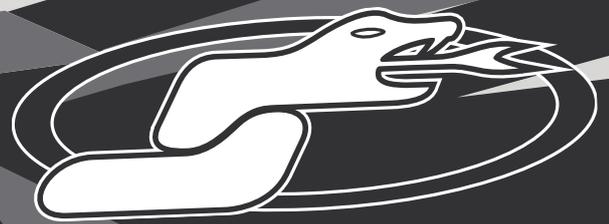


# SERPENT *seven20* 720

1/10TH SCALE 4WD COMPETITION CAR



**INSTRUCTION MANUAL**

# SERPENT 720

## INTRODUCTION

Rising to the challenge of improving upon their race-winning Serpent 710, the engineers at Serpent once again came up with a formidable challenger, destined for the Winners' Circle. The Serpent 720 is evolution realized in a performance package, with a focus on ease of assembly and tuning. You are now part of the worldwide network of Serpent drivers, which gives you superior technical support and access to many benefits that only Serpent drivers can enjoy.

The Serpent 720 offers many of the same specifications and features that made the Serpent 710 into a top-competition racecar. The new, refined chassis design allows for faster cornering and better overall handling in high-grip conditions, while the optimized internal gear ratios showcase the improved performance on smaller technical tracks. The Serpent 720's new, reinforced parts are easier to assemble and maintain, and improve on the already impressive geometry of its predecessor. Other features include identical left/right wishbones, new Serpent RCC shock absorbers, improved CG, standard front and rear gear differentials, an improved braking system, to name only a few.

Refinement, attention to detail, and unsurpassed performance can be summed up in one word... Serpent.

### INSTRUCTIONS

Serpent's long tradition of excellence extends to their 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 racecar that will soon be able to unleash its full potential at the racetrack.

This instruction manual has been divided into sections that will logically lead you through the assembly process of your Serpent 720. Follow the assembly steps in the order presented to ensure that no problems occur during assembly. Each step indicates all the fasteners and small parts used. Bag numbers identify the kit bag(s) that contains the appropriate parts.

### SETUP

In certain assembly steps you need to make basic adjustments, which will give you a good initial setup for your Serpent 720. Fine-tuning the initial setup is an essential part of building a high-performance racecar like your Serpent 720. The separate Serpent 720 Setup Book is an invaluable resource for making adjustments to your Serpent 720 and understanding the concepts behind those adjustments.

### EXPLODED VIEWS AND PARTS LIST

The exploded views and parts lists for the Serpent 720 are contained in a separate Serpent 720 Reference Guide. The exploded views show all the parts of a particular assembly step along with the Serpent part number. The parts lists indicate the part number and name of each part for easy reference when ordering.

### SAFETY

Included with your Serpent 720 kit is a document entitled "Read This First" that covers safety precautions for the assembly and use of this product. We strongly recommend that you thoroughly read and understand that document, and follow all the precautions.

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# USING THE MANUAL

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

LINE / SYMBOL	DESCRIPTION
        	<p>Step number; the order in which you should assemble the indicated parts</p> <p>Length after assembly</p> <p>Assembly path of one item into another</p> <p>Group of items (within lines) should be assembled first</p> <p>Direction the item should be moved</p> <p>Glue one item to another</p> <p>Press/Insert one item into another</p> <p>Connect one item to another</p> <p>Gap between two items</p>
 	<p>Refer to Serpent 720 Setup Book - Section A: Basic Setup</p> <p>Refer to Serpent 720 Setup Book - Section B: Advanced Setup</p>
   	<p>Apply graphite grease (GR), threadlock (TL), CA glue (CA) or Serpent's One-way Lube (OW). (Items not included.)</p>

## SERPENT.COM

The printed instruction manual included with your Serpent 720 kit is very complete, though due to continuous product development, more up-to-date information is provided at our Serpent.com web portal. This state-of-the-art R/C technology portal is where Serpent racers from all over the world meet and exchange their ideas, and share useful information and experiences about their Serpent cars.

All information about the Serpent 720 is accessible from the Serpent 720 product page on Serpent.com. You can access this page by going to the Products section, and

then search for the 'Serpent 720' product name. From the Serpent 720 product page you will find the very latest information about your Serpent 720: reports by team drivers and other experts, tips and tricks, FAQ, forums, setups, image gallery, downloadable files, and even streaming video of the Serpent 720 on how to further improve the car. The latest version of the instruction manual (including team and racer tips, and part lists and option lists) will be made available as downloadable PDF-files and online viewable pages under 'i-Manual.'

# 1.0 PREPARATION

## STEP 1.1

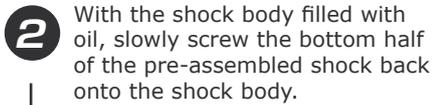
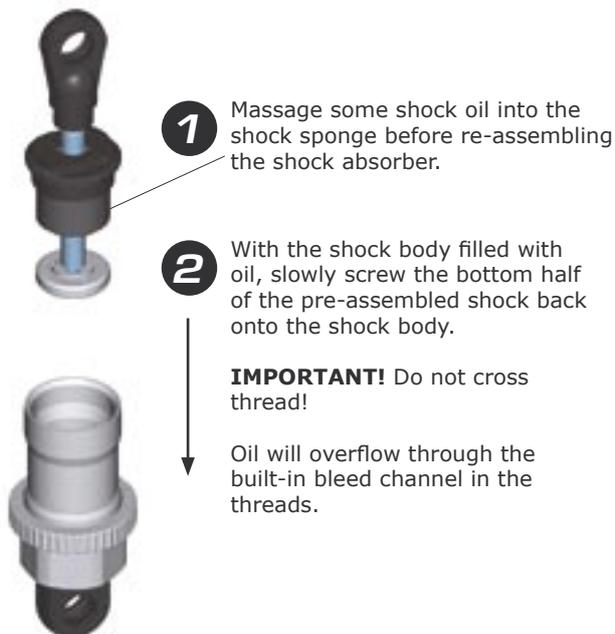
### BAG D

#### SHOCK ABSORBERS

Fill ALL 4 shock absorbers with shock oil using the following steps



## STEP 1.2

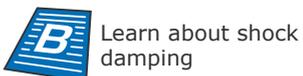


**IMPORTANT!** Do not cross thread!

Oil will overflow through the built-in bleed channel in the threads.



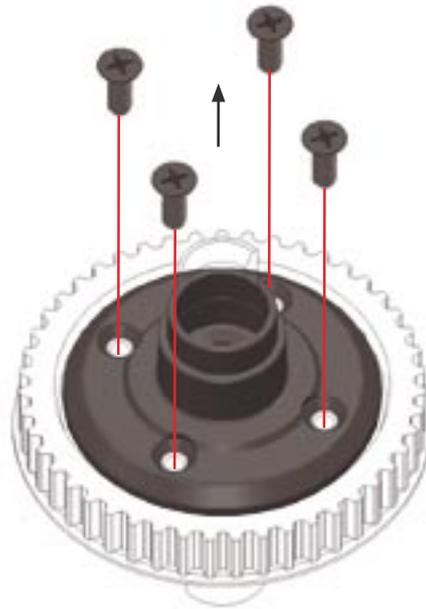
**Shock Length**  
68mm  
for all shocks



## STEP 1.3

### GEAR DIFFERENTIALS

Fill BOTH pre-assembled front & rear gear diffs with diff oil using the following steps.



## STEP 1.4



## STEP 1.5

**FRONT DIFF:** Use **50,000** diff oil

**REAR DIFF:** Use **30,000** diff oil



Fill the space around the gears with the indicated Serpent Diff Oil **until level with the top of the casing**. Rotate the output shaft to allow the grease to fill all gaps in and around the gears.

## STEP 1.6



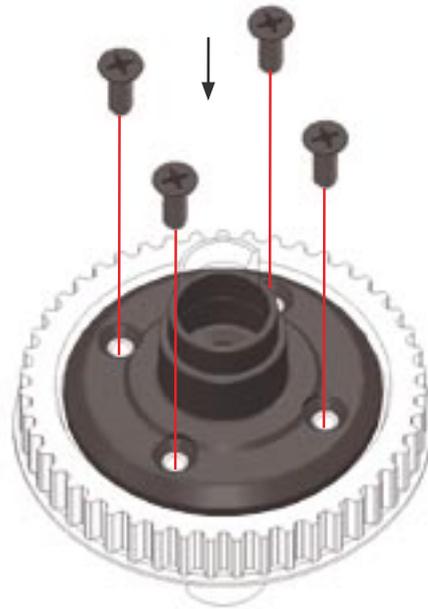
**IMPORTANT!**  
Make sure to set O-ring in place

## STEP 1.7

**IMPORTANT!**

The mounting screws are different for the front and rear differential so please be sure to use the correct ones.

**Front Diff - Long Screws**  
**Rear Diff - Short Screws**

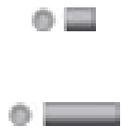


Do not overtighten screws

# 2.0 FRONT ASSEMBLY

## STEP 2.1

### BAG 1

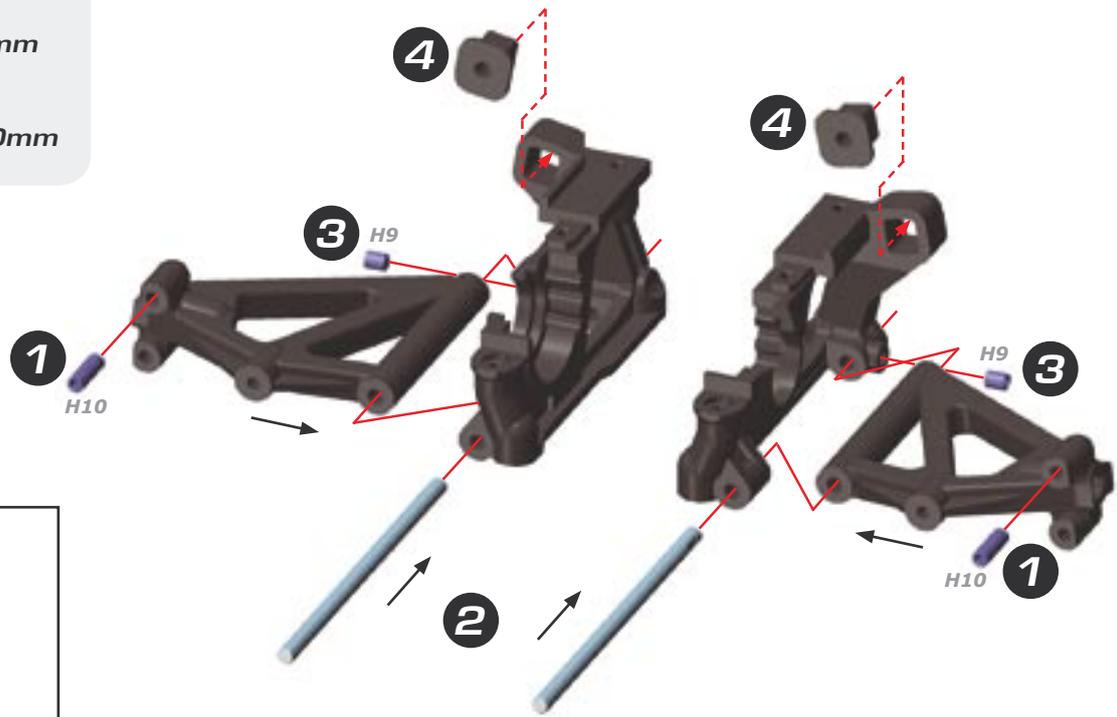


**H9**  
M3x4mm

**H10**  
M3x10mm



Learn about front roll center adjustment



**4** Make sure L + R inserts are in equal but opposite positions (mirrored).



Right



Left

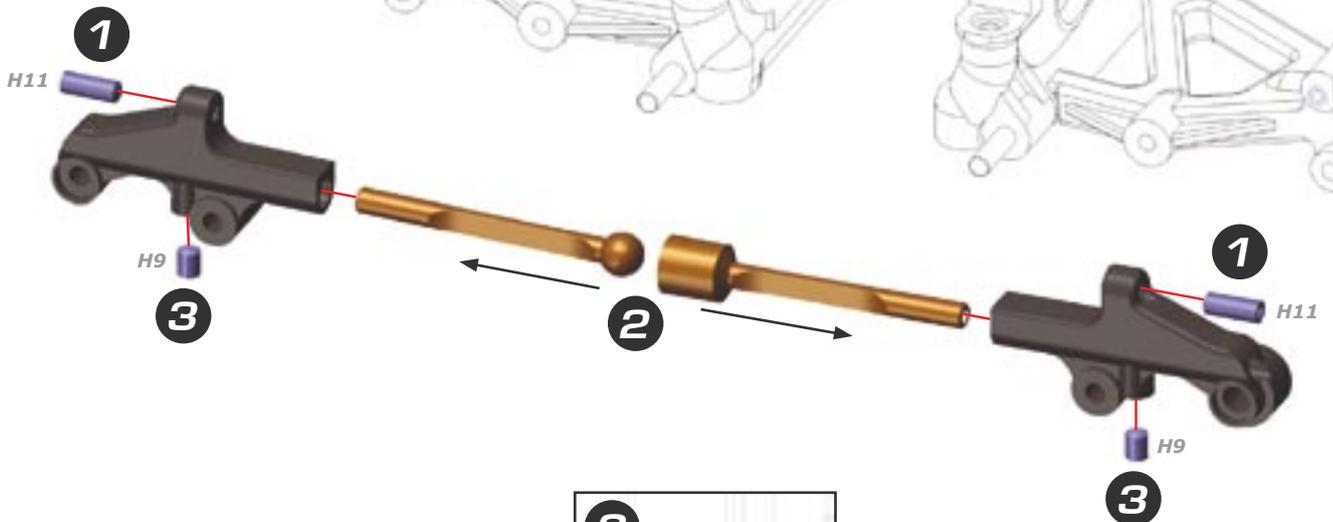
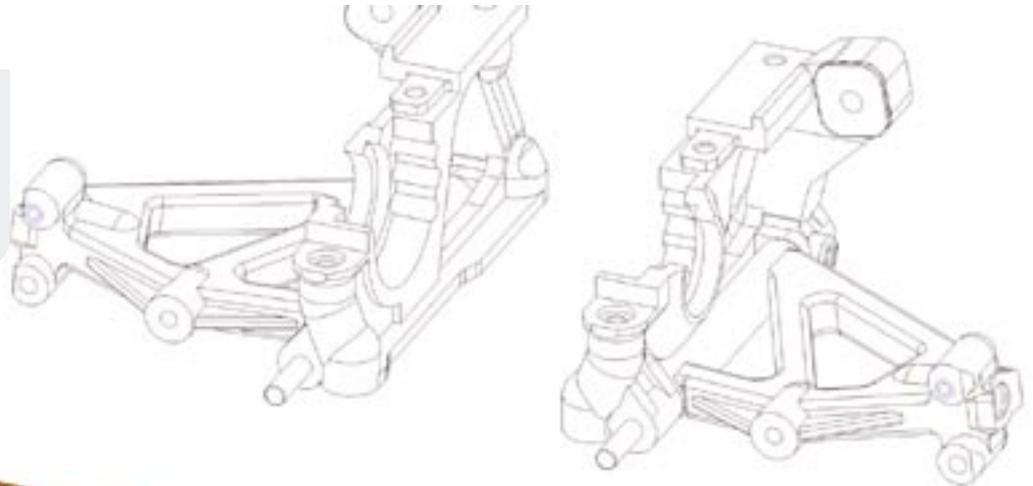
## STEP 2.2

### BAG 2

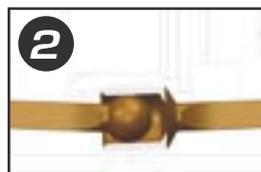


**H11**  
M3x8mm

**H9**  
M3x4mm



Set front anti-roll bar



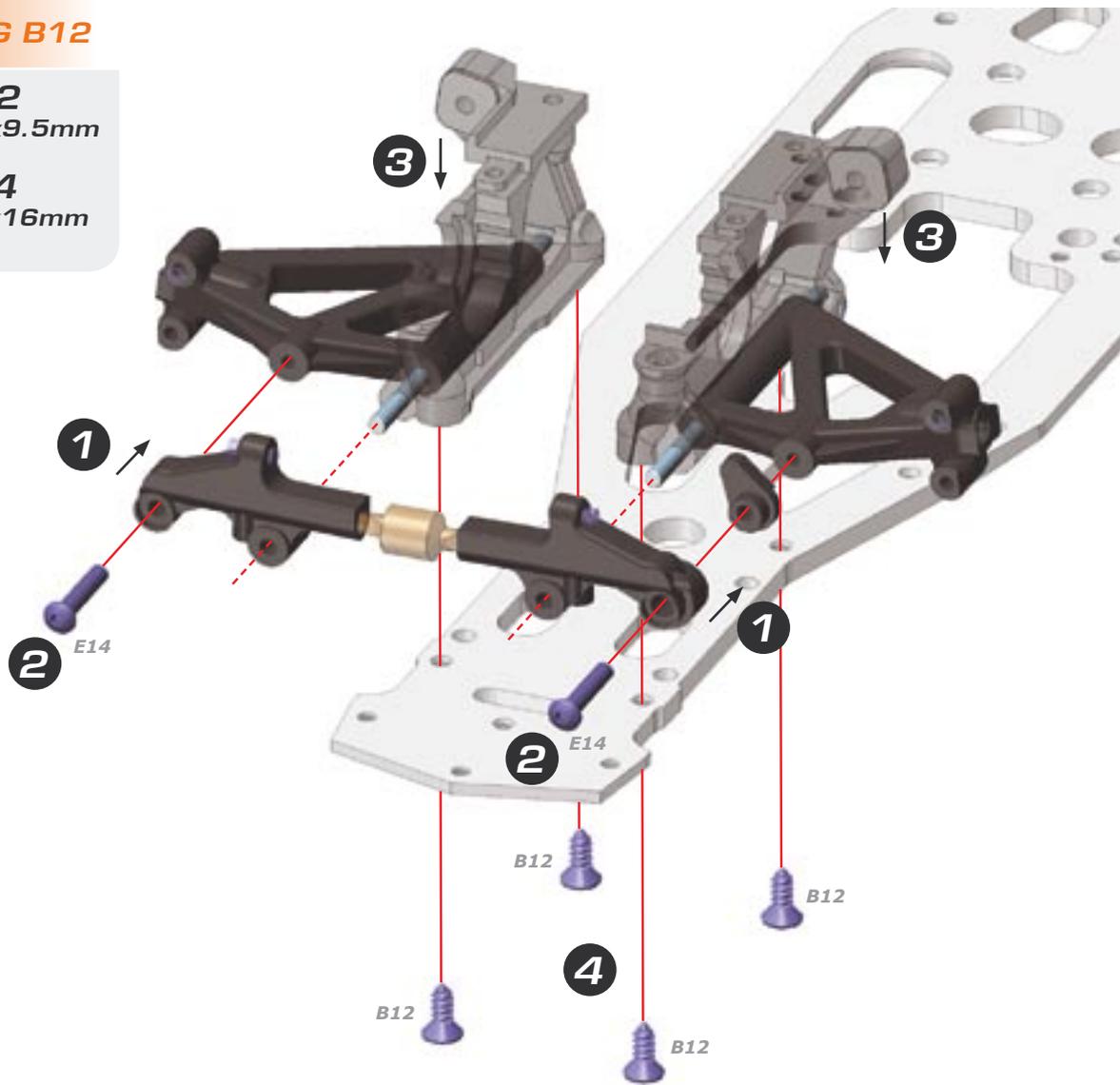
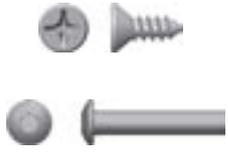
Press anti-roll bars into mounts far enough so the bars do not bind when the suspension is compressed.

## STEP 2.3

### BAG B12

**B12**  
3.5x9.5mm

**E14**  
M3x16mm

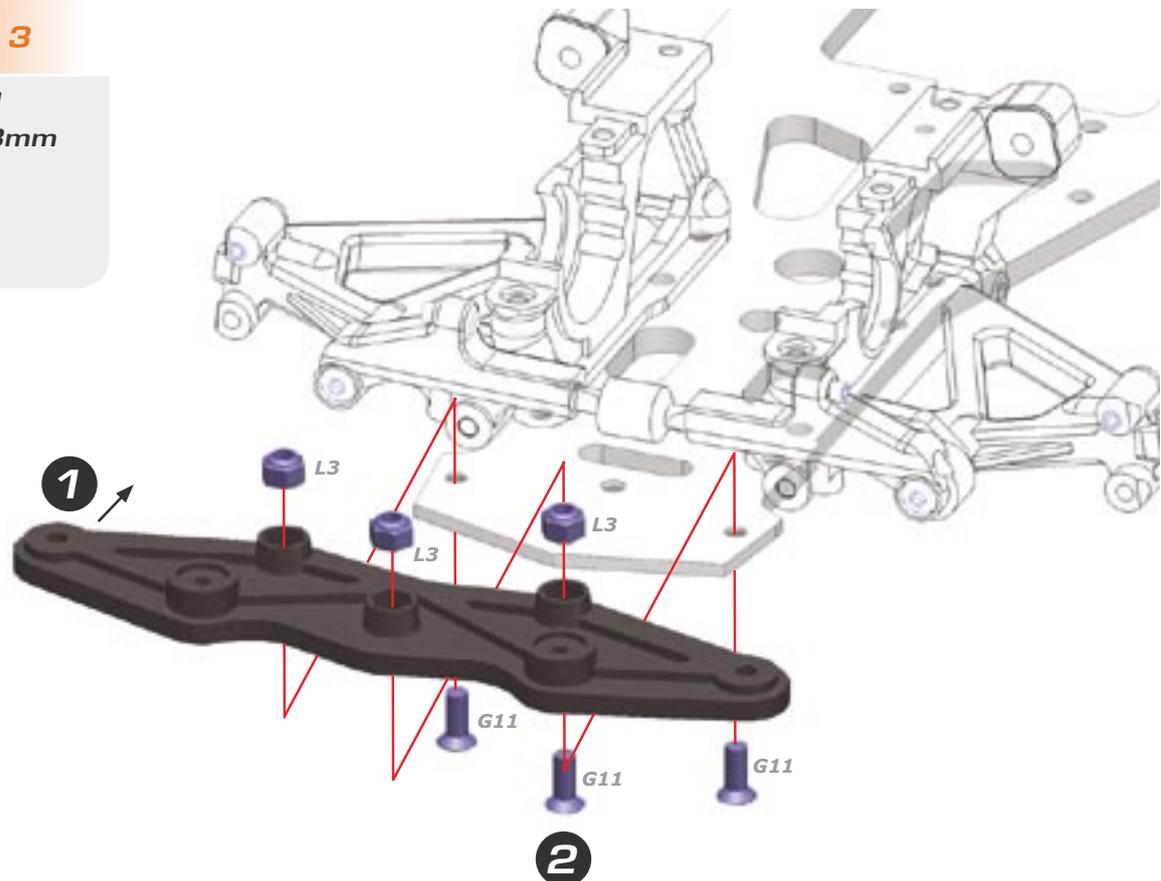


## STEP 2.4

### BAG 3

**G11**  
M3x8mm

**L3**  
M3



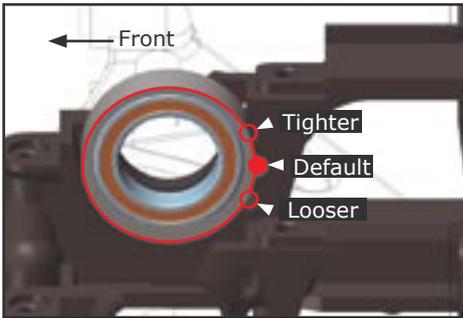
## STEP 2.5

BAG U



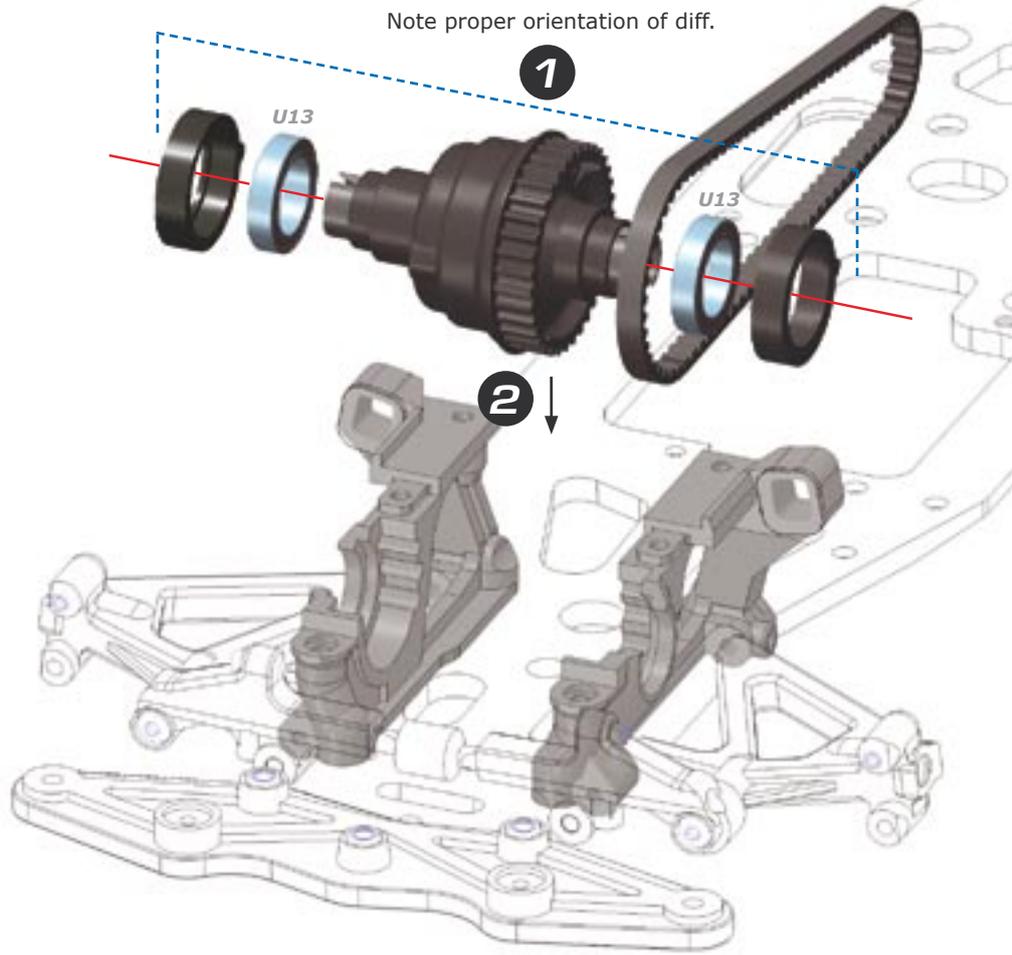
**U13**  
12x18mm

LEFT FRONT ECCENTER



Change the position of **BOTH** eccentric hubs to adjust front belt tension. Both hubs should have the same position.

Note proper orientation of diff.



## STEP 2.6

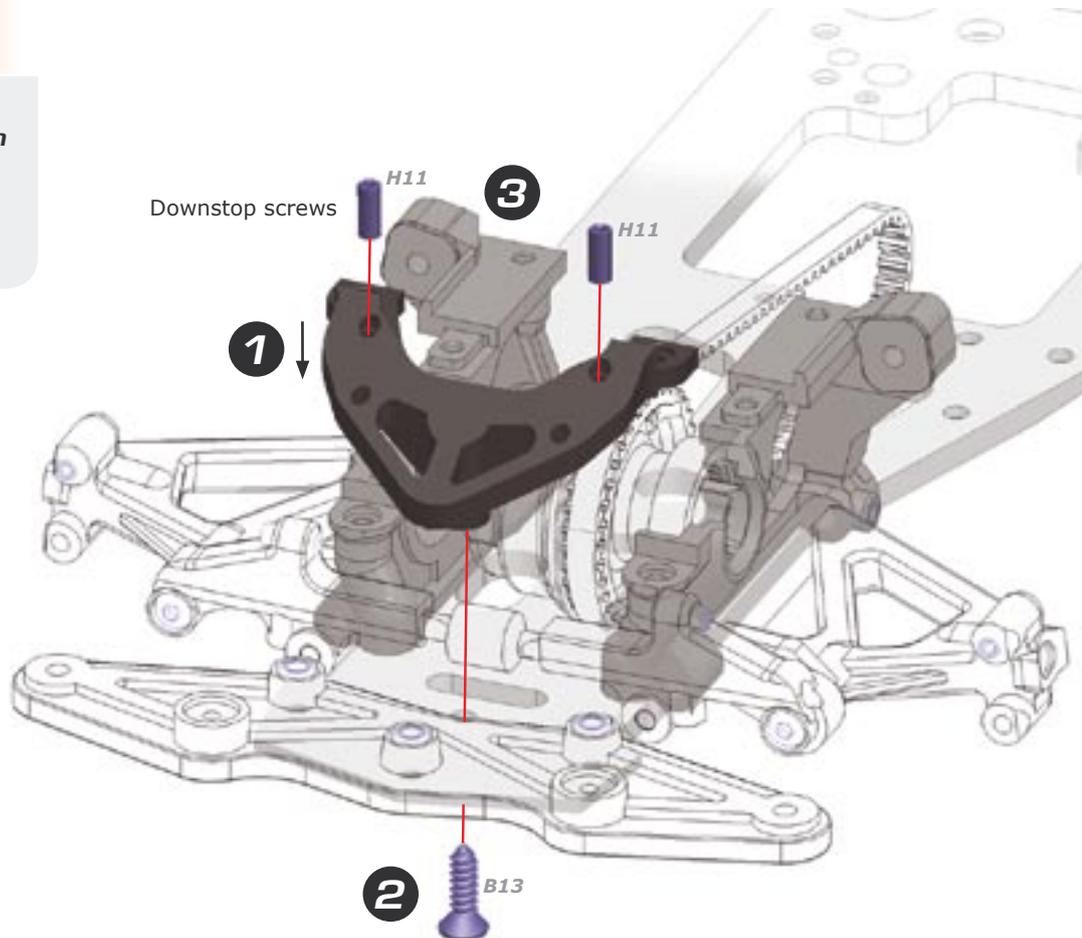
BAG 4



**B13**  
3.5x13mm

**H11**  
M3x8mm

Downstop screws



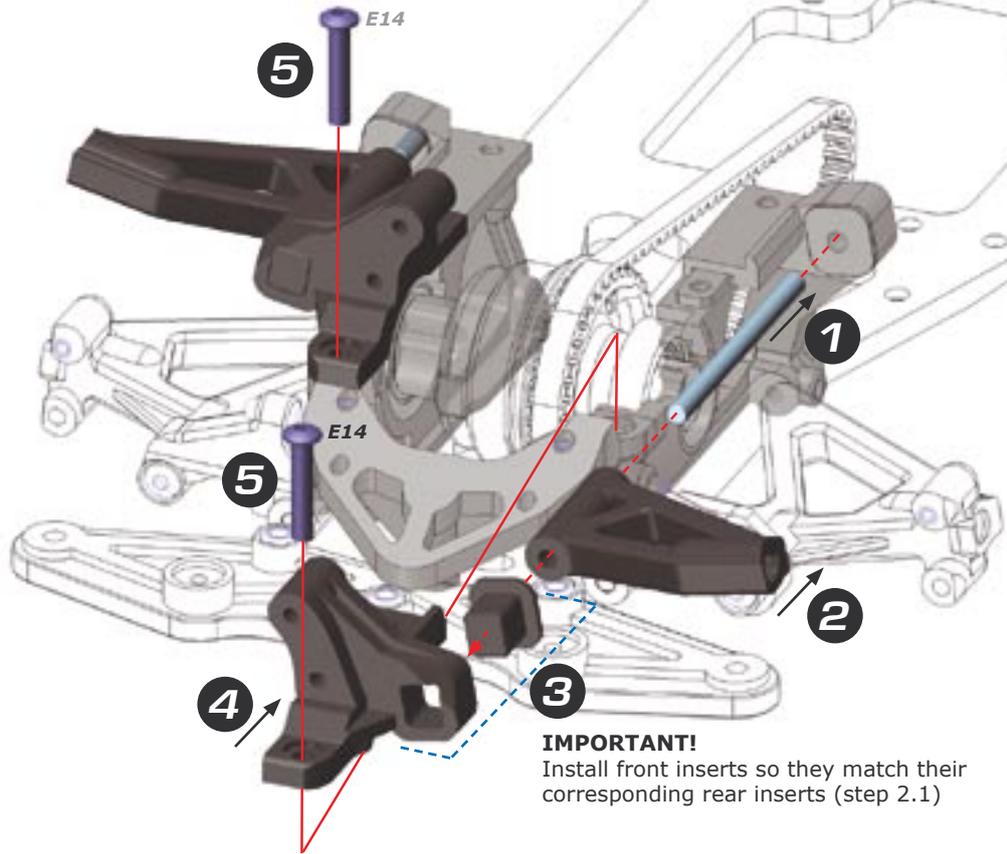
Set front downstops

## STEP 2.7



**E14**  
M3x16mm

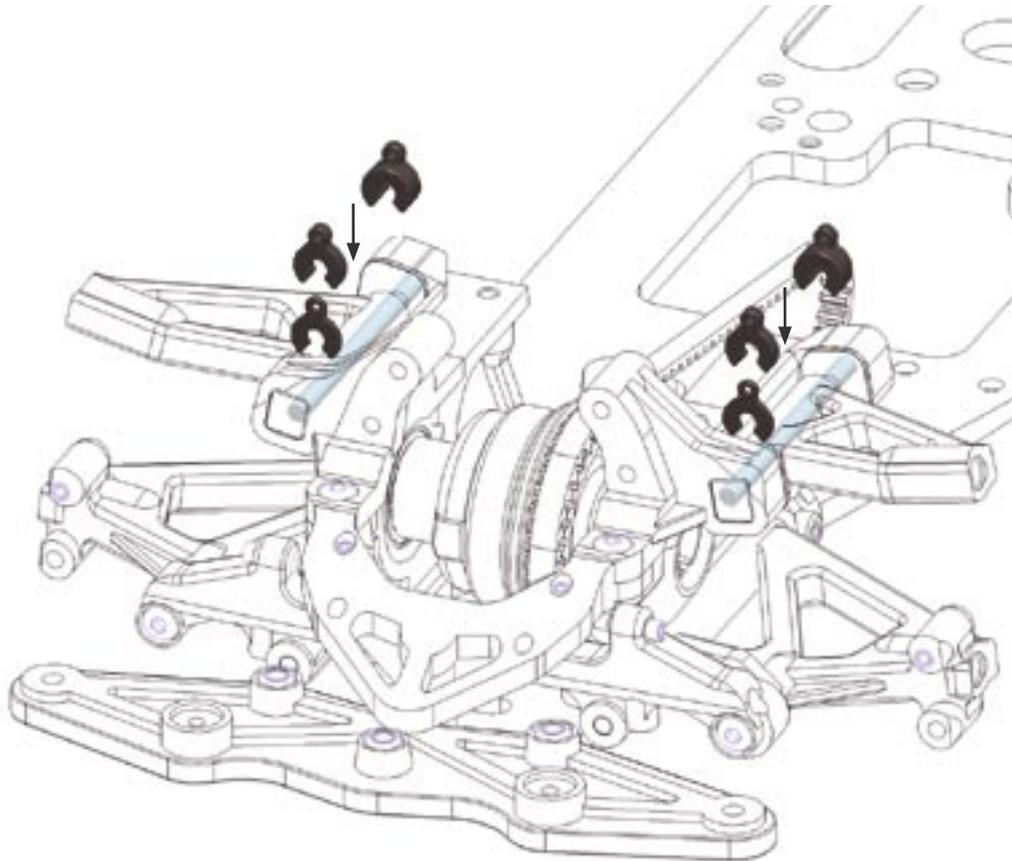
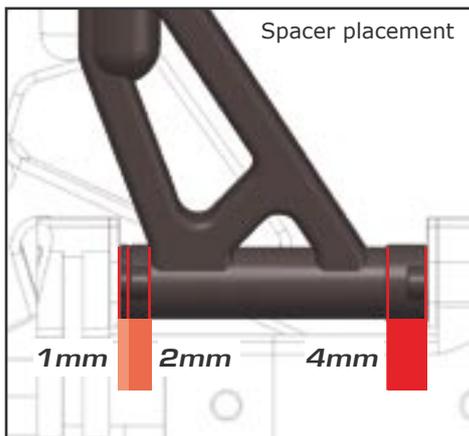
Assemble both front upper arms using the indicated steps.



## STEP 2.8



Set caster



## STEP 2.9

### BAG 5, U

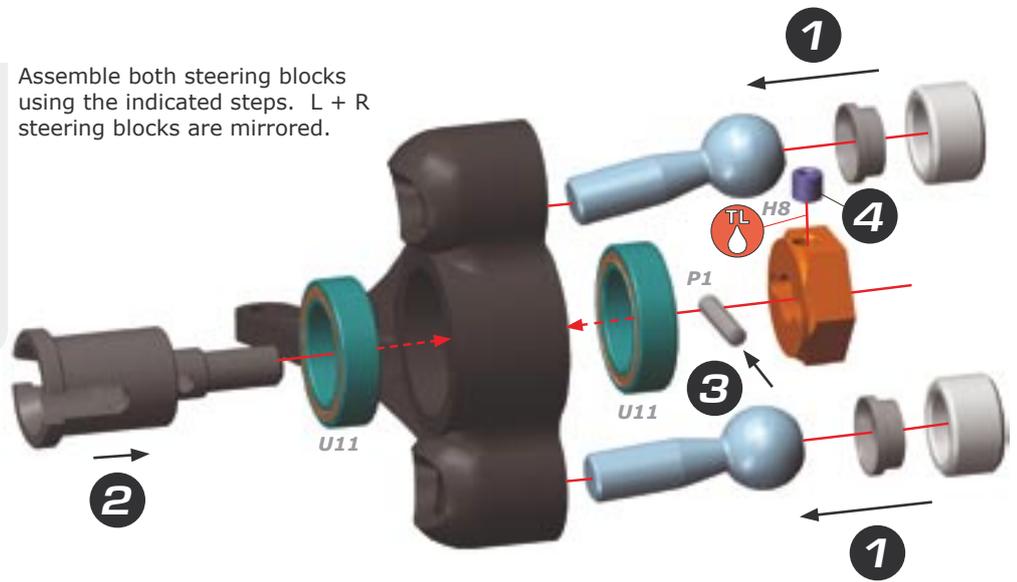


**H8**  
M3x3mm

**P1**  
2x10mm

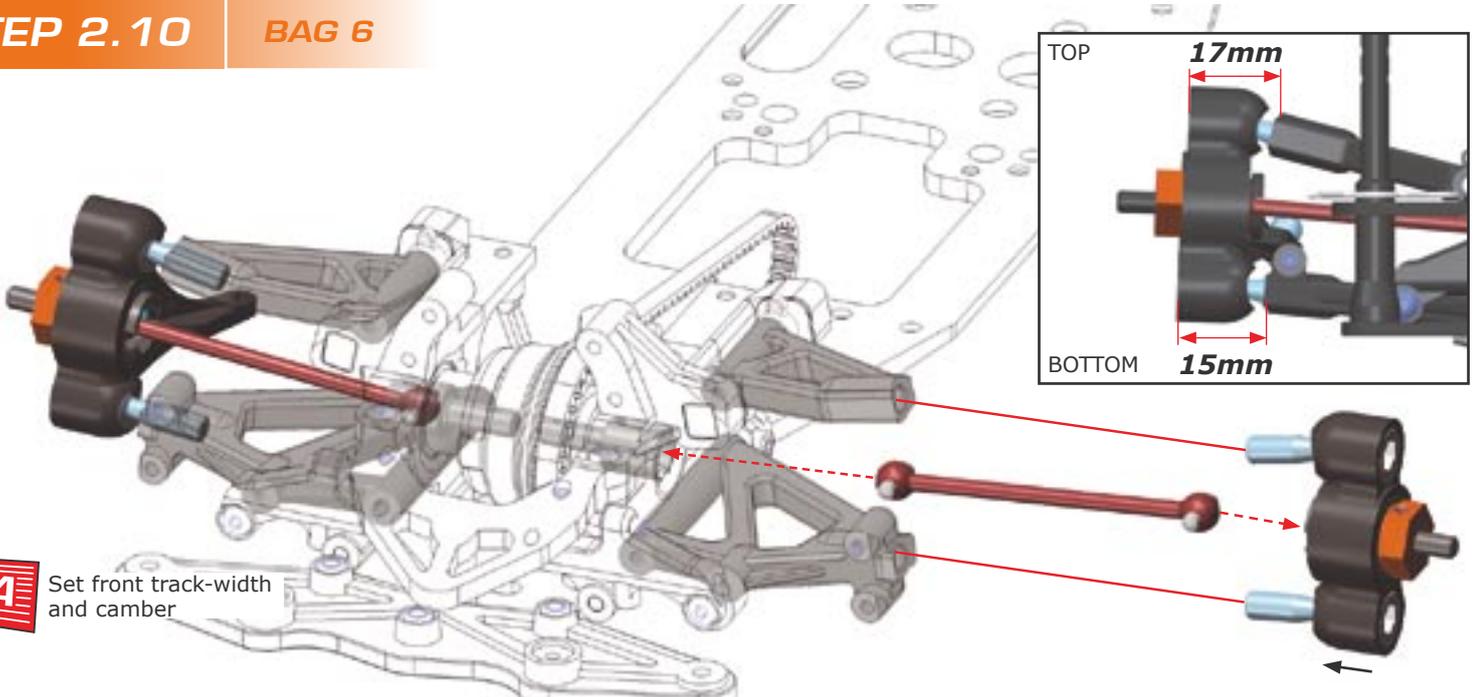
**U11**  
10x15mm

Assemble both steering blocks using the indicated steps. L + R steering blocks are mirrored.



## STEP 2.10

### BAG 6



**A** Set front track-width and camber

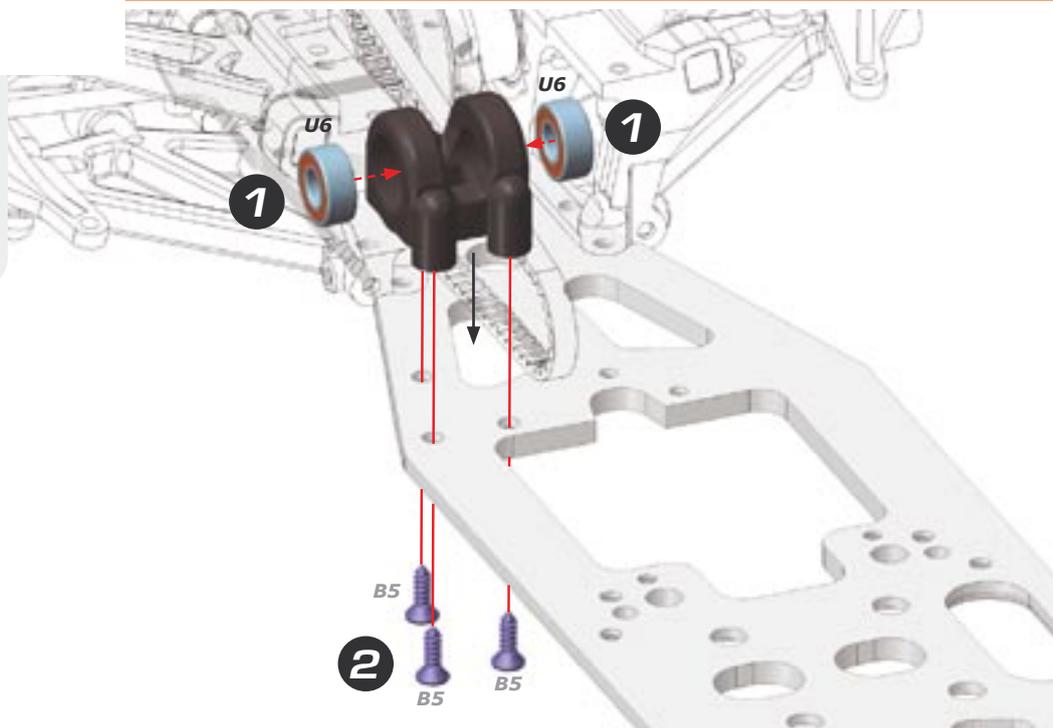
## STEP 2.11

### BAG U



**B5**  
2.9x9.5mm

**U6**  
6x13mm



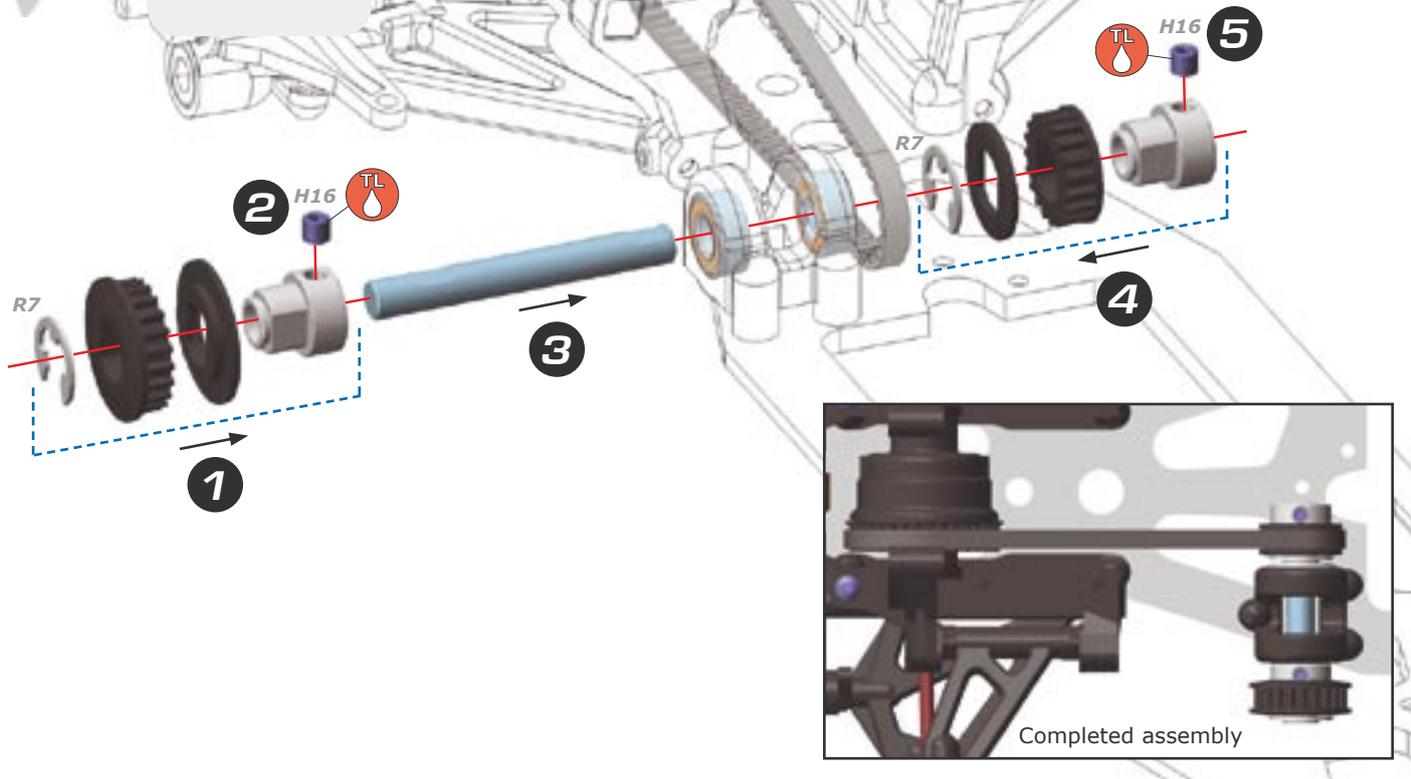
## STEP 2.12

### BAG 7

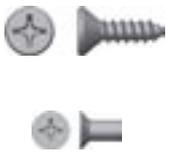


**H16**  
M4x4mm

**R7**  
7mm

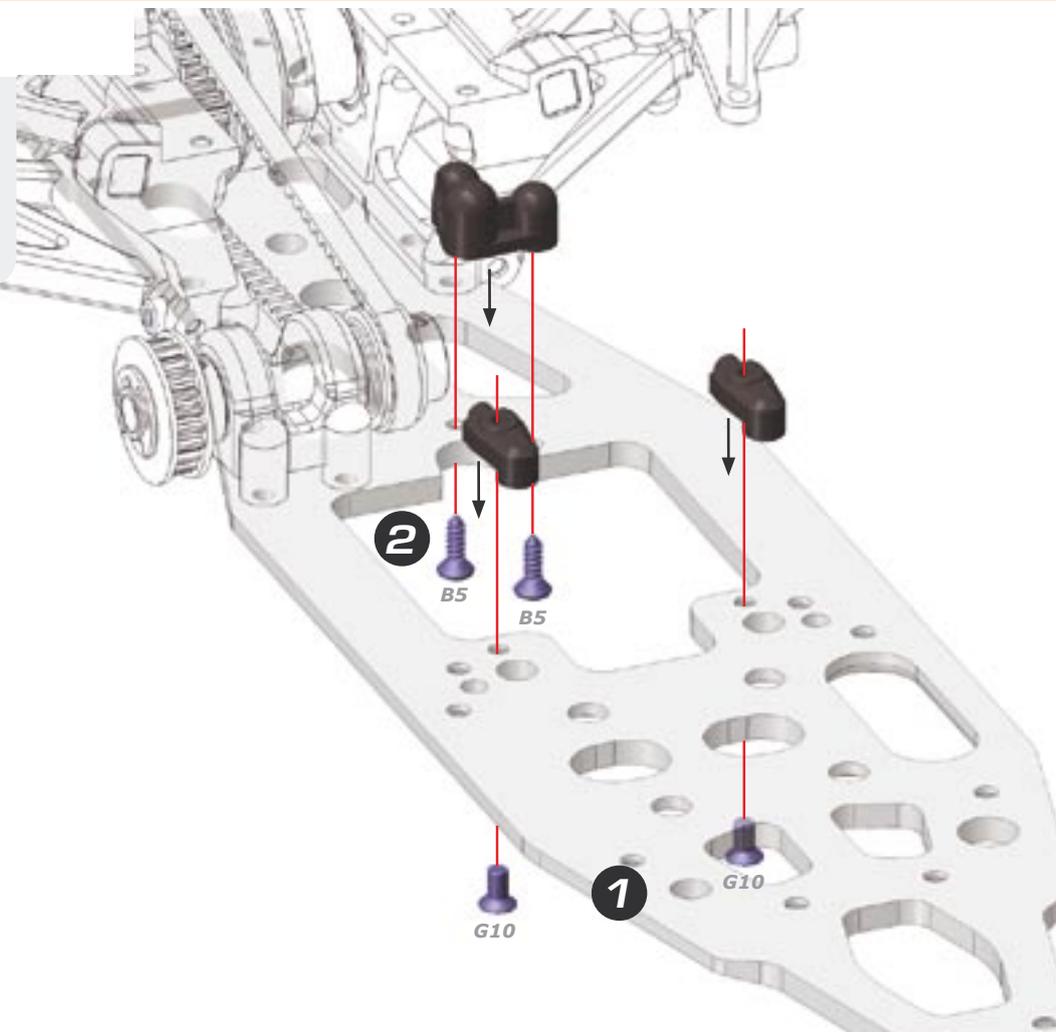


## STEP 2.13



**B5**  
2.9x9.5mm

**G10**  
M3x6mm



# 3.0 REAR ASSEMBLY

## STEP 3.1

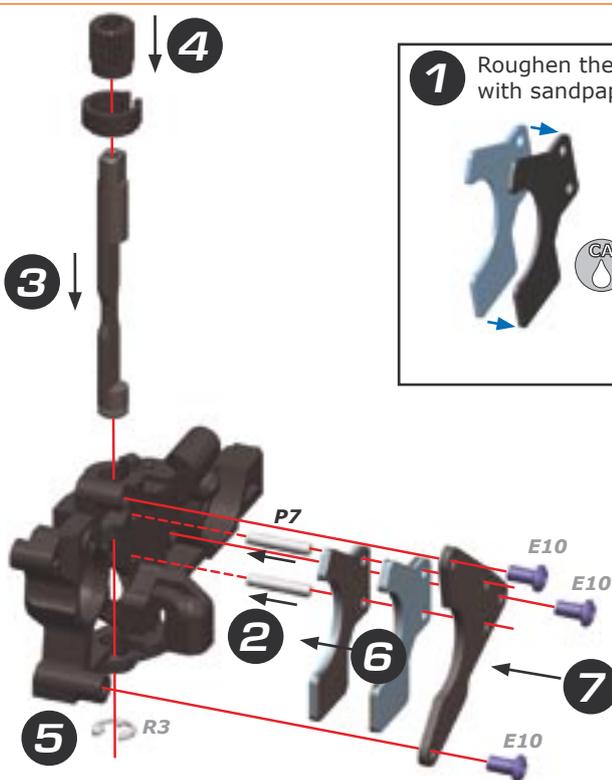
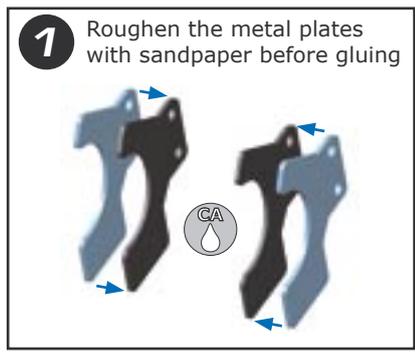
BAG 8, E10



**E10**  
M3x6mm

**P7**  
2.5x14mm

**R3**  
3mm



## STEP 3.2

BAG 9, 10, B13, U

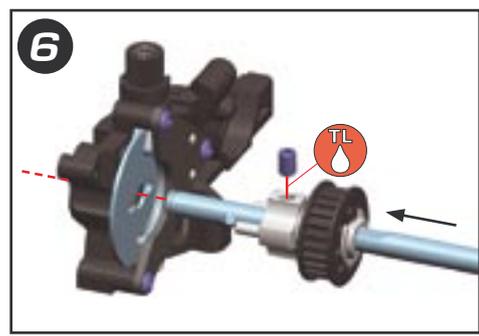
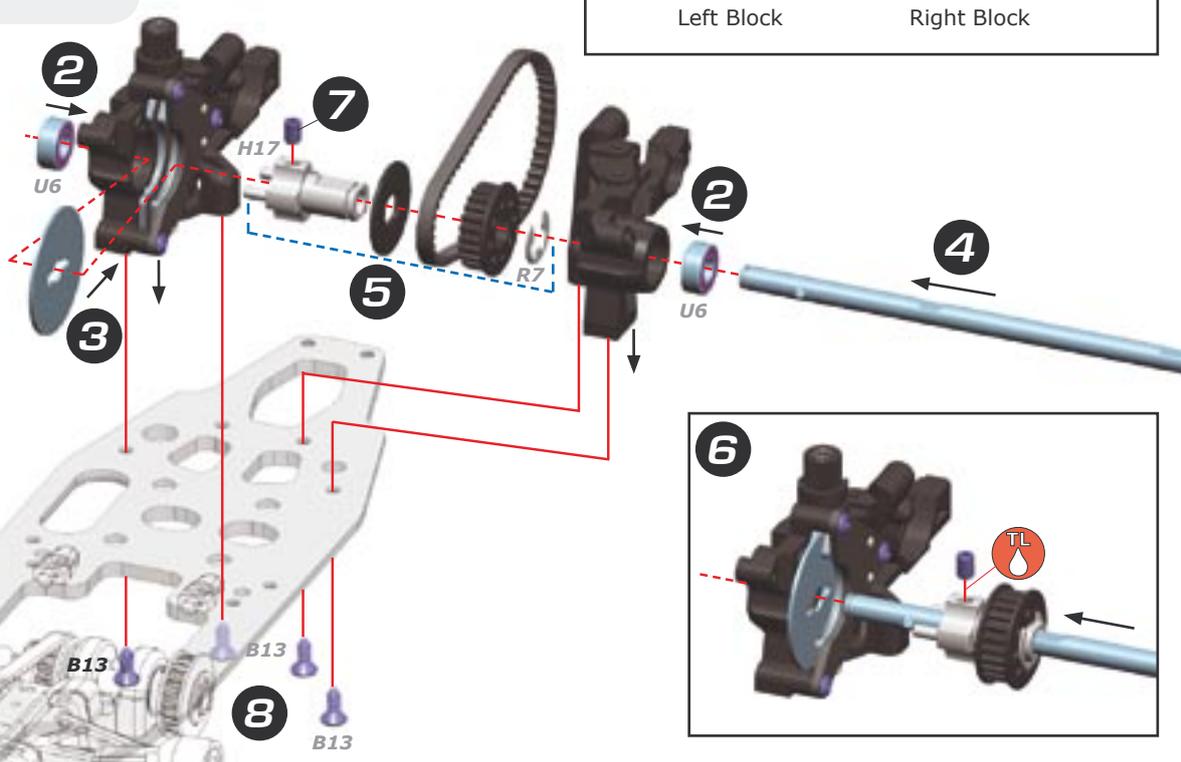
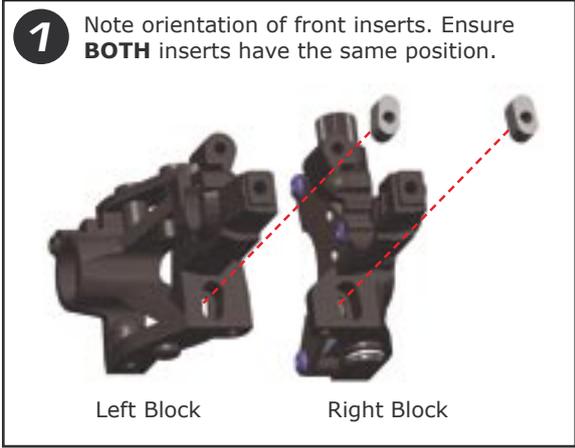
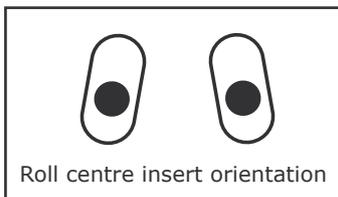


**B13**  
3.5x13mm

**H17**  
M4x6mm

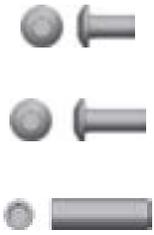
**R7**  
7mm

**U6**  
6x13mm



**B** Learn about rear roll center adjustment

### STEP 3.3

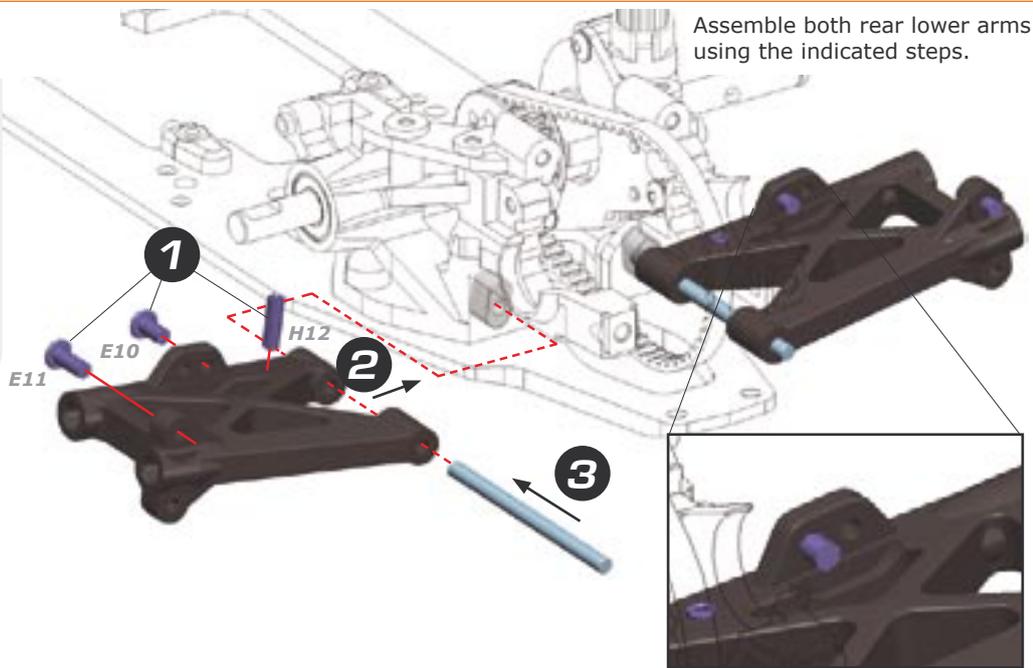


**E10**  
M3x6mm

**E11**  
M3x8mm

**H12**  
M3x10mm

Assemble both rear lower arms using the indicated steps.



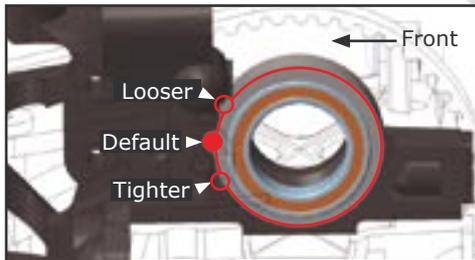
Set rear downstops

### STEP 3.4

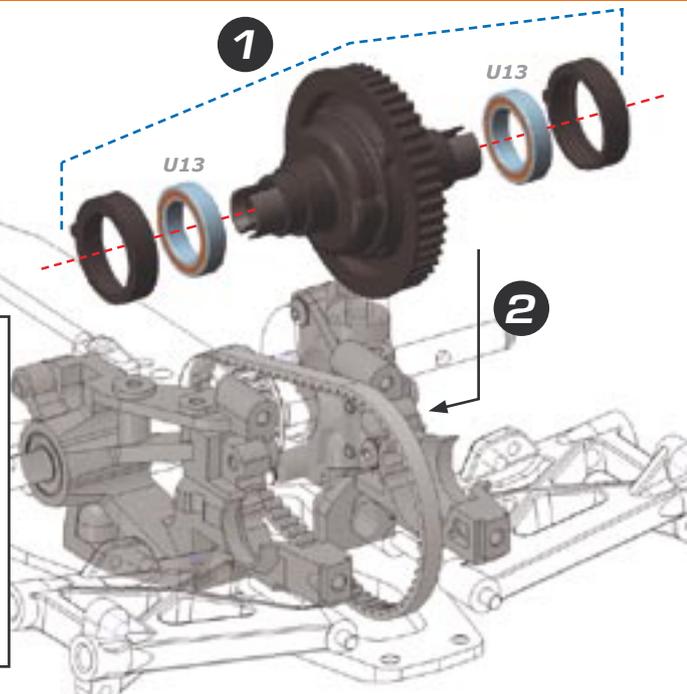
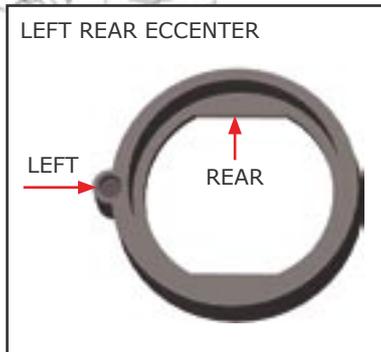
**BAG U**



**U13**  
12x18mm

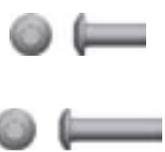


Change the position of **BOTH** eccentric hubs to adjust rear belt tension. Both hubs should have the same position.



### STEP 3.5

**BAG 11, E11**

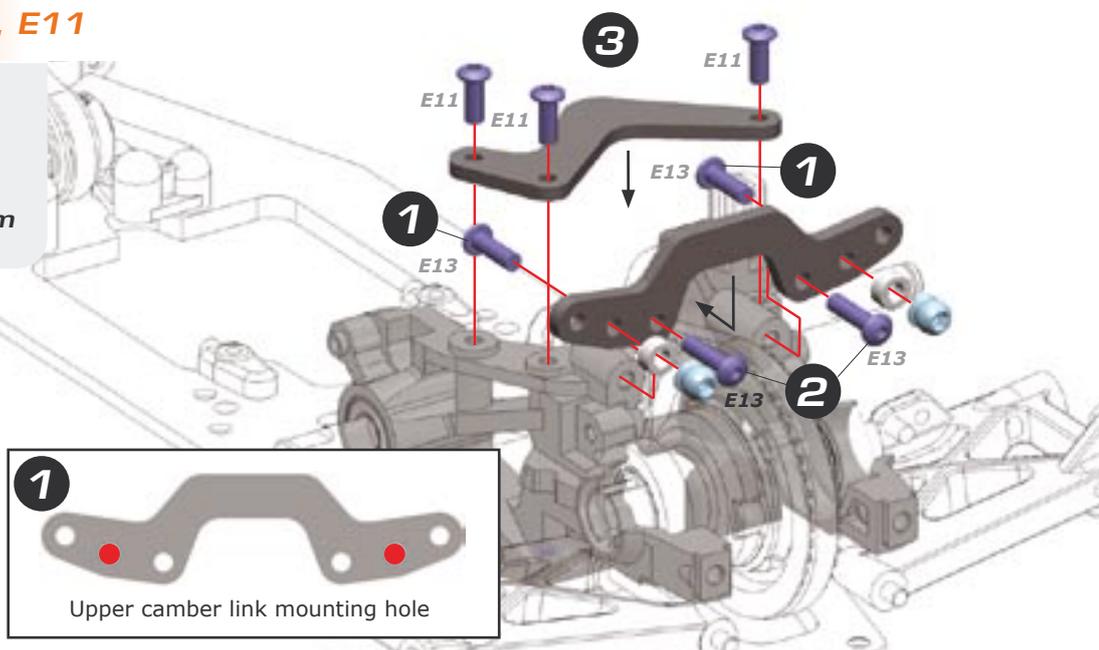


**E11**  
M3x8mm

**E13**  
M3x12mm

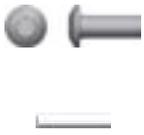


Learn about rear camber rise adjustment



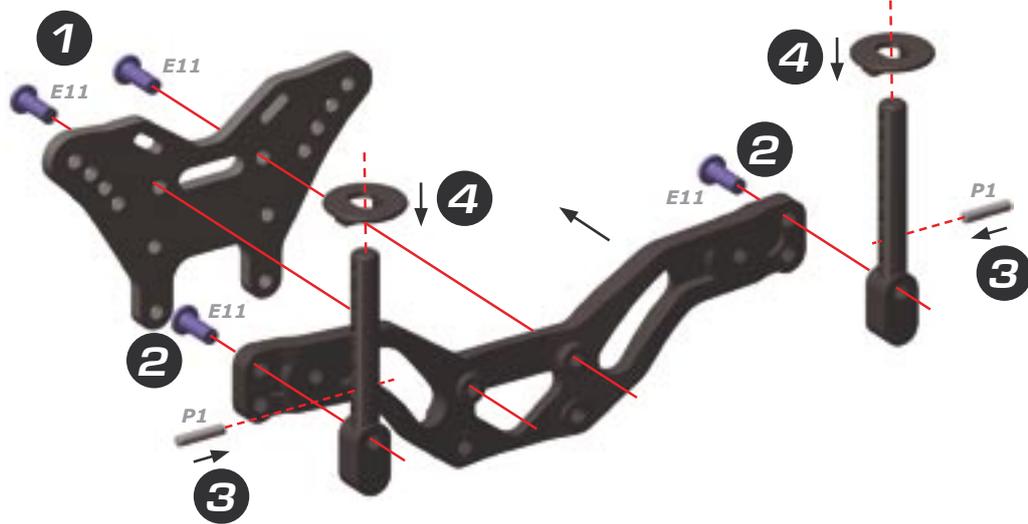
### STEP 3.6

#### BAG E11



**E11**  
M3x8mm

**P1**  
2x10mm



### STEP 3.7

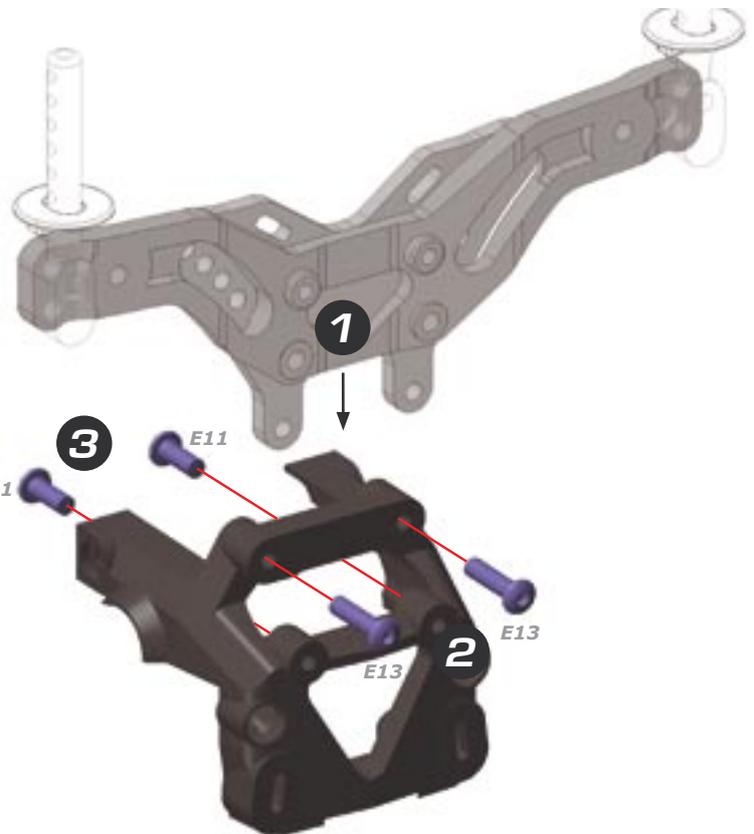
#### BAG 12, E11



**E11**  
M3x8mm



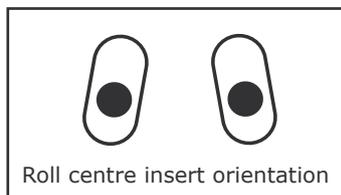
**E13**  
M3x12mm



### STEP 3.8

#### IMPORTANT!

Install rear inserts so they match their corresponding front inserts (step 3.2)



Roll centre insert orientation



 Learn about rear roll center adjustment

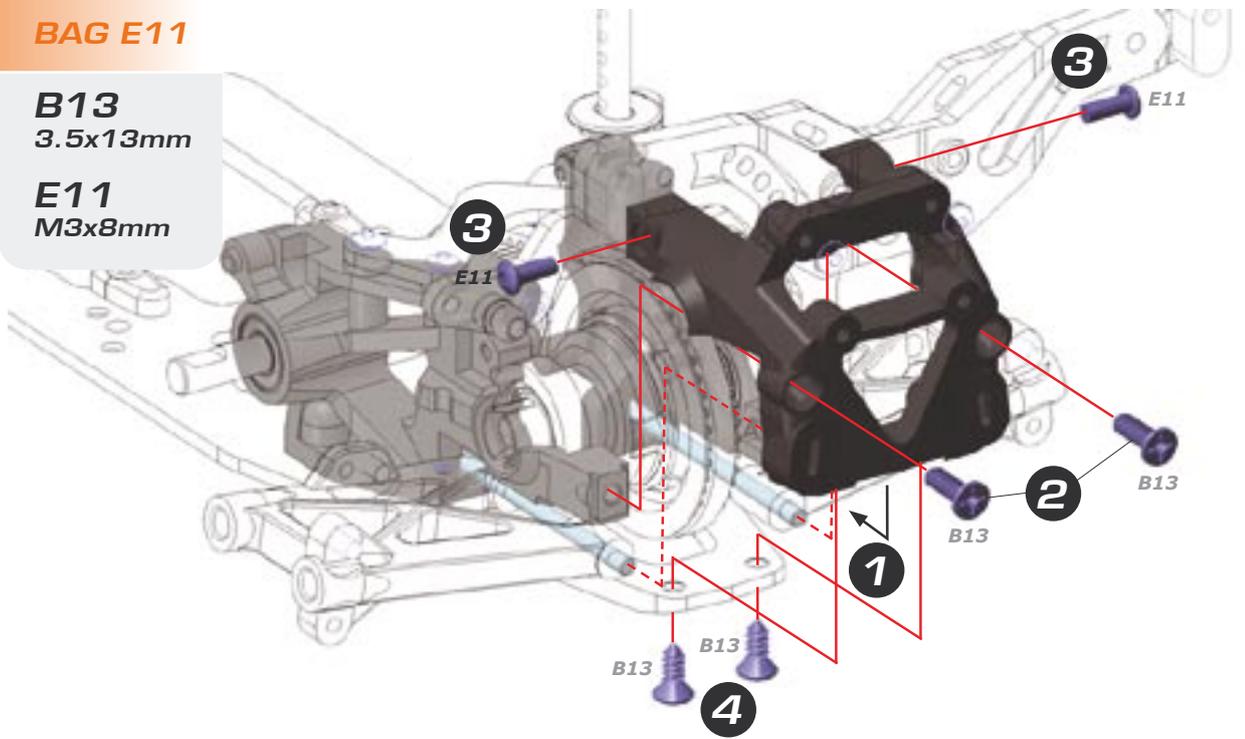
### STEP 3.9

#### BAG E11



**B13**  
3.5x13mm

**E11**  
M3x8mm



### STEP 3.10

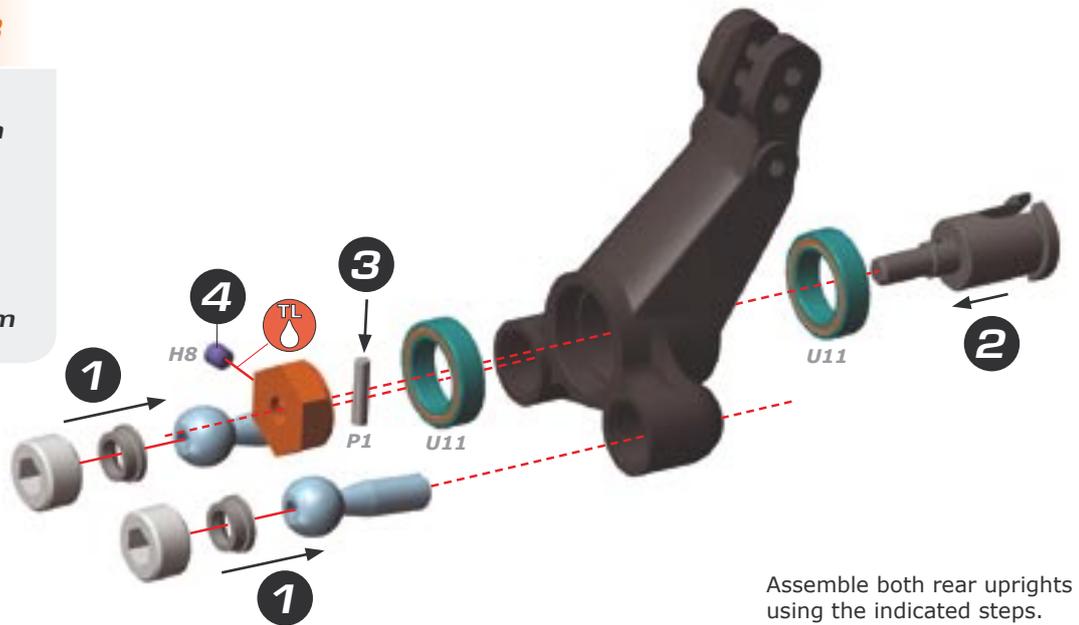
#### BAG 13



**H8**  
M3x3mm

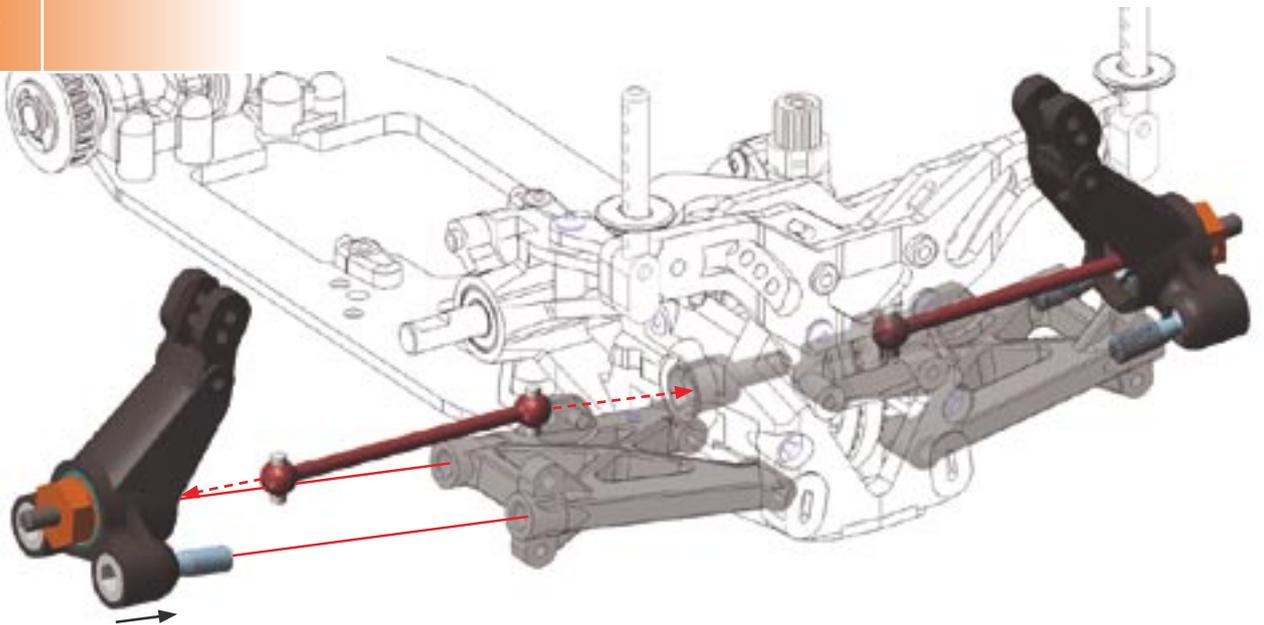
**P1**  
2x10mm

**U11**  
10x15mm



Assemble both rear uprights using the indicated steps.

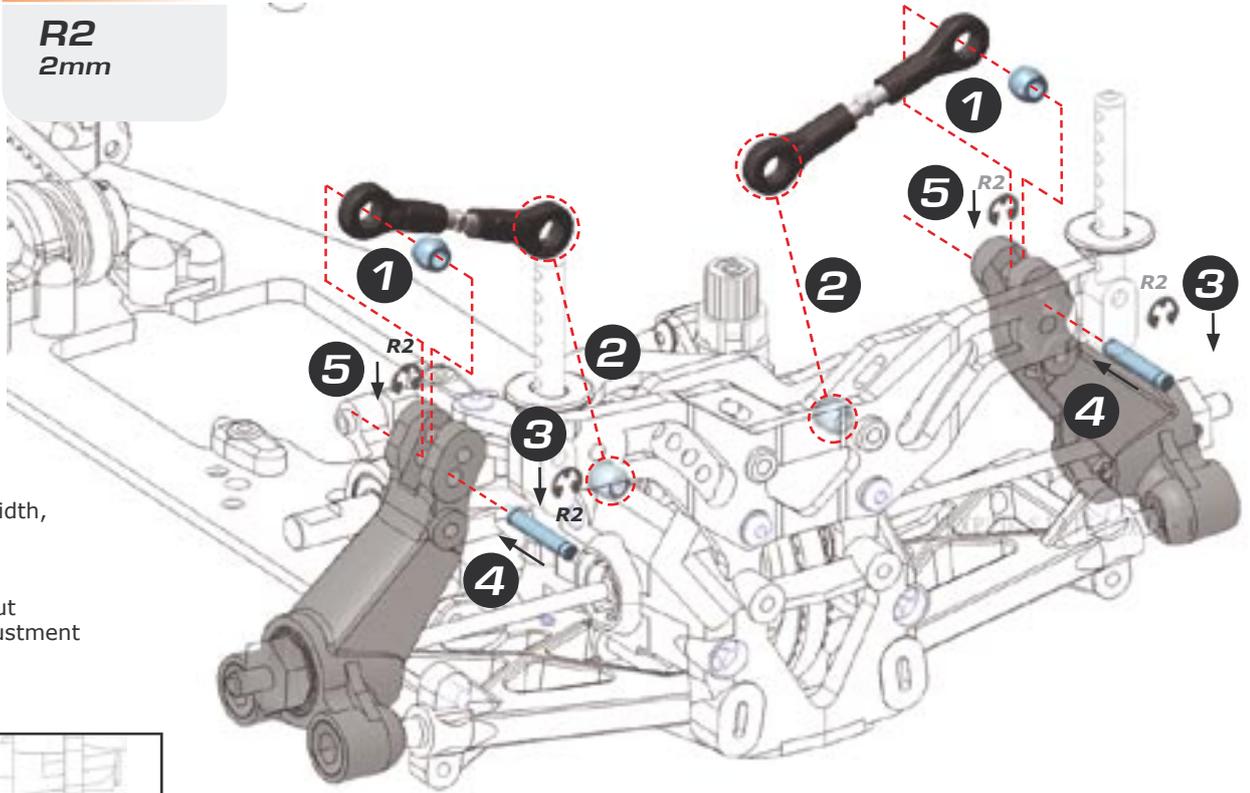
### STEP 3.11



# STEP 3.12

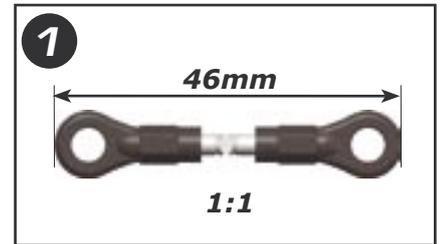
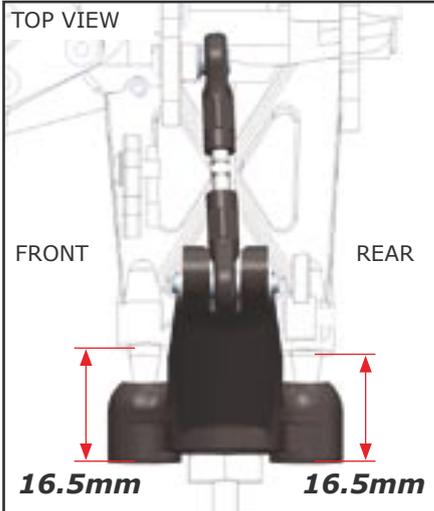
## BAG 14

R2  
2mm



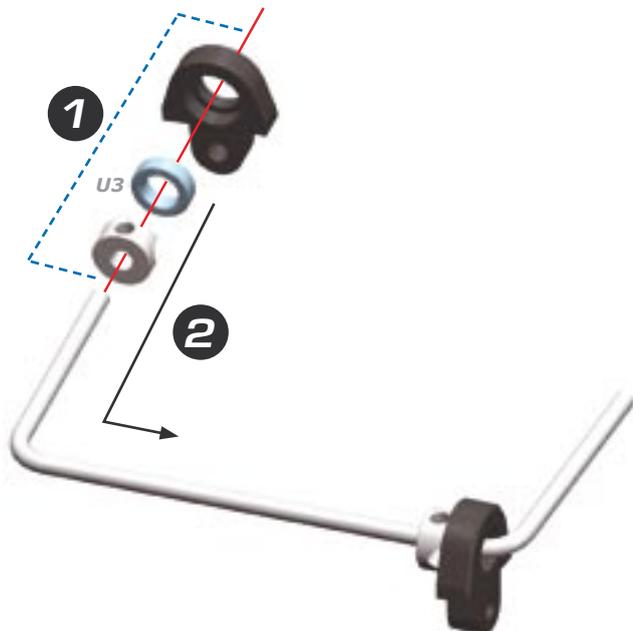
**A** Set rear track-width, camber and toe

**B** Learn more about camber rise adjustment



# STEP 3.13

U3  
4x8mm



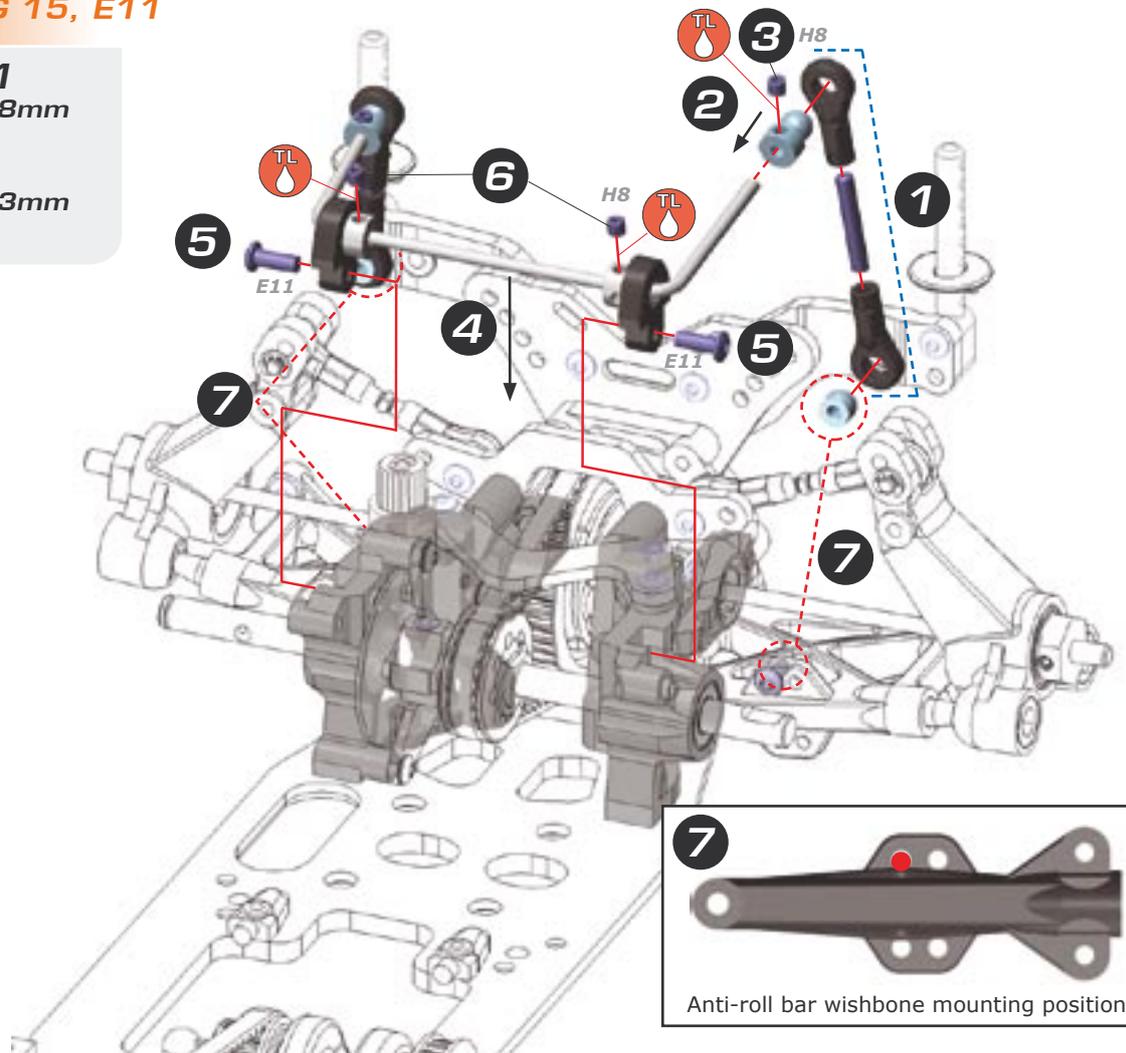
### STEP 3.14

**BAG 15, E11**



**E11**  
M3x8mm

**H8**  
M3x3mm



1



7

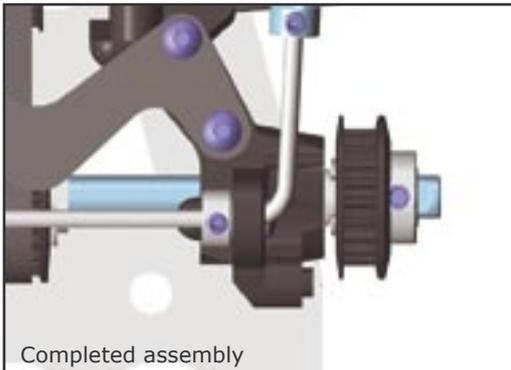
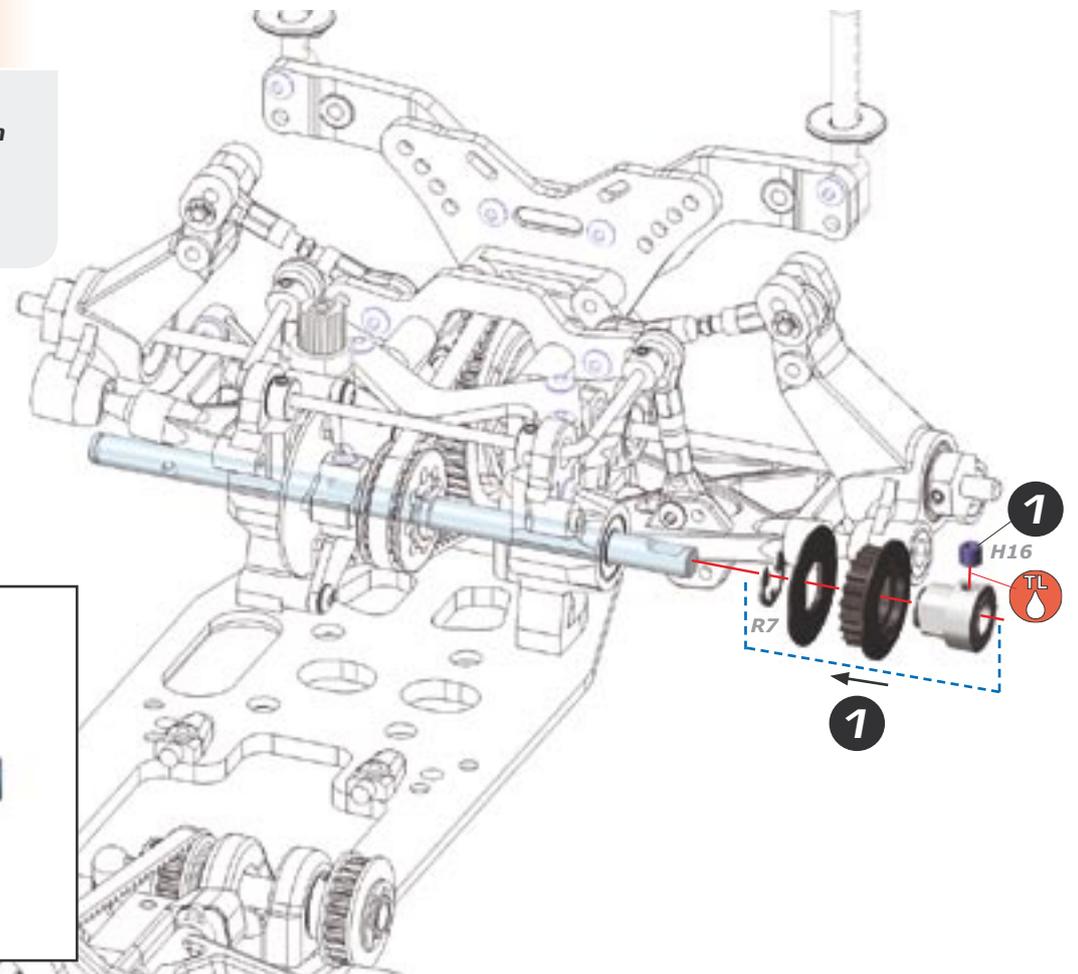


Anti-roll bar wishbone mounting position

### STEP 3.15

**H16**  
M4x4mm

**R7**  
7mm

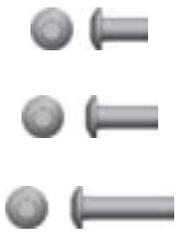


Completed assembly

# 4.0 RADIO PLATE ASSEMBLY

## STEP 4.1

### BAG 16, E11

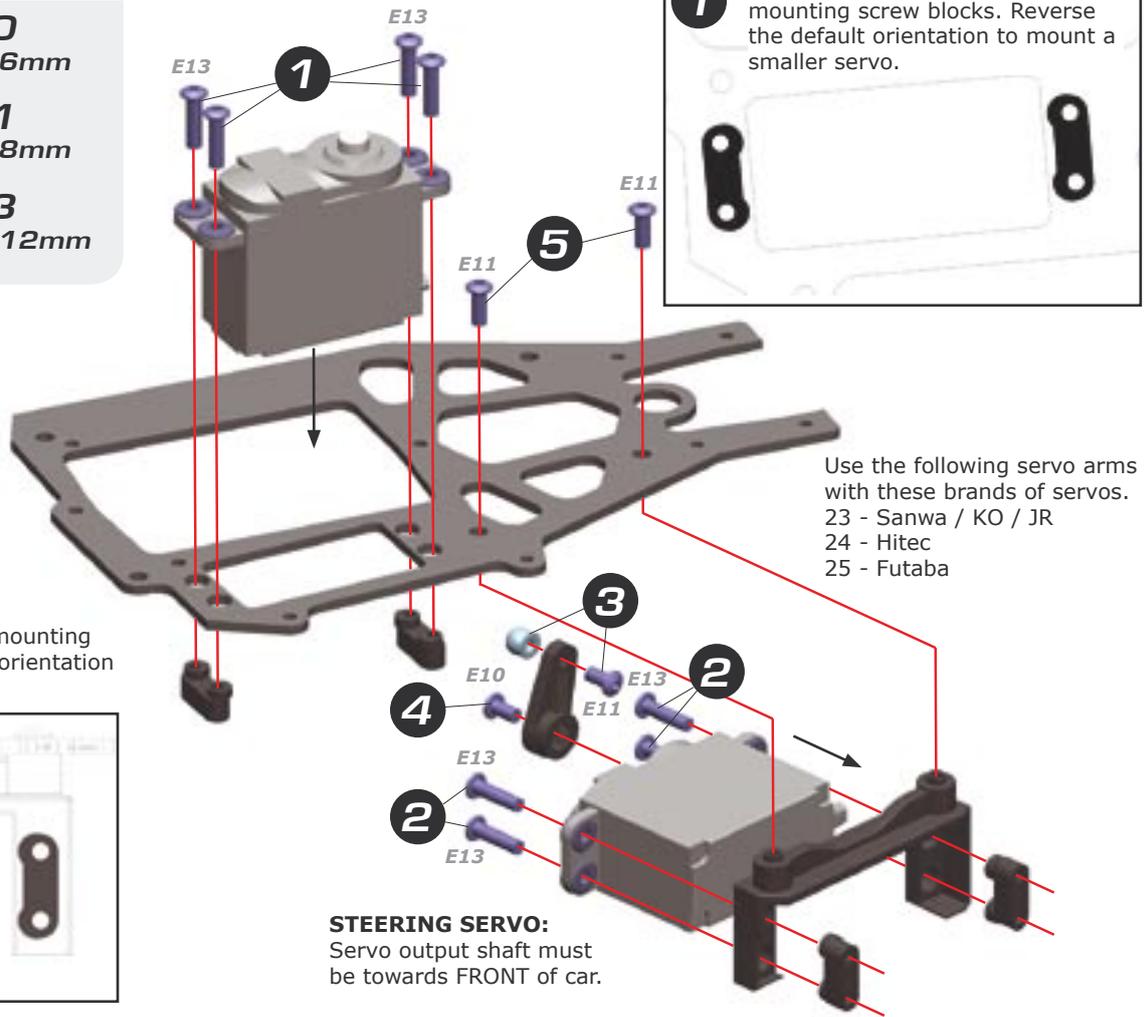
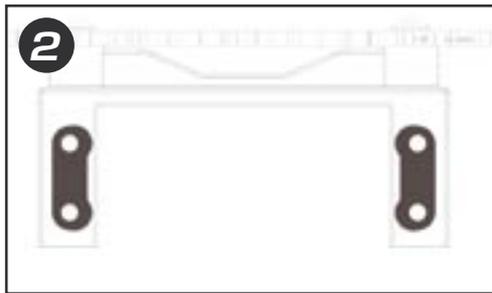


**E10**  
M3x6mm

**E11**  
M3x8mm

**E13**  
M3x12mm

Note the orientation of the servo mounting screw blocks. Reverse the default orientation to mount a smaller servo.



**1** Note the orientation of the servo mounting screw blocks. Reverse the default orientation to mount a smaller servo.

Use the following servo arms with these brands of servos.  
23 - Sanwa / KO / JR  
24 - Hitec  
25 - Futaba

**STEERING SERVO:**  
Servo output shaft must be towards FRONT of car.

## STEP 4.2

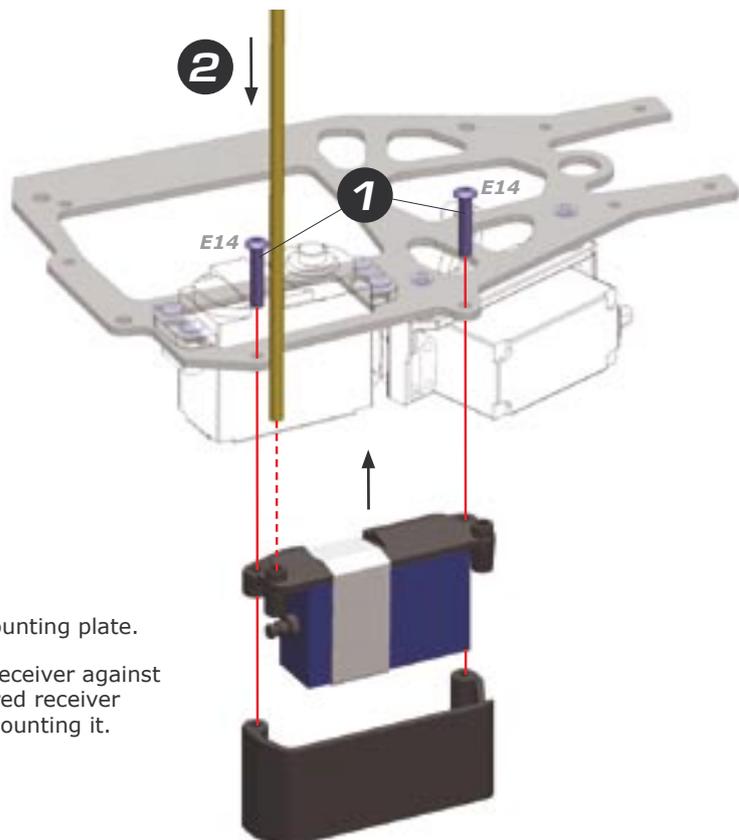
### BAG 17



**E14**  
M3x16mm

Securely attach receiver to mounting plate.

**RACING TIP:** To protect the receiver against fuel and moisture, seal the wired receiver into a rubber balloon before mounting it.



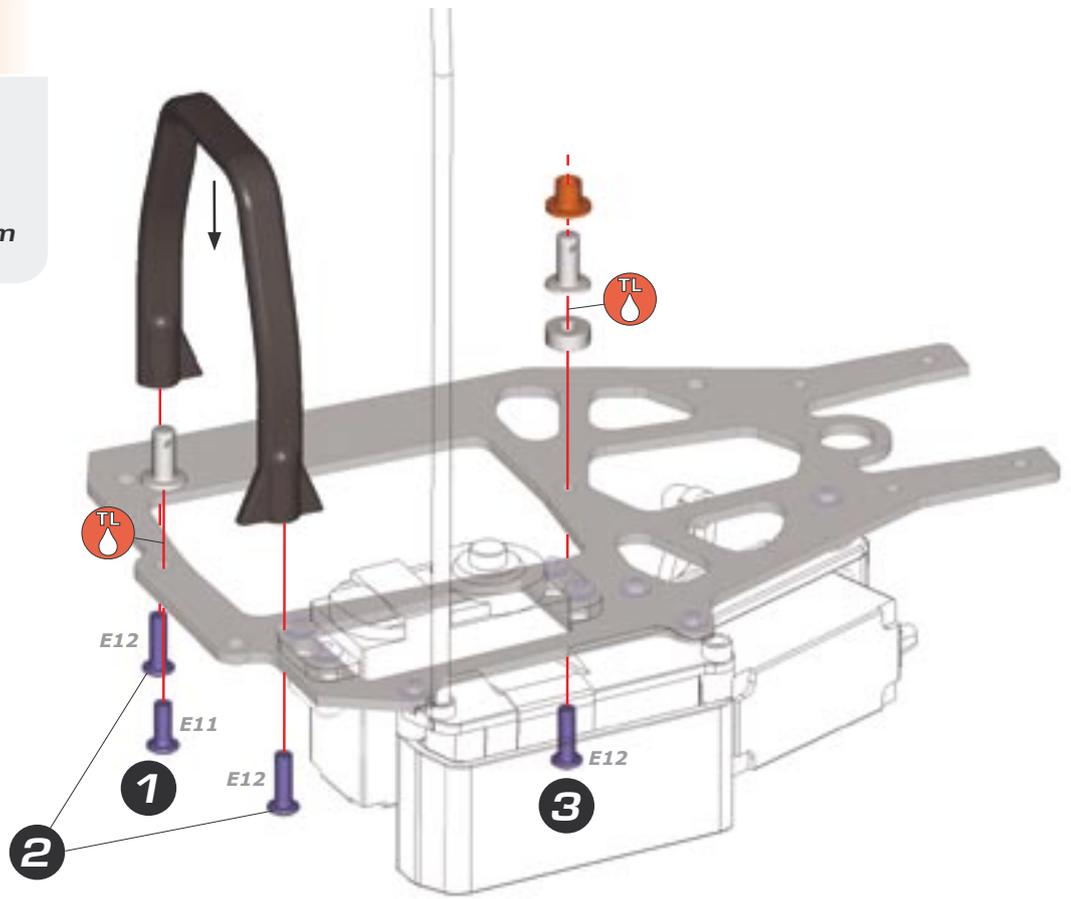
### STEP 4.3



**E11**  
M3x8mm



**E12**  
M3x10mm



### STEP 4.4

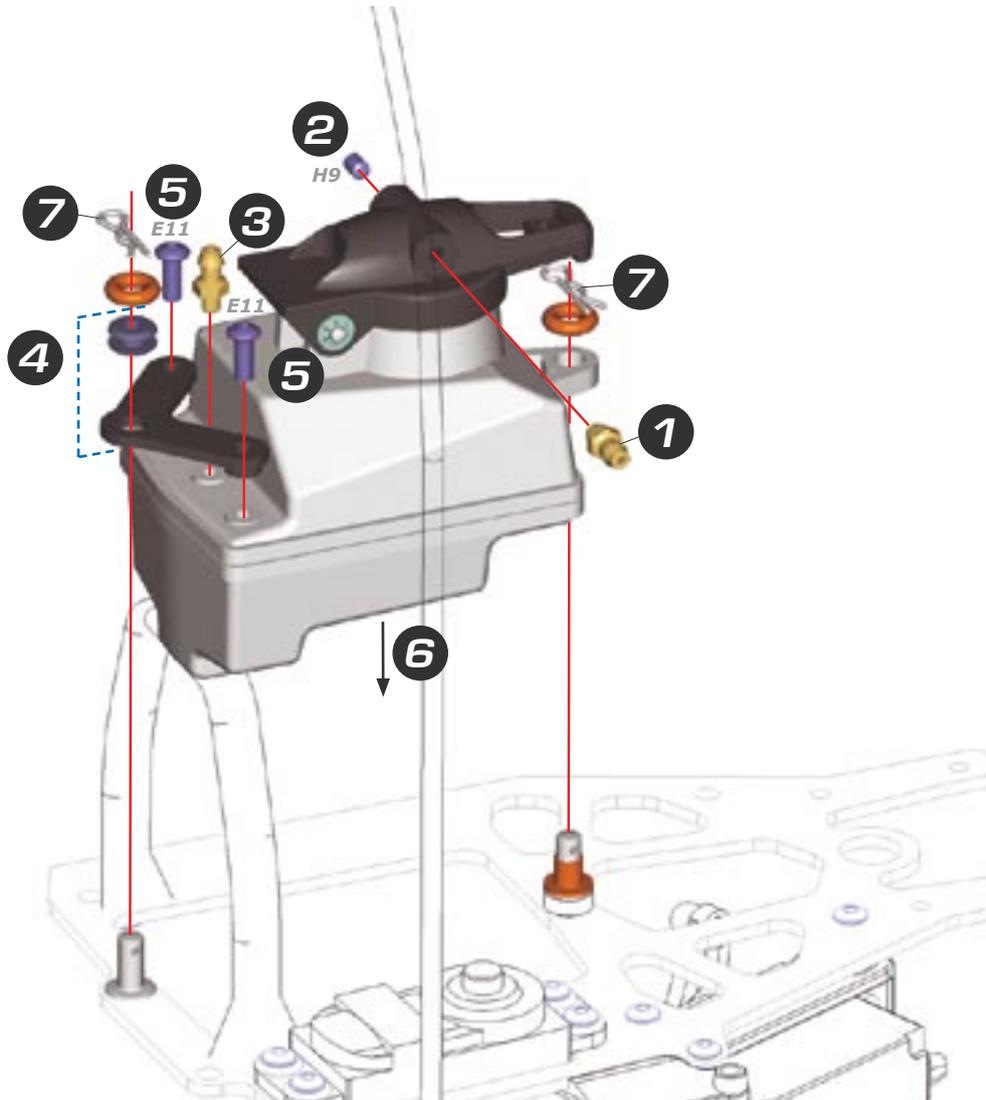
**BAG 18, E11**



**E11**  
M3x8mm



**H9**  
M3x4mm



**FUEL CAP FITTING PLACEMENT**  
CW tracks: Fitting on **RIGHT** side.  
CCW tracks: Fitting on **LEFT** side.

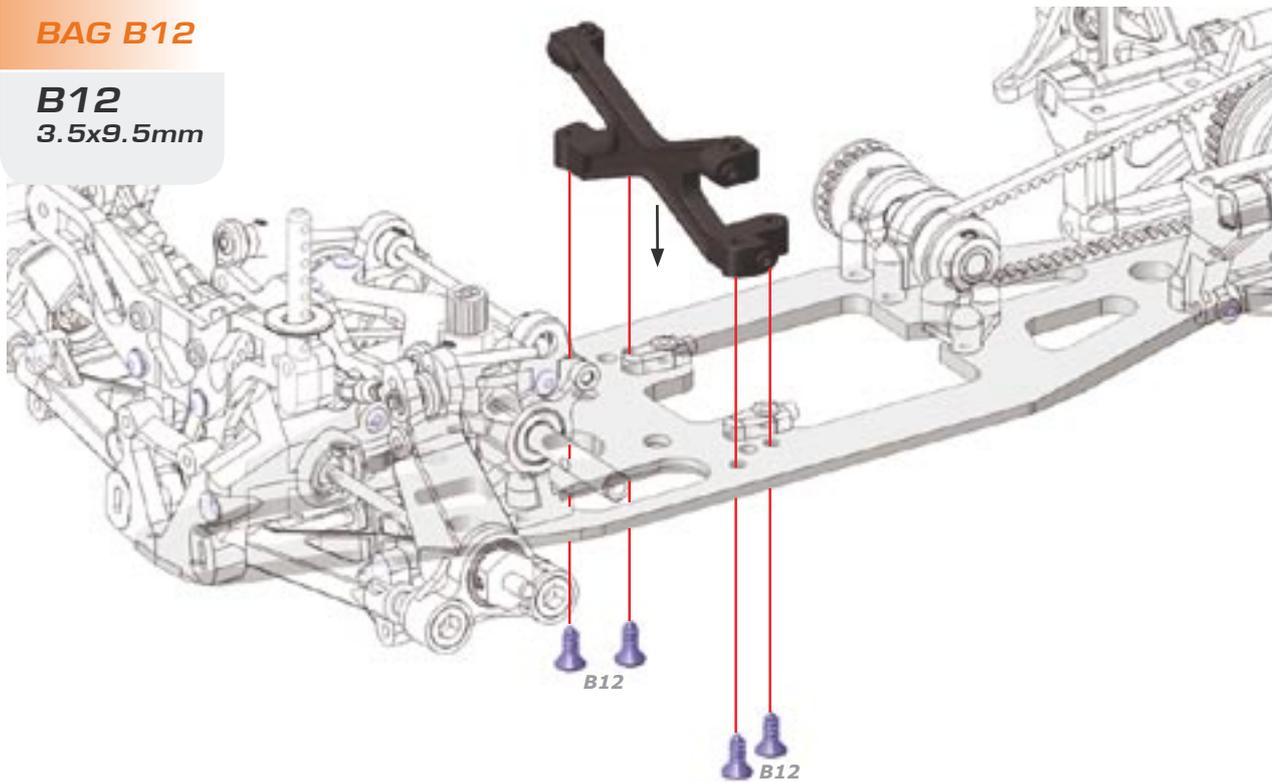
# 5.0 RADIO PLATE MOUNTING

## STEP 5.1

**BAG B12**



**B12**  
3.5x9.5mm



## STEP 5.2

**BAG 19, U**



**E11**  
M3x8mm



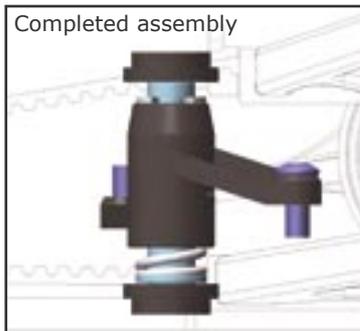
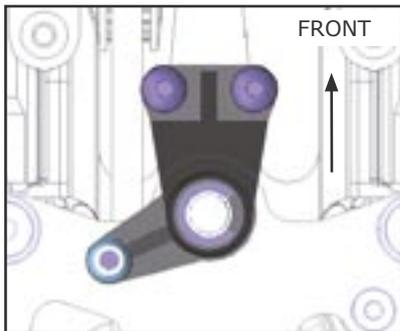
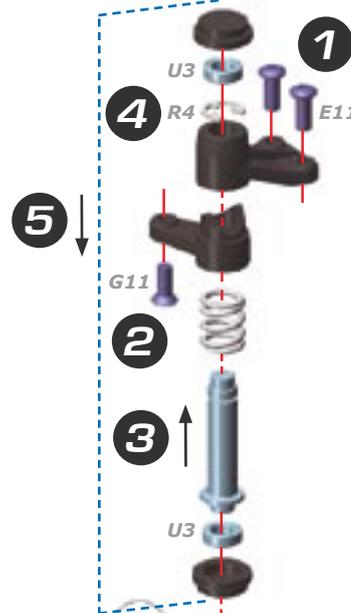
**G11**  
M3x8mm



**R4**  
4mm



**U3**  
5x8mm



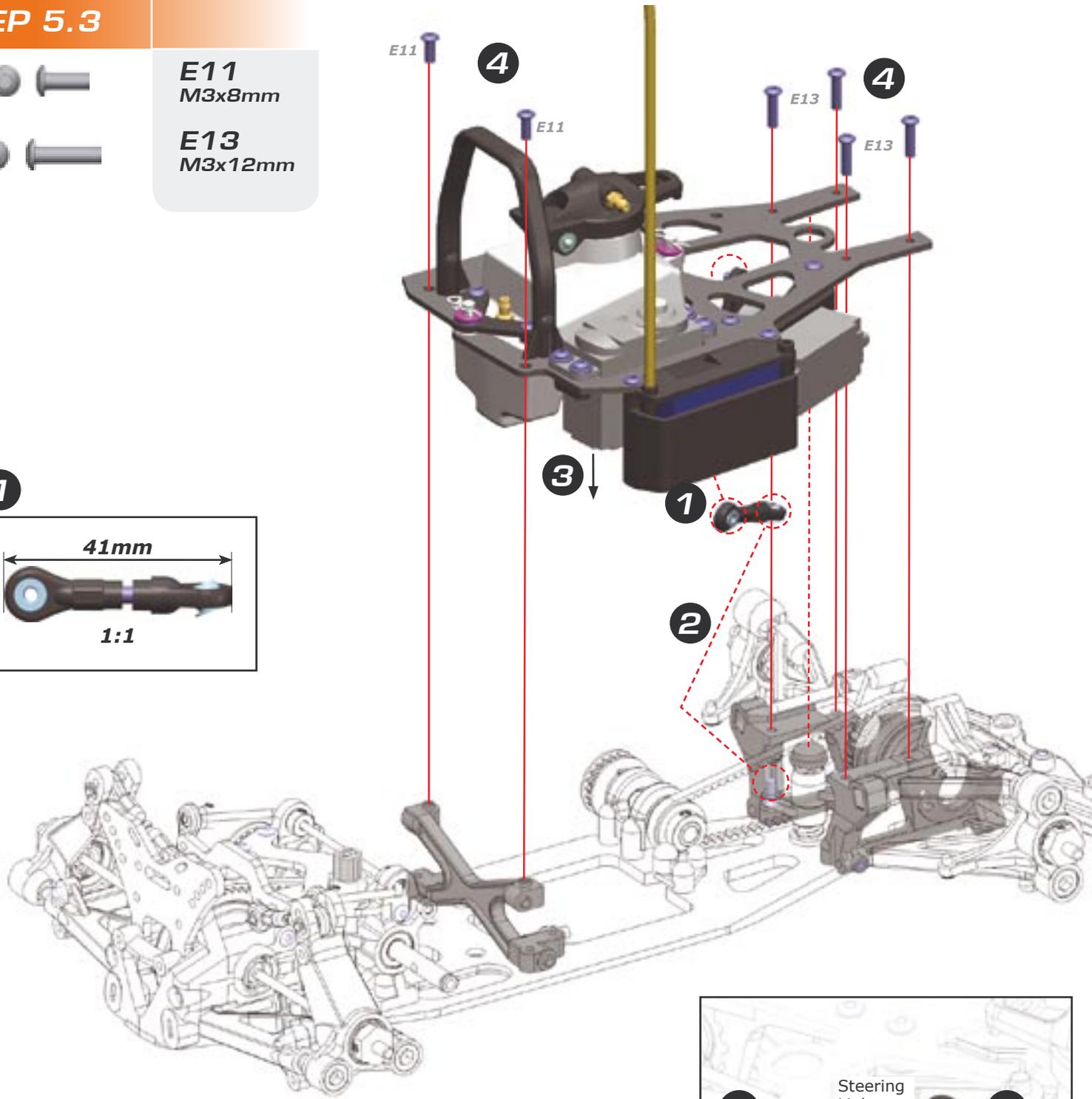
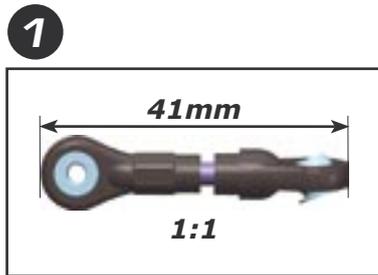
# STEP 5.3



**E11**  
M3x8mm



**E13**  
M3x12mm

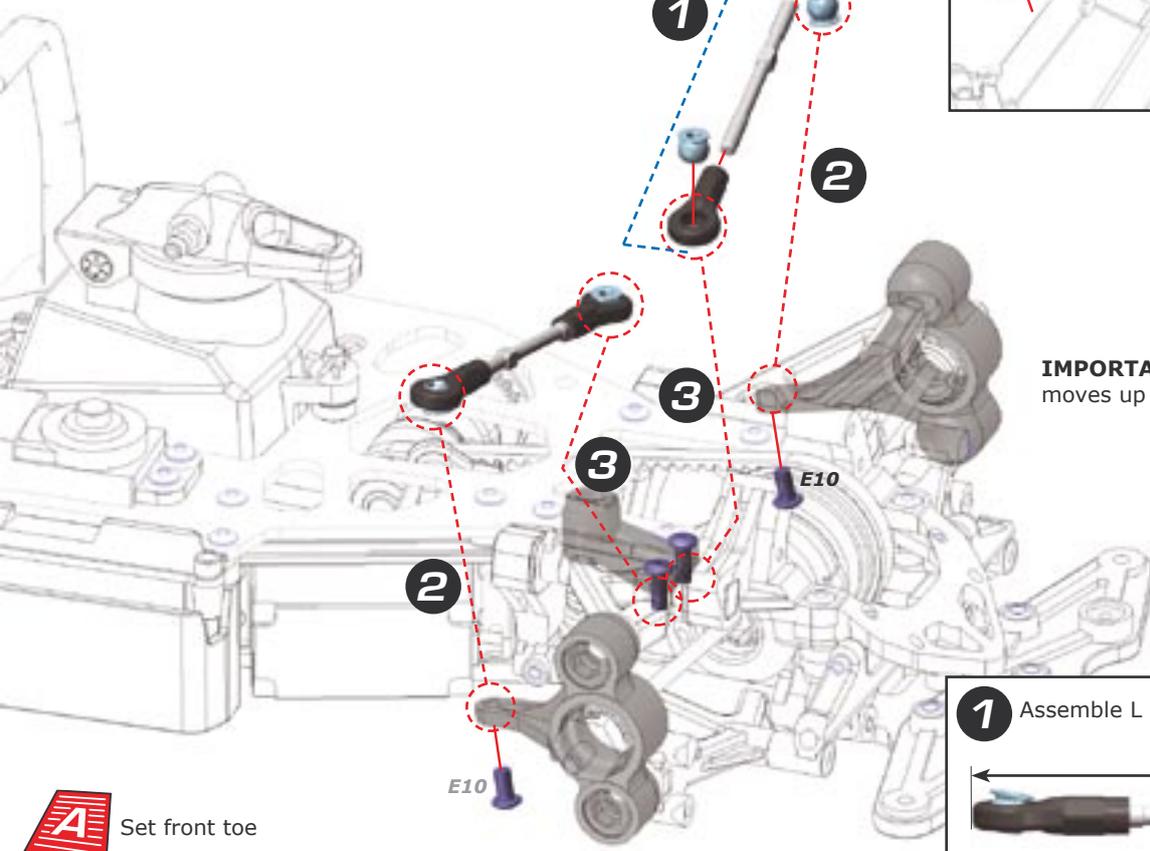
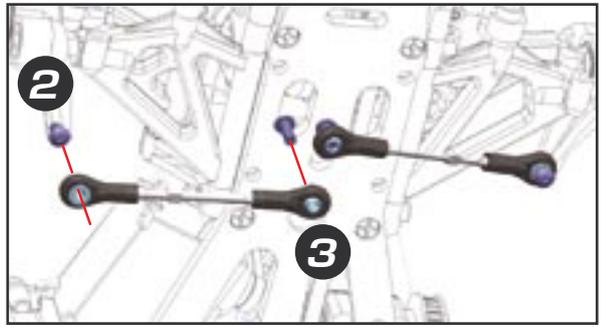


## STEP 5.4

BAG 20, E10

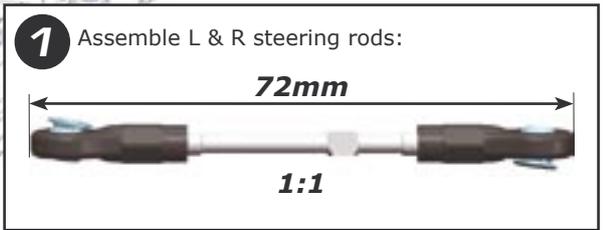


E10  
M3x6mm



**IMPORTANT!** Ensure the front suspension moves up and down freely without binding.

**A** Set front toe



## STEP 5.5

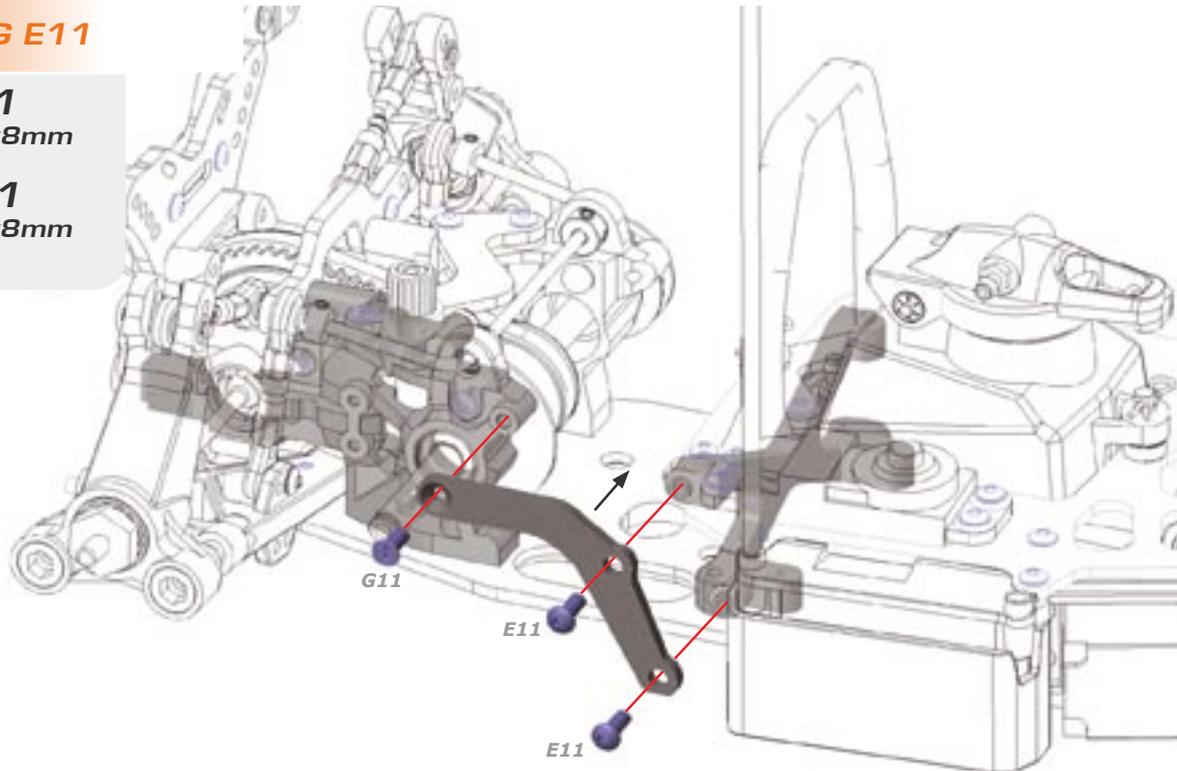
BAG E11



E11  
M3x8mm



G11  
M3x8mm



# 6.0 GEARBOX ASSEMBLY

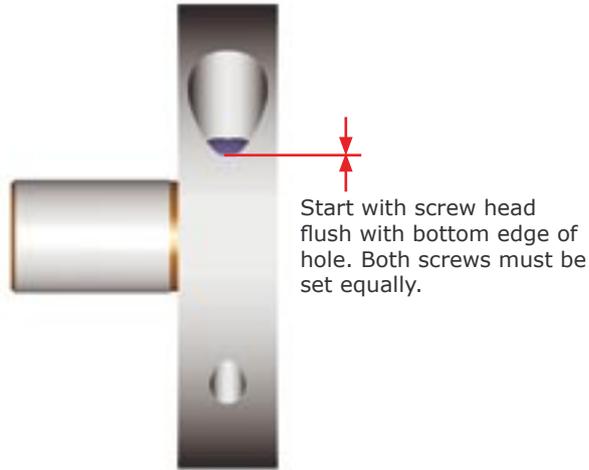
## STEP 6.1

BAG 21, E13

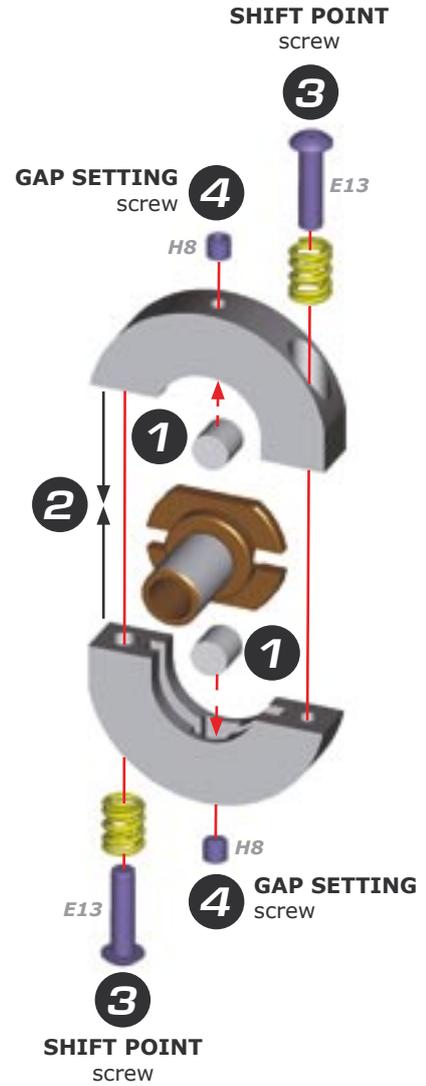


**E13**  
M3x12mm

**H8**  
M3x3mm



**B** Learn about shift point and shoe gap



**3** **TO SHIFT LATER**  
Tighten both screws equally

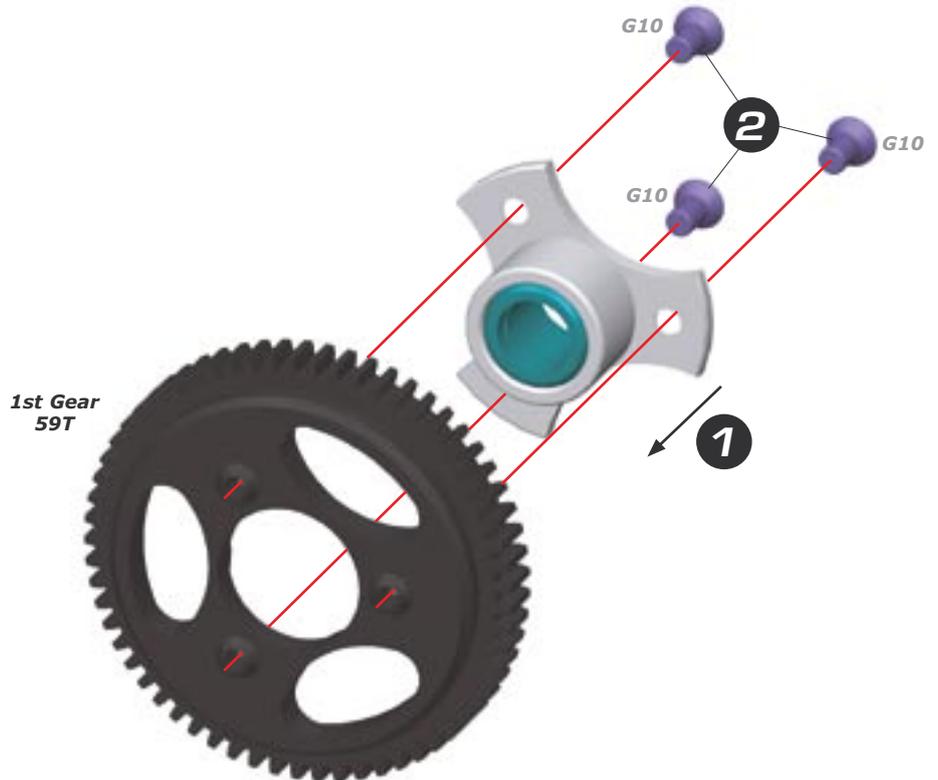
**TO SHIFT EARLIER**  
Loosen both screws equally



## STEP 6.2



**G10**  
M3x6mm



## STEP 6.3

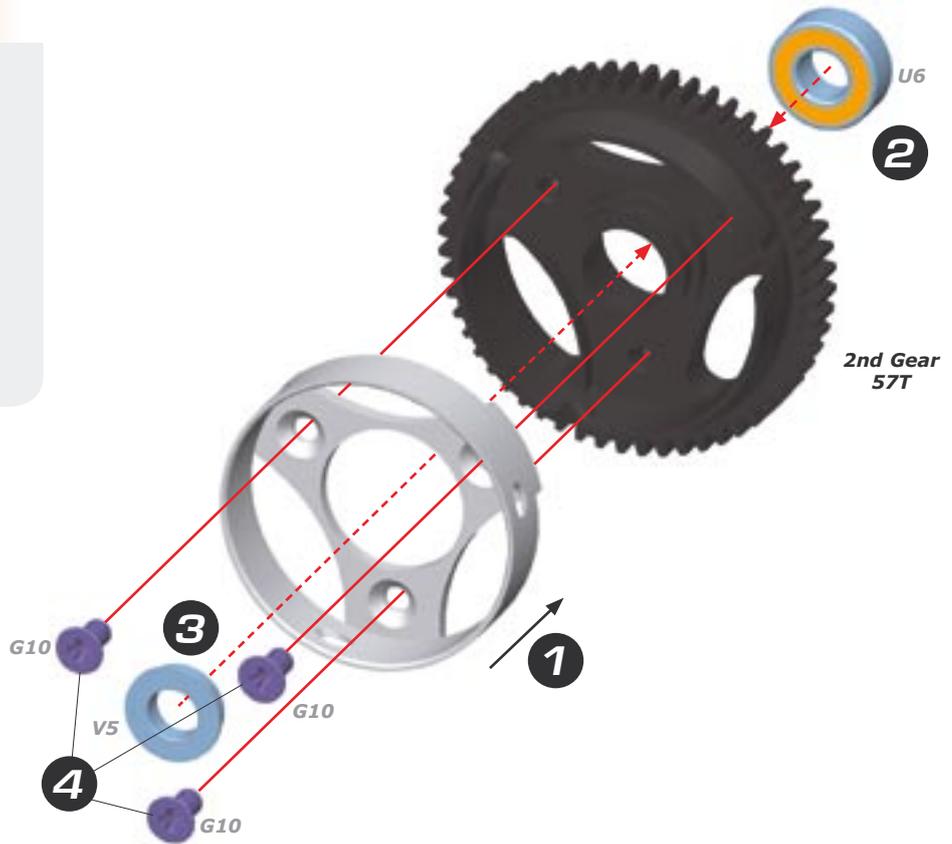
### BAG U1



**G10**  
M3x6mm

**U6**  
6x13mm

**V5**  
6x10mm



## STEP 6.4

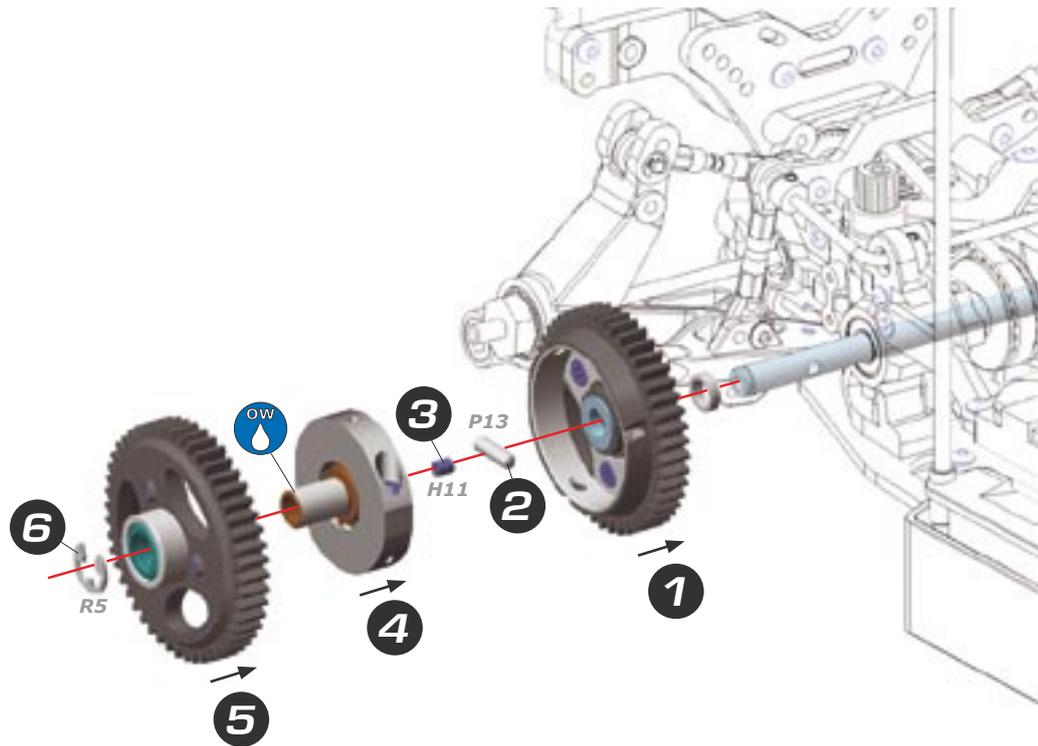
### BAG 22



**H11**  
M3x8mm

**P13**  
3x13.8mm

**R5**  
5mm



Learn about shoe gap

### ADJUSTING THE 2-SPEED SHOE GAP

Loosen the two gap-setting set screws to allow the shoes to rest on the drive adaptor.

Install the 2-speed shoes in the 2nd gear drum, but do NOT install the 1st gear.

There should be equal but minimal spacing between the 2-speed shoes and the 2nd gear drum. Tighten BOTH gap setting set screws until the shoes touch the inside surface of the aluminum 2nd gear drum, then loosen BOTH set screws by 1/2 turn each. The 2nd gear should spin freely.

Install the first gear.

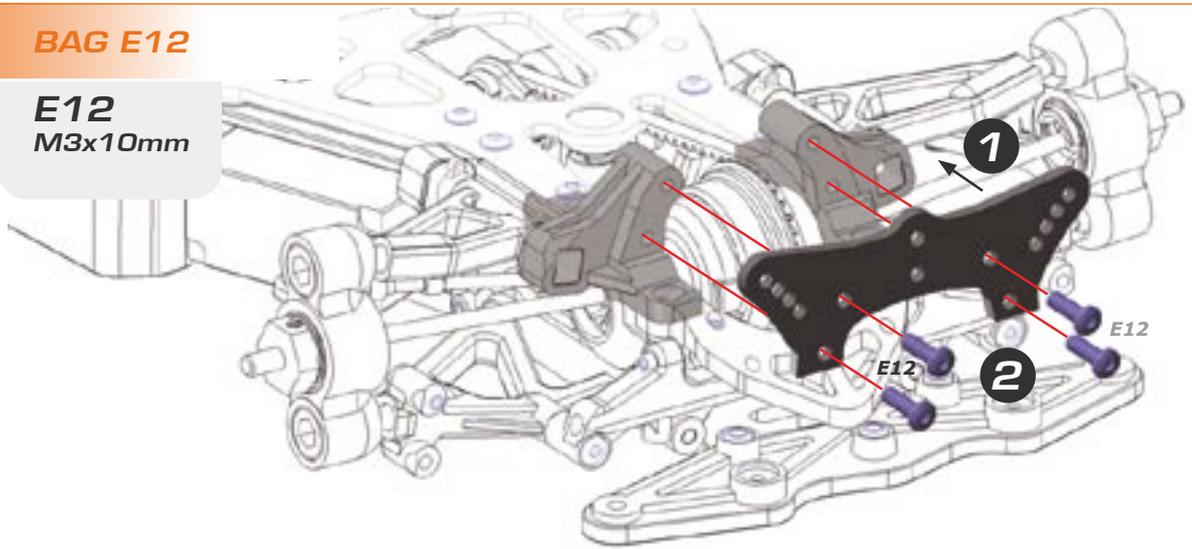
# 7.0 SHOCK ATTACHMENT

## STEP 7.1

BAG E12



E12  
M3x10mm

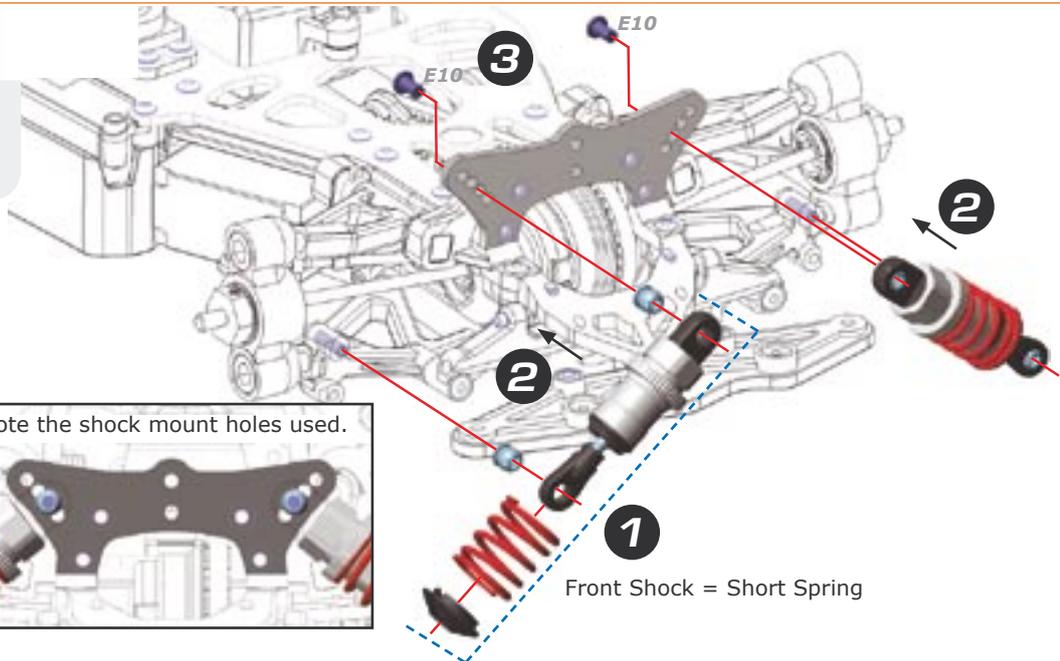


## STEP 7.2

BAG E10



E10  
M3x6mm



Set front shock position



Learn about shock adjustment (damping, springs, preload)

## STEP 7.3

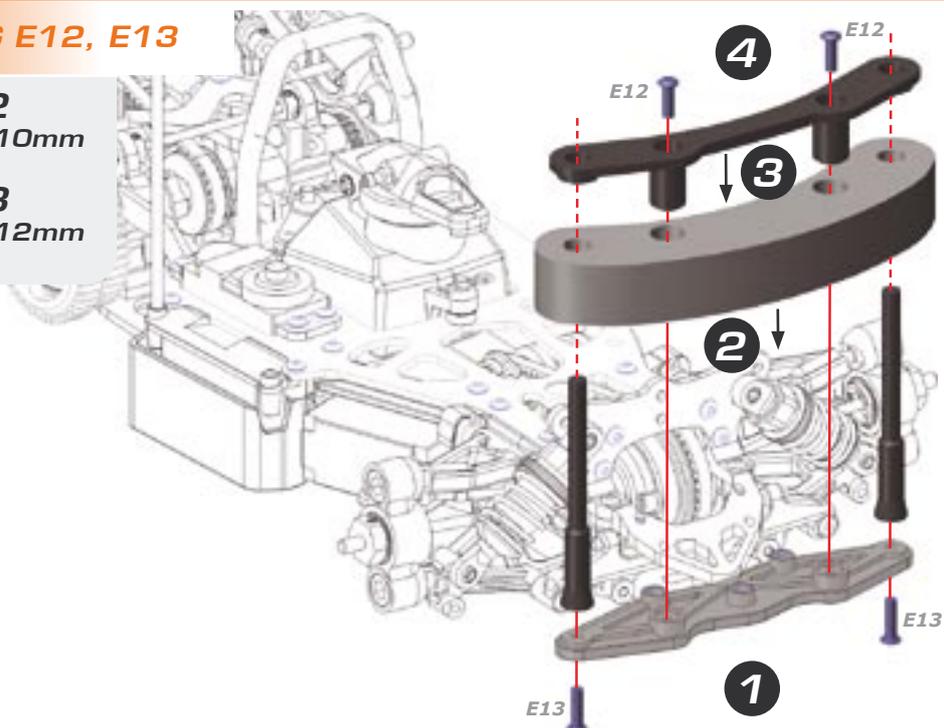
BAG E12, E13



E12  
M3x10mm

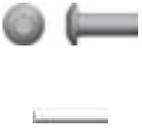


E13  
M3x12mm



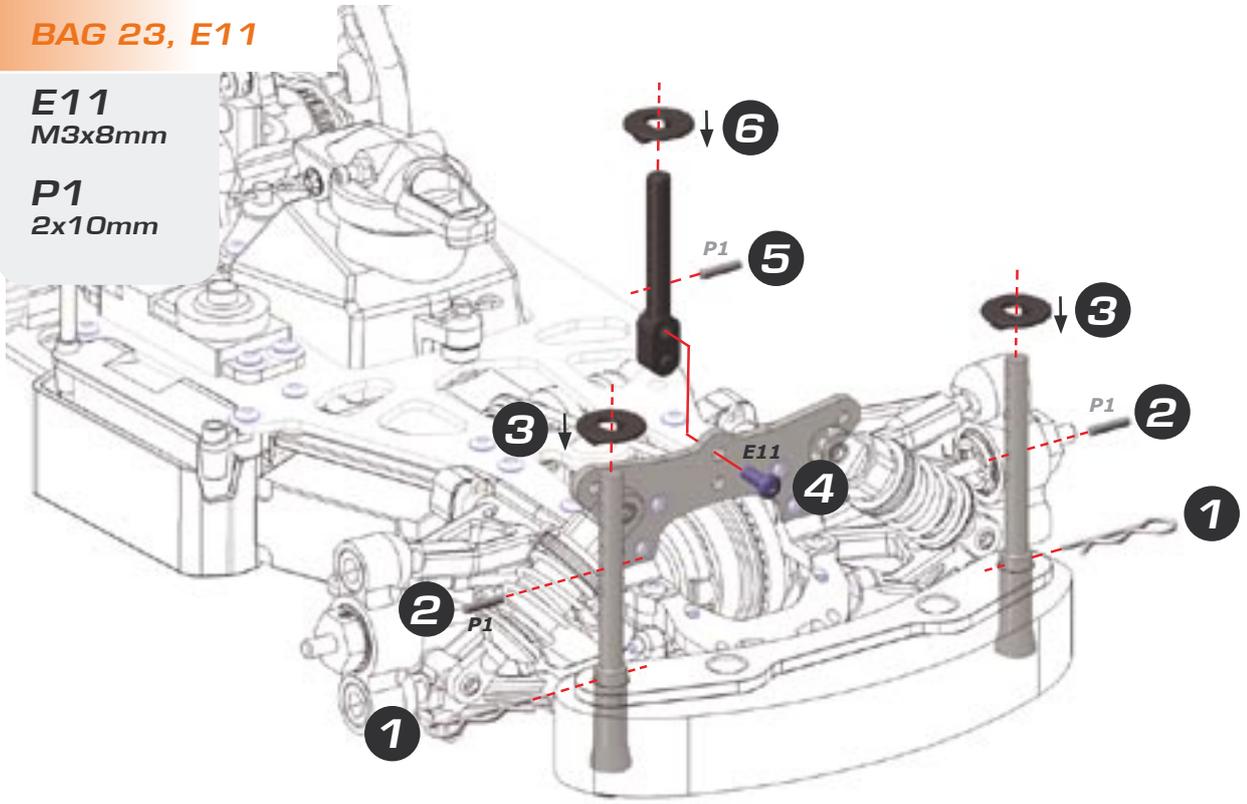
## STEP 7.4

### BAG 23, E11



**E11**  
M3x8mm

**P1**  
2x10mm

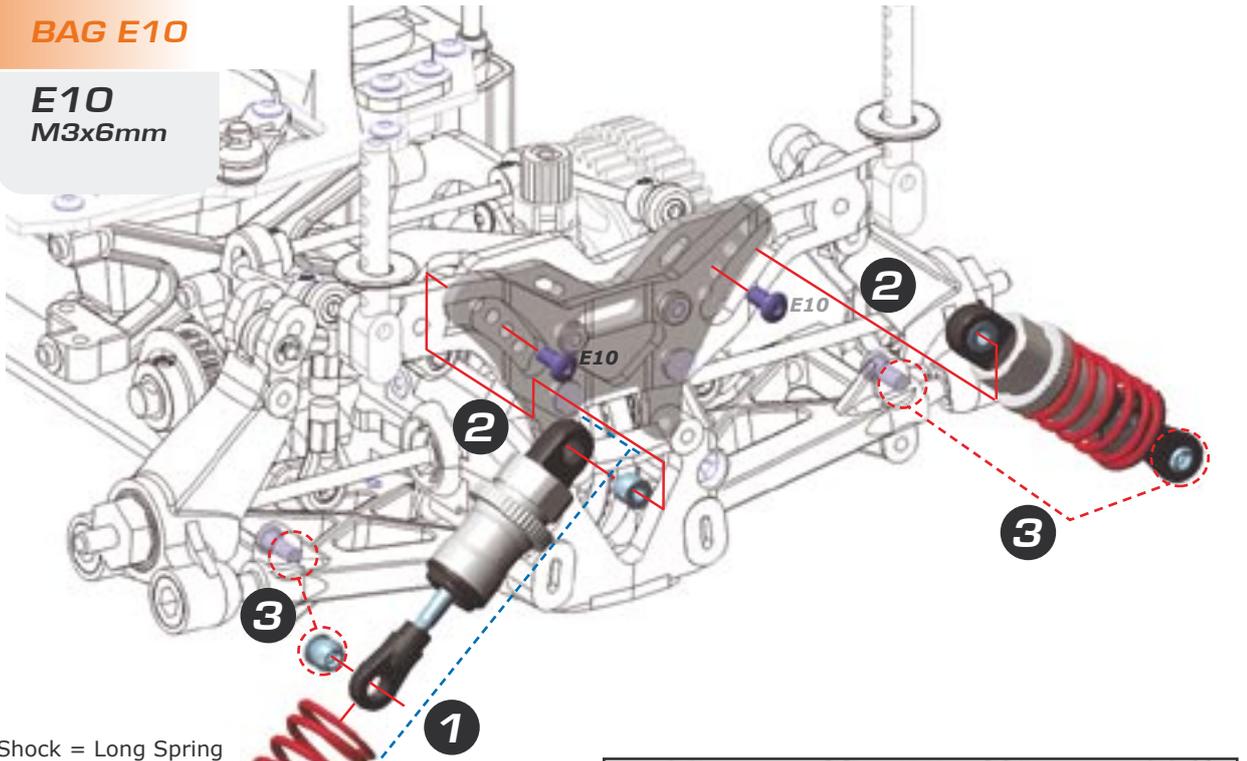


## STEP 7.5

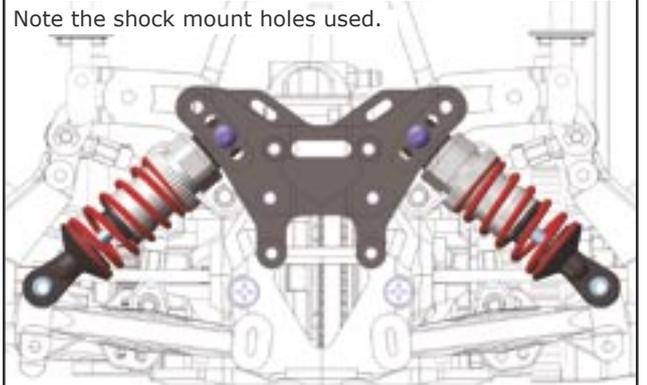
### BAG E10



**E10**  
M3x6mm



Rear Shock = Long Spring



Set rear shock position

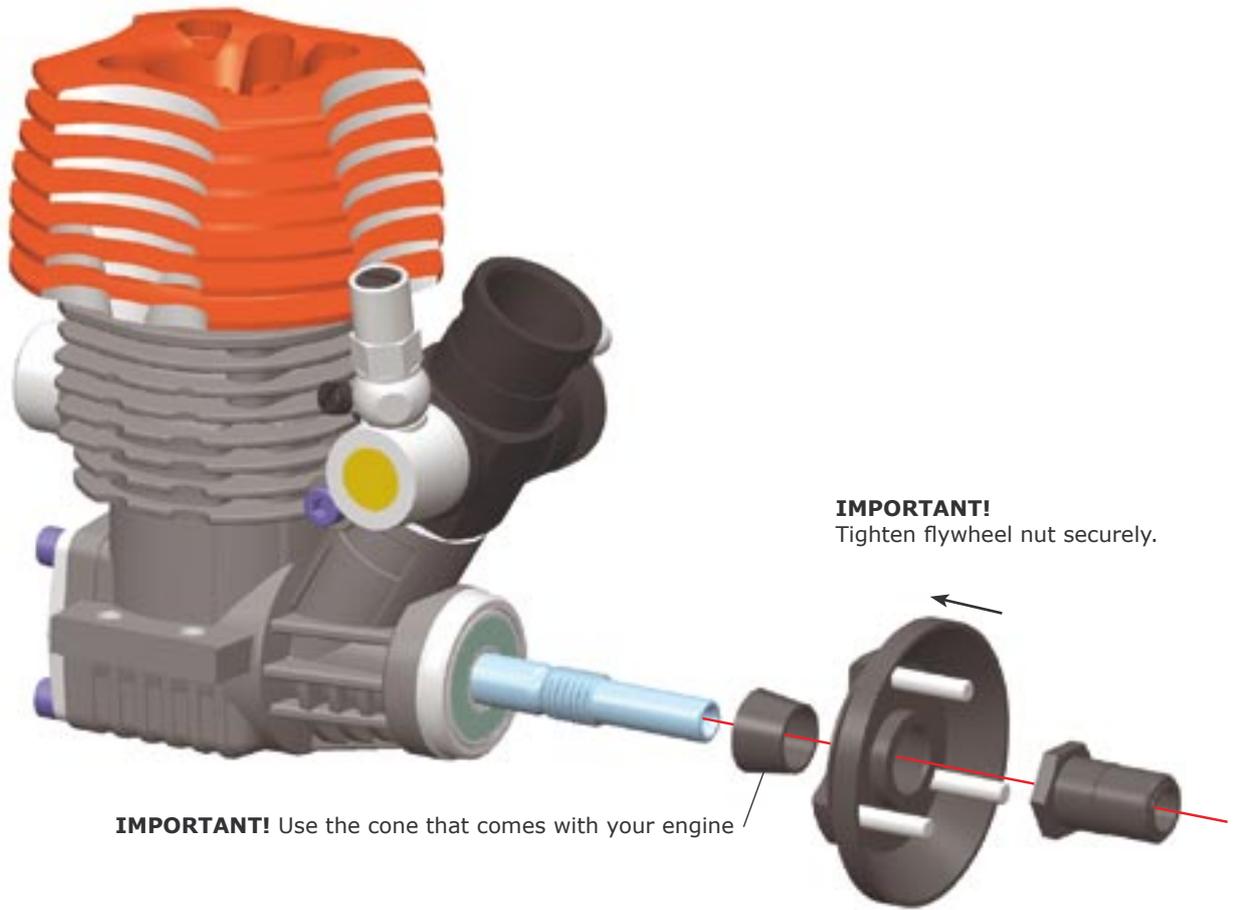


Learn about shock adjustment (damping, springs, preload)

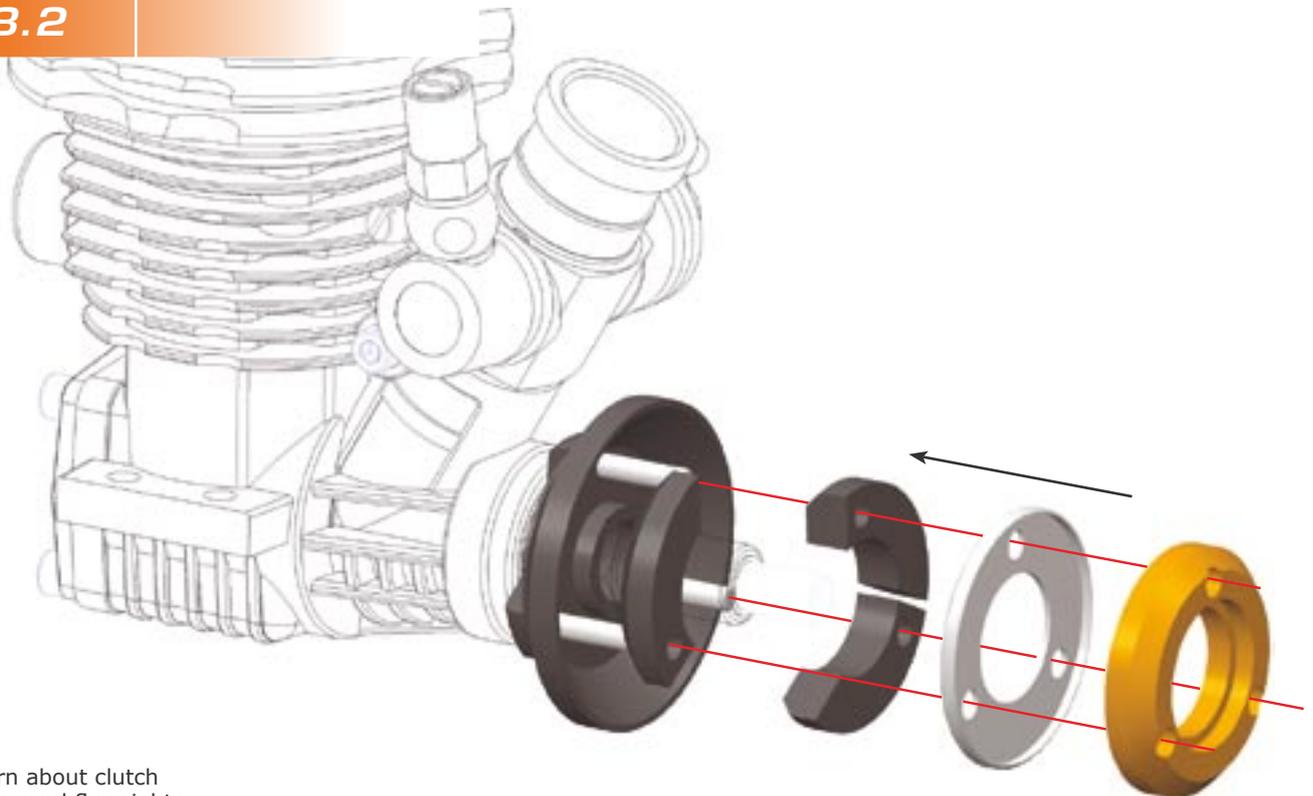
# 8.0 CENTAX ASSEMBLY

## STEP 8.1

BAG 24



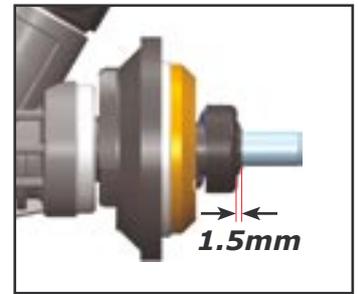
## STEP 8.2



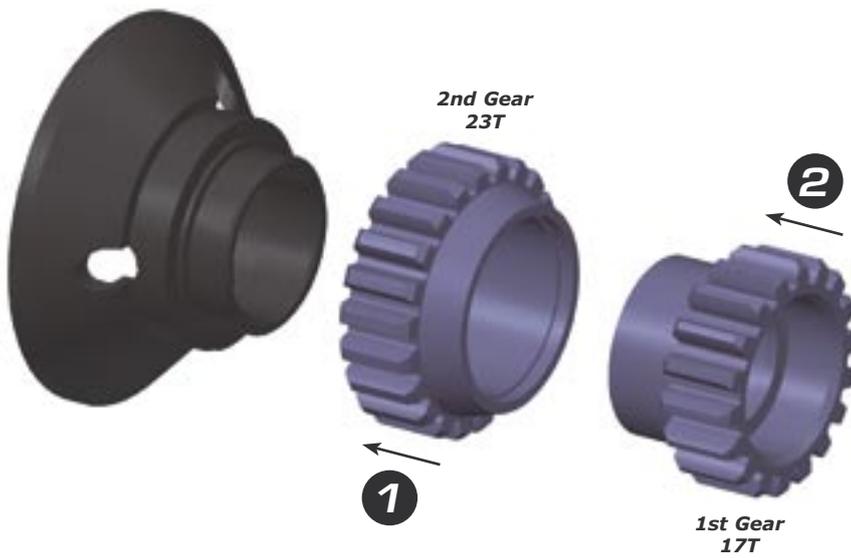
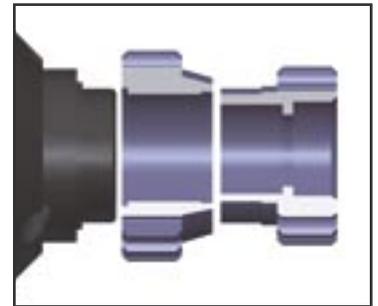
 Learn about clutch shoes and flyweights

### STEP 8.3

Initial clutch spring tension



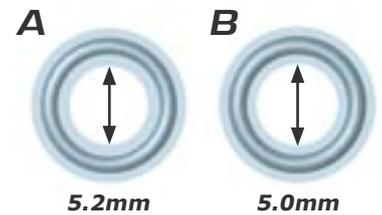
### STEP 8.4



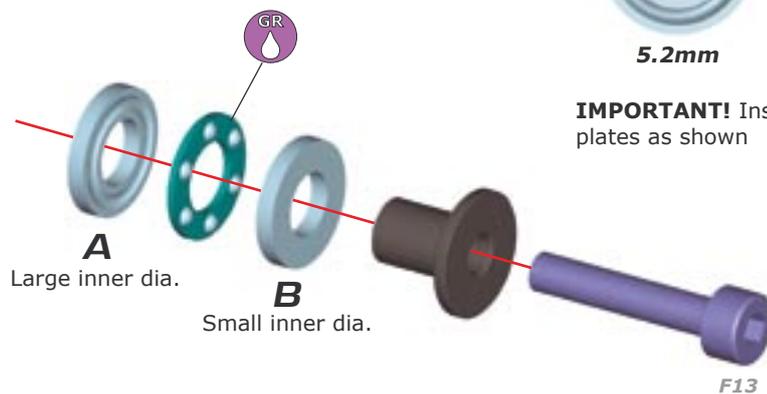
### STEP 8.5

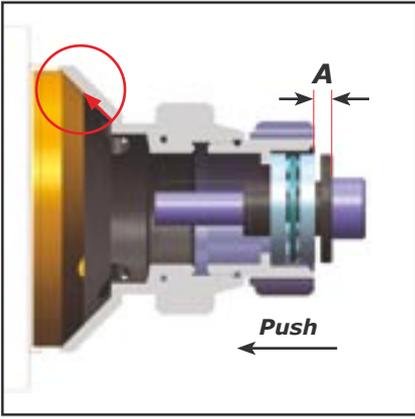
**BAG 25**

**F13**  
M3x12mm

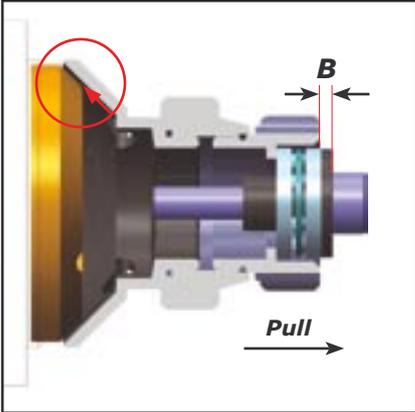


**IMPORTANT!** Install thrust bearing plates as shown





**1** Install only the clutchbell and the thrustbearing assembly on the engine crankshaft. Push the clutchbell onto the clutch shoe, and then measure the distance A as indicated.

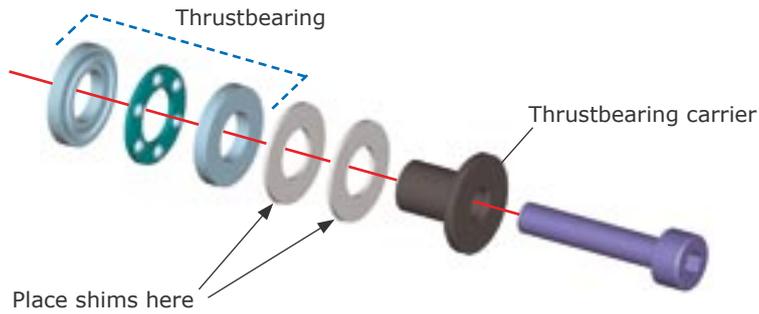


**2** Pull the clutchbell away from the clutch shoe, and then measure the distance B as indicated.

**3** The clutch gap is  $A - B$ ; the correct gap is 0.7mm. If the clutch gap is greater than 0.7mm, you can easily calculate the thickness of shims required to set the correct gap:  
 Thickness of shims required (in mm) =  $A - B - 0.7$

For example, using the values  $A=1.3\text{mm}$ ,  $B=0.3\text{mm}$   
 Shim thickness =  $1.3 - 0.3 - 0.7 = 0.3\text{mm}$

**4** Place shims between the outer thrustbearing plate and the rim of the thrustbearing carrier as shown.

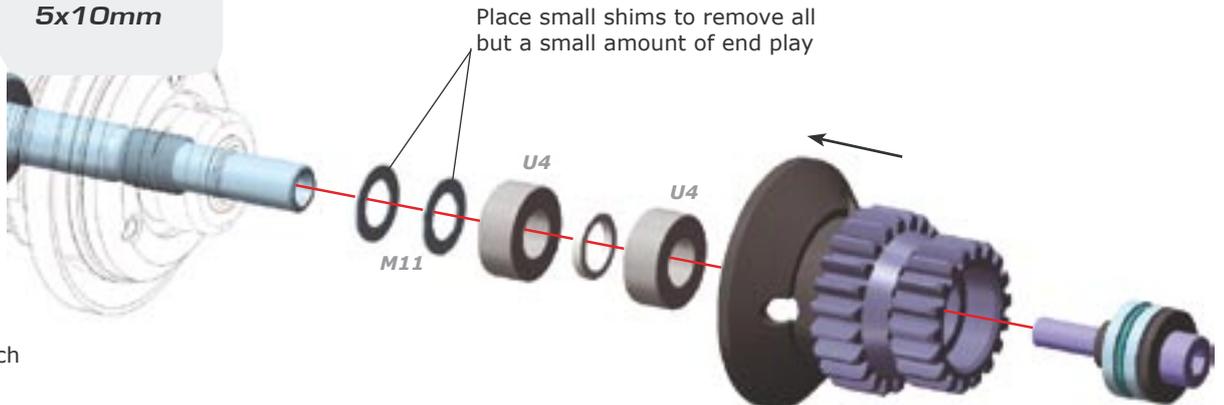


**B** Learn about clutch shoe gap



**M11**  
 5x8x0.1mm  
 5x8x0.3mm

**U4**  
 5x10mm



**B** Learn about clutch end play

# 9.0 FINAL ASSEMBLY

## STEP 9.1

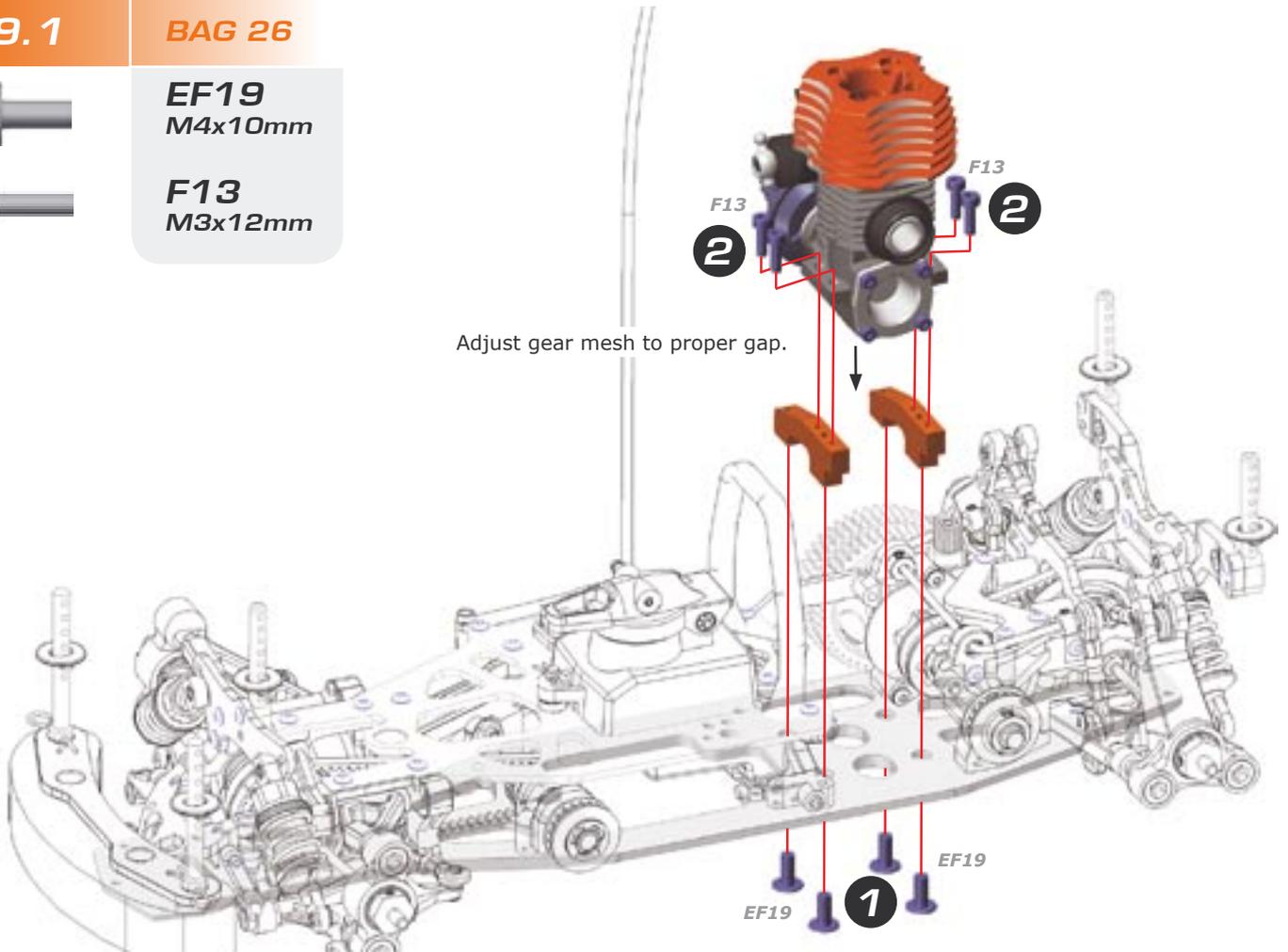
**BAG 26**



**EF19**  
M4x10mm



**F13**  
M3x12mm



## STEP 9.2

**BAG E11, U**



**E11**  
M3x8mm



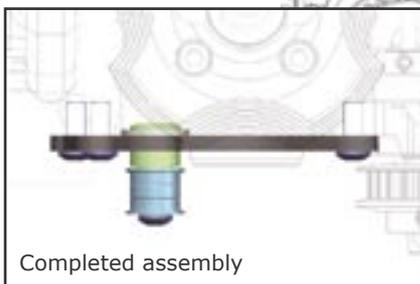
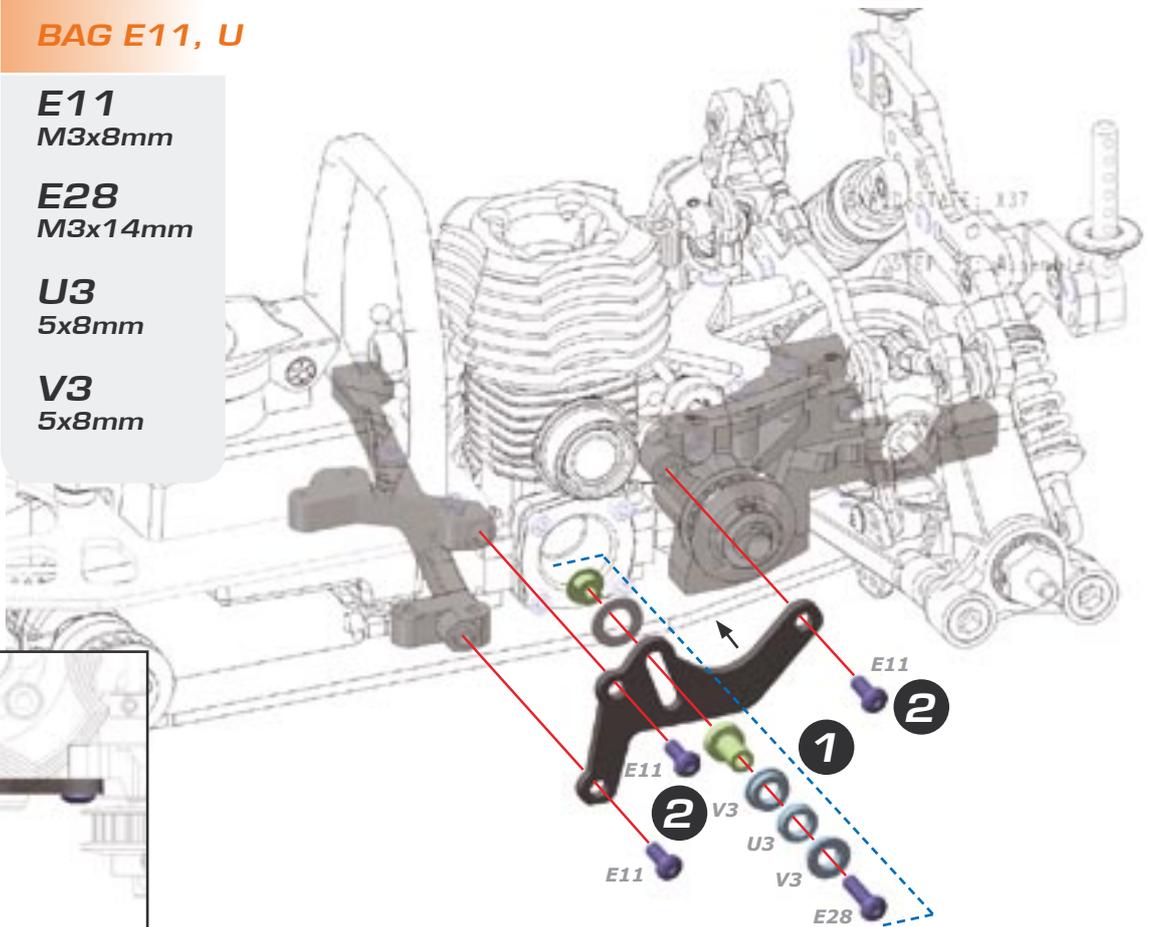
**E28**  
M3x14mm



**U3**  
5x8mm



**V3**  
5x8mm

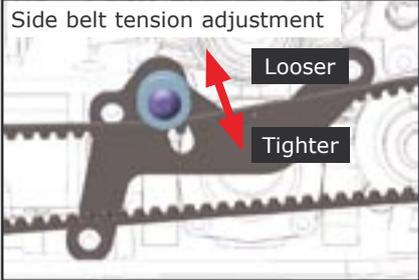
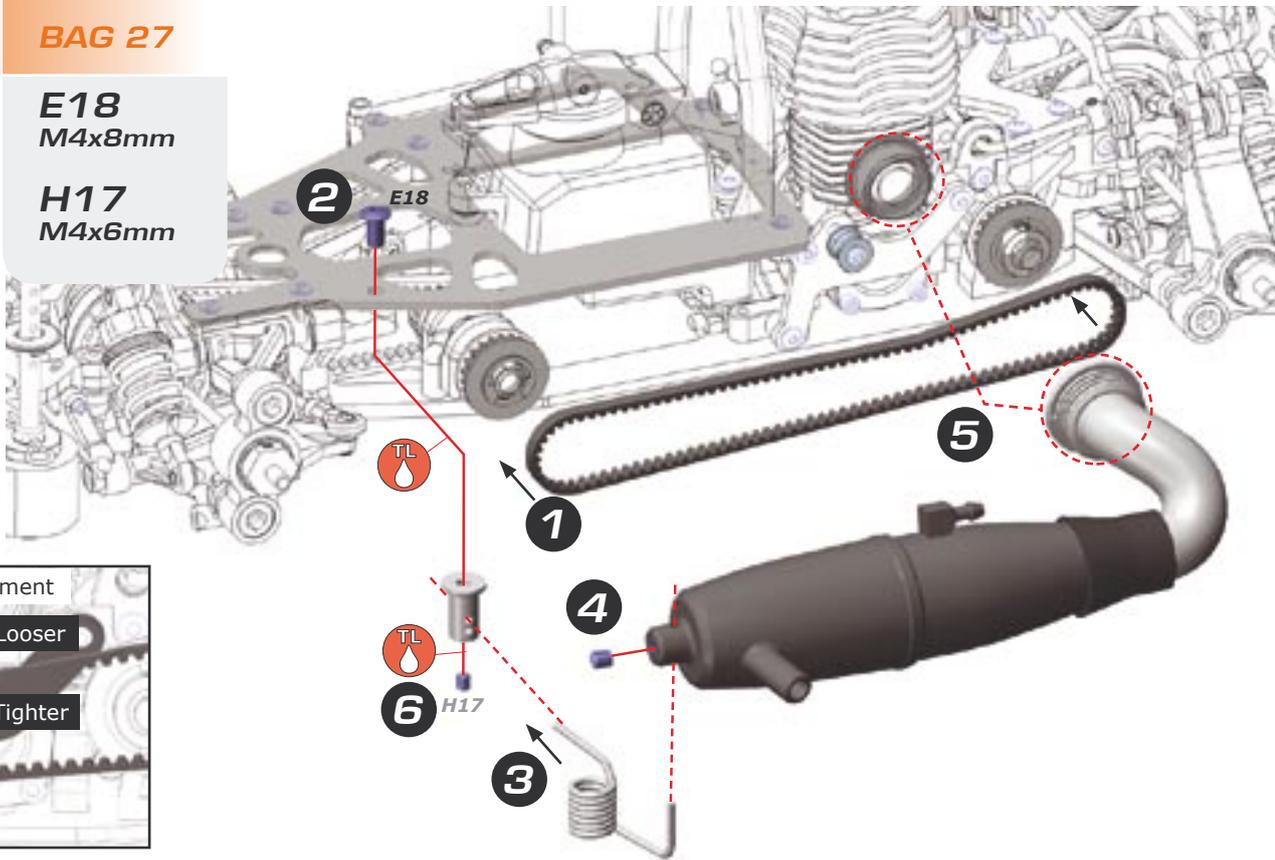


### STEP 9.3

### BAG 27

**E18**  
M4x8mm

**H17**  
M4x6mm



### STEP 9.4

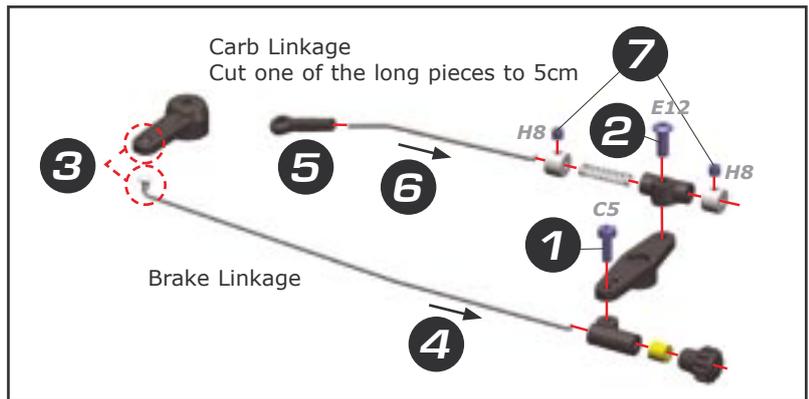
### BAG 28, 29, E11, E12

**C5**  
2.5x10mm

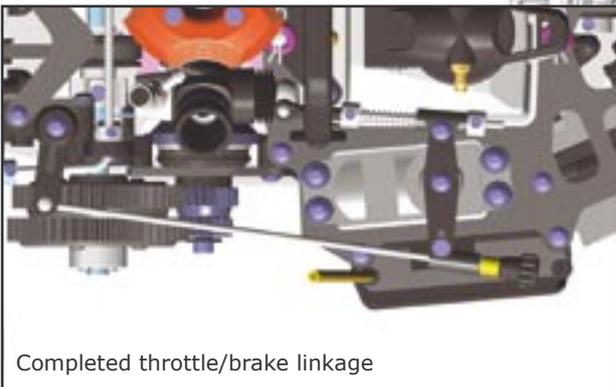
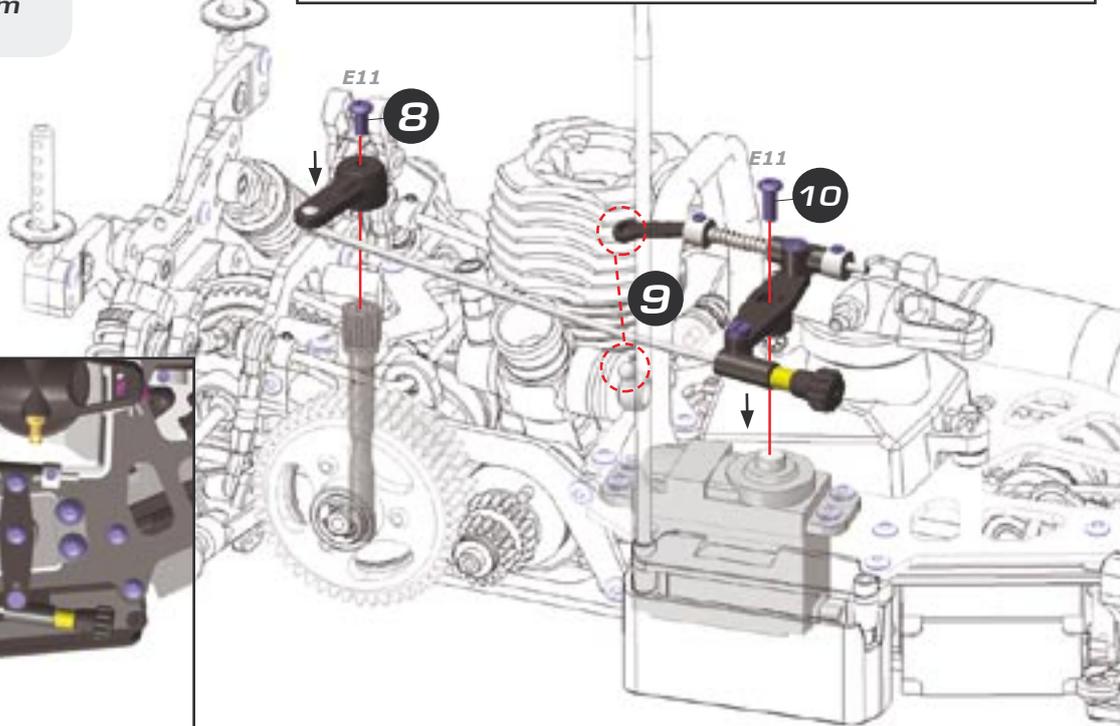
**E11**  
M3x8mm

**E12**  
M3x10mm

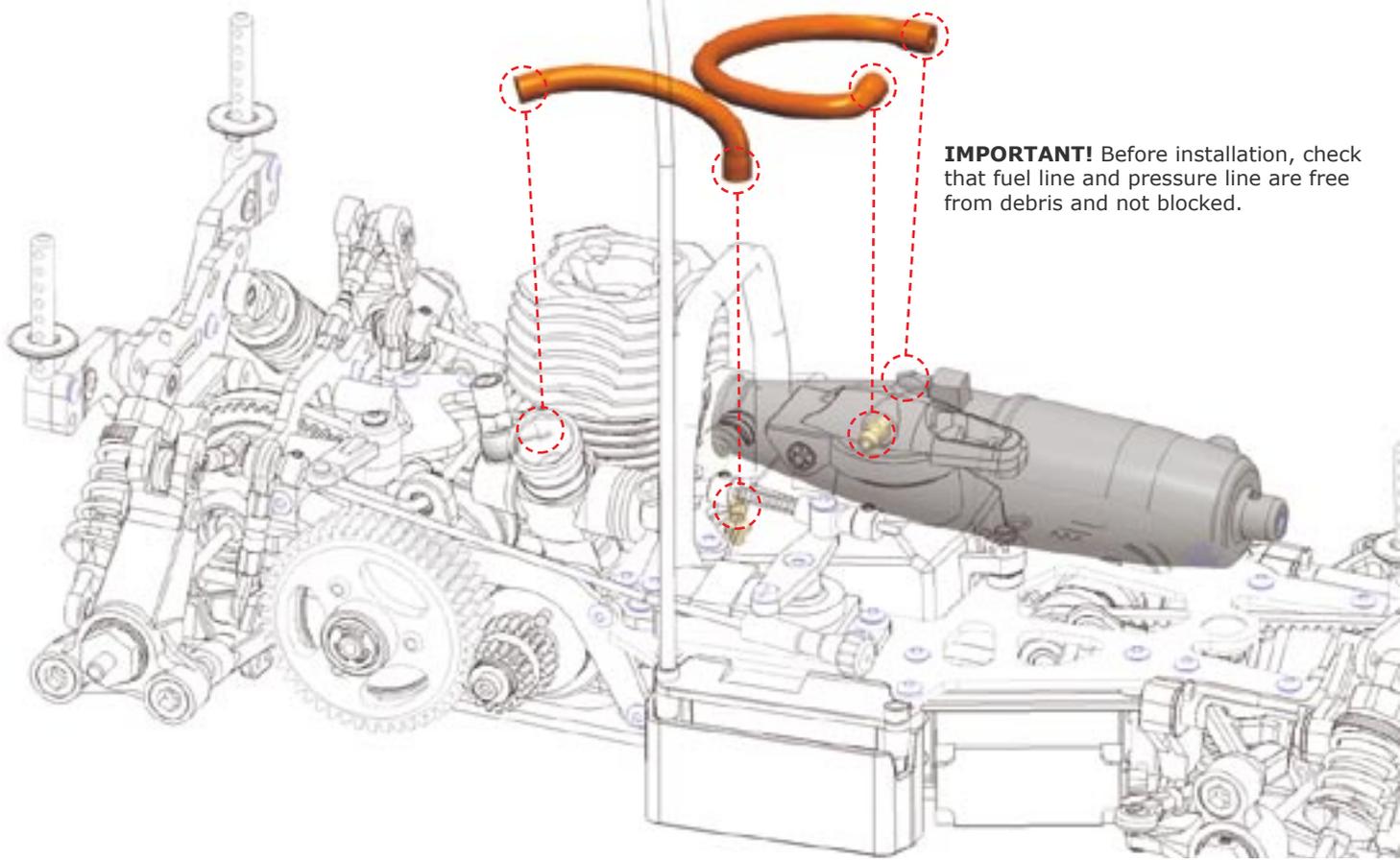
**H8**  
M3x3mm



Use the following servo arms with these brands of servos.  
23 - Sanwa / KO / JR  
24 - Hitec  
25 - Futaba

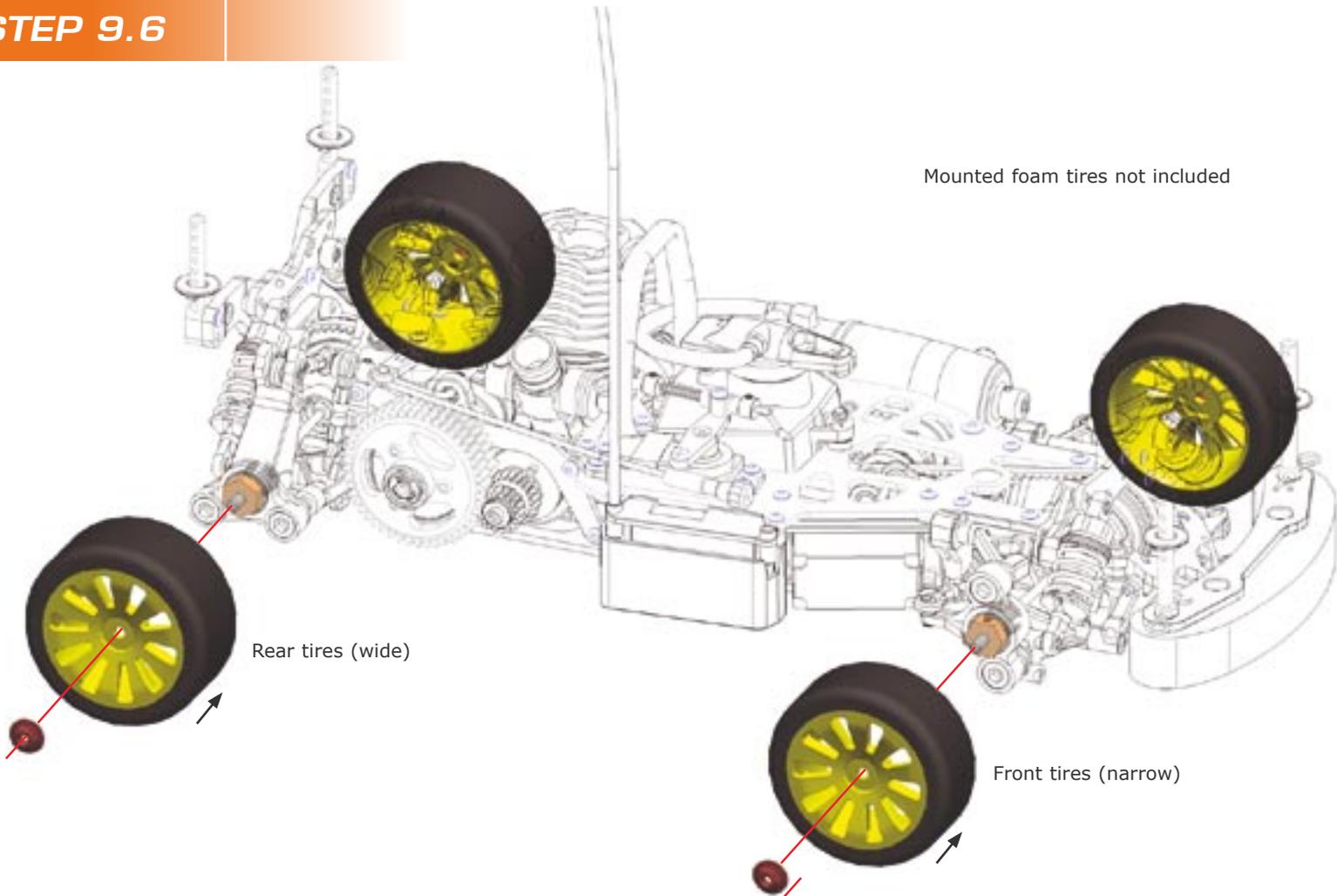


## STEP 9.5



**IMPORTANT!** Before installation, check that fuel line and pressure line are free from debris and not blocked.

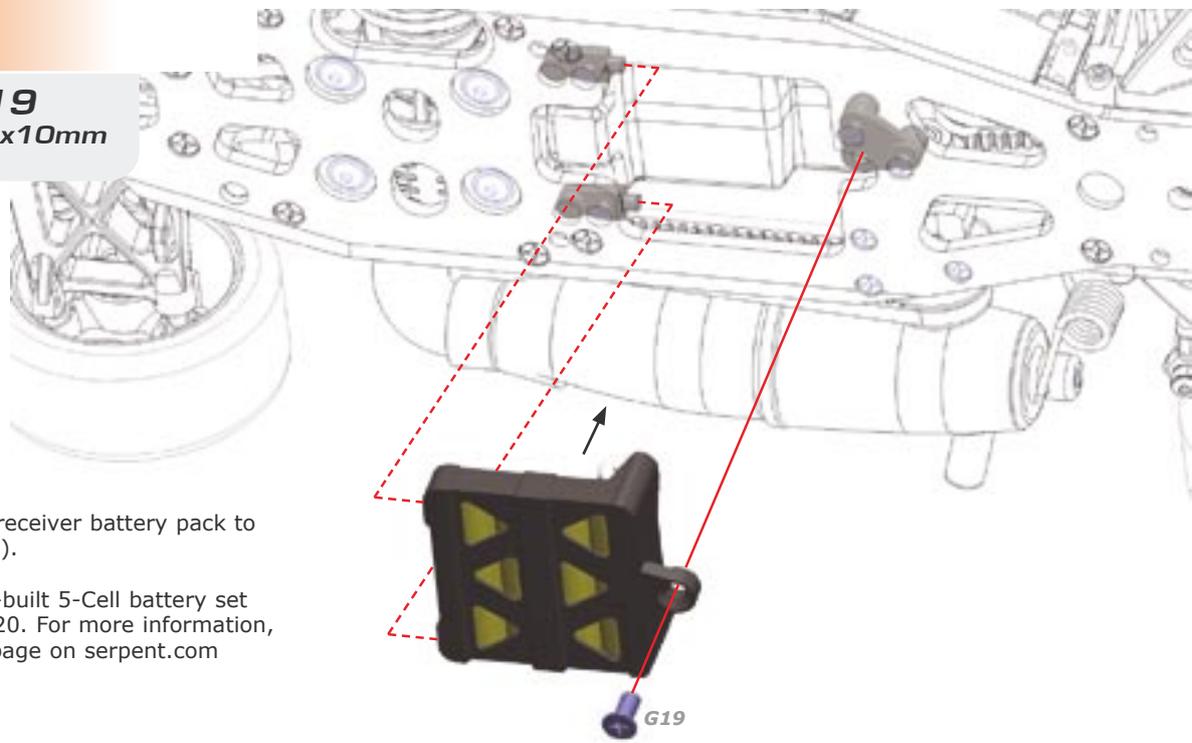
## STEP 9.6



## STEP 9.7



**G19**  
M4x10mm



Securely attach a AAA 5-cell receiver battery pack to the battery tray (not included).

**Note:** Serpent offers the pre-built 5-Cell battery set (#801173) for the Serpent 720. For more information, see the appropriate product page on [serpent.com](http://serpent.com)



# SERPENT 720



# **SERPENT** *seven20* **720**

**SERPENT**  
**MOTORSPORT**

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