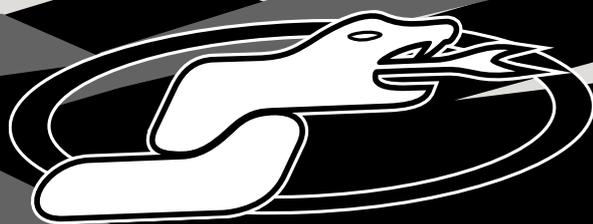


SERPENT 960

1/8TH SCALE 4WD COMPETITION CAR



INSTRUCTION MANUAL

SERPENT

INTRODUCTION

The Serpent 960 is the next evolution of Serpent's hugely-successful 950 lineage, combining ultimate performance into a single package. The Serpent 960 was designed to be a world champion, while still being easy to use, assemble, and set up. 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 960 offers many of the same specifications and features that made the Serpent 950/950R into top-competition racecars. Continuously pushing the performance envelope, Serpent's engineers have added many new and innovative features that can help take your Serpent 960 into the winner's circle: stronger reinforced components, easier roll-centre adjustment, redesigned braking system, improved rear suspension design, adjustable rear anti-roll bar, optional throttle servo positioning (laydown or upright), new improved shock absorbers, and new receiver pack configuration.

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 960. 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 960. Fine-tuning the initial setup is an essential part of building a high-performance racecar like your Serpent 960. The separate Serpent 960 Setup Book is an excellent resource for making adjustments on your Serpent 960 and understanding the concepts behind those adjustments.

EXPLODED VIEWS AND PARTS LIST

The exploded views and parts lists for the Serpent 960 are contained in a separate Serpent 960 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

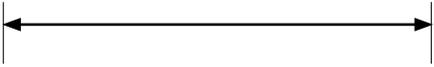
Included with your Serpent 960 kit is a document entitled "Read This First" that covers safety precautions for the assembly and use of this product. We strongly recommend that you thoroughly read and understand that document, and follow all the precautions.

CONTENTS

1.0	FRONT ASSEMBLY	4
2.0	REAR ASSEMBLY	9
3.0	RADIO PLATE ASSEMBLY	14
4.0	RADIO PLATE MOUNTING	17
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6.0	CENTAX ASSEMBLY	23
7.0	FINAL ASSEMBLY	26

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 960 Setup Book - Section A: Basic Setup</p> <p>Refer to Serpent 960 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 960 kit is very complete, though due to continuous product development, more up-to-date information may be provided at our Serpent.com website.

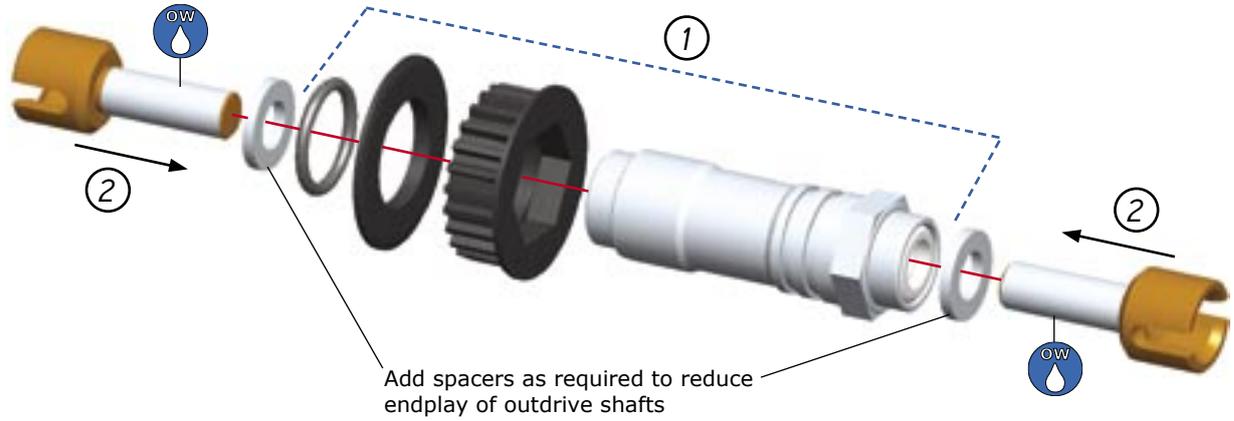
All information about the Serpent 960 is accessible from the Serpent 960 product page which can be found on Serpent.com and can be accessed by simply typing **serpent.com/903008** into your web browsers address bar.

From the Serpent 960 product page you will find the very latest information about your Serpent 960: reports by team drivers and other experts, tips and tricks, setups, image gallery and downloadable files including the latest version of the instruction manual will be made available as downloadable PDF-files.

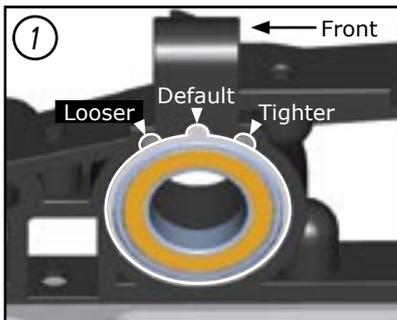
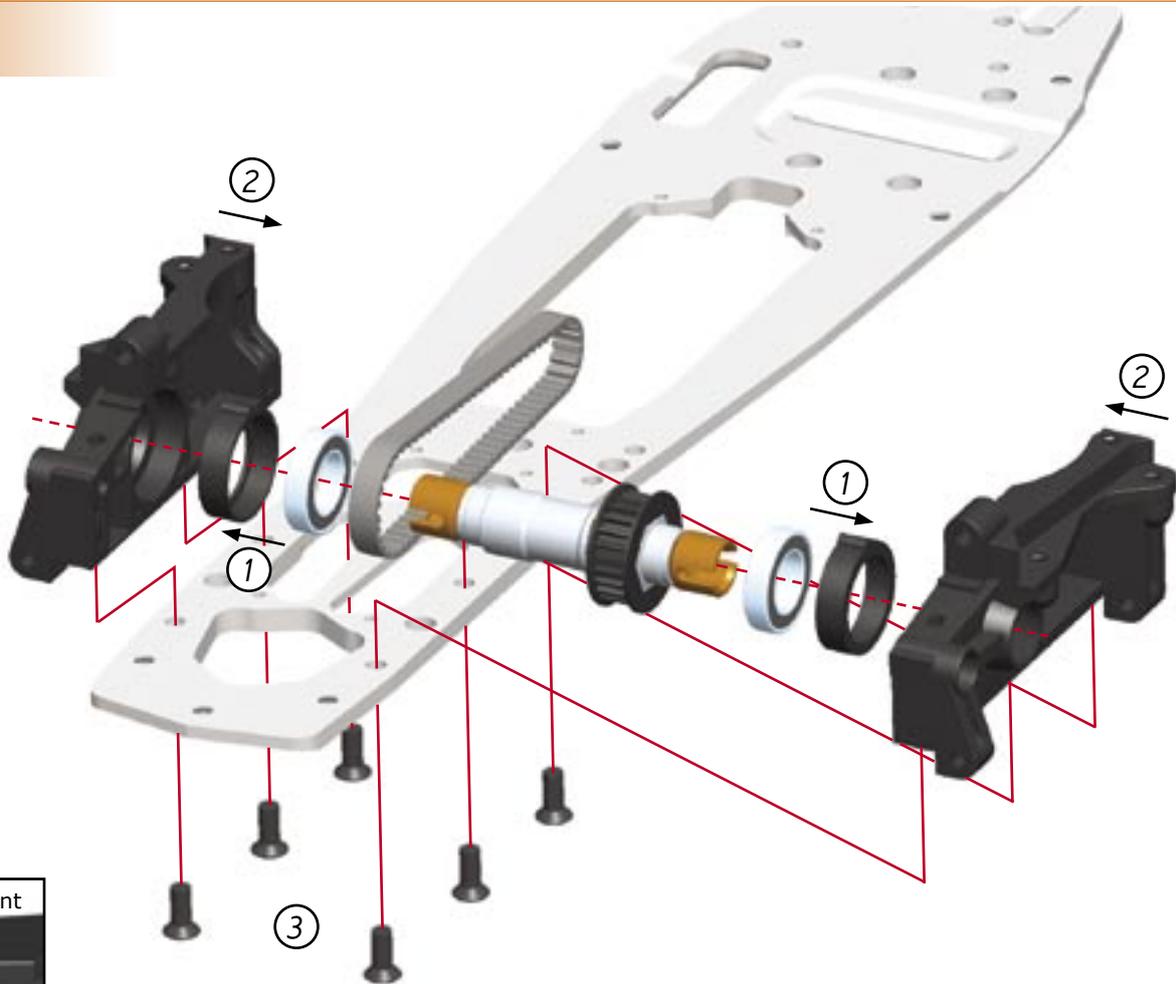
1.0 FRONT ASSEMBLY

STEP 1.1

BAG 1



STEP 1.2



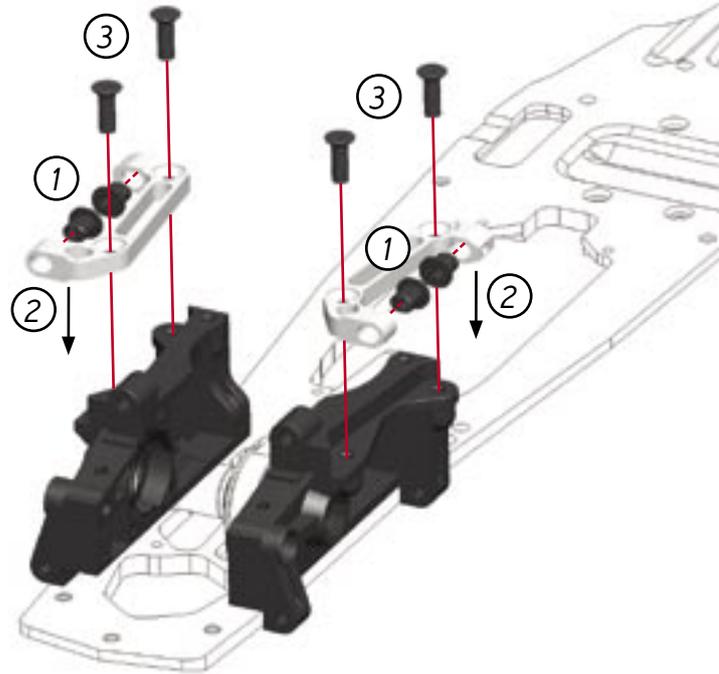
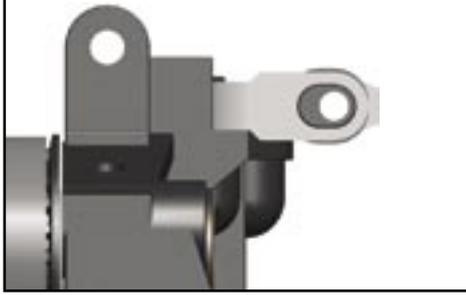
Change the position of **BOTH** eccentric hubs to adjust front belt tension. Both hubs should have the same position.

STEP 1.3



M4x12mm

Insert setting - hole mounted to outside



Learn about front roll center adjustment

STEP 1.4

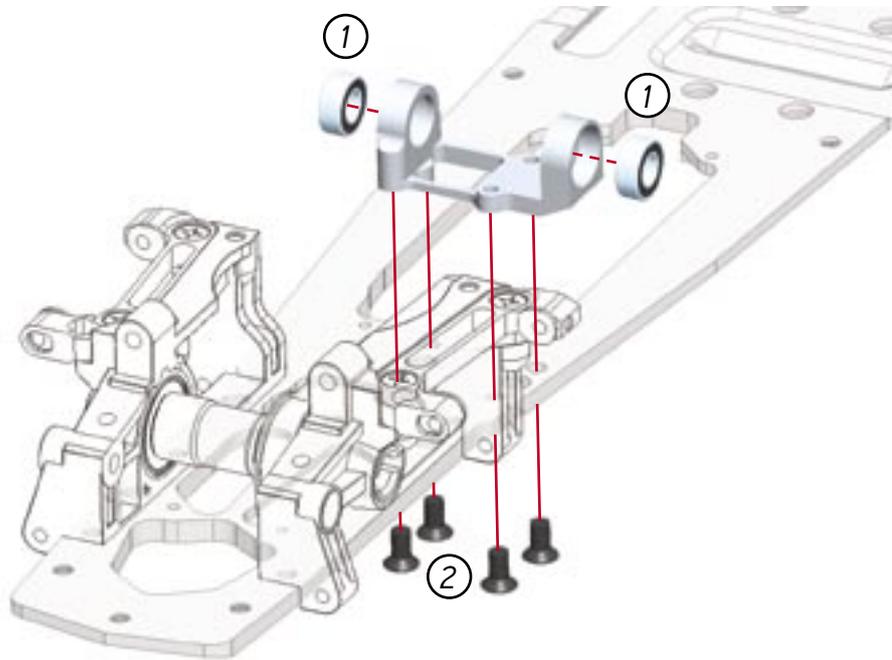
BAG 2



M4x8mm



6x13mm



STEP 1.5

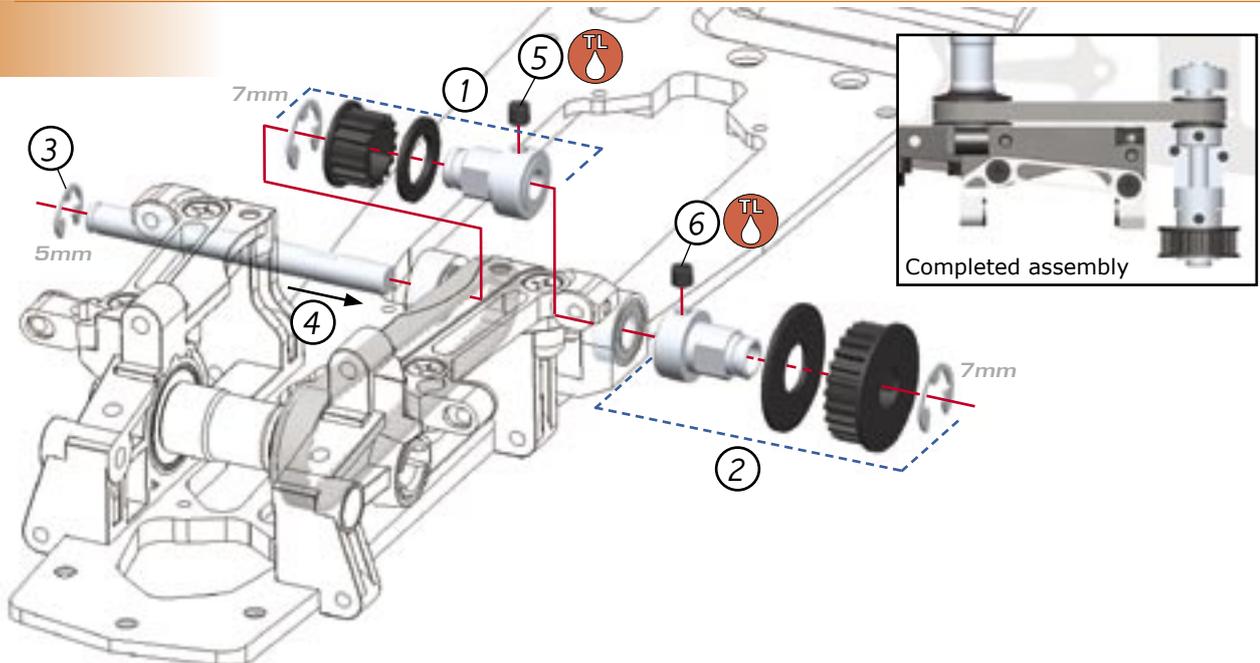
M4x4mm



5mm



7mm

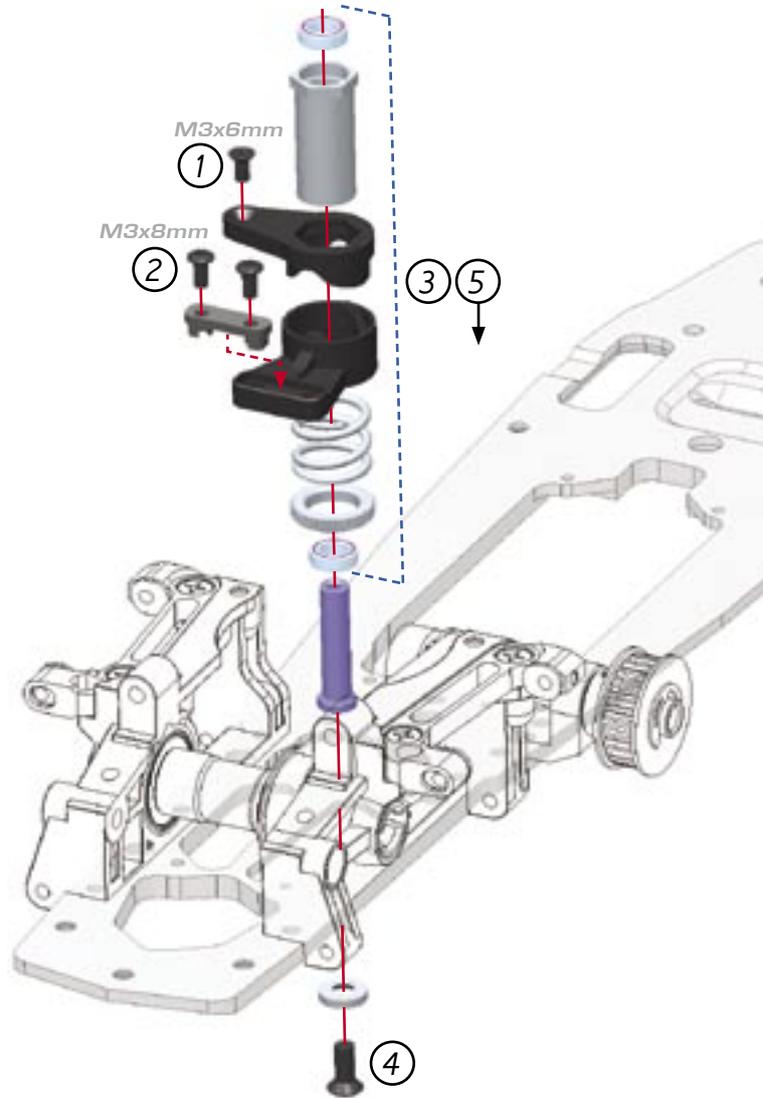
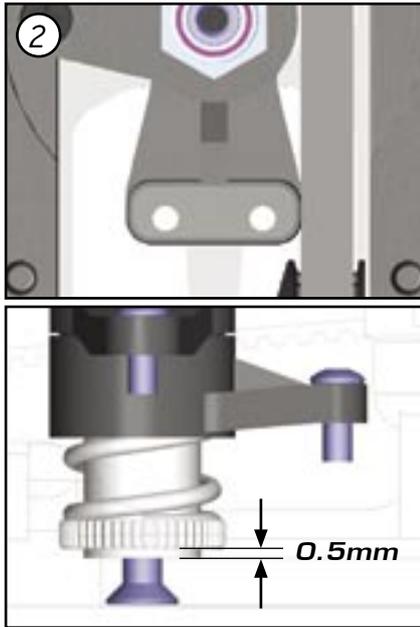


STEP 1.6

BAG 3

-  **M3x6mm**
-  **M3x8mm**
-  **M4x10mm**
-  **6x10mm**

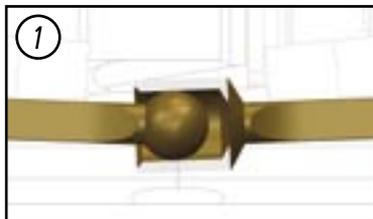
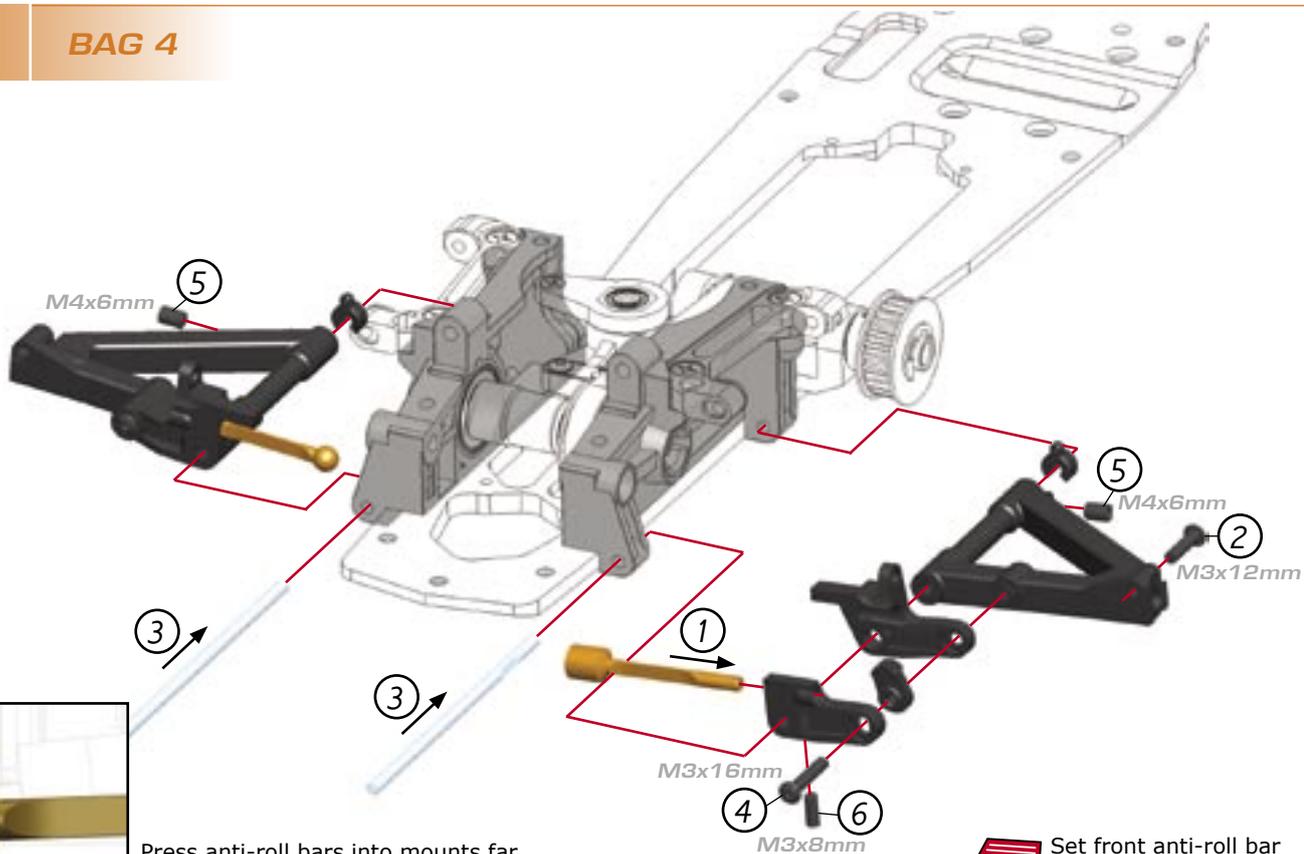
Servo Saver Ackermann insert position



STEP 1.7

BAG 4

-  **M3x8mm**
-  **M4x6mm**
-  **M3x12mm**
-  **M3x16mm**

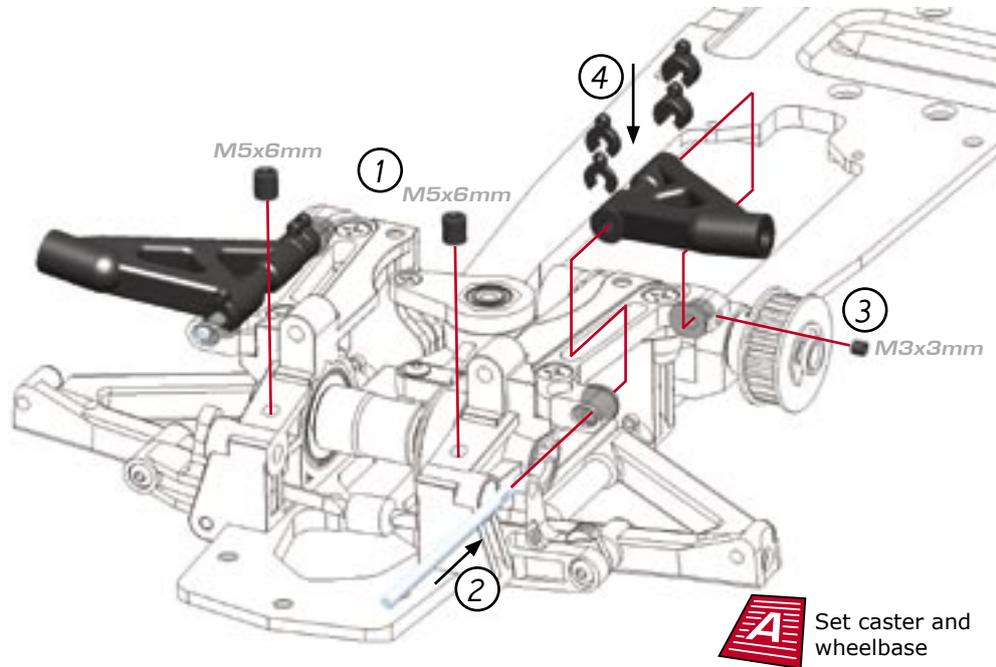
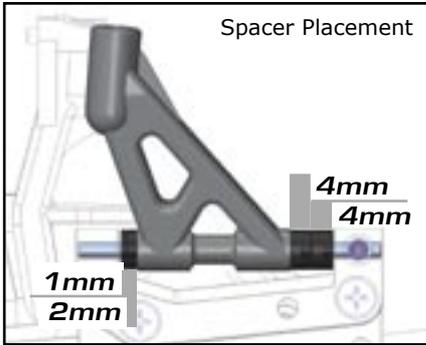


Press anti-roll bars into mounts far enough so the bars do not bind when the suspension is compressed

A Set front anti-roll bar
Set front downstops and wheelbase

STEP 1.8

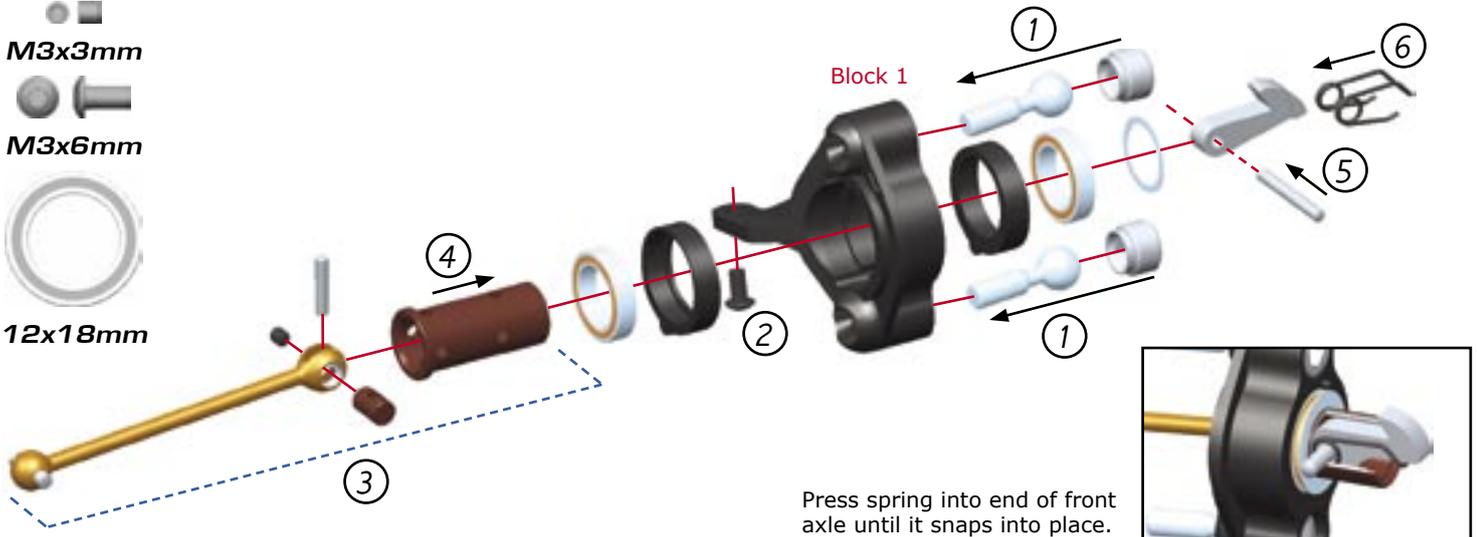
- M3x3mm
- M5x6mm



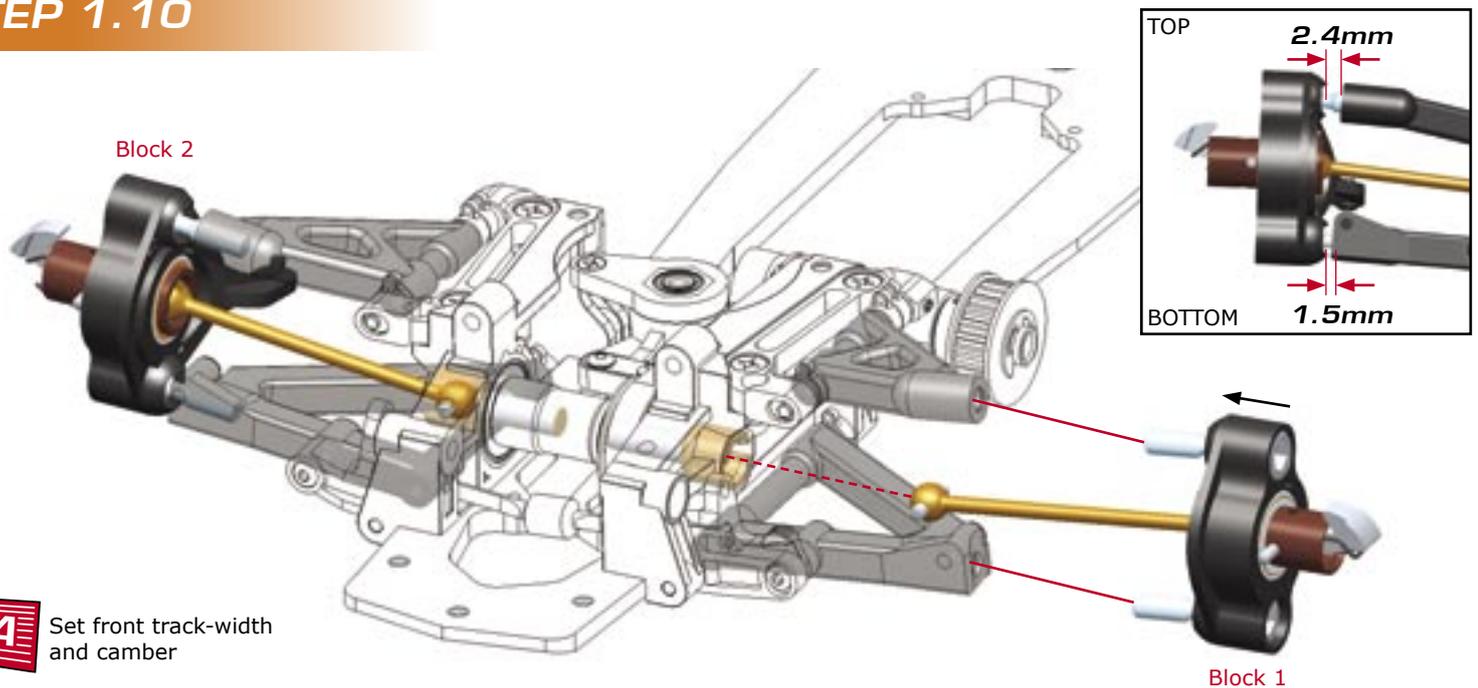
STEP 1.9

BAG 5

- M3x3mm
- M3x6mm
- 12x18mm

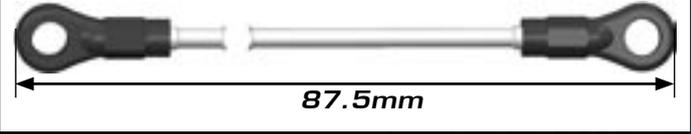


STEP 1.10

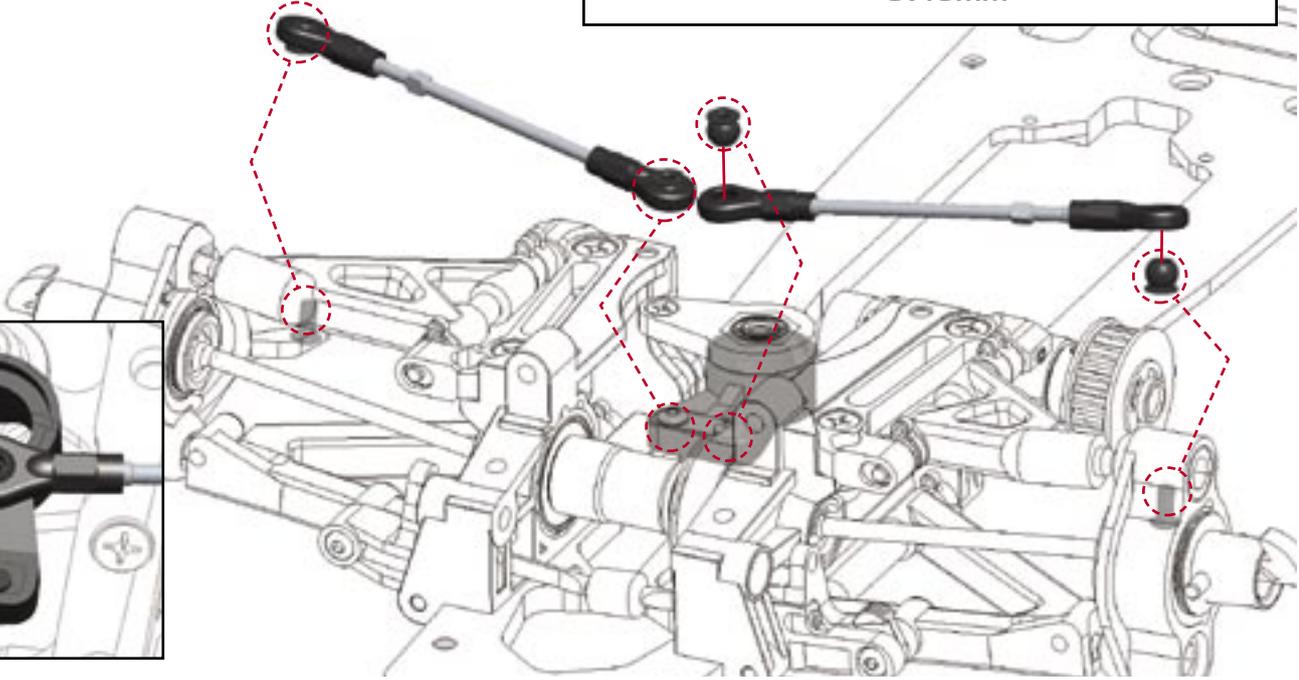
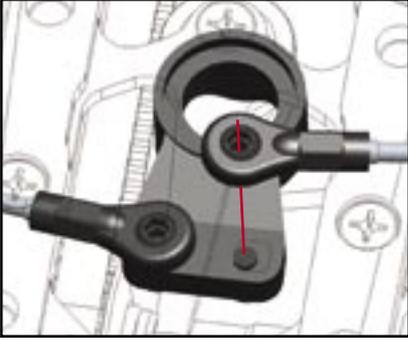


STEP 1.11

Assemble L & R steering rods:

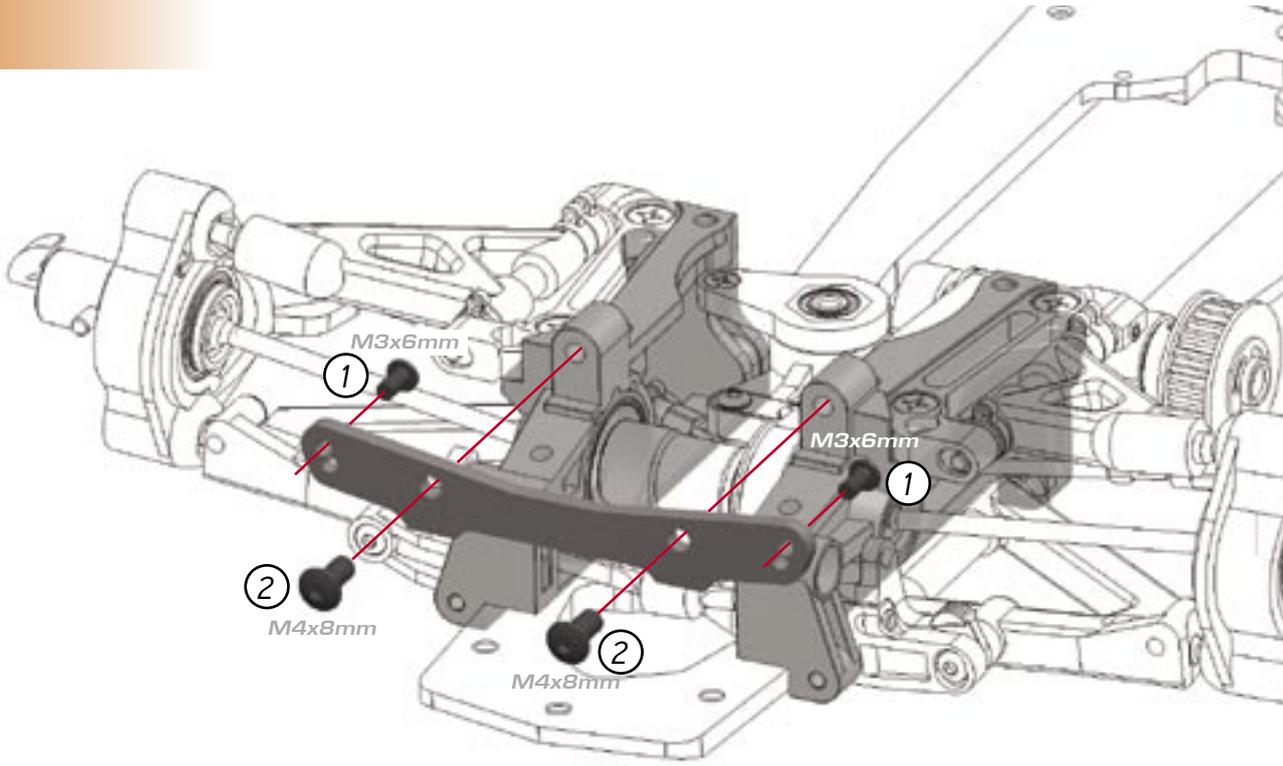


A Set front toe



STEP 1.12

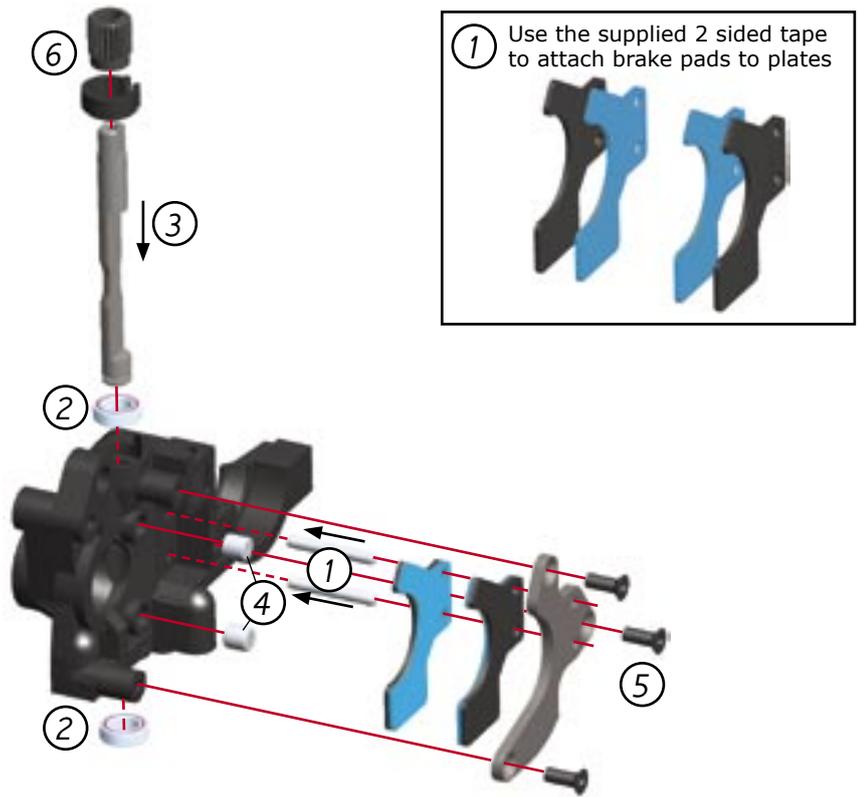
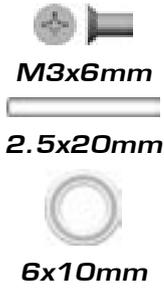
- M3x6mm
- M4x8mm



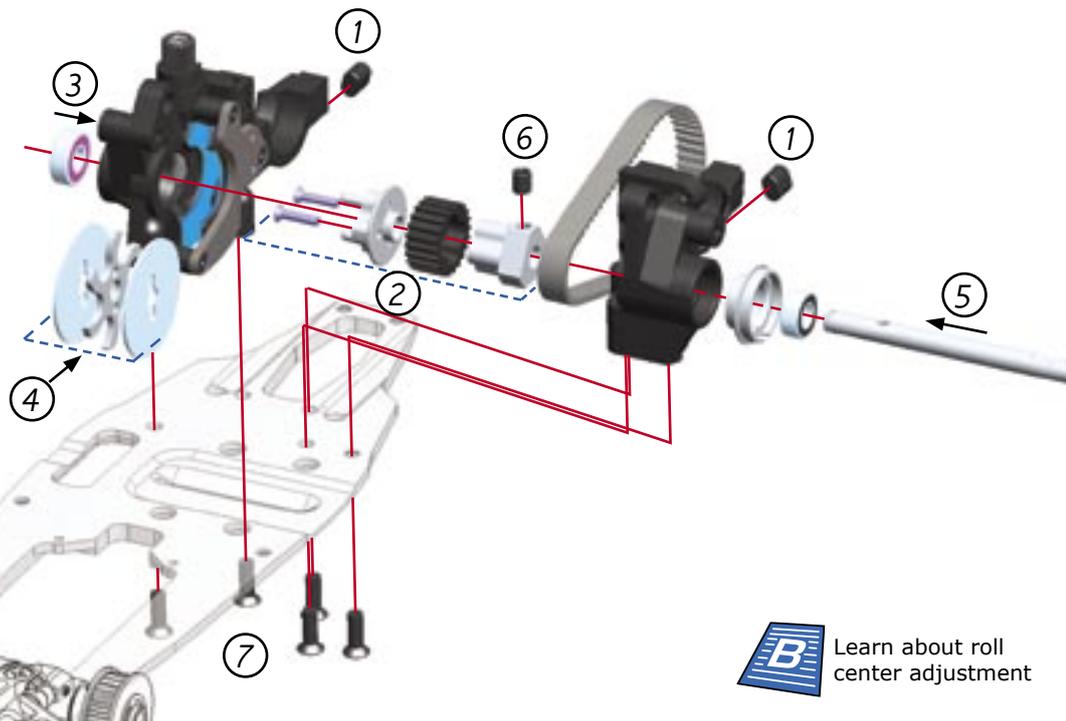
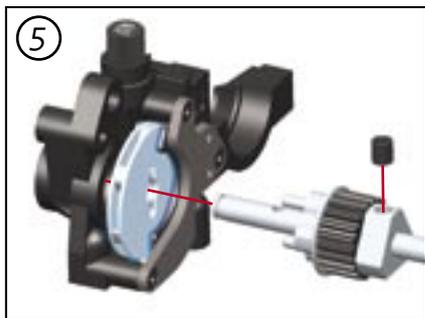
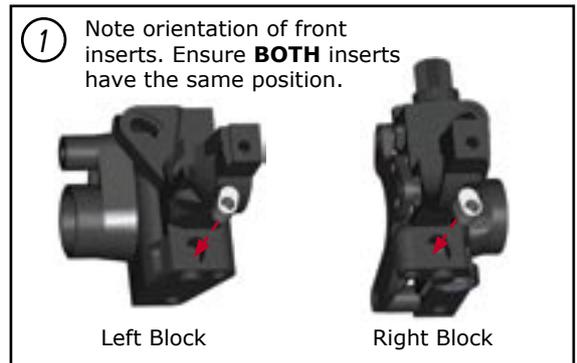
2.0 REAR ASSEMBLY

STEP 2.1

BAG 6



STEP 2.2



 Learn about roll center adjustment

STEP 2.3

BAG 7



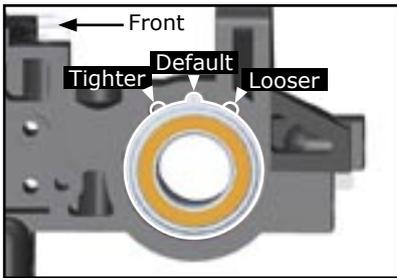
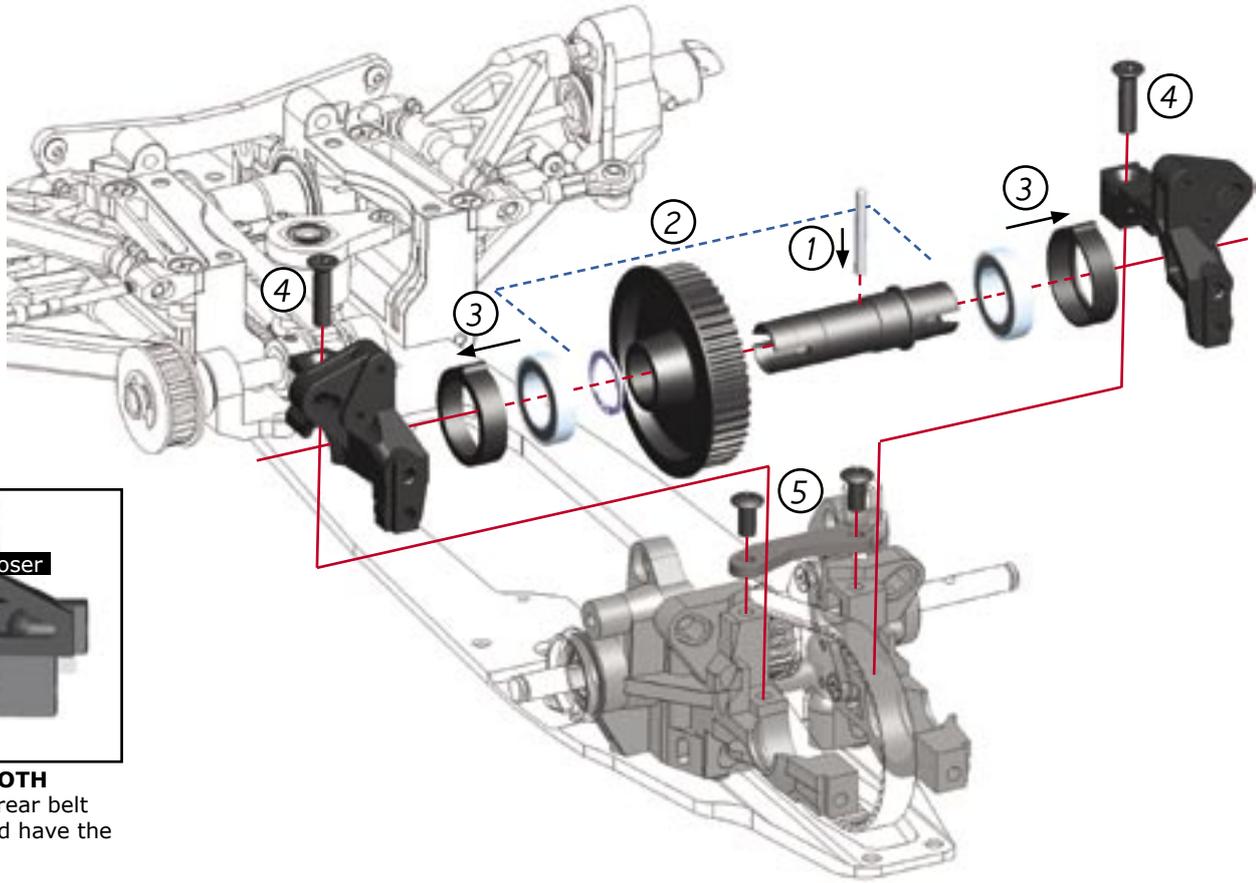
M4x8mm



M4x16mm



12x21mm



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

STEP 2.4

Assemble both rear lower arms using the indicated steps.



M3x6mm



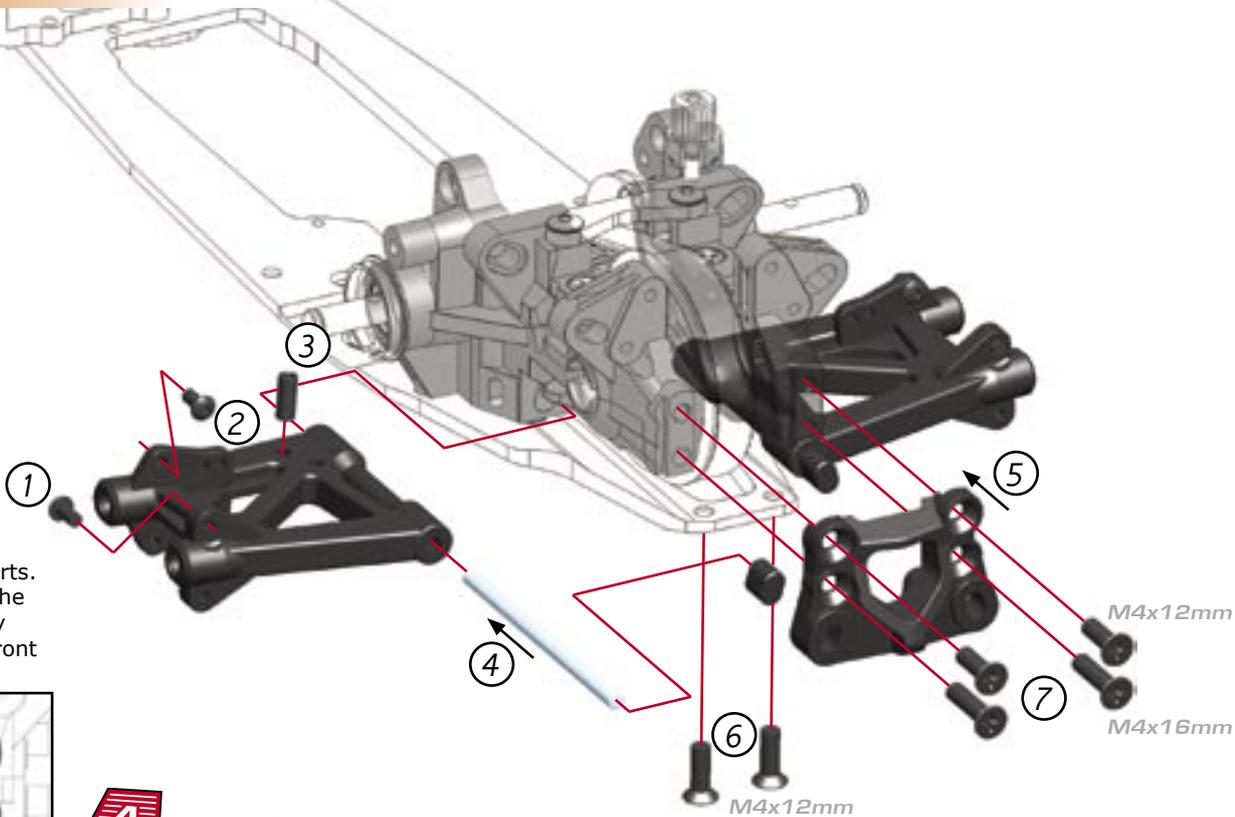
M4x12mm



M4x16mm



M4x10mm



Note orientation of rear inserts. Ensure **BOTH** inserts have the same position, and that they match the positions of the front inserts (see step 2.2)



Set rear downstops

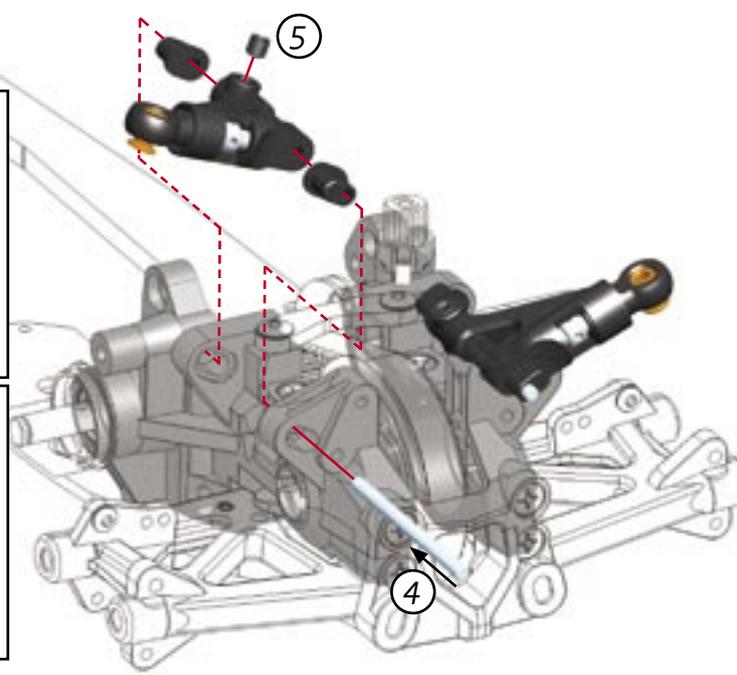
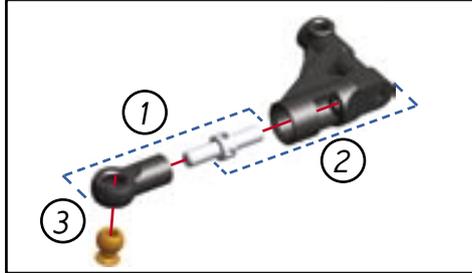


Learn about roll center adjustment

STEP 2.5

M4x4mm

Note orientation of front and rear inserts. Ensure **BOTH** inserts have same position.



STEP 2.6

BAG 8

Assemble both rear hubs using the indicated steps.

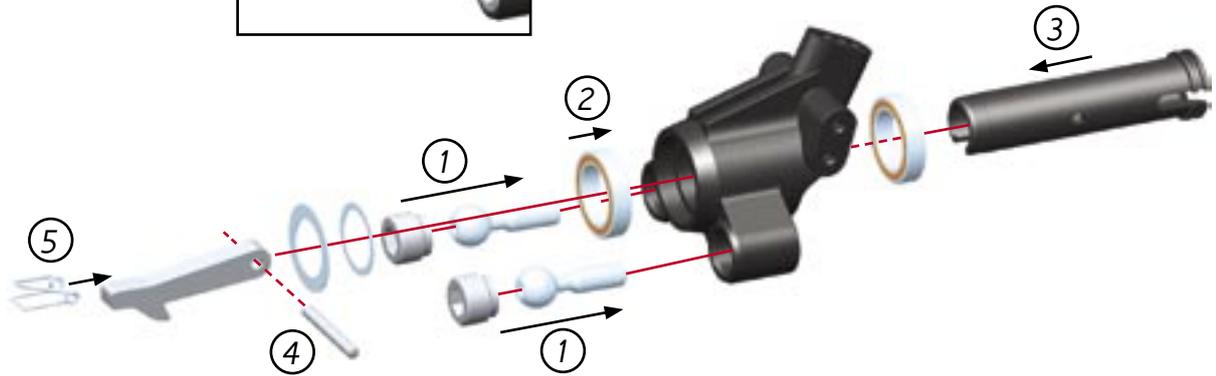
2.5x22mm



12x18mm

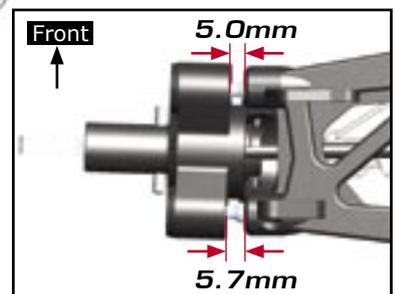
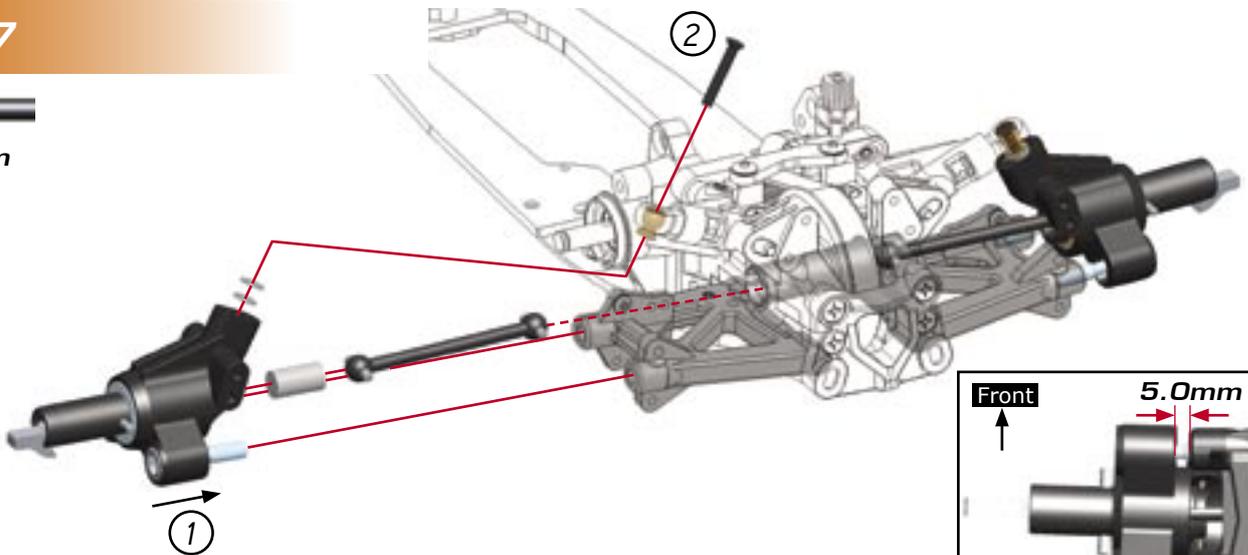


Press spring into end of rear axle until it snaps into place.



STEP 2.7

M4x20mm



A Set rear track width, camber and toe

STEP 2.8

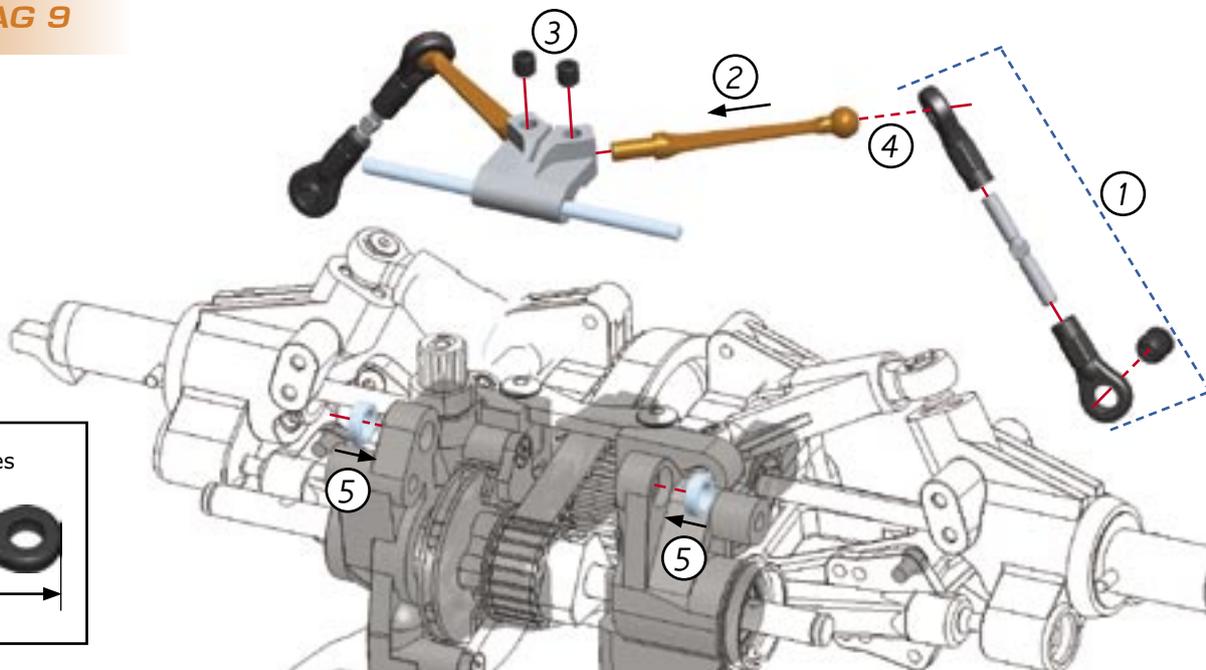
BAG 9

M4x4mm

5x8mm

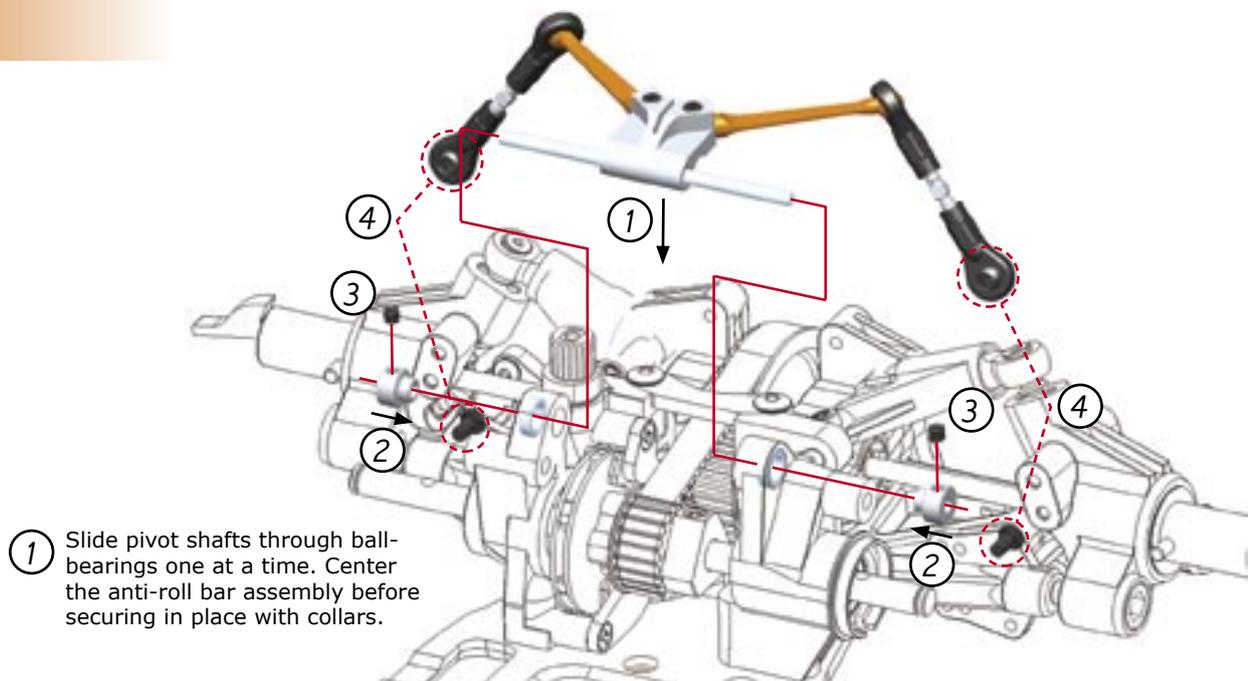


Set rear anti-roll bar



STEP 2.9

M3x3mm



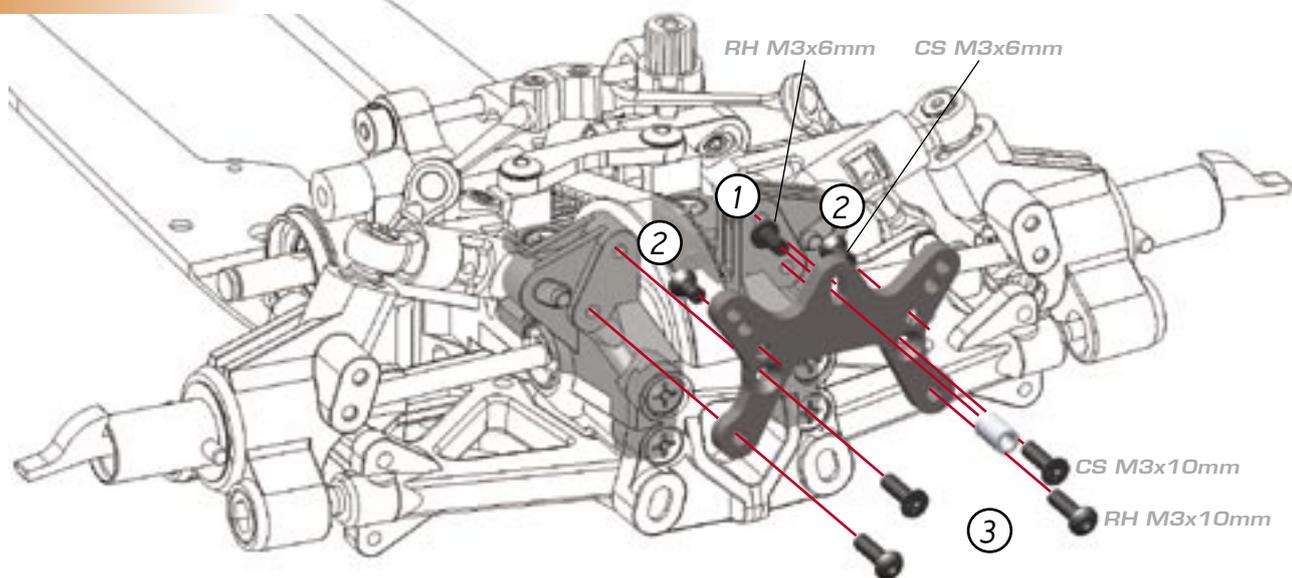
STEP 2.10

M3x6mm

M3x6mm

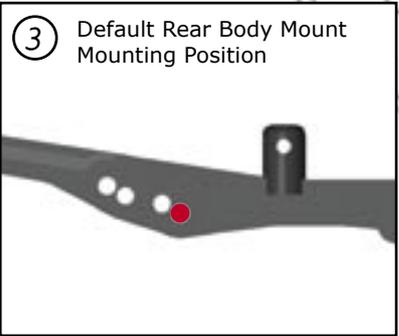
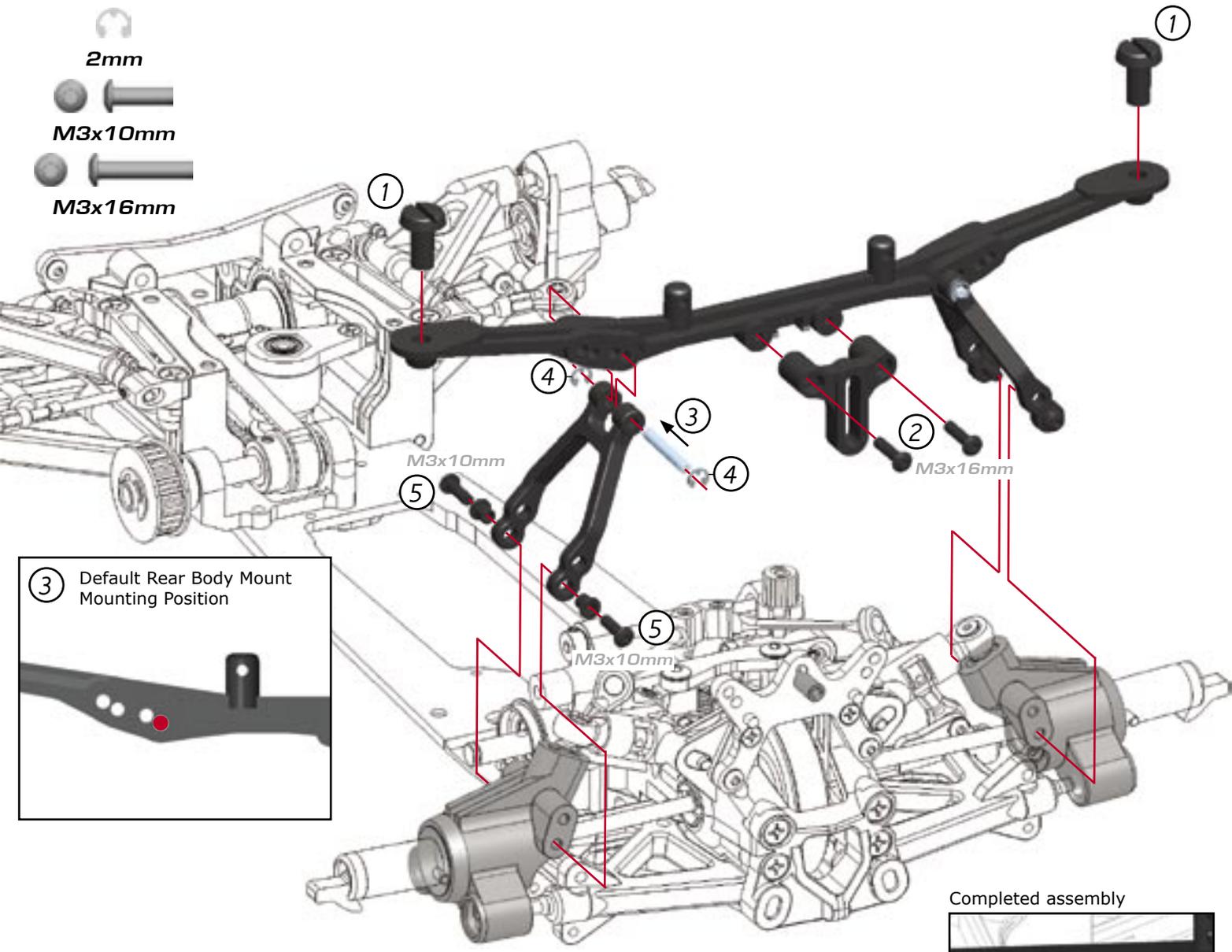
M3x10mm

M3x10mm



STEP 2.11

-  2mm
-  M3x10mm
-  M3x16mm



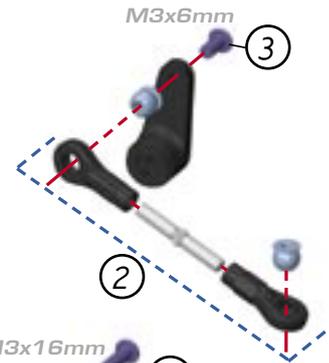
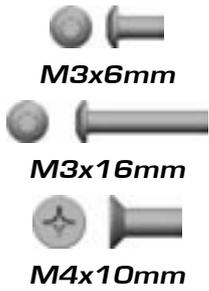
Completed assembly



3.0 RADIO PLATE ASSEMBLY

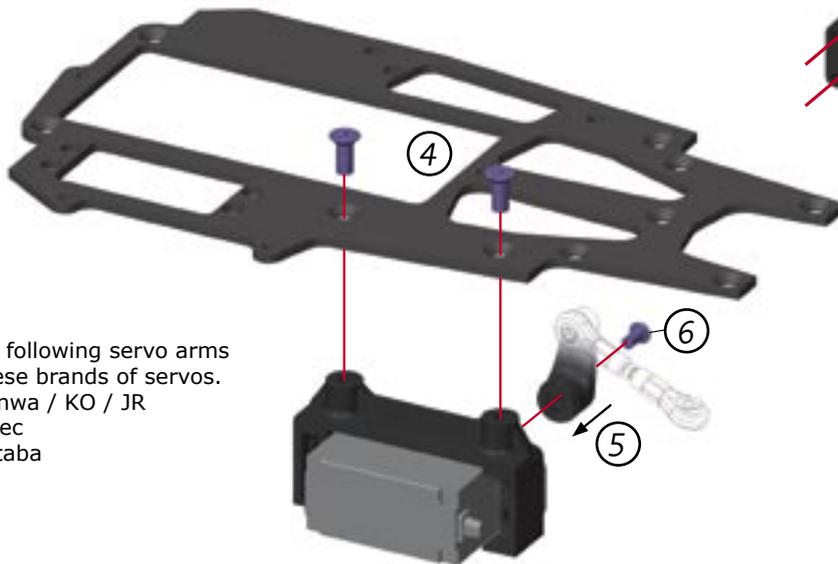
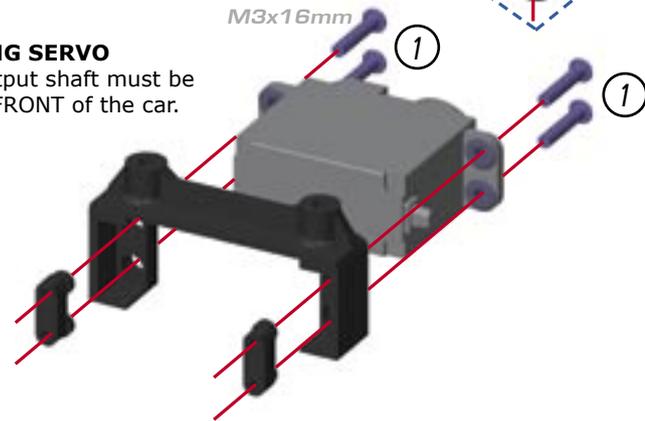
STEP 3.1

BAG 10



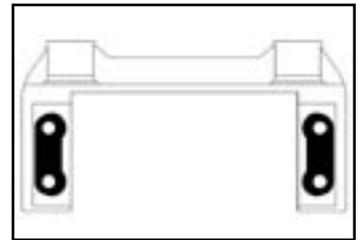
STEERING SERVO

Servo output shaft must be towards FRONT of the car.

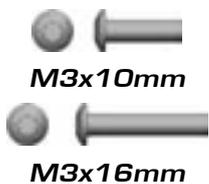


Use the following servo arms with these brands of servos.
23 - Sanwa / KO / JR
24 - Hitec
25 - Futaba

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

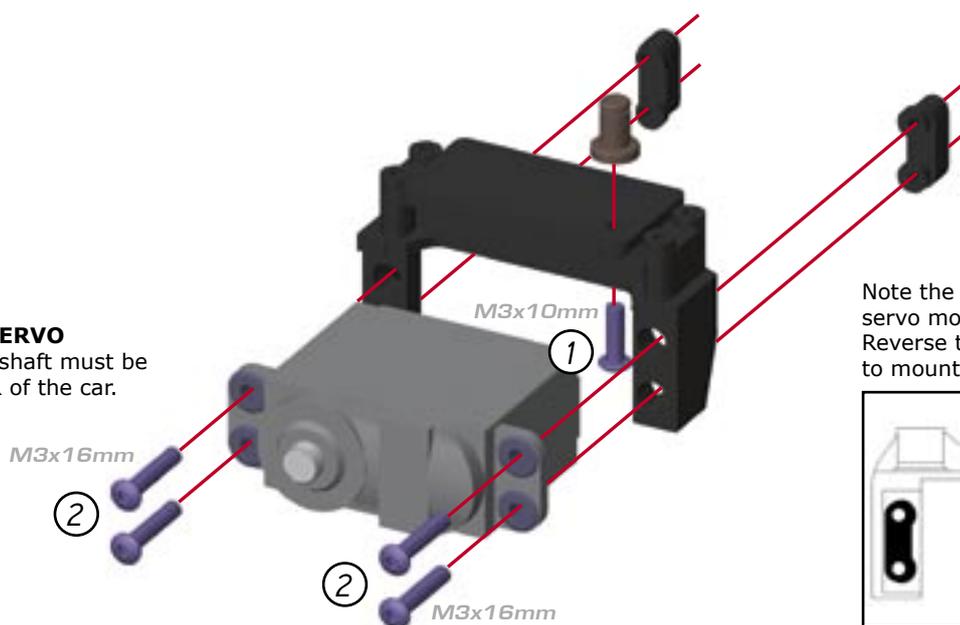


STEP 3.2

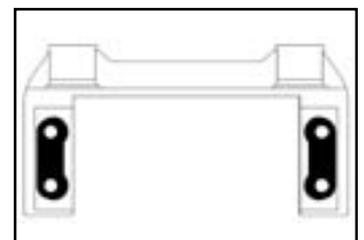


THROTTLE SERVO

Servo output shaft must be towards REAR of the car.

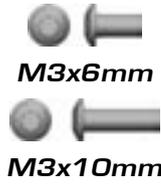


Note the orientation of the servo mounting screw blocks. Reverse the default orientation to mount a smaller servo.

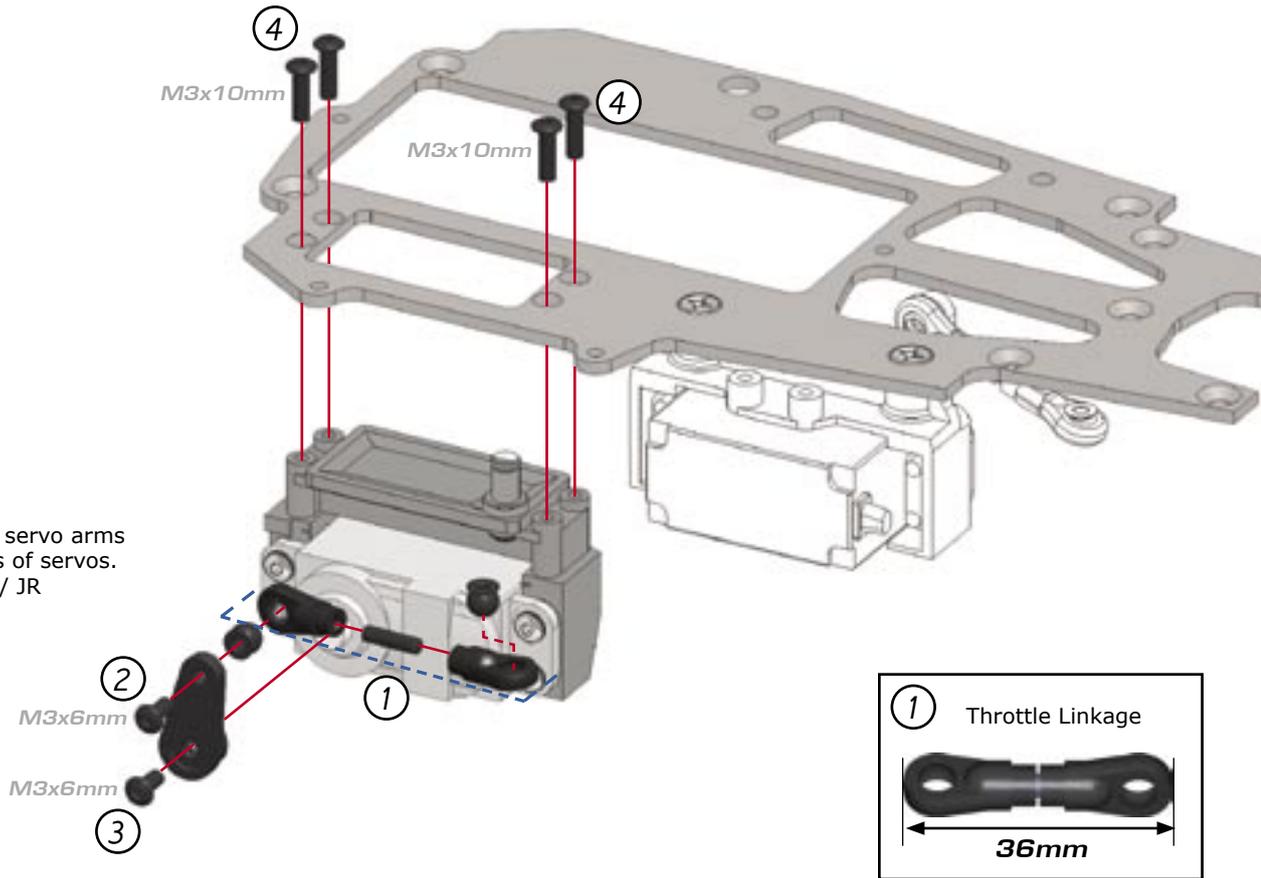


STEP 3.3

OPTION 1: Laydown Throttle Servo



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

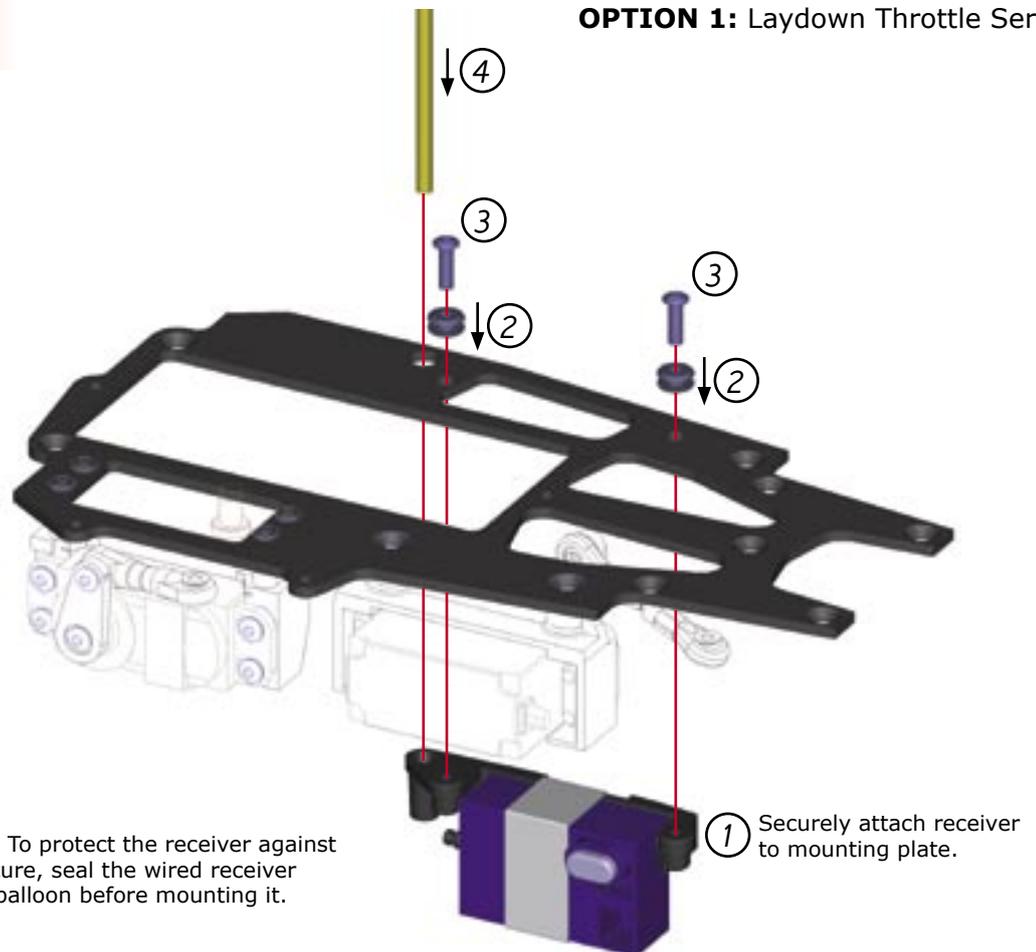


STEP 3.4

OPTION 1: Laydown Throttle Servo

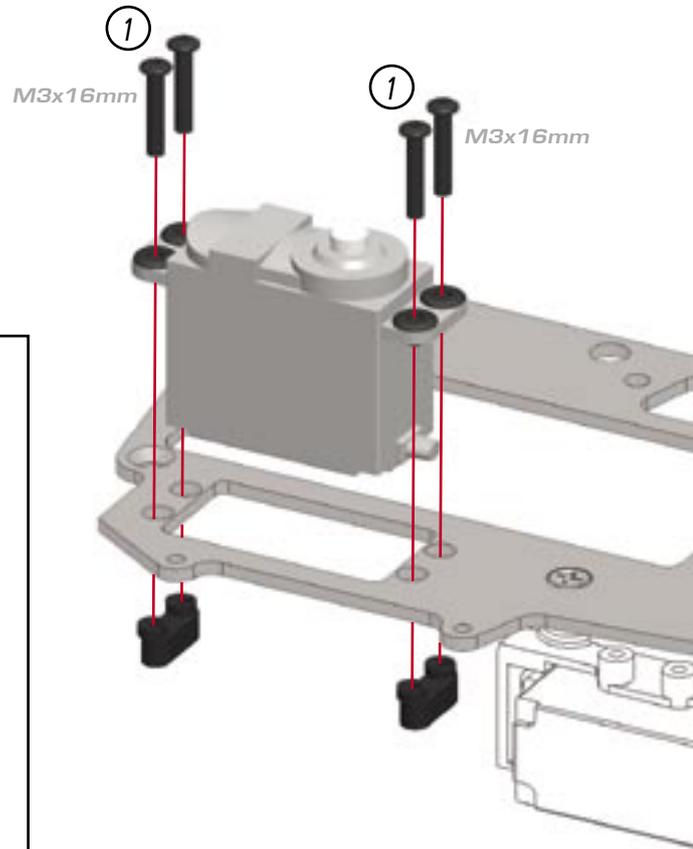
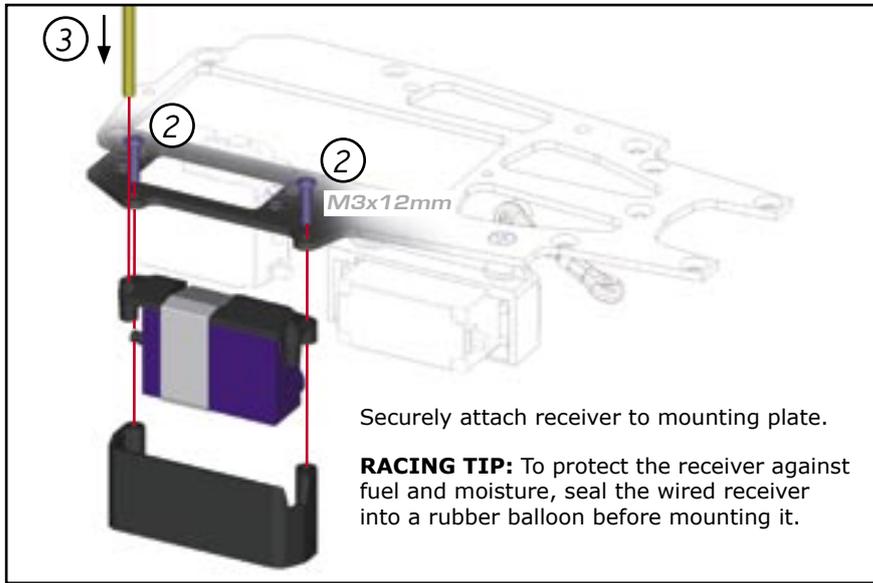
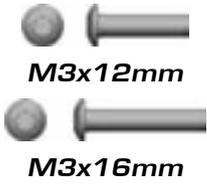


RACING TIP: To protect the receiver against fuel and moisture, seal the wired receiver into a rubber balloon before mounting it.



STEP 3.5

OPTION 2: Upright Throttle Servo

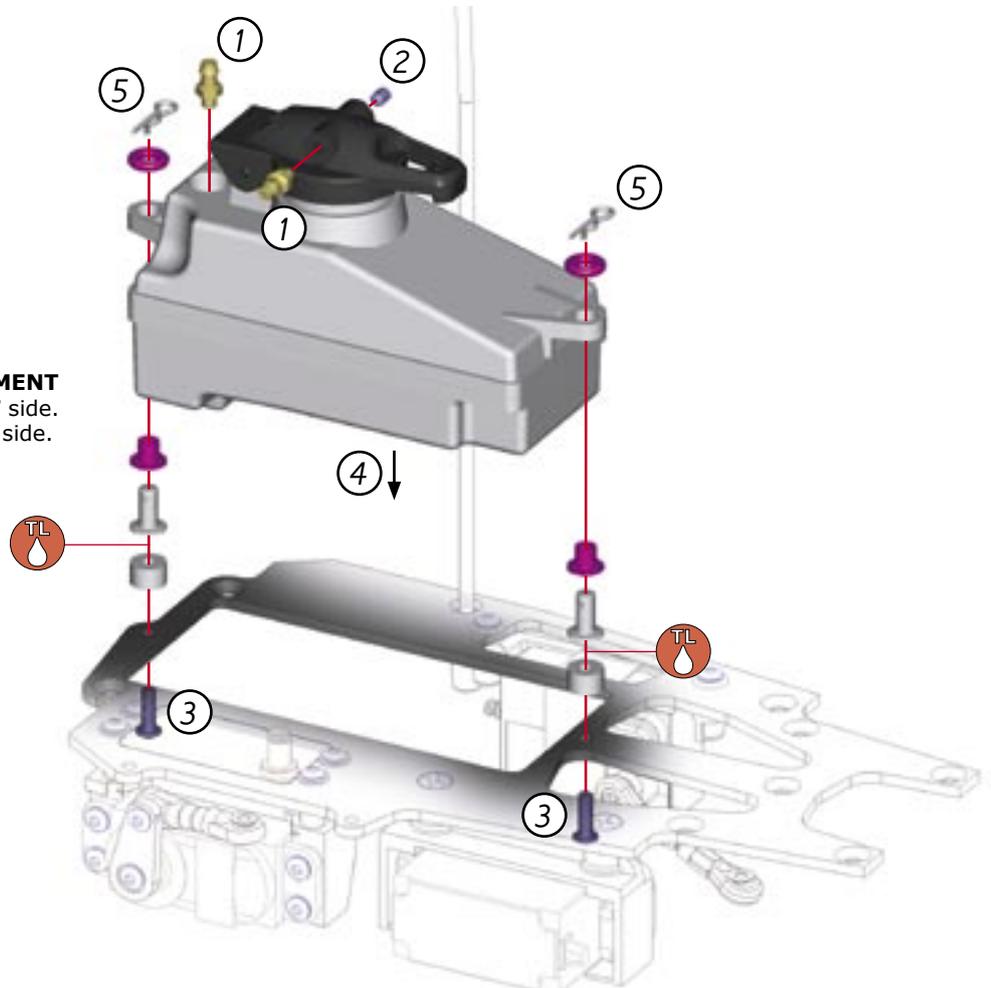


STEP 3.6

BAG 11



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



4.0 RADIO PLATE MOUNTING

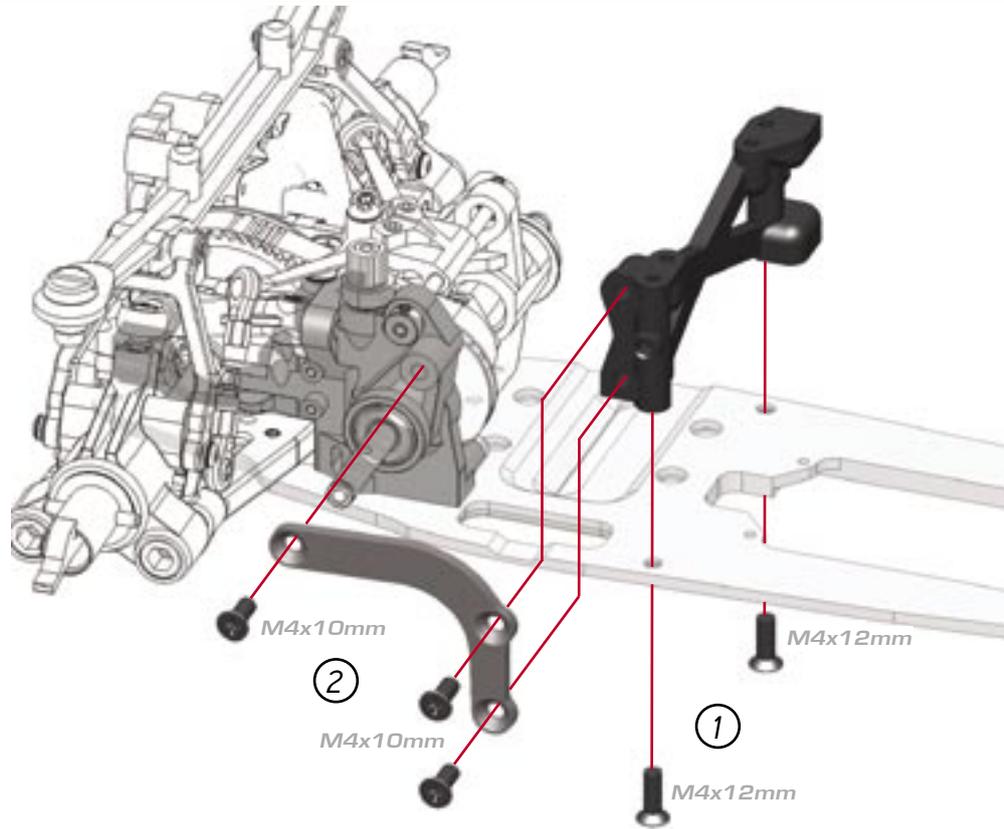
STEP 4.1



M4x10mm



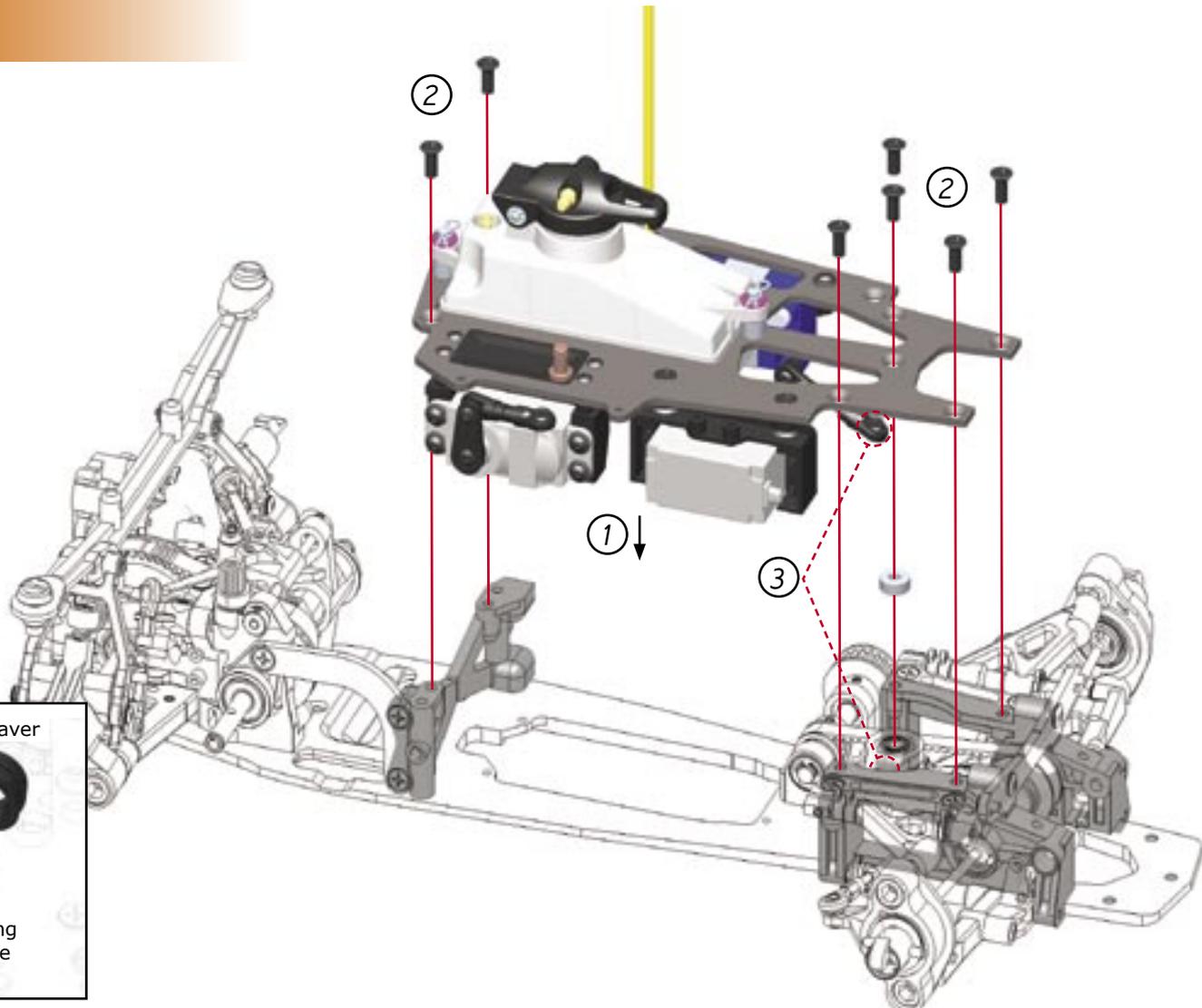
M4x12mm



STEP 4.2



M4x10mm

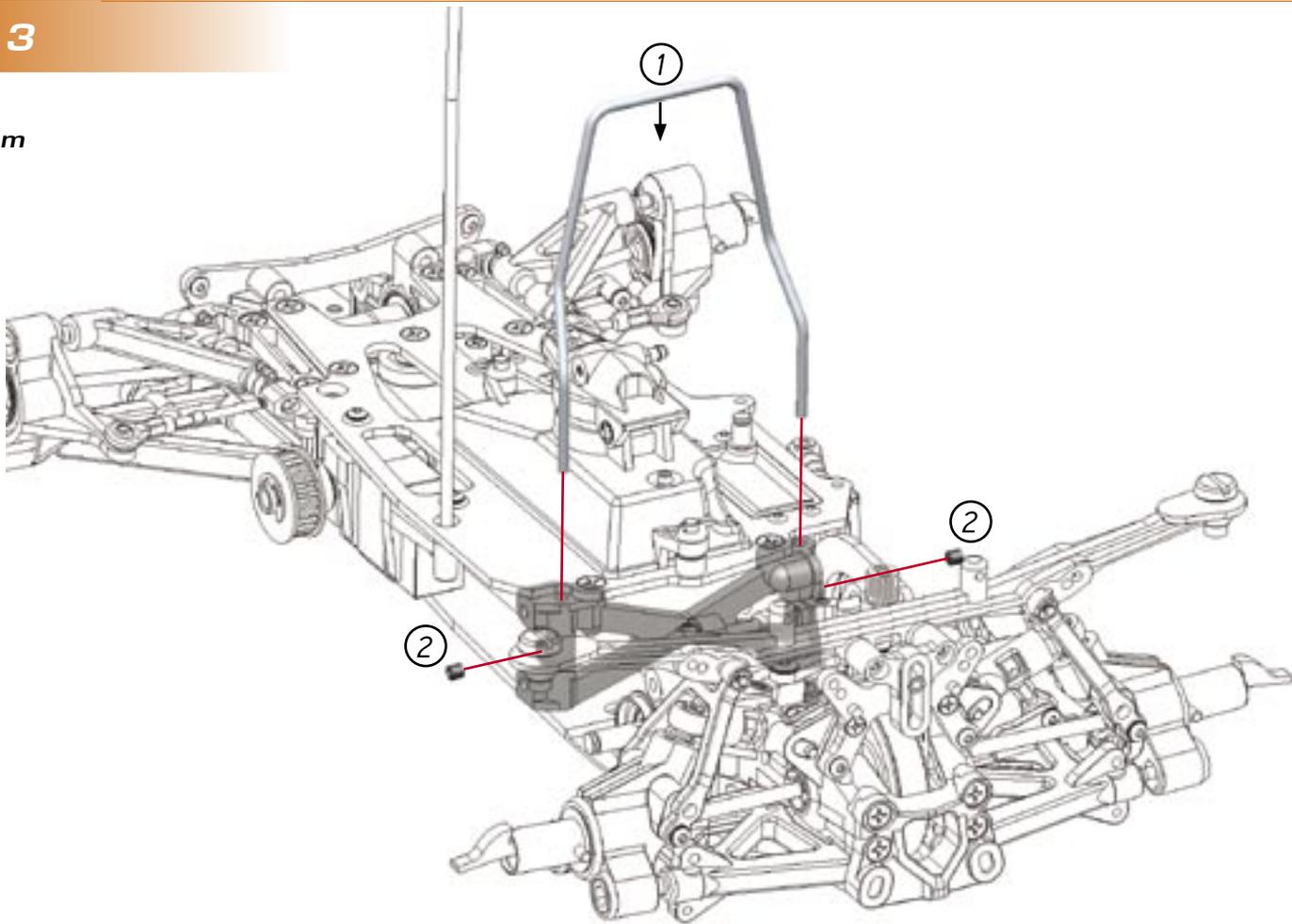


③ Servo Saver

Steering Linkage

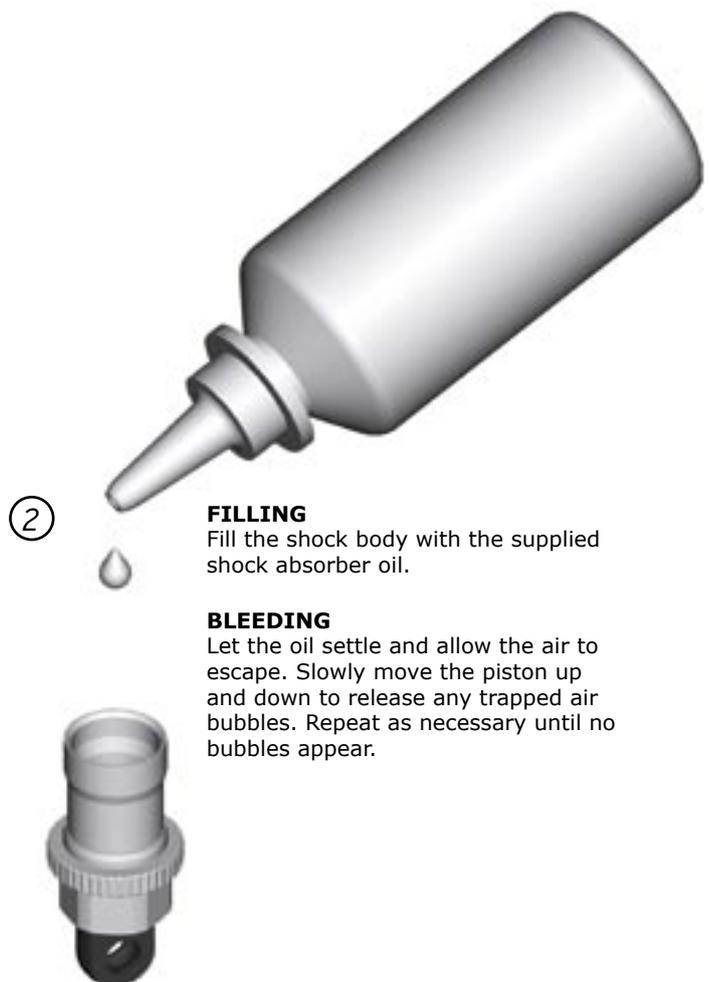
STEP 4.3


M4x4mm



STEP 4.4

BAG 12



STEP 4.5



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

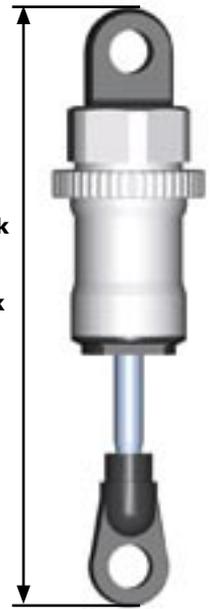
IMPORTANT! Do not cross thread!

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



Front shock
68mm

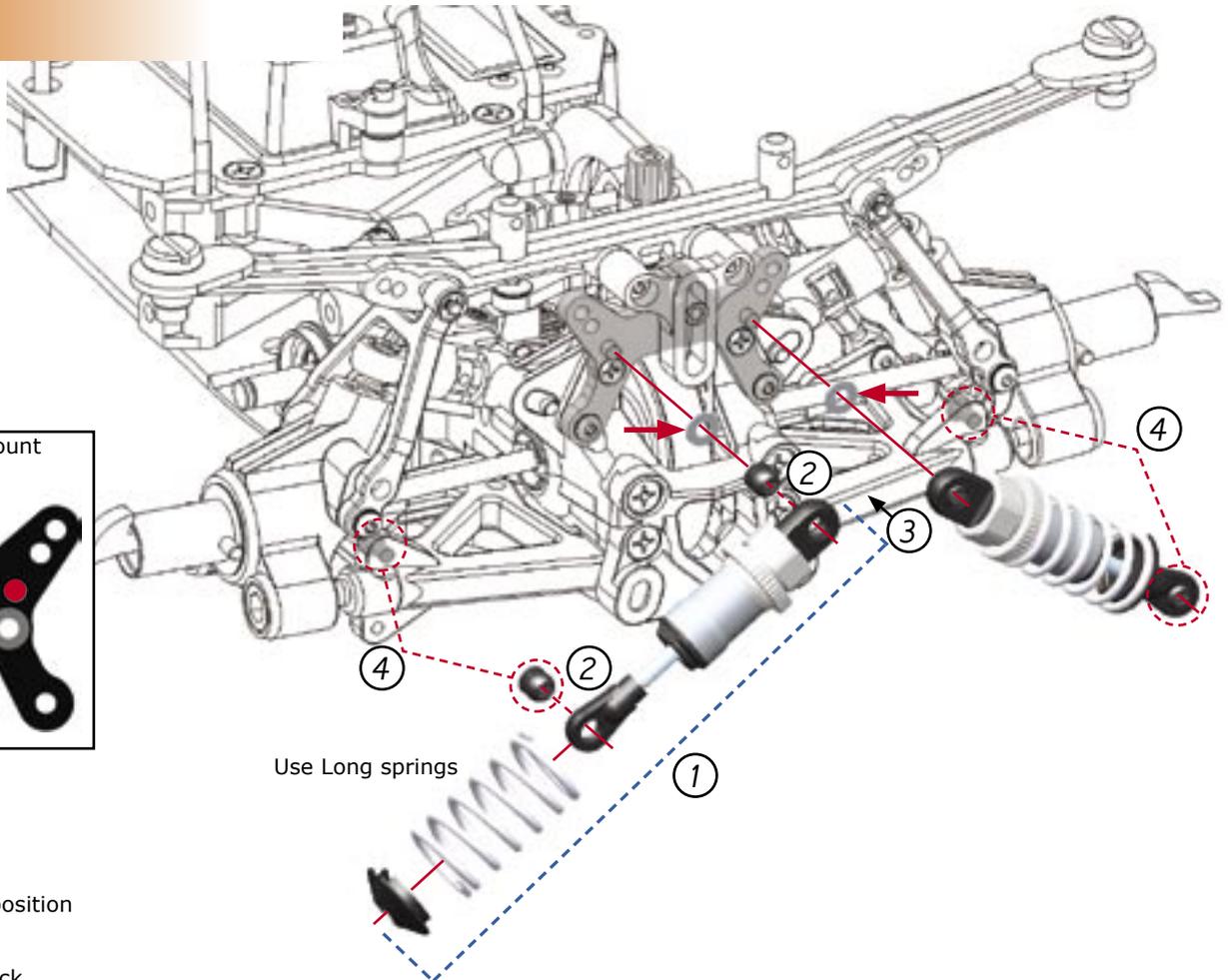
Rear shock
73mm



B Learn about shock damping

STEP 4.6

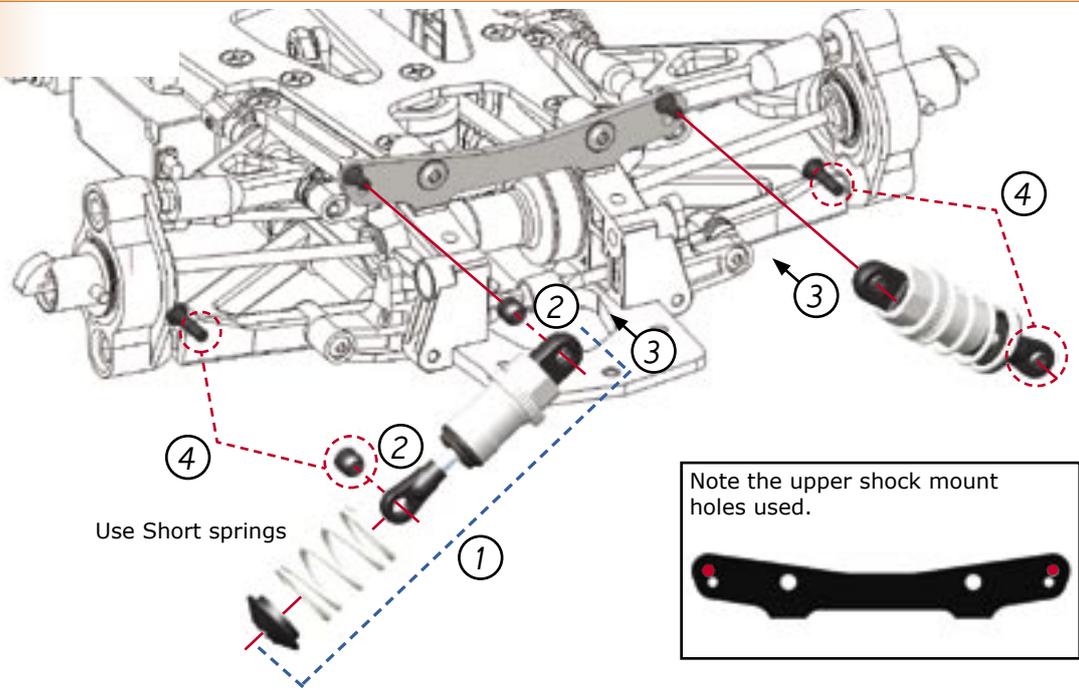
Note the lower shock mount holes used.



A Set rear shock position

B Learn about shock adjustment (damping, springs, preload)

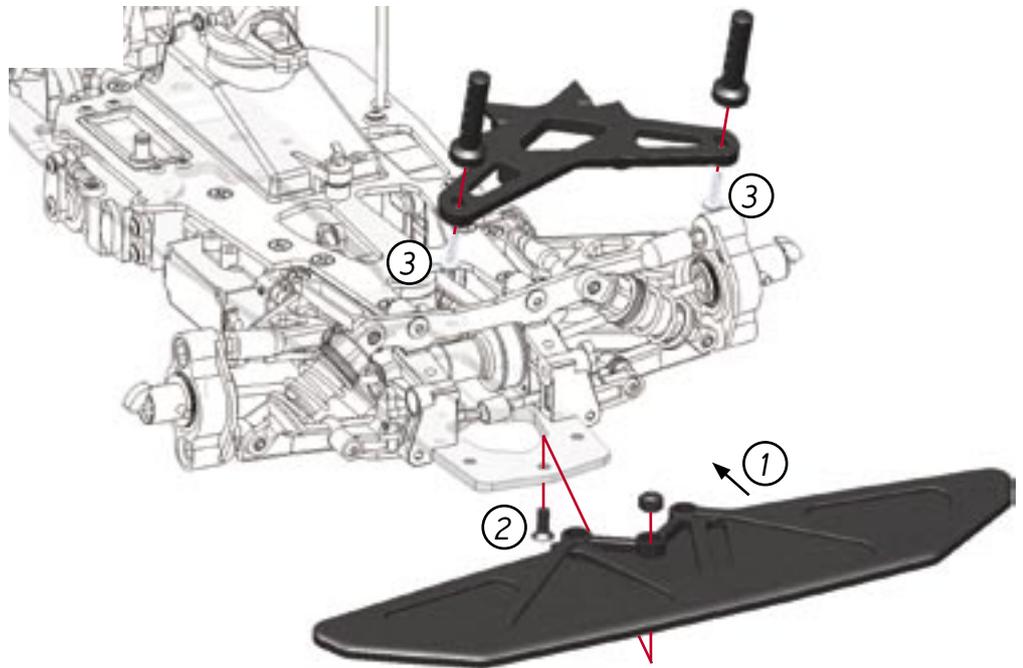
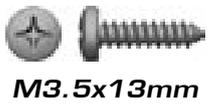
STEP 4.7



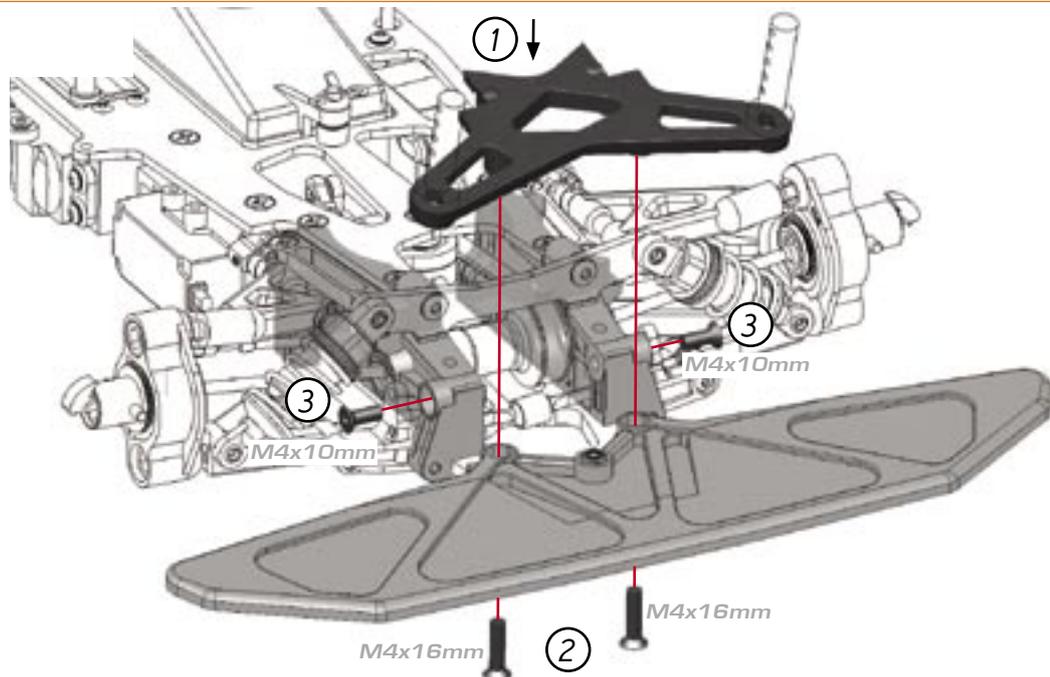
A Set front shock position

B Learn about shock adjustment (damping, springs, preload)

STEP 4.8



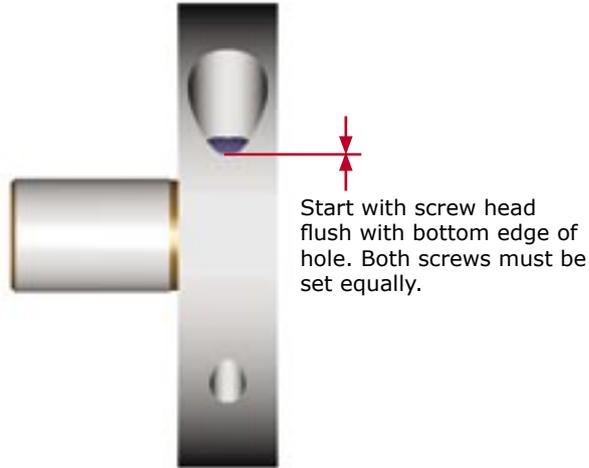
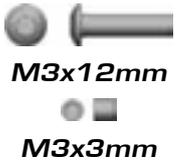
STEP 4.9



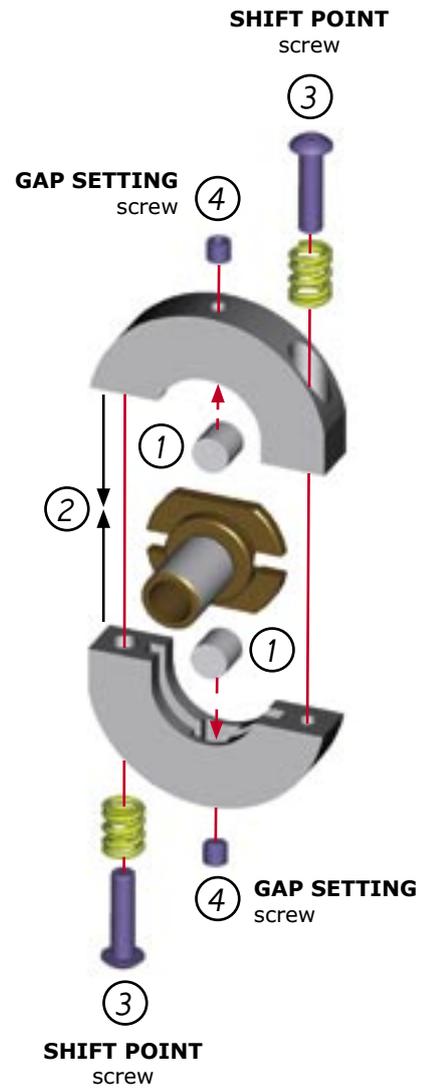
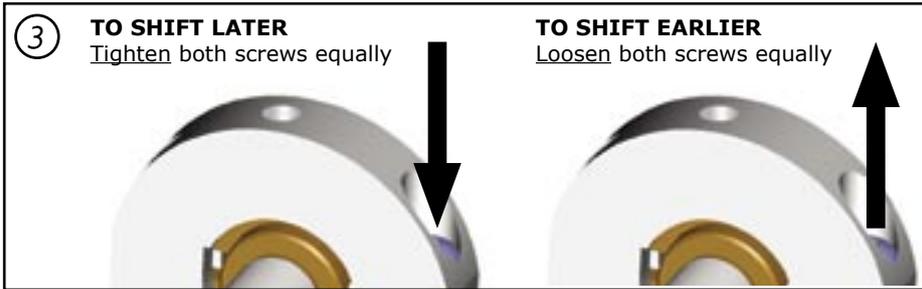
5.0 GEARBOX ASSEMBLY

STEP 5.1

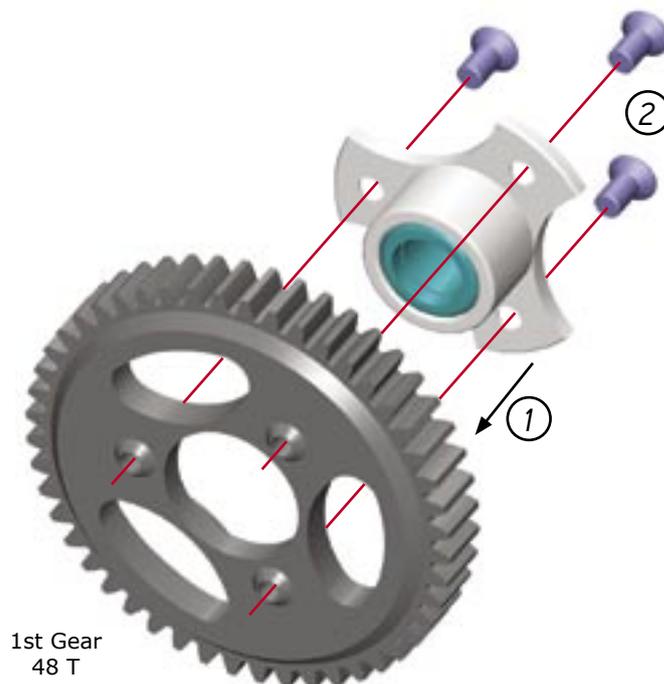
BAG 13



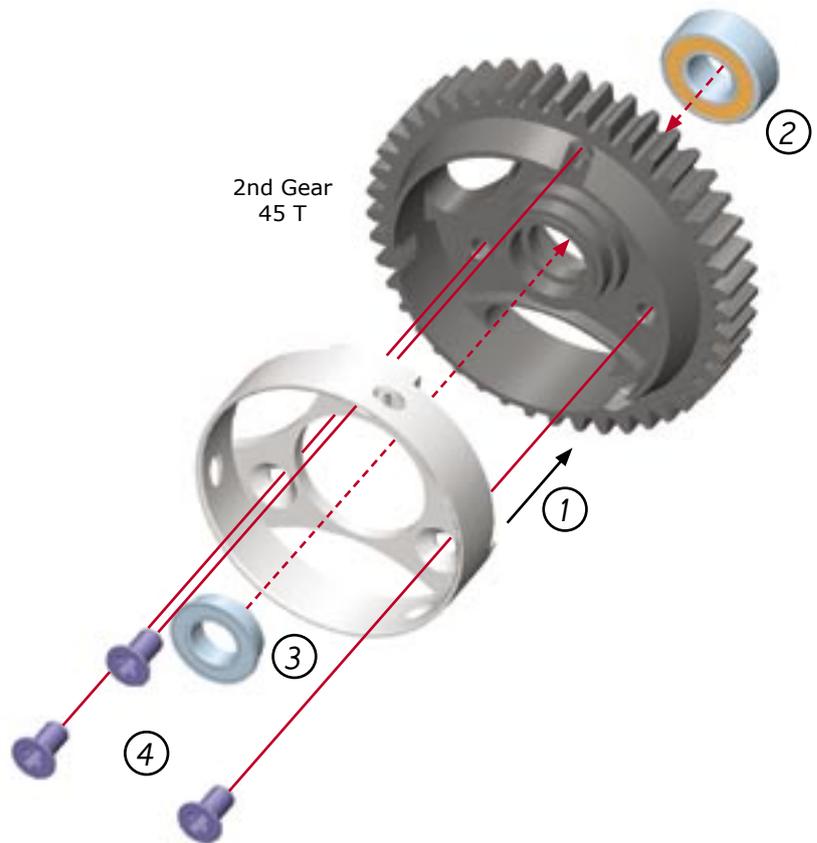
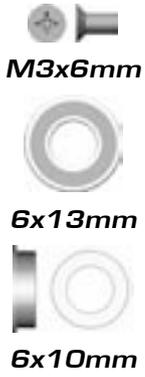
B Learn about shift point and shoe gap



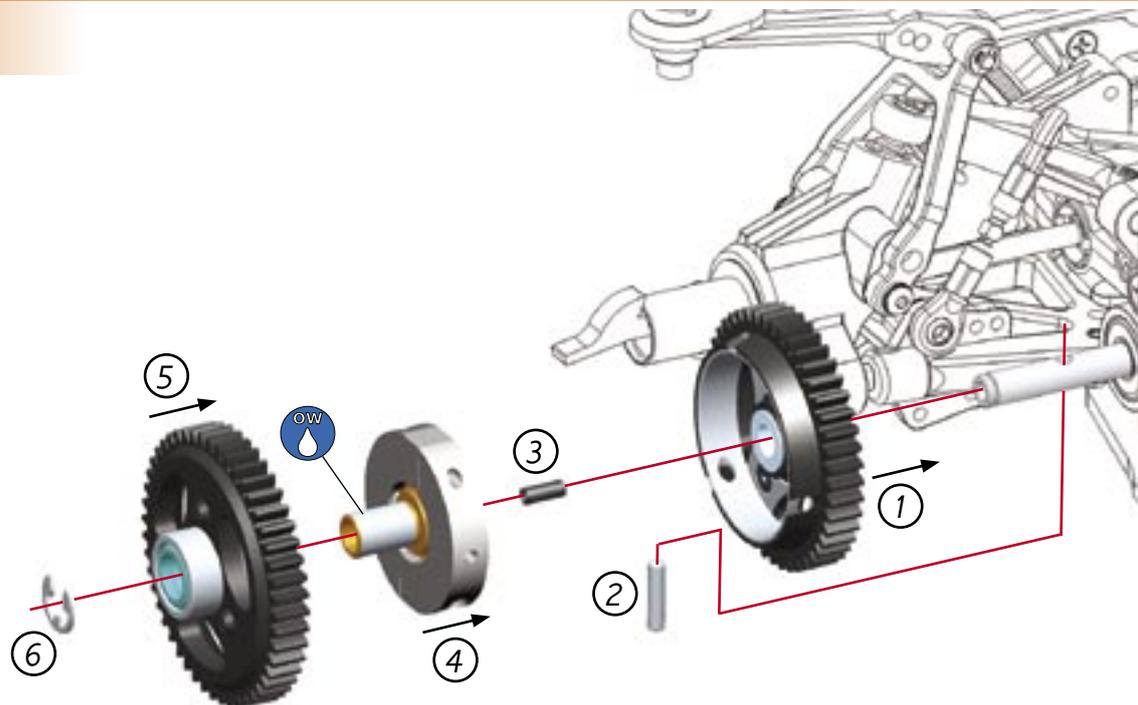
STEP 5.2



STEP 5.3



STEP 5.4



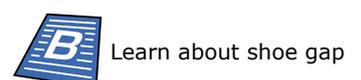
ADJUSTING THE 2-SPEED SHOE GAP

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.

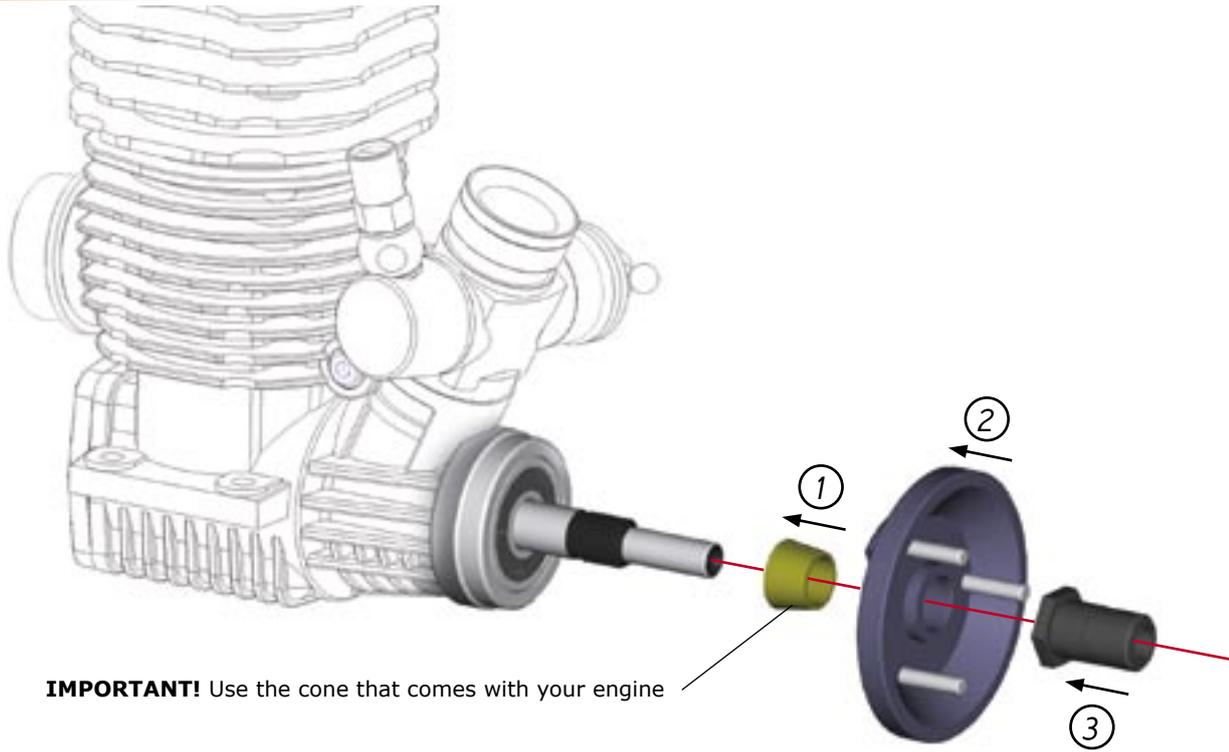
Install the first gear.



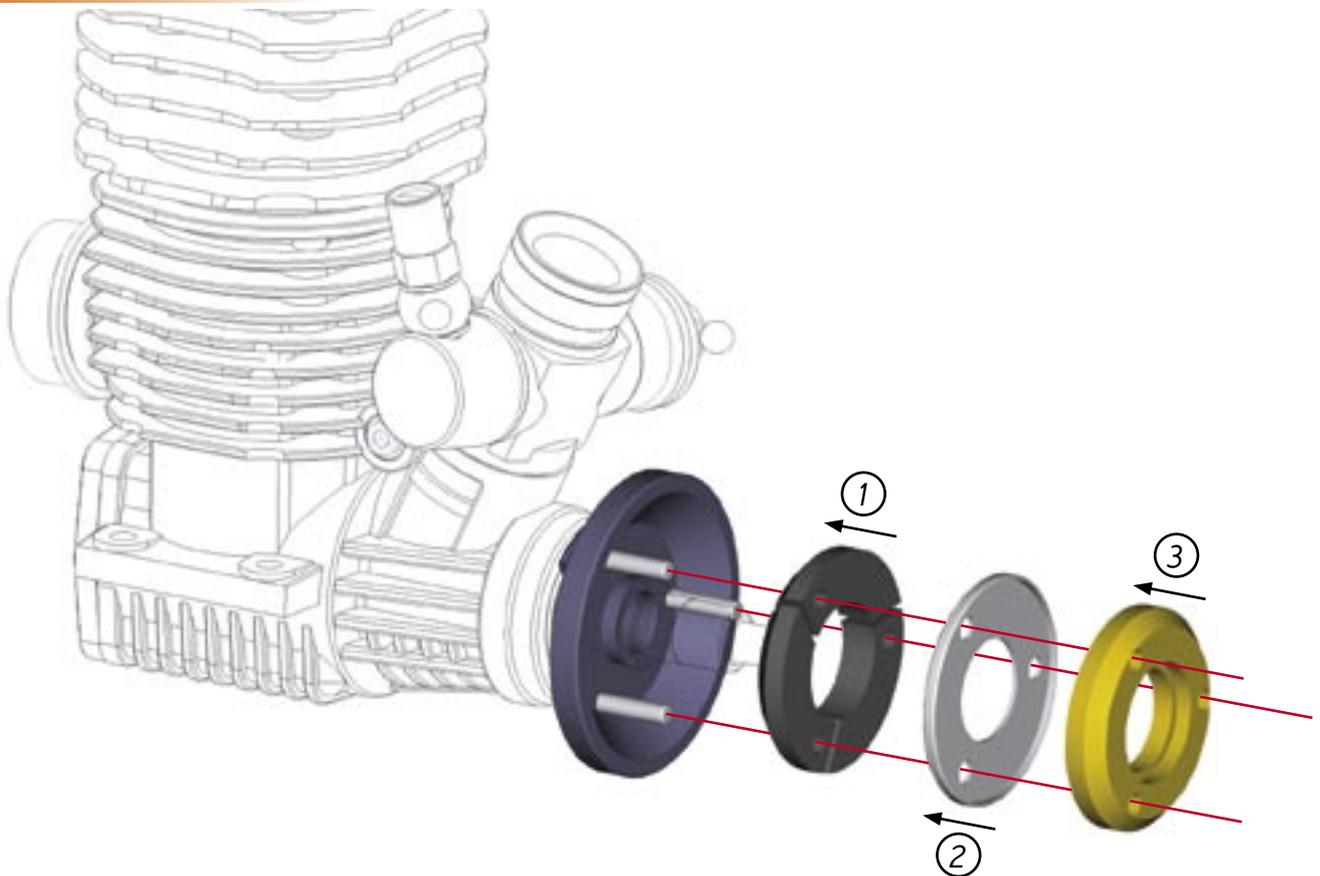
6.0 CENTAX ASSEMBLY

STEP 6.1

BAG 14

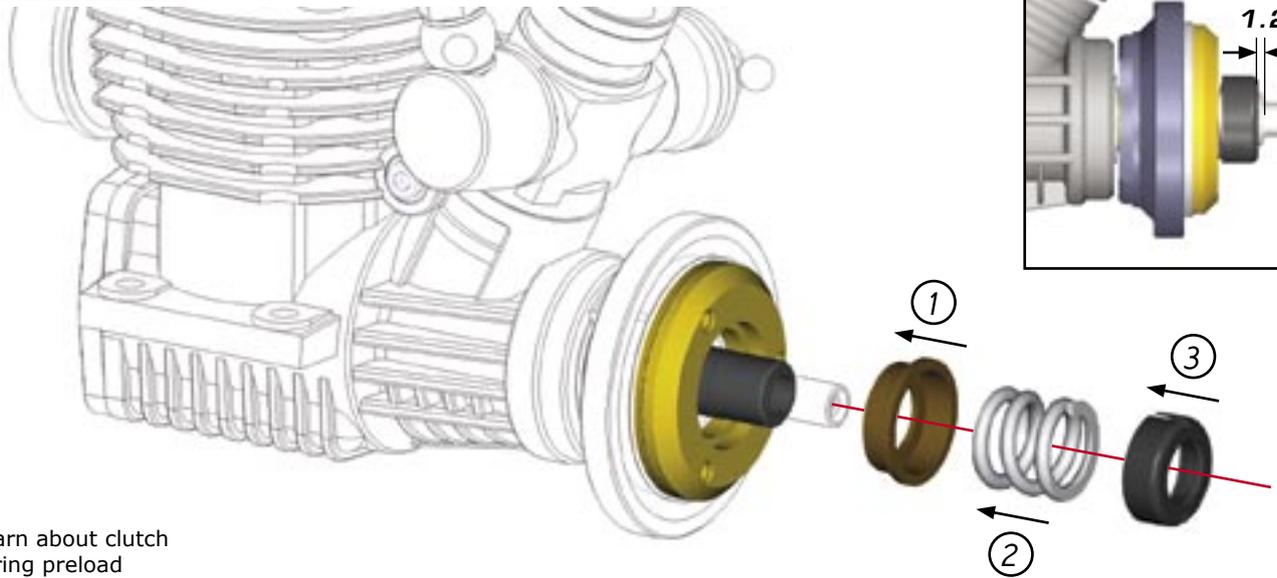


STEP 6.2



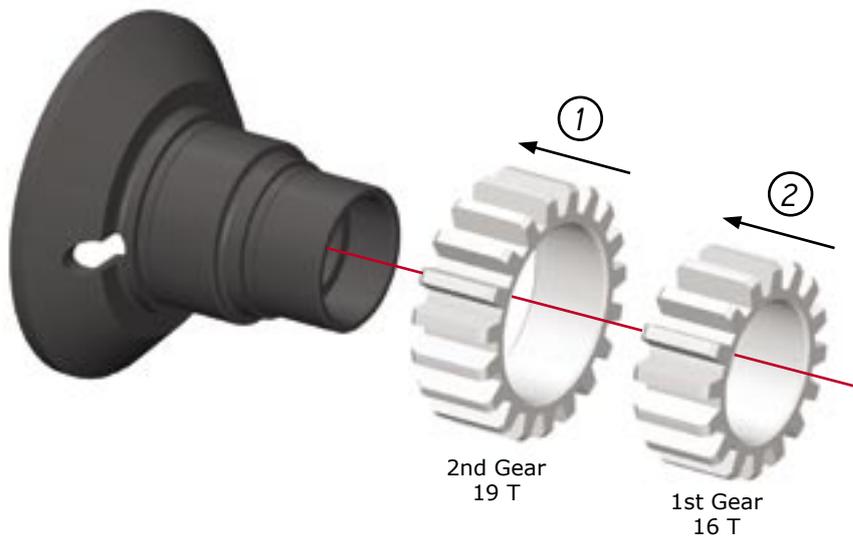
 Learn about clutch shoes and flyweights

STEP 6.3



B Learn about clutch spring preload

STEP 6.4

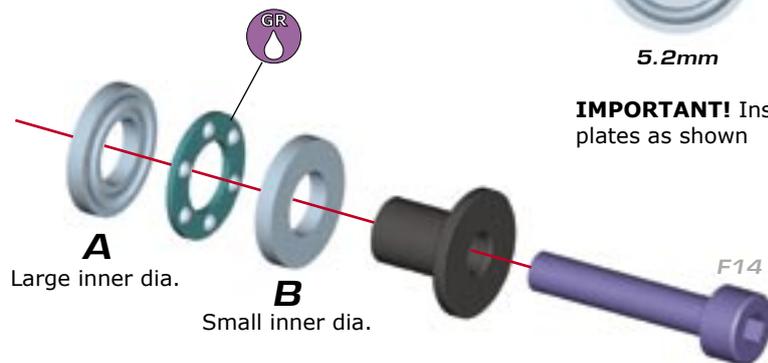


Note inside shoulders

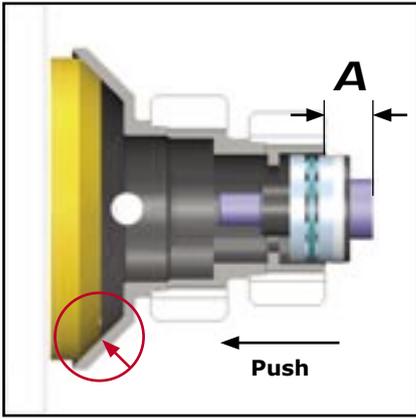
STEP 6.5



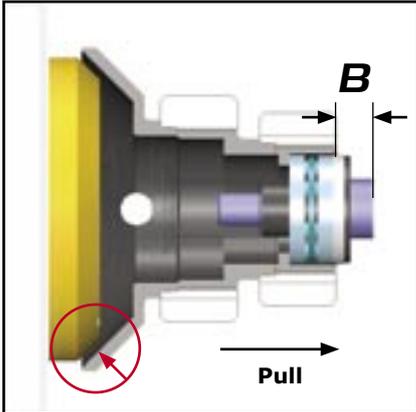
M3x16mm



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.

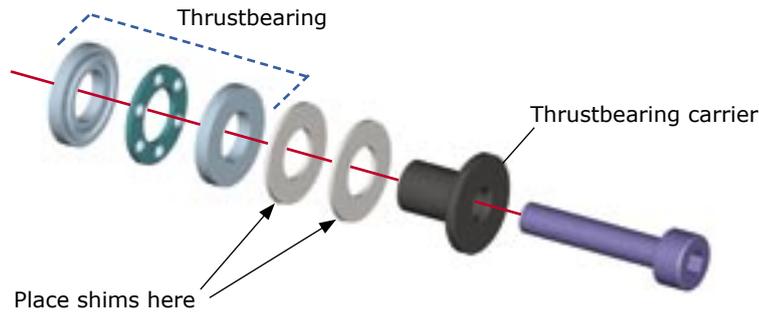


2 Pull the clutchbell away from the clutch shoe, and then measure the distance B as indicated.

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

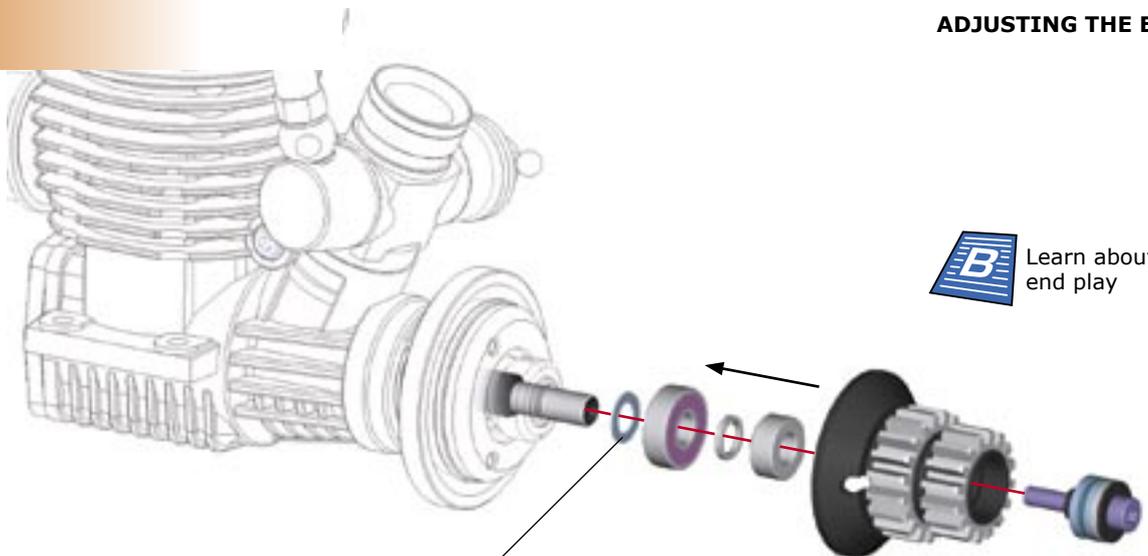
For example, using the values A=1.3mm, B=0.3mm
Shim thickness = 1.3 - 0.3 - 0.7 = 0.3mm

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



B Learn about clutch shoe gap

-  5x10x0.1mm
-  5x10x0.3mm
-  5x10mm
-  5x13mm



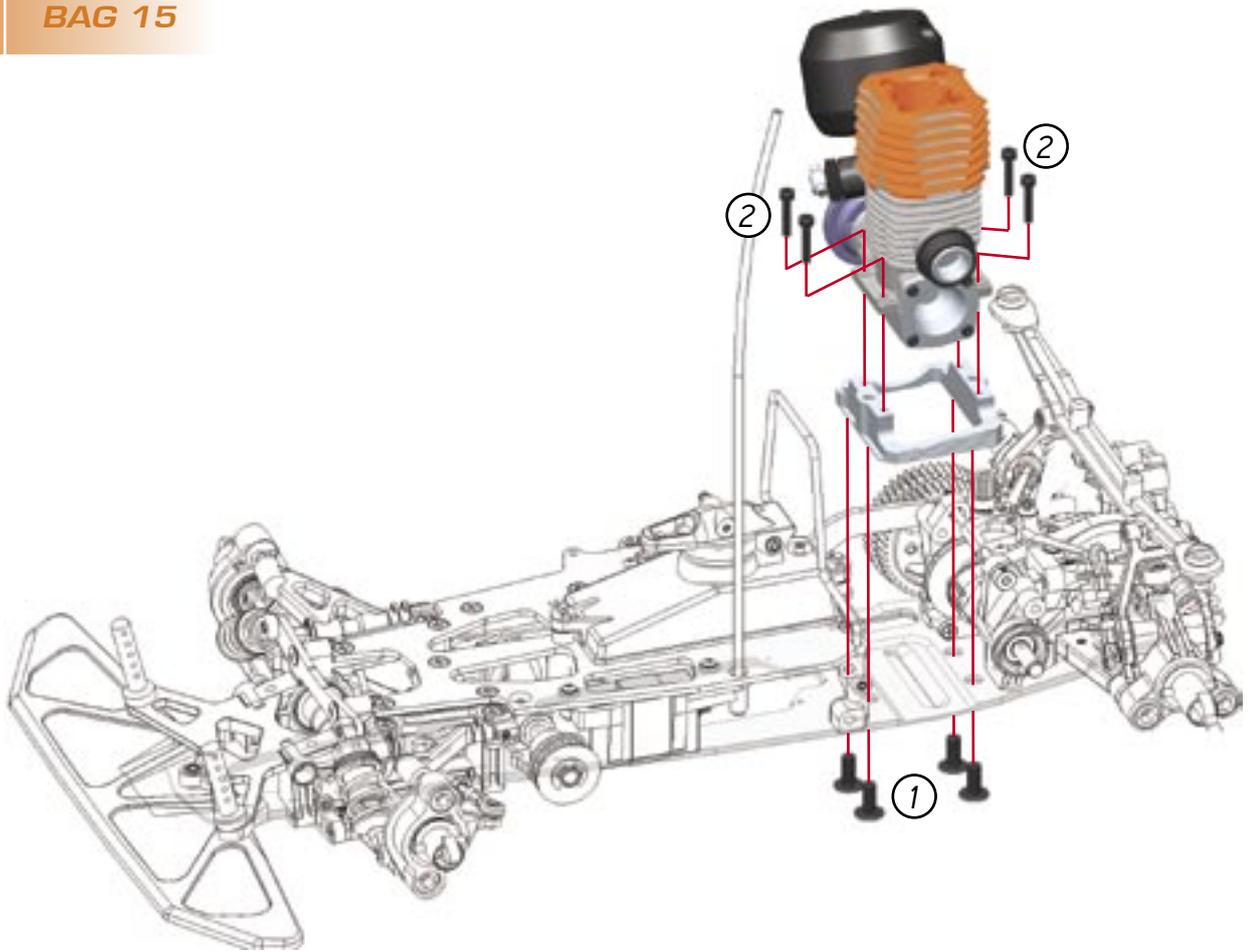
B Learn about clutch end play

Place small shims to remove all but a small amount of end play

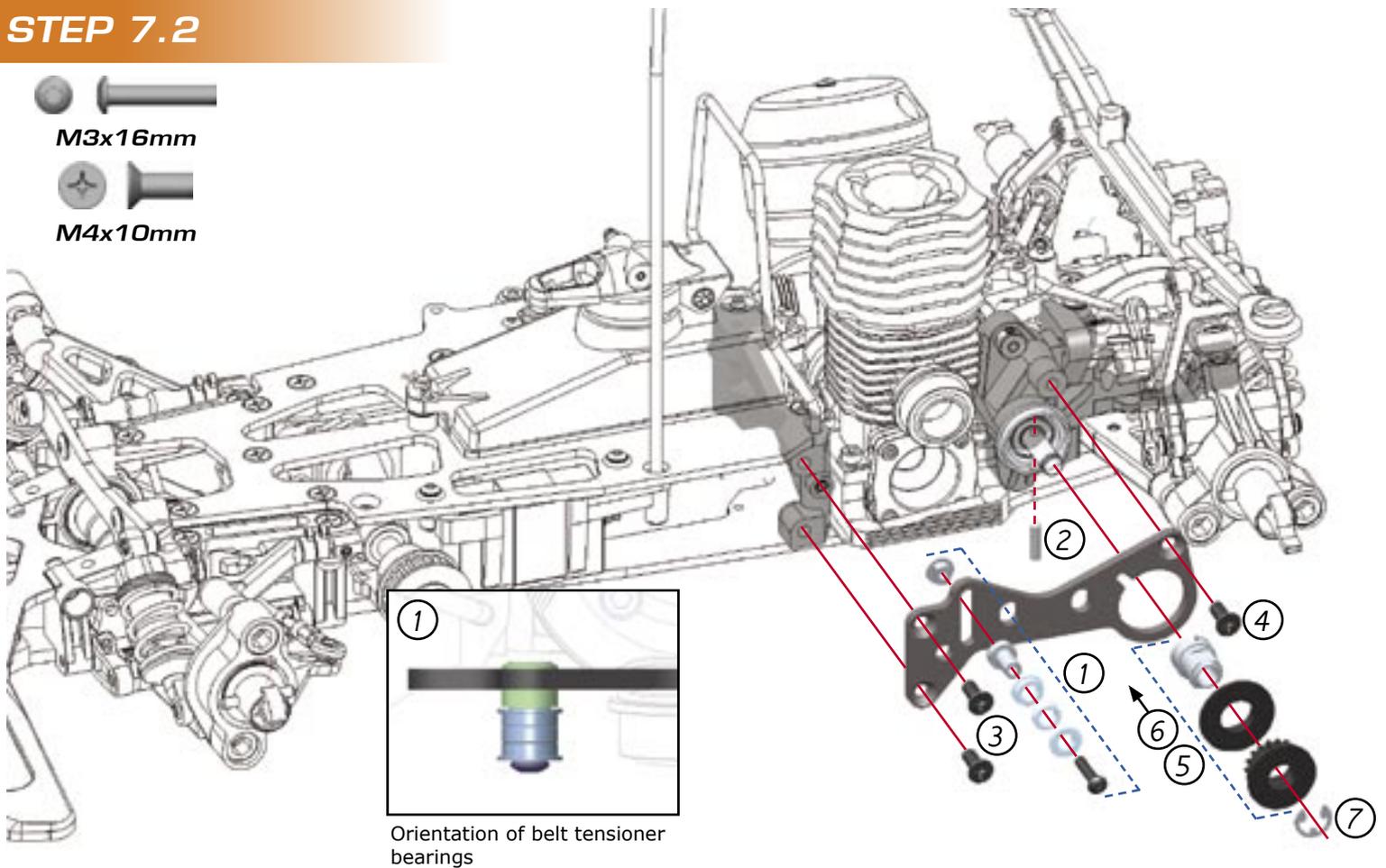
7.0 FINAL ASSEMBLY

STEP 7.1

BAG 15



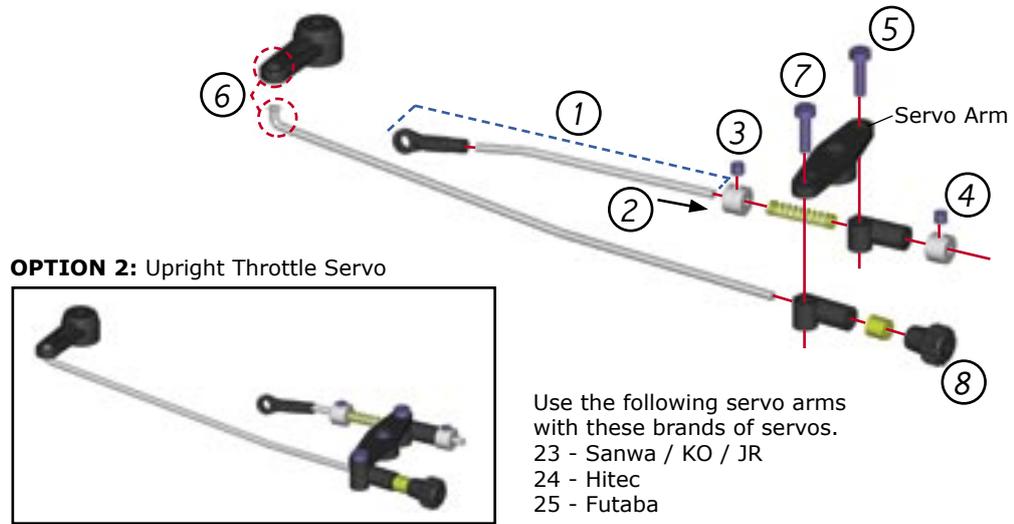
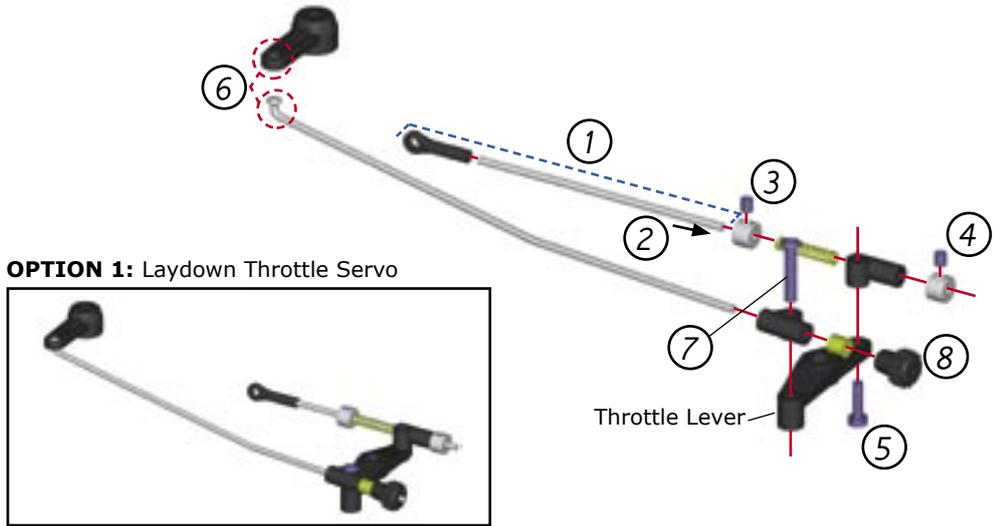
STEP 7.2



STEP 7.3

BAG 16

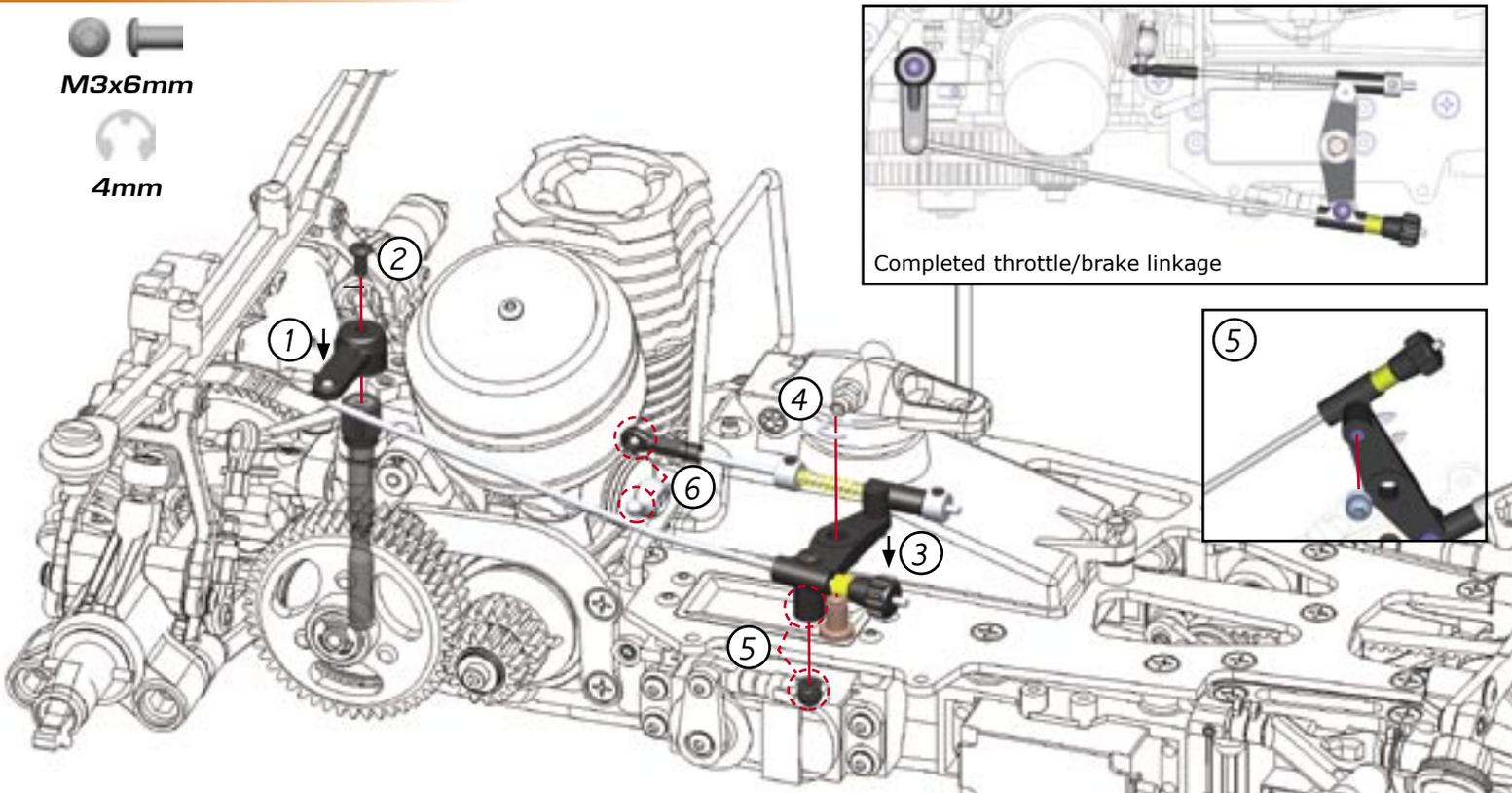
-  M2.5x8mm
-  M3x16mm
-  M3x3mm



STEP 7.4

-  M3x6mm
-  4mm

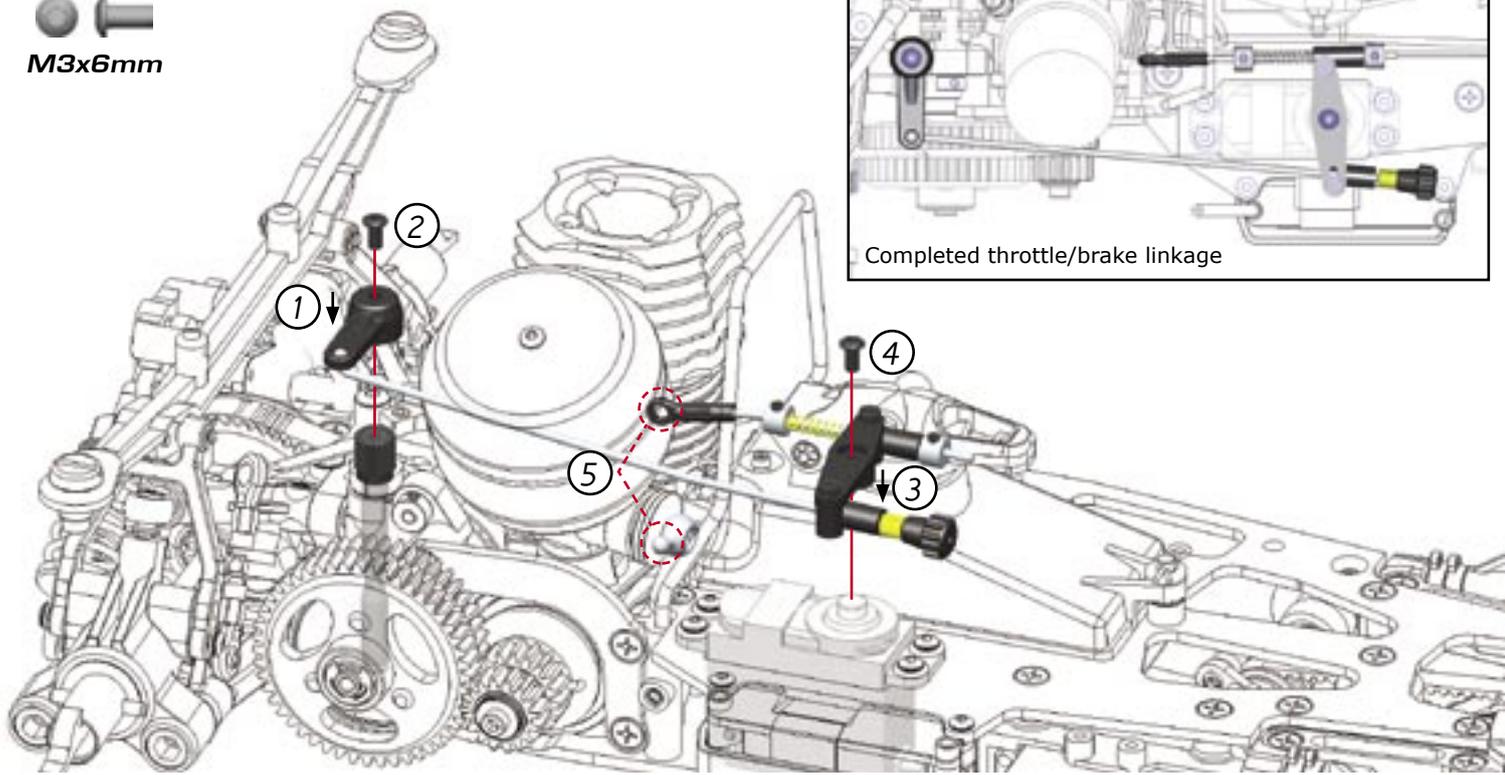
OPTION 1: Laydown Throttle Servo



STEP 7.5

OPTION 2: Upright Throttle Servo

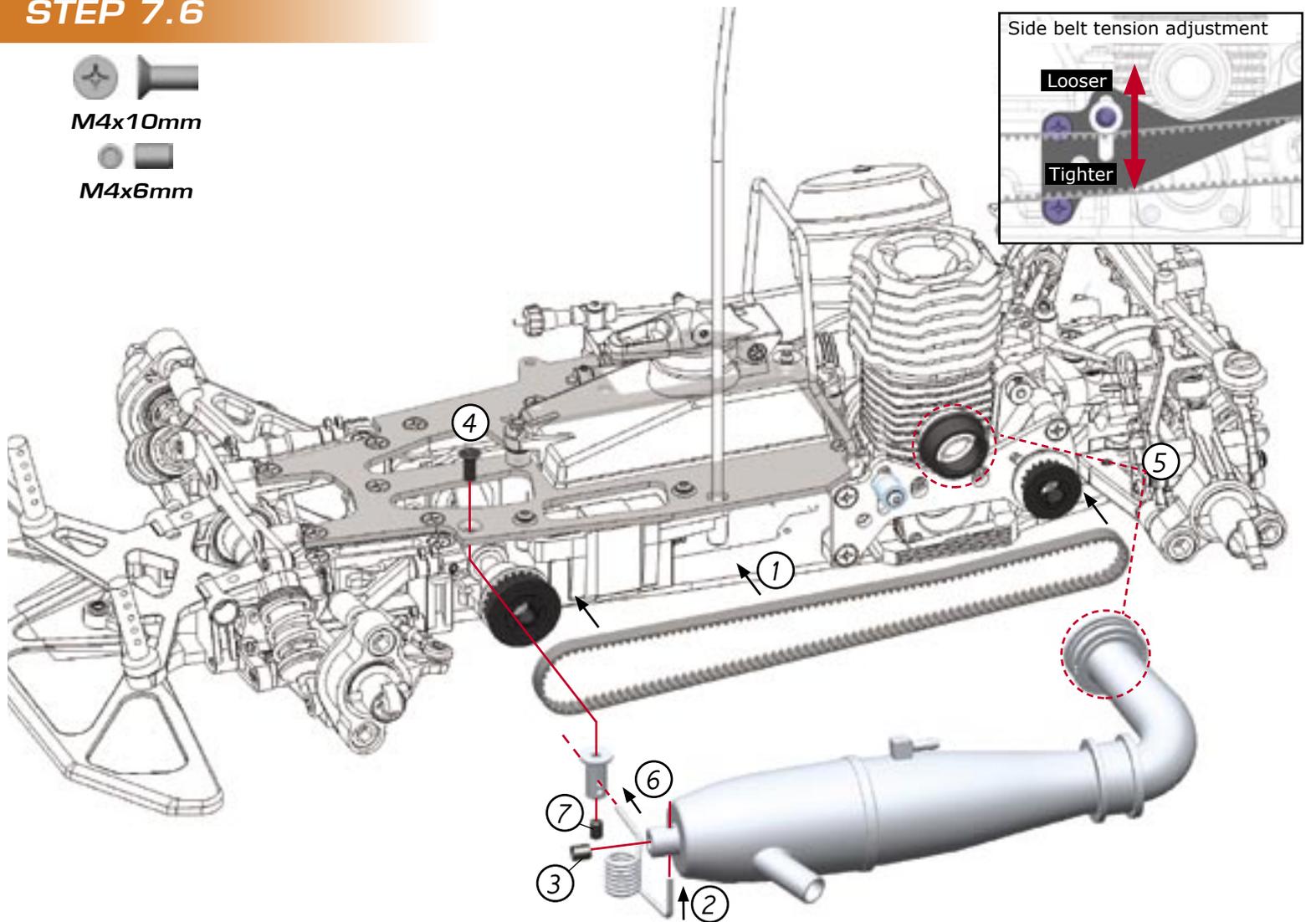

M3x6mm



STEP 7.6

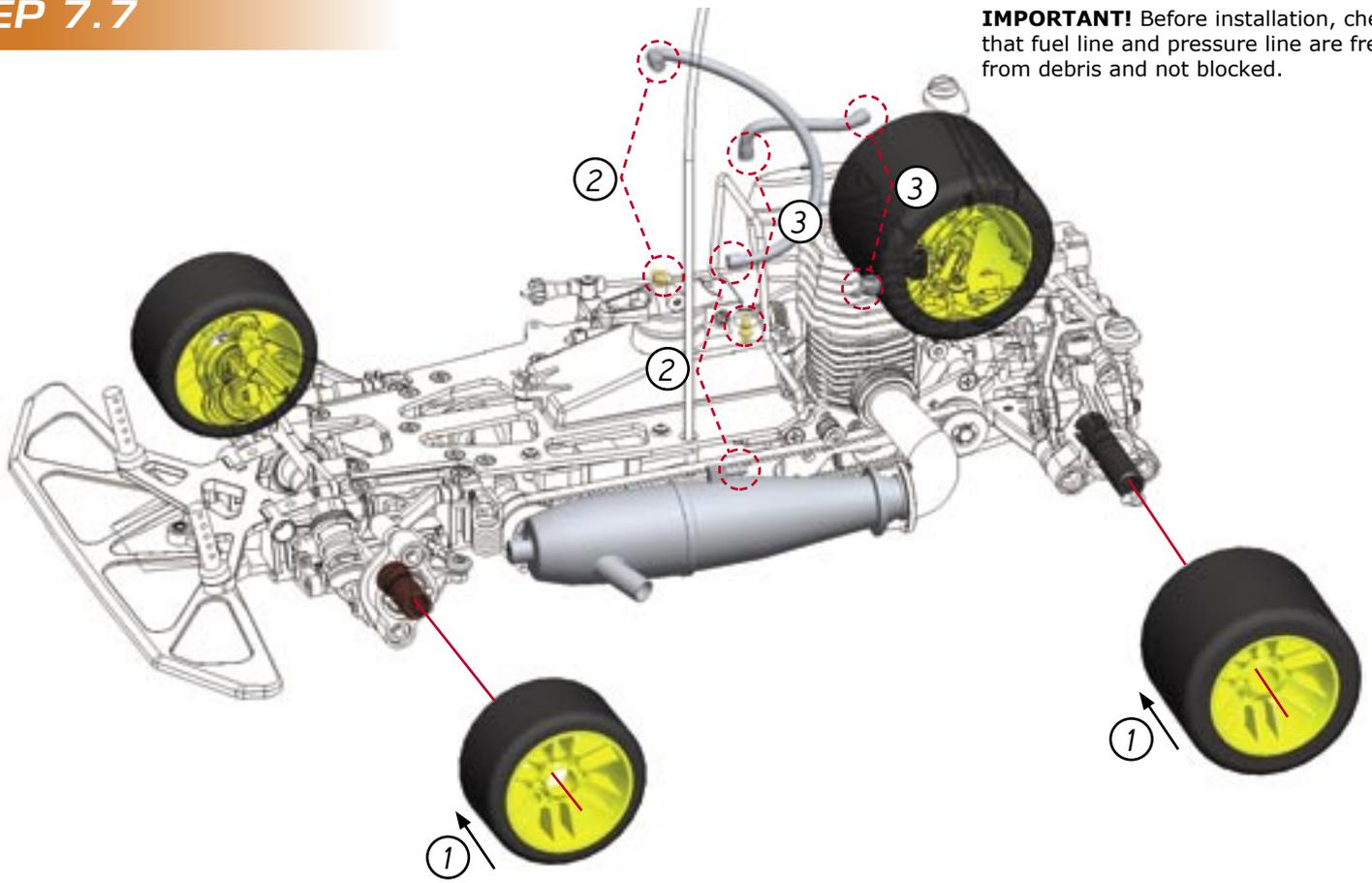

M4x10mm

M4x6mm



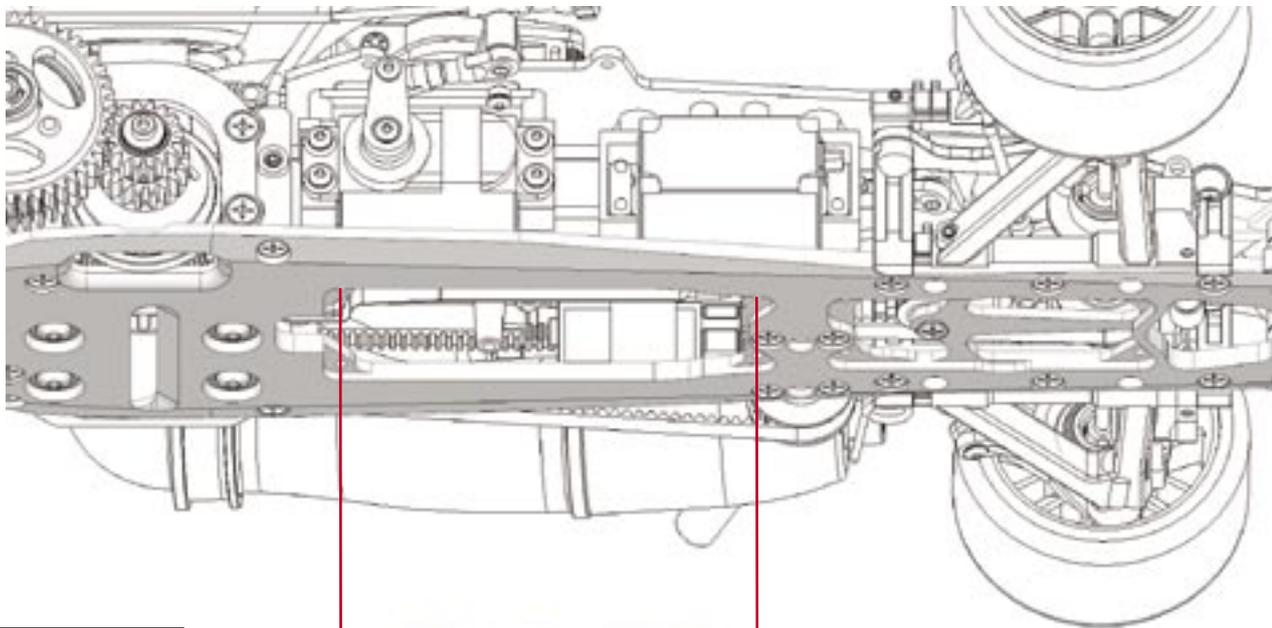
STEP 7.7

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

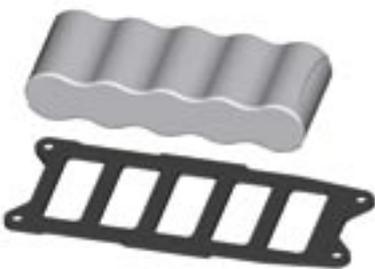


STEP 7.8


M3x6mm



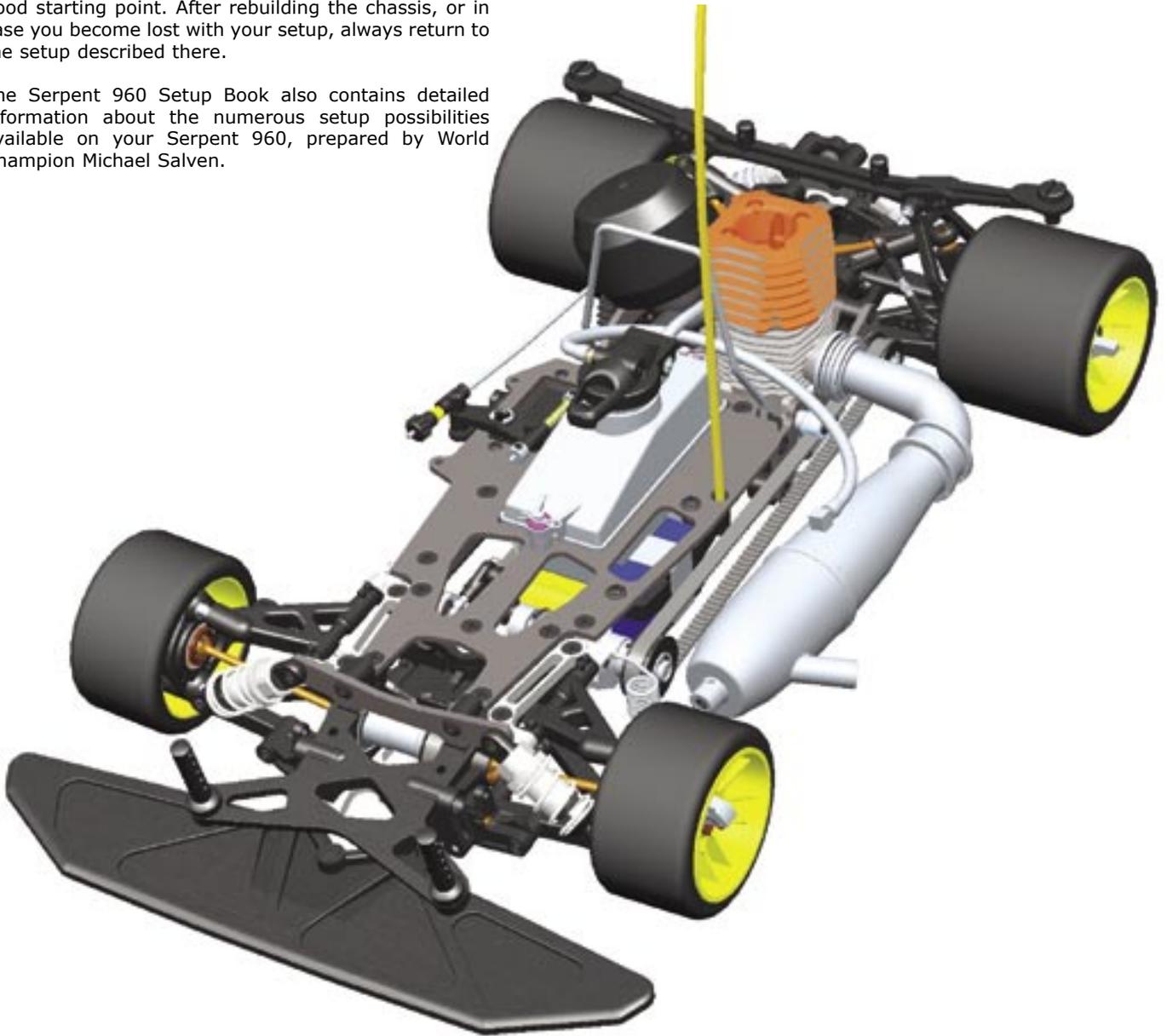
① Securely attach battery pack to mounting plate.



Congratulations, you have completed the building of your new Serpent 960 !

To prepare your car for its first run, go to the *Serpent 960 Setup Book* and follow the setup instructions in Section A: Basic Setup. The setup described there is a good starting point. After rebuilding the chassis, or in case you become lost with your setup, always return to the setup described there.

The Serpent 960 Setup Book also contains detailed information about the numerous setup possibilities available on your Serpent 960, prepared by World Champion Michael Salven.



SERPENT 960

SERPENT

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