyes and hands.



Detail view to explain assembly or order of parts better.



Default set-up: This symbol indicates the default setup.



Grease: apply a small amount of grease to the parts shown.



Silicone grease: apply a small amount of grease to the parts shown.



Left and right parts should be assembled in the same way.



Thread lock: apply a small amount on the parts shown. Before applying the threadlock, make sure to degrease the parts very well, as otherwise the threadlock will not work.



Silicone oil: use the indicated silicone oil for the shocks and differentials.



Parts or items not included in the kit.

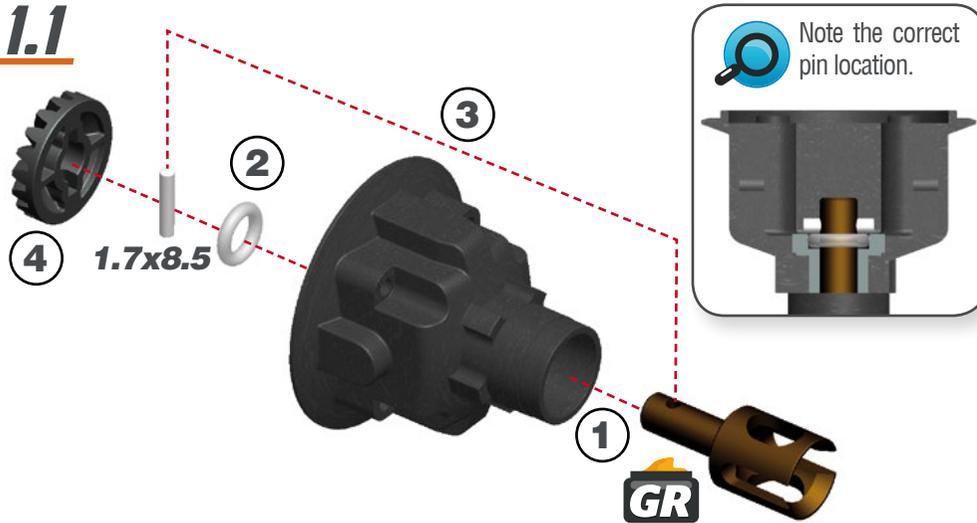


Optional part, not standard in the kit.

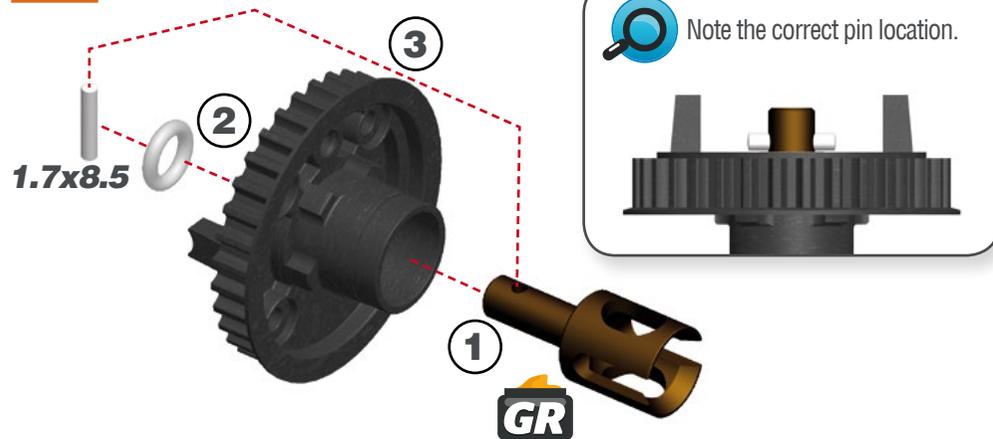
STEP 1

FRONT DIFF BAG

1.1



1.2



1.75x8.5

STEP 2

2.1

Add just enough oil to cover the large gear before assembling the small satellite gears and cross pins.

For the correct cst value please check the default setupsheet.



2.2



4x10x0.2

STEP 3

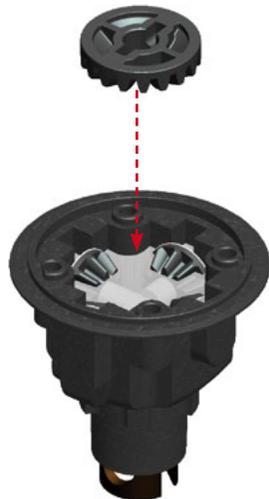
3.1

! Fill the differential with silicone oil 1 mm above the crosspin, do NOT overfill. For the correct cst value please check the default setupsheet.



3.2

! Add the big gear.

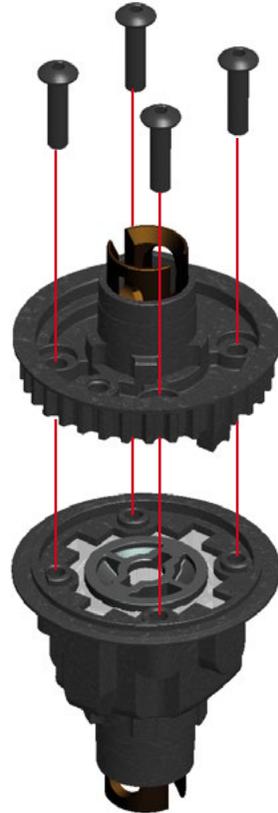


STEP 4



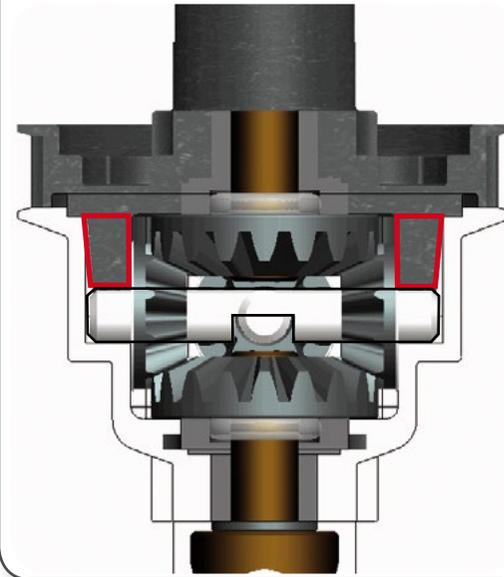
Mount the diff top-case on the lower case, make sure to follow below Detail View, and tighten the screws.

M2.5x10



HOW TO CLOSE THE FRONT DIFF

The front diff top case has two protrusions (see below picture in red) to hold the gear/diff shafts in the correct position. The two protrusions press on the upper shaft and thus secure the shafts in position.



STEP 5

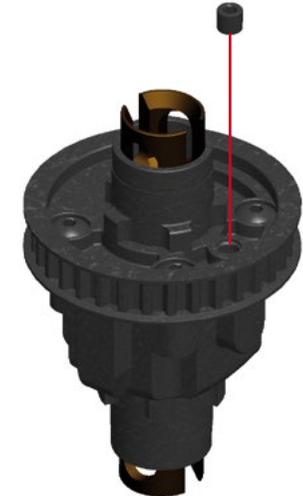


1- Allow the excess of oil to escape through the escape hole.

2- Close the hole with the 3x3 setscrew. Tighten carefully.

3- In case the diff feels too hard remove the M3x3 set screw and let some oil escape and close again. Tighten carefully.

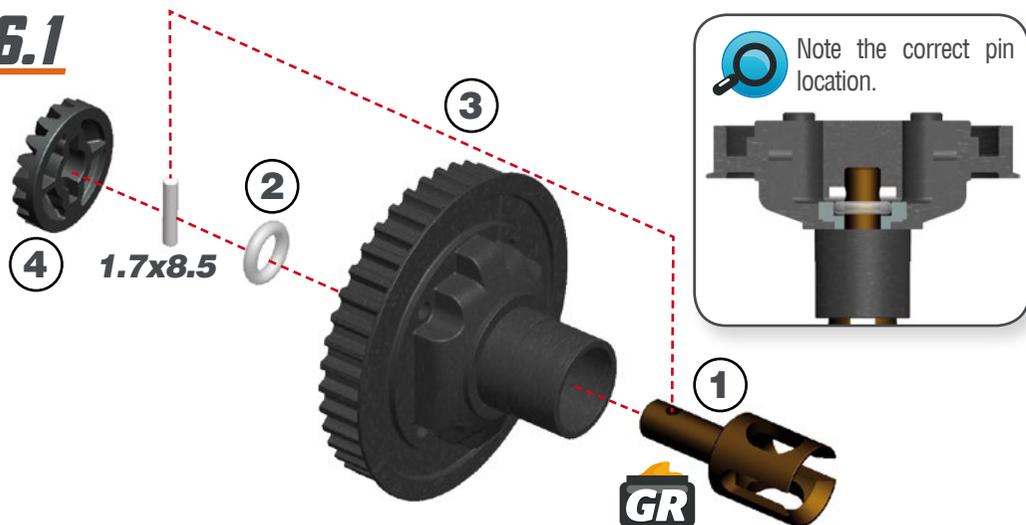
M3x3



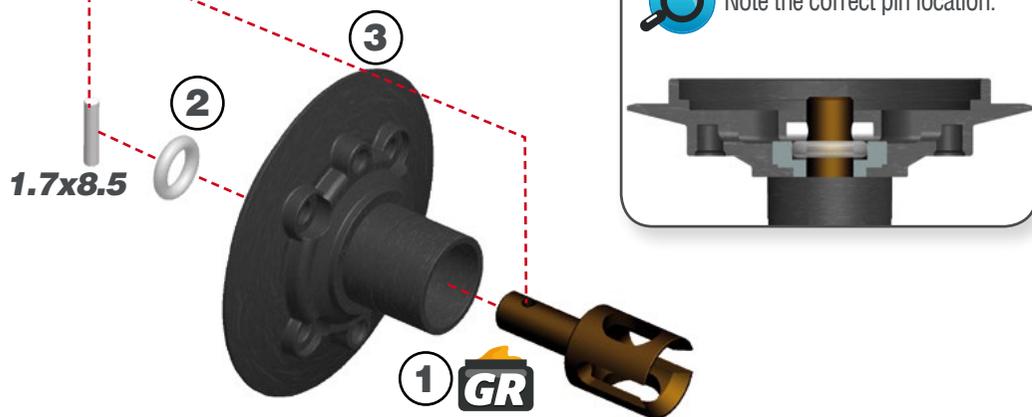
STEP 6

REAR DIFF BAG

6.1



6.2



1.75x8.5

STEP 7

7.1

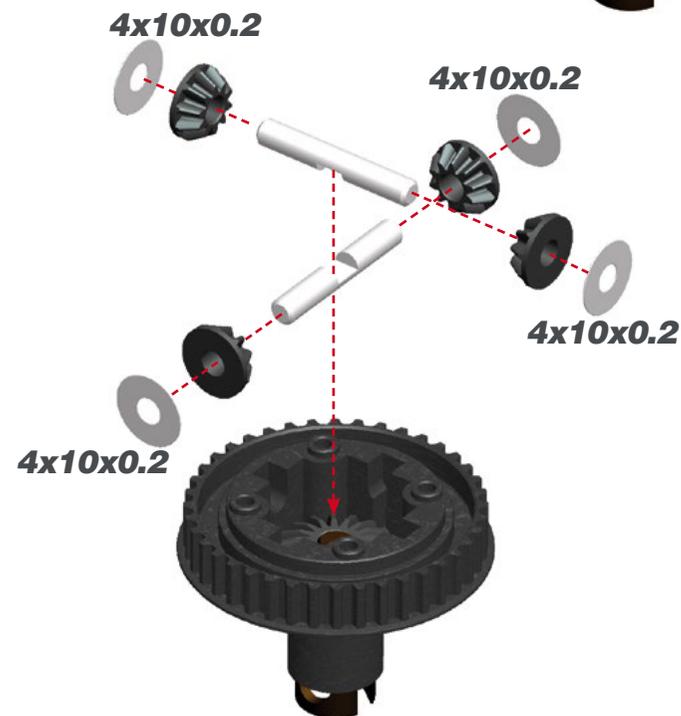
Add just enough oil to cover the large gear before assembling the small satellite gears and cross pins.

For the correct cst value please check the default setupsheet.

SO



7.2



4x10x0.2

STEP 8

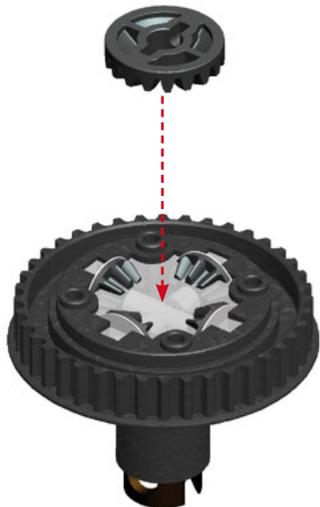
8.1

! Fill the differential with silicone oil 1 mm above the crosspin, do NOT overfill. For the correct cst value please check the default setupsheet.



8.2

! Add the big gear.

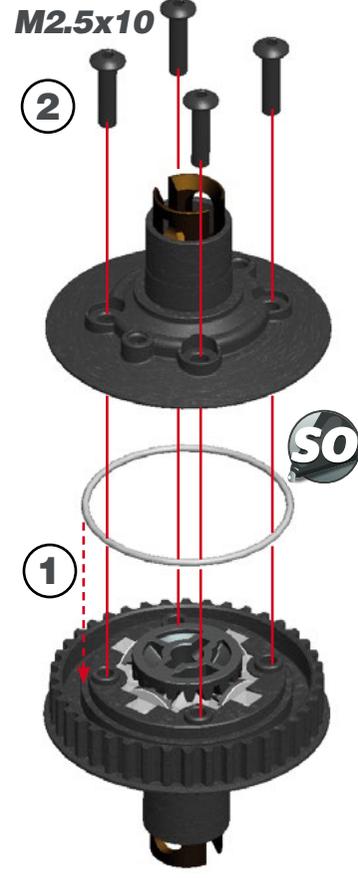


STEP 9



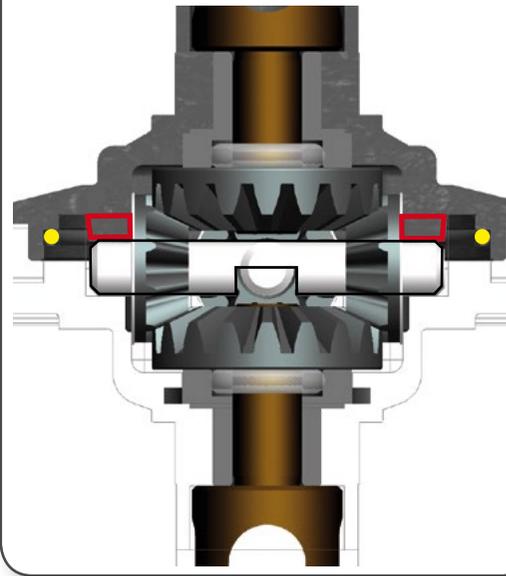
1- Fit the o-ring (see detail view picture in yellow) in the slot of the bottom case using some silicone oil to hold it in position.

2- Mount the diff top-case on the lower case, make sure to follow below Detail View, and tighten the screws.



HOW TO CLOSE THE REAR DIFF

The rear diff top case has two protrusions (see below picture in red) to hold the gear/diff shafts in the correct position. The protrusion should hold the upper shaft as it will hold the bottom shaft.



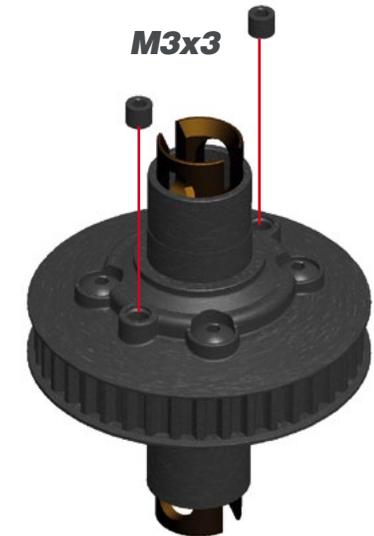
STEP 10



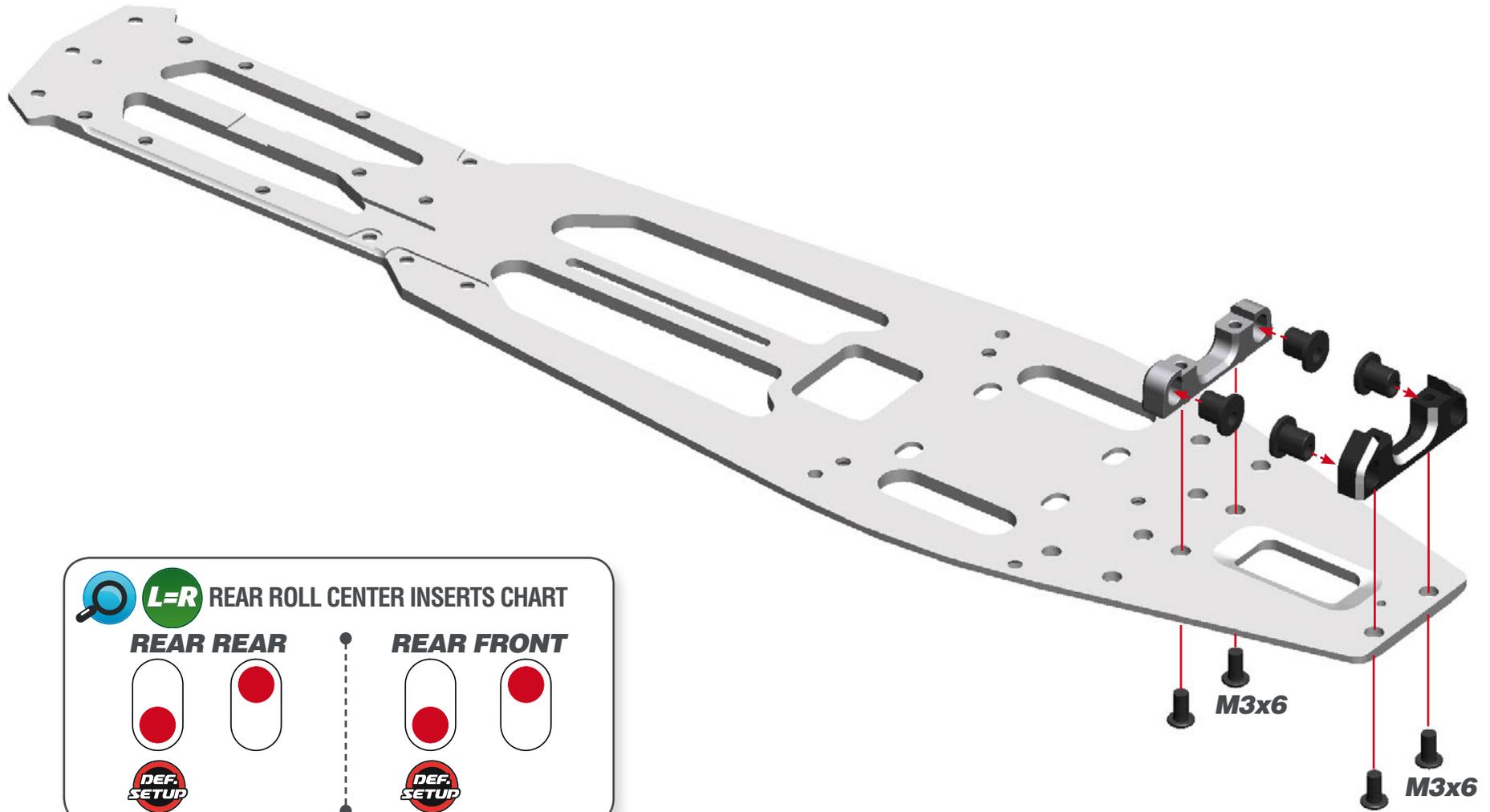
1- Allow the excess of oil to escape through the escape holes.

2- Close the holes with the 3x3 setscrews. Tighten carefully.

3- In case the diff feels too hard remove the M3x3 setscrews and let some oil escape and close again. Tighten carefully.



STEP 11 BAG 1



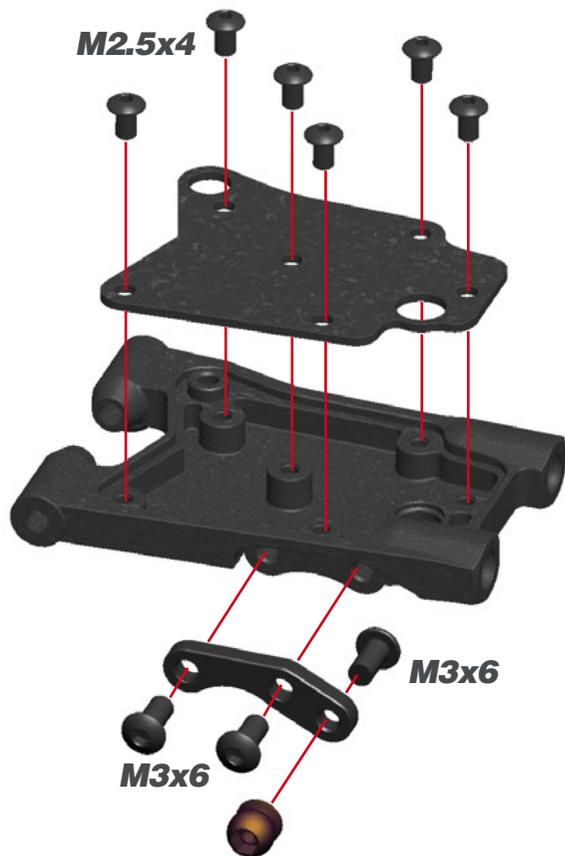
 **L=R** REAR ROLL CENTER INSERTS CHART

REAR REAR		REAR FRONT	
			
			

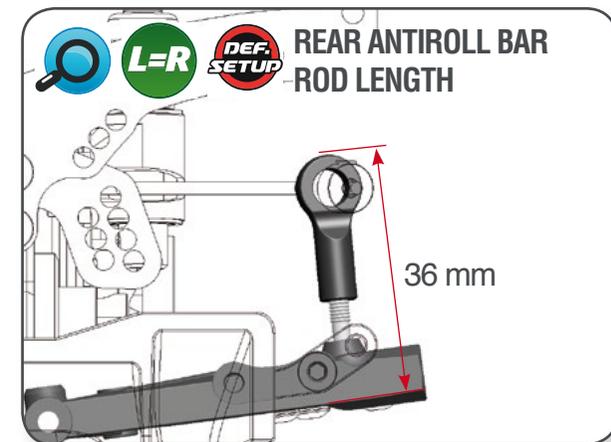


STEP 12

12.1

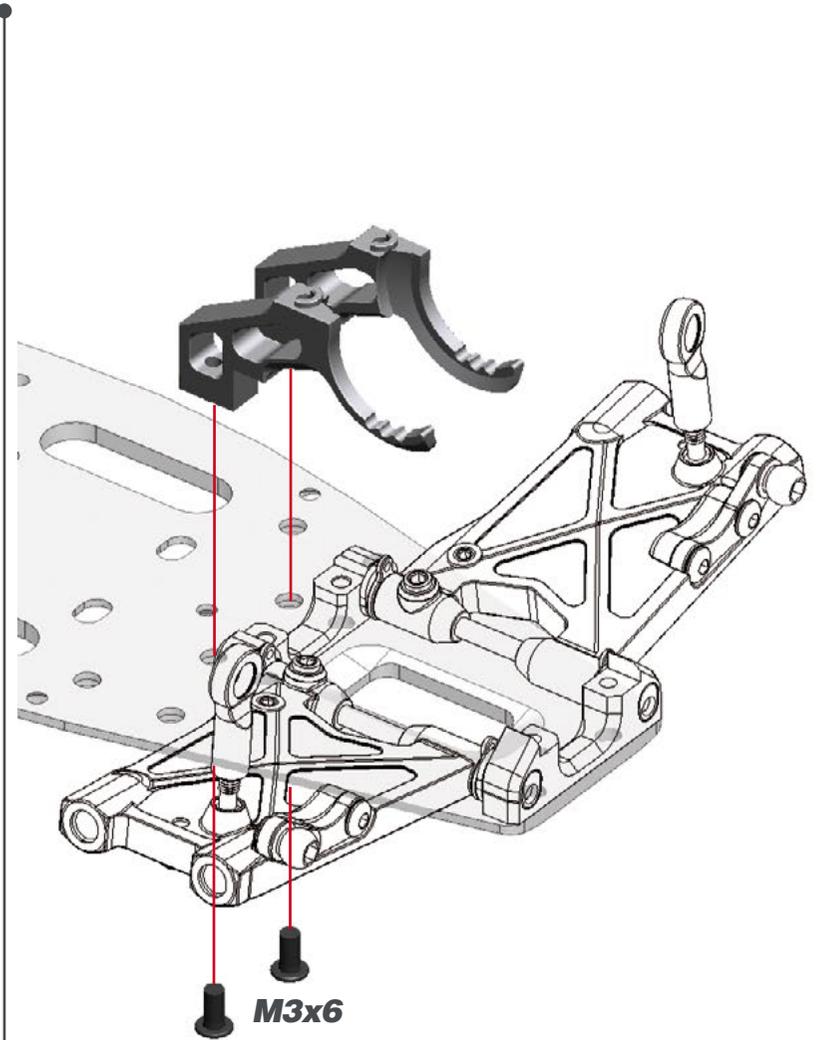
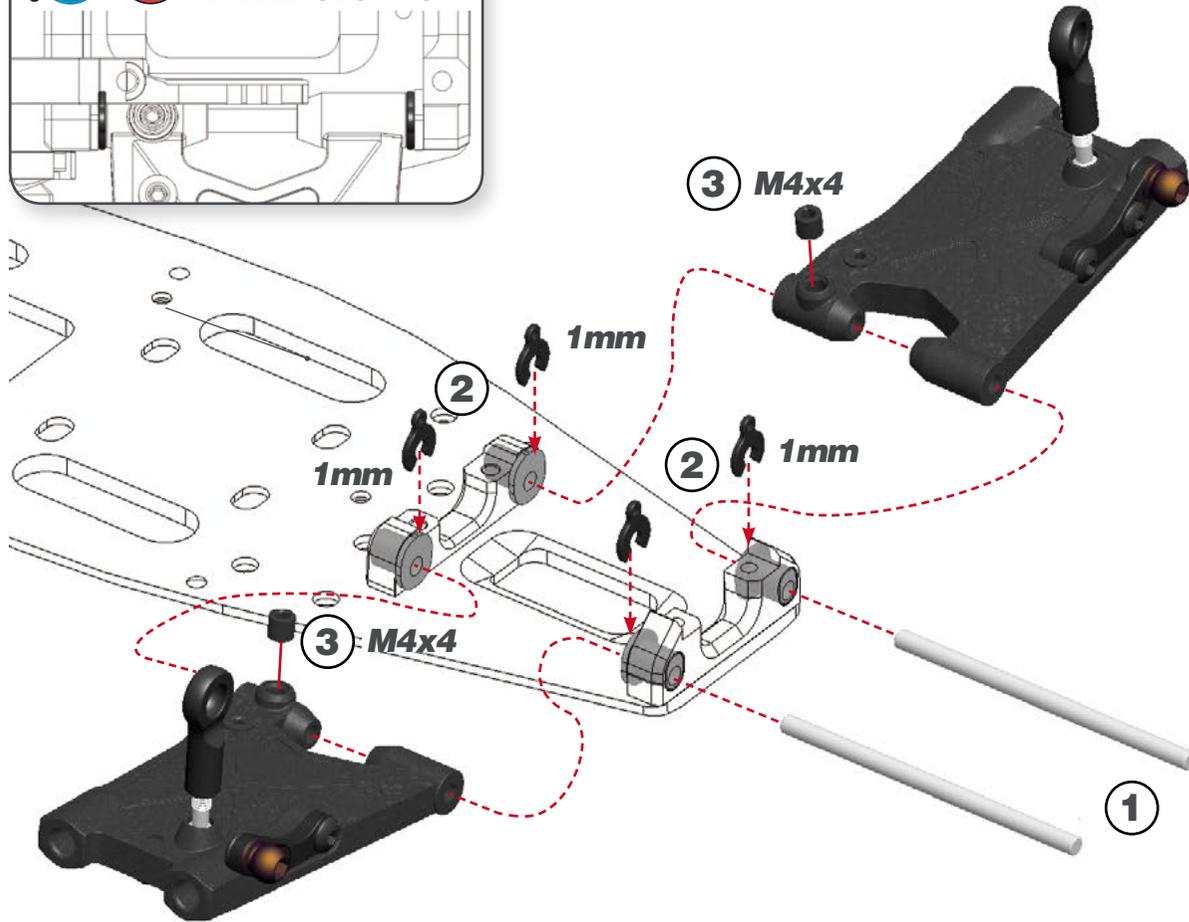
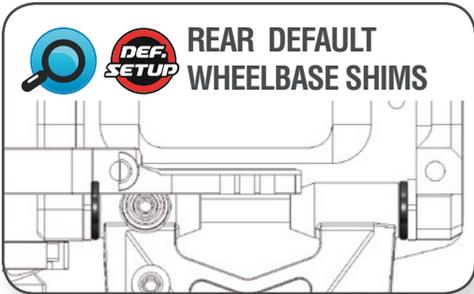


12.2



STEP 13

STEP 14 **BAG 2**

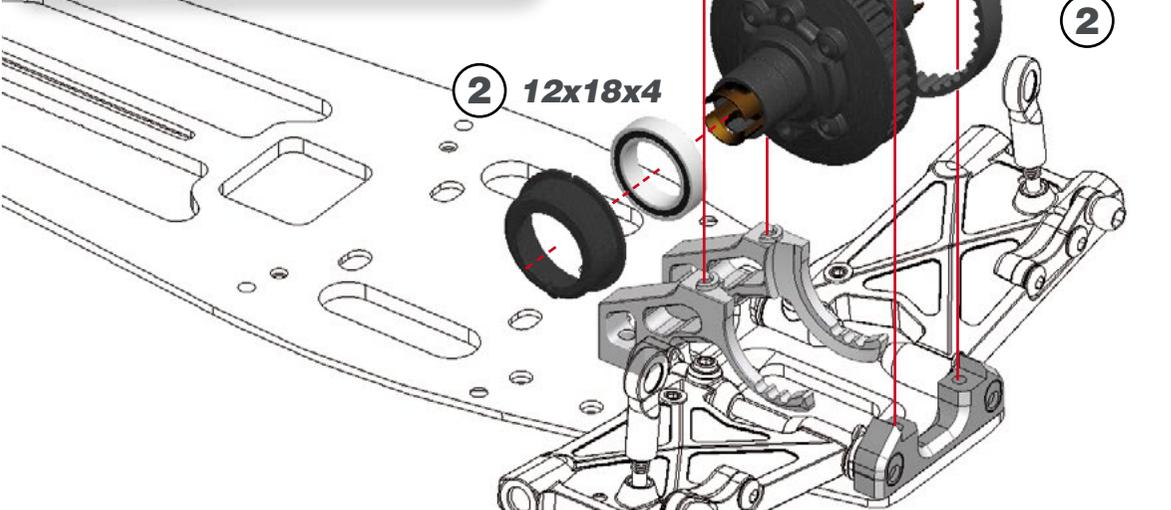
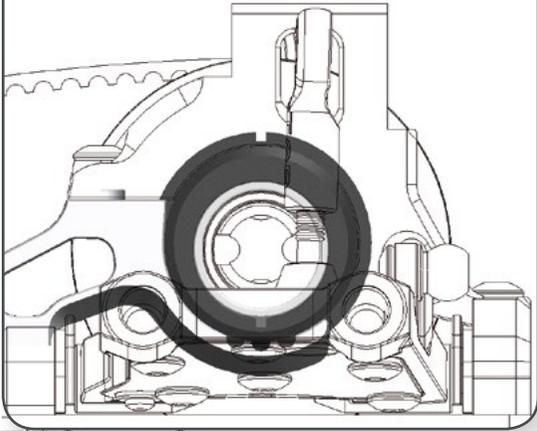


STEP 15

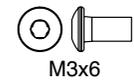
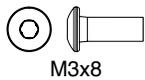
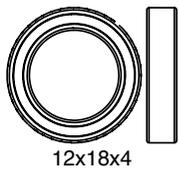
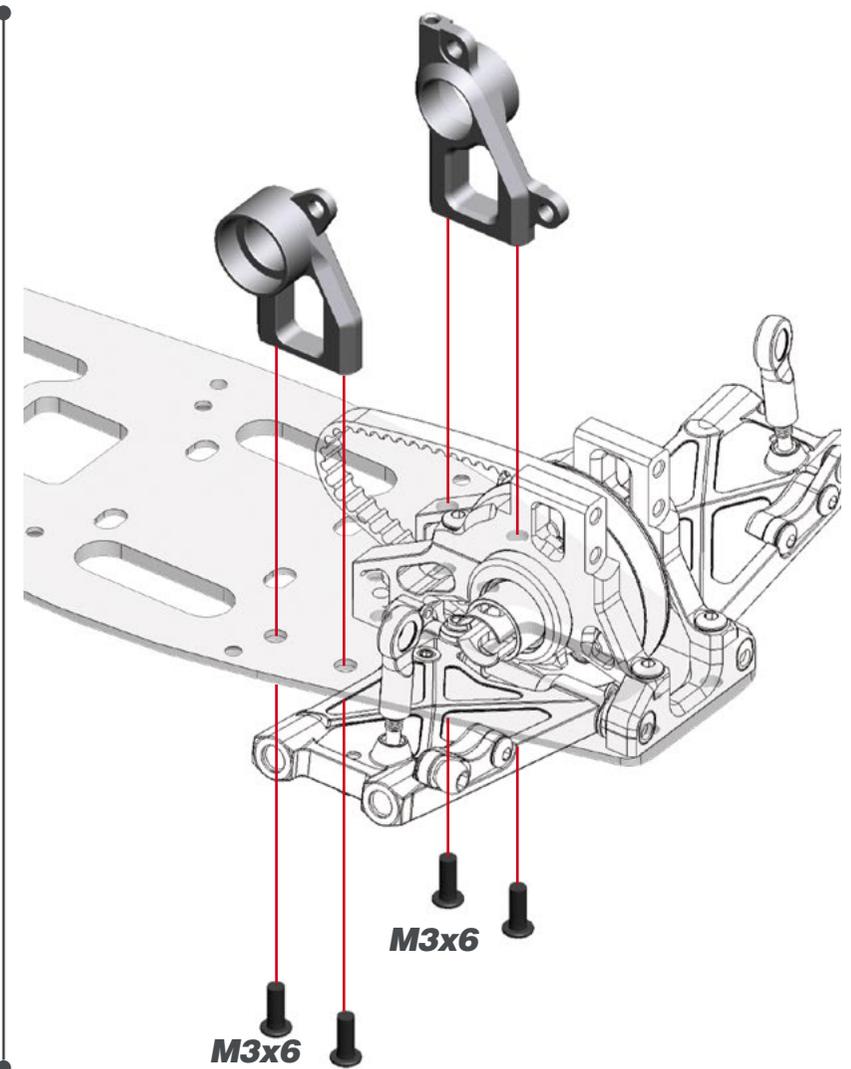


REAR BELT TENSION

Use the central slot as starting position.

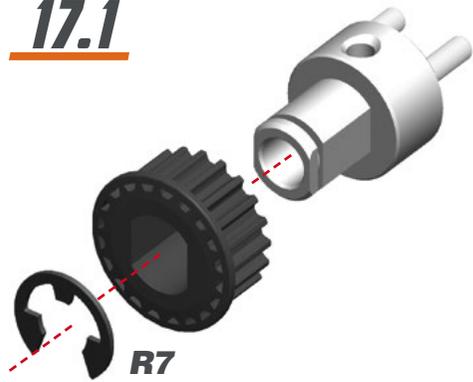


STEP 16

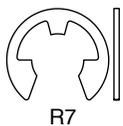
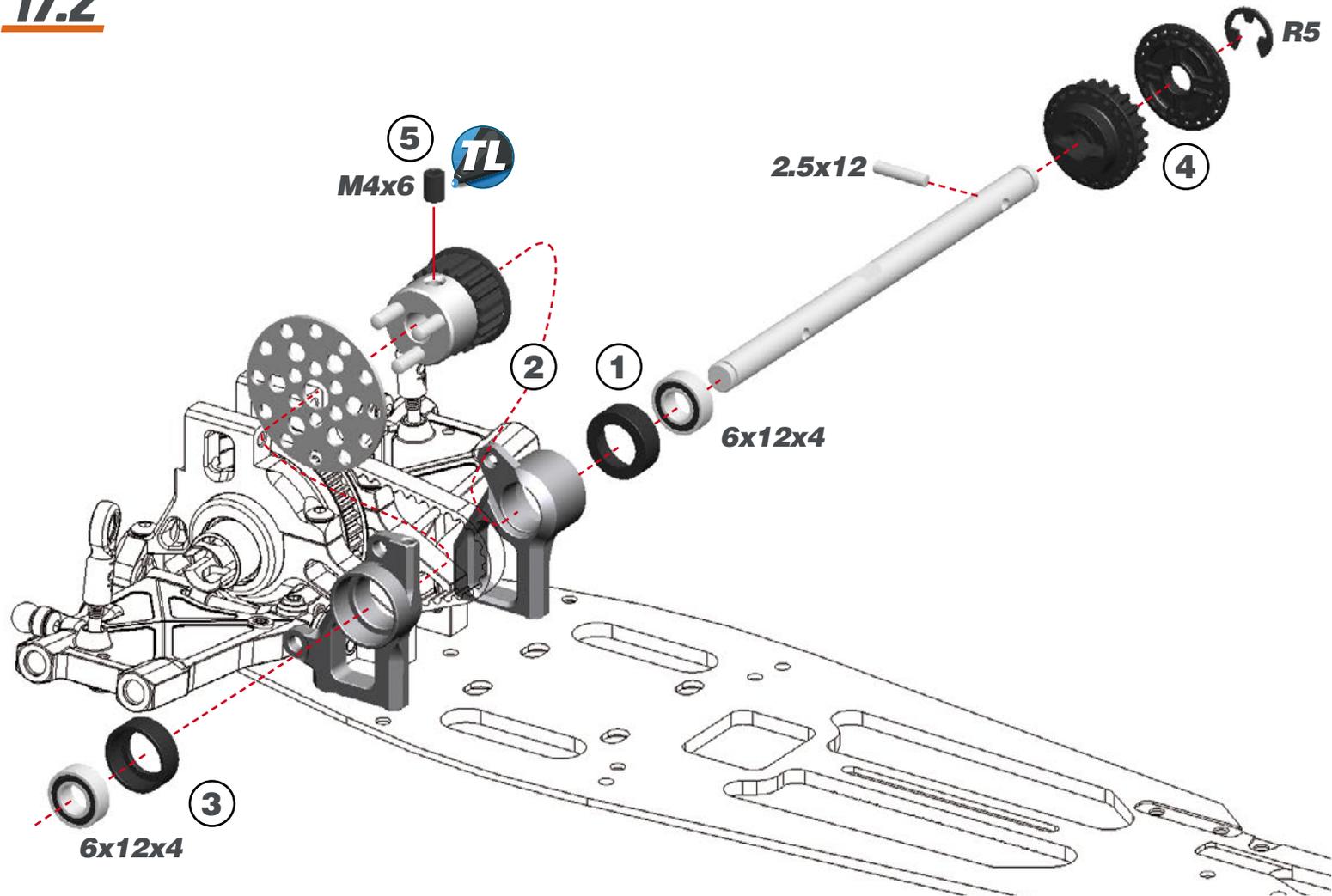


STEP 17 **BAG 3**

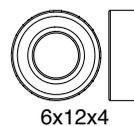
17.1



17.2



R7



6x12x4



2.5x12



M4x6



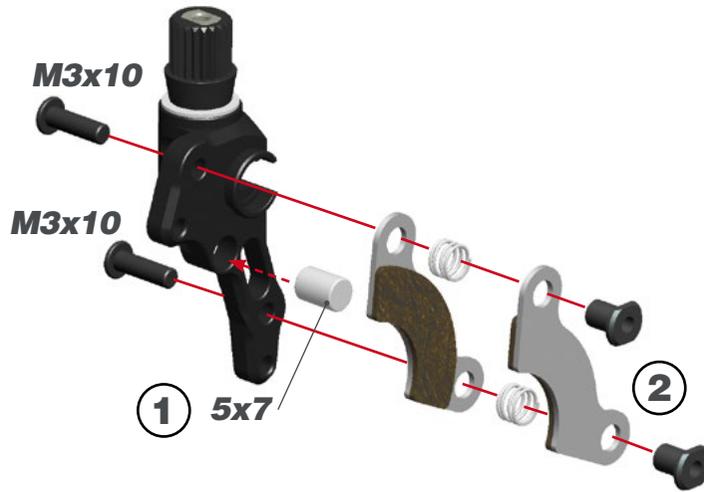
R5

STEP 18

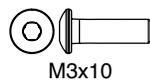
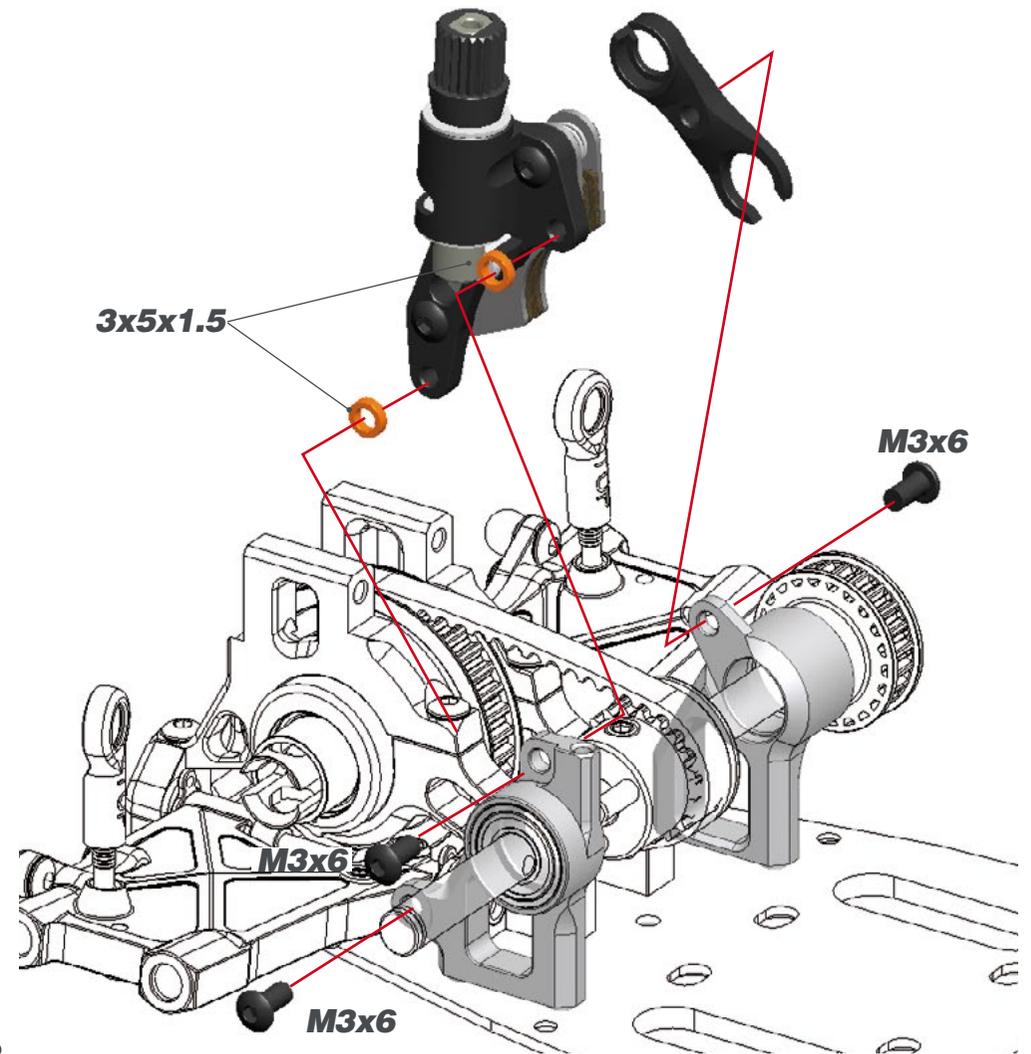
18.1



18.2



STEP 19

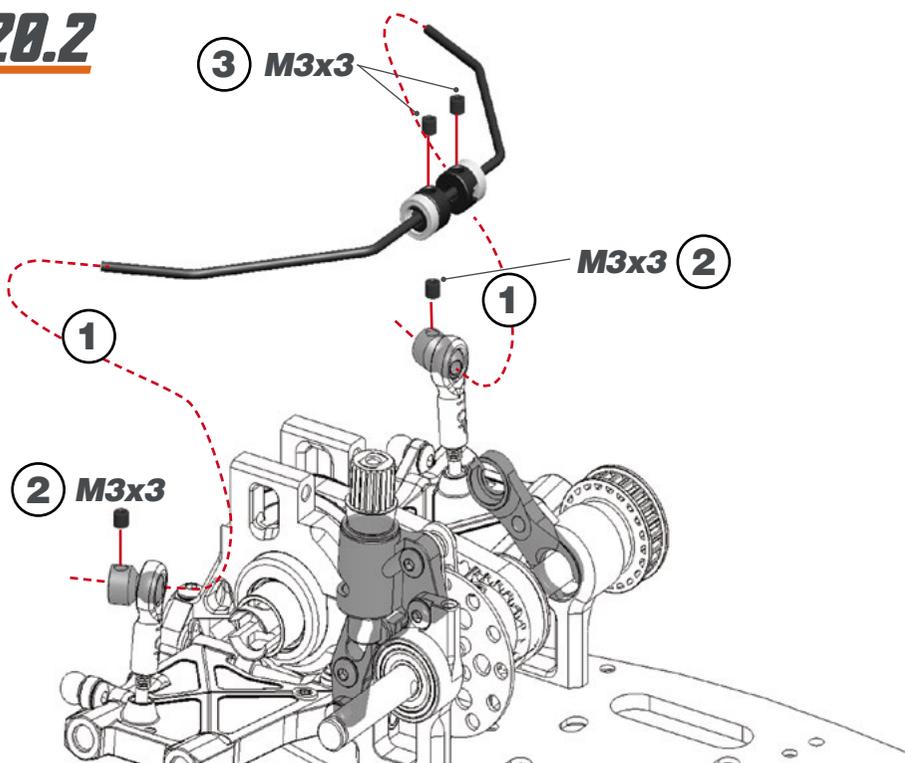


STEP 20

20.1

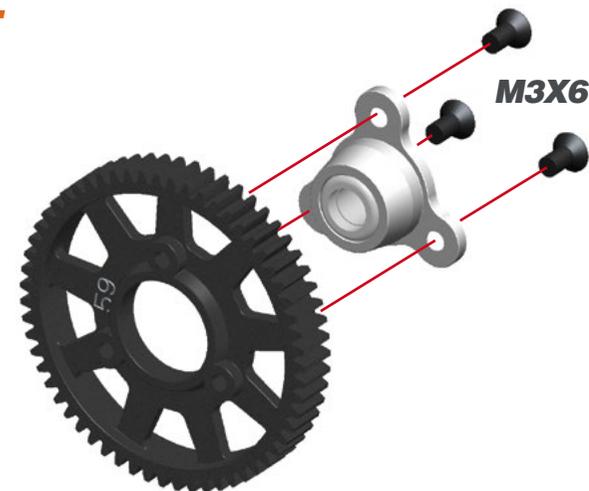


20.2

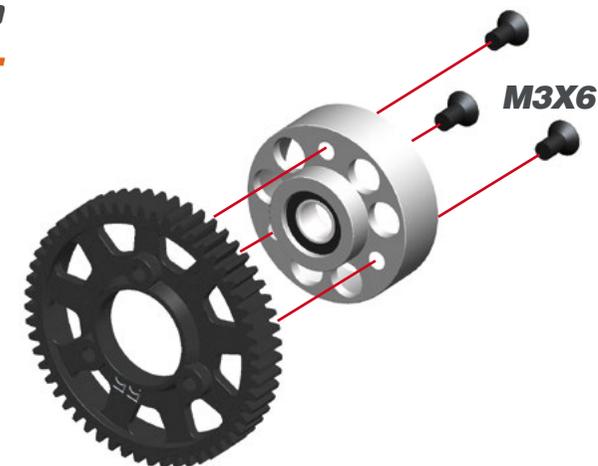


STEP 21 **BAG 4**

21.1

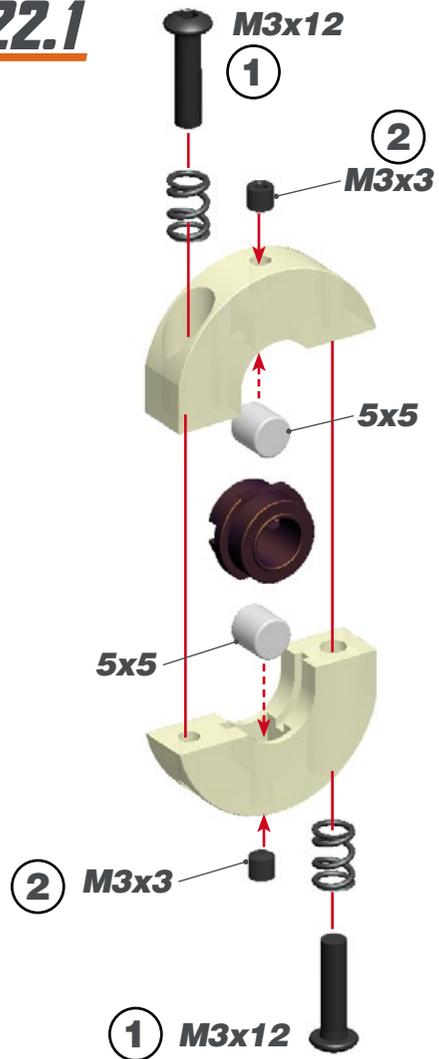


21.2

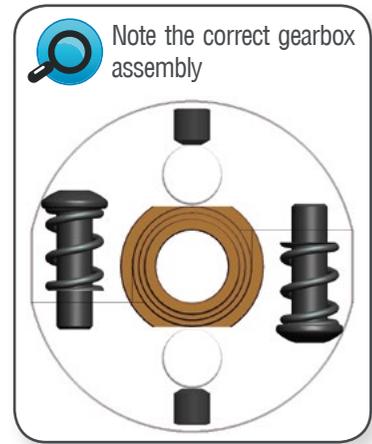


STEP 22

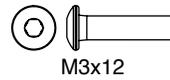
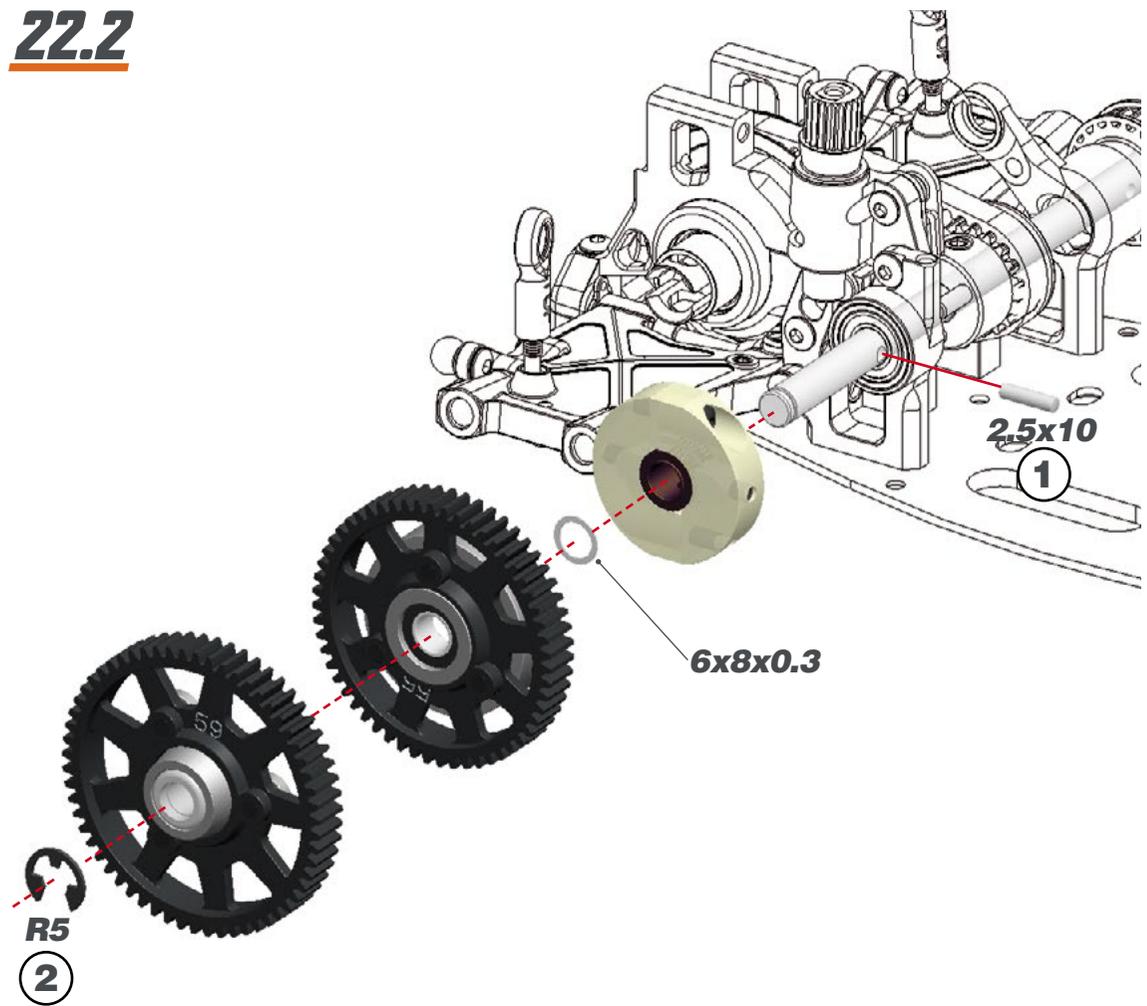
22.1



- !** 1- The M3x12 screw adjust the SHIFT POINT. As default adjustment screw it in all the way (do not over tighten the spring deforming it), then unscrew 3 turns.
- 2- Adjust the M3x3 screw to minimise the gap between the shoes to the bell. Check regularly.

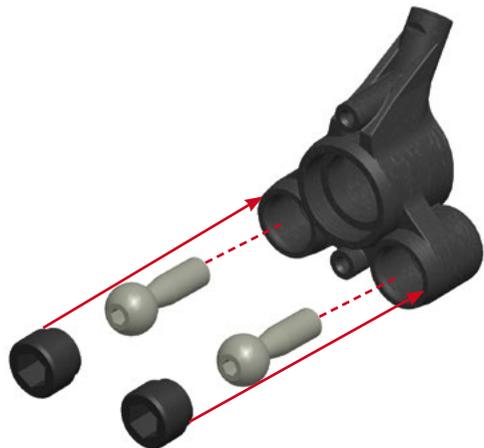


22.2

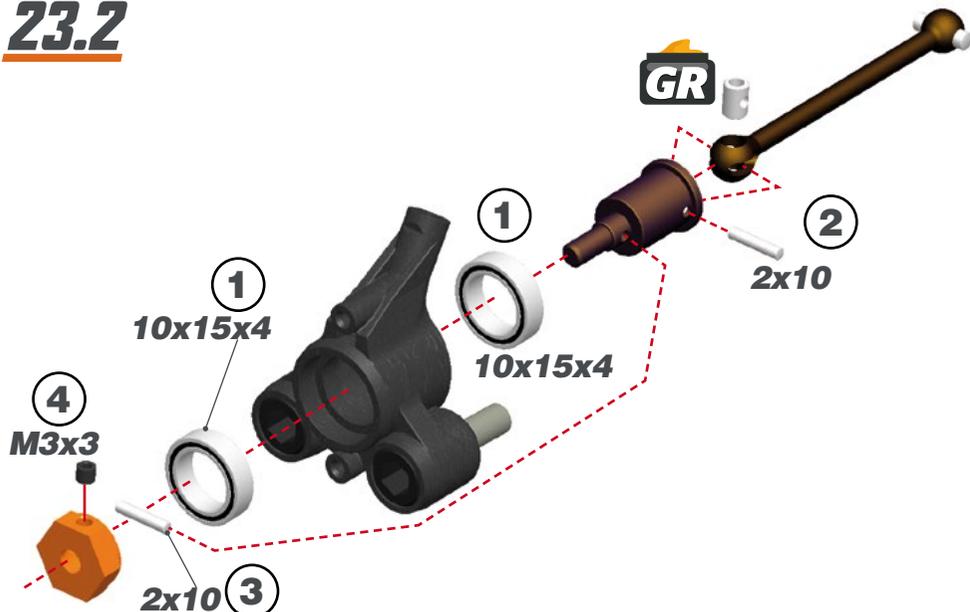


STEP 23 **BAG 5**

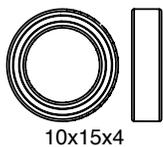
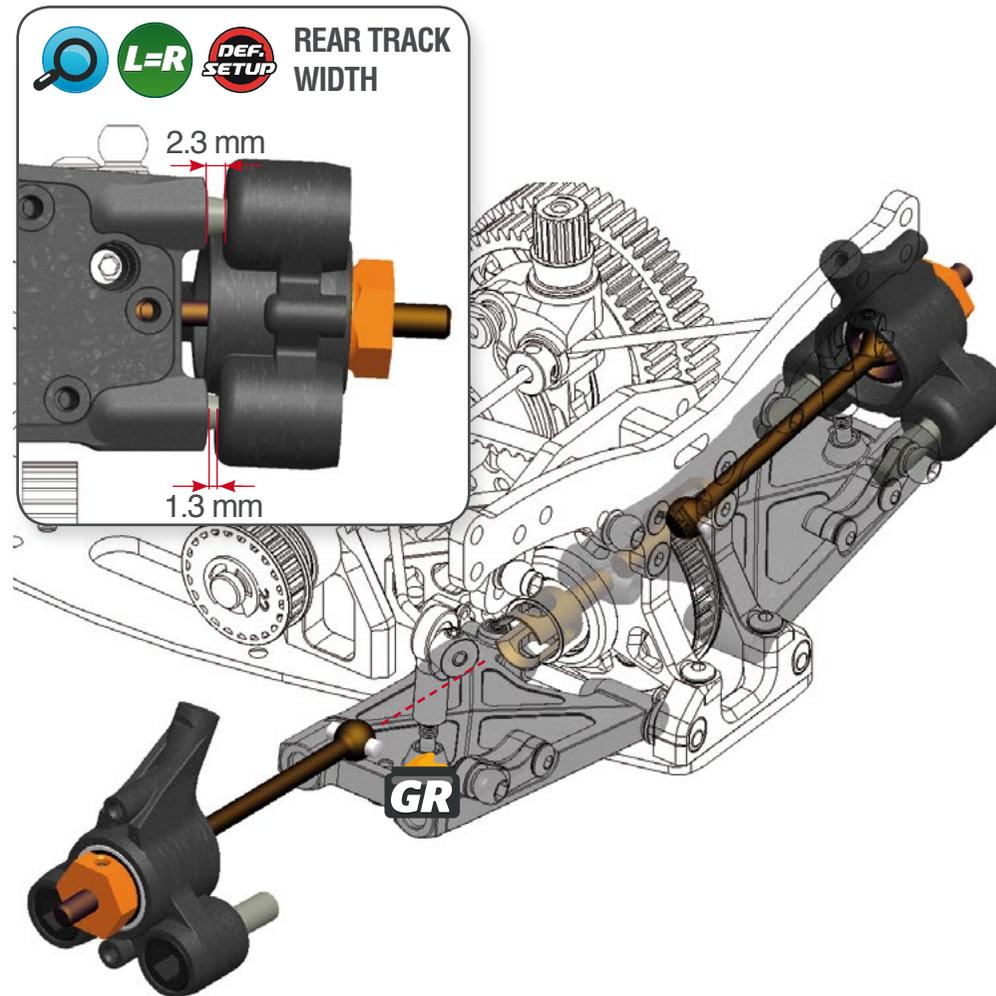
23.1



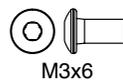
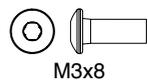
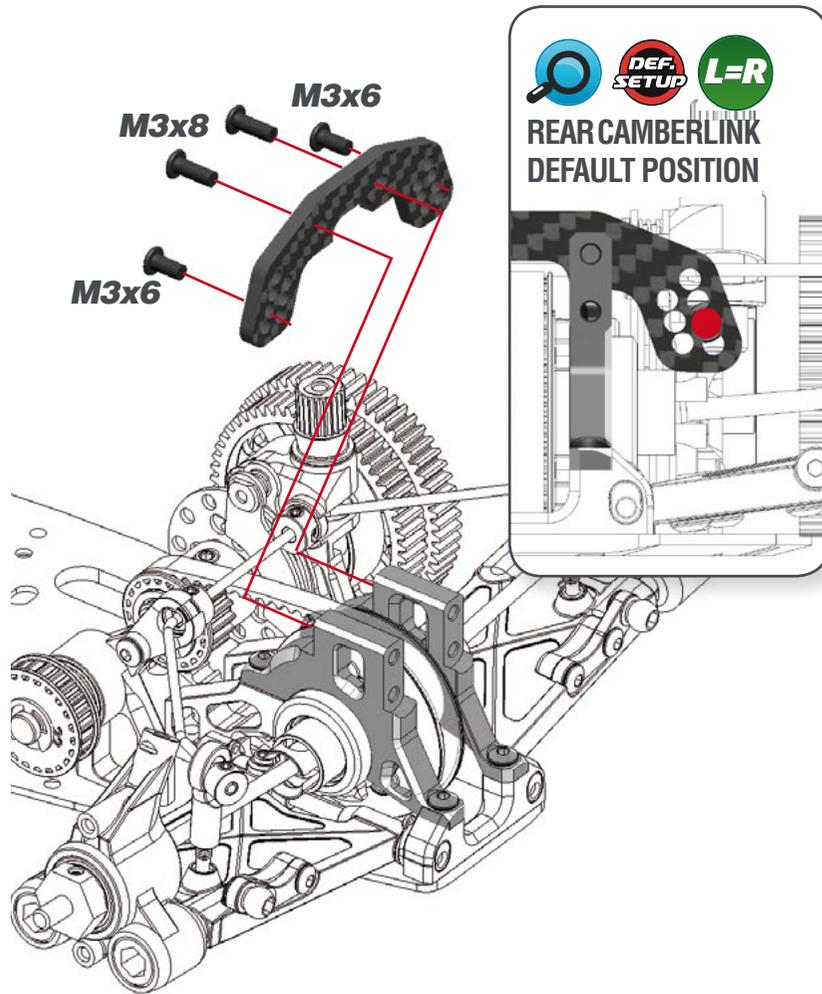
23.2



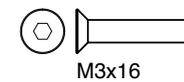
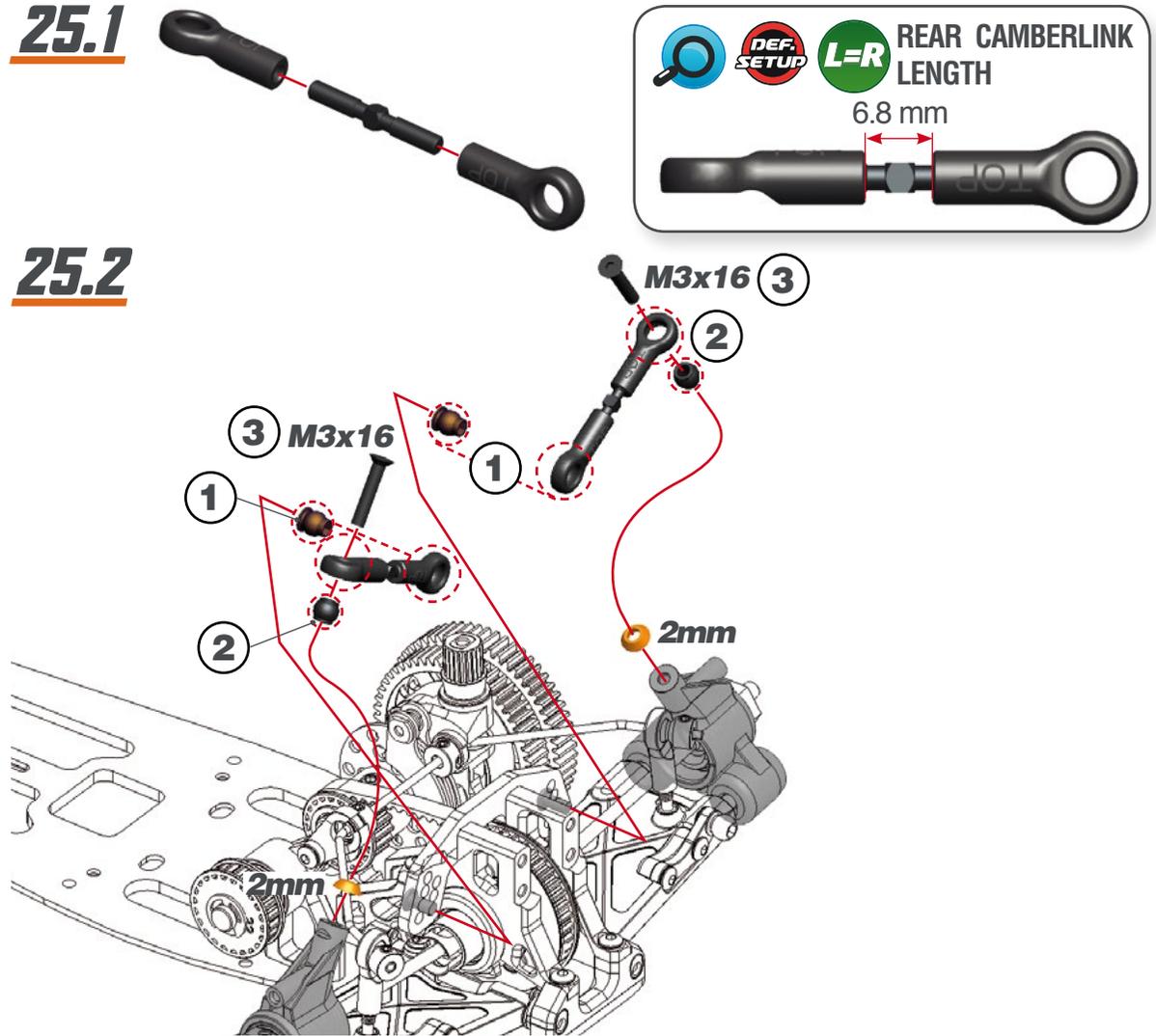
23.3



STEP 24



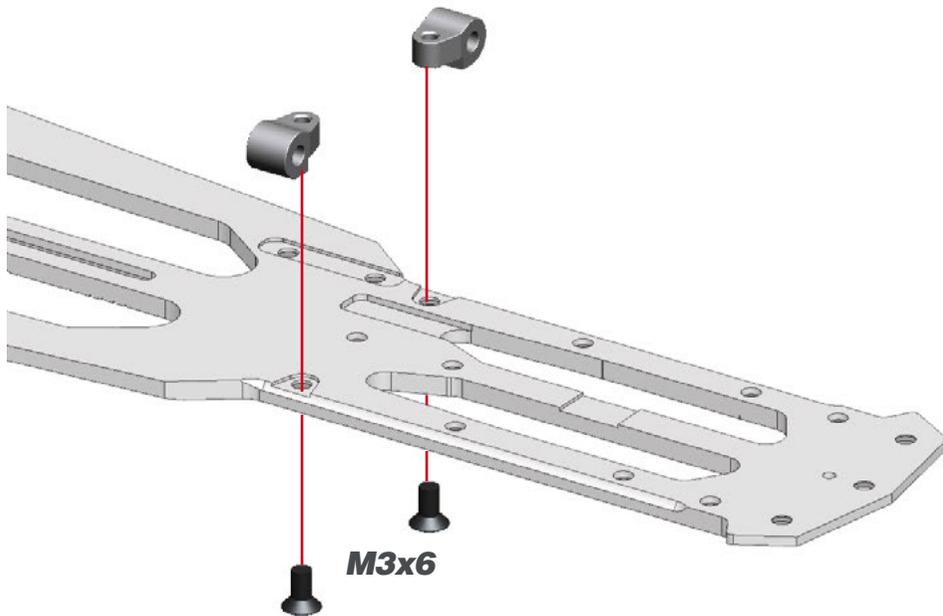
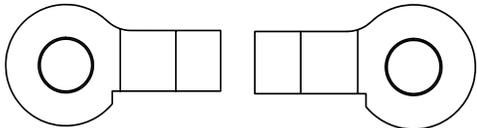
STEP 25



STEP 26 BAG 6

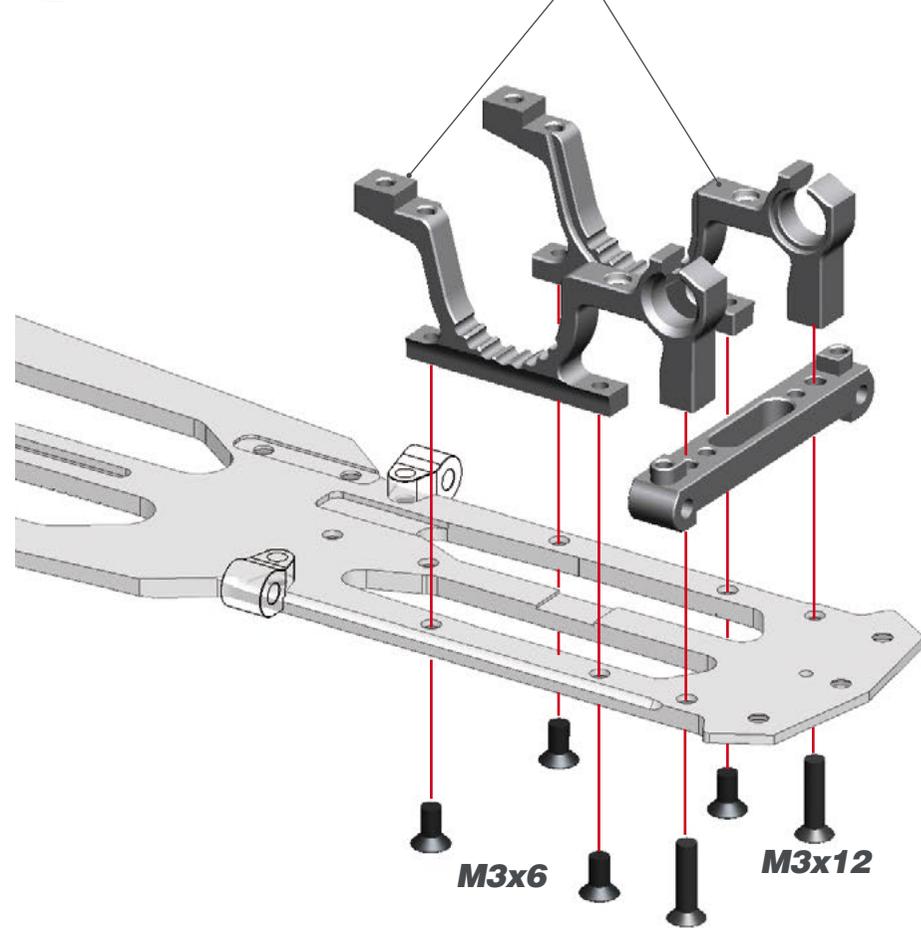
  Note that the front suspension brackets are not symmetric. Check below the correct orientation

RIGHT **LEFT**



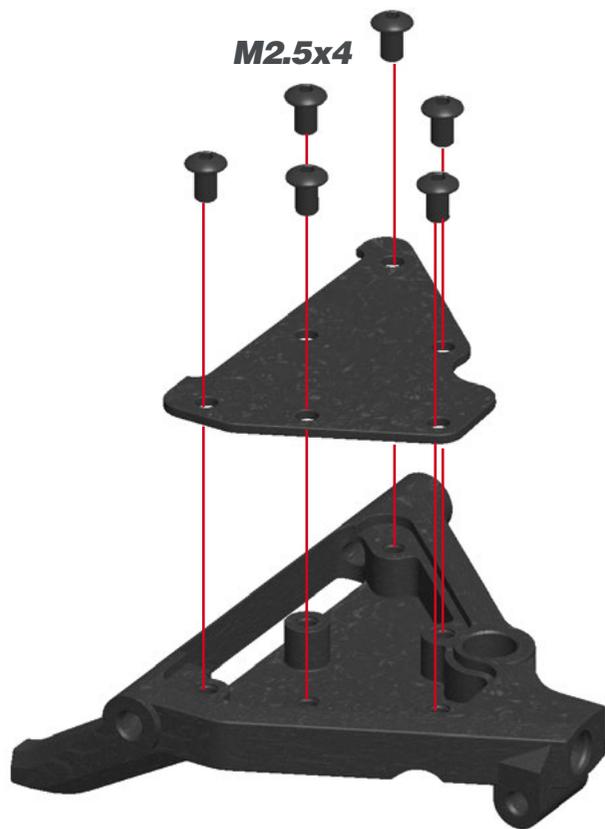
STEP 27

 Note that the front bearing blocks are not symmetric.



STEP 28

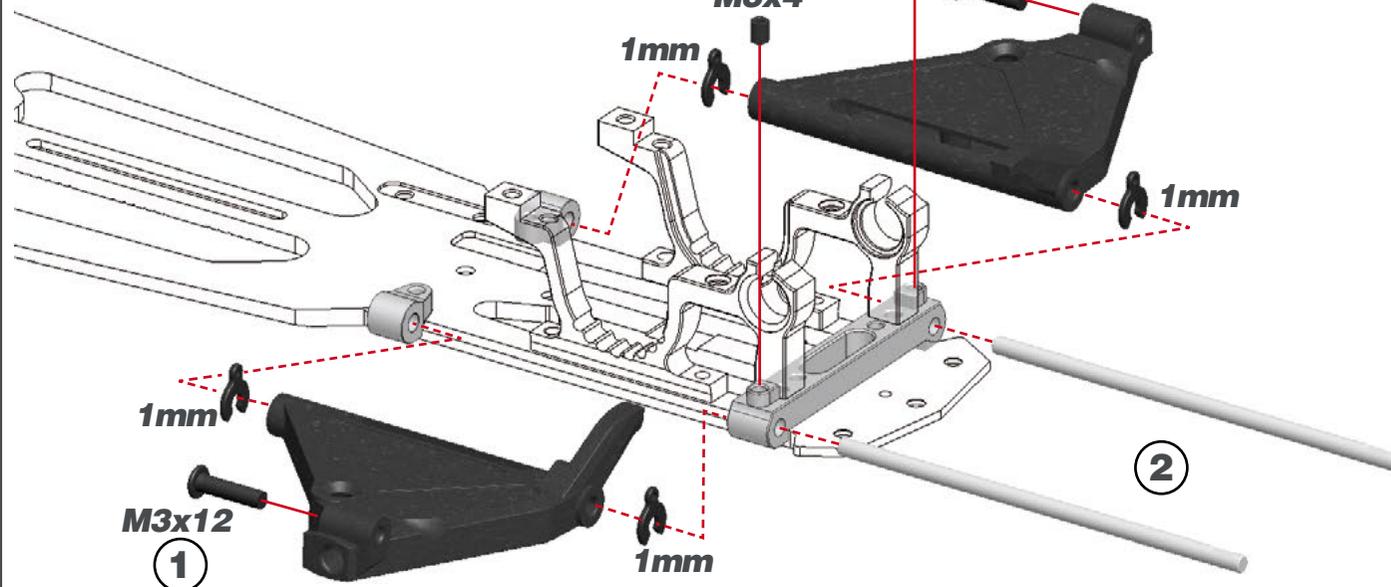
STEP 29



M2.5x4



FRONT DEFAULT WHEELBASE SHIMS



3

M3x4

1

M3x12

M3x4

1mm

1mm

1mm

M3x12

1

1mm

2



M2.5x4



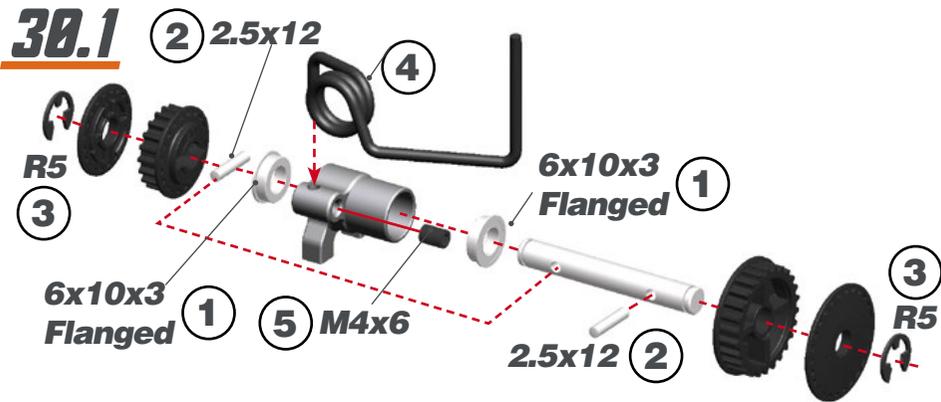
M3x12



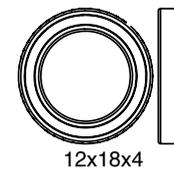
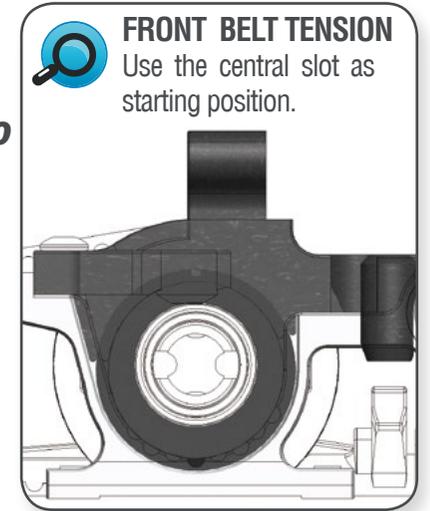
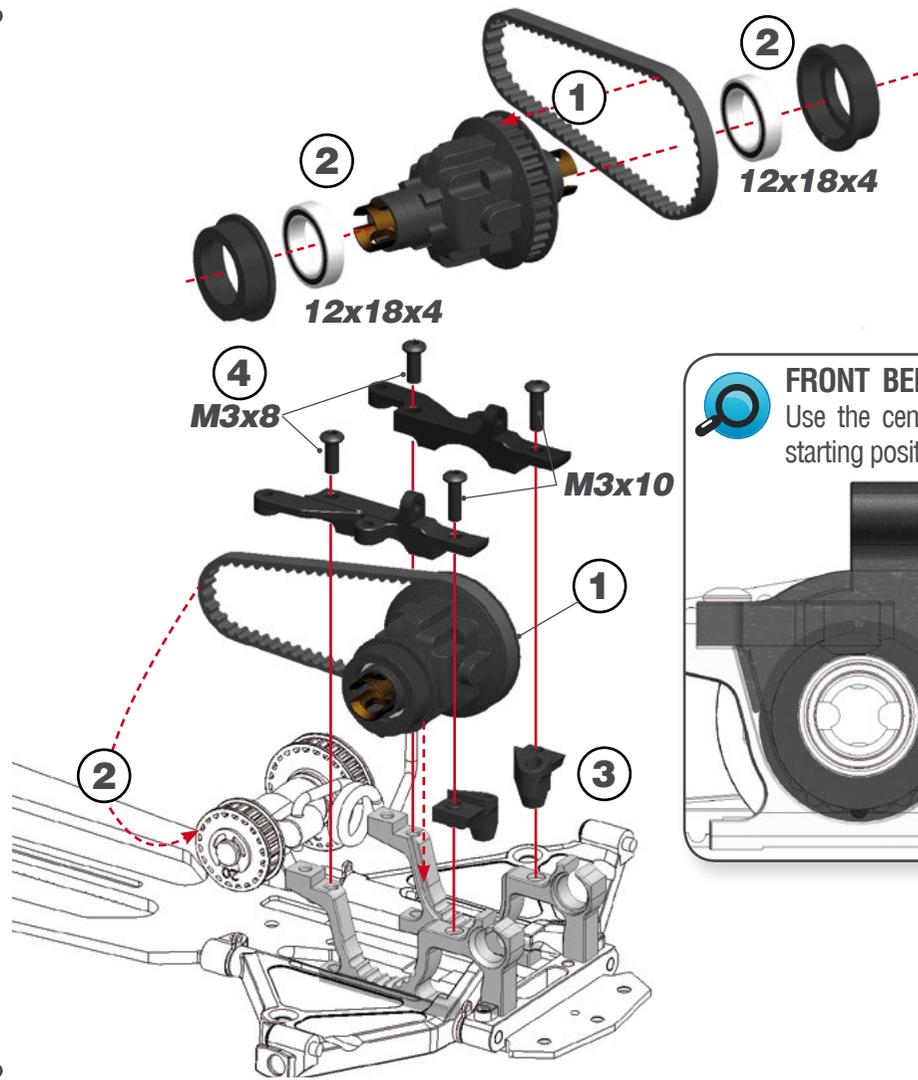
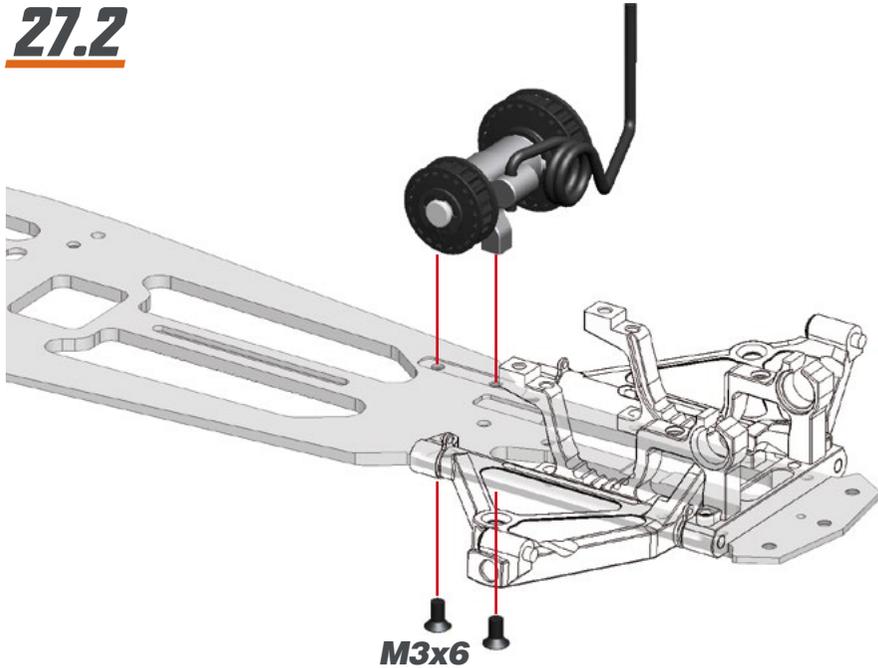
M3x4

STEP 30

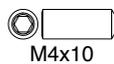
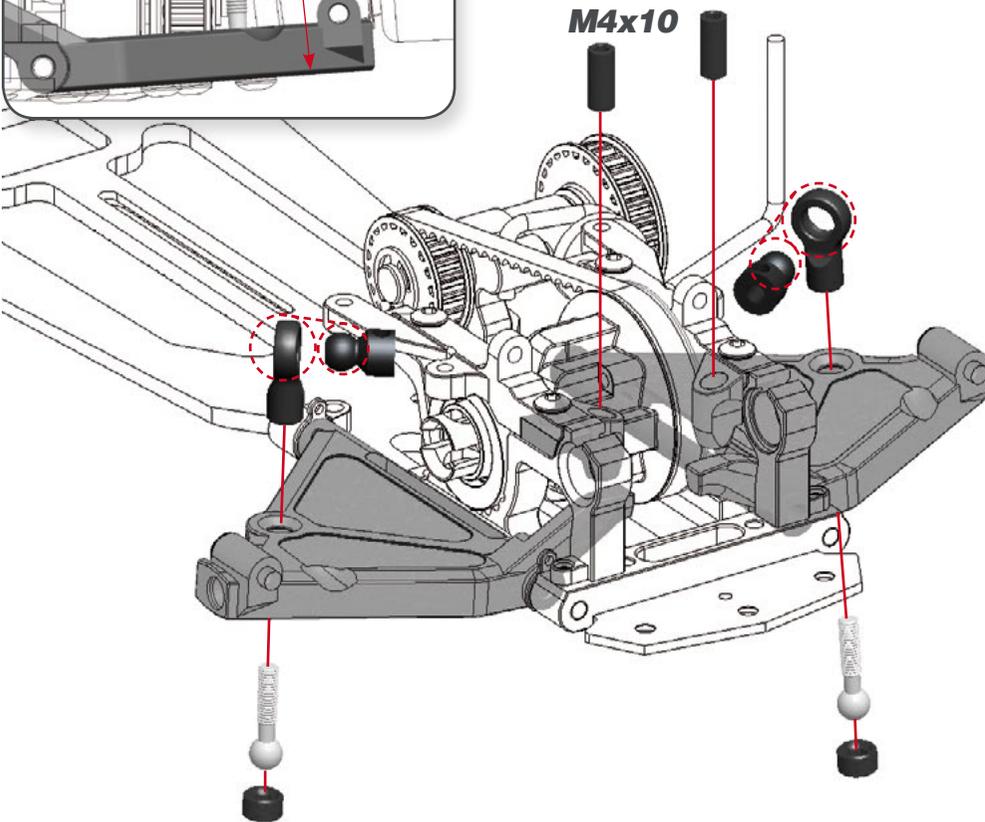
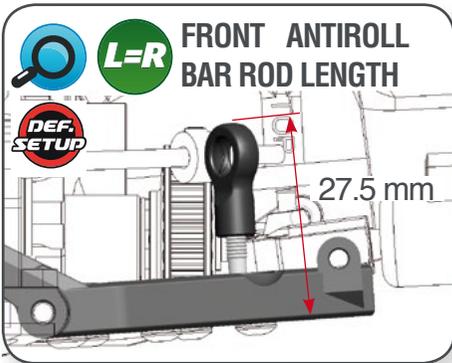
STEP 31 **BAG 7**



27.2



STEP 32

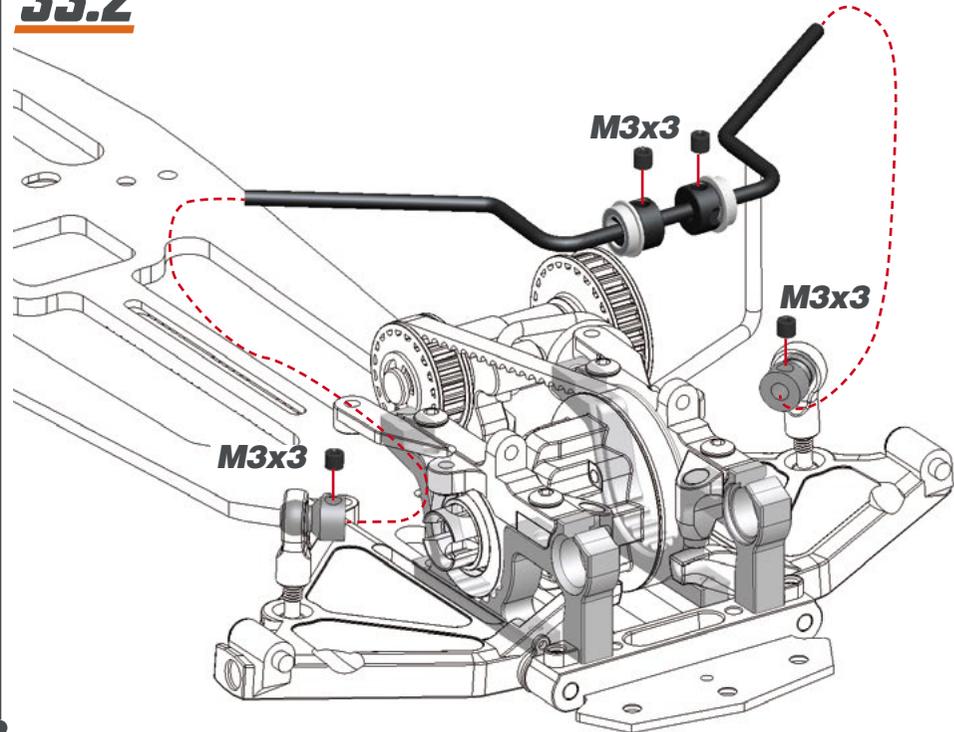


STEP 33

33.1

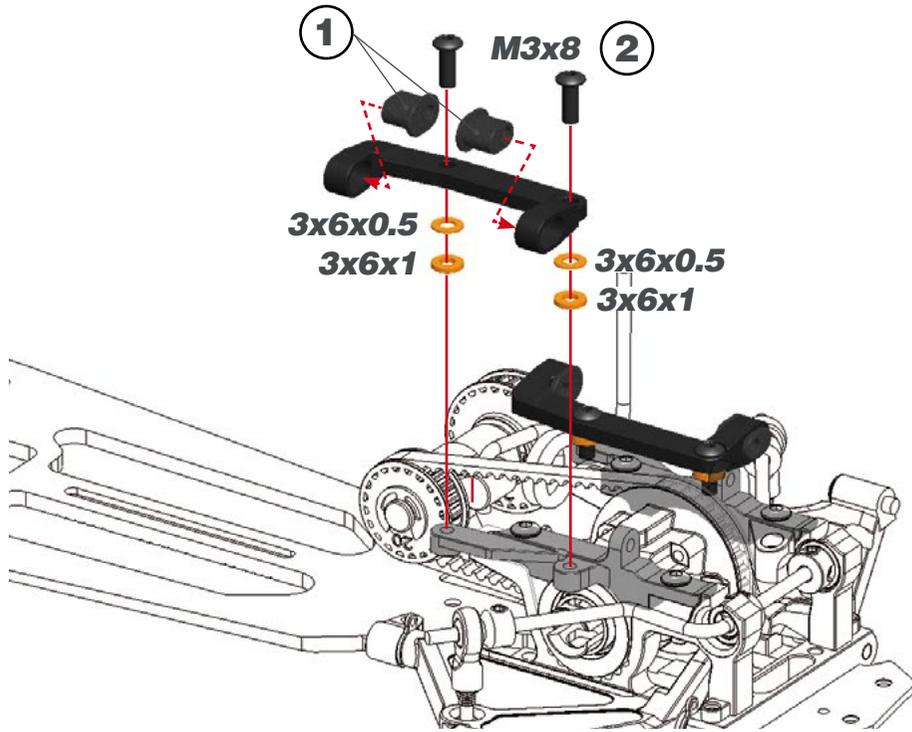


33.2



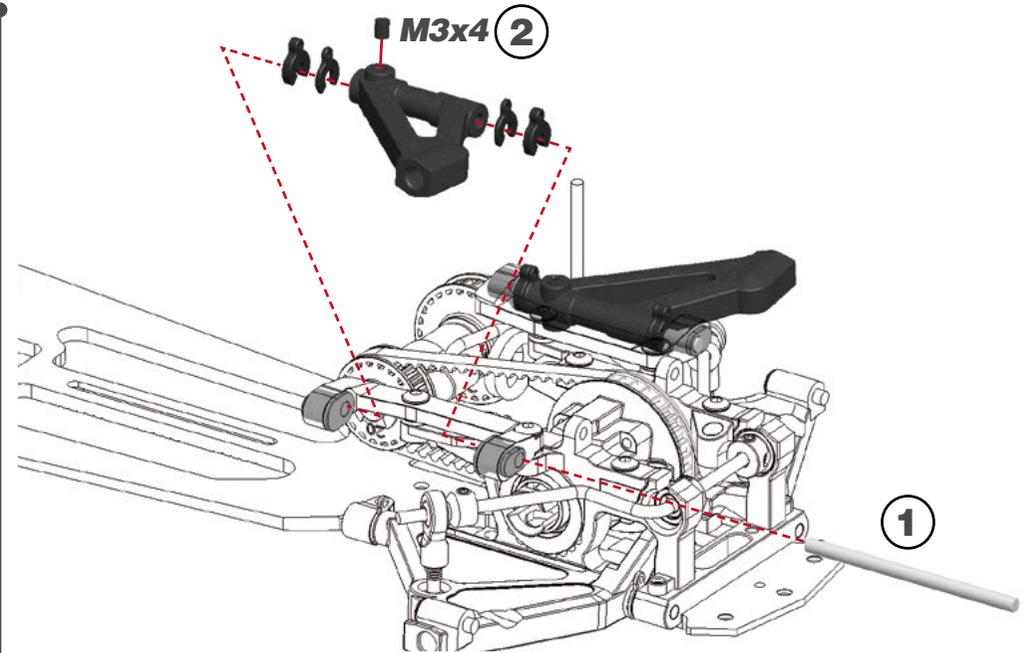
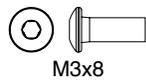
STEP 34 **BAG 8**

STEP 35



L-R FRONT SUSPENSION INSERTS CHART

INSIDE		MID		OUTSIDE	
RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT
DEF. SETUP					



L-R FRONT CASTER
DEFAULT SPACERS

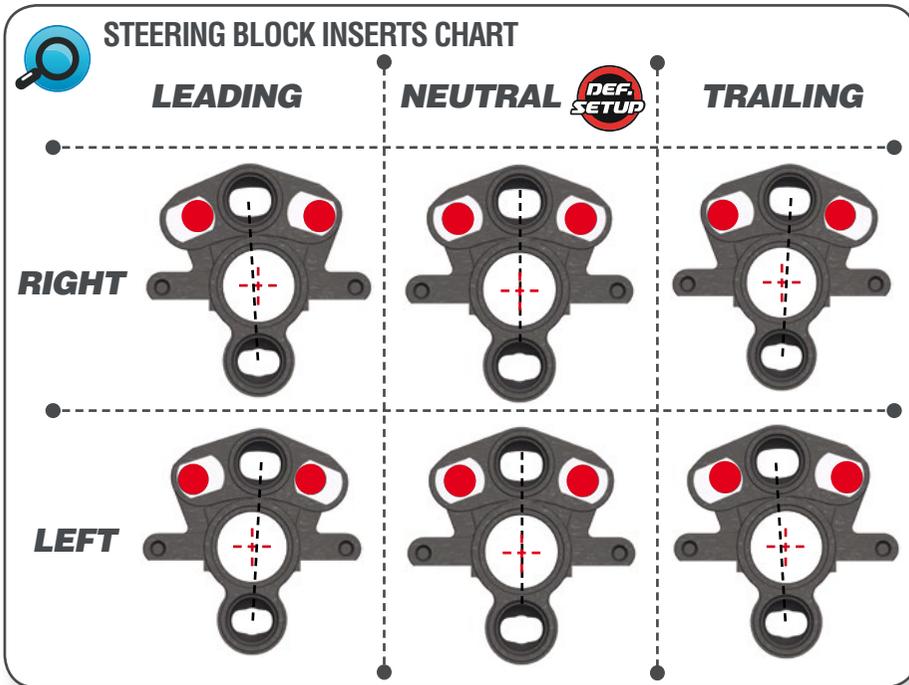
DEF. SETUP

2mm 1mm 1mm 2mm

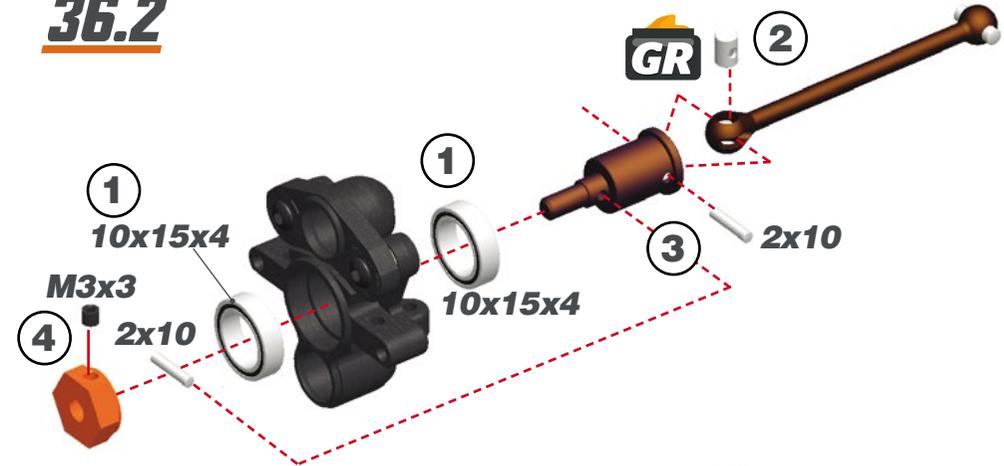


STEP 36

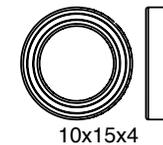
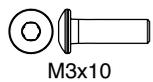
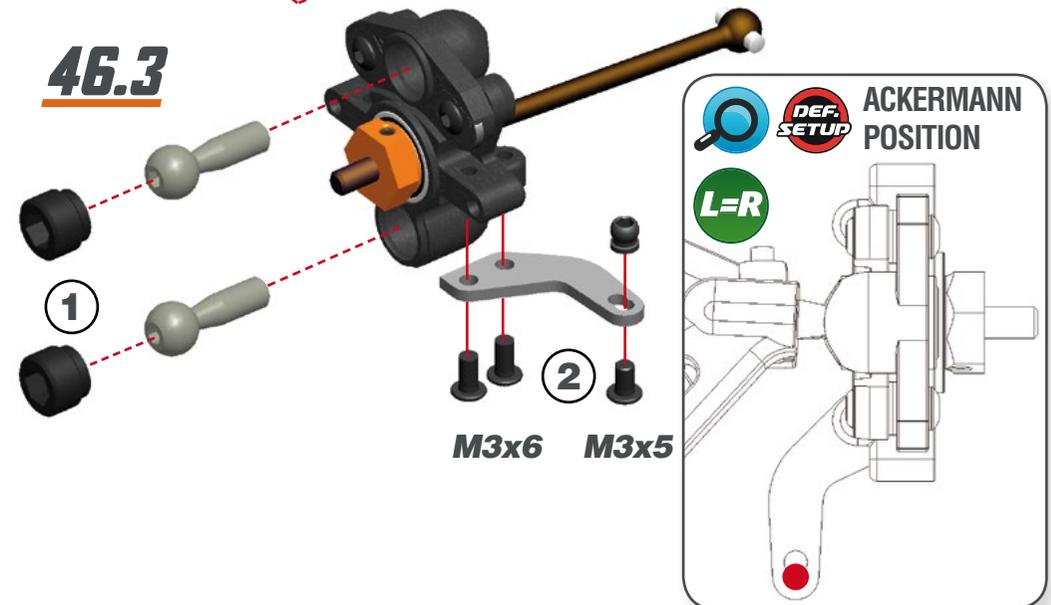
36.1



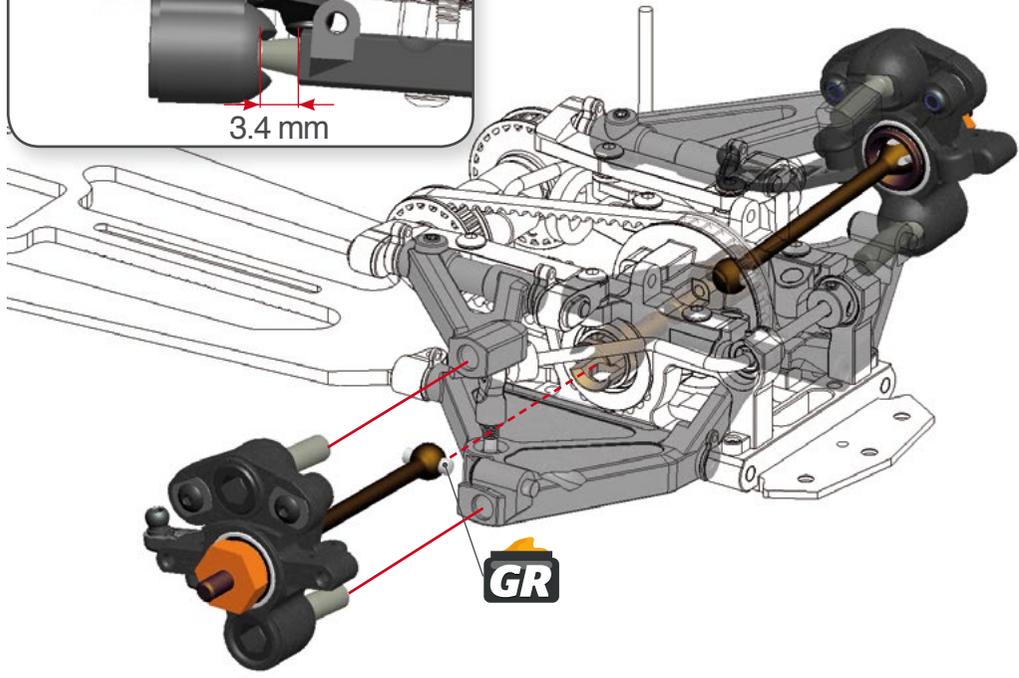
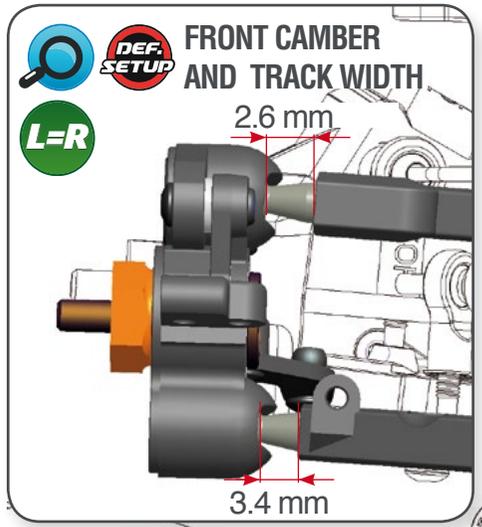
36.2



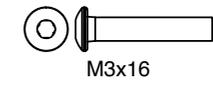
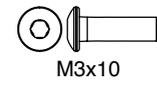
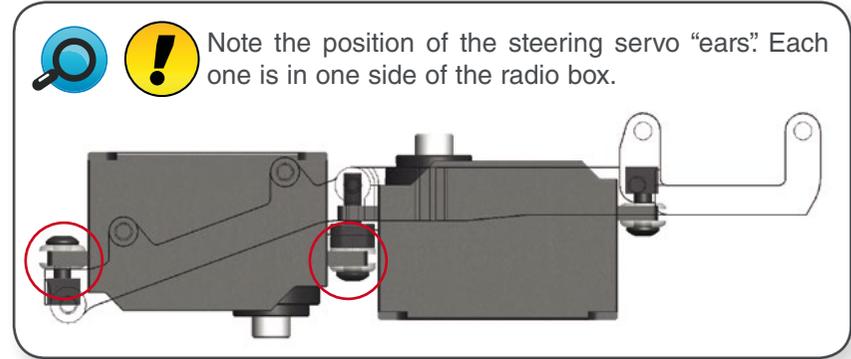
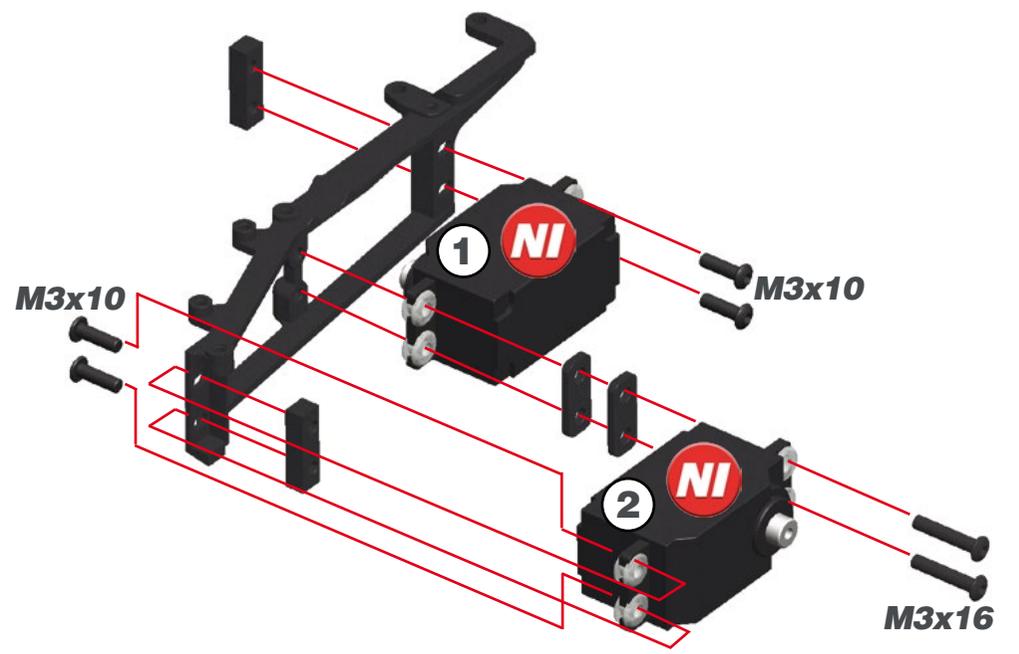
46.3



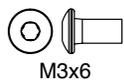
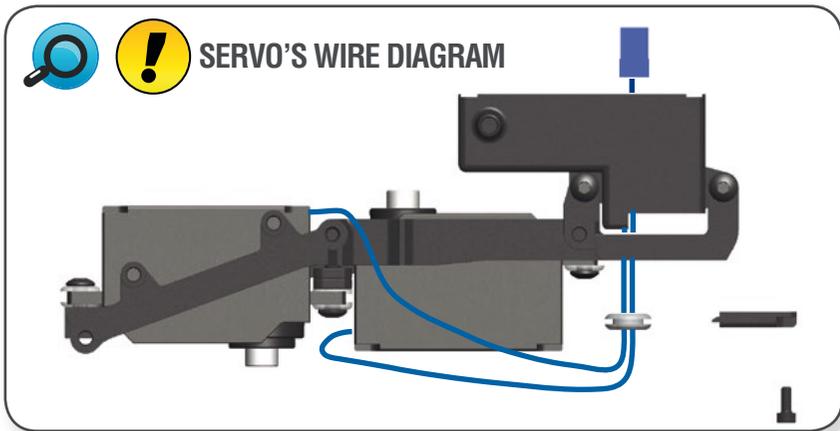
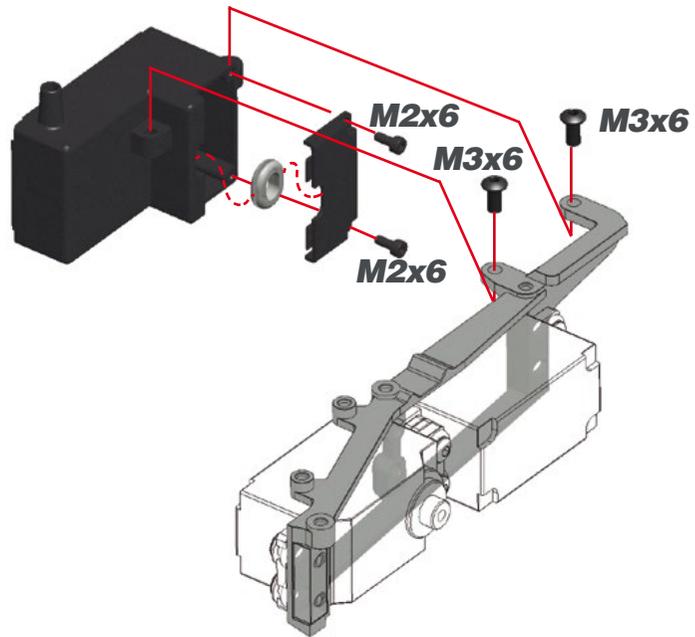
STEP 37



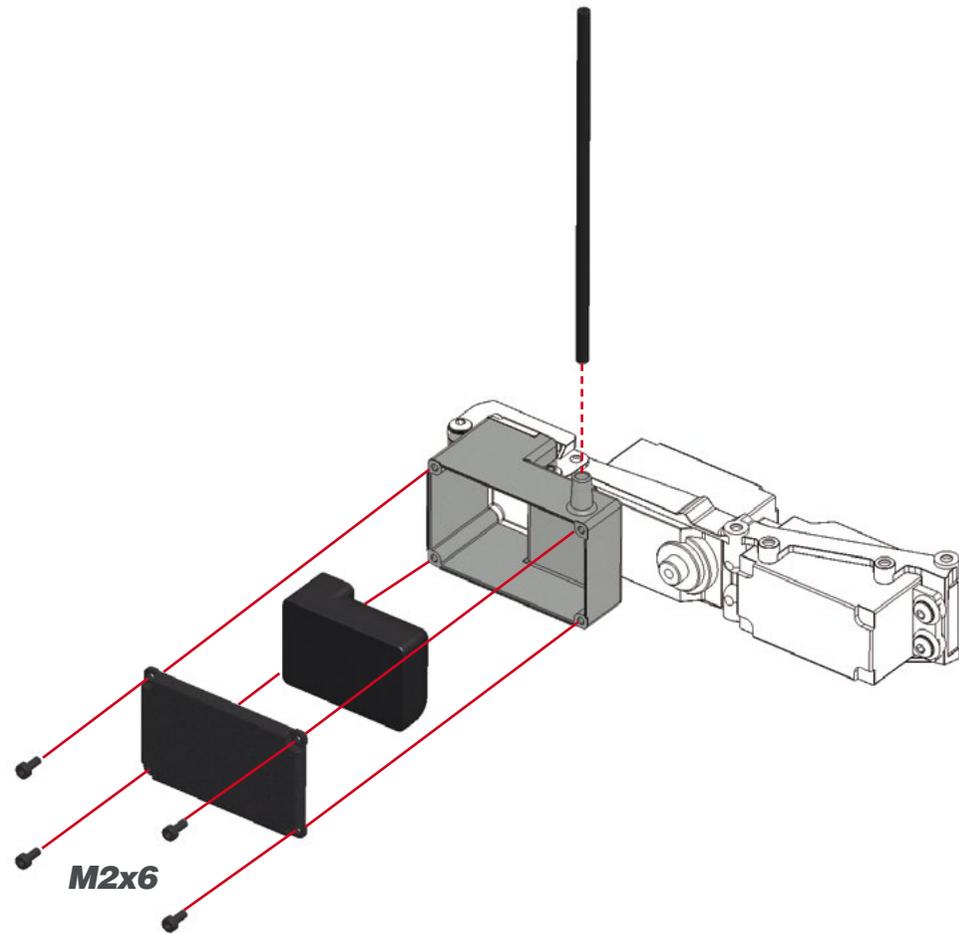
STEP 38 BAG 9



STEP 39



STEP 40



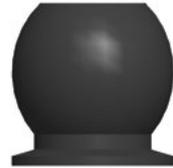
STEP 41



Check how many teeth your servo spline has (23, 24 or 25) and use the right levers.



Note correct pivot ball type.



M3x5

M3x6



Note correct pivot ball type.



M3x6

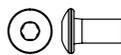
M3x6



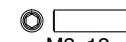
M3x5



M3x6



M3x6



M3x12

STEP 42

42.1



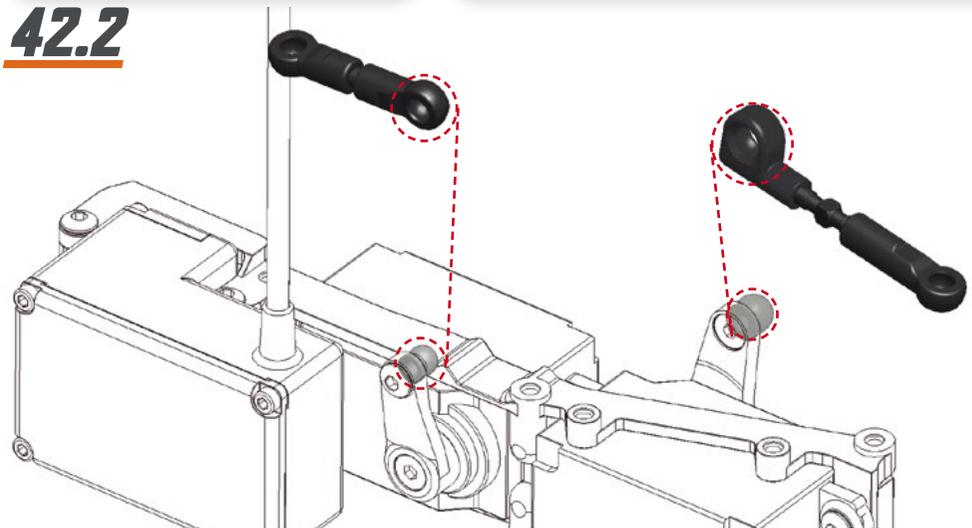
M3x12



THROTTLE LINK LENGTH
Between different servo brands there can be slight differences.
1.5 - 2 mm

STEERING LINK LENGTH
Between different servo brands there can be slight differences.
9.7 - 10.3 mm

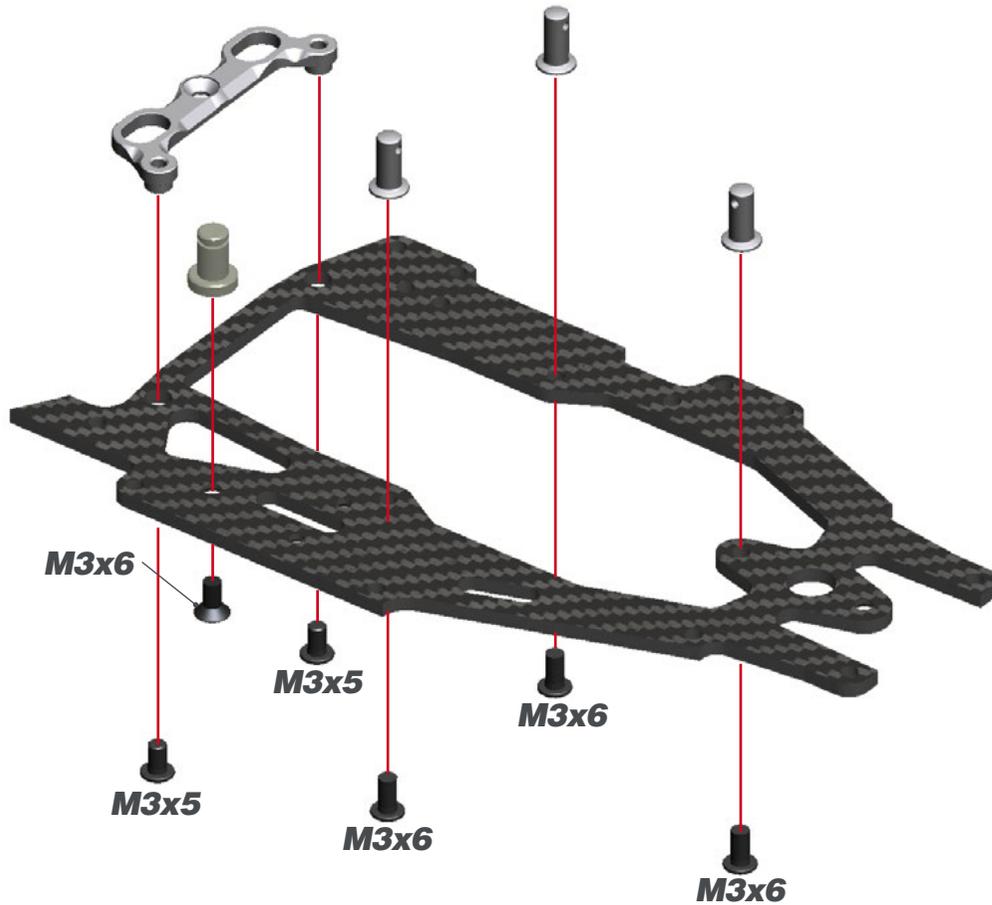
42.2



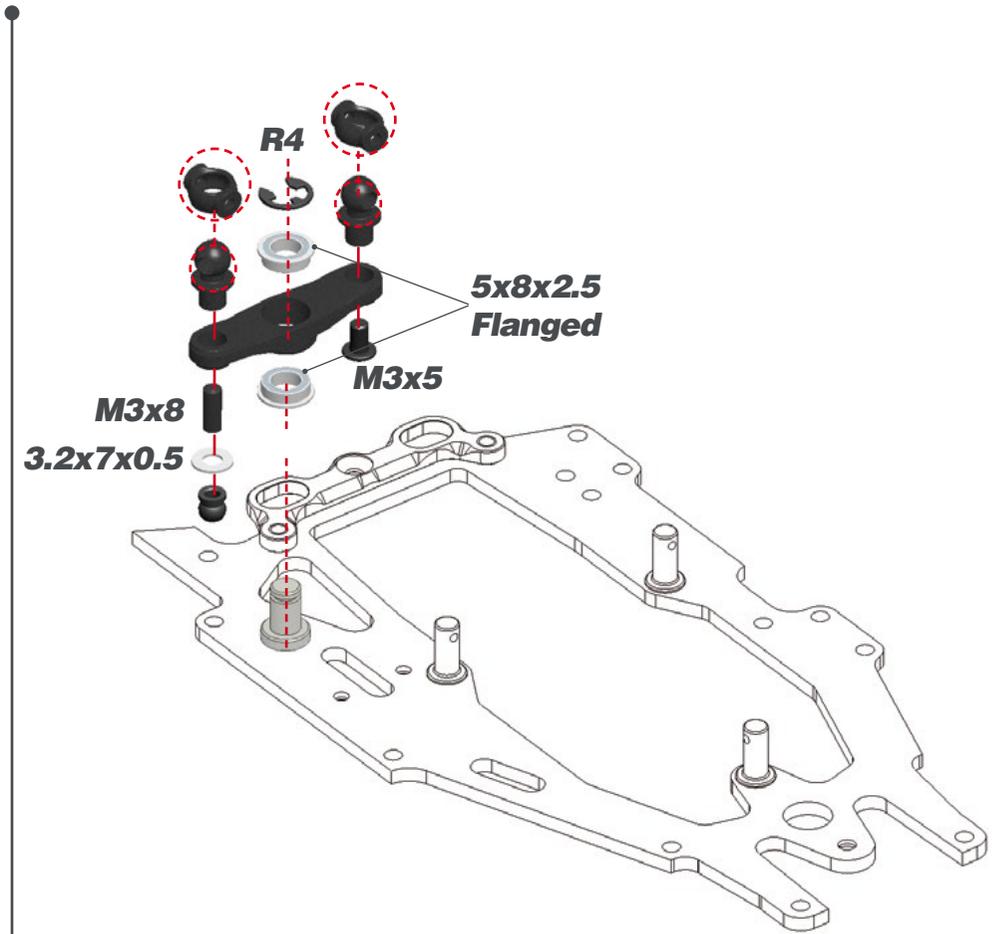
STEP 43 **BAG 10**



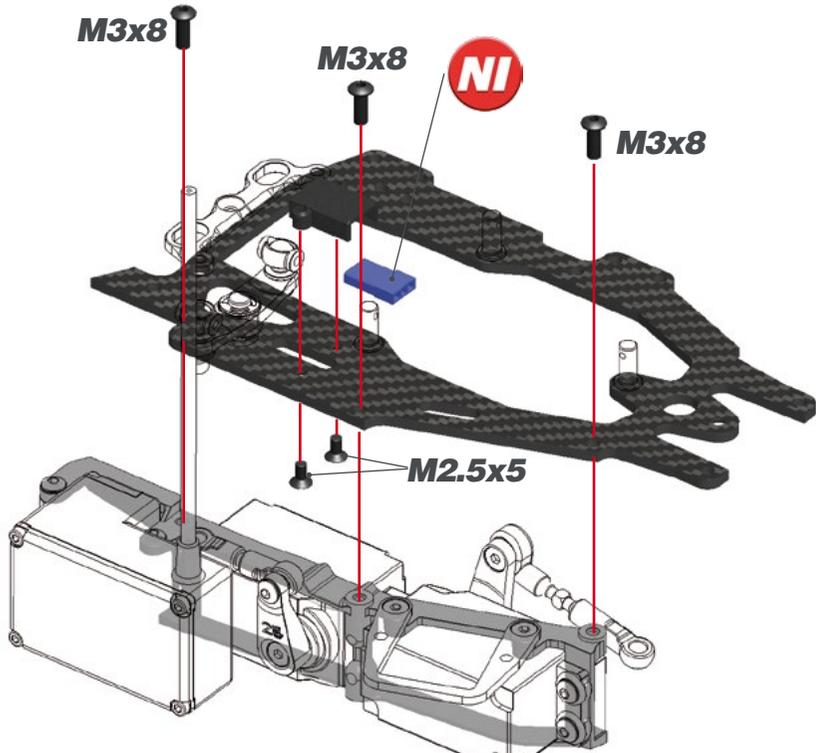
NOTE: When using Nimh or some Life receiver batteries, it is needed to raise the fuel tank 2mm adding 2mm shims between the fuel tank mountings and the radio plate.



STEP 44



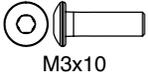
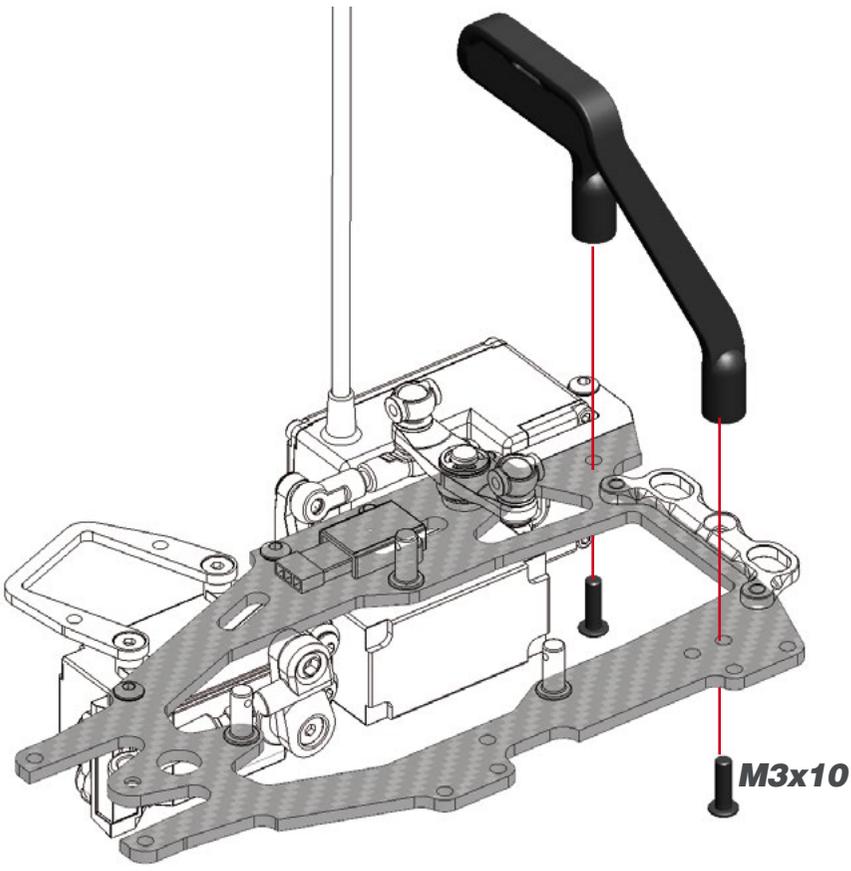
STEP 45



  Note the receiver's power input wire diagram



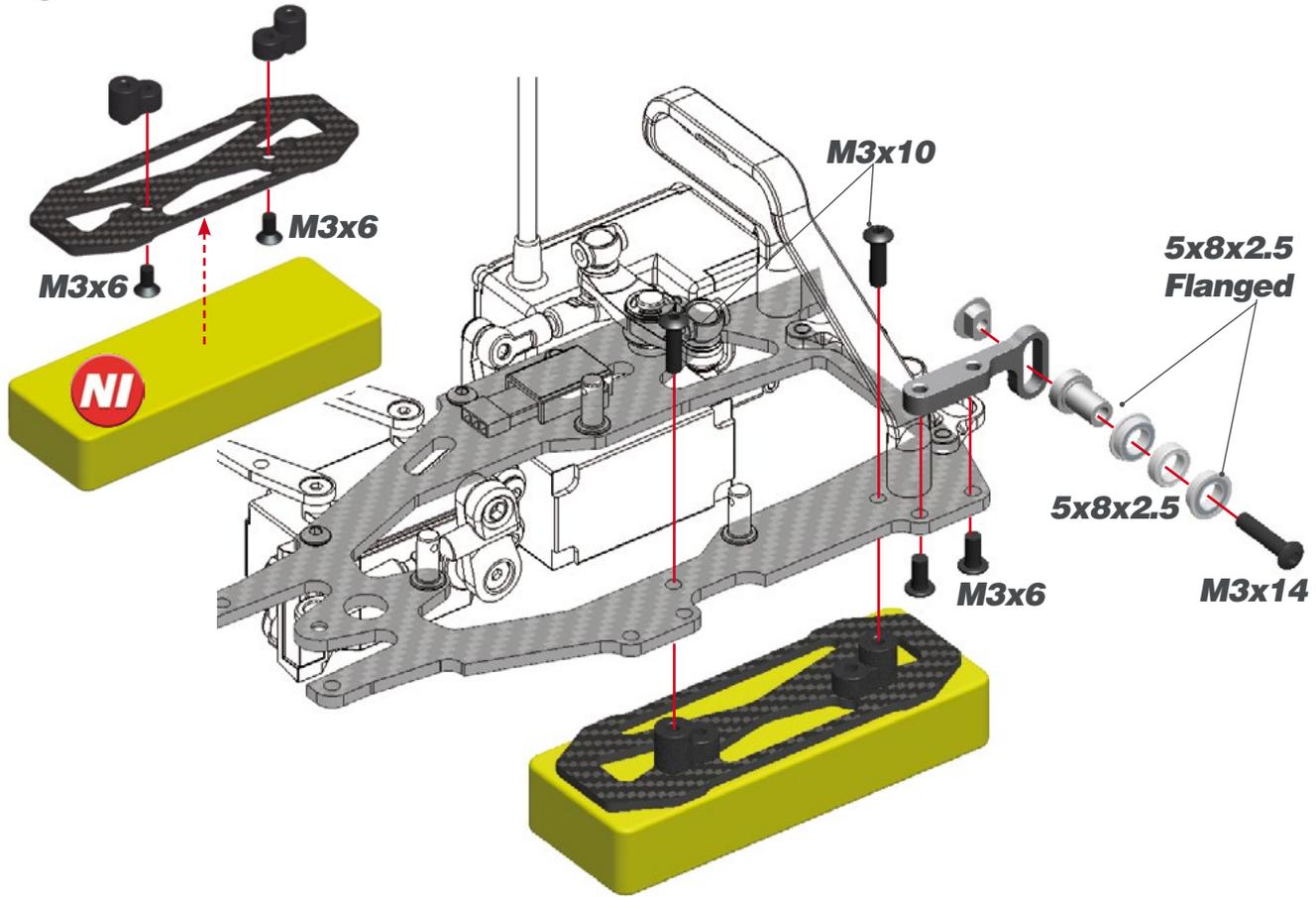
STEP 46



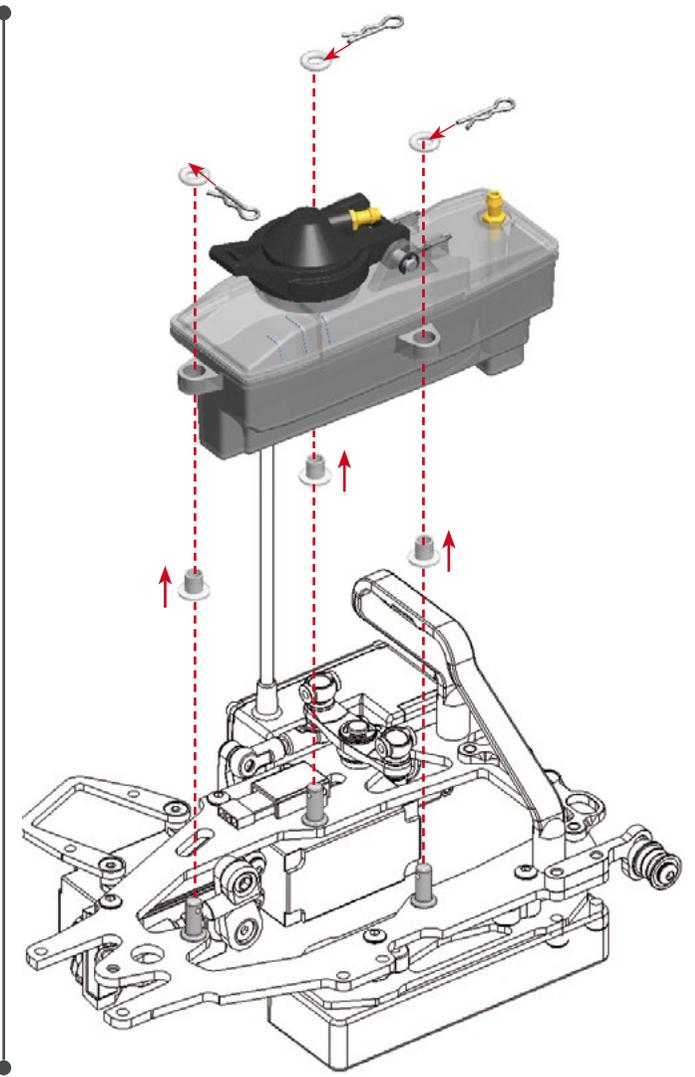
STEP 47

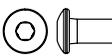
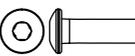
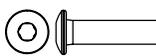
47.1 **47.2**

! Use tape to mount the battery to the carbon support.



STEP 48

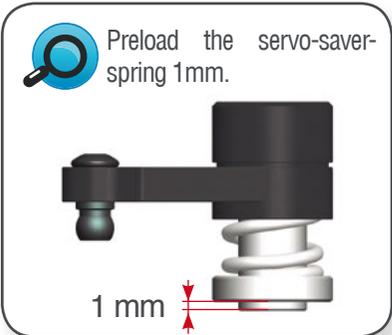


- 
M3x6
- 
M3x6
- 
M3x10
- 
5x8x2.5
- 
5x8x2.5 Flanged
- 
M3x14

- 
Clip small

STEP 49 **BAG 11**

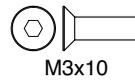
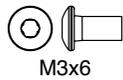
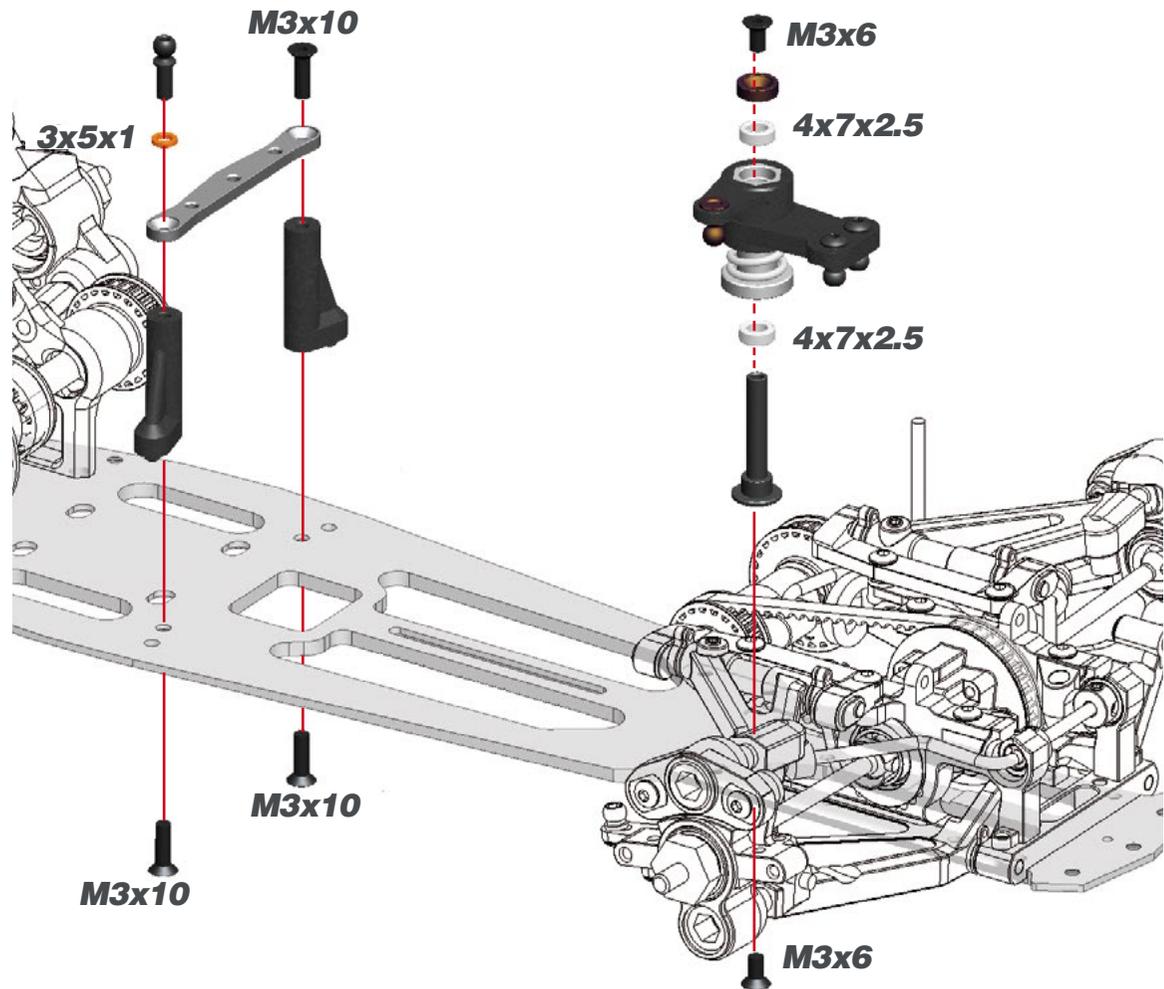
49.1



SERVOSAVER ACKERMANN INSERTS

		FORWARD NARROW	
		REARWARD NARROW	
		FORWARD WIDE	
		REARWARD WIDE	

49.2



STEP 50

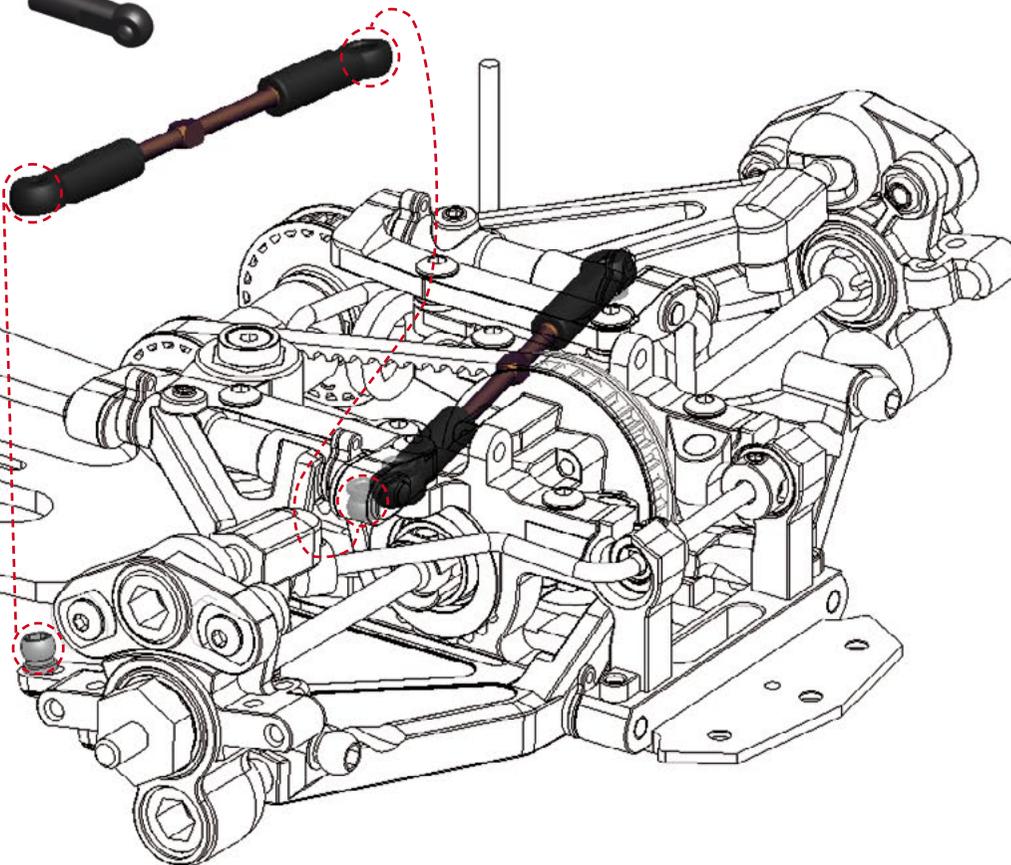
50.1



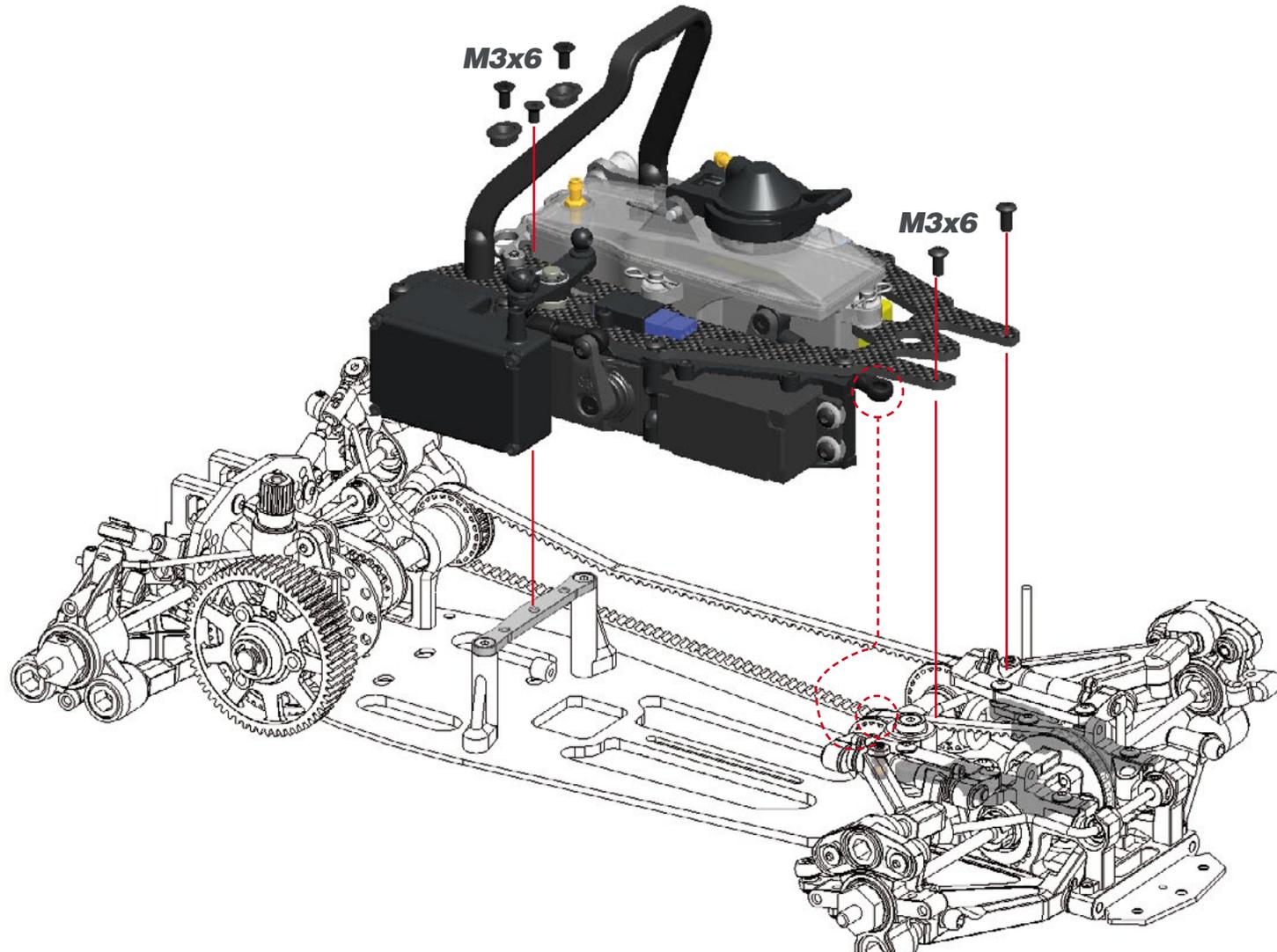
STEERING TRACKROD LENGTH 27.2 mm

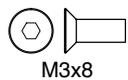
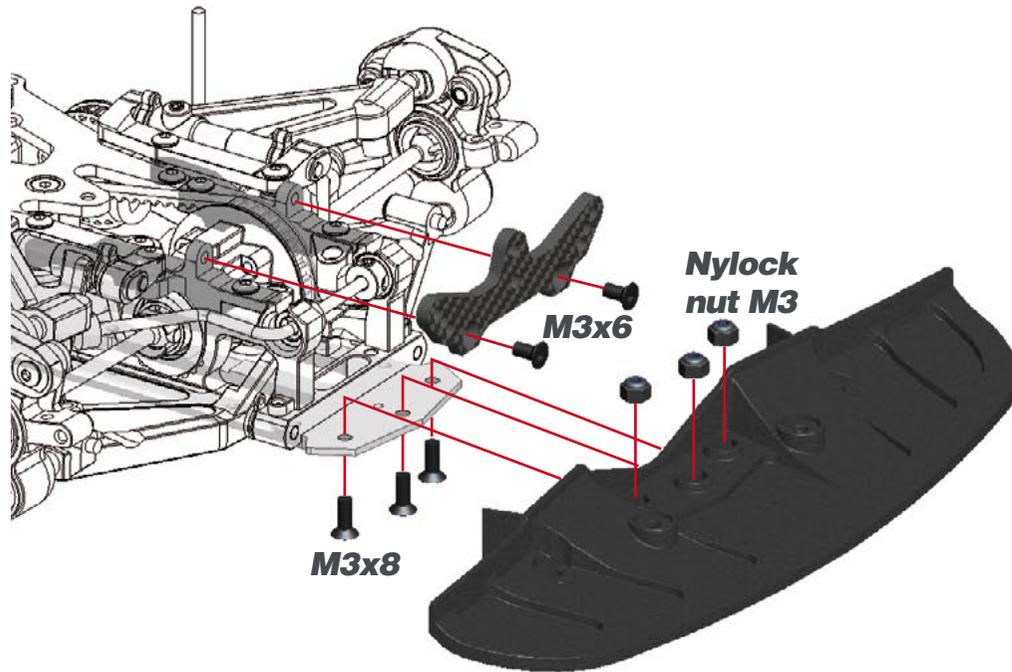
50.2



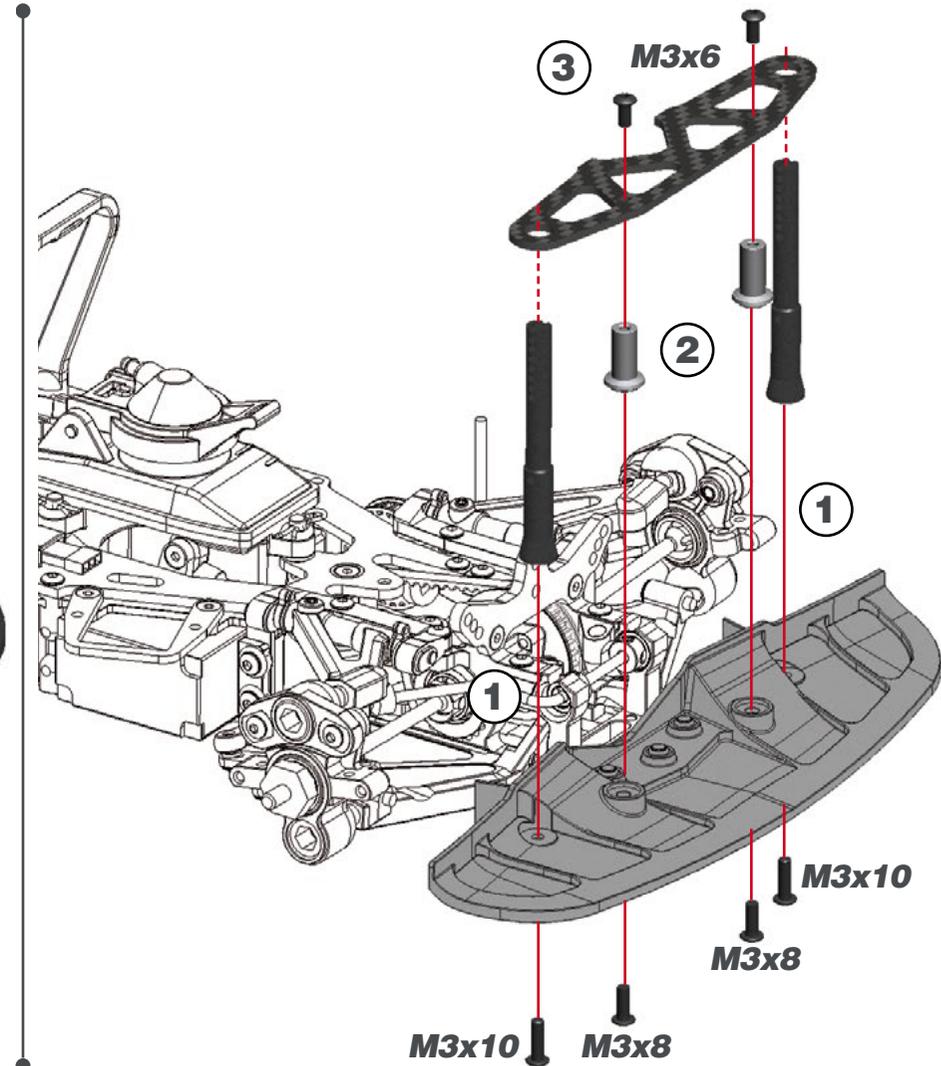
STEP 51



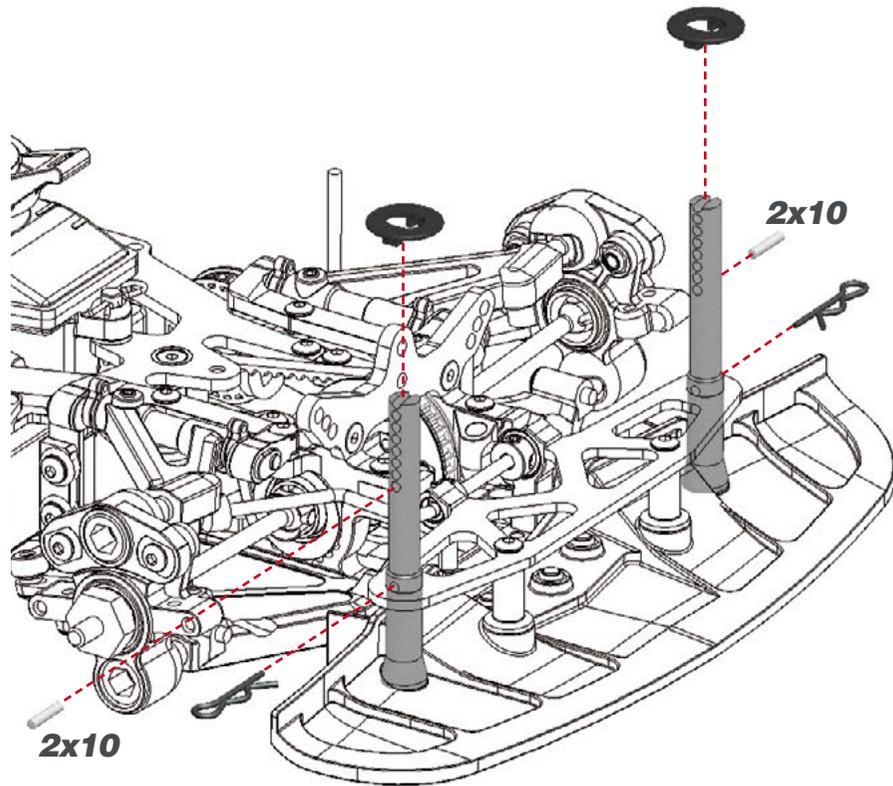
STEP 52 BAG 12



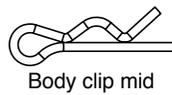
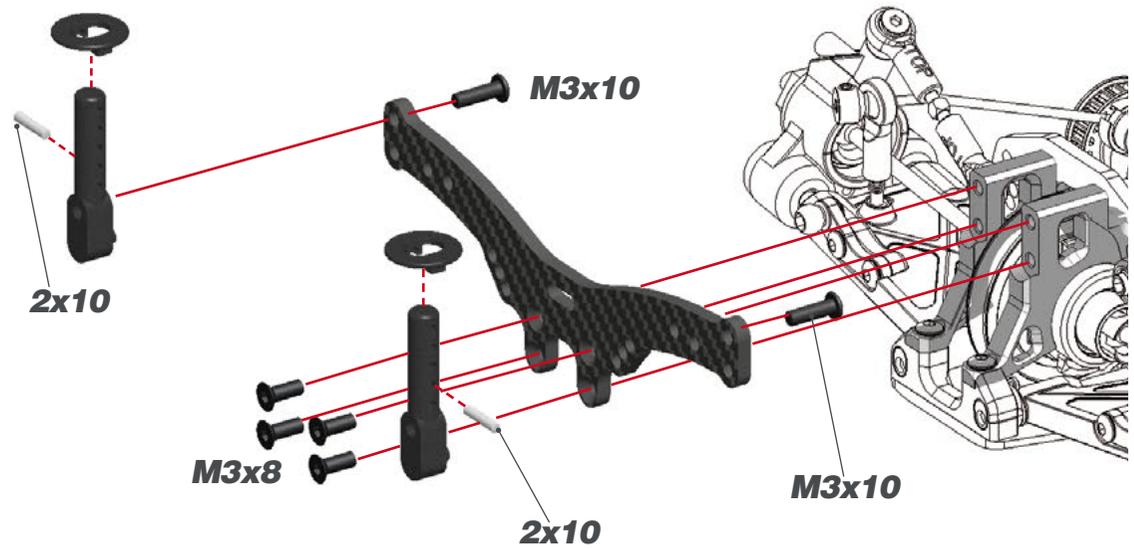
STEP 53



STEP 54

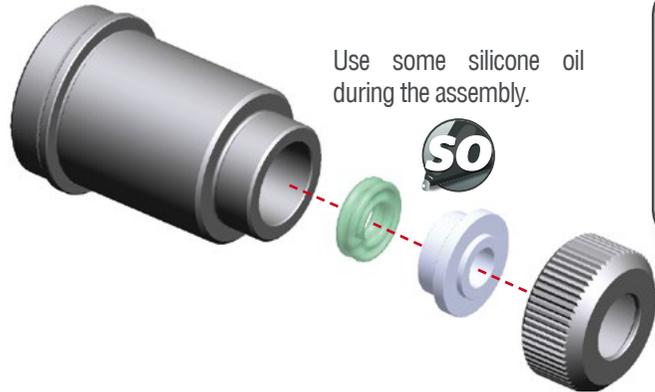


STEP 55



STEP 56 BAG 13

56.1



Use some silicone oil during the assembly.



Note the correct orientation of the shock spacers .

56.2



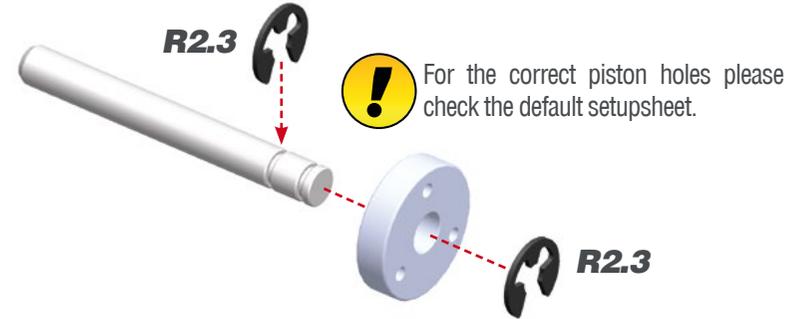
1 Insert the o-ring inside the spring collar.



Note the correct position of the o-ring .

STEP 57

57.1



R2.3



For the correct piston holes please check the default setupsheet.

R2.3

57.2



Use some silicone oil during the assembly.



R2.3

STEP 58

58.1

Push the shock top and the membrane into the shock cap.



58.2

1- Fill up with silicone oil fully using the silicone oil supplied in the kit. For the correct cst value please check the default setupsheet.



2- Extend the shockrod fully

3- Move the shockrod slowly up and down to let ALL air bubbles escape.

4- Close top only 3/4.

58.3

1-Bleed: push the shockrod all the way in slowly, to allow excessive oil to escape.

2- Close completely the shock cap.

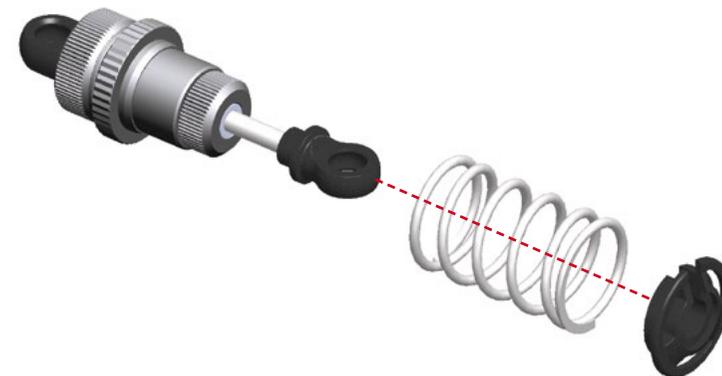


SHOCKS LENGTH: Measure the shock length fully extended.

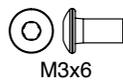
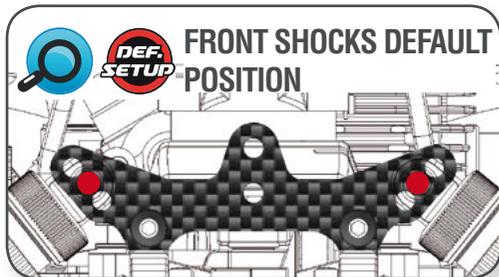
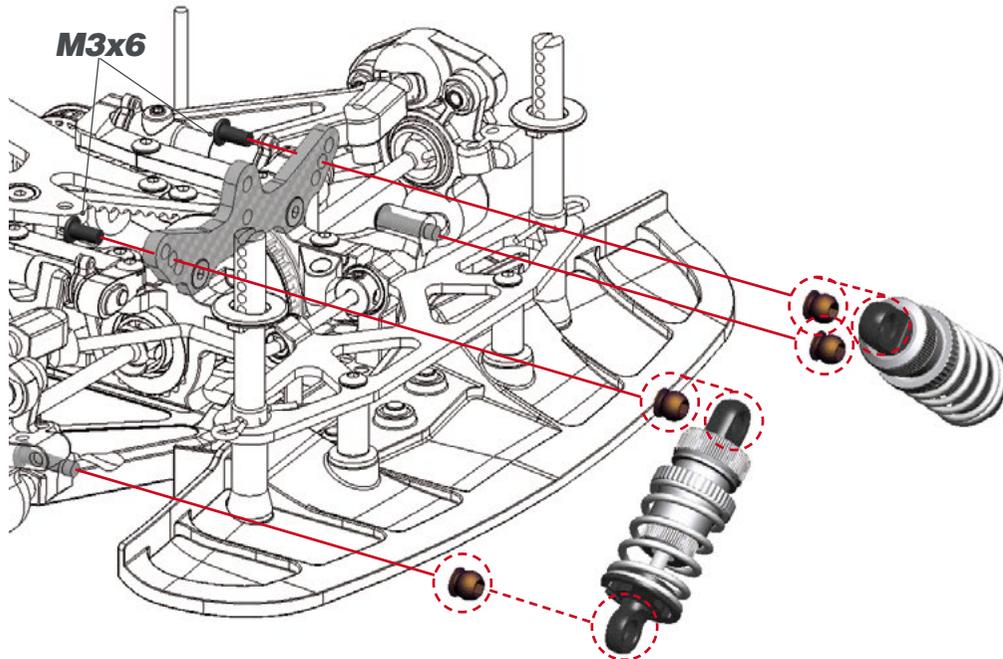
11.5 mm

STEP 59

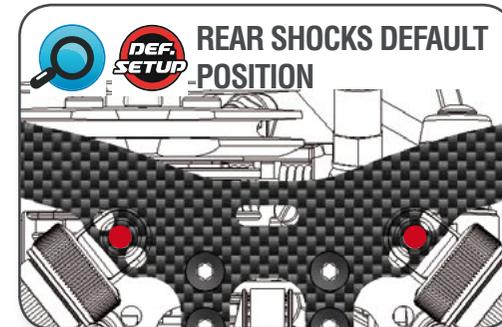
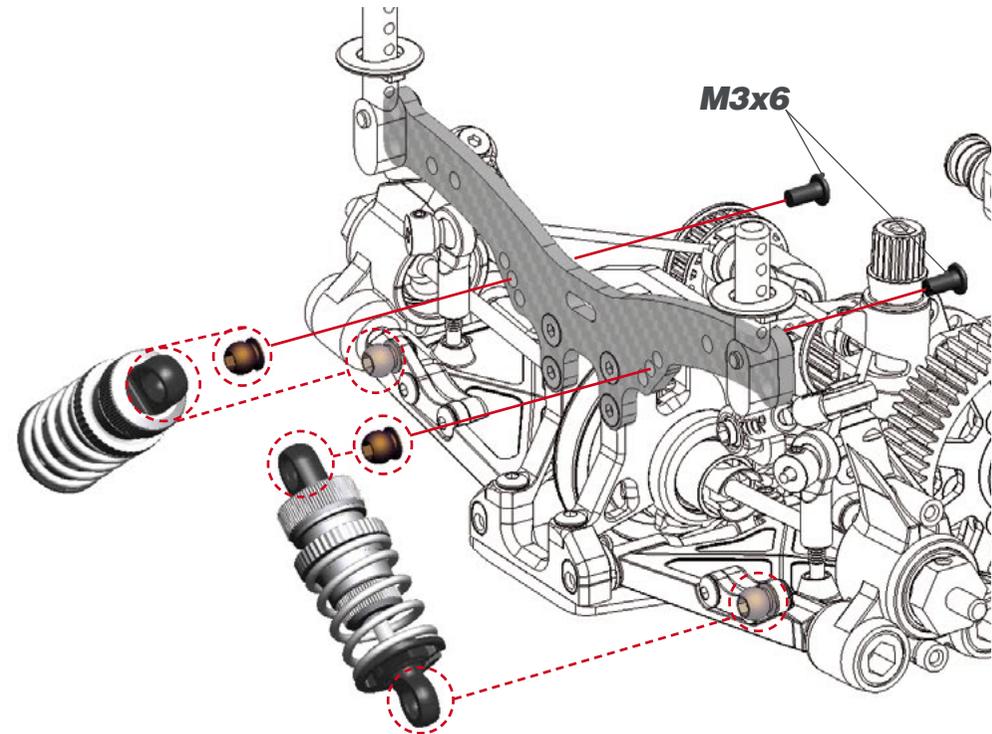
Assemble the spring and spring-cup (align correctly) to complete the shock.



STEP 60

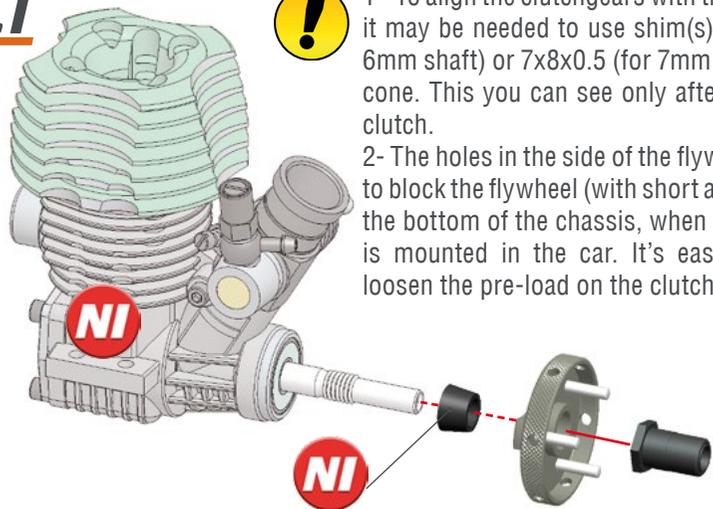


STEP 61



STEP 62 BAG 14

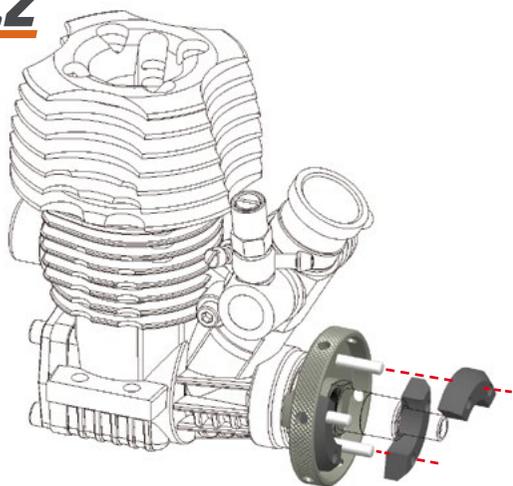
62.1



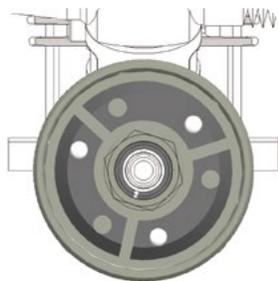
1- To align the clutchgears with the 2-speed gears, it may be needed to use shim(s) 6x8x0.5mm (for 6mm shaft) or 7x8x0.5 (for 7mm shaft) behind the cone. This you can see only after assembling the clutch.

2- The holes in the side of the flywheel can be used to block the flywheel (with short allen tool) through the bottom of the chassis, when the engine/clutch is mounted in the car. It's easier to tighten or loosen the pre-load on the clutch spring that way.

62.2

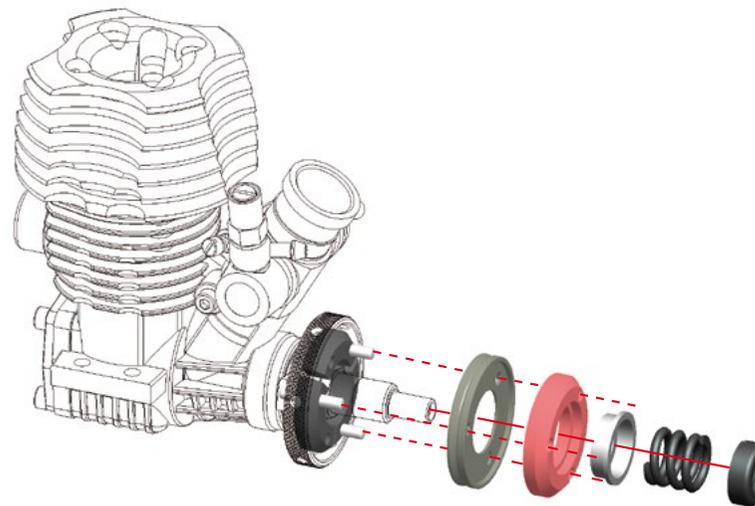


Note the orientation of the flyweights. Use the right hole for having a more aggressive clutch



STEP 63

63.1

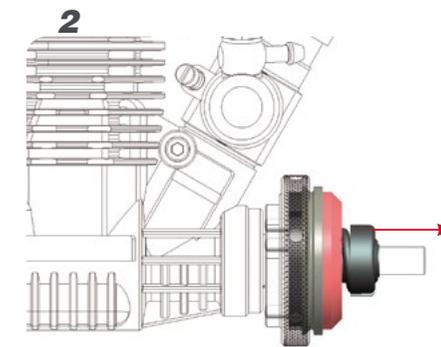
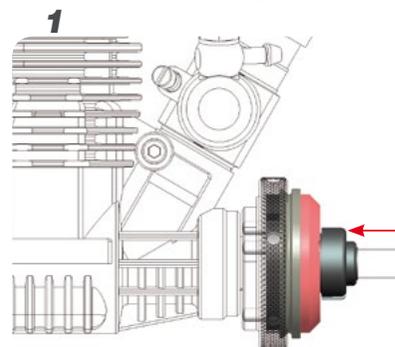


63.2



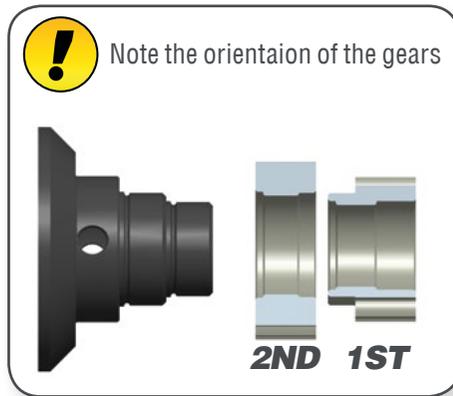
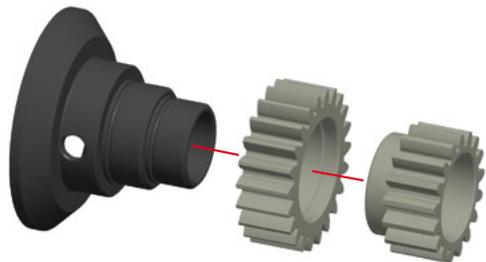
For adjusting the default clutch spring tension:

- 1- Screw in the adjusting nut all the way.
- 2- Unscrew it one and a half turns.
- 3- Fine tune the setup of your clutch on the track according to your driving style, track and weather conditions.

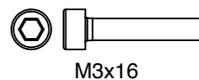
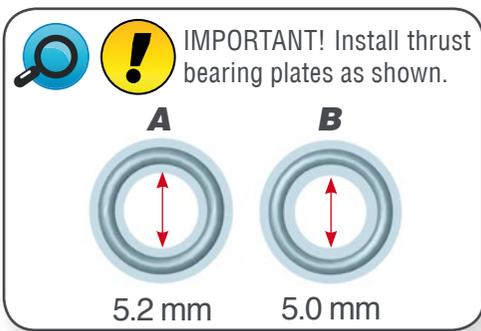
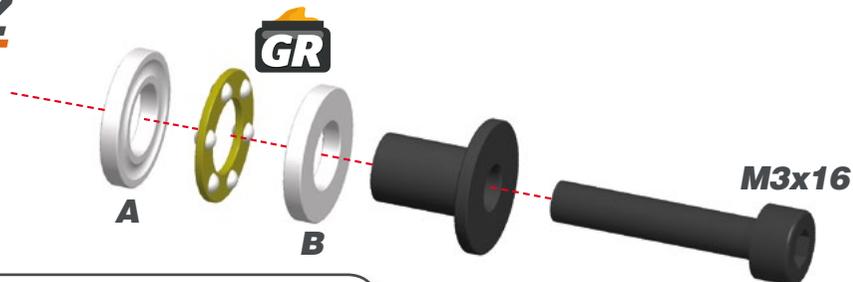


STEP 64

64.1

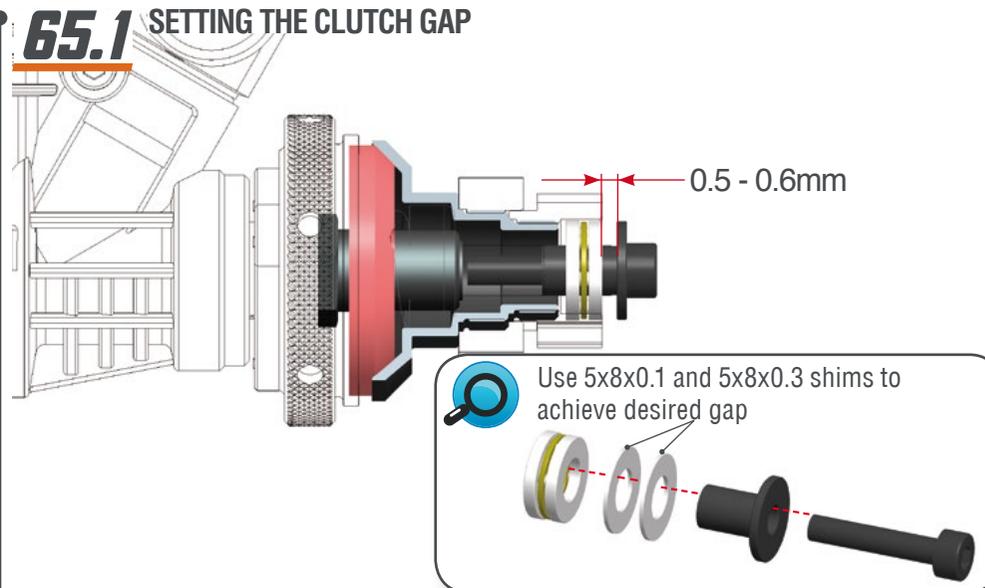


64.2

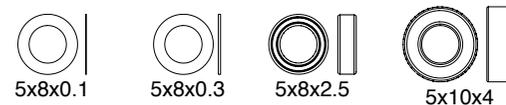
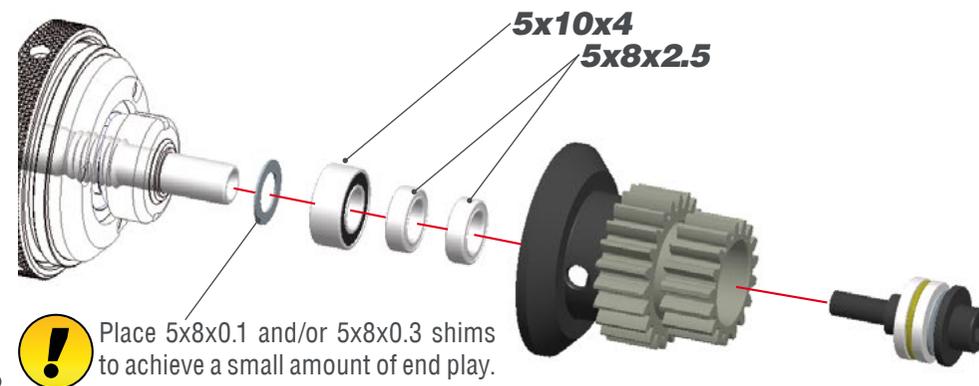


STEP 65

65.1 SETTING THE CLUTCH GAP

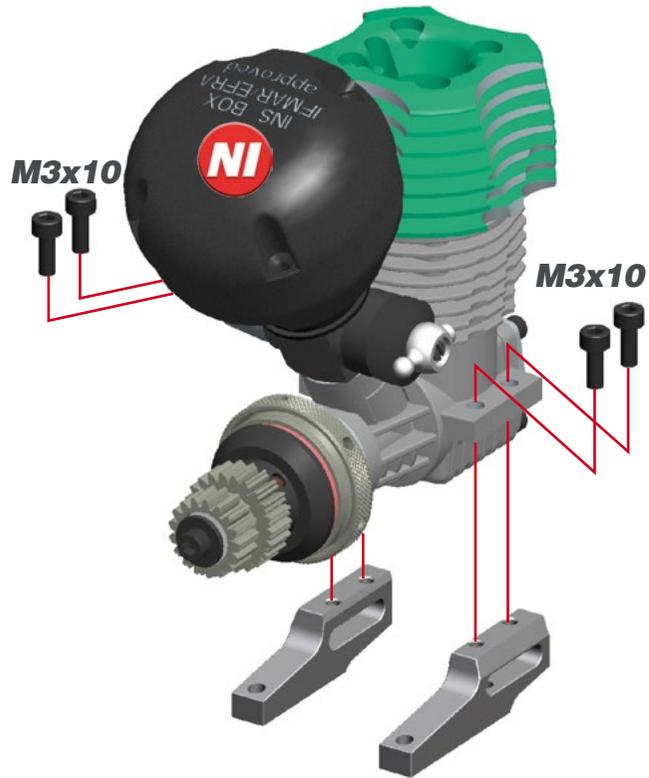


65.2 SETTING THE CLUTCH END PLAY

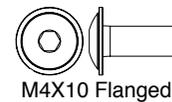
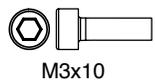
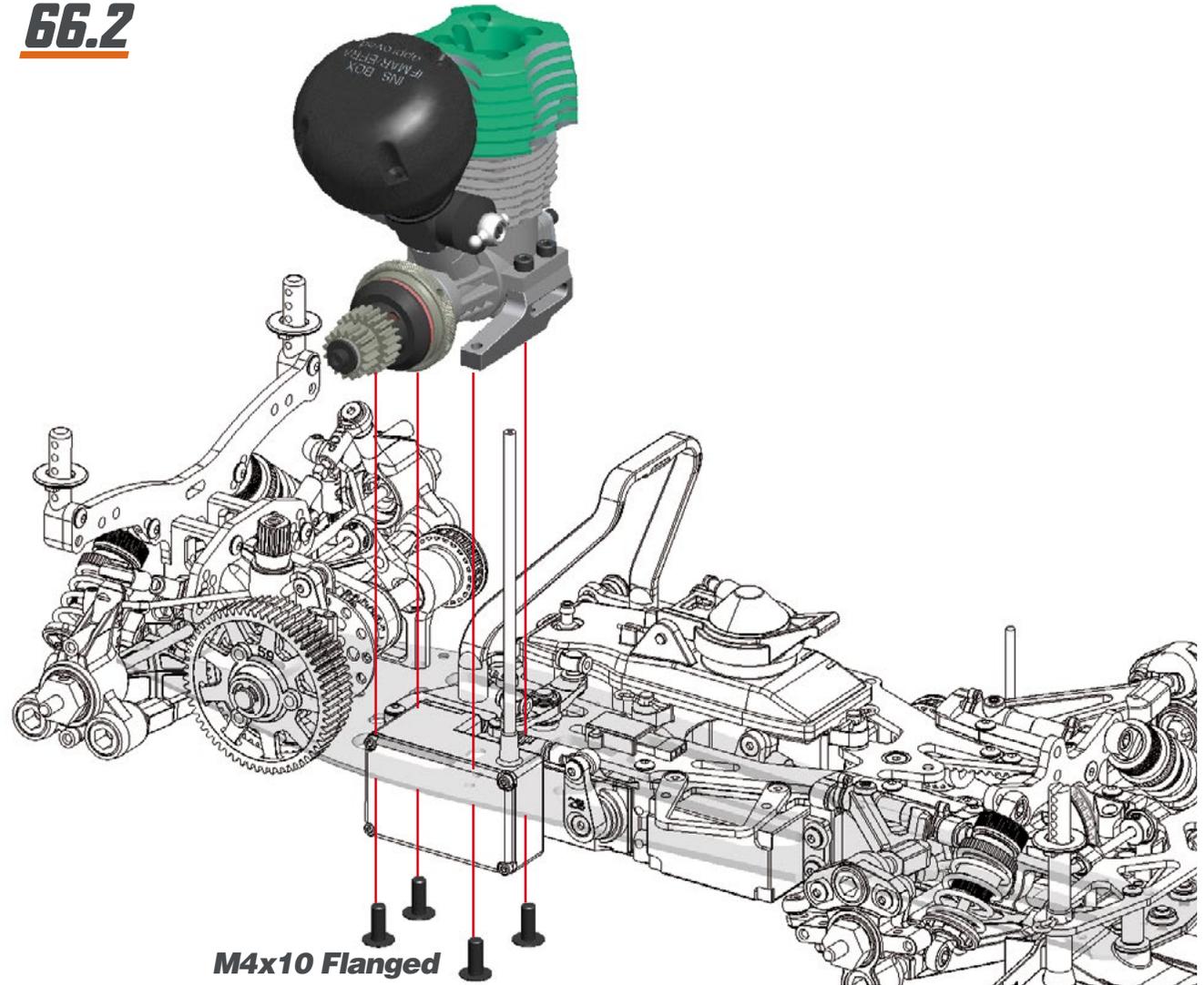


STEP 66

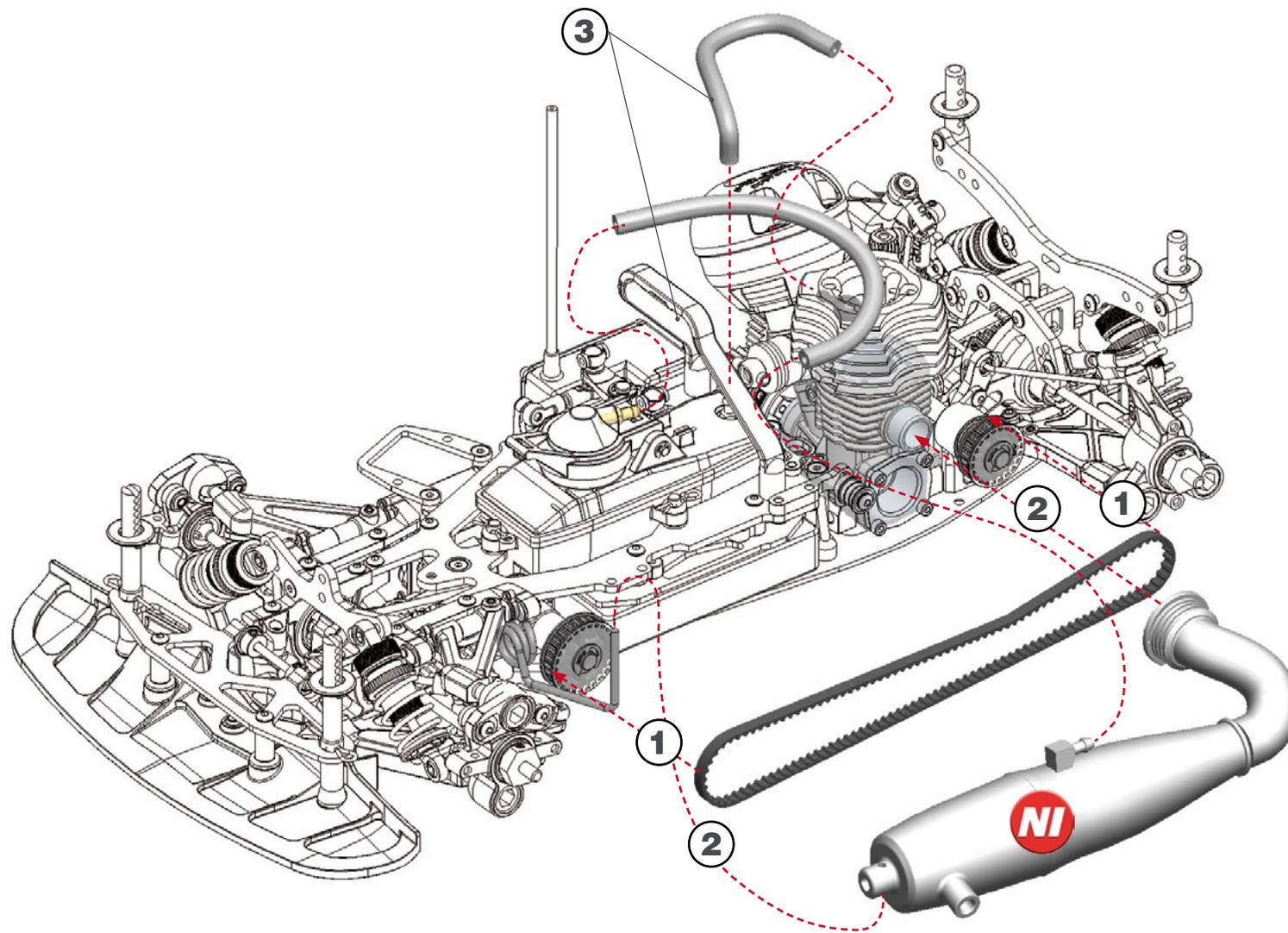
66.1



66.2

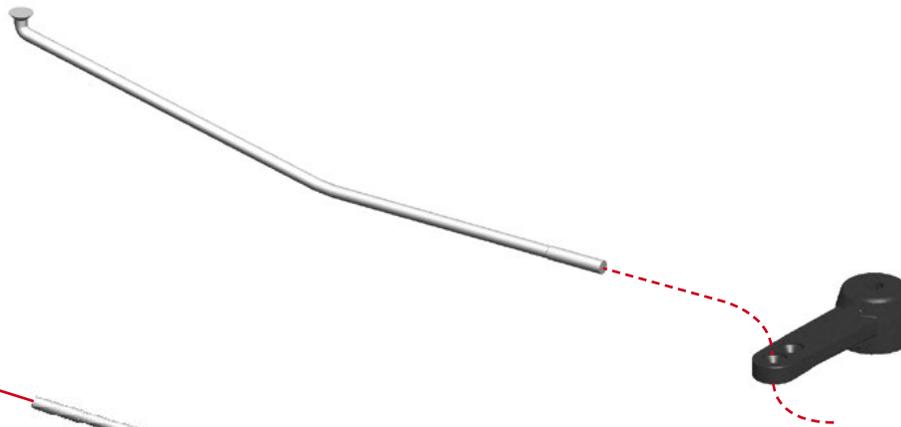


STEP 67 **BAG 15**

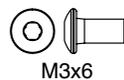
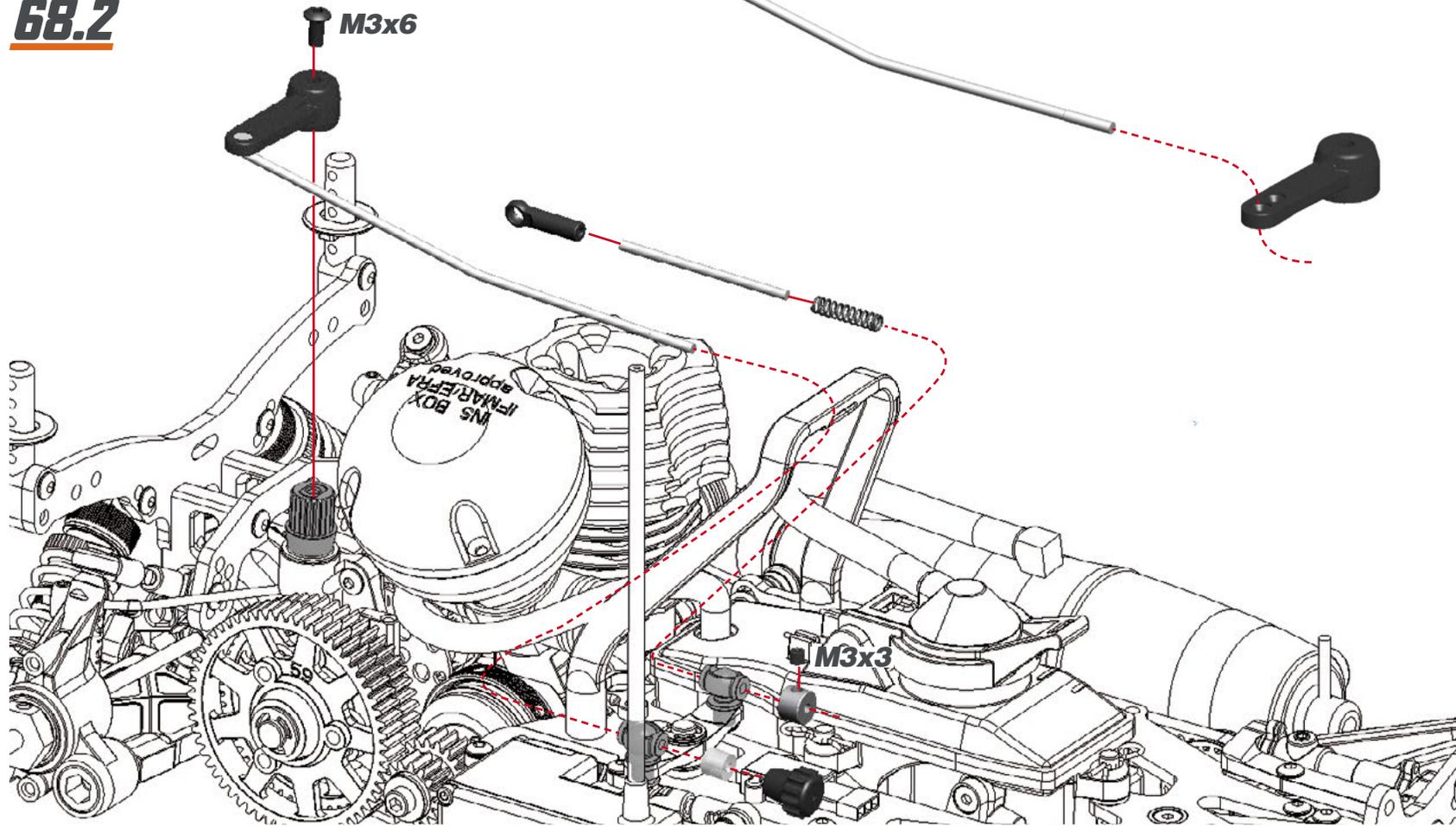


STEP 68

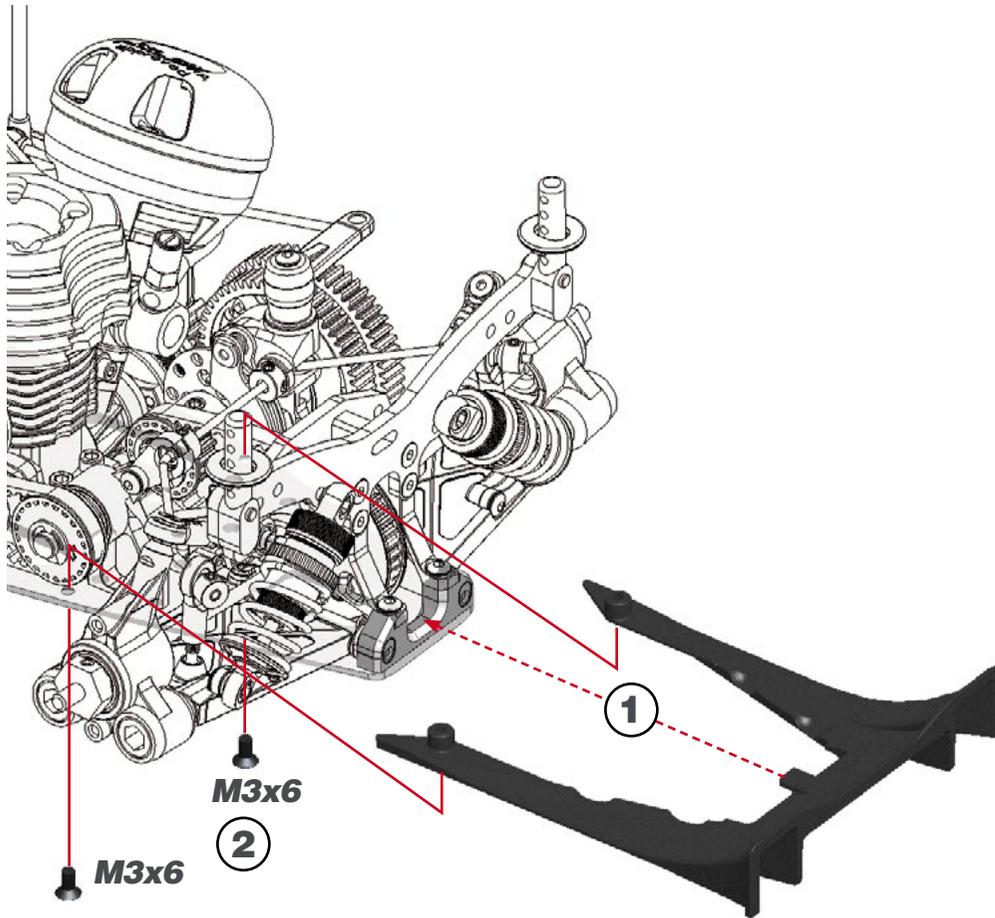
68.1



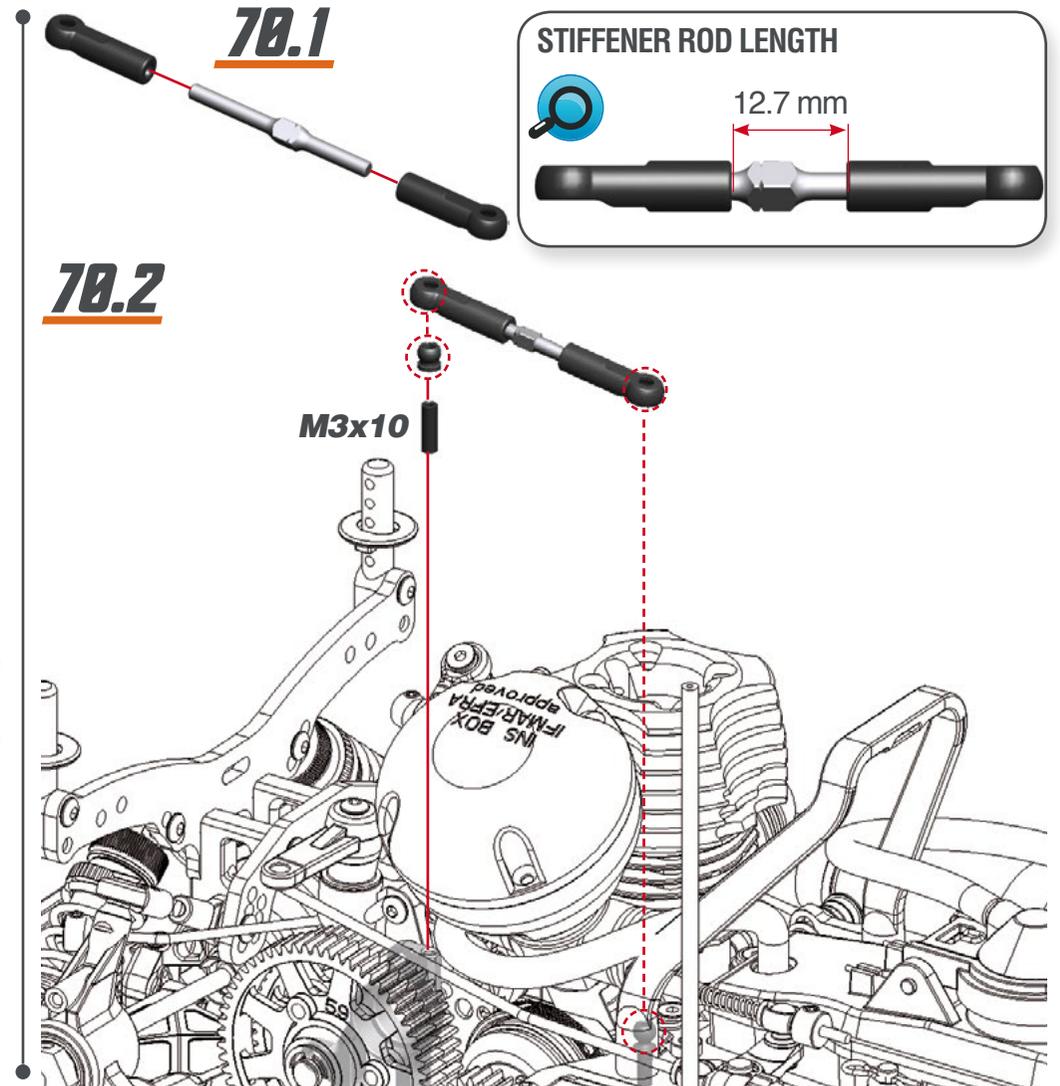
68.2



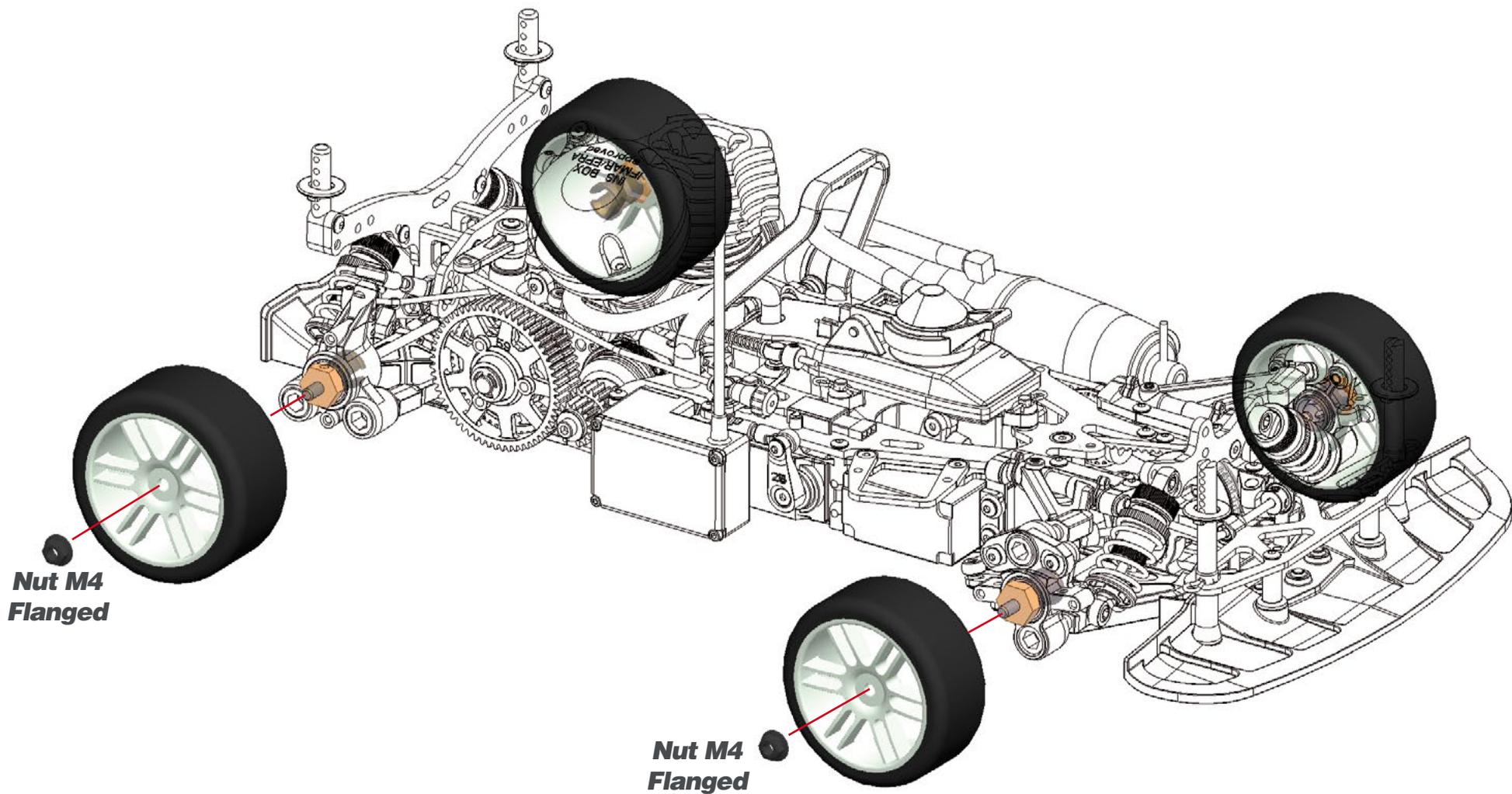
STEP 69



STEP 70

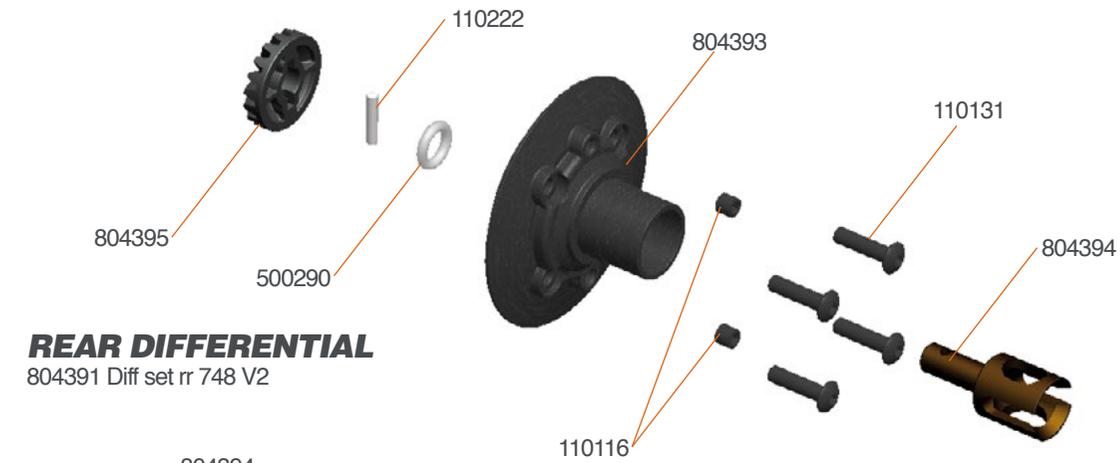


STEP 71

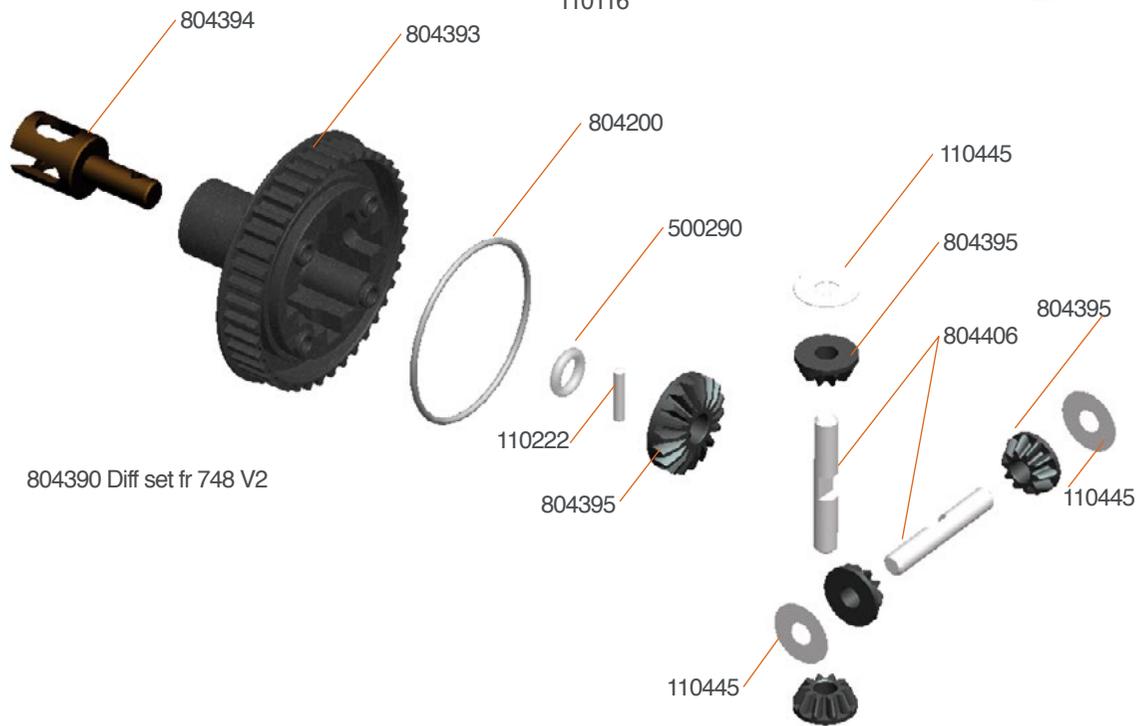


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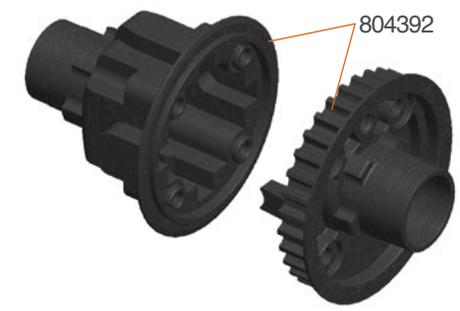


REAR DIFFERENTIAL
804391 Diff set rr 748 V2

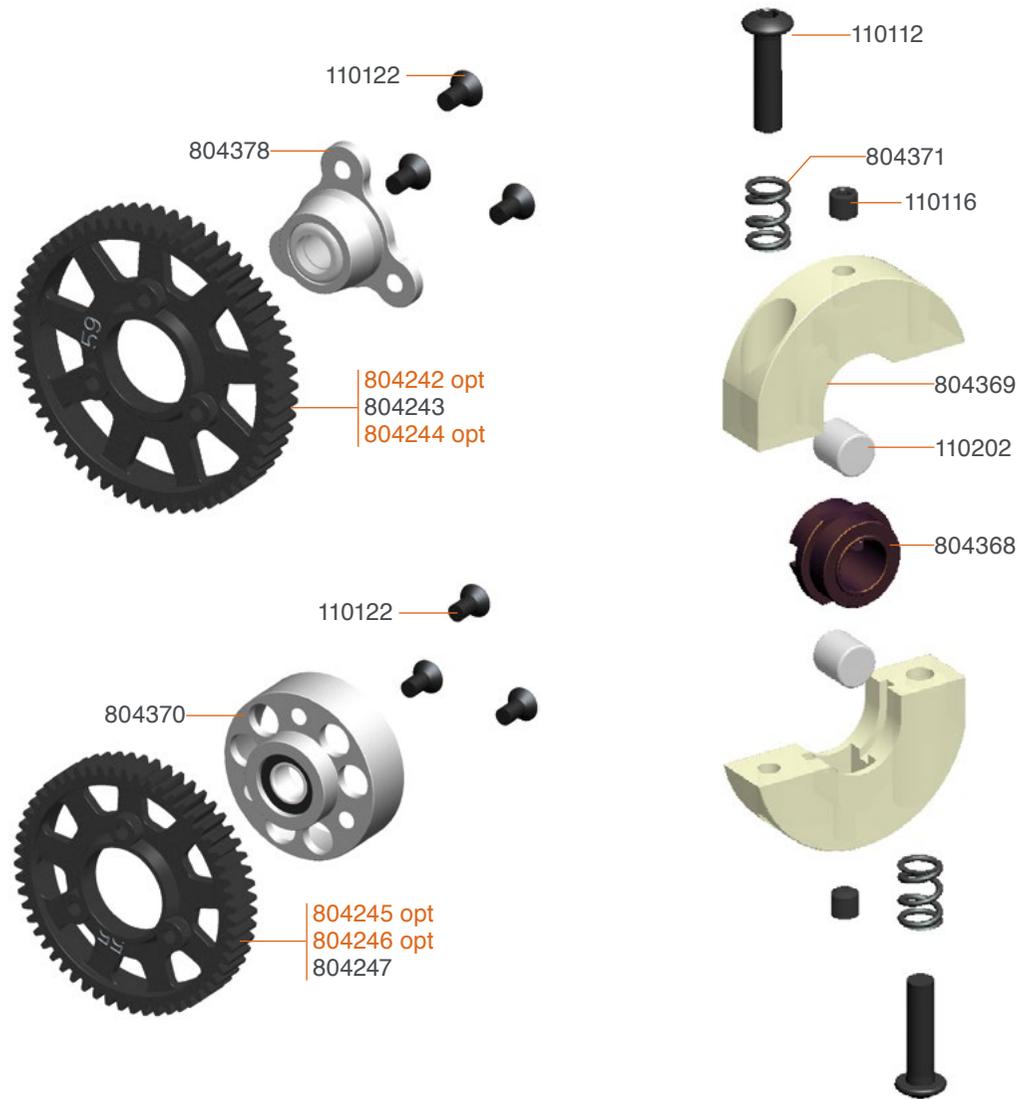


804390 Diff set fr 748 V2

FRONT DIFFERENTIAL

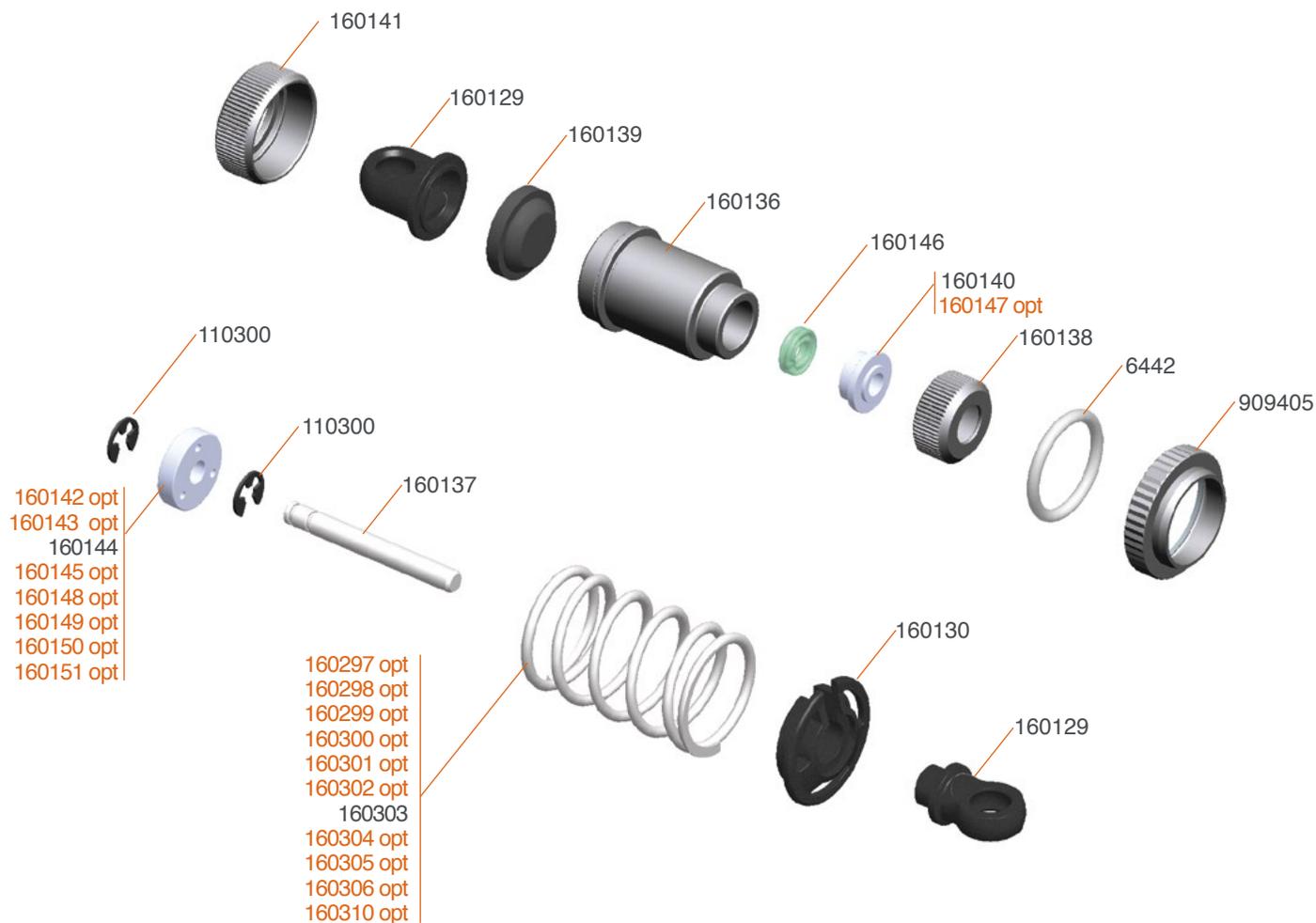


- 804374 Solid axle set front alu
- 804375 Solid axle front alu
- 804376 Solid axle outdrive (2)



804241 2-speed gear set SL6 (6)
804242 2-Speed gear 58T SL6
804244 2-Speed gear 60T SL6

804245 2-Speed gear 53T SL6
804246 2-Speed gear 54T SL6

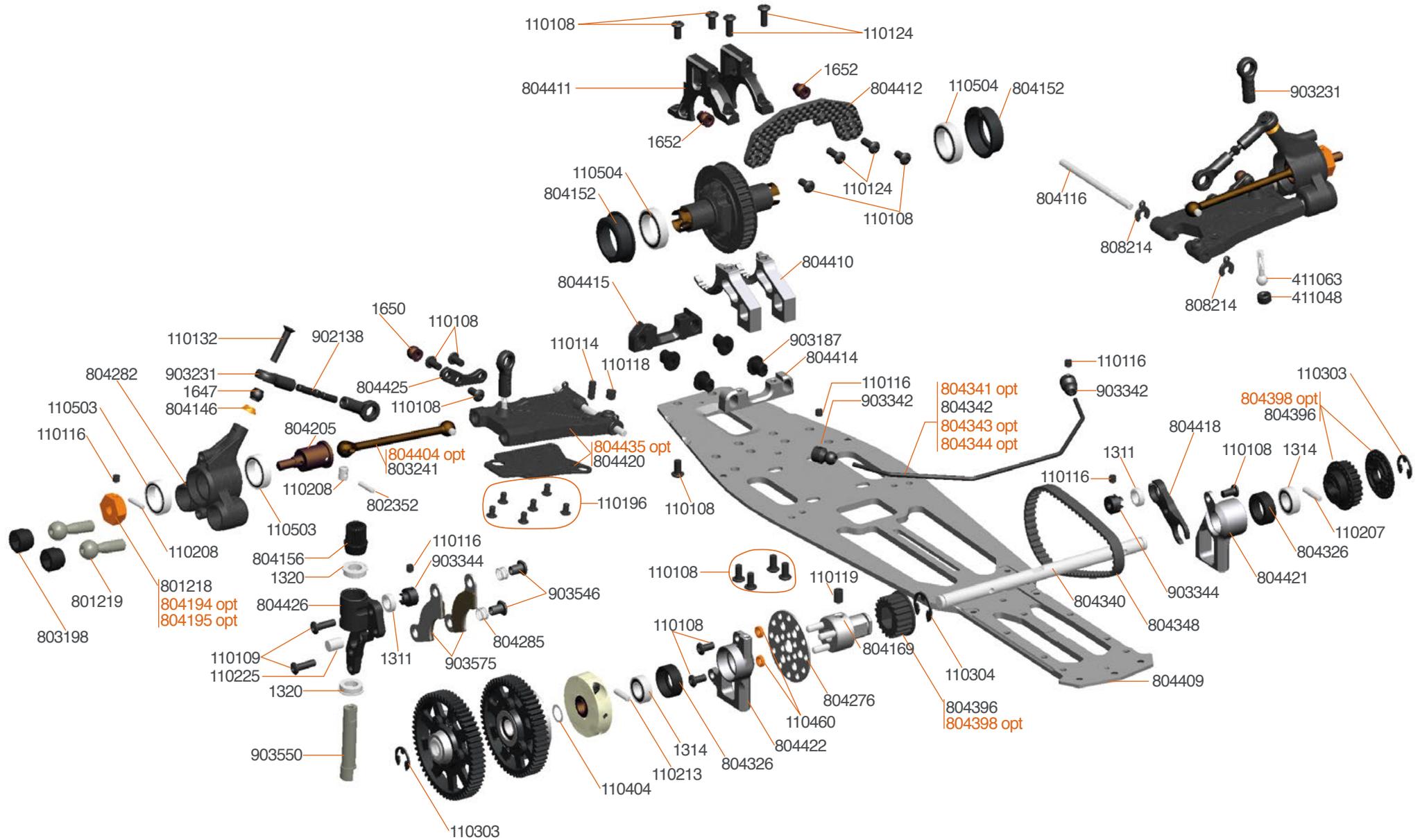


- 160142 Shock onroad big bore piston 1 hole (4)
- 160143 Shock onroad big bore piston 2 hole (4)
- 160144 Shock onroad big bore piston 4 hole (4)
- 160148 Shock onroad big bore piston 1 hole LF (2)
- 160149 Shock onroad big bore piston 2 hole LF (2)
- 160150 Shock onroad big bore piston 3 hole LF (2)

- 160151 Shock onroad big bore piston 4 hole LF (2)
- 160297 Spring grey TC
- 160298 Spring black TC
- 160299 Spring green TC
- 160300 Spring white
- 160301 Spring yellow

- 160302 Spring orange
- 160304 Spring Pink
- 160305 Spring blue
- 160306 Spring purple
- 160310 Spring-set L23 (5x2)
- 160147 Shock onroad big bore bushing LF (4)





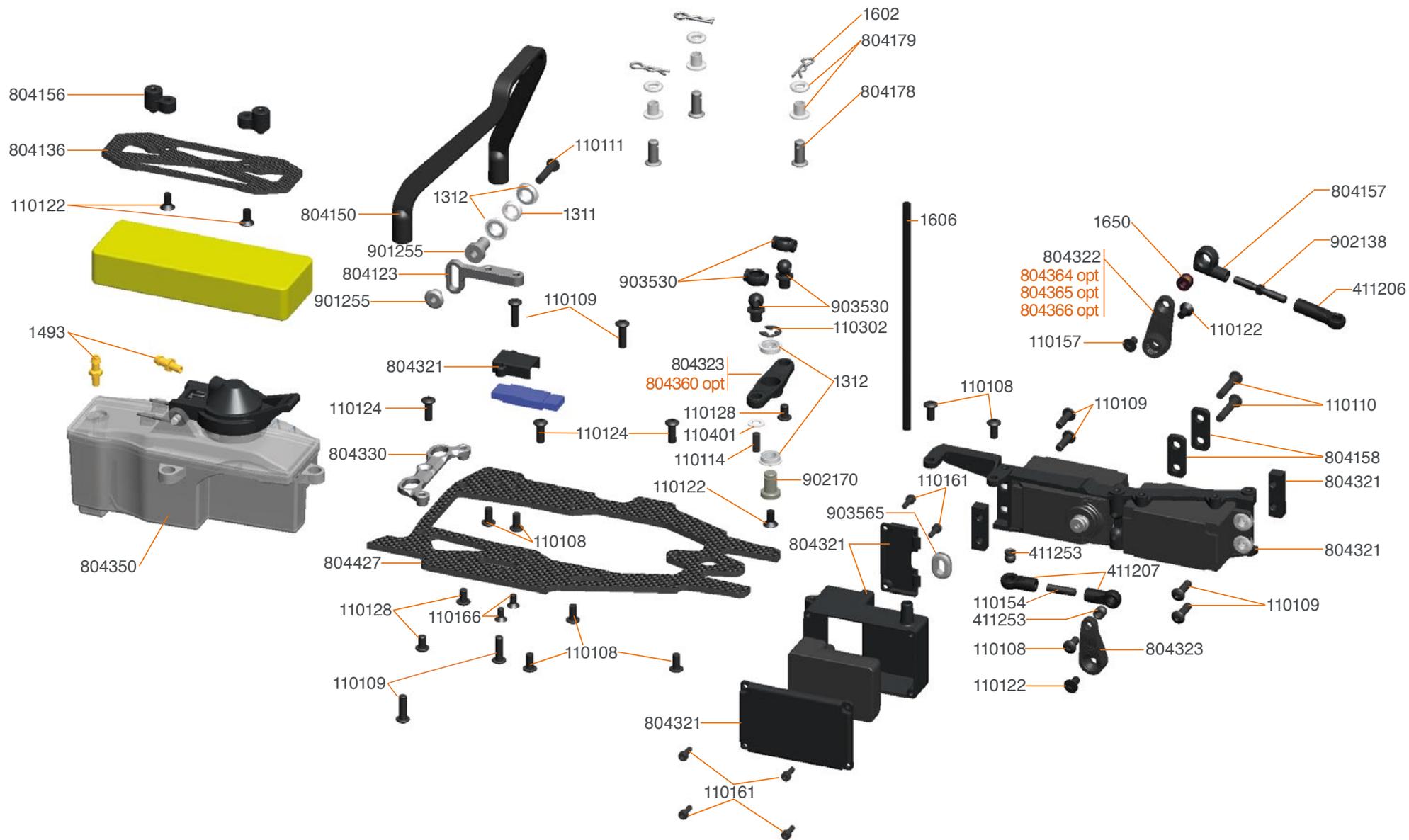
803240 CVD-set Pro (2)
 804194 Wheel hexagon +1mm (4)
 804195 Wheel hexagon -1mm (4)
 804281 Wishbone 747 RR LW medium (2)

804341 Antiroll bar 1.6 RR 748
 804343 Antiroll bar 2.0 RR 748
 804344 Antiroll bar 2.2 RR 748
 804398 Pulley set low friction (6) 748 V2

804401 Wheel-axle set CVD alu (2)
 804402 Wheelaxle CVD alu (2)
 804403 Wheelaxle CVD -1mm alu (2)
 804404 Driveshaft CVD alu (2)

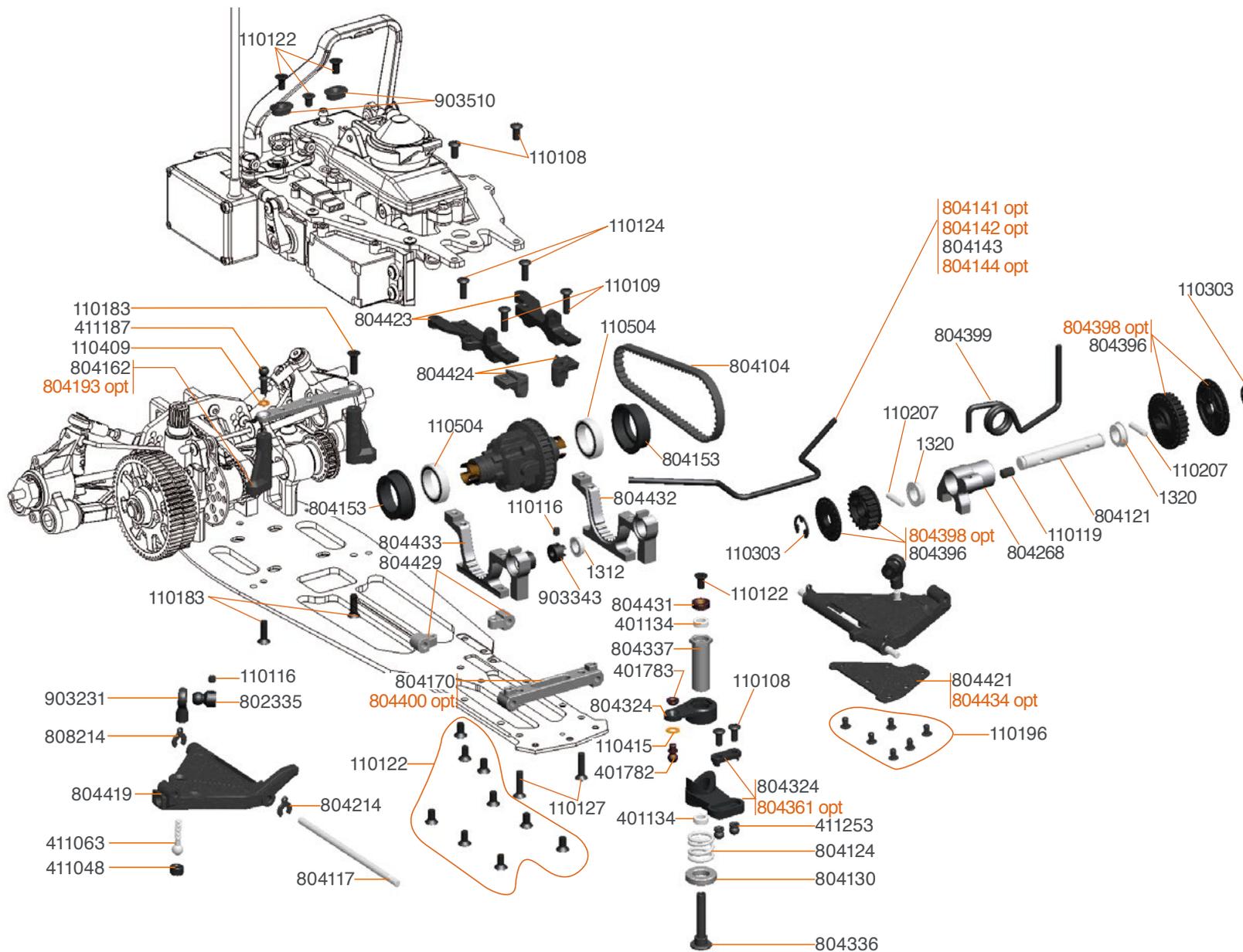
804435 Wishbone insert carbon RR lw (2)





804360 Throttle lever alu
 804364 Servo lever steering alu 23T 748
 804365 Servo lever steering alu 24T 748

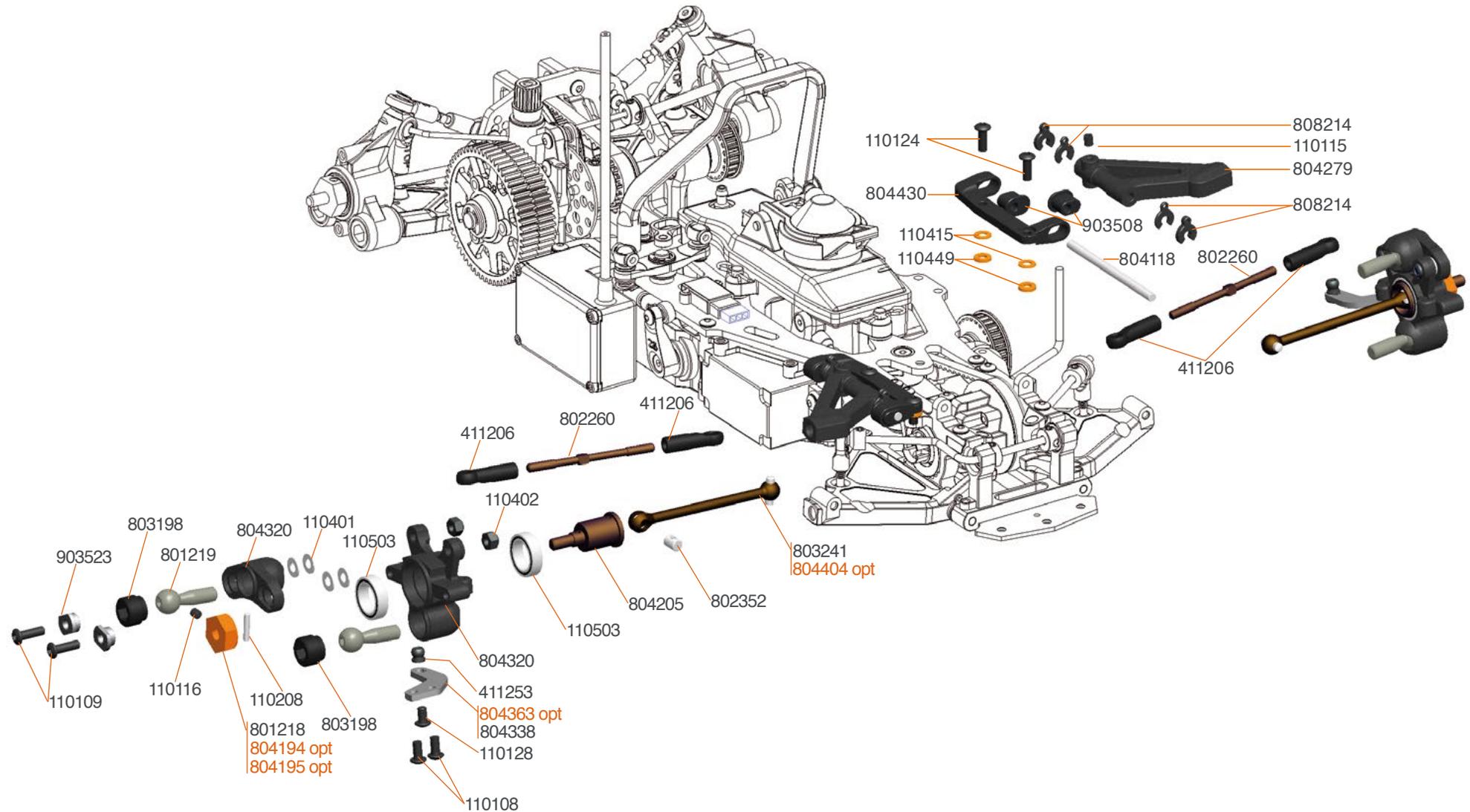
804366 Servo lever steering alu 25T 748



804110 Wishbone front lw L+R (M)
 804141 Anti-rollbar FR 1.8mm
 804142 Anti-rollbar FR 2.2mm
 804144 Anti-rollbar FR 2.8mm

804193 Radioplate support alu
 804361 Servosaver bottom alu
 804374 Solid axle set front alu
 804375 Solid axle front alu

804376 Solid axle outdrive (2)
 804398 Pulley set low friction (6) 748 V2
 804400 Suspension bracket FR brass
 804434 Wishbone insert carbon FR lw (2)



804194 Wheel hexagon +1mm (4)
 804195 Wheel hexagon -1mm (4)
 804240 CVD-set Pro (2)

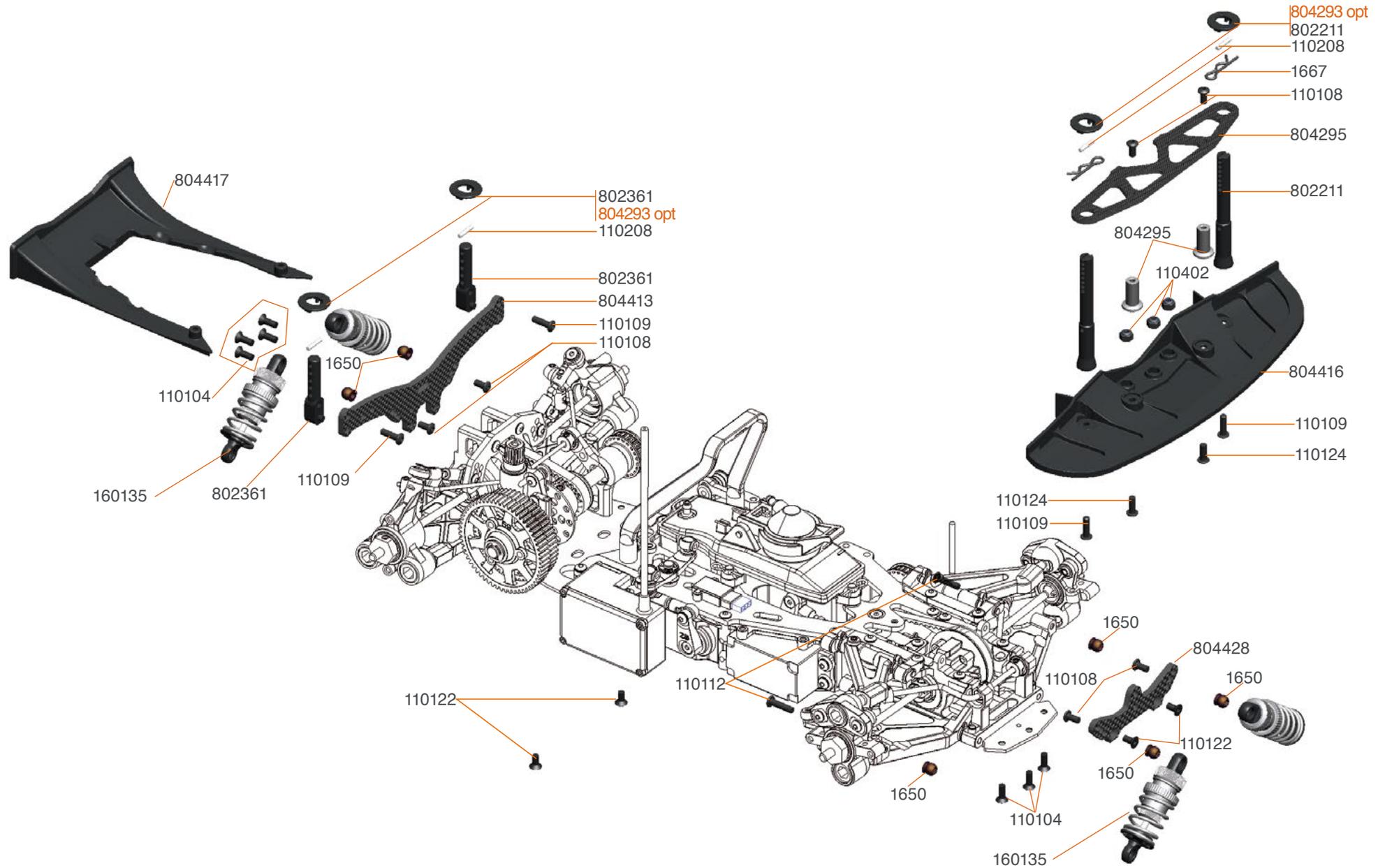
804363 Steeringblock lever carbon 748 (2)
 804401 Wheel-axle set CVD alu (2)
 804402 Wheelaxle CVD alu (2)

804403 Wheelaxle CVD -1mm alu (2)
 804404 Driveshaft CVD alu (2)

SHOCKS MOUNTING EXPLODED VIEW

750
MATRIX

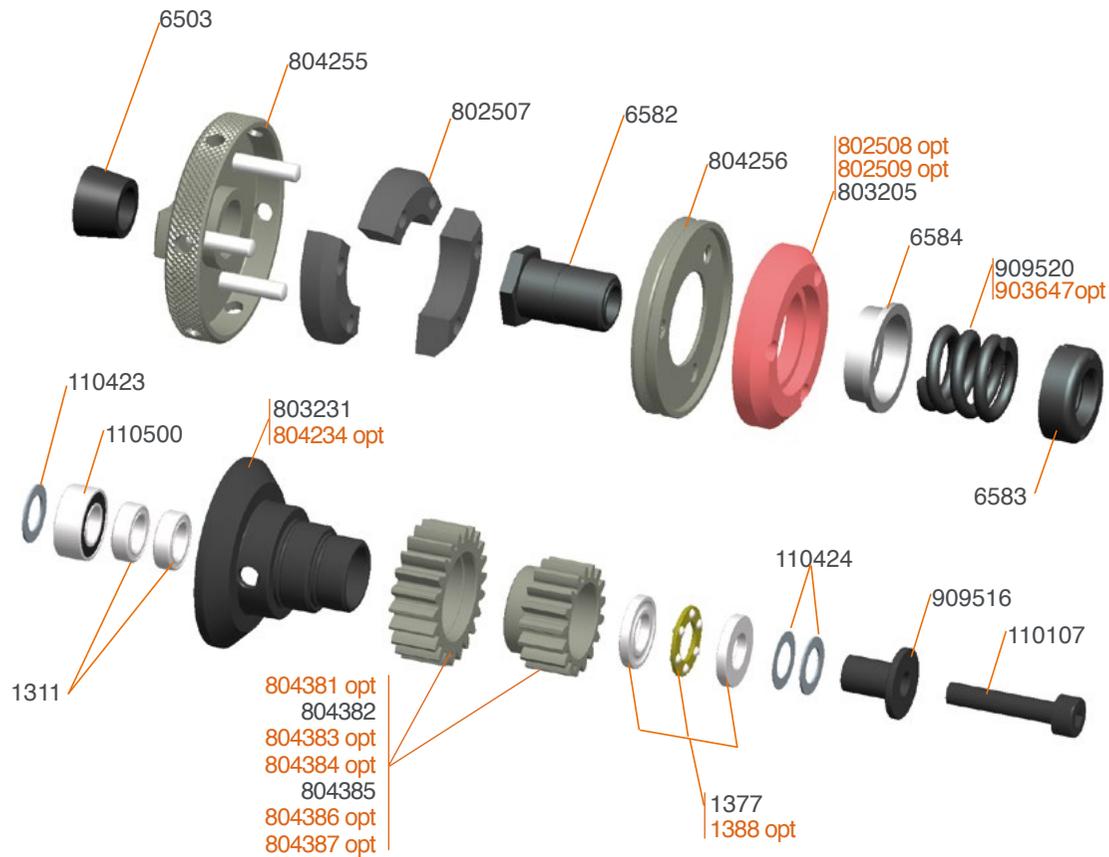
SPT
SERPENT



804293 Body support washers med + high (5+5)



Centax True Motion clutch 1/10 #804250



1388 Thrust bearing 5x10 Ceramic
802508 Centax - 3 clutch shoe XP
802509 Centax-3 clutch shoe yellow
804234 Centax-3 clutchbell alu coated

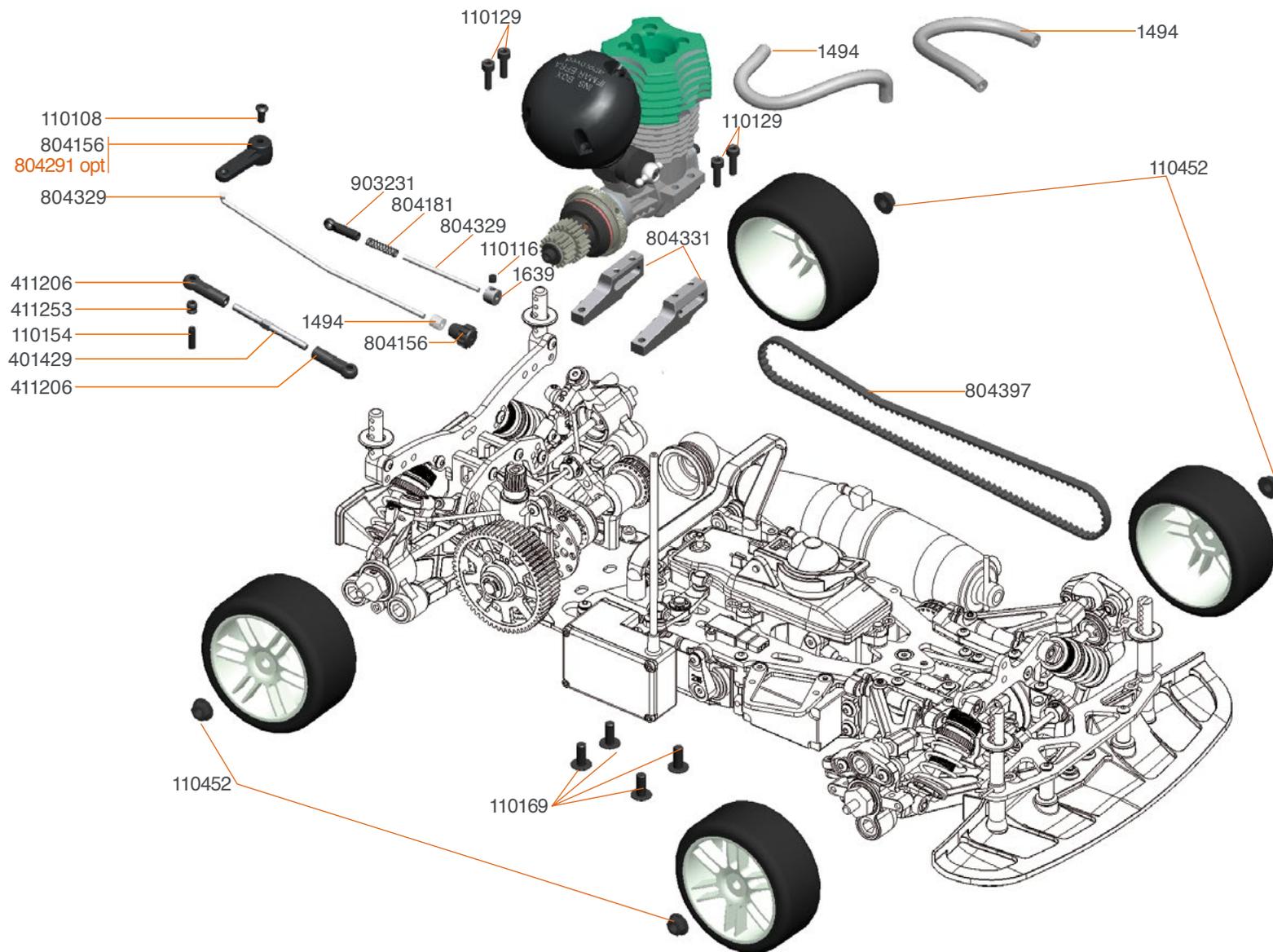
804381 Centax-3 gear-pinion alu 15t wc V2
804383 Centax-3 gear-pinion alu 17t wc V2
804384 Centax-3 gear-pinion alu 20t wc V2
804386 Centax-3 gear-pinion alu 22t wc V2

804387 Centax-3 gear-pinion alu set wc (6) V2
903647 Centax spring x-hard

FINAL ASSEMBLY EXPLODED VIEW

750
NATRIX

SPT
SERPENT



804291 Brake lever on-road alu



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GP 1/10 scale onroad



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