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.

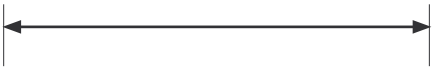
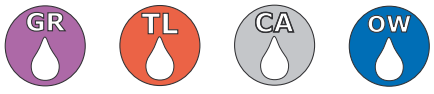
EXPLODED VIEWS AND PARTS LIST
The exploded views and parts lists for the Serpent 720 are contained in a separate Serpent 720 Reference Guide. The exploded views show all the parts of a particular assembly step along with the Serpent part number. The parts lists indicate the part number and name of each 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.

CONTENTS

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
	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
	Refer to Serpent 720 Setup Book - Section A: Basic Setup
	Refer to Serpent 720 Setup Book - Section B: Advanced Setup
	Apply graphite grease (GR), threadlock (TL), CA glue (CA) or Serpent's One-way Lube (OW). (Items not included.)

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

1

Unscrew the bottom half of the pre-assembled shock absorbers.

2

FILLING
Fill the shock body with the supplied shock absorber oil.

BLEEDING
Let the oil settle and allow the air to escape.

STEP 1.2

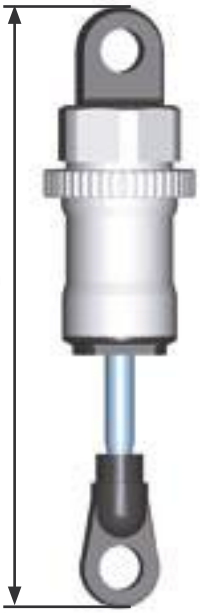
1 Massage some shock oil into the shock sponge before re-assembling the shock absorber.

2 With the shock body filled with oil, slowly screw the bottom half of the pre-assembled shock back onto the shock body.

IMPORTANT! Do not cross thread!

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

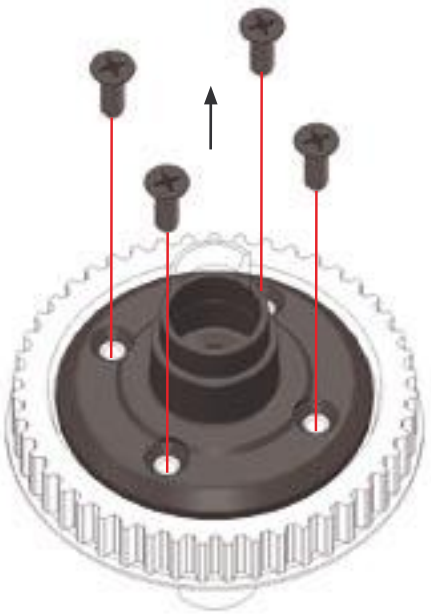
Shock Length
68mm
for all shocks



Learn about shock damping

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.

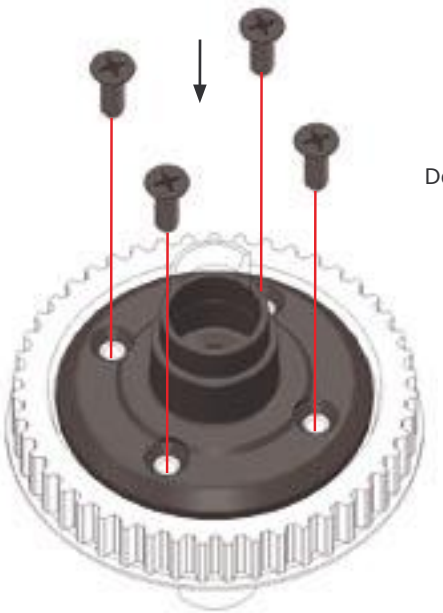
STEP 1.6

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

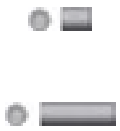


Do not overtighten screws

2.0 FRONT ASSEMBLY

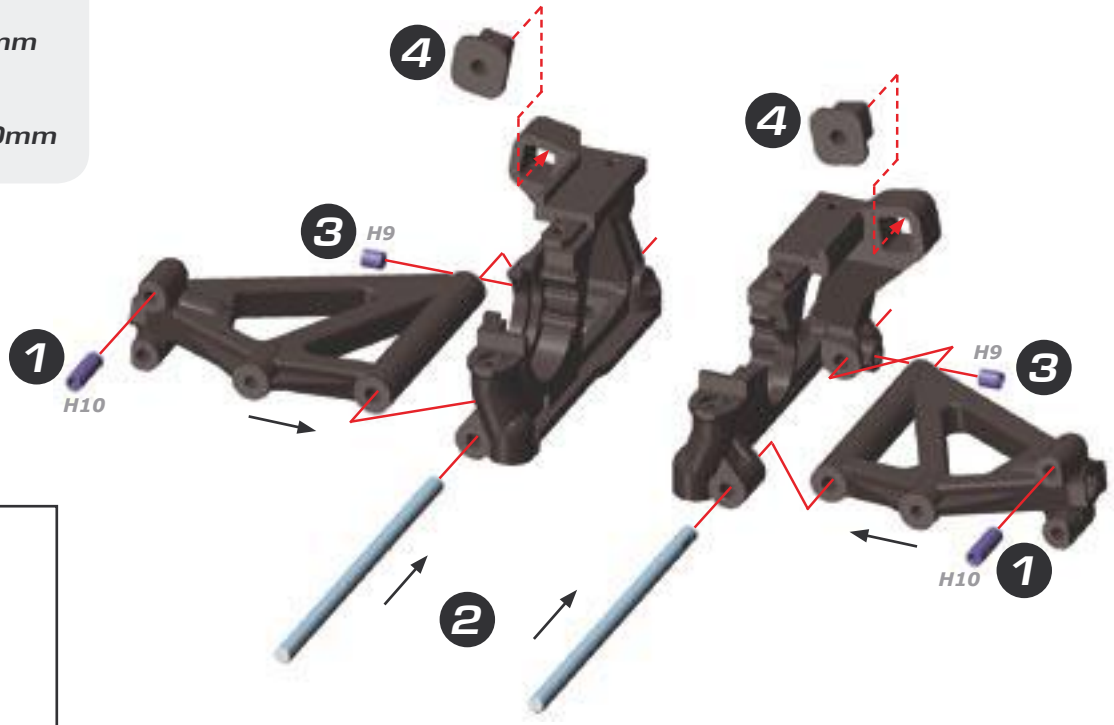
STEP 2.1

BAG 1



H9
M3x4mm

H10
M3x10mm



B Learn about front roll center adjustment

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

Right | Left

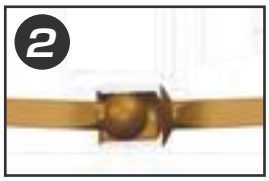
STEP 2.2

BAG 2

H11
M3x8mm

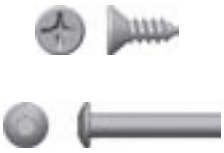
H9
M3x4mm

A Set front anti-roll bar



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

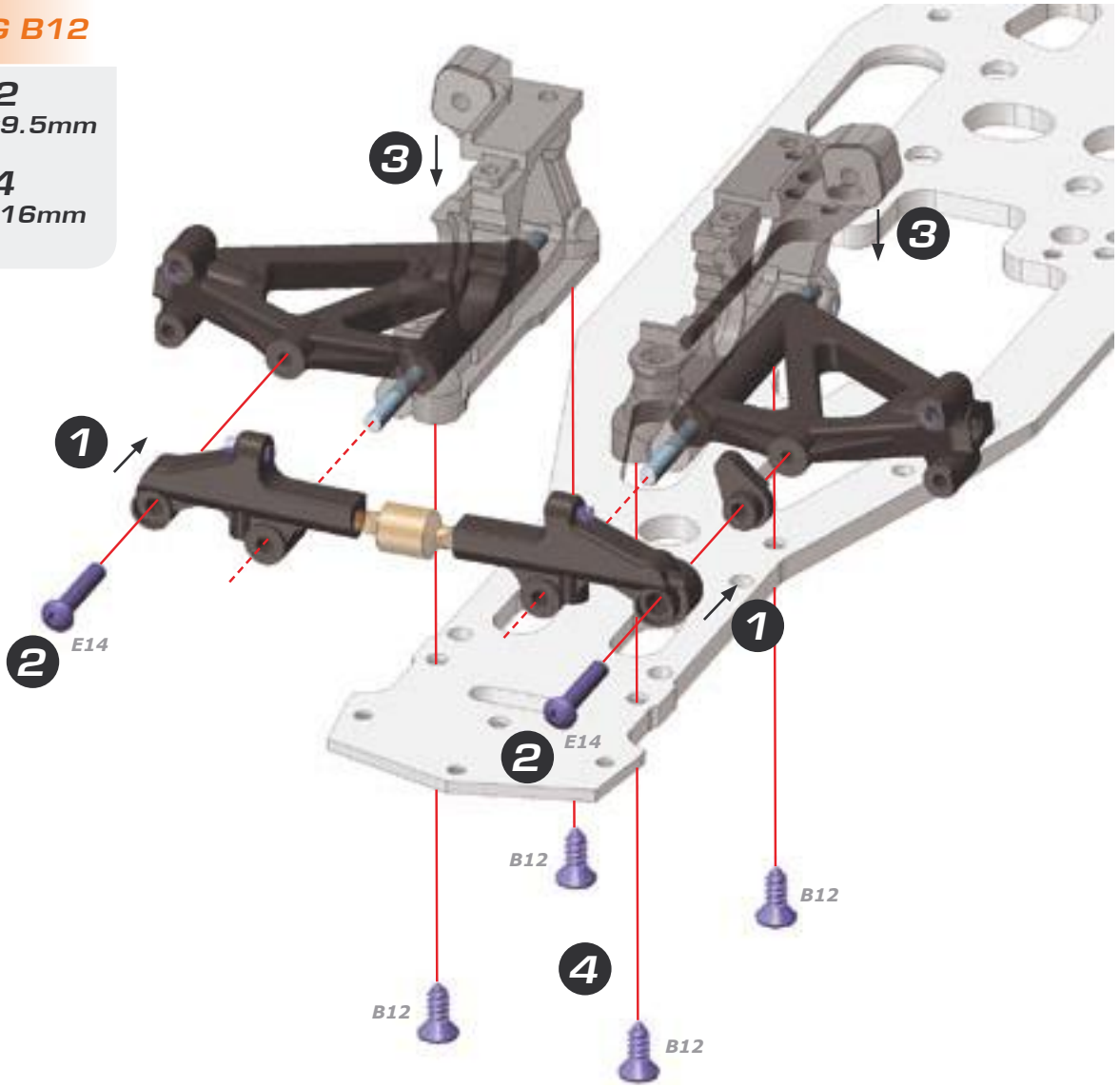
STEP 2.3



BAG B12

B12
3.5x9.5mm

E14
M3x16mm

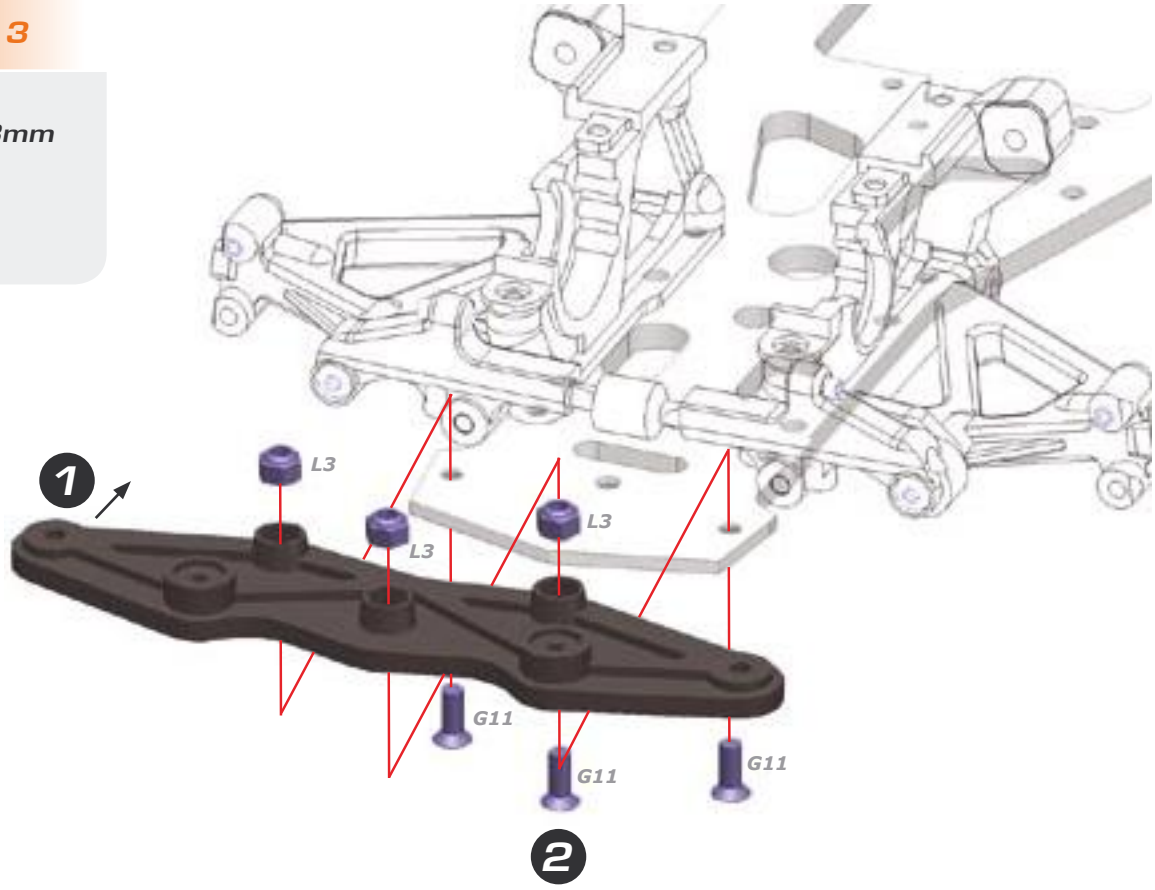


STEP 2.4

BAG 3

G11
M3x8mm

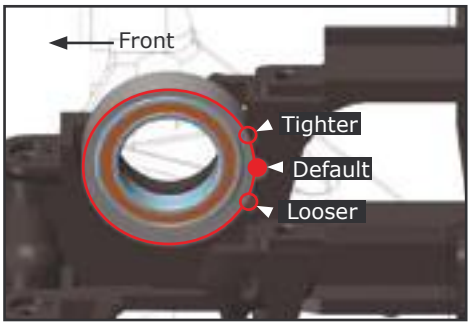
L3
M3



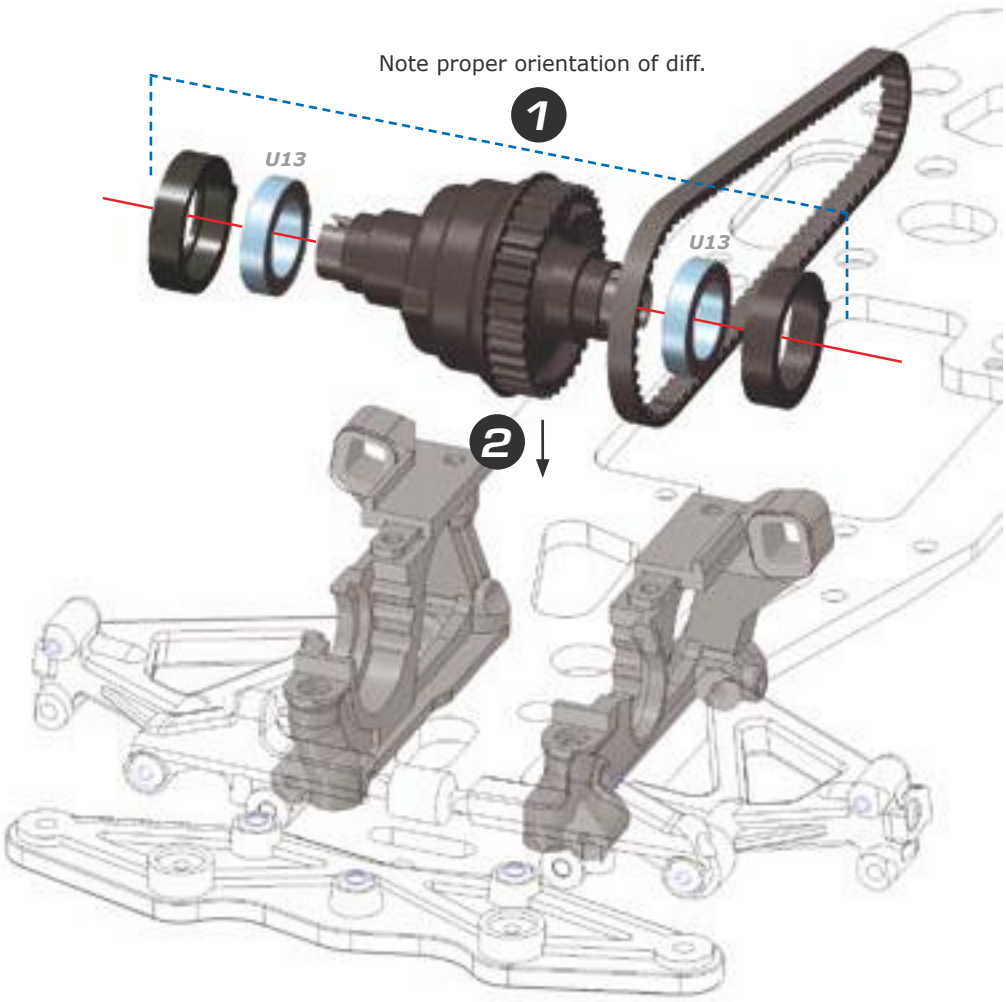
STEP 2.5

BAG U

U13
12x18mm



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

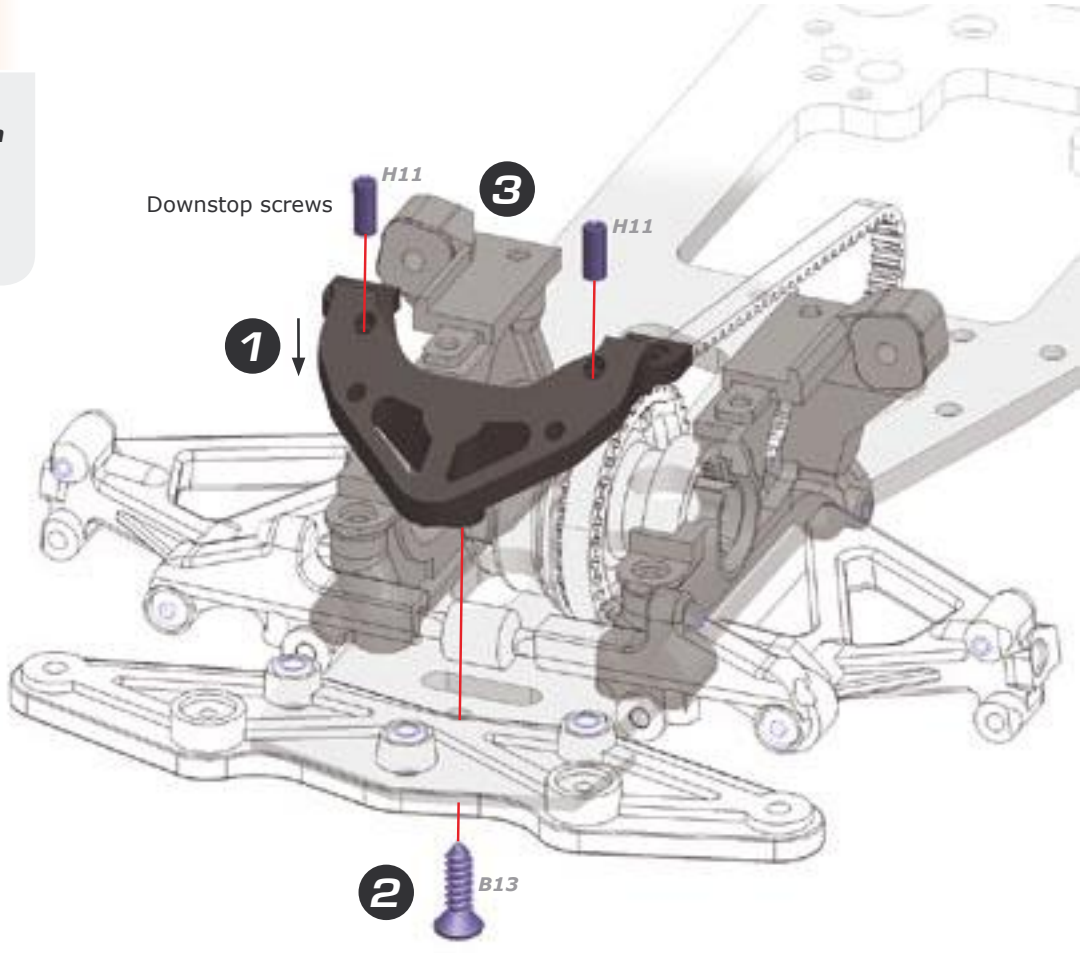


STEP 2.6

BAG 4

B13
3.5x13mm

H11
M3x8mm

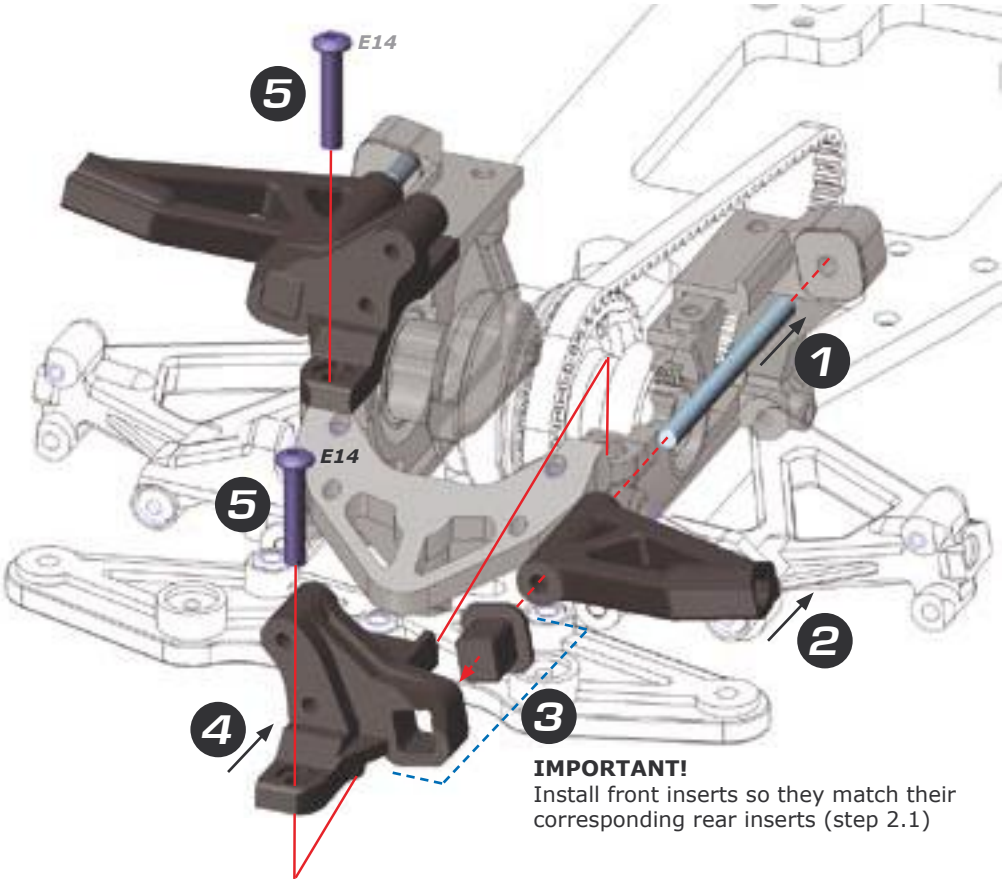


Set front downstops

STEP 2.7

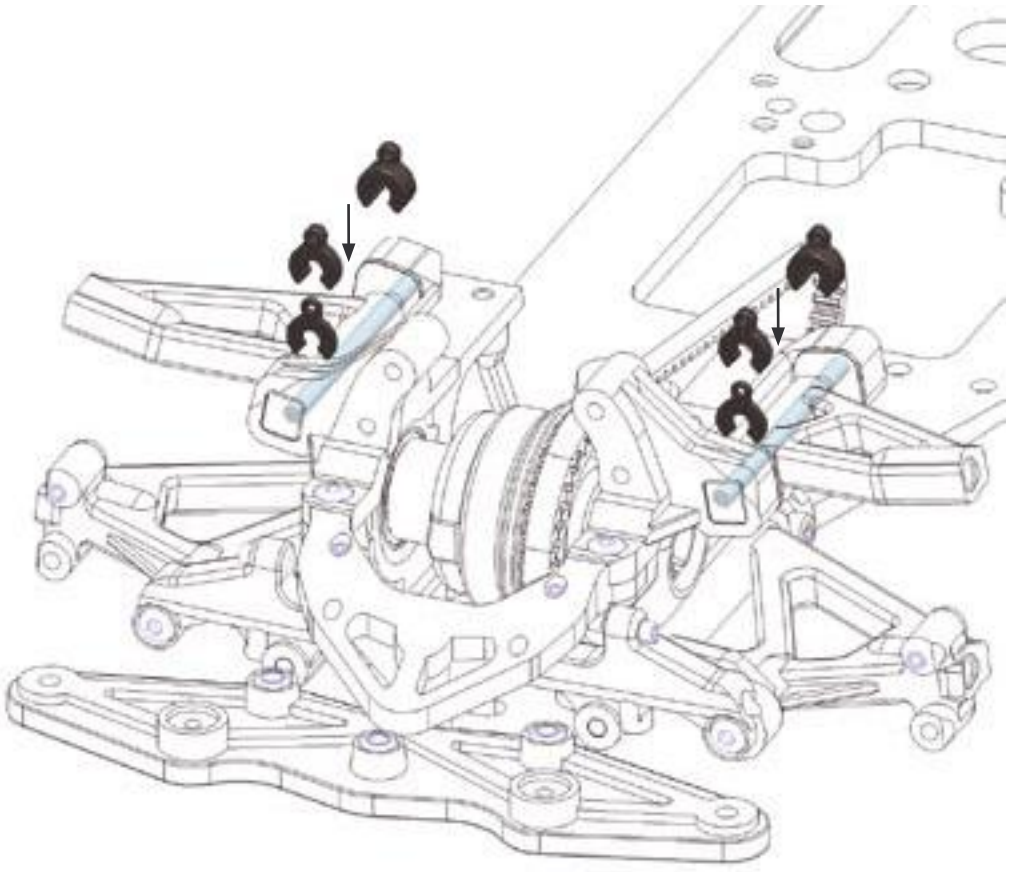
E14
M3x16mm

Assemble both front upper arms using the indicated steps.

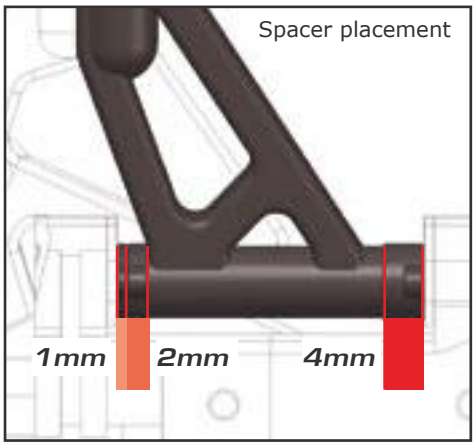


IMPORTANT!
Install front inserts so they match their corresponding rear inserts (step 2.1)

STEP 2.8



Set caster



STEP 2.9

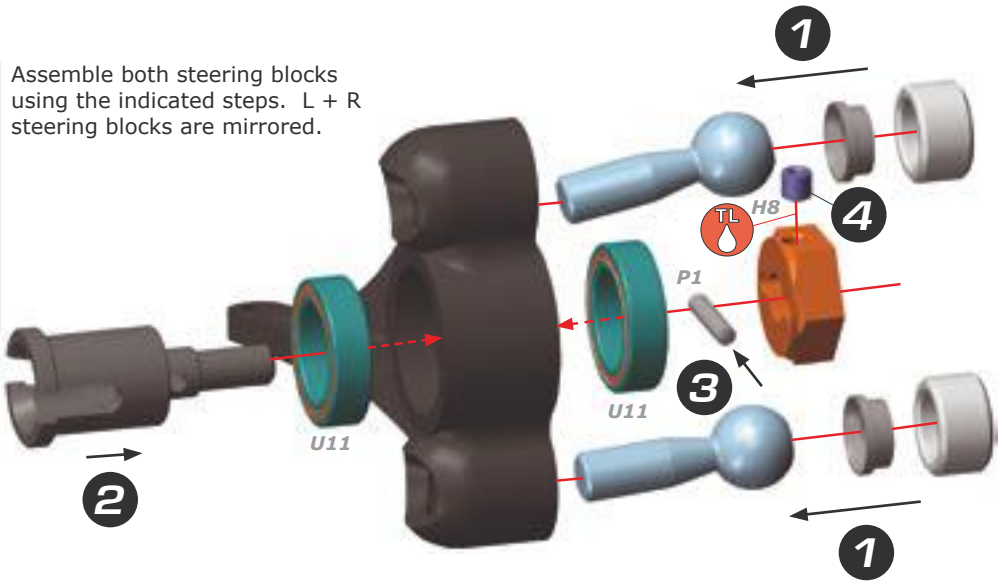
BAG 5, U

H8
M3x3mm

P1
2x10mm

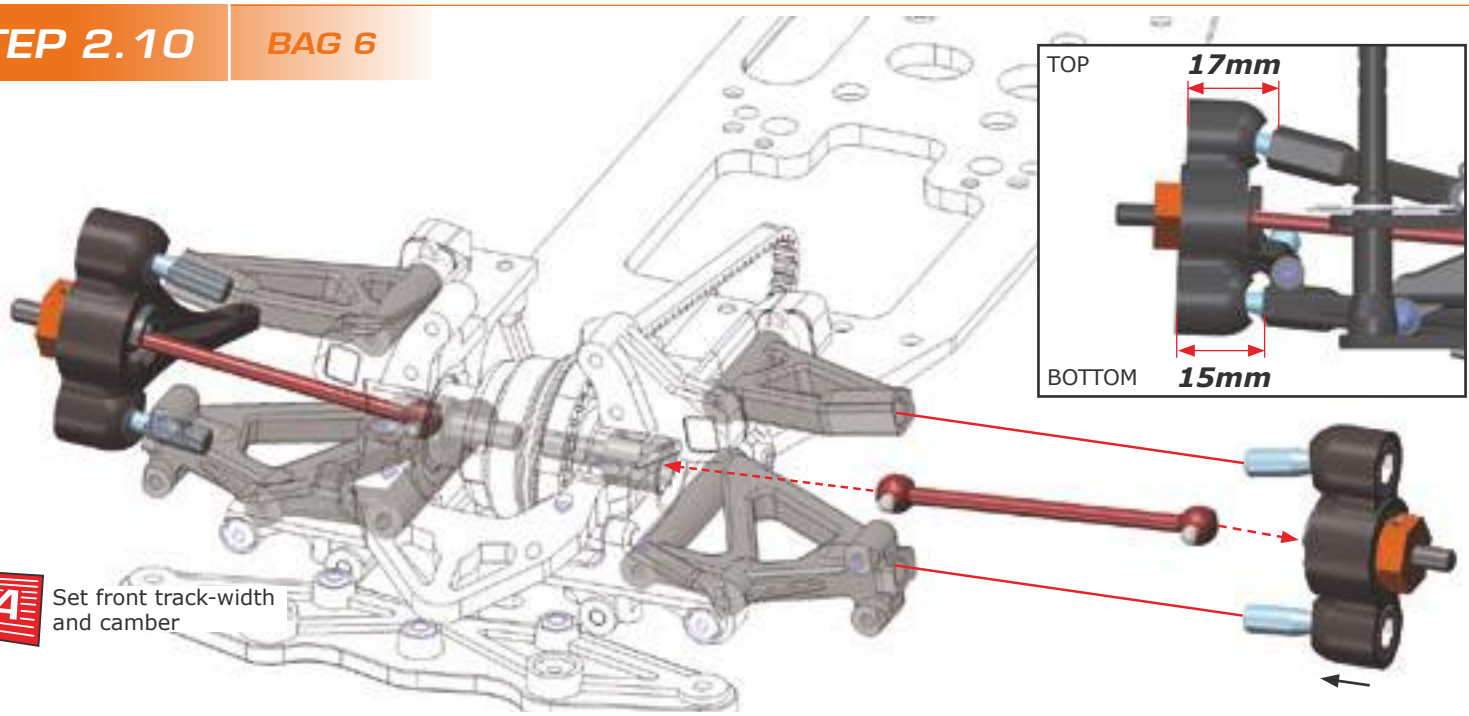
U11
10x15mm

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



STEP 2.10

BAG 6



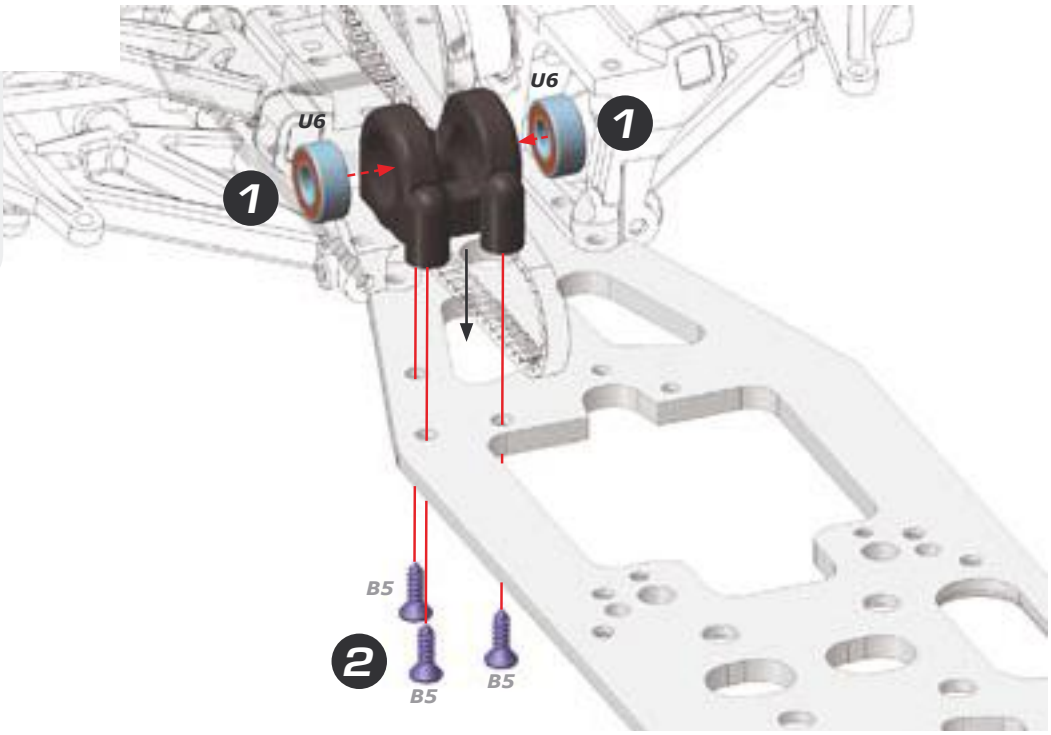
A Set front track-width and camber

STEP 2.11

BAG U

B5
2.9x9.5mm

U6
6x13mm

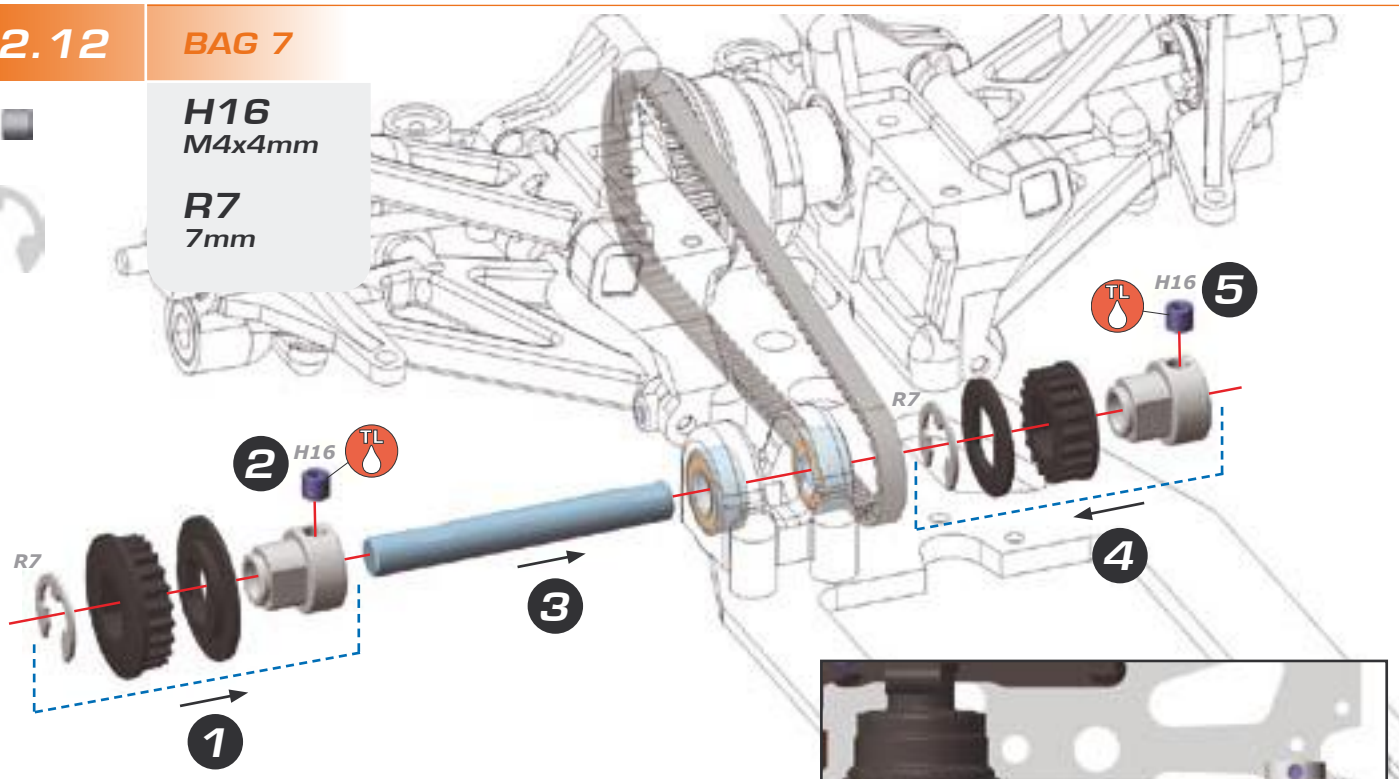


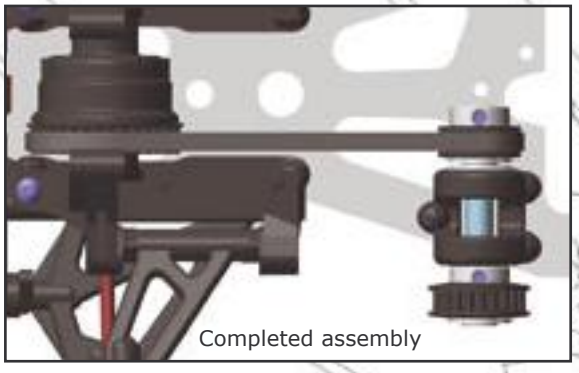
STEP 2.12

BAG 7

H16
M4x4mm

R7
7mm

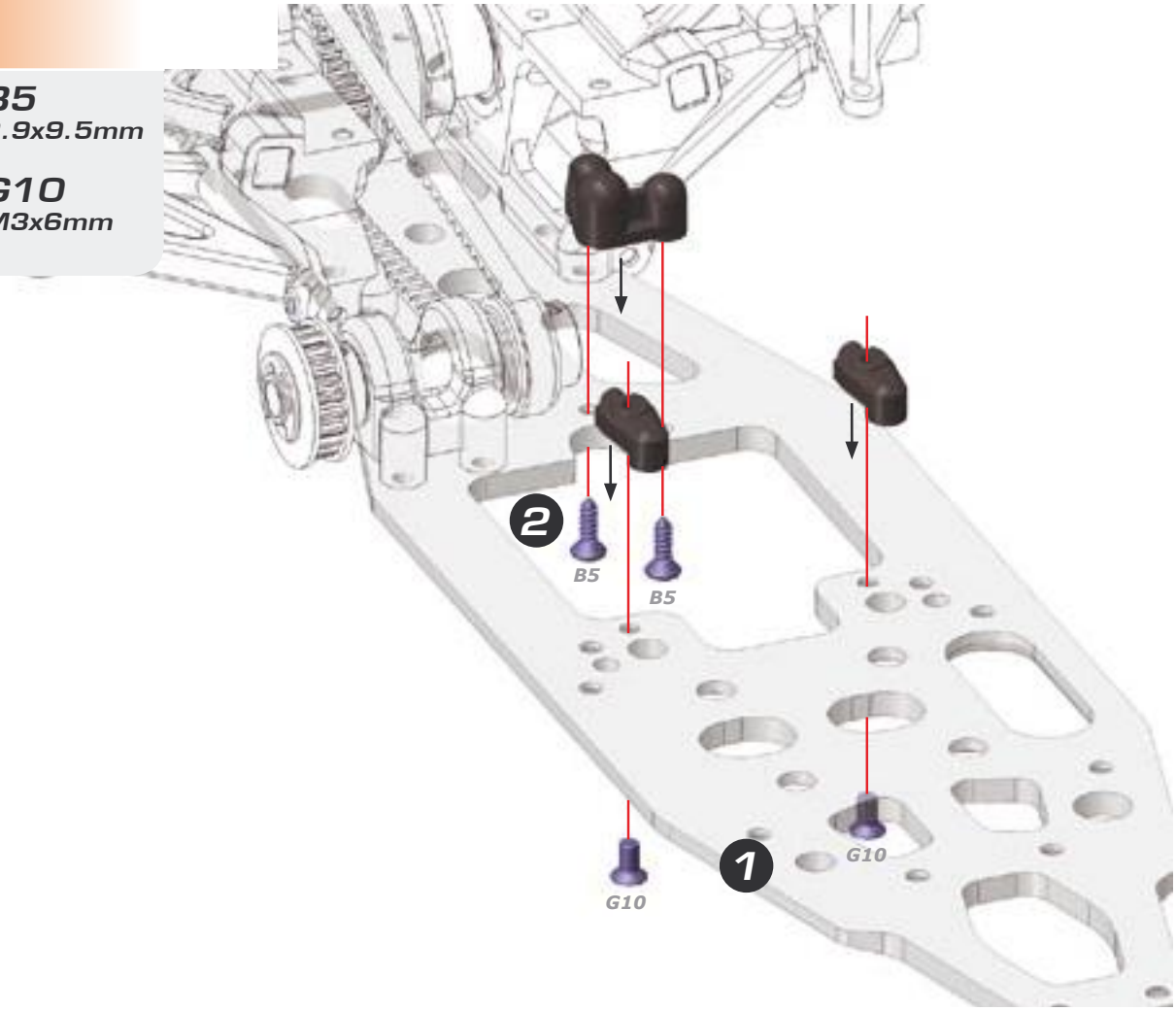



Completed assembly

STEP 2.13

B5
2.9x9.5mm

G10
M3x6mm



3.0 REAR ASSEMBLY

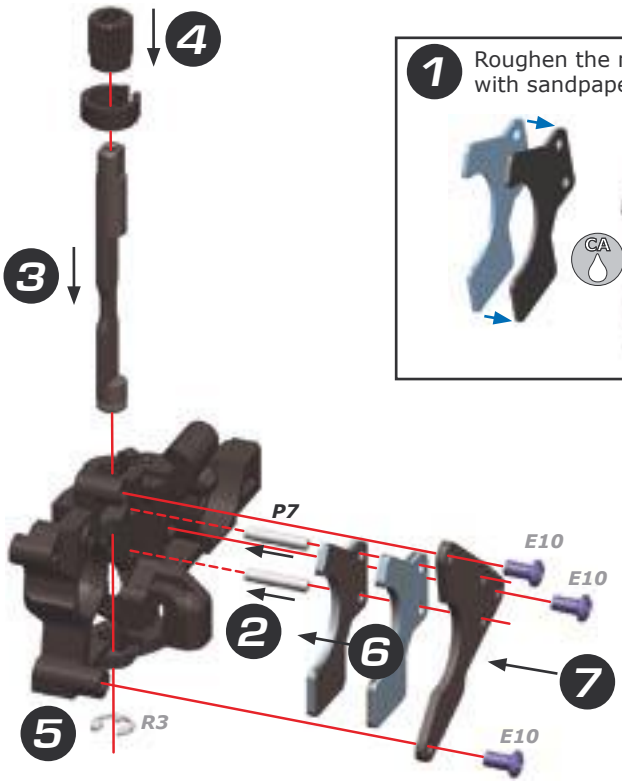
STEP 3.1

BAG 8, E10

E10
M3x6mm

P7
2.5x14mm

R3
3mm



1 Roughen the metal plates with sandpaper before gluing

STEP 3.2

BAG 9, 10, B13, U

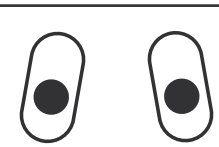
B13
3.5x13mm

H17
M4x6mm

R7
7mm

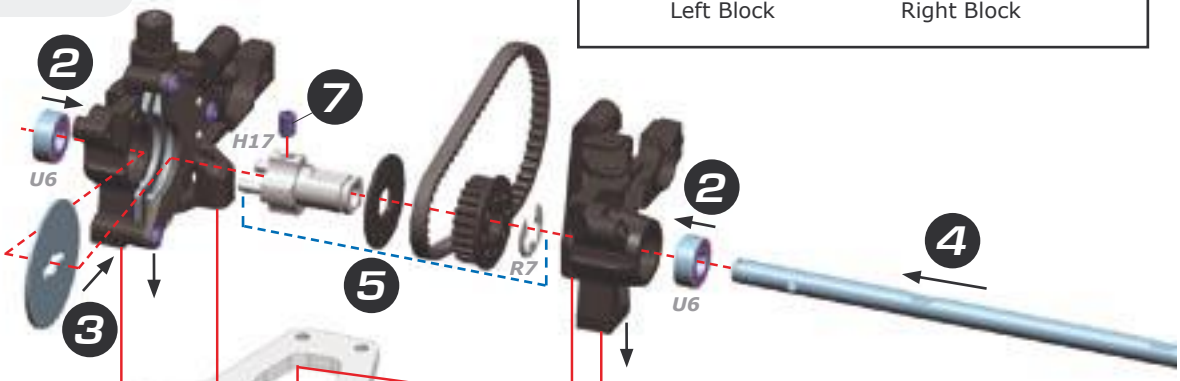
U6
6x13mm

Roll centre insert orientation

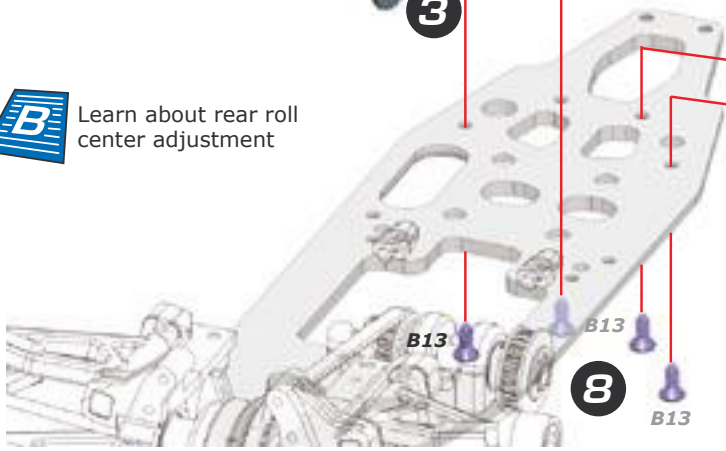


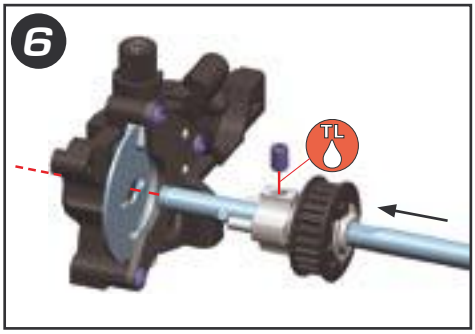
1 Note orientation of front inserts. Ensure **BOTH** inserts have the same position.

Left Block Right Block

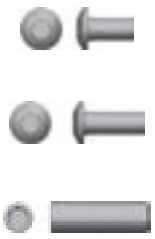


Learn about rear roll center adjustment





STEP 3.3

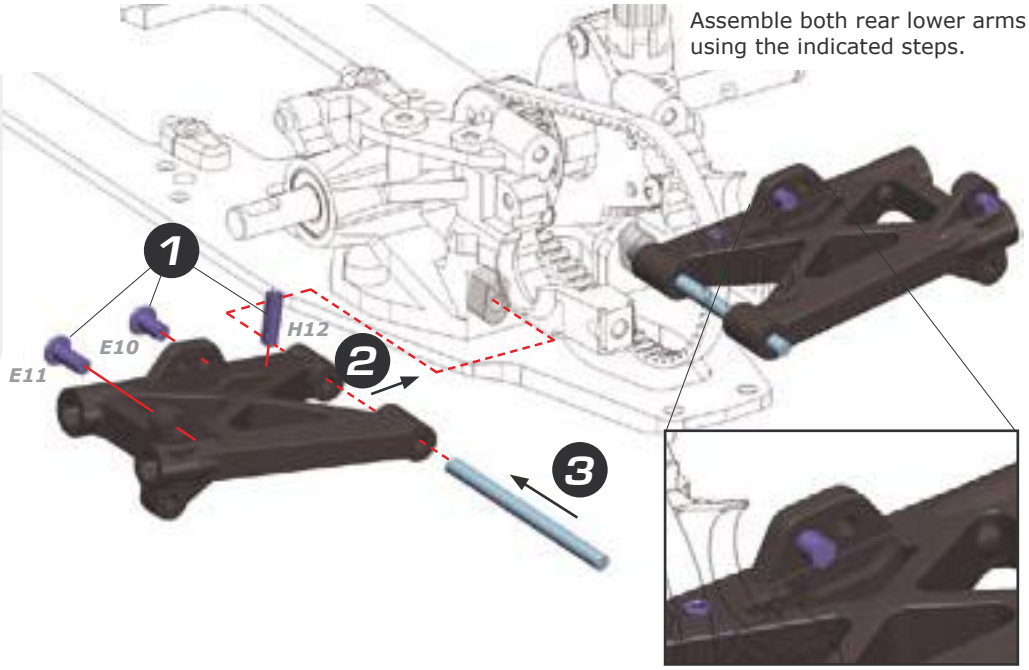


E10
M3x6mm

E11
M3x8mm

H12
M3x10mm

Assemble both rear lower arms using the indicated steps.

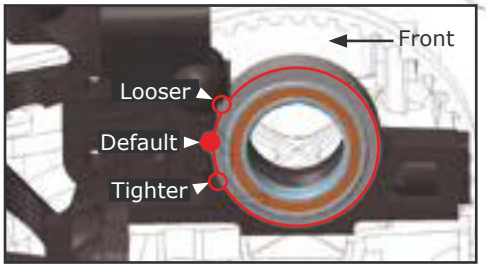


A Set rear downstops

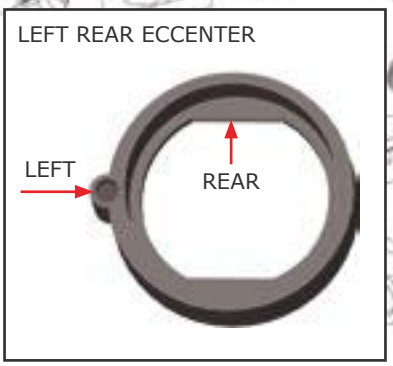
STEP 3.4

BAG U

U13
12x18mm

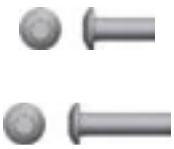


Change the position of **BOTH** eccentric hubs to adjust rear belt tension. Both hubs should have the same position.



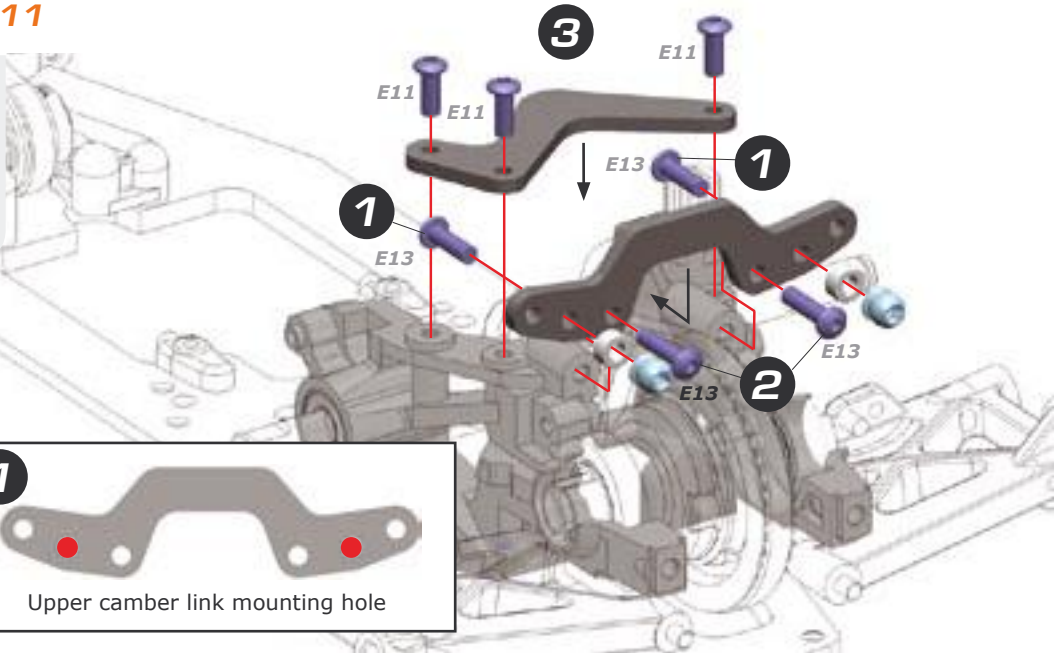
STEP 3.5

BAG 11, E11



E11
M3x8mm

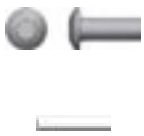
E13
M3x12mm



B Learn about rear camber rise adjustment

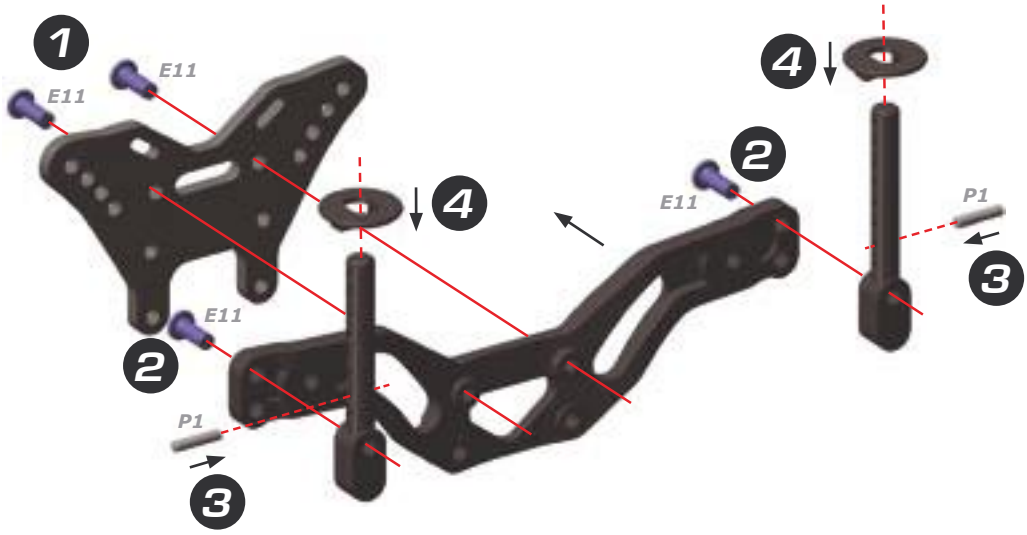
STEP 3.6

BAG E11



E11
M3x8mm

P1
2x10mm

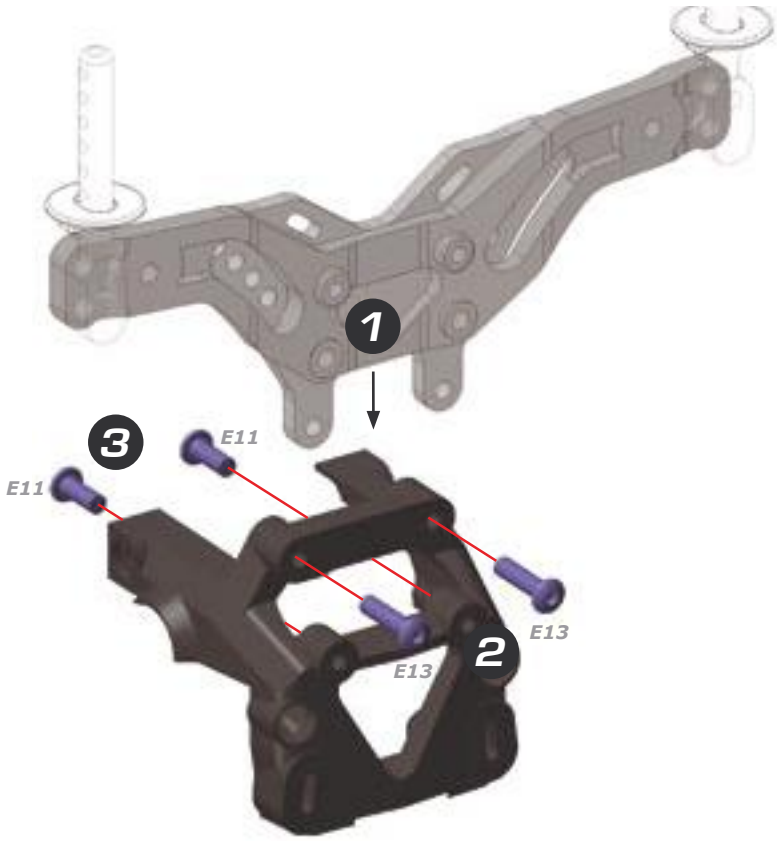


STEP 3.7

BAG 12, E11

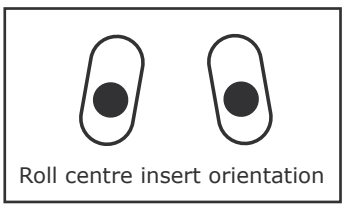
E11
M3x8mm

E13
M3x12mm



STEP 3.8

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



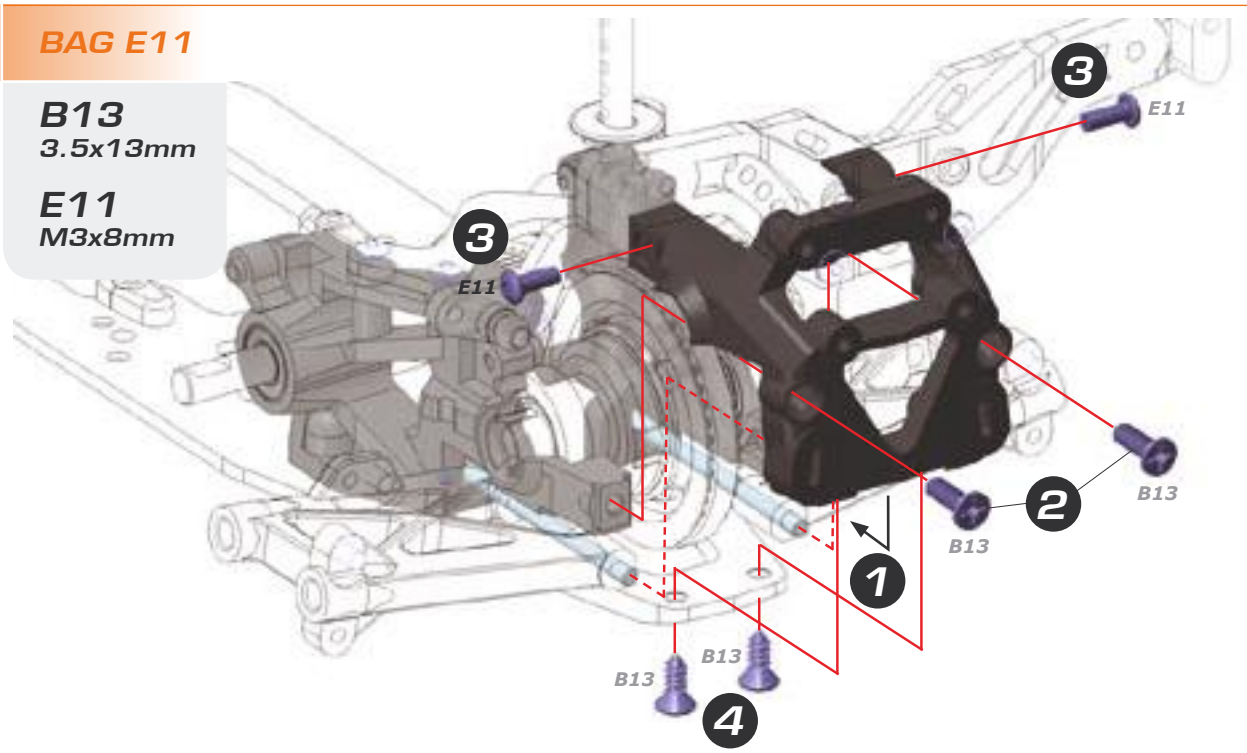
Learn about rear roll center adjustment

STEP 3.9

BAG E11

B13
3.5x13mm

E11
M3x8mm



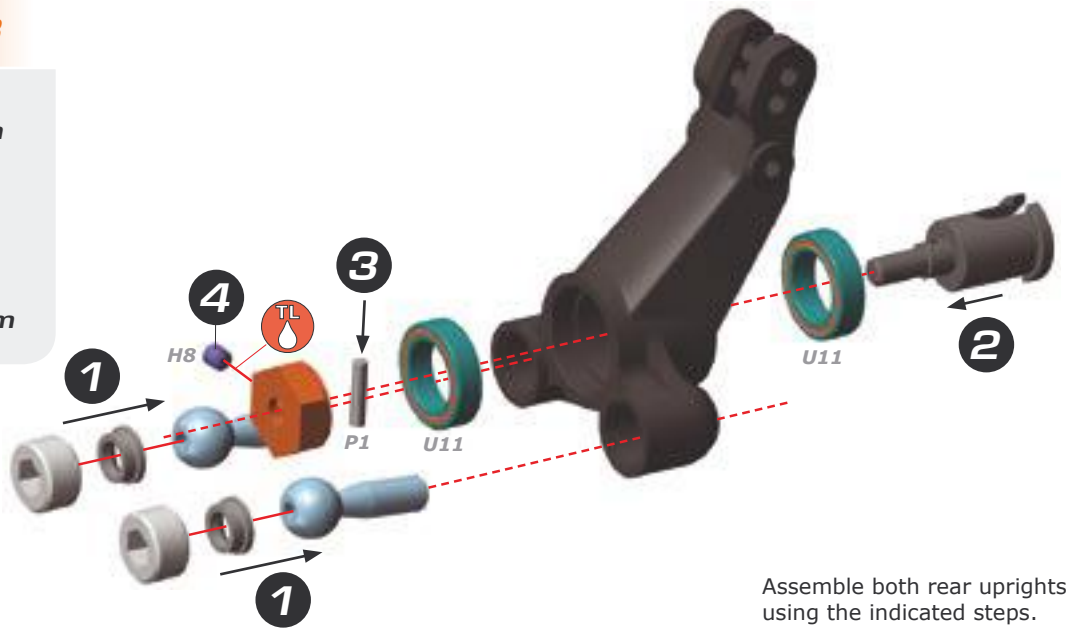
STEP 3.10

BAG 13

H8
M3x3mm

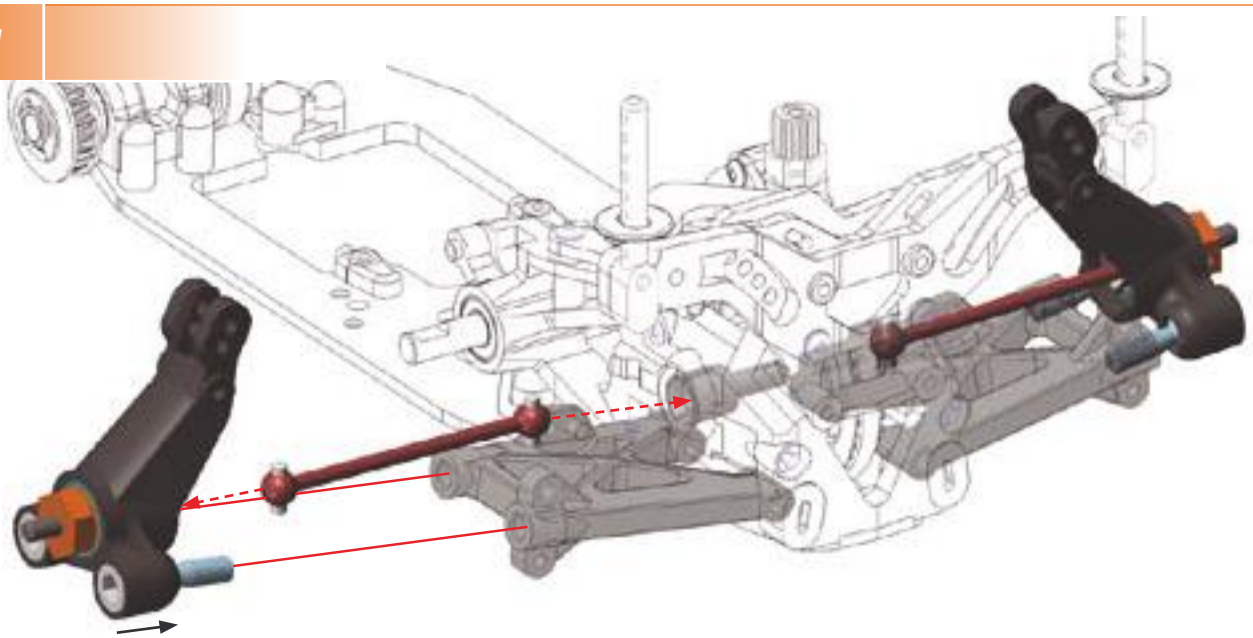
P1
2x10mm

U11
10x15mm



Assemble both rear uprights using the indicated steps.

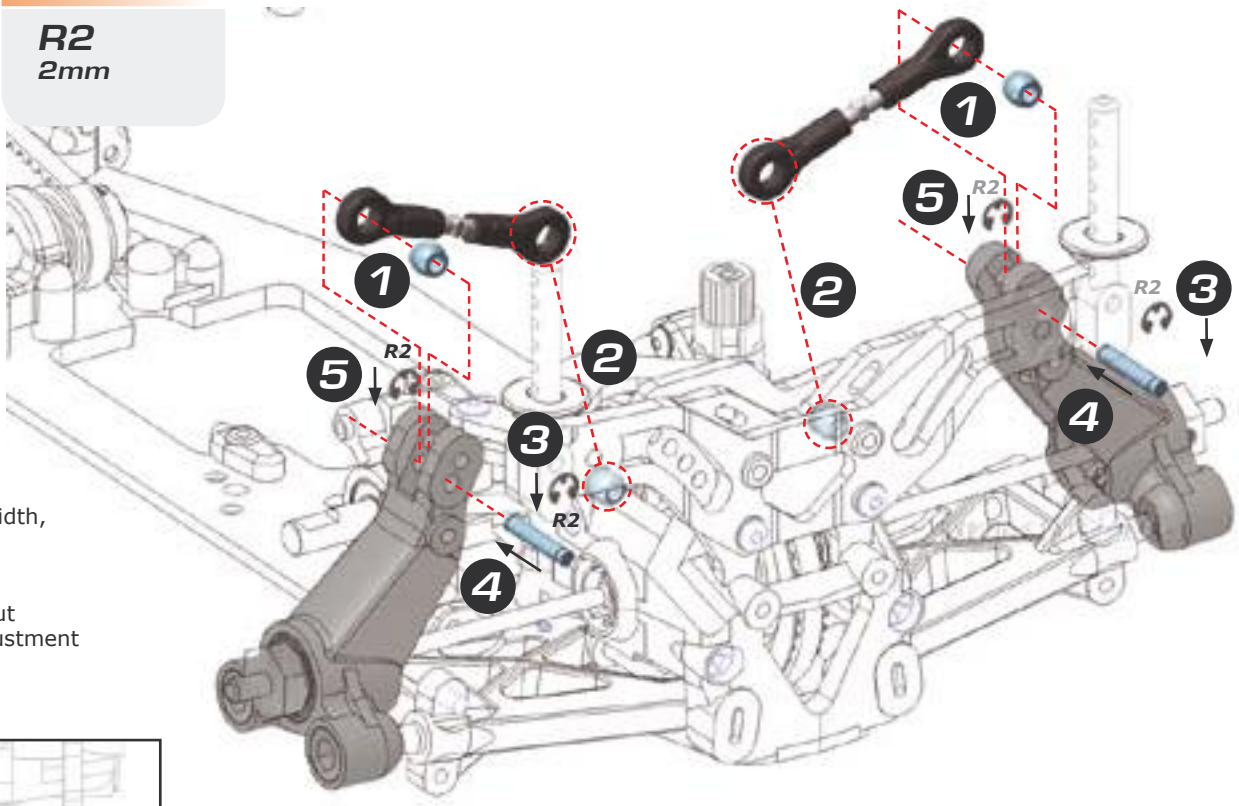
STEP 3.11



STEP 3.12

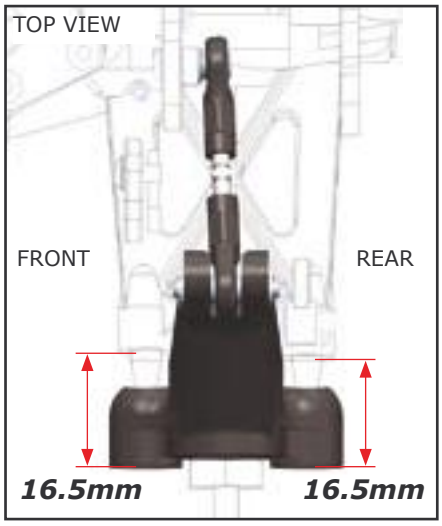
BAG 14

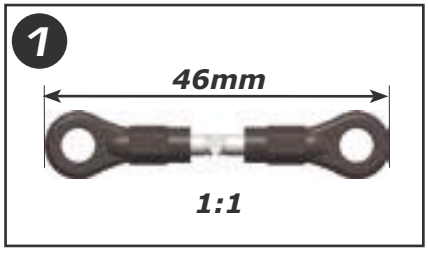
R2
2mm



A Set rear track-width, camber and toe

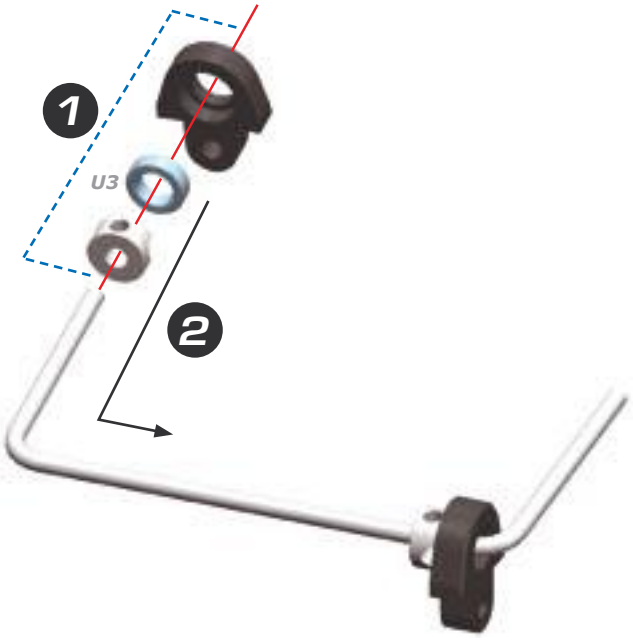
B Learn more about camber rise adjustment





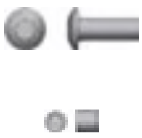
STEP 3.13

U3
4x8mm



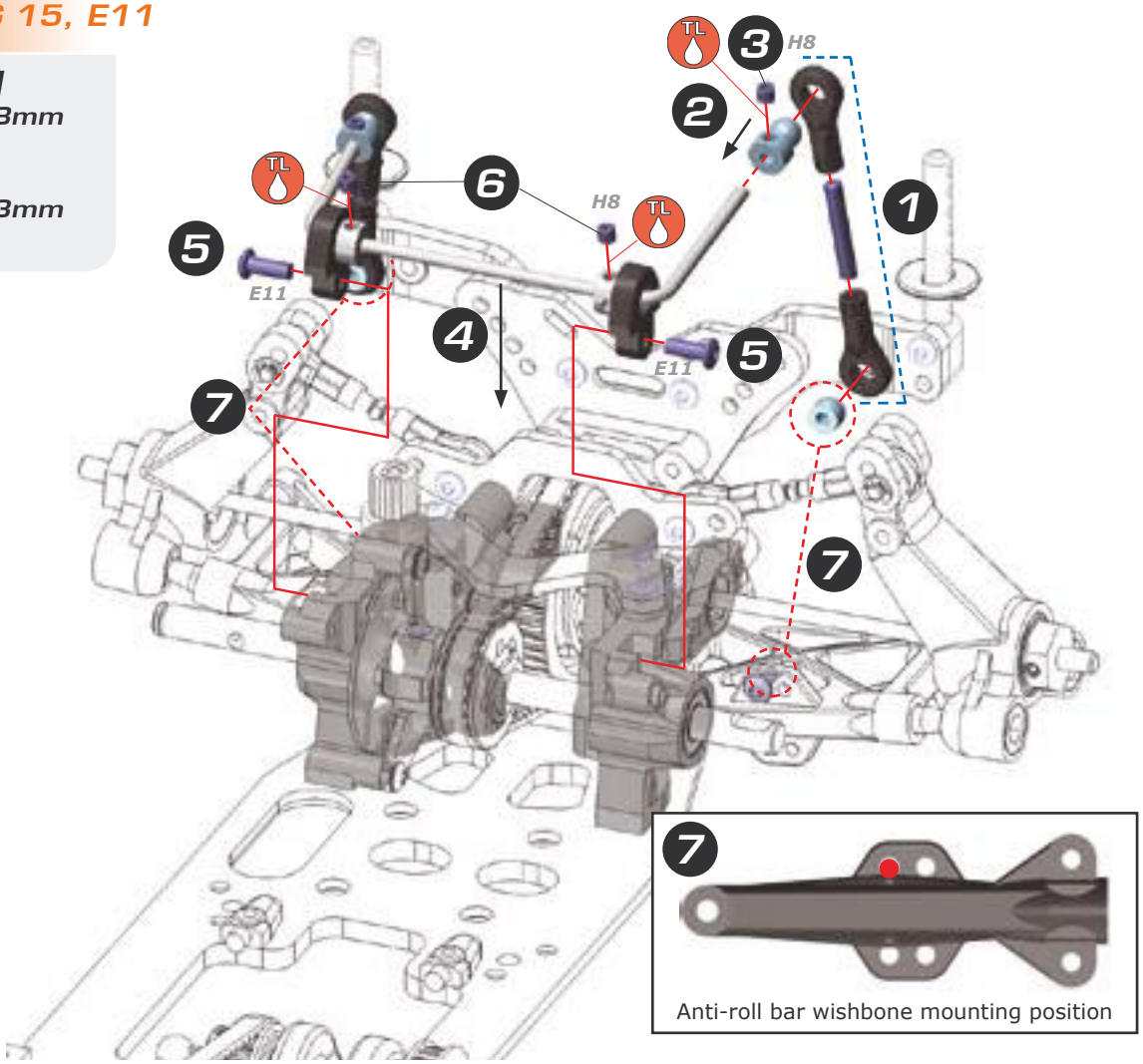
STEP 3.14

BAG 15, E11



E11
M3x8mm

H8
M3x3mm



1

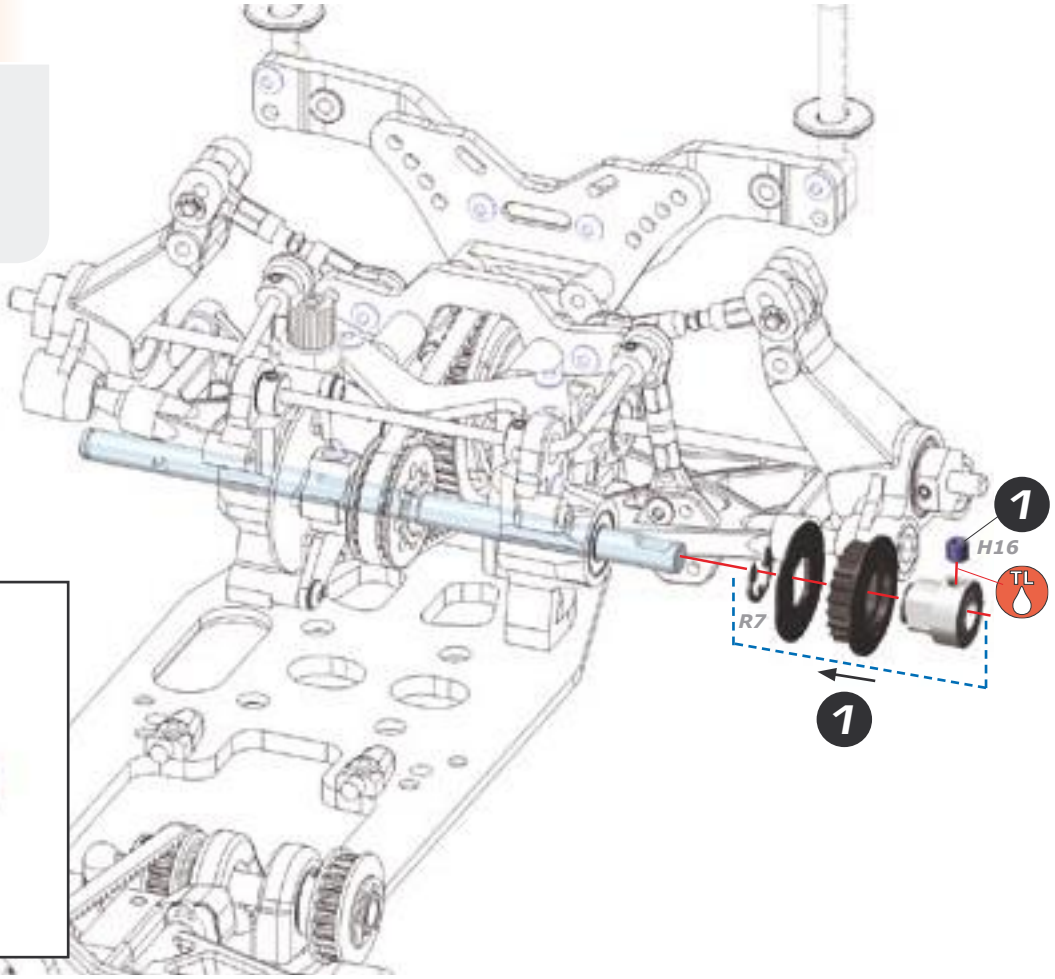
7

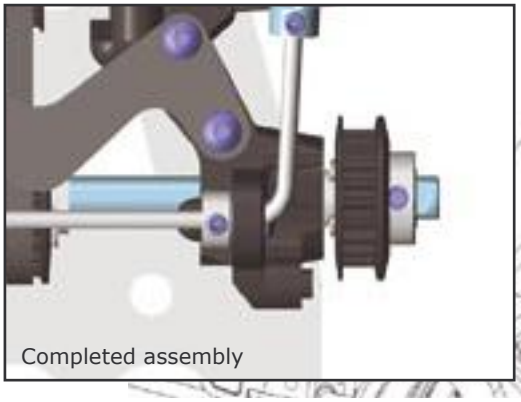
Anti-roll bar wishbone mounting position

STEP 3.15

H16
M4x4mm

R7
7mm



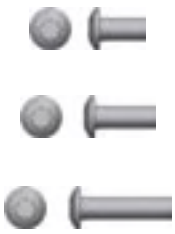


Completed assembly

4.0 RADIO PLATE ASSEMBLY

STEP 4.1

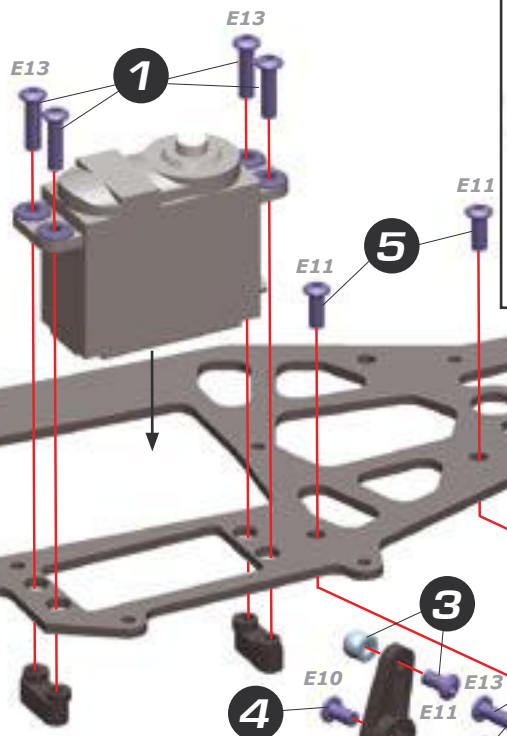
BAG 16, E11



E10
M3x6mm

E11
M3x8mm

E13
M3x12mm



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

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

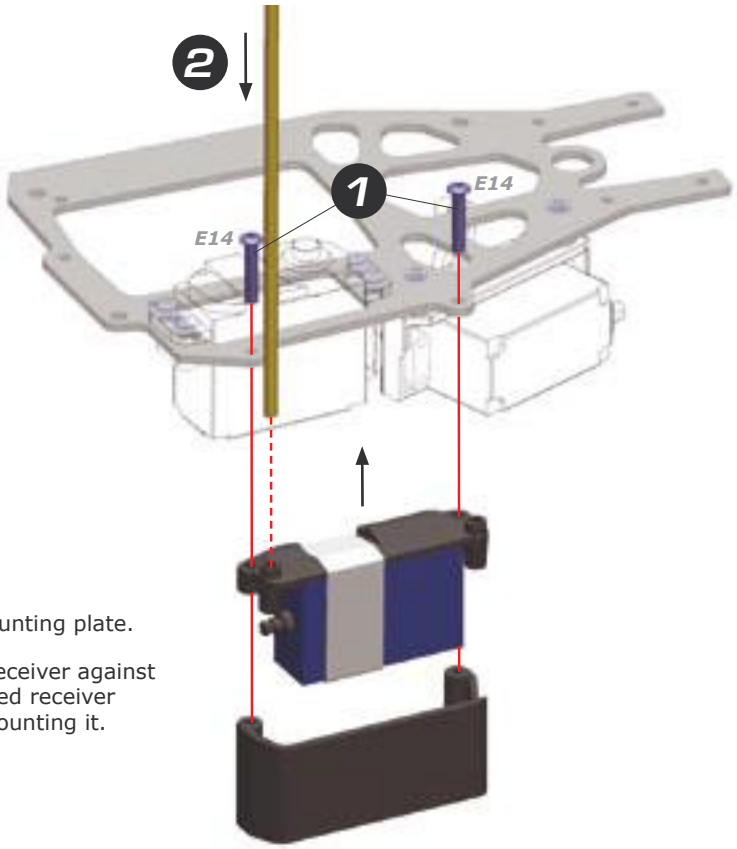
2

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

STEP 4.2

BAG 17

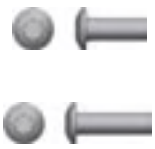
E14
M3x16mm



Securely attach receiver to mounting plate.

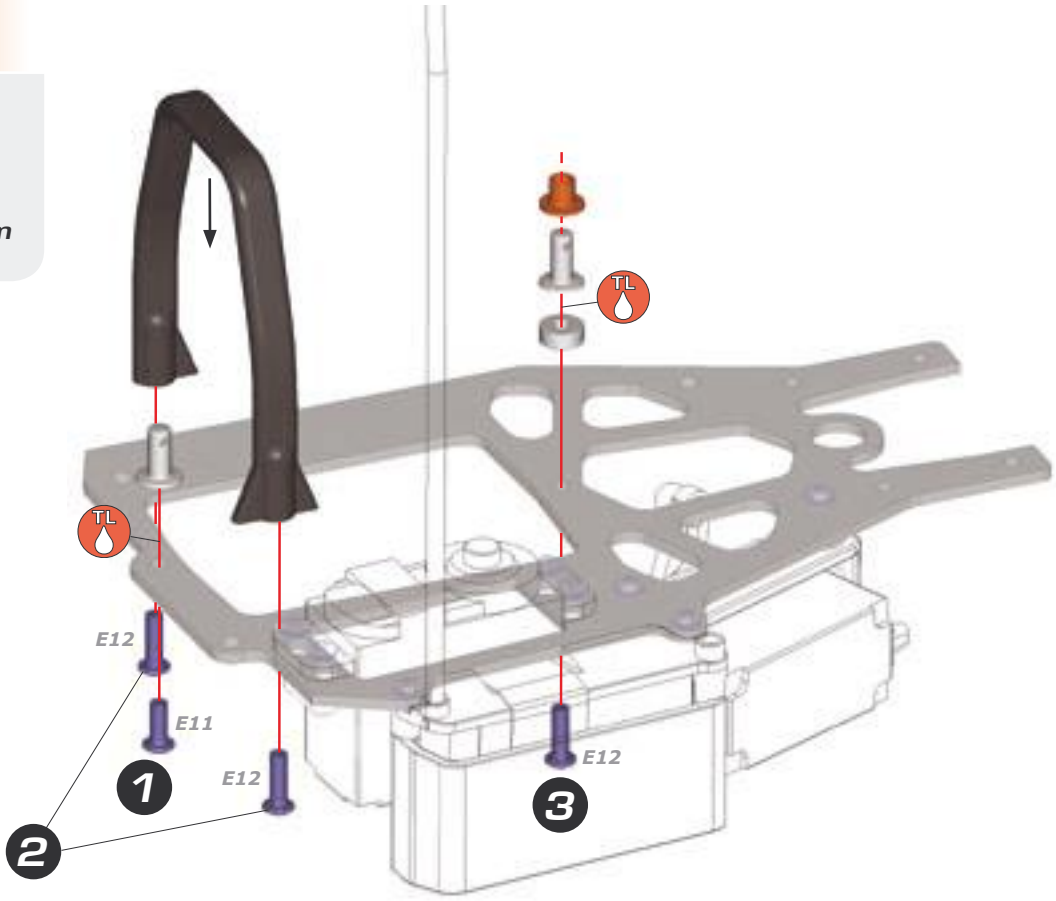
RACING TIP: To protect the receiver against fuel and moisture, seal the wired receiver into a rubber balloon before mounting it.

STEP 4.3



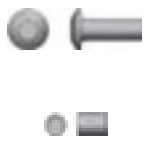
E11
M3x8mm

E12
M3x10mm



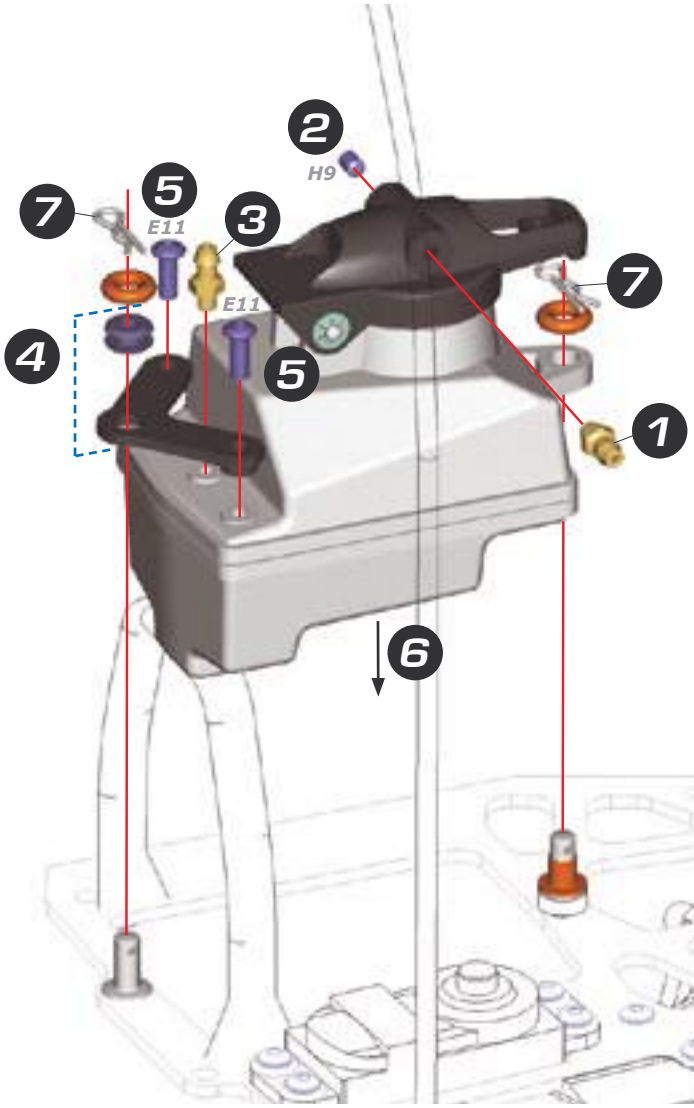
STEP 4.4

BAG 18, E11



E11
M3x8mm

H9
M3x4mm



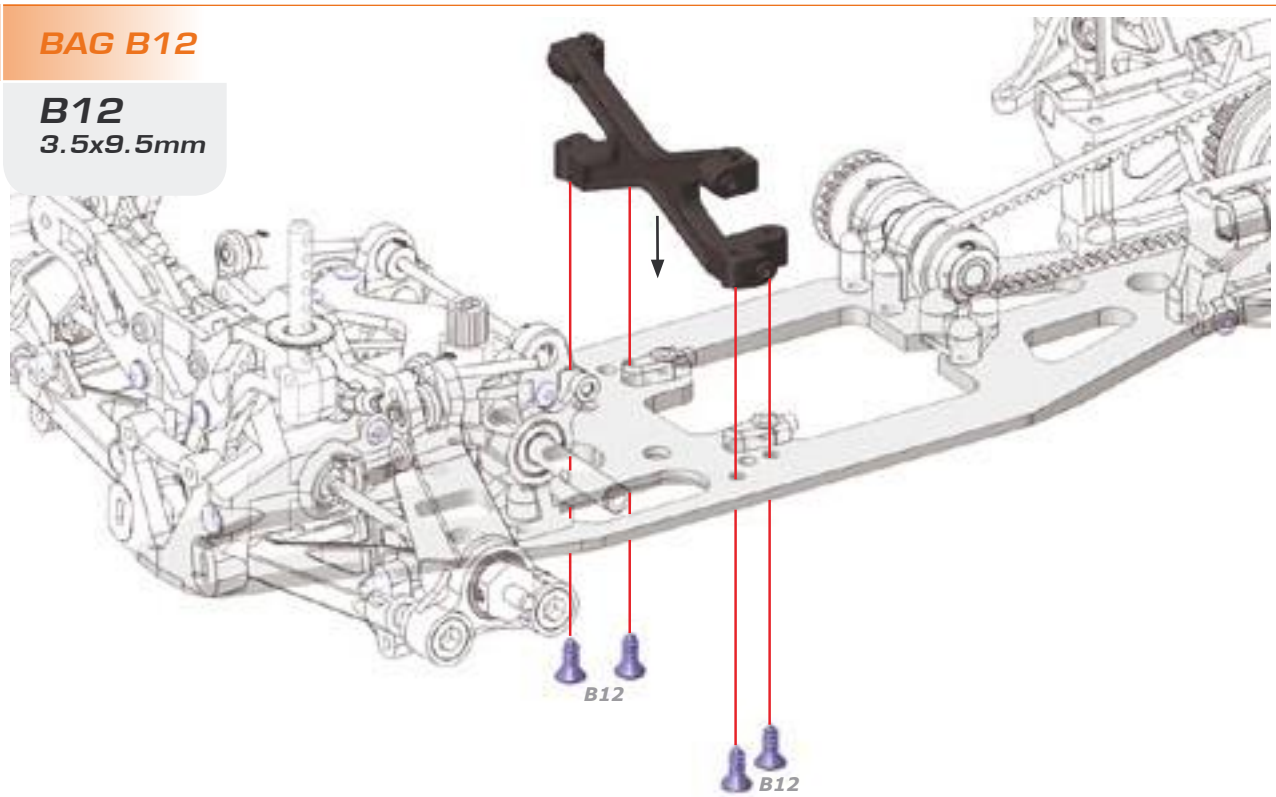
FUEL CAP FITTING PLACEMENT
CW tracks: Fitting on **RIGHT** side.
CCW tracks: Fitting on **LEFT** side.

5.0 RADIO PLATE MOUNTING

STEP 5.1

BAG B12

B12
3.5x9.5mm



STEP 5.2

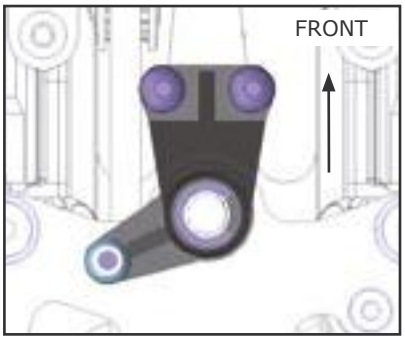
BAG 19, U

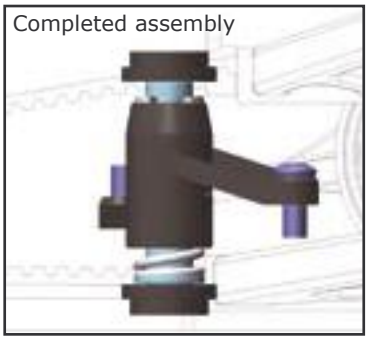
E11
M3x8mm

G11
M3x8mm

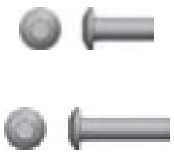
R4
4mm

U3
5x8mm



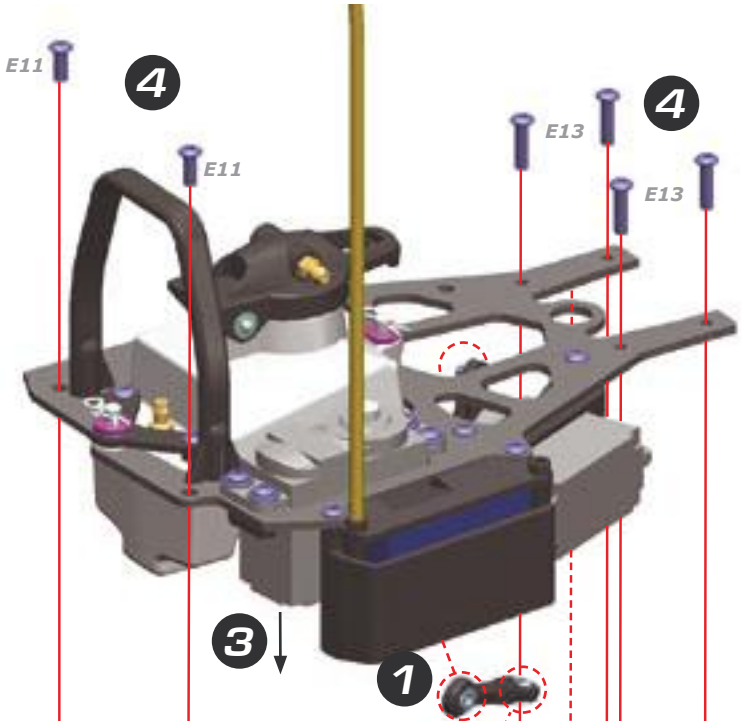


STEP 5.3



E11
M3x8mm

E13
M3x12mm

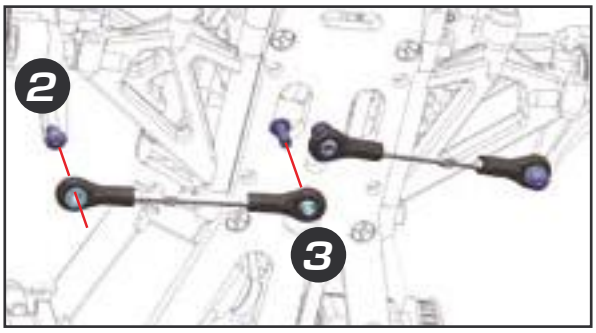


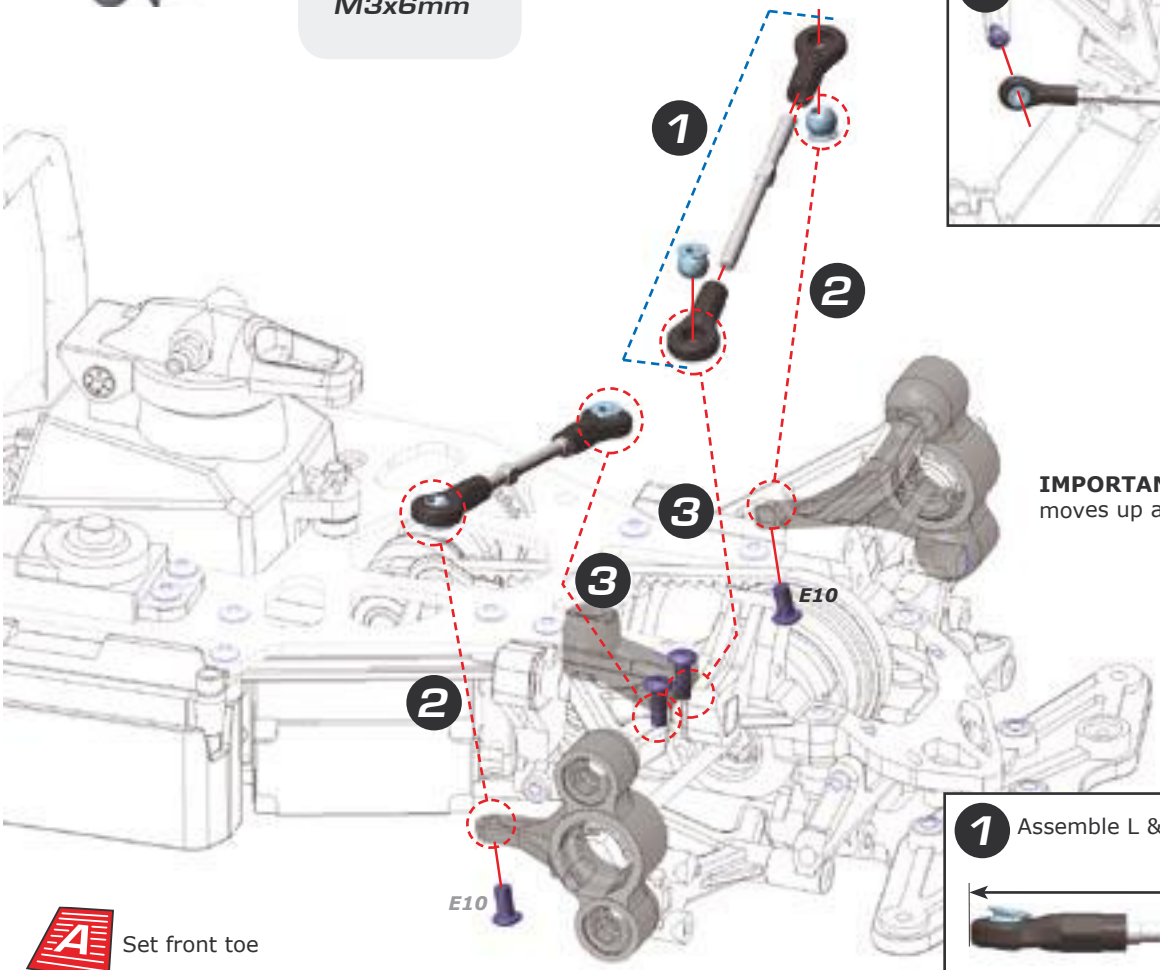
1

STEP 5.4

BAG 20, E10

E10
M3x6mm





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

A Set front toe

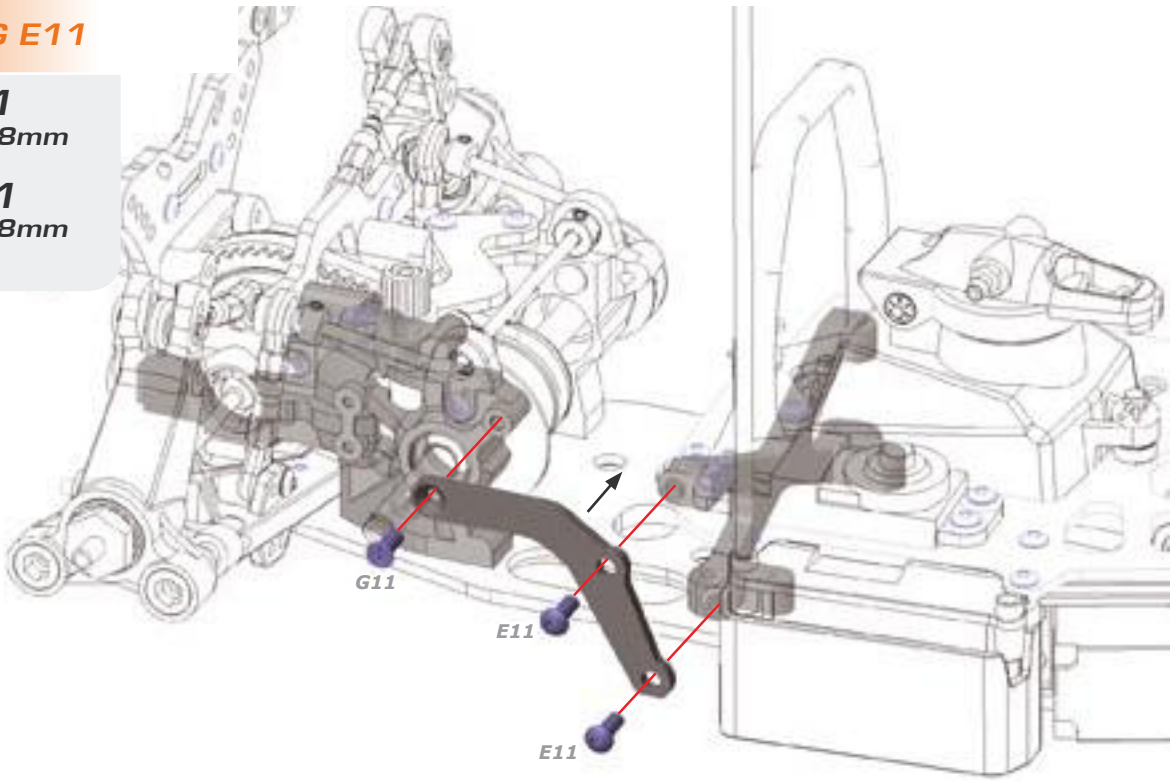
1 Assemble L & R steering rods:

STEP 5.5

BAG E11

E11
M3x8mm

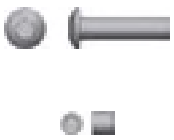
G11
M3x8mm



6.0 GEARBOX ASSEMBLY

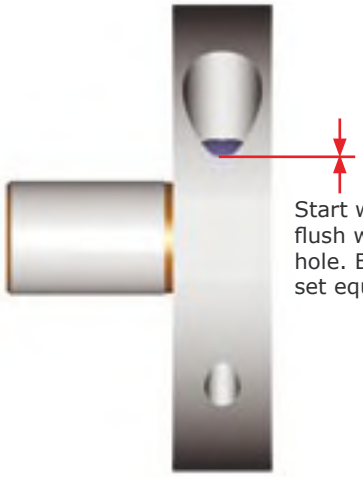
STEP 6.1

BAG 21, E13



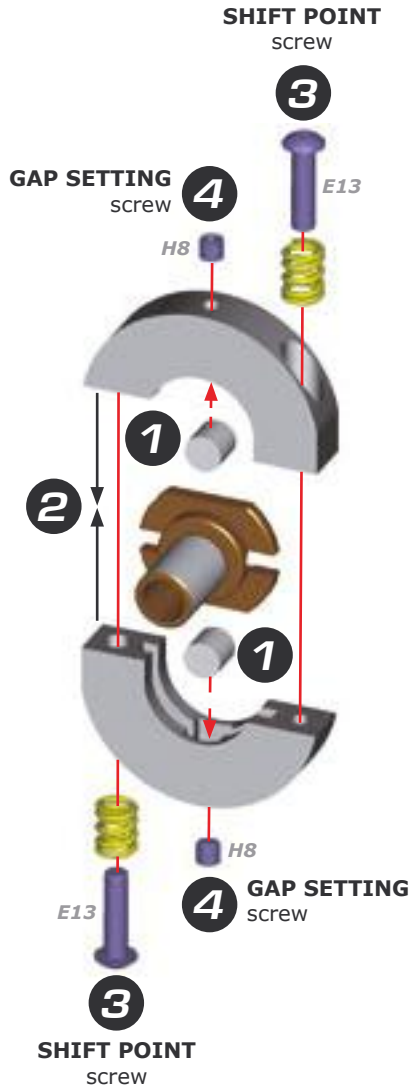
E13
M3x12mm

H8
M3x3mm



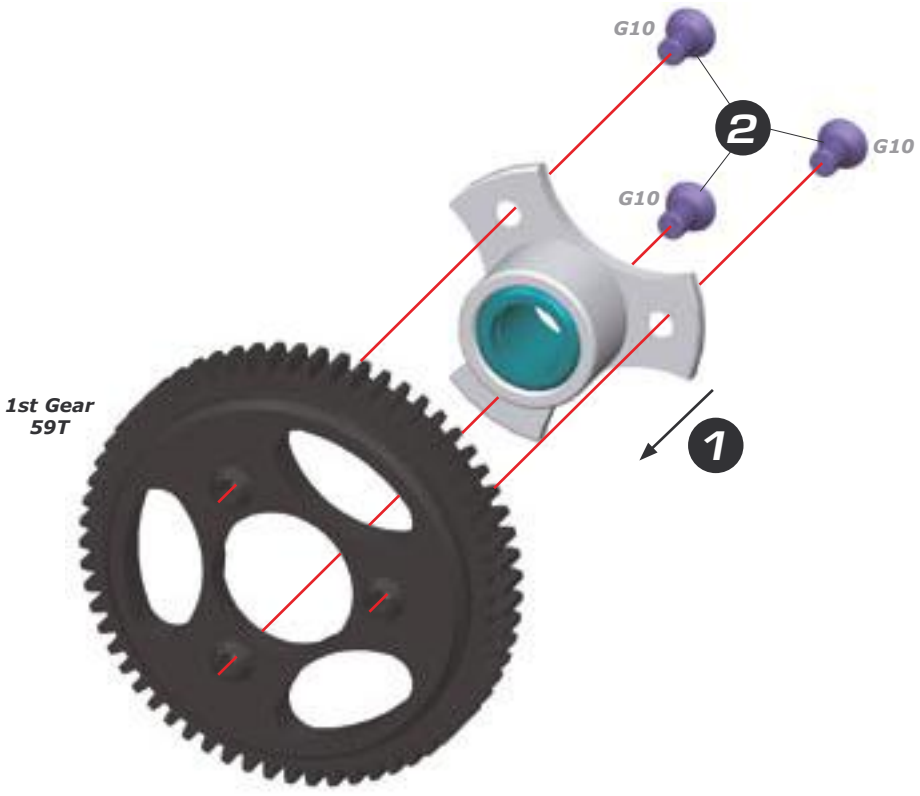
Start with screw head flush with bottom edge of hole. Both screws must be set equally.

Learn about shift point and shoe gap



STEP 6.2

G10
M3x6mm



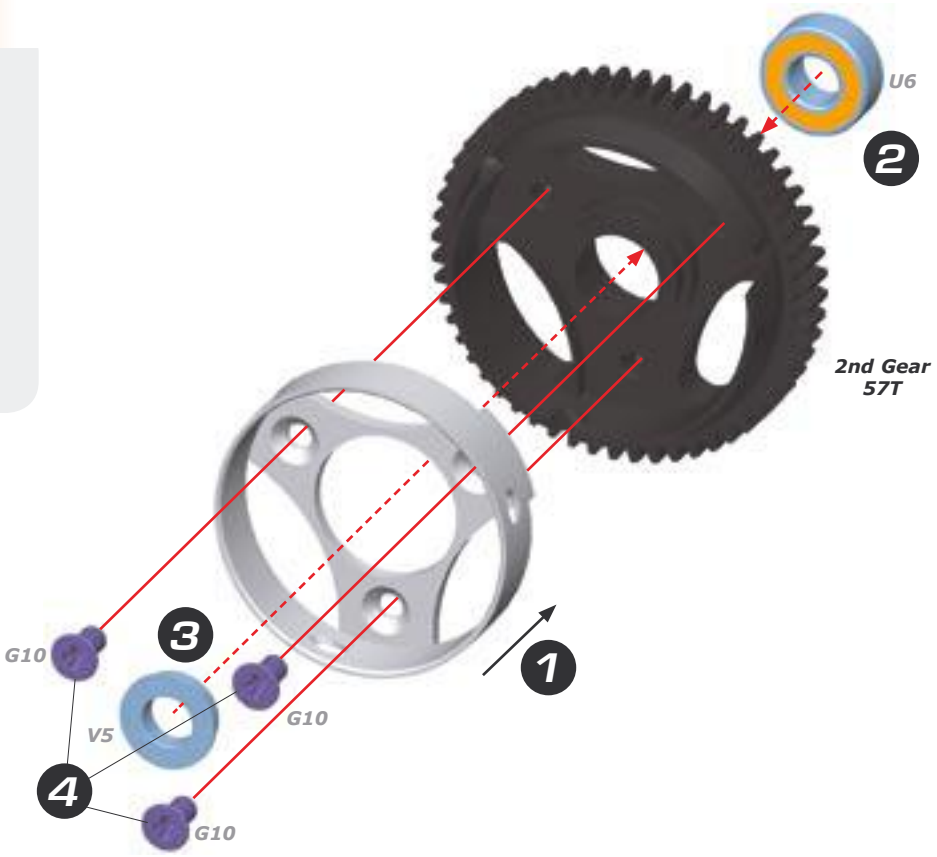
STEP 6.3

BAG U1

G10
M3x6mm

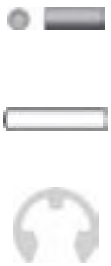
U6
6x13mm

V5
6x10mm



STEP 6.4

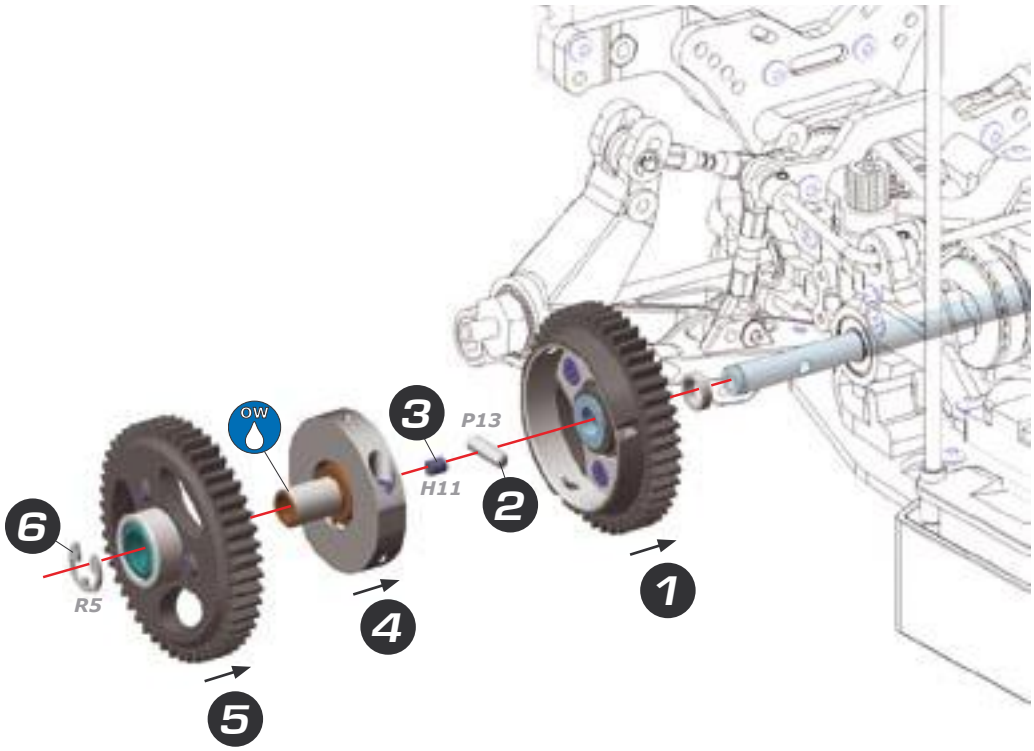
BAG 22



H11
M3x8mm

P13
3x13.8mm

R5
5mm



Learn about shoe gap

ADJUSTING THE 2-SPEED SHOE GAP
Loosed 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.

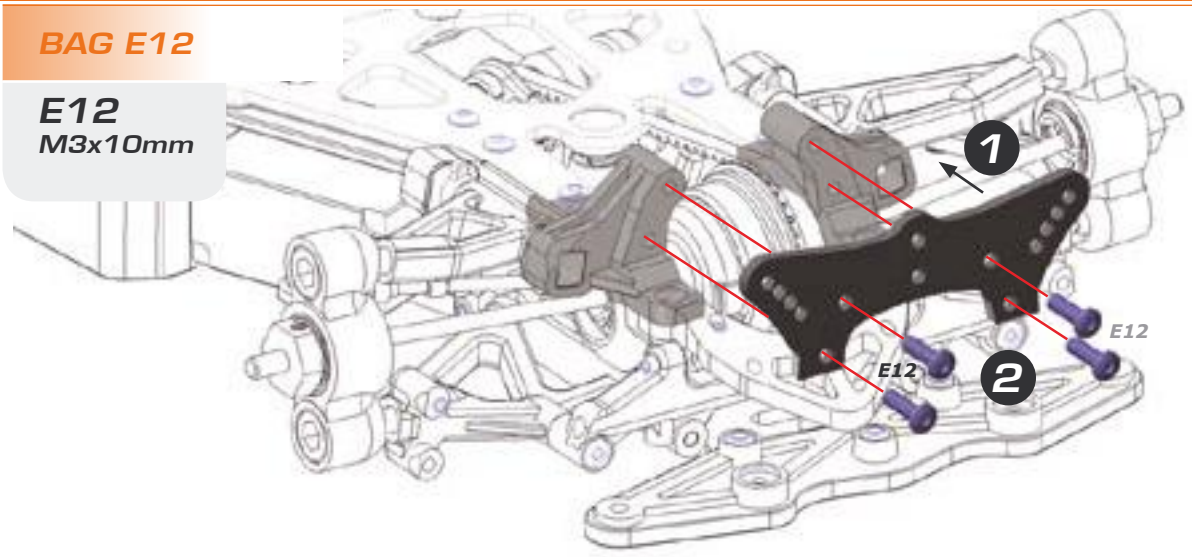
Install the first gear.

7.0 SHOCK ATTACHMENT

STEP 7.1

BAG E12

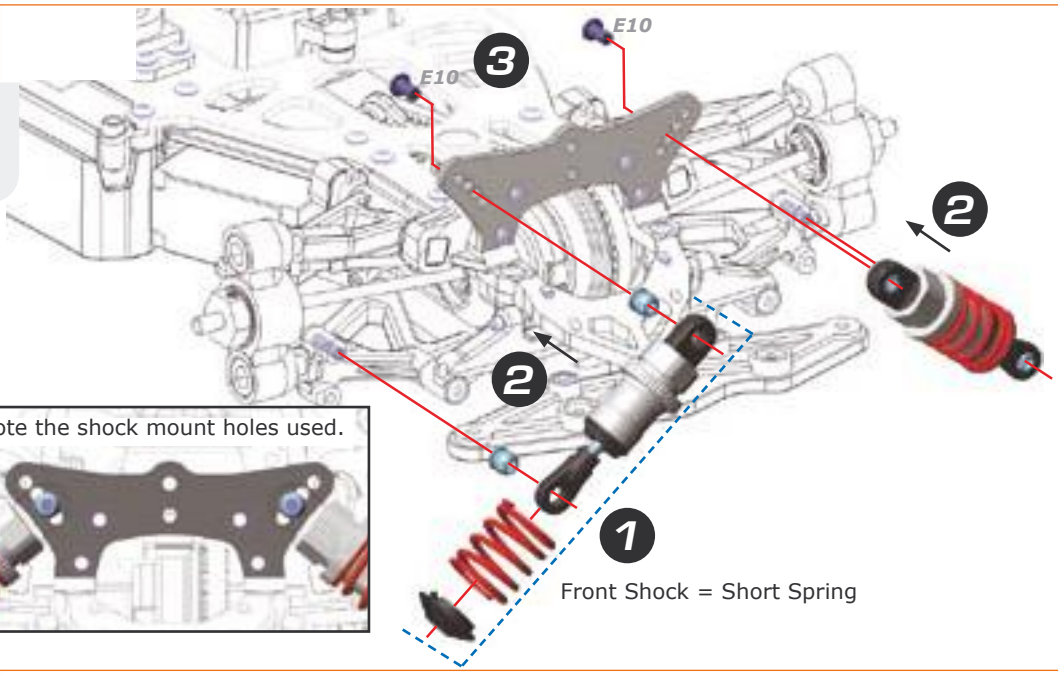
E12
M3x10mm



STEP 7.2

BAG E10

E10
M3x6mm



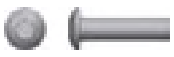
Set front shock position

Learn about shock adjustment (damping, springs, preload)

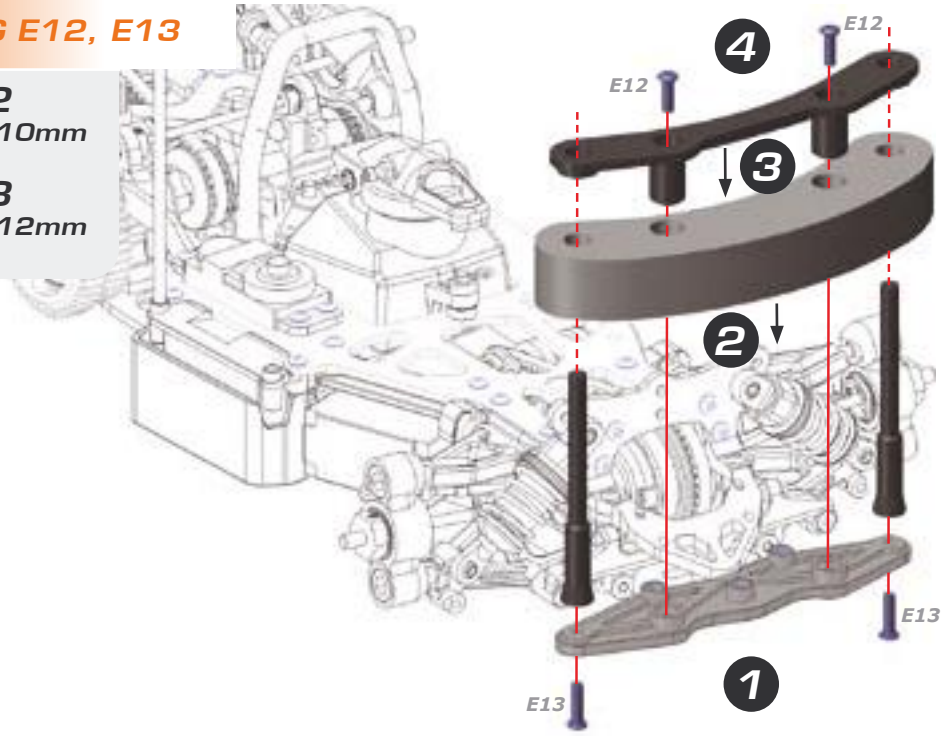
STEP 7.3

BAG E12, E13

E12
M3x10mm

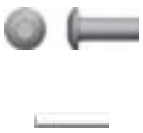


E13
M3x12mm



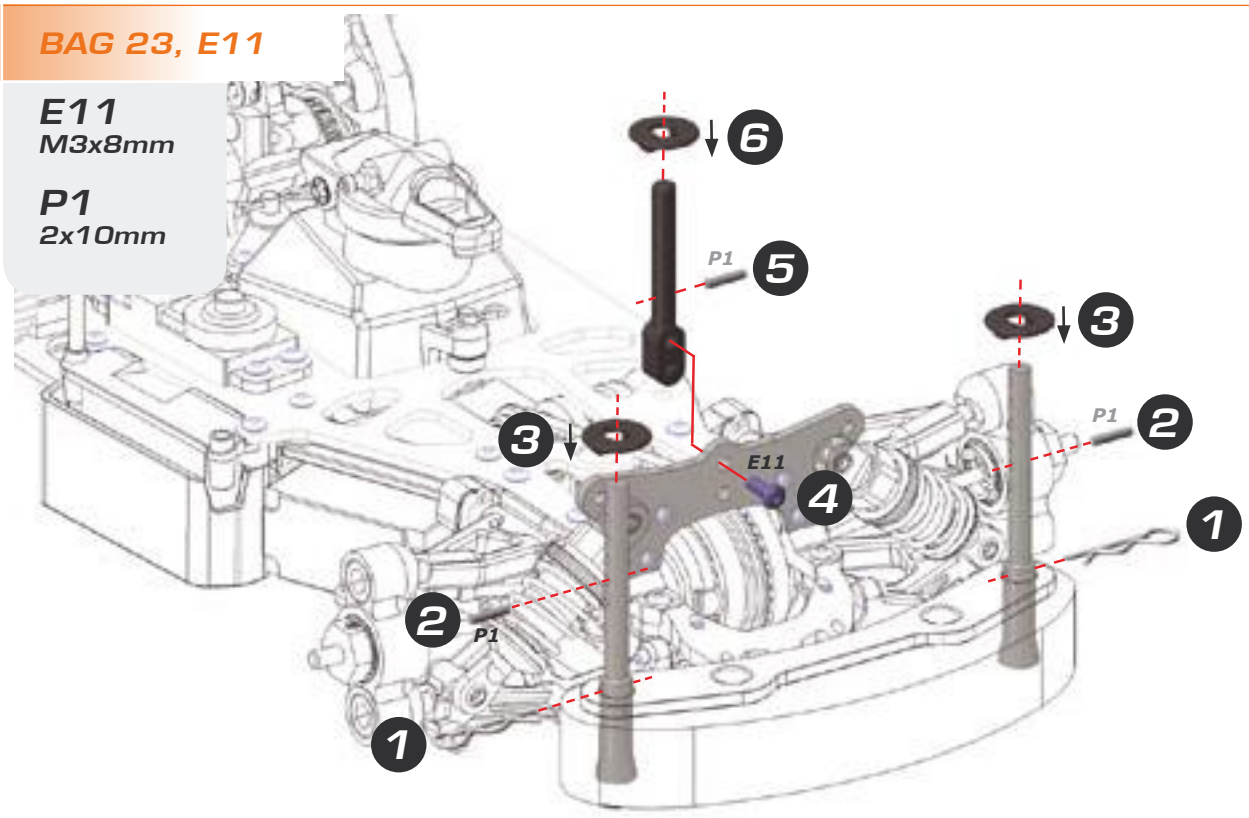
STEP 7.4

BAG 23, E11



E11
M3x8mm

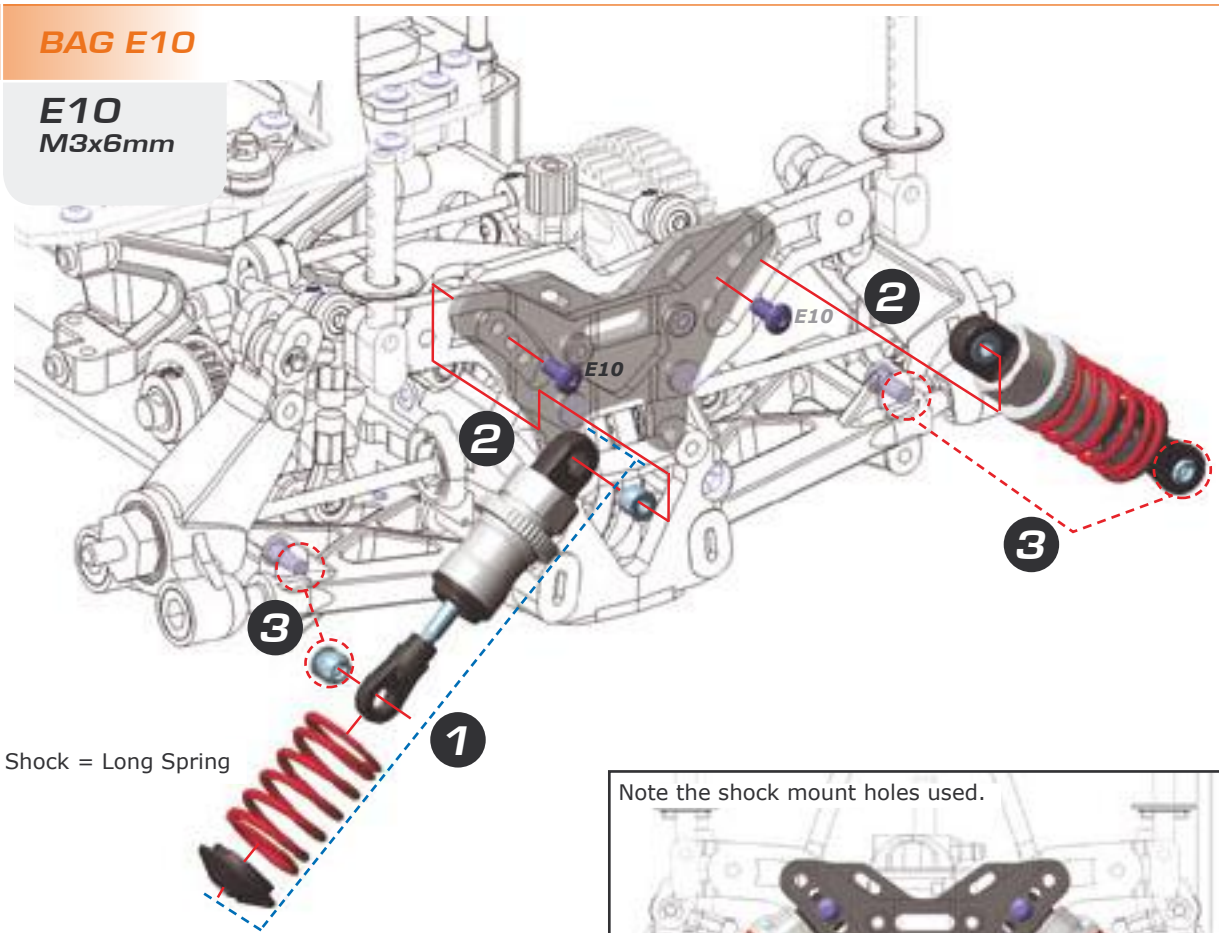
P1
2x10mm



STEP 7.5

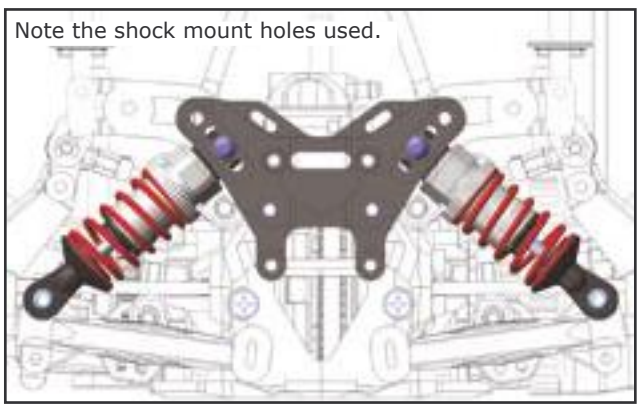
BAG E10

E10
M3x6mm



Rear Shock = Long Spring

Note the shock mount holes used.



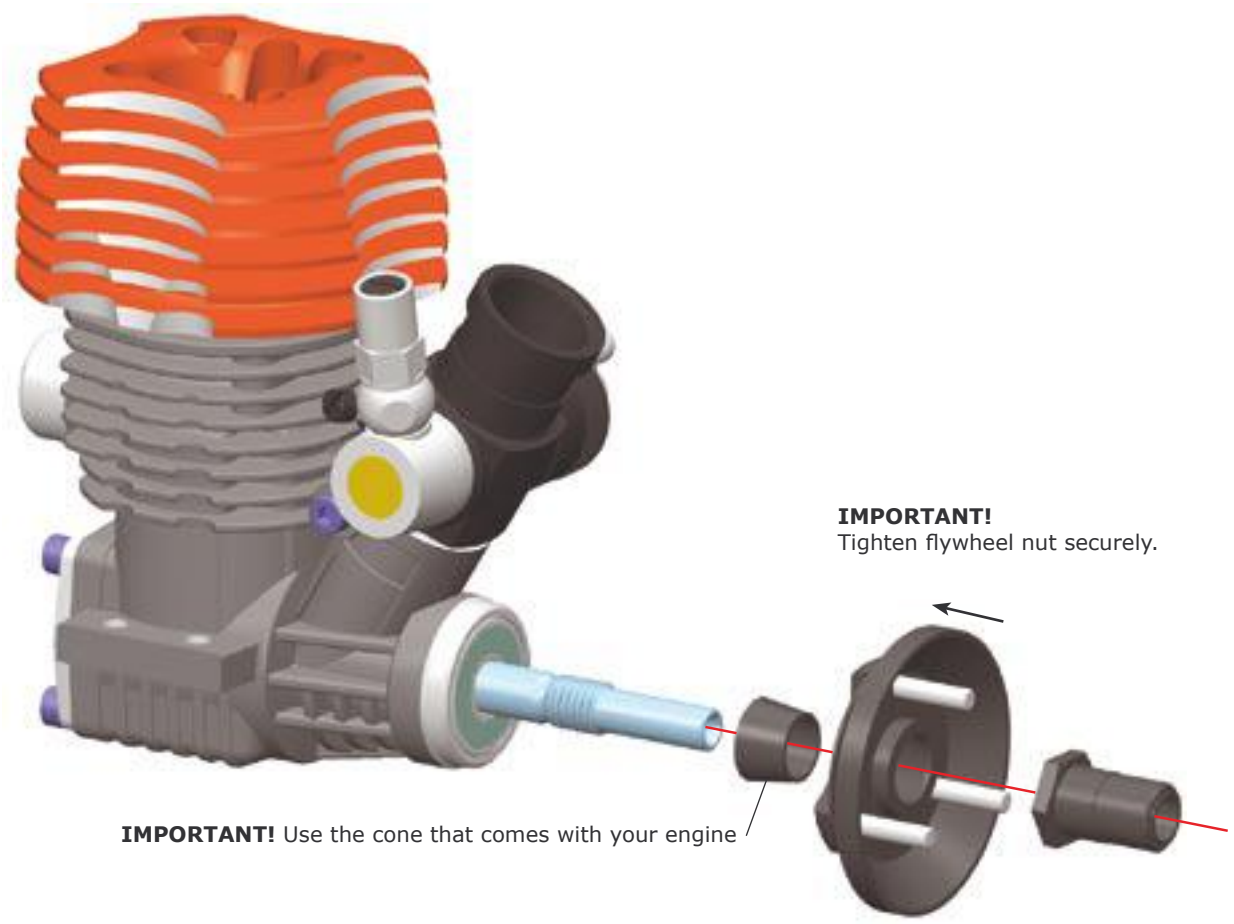
Set rear shock position

Learn about shock adjustment (damping, springs, preload)

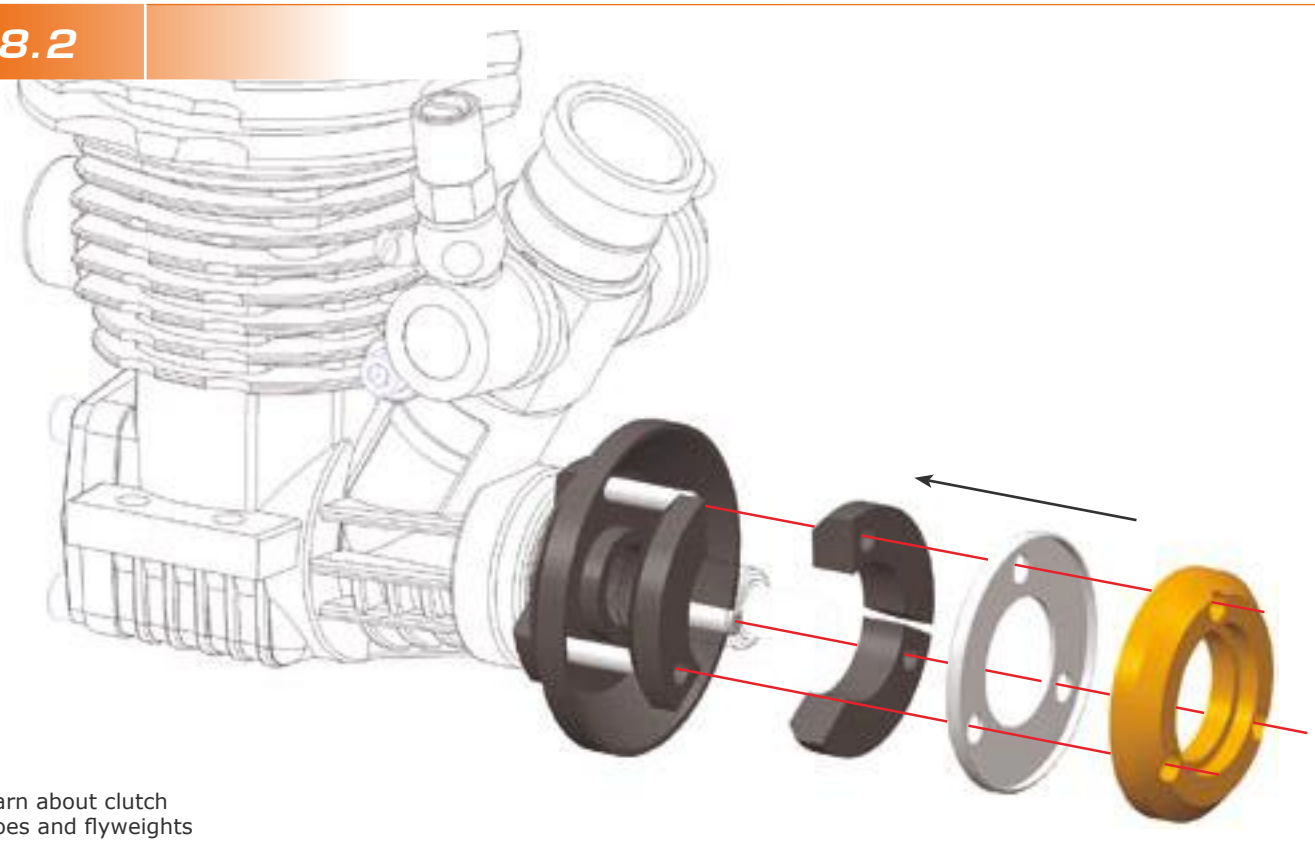
8.0 CENTAX ASSEMBLY

STEP 8.1

BAG 24



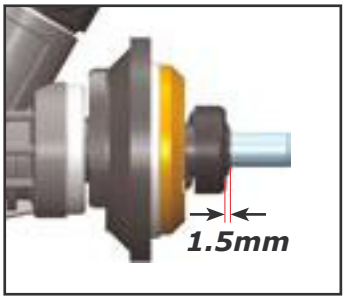
STEP 8.2



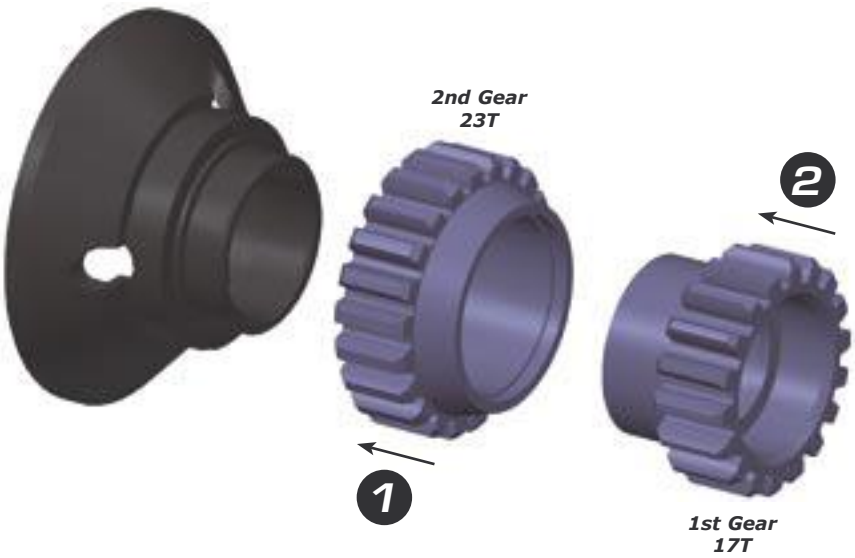
Learn about clutch shoes and flyweights

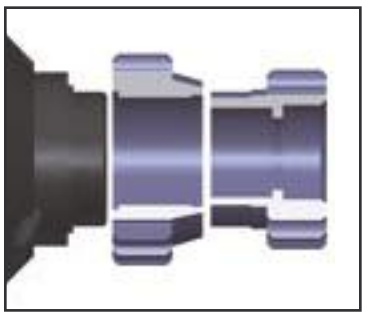
STEP 8.3

Initial clutch spring tension



STEP 8.4

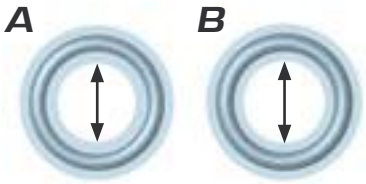




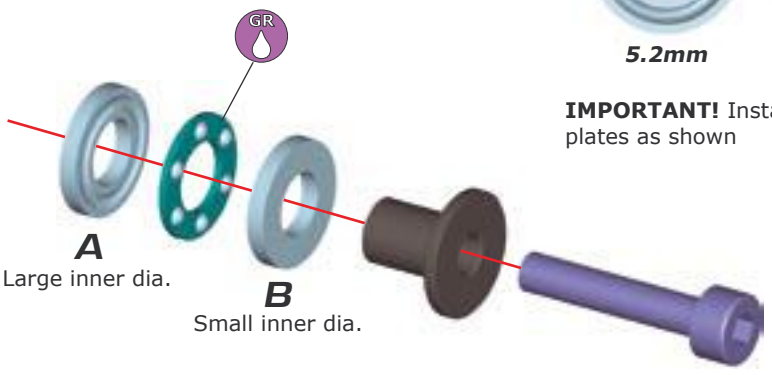
STEP 8.5

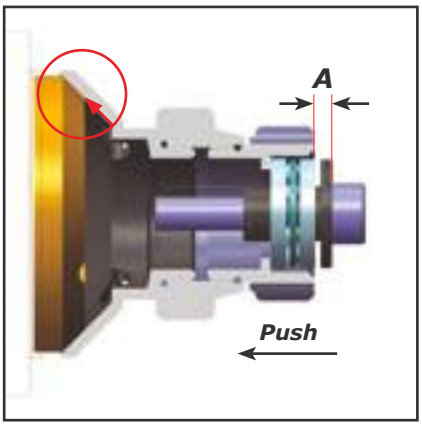
BAG 25

F13
M3x12mm

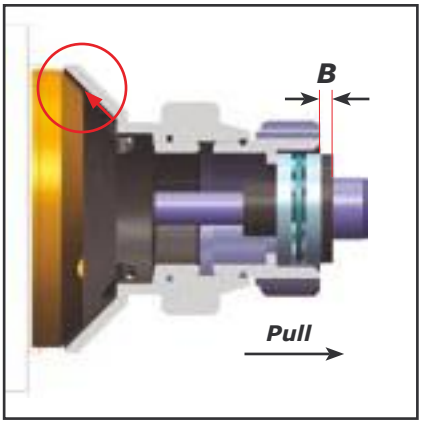


IMPORTANT! Install thrust bearing plates as shown





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.

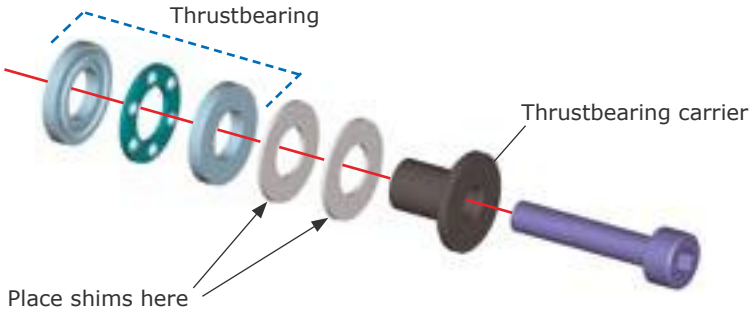


2 Pull the clutchbell away from the clutch shoe, and then measure the distance B as indicated.

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=1.3mm, B=0.3mm
Shim thickness = 1.3 – 0.3 – 0.7 = 0.3mm

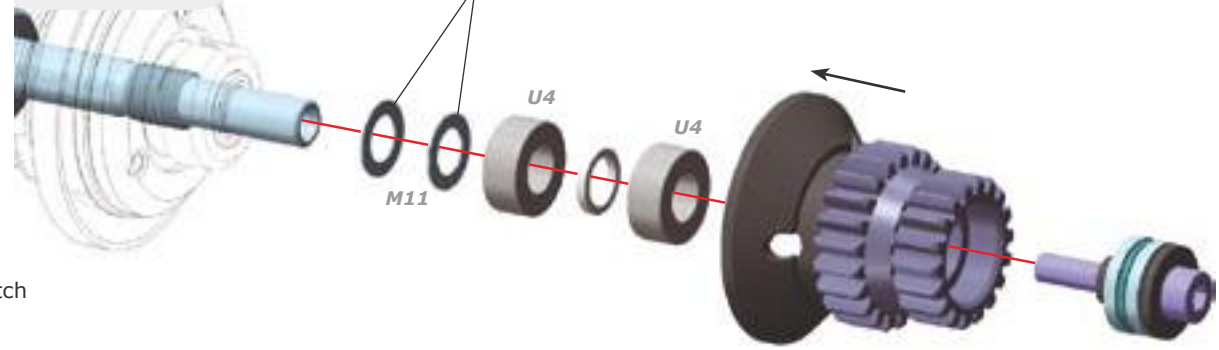
4 Place shims between the outer thrustbearing plate and the rim of the thrustbearing carrier as shown.



Learn about clutch shoe gap

M11
5x8x0.1mm
5x8x0.3mm

U4
5x10mm

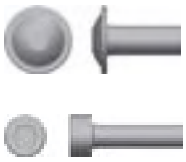


Learn about clutch end play

9.0 FINAL ASSEMBLY

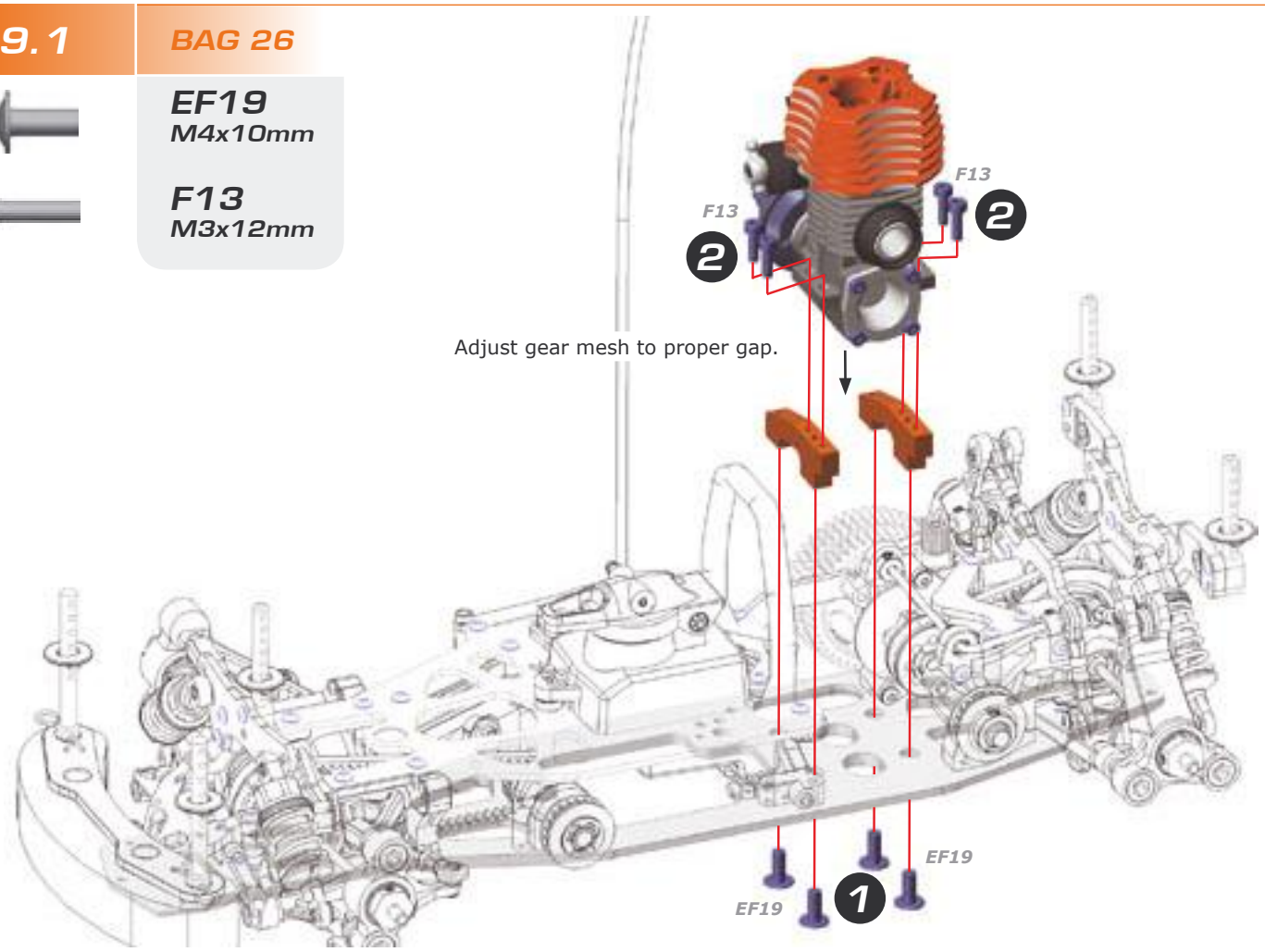
STEP 9.1

BAG 26



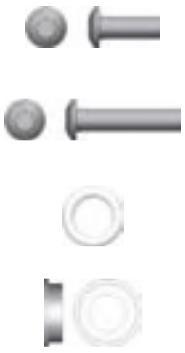
EF19
M4x10mm

F13
M3x12mm



STEP 9.2

BAG E11, U

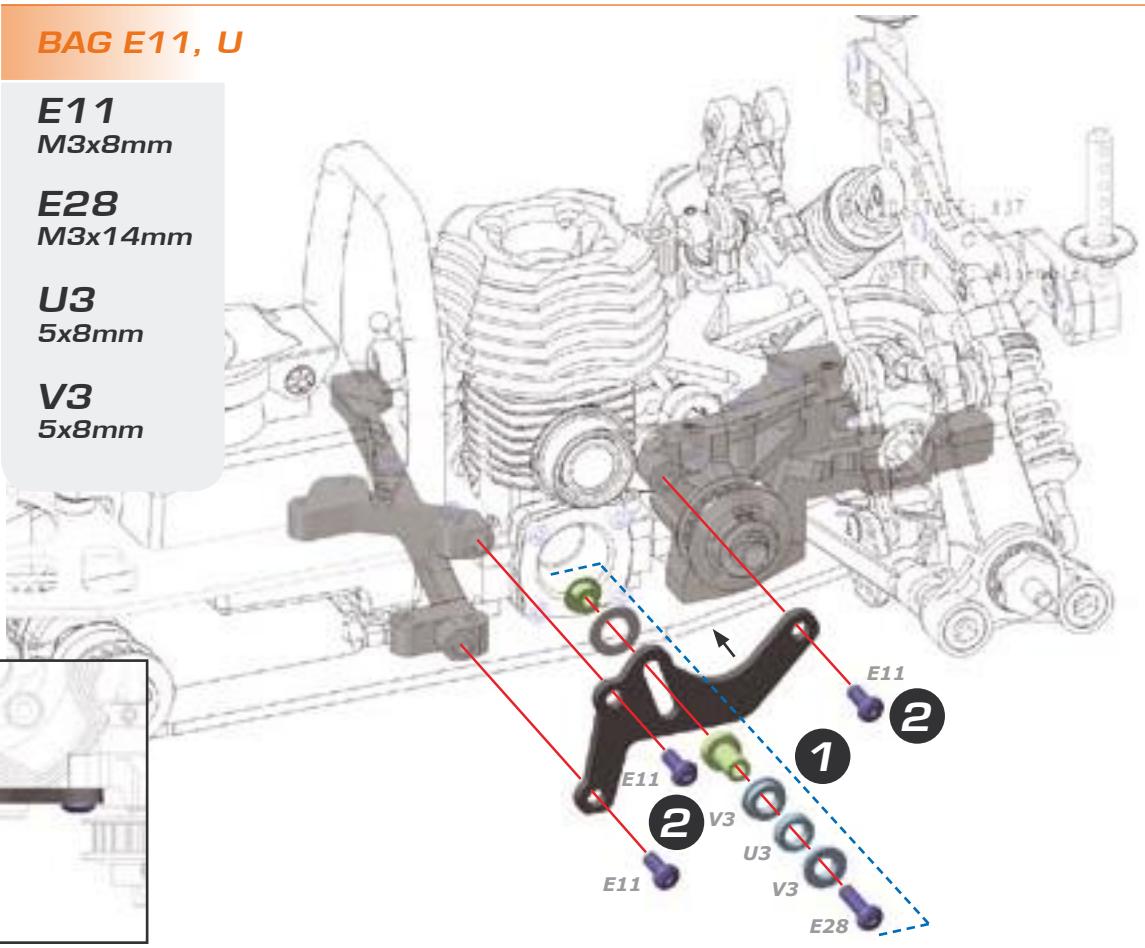


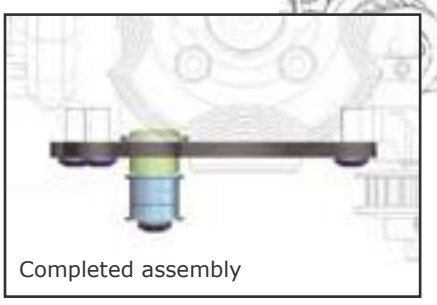
E11
M3x8mm

E28
M3x14mm

U3
5x8mm

V3
5x8mm

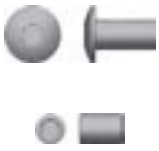




Completed assembly

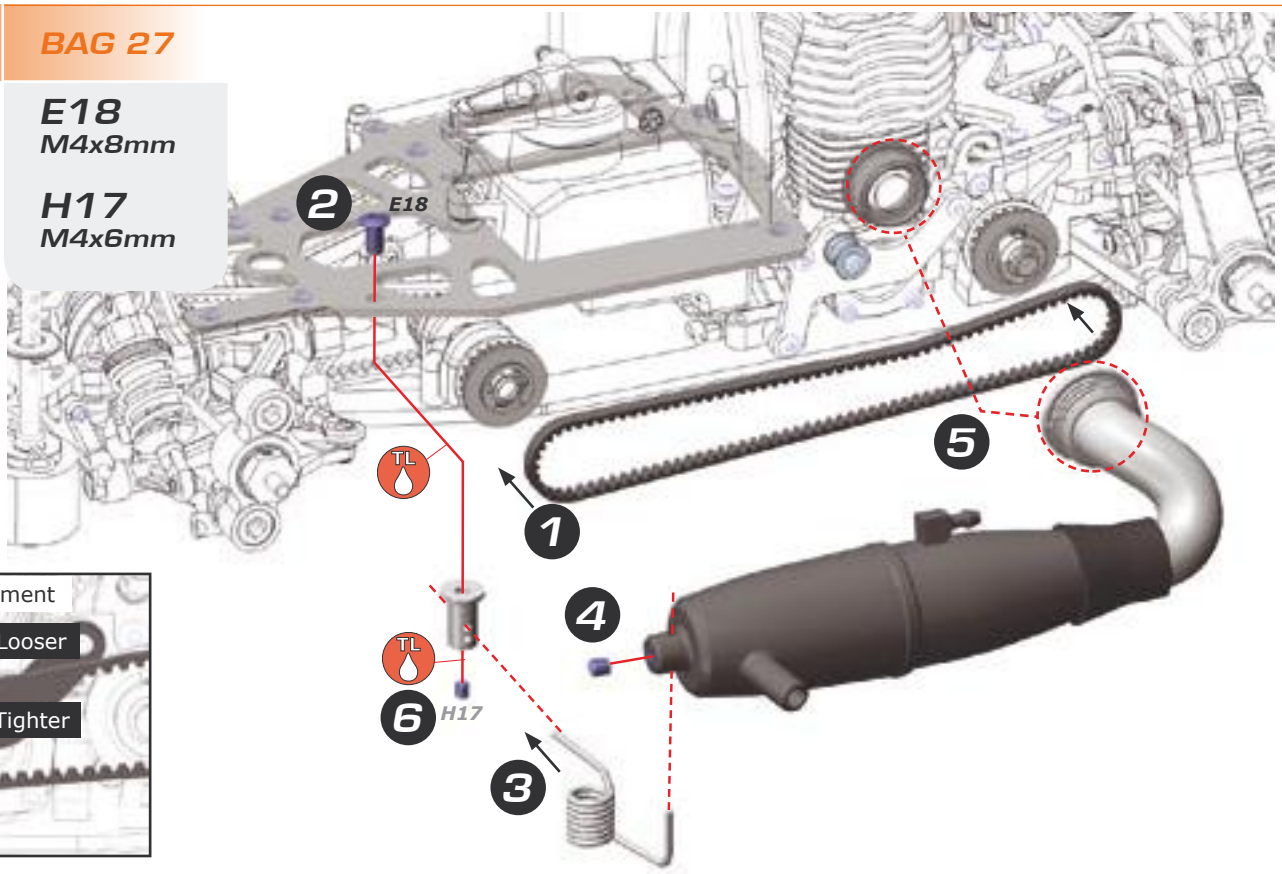
STEP 9.3

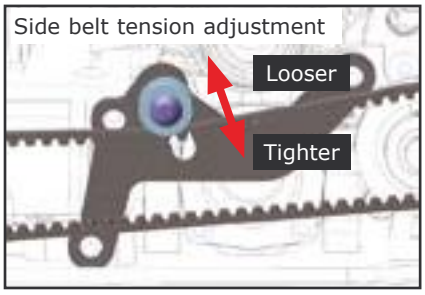
BAG 27



E18
M4x8mm

H17
M4x6mm





STEP 9.4

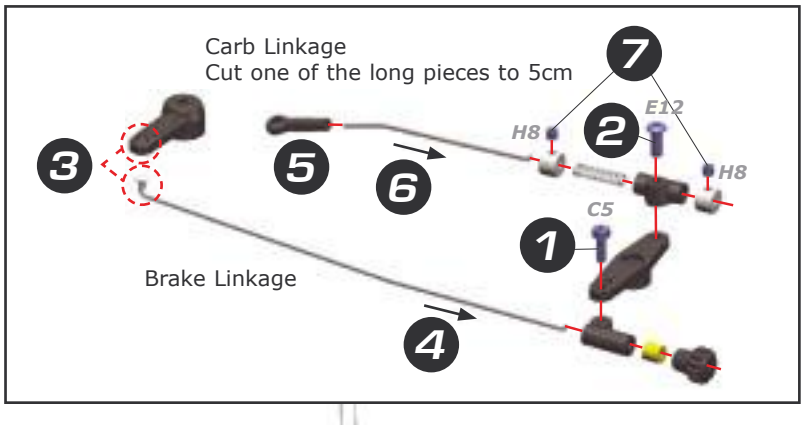
BAG 28, 29, E11, E12

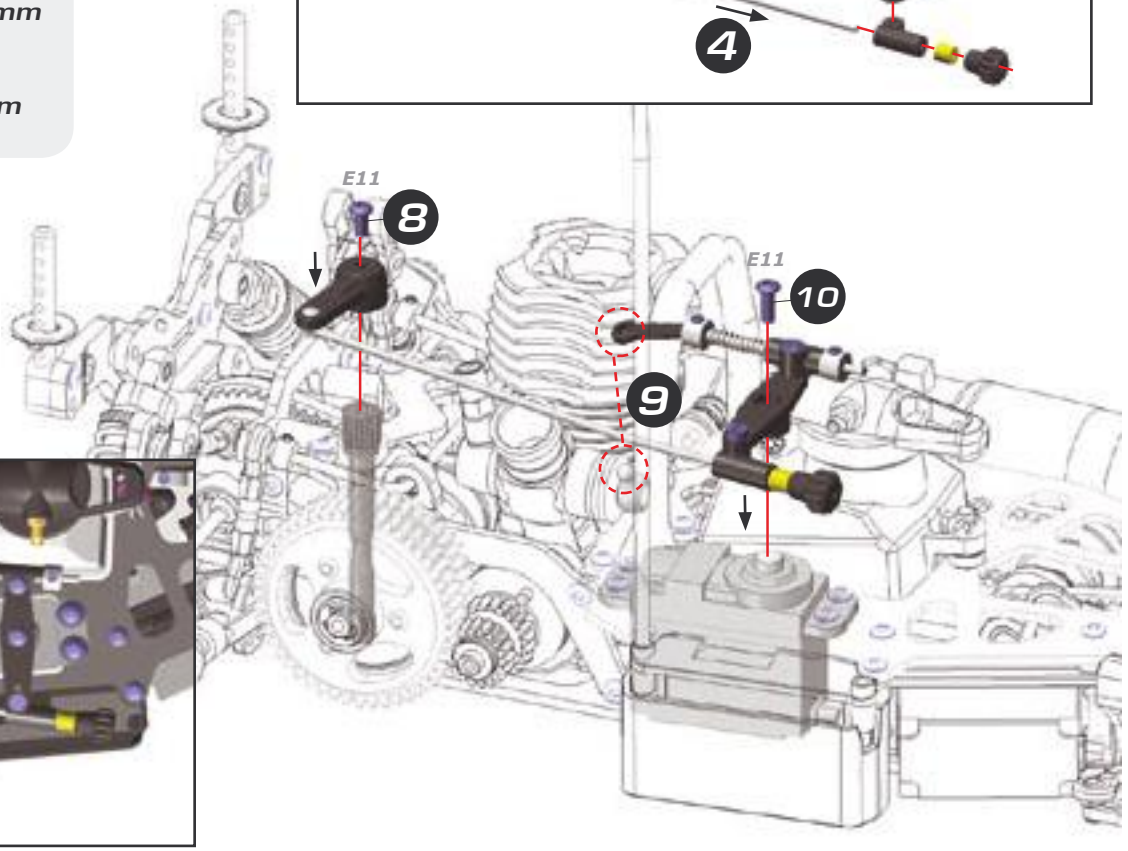
C5
2.5x10mm

E11
M3x8mm

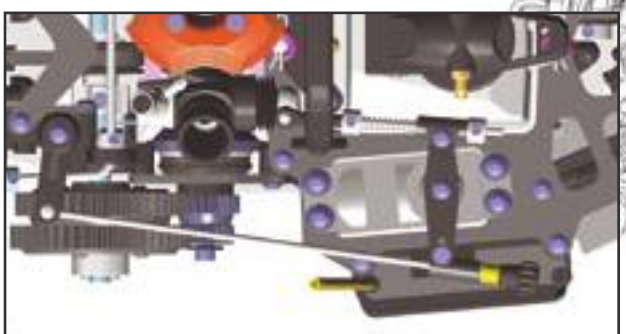
E12
M3x10mm

H8
M3x3mm



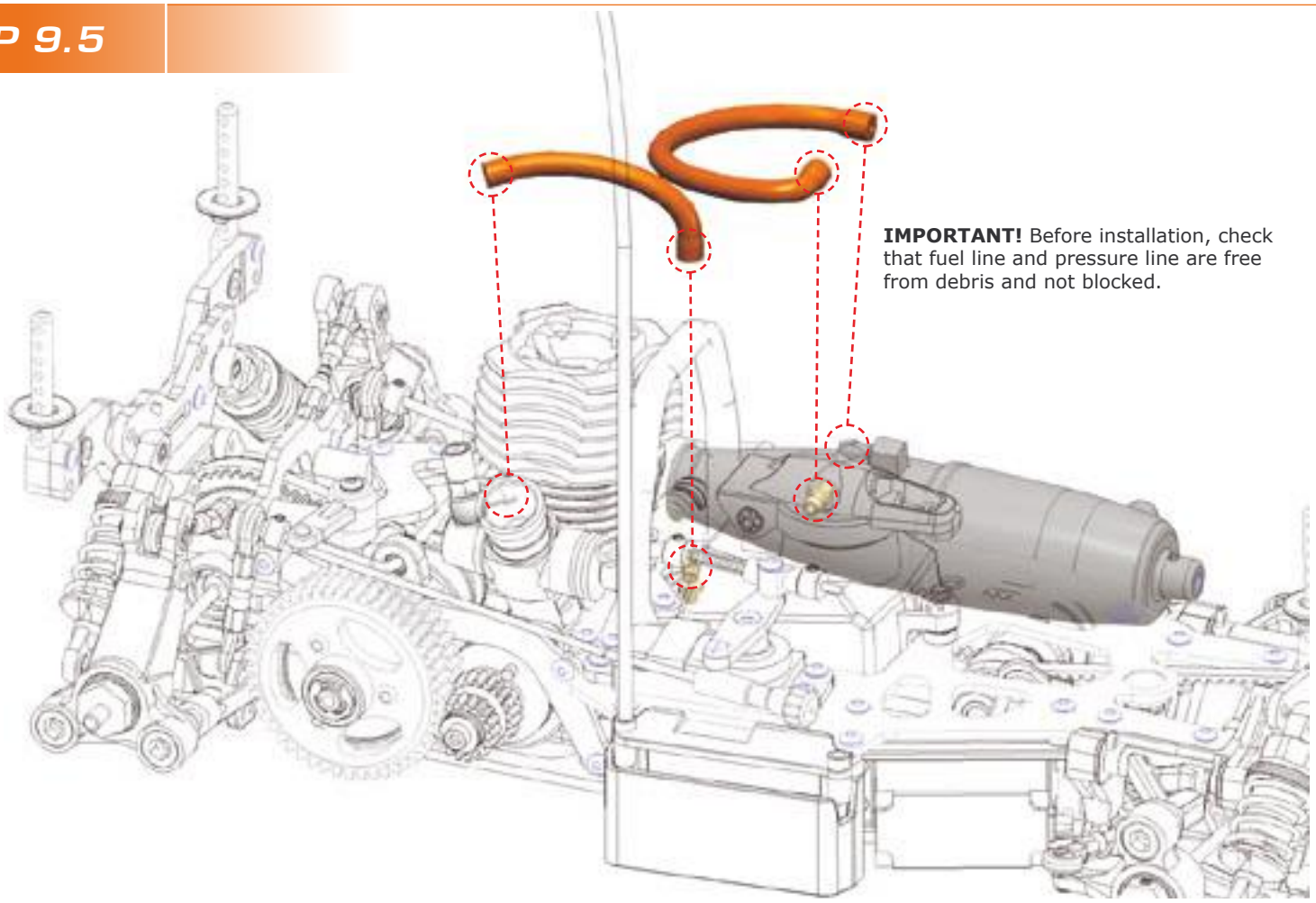


Use the following servo arms
with these brands of servos.
23 - Sanwa / KO / JR
24 - Hitec
25 - Futaba



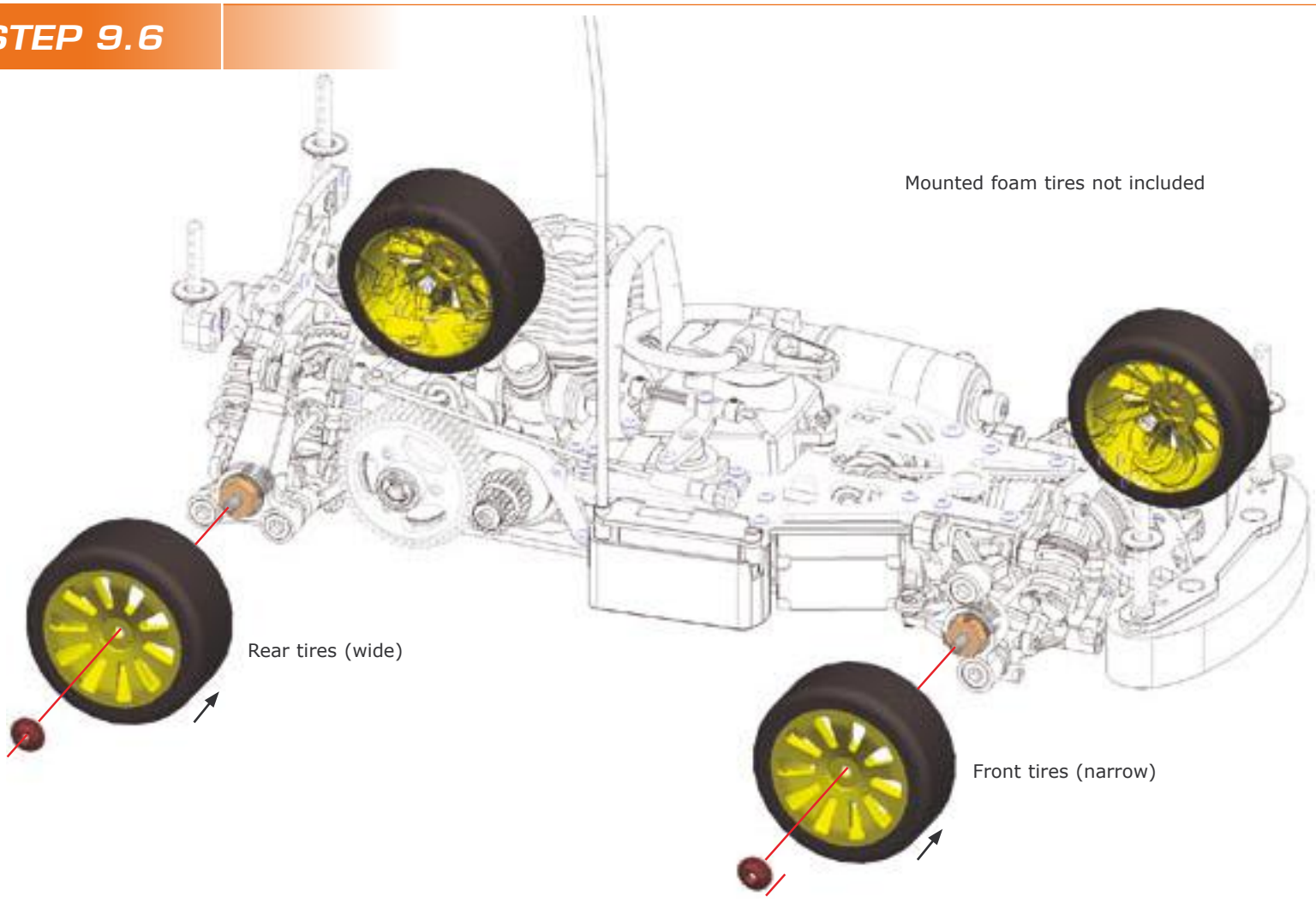
Completed throttle/brake linkage

STEP 9.5



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

STEP 9.6



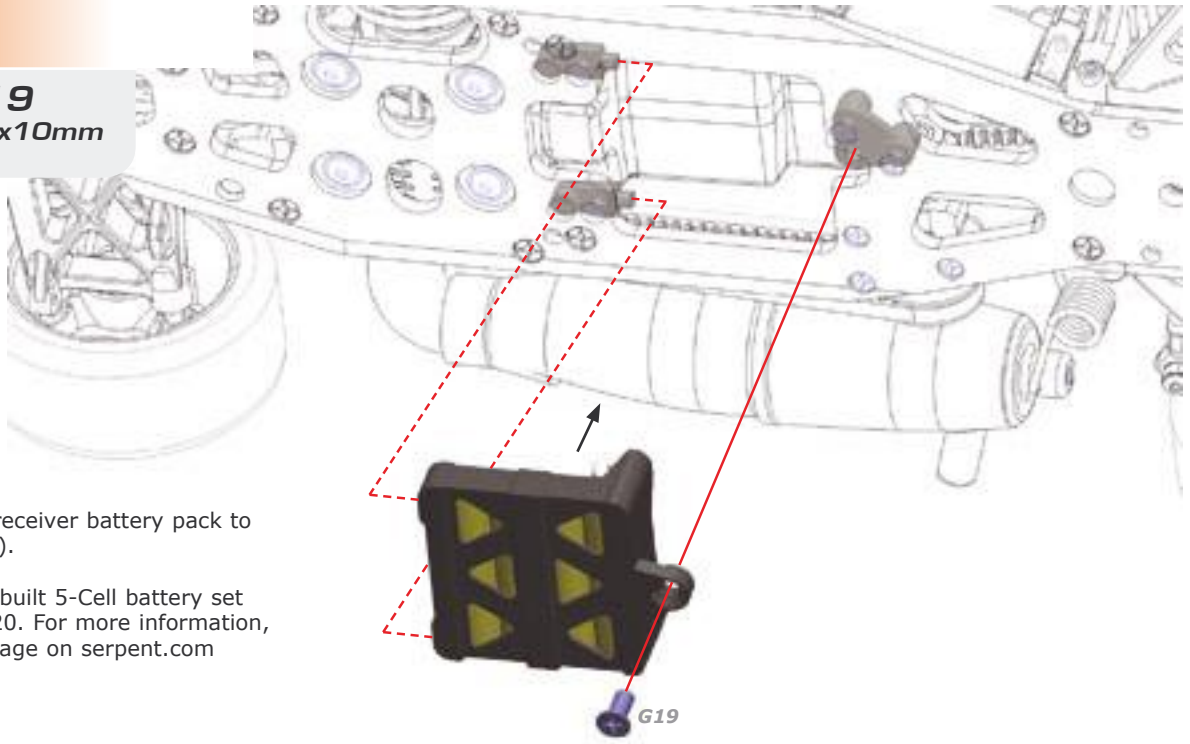
Mounted foam tires not included

Rear tires (wide)

Front tires (narrow)

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

SERPENT 720

SERPENT seven20 720

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