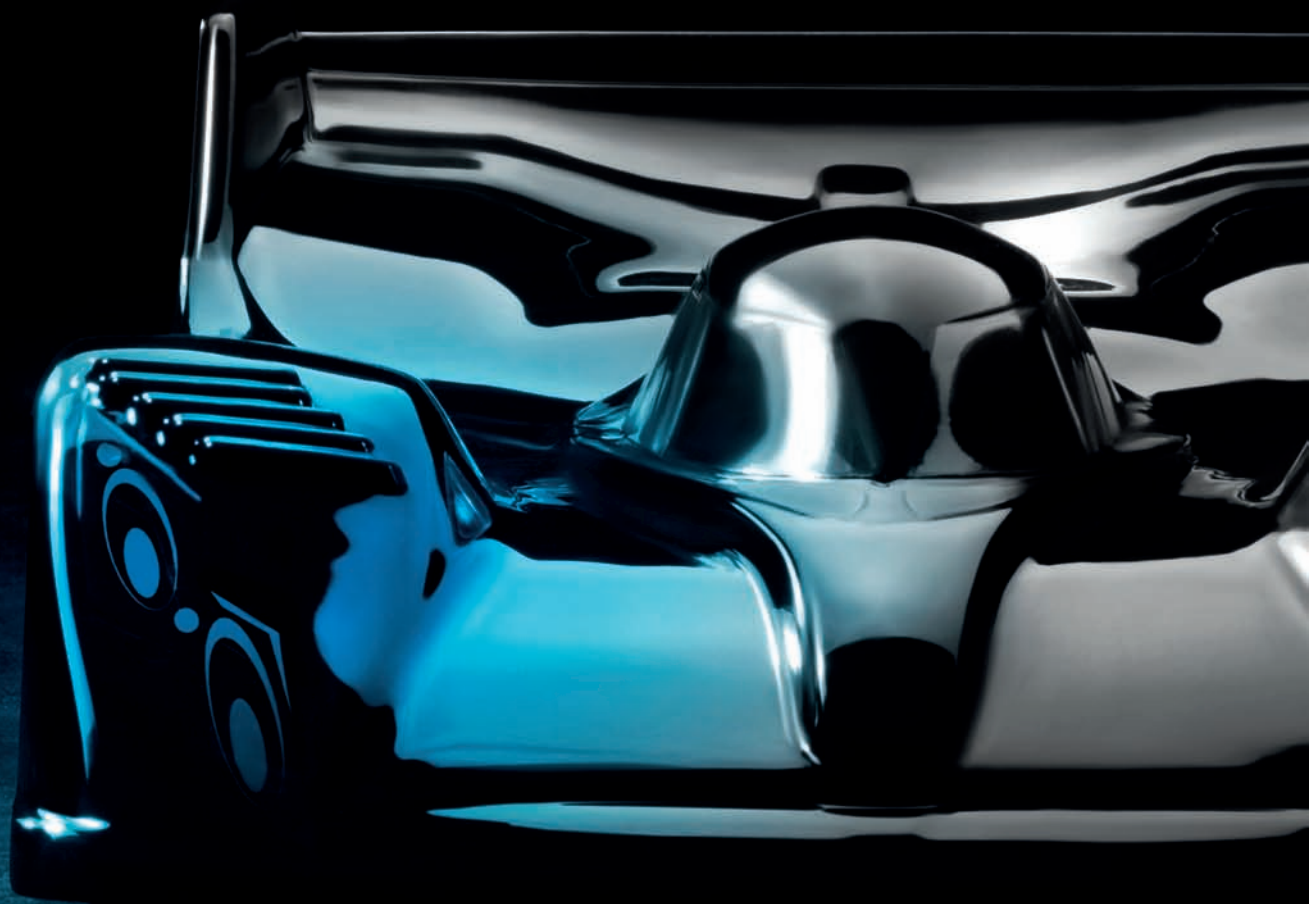


1/12 LUXURY PAN CAR

# XRAY X12



**INSTRUCTION MANUAL**  
FOR X12'20 EU & US EDITION

## BEFORE YOU START

This is a high-competition, high-quality RC car intended for persons aged 16 years and older with previous experience building and operating RC model racing cars. This is not a toy; it is a precision racing model. This model racing car is not intended for use by beginners, inexperienced customers, or by children without direct supervision of a responsible, knowledgeable adult. If you do not fulfill these requirements, please return the kit in unused and unassembled form back to the shop where you have purchased it.

Before building and operating your XRAY, **YOU MUST** read through all of the operating instructions and instruction manual and fully understand them to get the maximum enjoyment and prevent unnecessary damage.

## CUSTOMER SUPPORT

We have made every effort to make these instructions as easy to understand as possible. However, if you have any difficulties, problems, or questions, please do not hesitate to contact the XRAY support team at [info@teamxray.com](mailto:info@teamxray.com). Also, please visit our Web site at [www.teamxray.com](http://www.teamxray.com) to find the latest updates, set-up information, option parts, and many other goodies. We pride ourselves on taking excellent care of our customers.

You can join thousands of XRAY fans and enthusiasts in our online community at:

[www.teamxray.com](http://www.teamxray.com)

Read carefully and fully understand the instructions before beginning assembly.

Make sure you review this entire manual, download and use set-up book from the web, and examine all details carefully. If for some reason you decide this is not what you wanted or expected, **do not continue any further**. Your hobby dealer can not accept your kit for return or exchange after it has been partially or fully assembled.

Contents of the box may differ from pictures. In line with our policy of continuous product development, the exact specifications of the kit may vary without prior notice.

### XRAY Europe

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Slovakia, EUROPE  
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Fax: 421-32-7401109  
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### XRAY USA

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Irving, TX 75062  
USA  
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Fax: (214) 744-2401  
E-mail: [xray@rcamerica.com](mailto:xray@rcamerica.com)

**FAILURE TO FOLLOW THESE INSTRUCTIONS WILL BE CONSIDERED AS ABUSE AND/OR NEGLECT.**

## SAFETY PRECAUTIONS

Contains:

LEAD (CAS 7439-92-1) ANTIMONY (CAS 7440-36-0)

WARNING: This product contains a chemical known to the state of California to cause cancer and birth defects or other reproductive harm.

CAUTION: CANCER HAZARD

Contains lead, a listed carcinogen. Lead is harmful if ingested. Wash thoroughly after using. DO NOT use product while eating, drinking or using tobacco products. May cause chronic effects to gastrointestinal tract, CNS, kidneys, and blood. MAY CAUSE BIRTH DEFECTS.

When building, using and/or operating this model always wear protective glasses and gloves.

Take appropriate safety precautions prior to operating this model. You are responsible for this model's assembly and safe operation! Please read the instruction manual before building and operating this model and follow all safety precautions. Always keep the instruction manual at hand for quick reference, even

after completing the assembly. Use only genuine and original authentic XRAY parts for maximum performance. Using any third party parts on this model will void warranty immediately.

Improper operation may cause personal and/or property damage. XRAY and its distributors have no control over damage resulting from shipping, improper construction, or improper usage. XRAY assumes and accepts no responsibility for personal and/or property damages resulting from the use of improper building materials, equipment and operations. By purchasing any item produced by XRAY, the buyer expressly warrants that he/she is in compliance with all applicable federal, state and local laws and regulation regarding the purchase, ownership and use of the item. The buyer expressly agrees to indemnify and hold harmless XRAY for all claims resulting directly or indirectly from the purchase, ownership or use of the product. By the act of assembling or operating this product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, then he/she should return this kit in new, unassembled, and unused condition to the place of purchase.



## IMPORTANT NOTES - GENERAL

- This product is not suitable for children under 16 years of age without the direct supervision of a responsible and knowledgeable adult.
- Carefully read all manufacturers warnings and cautions for any parts used in the construction and use of your model.
- Assemble this kit only in places away from the reach of very small children.
- First-time builders and users should seek advice from people who have building experience in order to assemble the model correctly and to allow the model to reach its performance potential.
- Exercise care when using tools and sharp instruments.
- Take care when building, as some parts may have sharp edges.
- Keep small parts out of reach of small children. Children must not be allowed to put any parts in their mouth, or pull vinyl bag over their head.
- Read and follow instructions supplied with paints and/or cement, if used (not included in kit).
- Immediately after using your model, do NOT touch equipment on the model such as the motor and speed controller, because they generate high temperatures. You may seriously burn yourself seriously touching them.
- Follow the operating instructions for the radio equipment at all times.
- Do not put fingers or any objects inside rotating and moving parts, as this may cause damage or serious injury as your finger, hair, clothes, etc. may get caught.
- Be sure that your operating frequency is clear before turning on or running your model, and never share the same frequency with somebody else at the same time. Ensure that others are aware of the operating frequency you are using and when you are using it.
- Use a transmitter designed for ground use with RC cars. Make sure that no one else is using the same frequency as yours in your operating area. Using the same frequency at the same time, whether it is driving, flying or sailing, can cause loss of control of the RC model, resulting in a serious accident.
- Always turn on your transmitter before you turn on the receiver in the car. Always turn off the receiver before turning your transmitter off.
- Keep the wheels of the model off the ground when checking the operation of the radio equipment.
- Disconnect the battery pack before storing your model.
- When learning to operate your model, go to an area that has no obstacles that can damage your model if your model suffers a collision.
- Remove any sand, mud, dirt, grass or water before putting your model away.
- If the model behaves strangely, immediately stop the model, check and clear the problem.
- To prevent any serious personal injury and/or damage to property, be responsible when operating all remote controlled models.
- The model car is not intended for use on public places and roads or areas where its operation can conflict with or disrupt pedestrian or vehicular traffic.
- Because the model car is controlled by radio, it is subject to radio interference from many sources that are beyond your control. Since radio interference can cause momentary loss of control, always allow a safety margin in all directions around the model in order to prevent collisions.
- Do not use your model:
  - Near real cars, animals, or people that are unaware that an RC car is being driven.
  - In places where children and people gather
  - In residential districts and parks
  - In limited indoor spaces
  - In wet conditions
  - In the street
  - In areas where loud noises can disturb others, such as hospitals and residential areas.
  - At night or anytime your line of sight to the model may be obstructed or impaired in any way.

To prevent any serious personal injury and/or damage to property, please be responsible when operating all remote controlled models.

**XRAY**

## **IMPORTANT NOTES - ELECTRICAL**

- Insulate any exposed electrical wiring (using heat shrink tubing or electrical tape) to prevent dangerous short circuits. Take maximum care in wiring, connecting and insulating cables. Make sure cables are always connected securely. Check connectors for if they become loose. And if so, reconnect them securely. Never use RC models with damaged wires. A damaged wire is extremely dangerous, and can cause short-circuits resulting in fire. Please have wires repaired at your local hobby shop.
- Low battery power will result in loss of control. Loss of control can occur due to a weak battery in either the transmitter or the receiver. Weak running battery may also result in an out of control car if your car's receiver power is supplied by the running battery. Stop operation immediately if the car starts to slow down.
- When not using RC model, always disconnect and remove battery.
- Do not disassemble battery or cut battery cables. If the running battery short-circuits, approximately 300W of electricity can be discharged, leading to fire or burns. Never disassemble battery or cut battery cables.
- Use a recommended charger for the receiver and transmitter batteries and follow the instructions correctly. Over-charging, incorrect charging, or using

inferior chargers can cause the batteries to become dangerously hot. Recharge battery when necessary. Continual recharging may damage battery and, in the worst case, could build up heat leading to fire. If battery becomes extremely hot during recharging, please ask your local hobby shop for check and/or repair and/or replacement.

- Regularly check the charger for potential hazards such as damage to the cable, plug, casing or other defects. Ensure that any damage is rectified before using the charger again. Modifying the charger may cause short-circuit or overcharging leading to a serious accident. Therefore do not modify the charger.
- Always unplug charger when recharging is finished.
- Do not recharge battery while battery is still warm. After use, battery retains heat. Wait until it cools down before charging.
- Do not allow any metal part to short circuit the receiver batteries or other electrical/electronic device on the model.
- Immediately stop running if your RC model gets wet as may cause short circuit.
- Please dispose of batteries responsibly. Never put batteries into fire.

## **R/C & BUILDING TIPS**

- Make sure all fasteners are properly tightened. Check them periodically.
- Make sure that chassis screws do not protrude from the chassis.
- For the best performance, it is very important that great care is taken to ensure the free movement of all parts.
- Clean all ball-bearings so they move very easily and freely.
- Tap or pre-thread the plastic parts when threading screws.
- Self-tapping screws cut threads into the parts when being tightened. Do not use excessive force when tightening the self-tapping screws because you may strip out the thread in the plastic. We recommended you stop tightening a screw when you feel some resistance.
- Ask your local hobby shop for any advice.

Please support your local hobby shop. We at XRAY Model Racing Cars support all local hobby dealers. Therefore we ask you, if at all possible, to purchase XRAY products at your hobby dealer and give them your support like we do. If you have difficulty finding XRAY products, please check out [www.teamxray.com](http://www.teamxray.com) to get advice, or contact us via email at [info@teamxray.com](mailto:info@teamxray.com), or contact the XRAY distributor in your country.

## **WARRANTY**

XRAY guarantees this model kit to be free from defects in both material and workmanship within 30 days of purchase. The total monetary value under warranty will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification or as a result of wear. Part or parts missing from this kit must be reported within 30 days of purchase. No part or parts will be sent under warranty without proof of purchase. Should you find a defective or missing part, contact the local distributor. Service and customer support will be provided through local hobby store where you have purchased the kit, therefore make sure to purchase any XRAY products at your local hobby store. This model racing car is considered to be a high-performance racing vehicle. As such this vehicle will be used in an extreme range of conditions and situations, all which may cause premature wear or failure of any component. XRAY has no control over usage of vehicles once they leave the dealer, therefore XRAY can only offer warranty against all manufacturer's defects in materials, workmanship, and assembly at point of sale and before use. No warranties are expressed or implied that cover damage caused by what is considered normal use, or cover or imply how long any model cars' components or electronic components will last before requiring replacement.

Due to the high performance level of this model car you will need to periodically maintain and replace consumable components. Any and all warranty coverage will not cover replacement of any part or component damaged by neglect, abuse, or improper or unreasonable use. This includes but is not limited to damage from crashing, chemical and/or water damage, excessive moisture, improper

or no maintenance, or user modifications which compromise the integrity of components. Warranty will not cover components that are considered consumable on RC vehicles. XRAY does not pay nor refund shipping on any component sent to XRAY or its distributors for warranty. XRAY reserves the right to make the final determination of the warranty status of any component or part.

### **Limitations of Liability**

XRAY makes no other warranties expressed or implied. XRAY shall not be liable for any loss, injury or damages, whether direct, indirect, special, incidental, or consequential, arising from the use, misuse, or abuse of this product and/or any product or accessory required to operate this product. In no case shall XRAY's liability exceed the monetary value of this product.

**Take adequate safety precautions prior to operating this model. You are responsible for this model's assembly and safe operation.**

**Disregard of the any of the above cautions may lead to accidents, personal injury, or property damage. XRAY MODEL RACING CARS assumes no responsibility for any injury, damage, or misuse of this product during assembly or operation, nor any additions that may arise from the use of this product.**

**All rights reserved.**

## **QUALITY CERTIFICATE**

XRAY MODEL RACING CARS uses only the highest quality materials, the best compounds for molded parts and the most sophisticated manufacturing processes of TQM (Total Quality Management). We guarantee that all parts of a newly-purchased kit are manufactured with the highest regard to quality. However, due to the many factors inherent in model racecar competition, we cannot guarantee

any parts once you start racing the car. Products which have been worn out, abused, neglected or improperly operated will not be covered under warranty. We wish you enjoyment of this high-quality and high-performance RC car and wish you best success on the track!

**In line with our policy of continuous product development, the exact specifications of the kit may vary. In the unlikely event of any problems with your new kit, you should contact the model shop where you purchased it, quoting the part number.**

**We do reserve all rights to change any specification without prior notice. All rights reserved.**

# SYMBOLS USED

|                    |                                     |  |                          |  |                   |                        |
|--------------------|-------------------------------------|--|--------------------------|--|-------------------|------------------------|
| Part bags used<br> | Assemble in the specified order<br> | Assemble left and right sides the same way<br> | Pay attention here<br>   | Assemble as many times as specified (here twice)<br> | Cut<br>           | Apply CA glue<br>      |
| Apply oil<br>      | Apply grease<br>                    | Ensure smooth non-binding movement<br>         | Tighten screw gently<br> | Detail view<br>                                      | Assembly view<br> | Follow Set-Up Book<br> |

# TOOLS REQUIRED

|  |  |                                    |  |                                      |  |
|--|--|------------------------------------|--|--------------------------------------|--|
| <b>HUDY TOOLS:</b> Allen: 1.5mm, 2.0mm, 2.5mm<br>Socket: 5.5mm, Arm Reamer 3.0mm<br> | Combination Pliers<br>(HUDY #189020)<br> | Side Cutters<br>(HUDY #189010)<br> | Pocket Hobby Knife<br>(HUDY #188981)<br> | Turnbuckle 3mm<br>(HUDY #181030)<br> | Reamer<br>(HUDY #107600)<br>or<br>(HUDY #107601)<br> |
|  |  |                                    | Scissors<br>(HUDY #188990)<br>           | Turnbuckle 4mm<br>(HUDY #181040)<br> |  |

# EQUIPMENT INCLUDED

|   |                                    |
|---|------------------------------------|
| <b>HUDY Premium Silicone Oil</b><br>700cSt (HUDY #106370 50ml)<br>3000cSt (HUDY #106430 50ml)<br> | Diff. Grease<br>(HUDY #106211)<br> |
|---|------------------------------------|

# NOT INCLUDED

| <p>To ensure that you always have access to the most up-to-date version of the XRAY Set-up Book, XRAY will now be offering only the digital online version at our website at <a href="http://www.teamxray.com">www.teamxray.com</a>. By offering this online version instead of including a hardcopy printed version in kits, you will always be assured of having the most current updated version. The Set-up Book features the T-bar version of the XII, however the majority of all set-up adjustments and theory are the same. We strongly recommend that you read and understand the Set-up Book before operating your car.</p> | <table border="1"> <thead> <tr> <th colspan="2">SAMPLE OF OPTIONAL PARTS</th> </tr> </thead> <tbody> <tr> <td>#37XXX</td> <td>OPTION 1</td> </tr> <tr> <td>#37XXX</td> <td>OPTION 2</td> </tr> <tr> <td>#37XXX</td> <td>OPTION 3</td> </tr> </tbody> </table> <p>XRAY offers wide range of optional tuning parts which are listed in a table like this. Please refer to the exploded view of each main section to verify which parts are included in the kit; other parts are available as optional parts, and must be purchased separately.</p> | SAMPLE OF OPTIONAL PARTS |  | #37XXX | OPTION 1 | #37XXX | OPTION 2 | #37XXX | OPTION 3 |
|---|--|--------------------------|--|--------|----------|--------|----------|--------|----------|
| SAMPLE OF OPTIONAL PARTS  |  |                          |  |        |          |        |          |        |          |
| #37XXX  | OPTION 1   |                          |  |        |          |        |          |        |          |
| #37XXX  | OPTION 2   |                          |  |        |          |        |          |        |          |
| #37XXX  | OPTION 3   |                          |  |        |          |        |          |        |          |

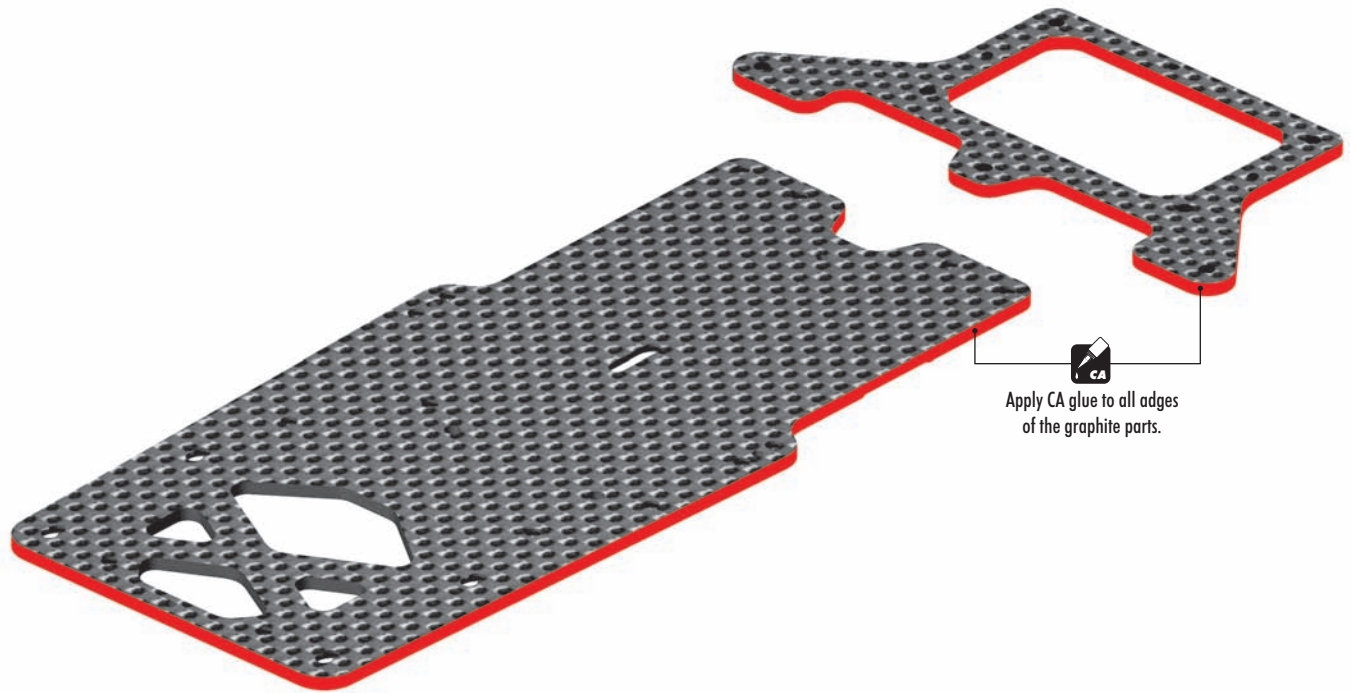
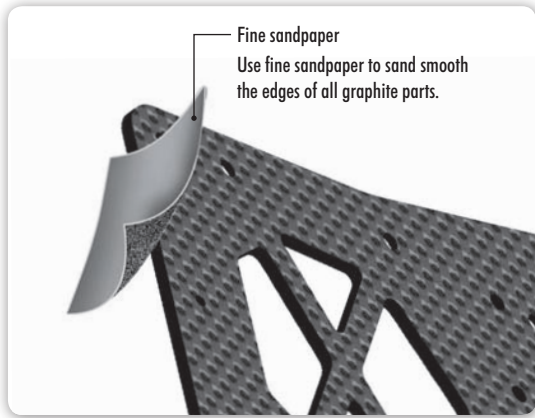
# EQUIPMENT REQUIRED

|                        |                         |                           |  |   |                             |
|------------------------|-------------------------|---------------------------|--|---|-----------------------------|
| <b>Transmitter</b><br> | <b>Receiver</b><br>     | <b>Steering Servo</b><br> | <b>Electric Motor &amp; Pinion Gear and Setscrew</b><br> | <b>Bearing Oil (HUDY #106230)</b><br>       | <b>Speed Controller</b><br> |
| <b>Body Shell</b><br>  | <b>LiPo Battery</b><br> | <b>Lexan™ Paint</b><br>   | <b>Battery Charger</b><br>                               | <b>Fibre Tape (HUDY #107870)</b><br>        | <b>Tires</b><br>            |
|                        |                         |                           |  | <b>Double-sided Tape (HUDY #107875)</b><br> |                             |

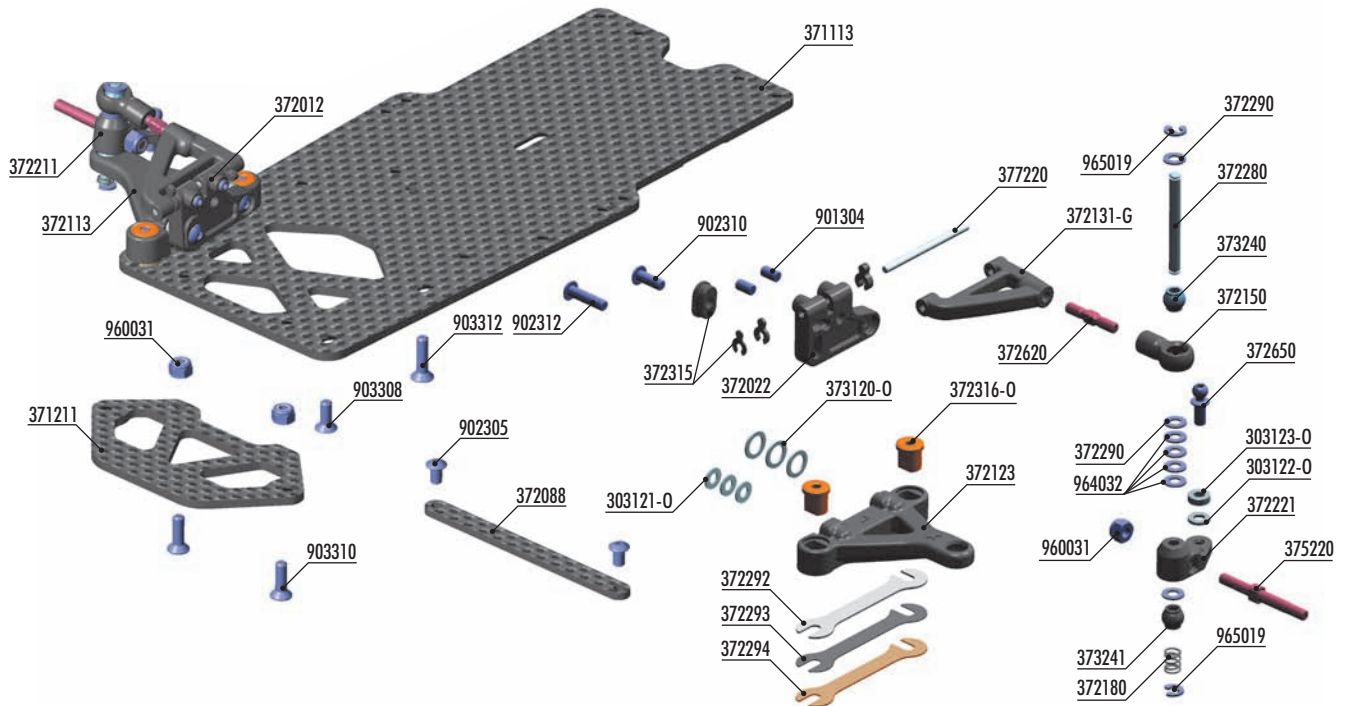
# GRAPHITE PART PREPARATION **EU**

## PREPARE ALL GRAPHITE PARTS

To protect and seal edges of graphite parts, sand edges smooth and then apply CA glue.



# 1. FRONT SUSPENSION **EU**



**FRONT UPPER ARM**

|           |          |          |
|-----------|----------|----------|
| #372130   | MEDIUM   | OPTION   |
| #372131   | HARD     | OPTION   |
| #372131-G | GRAPHITE | INCLUDED |

**#371114 X12'20 ALU CHASSIS**

**#371115 X12'20 ALU FLEX CHASSIS**

**ALU ECCENTRIC BUSHINGS**

|           |       |          |
|-----------|-------|----------|
| #372316-0 | 0mm   | INCLUDED |
| #372317-0 | 0.5mm | OPTION   |
| #372318-0 | 1.0mm | OPTION   |

**FRONT COIL SPRINGS - SOFT**

|         |       |        |        |
|---------|-------|--------|--------|
| #372176 | C=1.5 | GOLD   | OPTION |
| #372177 | C=2.0 | SILVER | OPTION |
| #372178 | C=2.5 | BLACK  | OPTION |
| #372179 | C=3.0 | GREY   | OPTION |

**FRONT COIL SPRINGS**

|         |       |        |          |
|---------|-------|--------|----------|
| #372180 | C=3.5 | GOLD   | INCLUDED |
| #372181 | C=4.0 | SILVER | OPTION   |
| #372182 | C=5.0 | BLACK  | OPTION   |
| #372183 | C=5.5 | GREY   | OPTION   |

**COMPOSITE SUSPENSION ARMS**

|         |       |          |          |
|---------|-------|----------|----------|
| #372112 | RIGHT | HARD     | OPTION   |
| #372113 | RIGHT | GRAPHITE | INCLUDED |
| #372122 | LEFT  | HARD     | OPTION   |
| #372123 | LEFT  | GRAPHITE | INCLUDED |

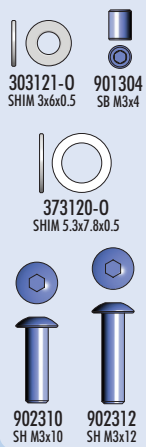
**UPPER ARM MOUNTS**

|         |       |          |          |
|---------|-------|----------|----------|
| #372010 | RIGHT | MEDIUM   | OPTION   |
| #372011 | RIGHT | HARD     | OPTION   |
| #372012 | RIGHT | GRAPHITE | INCLUDED |
| #372020 | LEFT  | MEDIUM   | OPTION   |
| #372021 | LEFT  | HARD     | OPTION   |
| #372022 | LEFT  | GRAPHITE | INCLUDED |

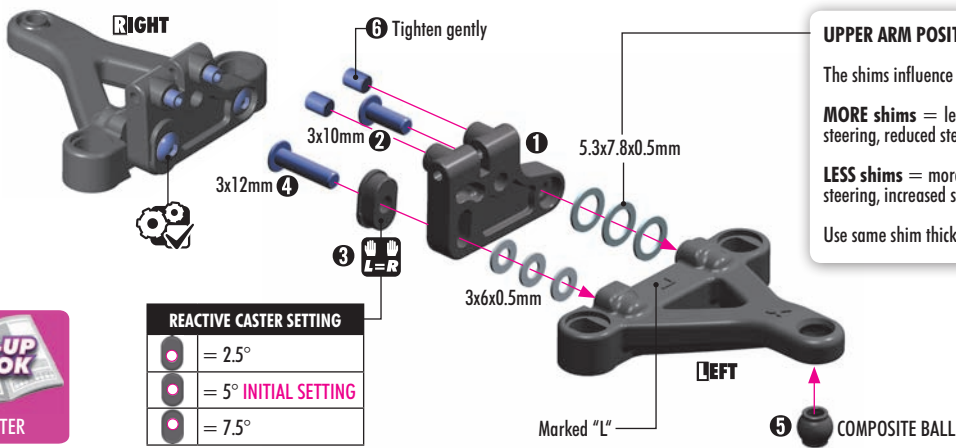
**BAG**  
**01**

- 303121-0 ALU SHIM 3x6x0.5MM - ORANGE (10)
- 303122-0 ALU SHIM 3x6x1.0MM - ORANGE (10)
- 303123-0 ALU SHIM 3x6x2.0MM - ORANGE (10)
- 371113 X12'20 GRAPHITE CHASSIS 2.5MM
- 371211 GRAPHITE BUMPER LOWER HOLDER 2.5MM
- 372012 COMPOSITE FRONT UPPER ARM MOUNT - RIGHT - GRAPHITE
- 372022 COMPOSITE FRONT UPPER ARM MOUNT - LEFT - GRAPHITE
- 372088 X12'20 FRONT BRACE - GRAPHITE 2.0MM
- 372113 COMPOSITE SUSPENSION ARM FRONT LOWER - RIGHT - GRAPHITE
- 372123 COMPOSITE SUSPENSION ARM FRONT LOWER - LEFT - GRAPHITE
- 372131-G COMPOSITE FRONT UPPER SUSPENSION ARM - GRAPHITE
- 372150 COMPOSITE FRONT UPPER BALL JOINT (2)
- 372180 FRONT COIL SPRING 3.6x6x0.5MM, C=3.5 - GOLD (2)
- 372211 COMPOSITE STEERING BLOCK - RIGHT - HARD - V3
- 372221 COMPOSITE STEERING BLOCK - LEFT - HARD - V3
- 372280 KING PIN (2)
- 372290 ALU SHIM 3.2x4.8x0.5 (4)
- 372292 STEEL SHIM 0.2MM - SILVER (2)
- 372293 STEEL SHIM 0.4MM - BLACK (2)
- 372294 STEEL SHIM 0.6MM - GOLD (2)
- 372315 COMPOSITE ECCENTRIC BUSHINGS + CASTER CLIPS (2)
- 372316-0 ALU ECCENTRIC BUSHING 0.0MM - ORANGE (2)
- 372620 ADJ. TURNBUCKLE M3x17 MM - HUDY SPRING STEEL™ (2)
- 372650 BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2)
- 373120-0 ALU SHIM 5.3x7.8x0.5MM - ORANGE (10)
- 373240 PIVOTBALL UNIVERSAL 6.0 MM - HUDY SPRING STEEL™ (2)
- 373241 COMPOSITE PIVOTBALL 6.0 MM - V2 (2)
- 375220 FRONT WHEEL AXLE (2)
- 377220 FRONT UPPER PIVOT PIN 2x31MM (2)
- 901304 HEX SCREW SB M3x4 (10)
- 902305 HEX SCREW SH M3x5 (10)
- 902310 HEX SCREW SH M3x10 (10)
- 902312 HEX SCREW SH M3x12 (10)
- 903308 HEX SCREW SFH M3x8 (10)
- 903310 HEX SCREW SFH M3x10 (10)
- 903312 HEX SCREW SFH M3x12 (10)
- 960031 ALU NUT M3 (10)
- 964032 WASHER S 3.2 x 4.8 x 0.2 (10)
- 965019 E-CLIP 1.9 (10)

# 1. FRONT SUSPENSION **EU**

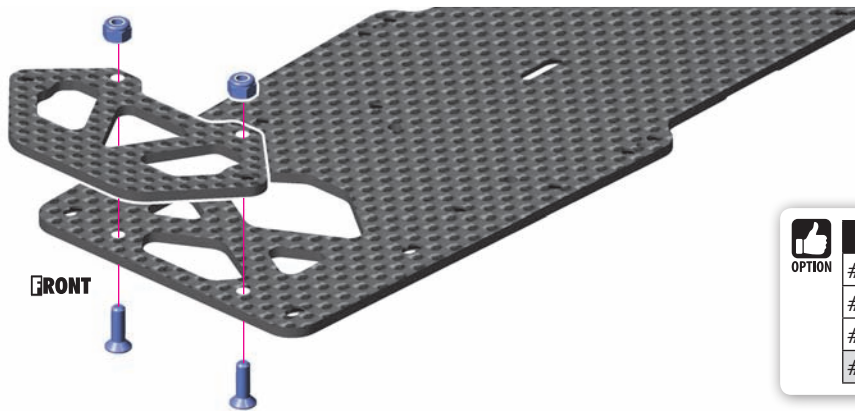


**2x**  
L=R



## UPPER ARM POSITION ADJUSTMENT SHIMS

The shims influence the camber gain change.  
**MORE shims** = less camber gain, reduced initial steering, reduced steering sensitivity (less twitchy).  
**LESS shims** = more camber gain, increased initial steering, increased steering sensitivity.  
 Use same shim thickness on both left & right sides.



| OPTION    | ALU NUTS M3 |          |  |
|-----------|-------------|----------|--|
| #296530-B | BLUE        | OPTION   |  |
| #296530-K | BLACK       | OPTION   |  |
| #296530-O | ORANGE      | OPTION   |  |
| #960031   | SILVER      | INCLUDED |  |

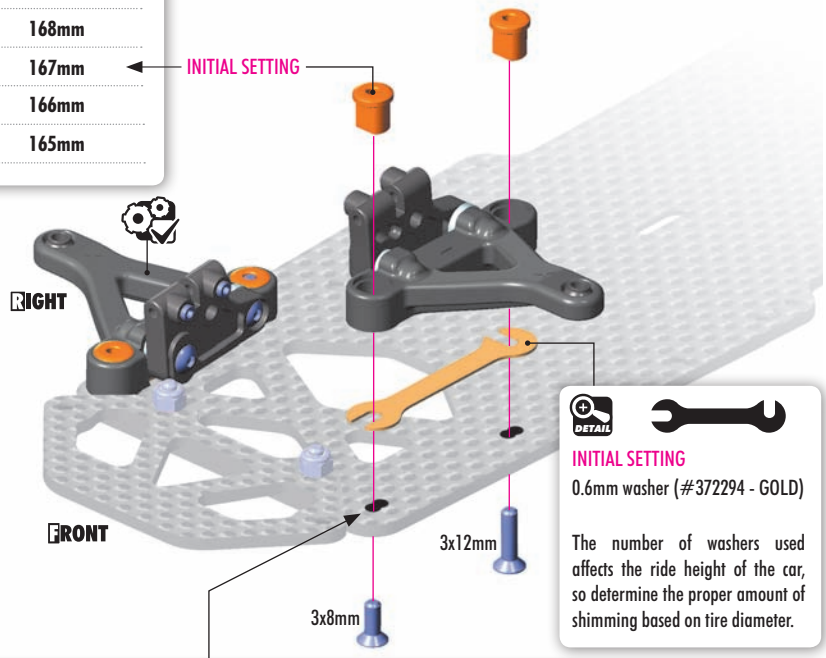


**2x**  
L=R

Use the proper matching bushings to achieve the desired front track-width

| LEFT | +      | RIGHT | = | TRACK-WIDTH |
|------|--------|-------|---|-------------|
|      | -1mm   |       |   | 169mm       |
|      | -0.5mm |       |   | 168mm       |
|      | 0mm    |       |   | 167mm       |
|      | +0.5mm |       |   | 166mm       |
|      | +1mm   |       |   | 165mm       |

The X12 has adjustable front track-width. There are 3 different bushings - 0mm centric (included in kit), or 0.5mm or 1.0mm eccentric (optional). Use the same bushing in front and rear, and also use the same (mirrored) orientation of the bushing on both right and left sides.



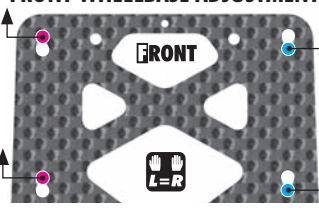
| OPTION    | ALU ECCENTRIC BUSHINGS |          |  |
|-----------|------------------------|----------|--|
| #372316-0 | 0mm                    | INCLUDED |  |
| #372317-0 | 0.5mm                  | OPTION   |  |
| #372318-0 | 1.0mm                  | OPTION   |  |

## ALTERNATIVE FRONT POSITION LONG WHEELBASE

(INITIAL SETTING)

This position has the same wheelbase as the previous X12 car as recommended for bigger tracks and tracks with longer sweepers.

## FRONT WHEELBASE ADJUSTMENT

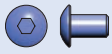


## ALTERNATIVE REAR POSITION SHORT WHEELBASE

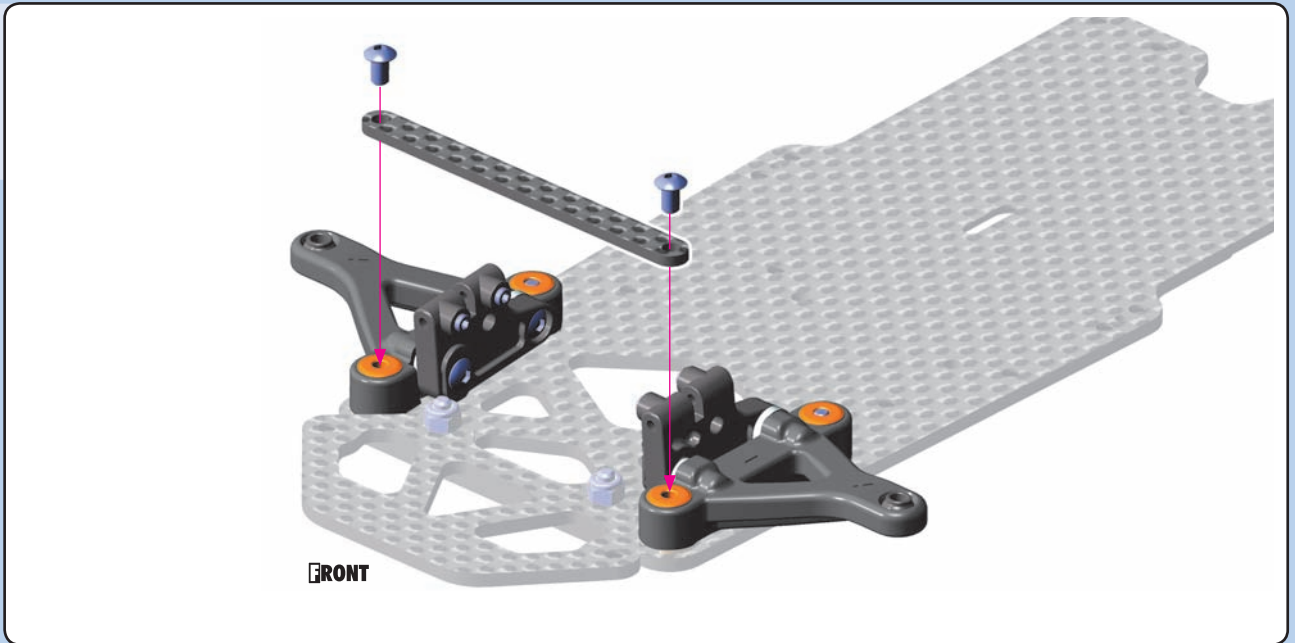
Shorter wheel base allows the car to rotate better right in the center of the corner to maintain corner speed and therefore it is recommended to use on tight technical tracks or tracks with many 180 degree corners



# 1. FRONT SUSPENSION **EU**



902305  
SH M3x5



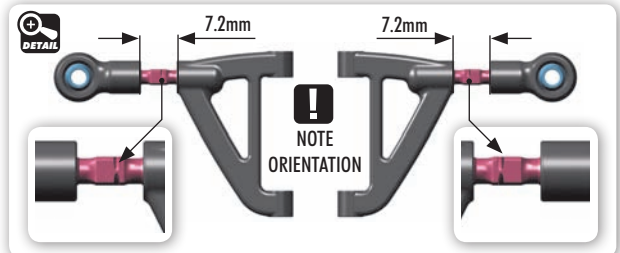
2x



RIGHT



LEFT



NOTE ORIENTATION



STEEL BALL

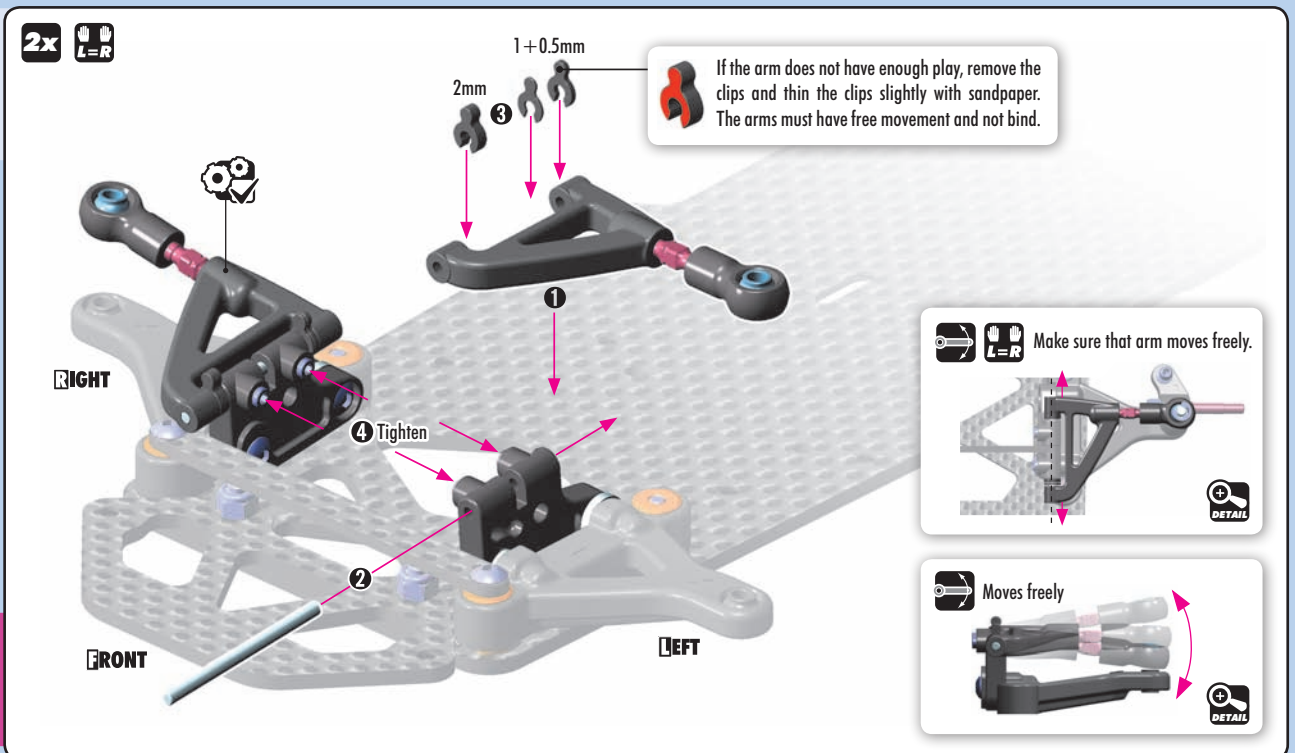
| FRONT UPPER ARM |           |          |          |
|-----------------|-----------|----------|----------|
| OPTION          | #372130   | MEDIUM   | OPTION   |
|                 | #372131   | HARD     | OPTION   |
|                 | #372131-G | GRAPHITE | INCLUDED |



CAMBER



901304  
SB M3x4



2x



RIGHT

4 Tighten

2

FRONT

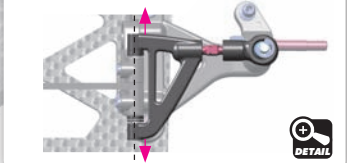
LEFT

1+0.5mm

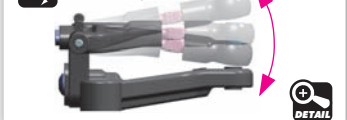
2mm

If the arm does not have enough play, remove the clips and thin the clips slightly with sandpaper. The arms must have free movement and not bind.

Make sure that arm moves freely.



Moves freely



CASTER



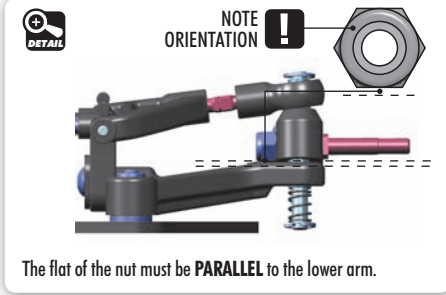
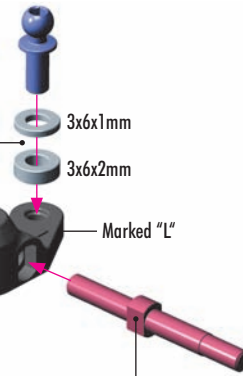
# 1. FRONT SUSPENSION **EU**



**2x**

The thickness of shims changes the steering linkage angle. Thicker shims gives decreased in-corner steering, but car becomes easier to drive.

Use 3mm bump steer as **INITIAL SETTING**.



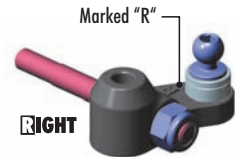
The flat of the nut must be **PARALLEL** to the lower arm.



| ALU NUTS M3 |                  |          |
|-------------|------------------|----------|
| OPTION      | #296530-B BLUE   | OPTION   |
|             | #296530-K BLACK  | OPTION   |
|             | #296530-O ORANGE | OPTION   |
|             | #960031 SILVER   | INCLUDED |



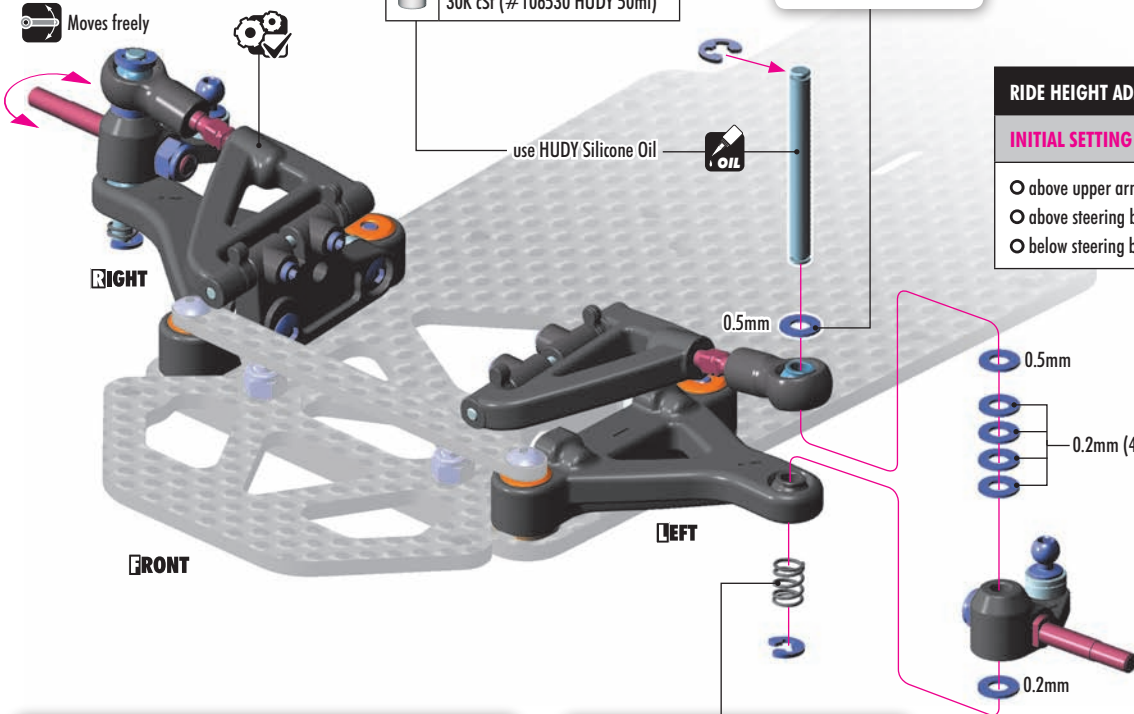
**L=R**



**2x**

|  |                              |
|--|------------------------------|
|  | LOW traction & bumpy track   |
|  | 10K cSt (#106510 HUDY 50ml)  |
|  | HIGH traction & smooth track |
|  | 30K cSt (#106530 HUDY 50ml)  |

The thickness of shims used affects the ride height of the car, so determine the proper amount of shimming based on tire diameter.



## RIDE HEIGHT ADJUSTMENT

### INITIAL SETTING

- above upper arm (0.5mm)
- above steering block (1.3mm)
- below steering block (0.2mm)

### TIP HUDY Arm Reamer 3.0mm

The front suspension parts were updated to eliminate play to ensure better steering performance. The updated holes in the steering blocks may cause a tighter fit of the kingpin in the steering block; it is important that the steering block moves freely but without excessive play. If the kingpin does not insert into the steering block easily, use a 3mm arm reamer to enlarge the hole. Be very careful to remove only enough material so you can insert the kingpin without a lot of force.



## FRONT COIL SPRINGS - SOFT

|        |         |       |        |        |
|--------|---------|-------|--------|--------|
| OPTION | #372176 | C=1.5 | GOLD   | OPTION |
|        | #372177 | C=2.0 | SILVER | OPTION |
|        | #372178 | C=2.5 | BLACK  | OPTION |
|        | #372179 | C=3.0 | GREY   | OPTION |

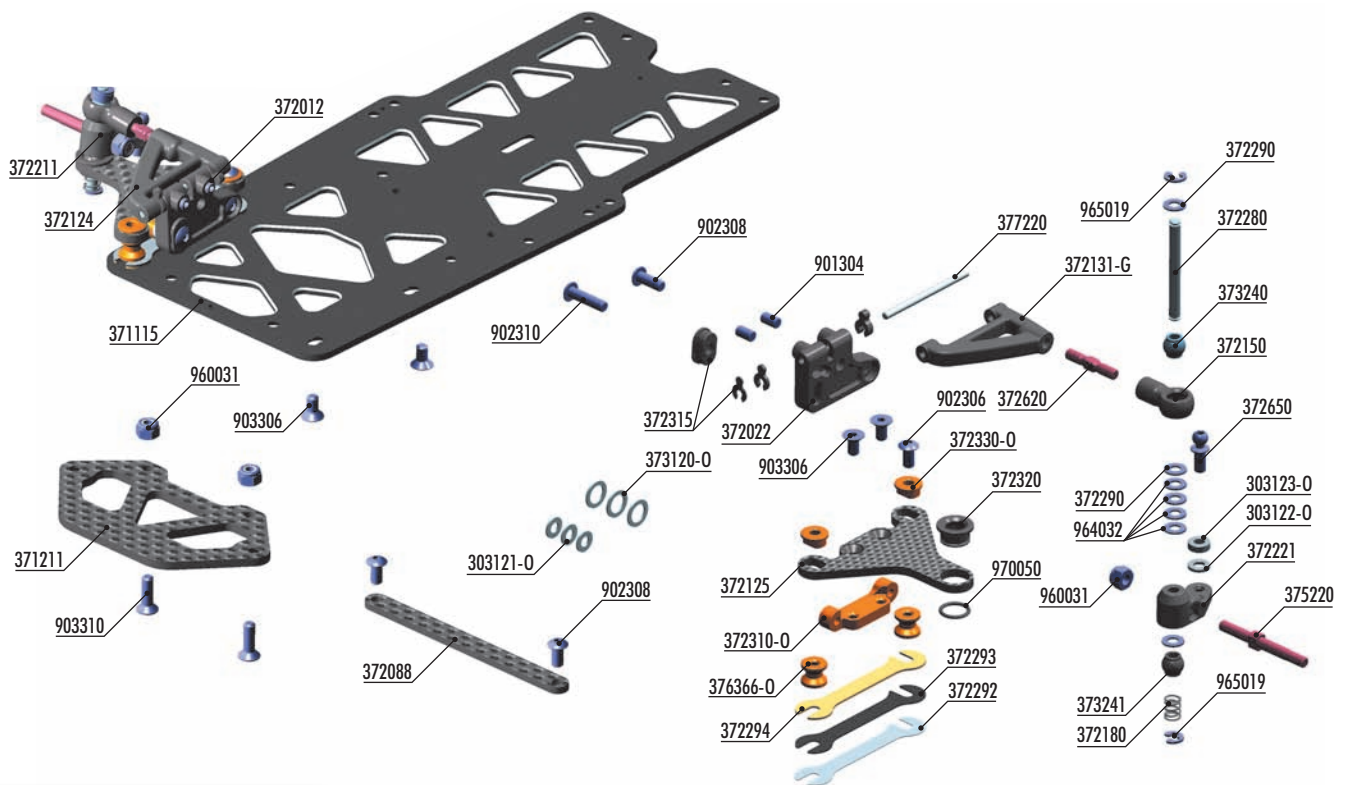
## FRONT COIL SPRINGS

|  |         |       |        |          |
|--|---------|-------|--------|----------|
|  | #372180 | C=3.5 | GOLD   | INCLUDED |
|  | #372181 | C=4.0 | SILVER | OPTION   |
|  | #372182 | C=5.0 | BLACK  | OPTION   |
|  | #372183 | C=5.5 | GREY   | OPTION   |



RIDE HEIGHT

# 1. FRONT SUSPENSION **US**



| ALU NUTS M3 |           |        |          |
|-------------|-----------|--------|----------|
| OPTION      | #296530-B | BLUE   | OPTION   |
|             | #296530-K | BLACK  | OPTION   |
|             | #296530-O | ORANGE | OPTION   |
|             | #960031   | SILVER | INCLUDED |

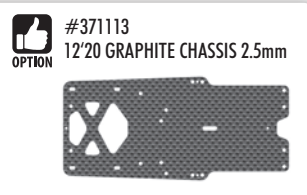
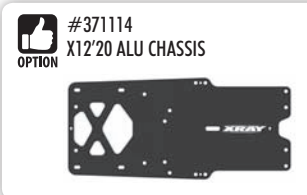
| ALU ECCENTRIC BUSHINGS |           |       |          |
|------------------------|-----------|-------|----------|
| OPTION                 | #372330-O | 0mm   | INCLUDED |
|                        | #372331-O | 0.5mm | OPTION   |
|                        | #372332-O | 1.0mm | OPTION   |

| FRONT UPPER ARM |           |          |          |
|-----------------|-----------|----------|----------|
| OPTION          | #372130   | MEDIUM   | OPTION   |
|                 | #372131   | HARD     | OPTION   |
|                 | #372131-G | GRAPHITE | INCLUDED |

| UPPER ARM MOUNTS |         |       |          |          |
|------------------|---------|-------|----------|----------|
| OPTION           | #372010 | RIGHT | MEDIUM   | OPTION   |
|                  | #372011 | RIGHT | HARD     | OPTION   |
|                  | #372012 | RIGHT | GRAPHITE | INCLUDED |
|                  | #372020 | LEFT  | MEDIUM   | OPTION   |
|                  | #372021 | LEFT  | HARD     | OPTION   |
|                  | #372022 | LEFT  | GRAPHITE | INCLUDED |

| FRONT COIL SPRINGS - SOFT |         |       |        |        |
|---------------------------|---------|-------|--------|--------|
| OPTION                    | #372176 | C=1.5 | GOLD   | OPTION |
|                           | #372177 | C=2.0 | SILVER | OPTION |
|                           | #372178 | C=2.5 | BLACK  | OPTION |
|                           | #372179 | C=3.0 | GREY   | OPTION |

| FRONT COIL SPRINGS |         |       |        |          |
|--------------------|---------|-------|--------|----------|
|                    | #372180 | C=3.5 | GOLD   | INCLUDED |
|                    | #372181 | C=4.0 | SILVER | OPTION   |
|                    | #372182 | C=5.0 | BLACK  | OPTION   |
|                    | #372183 | C=5.5 | GREY   | OPTION   |

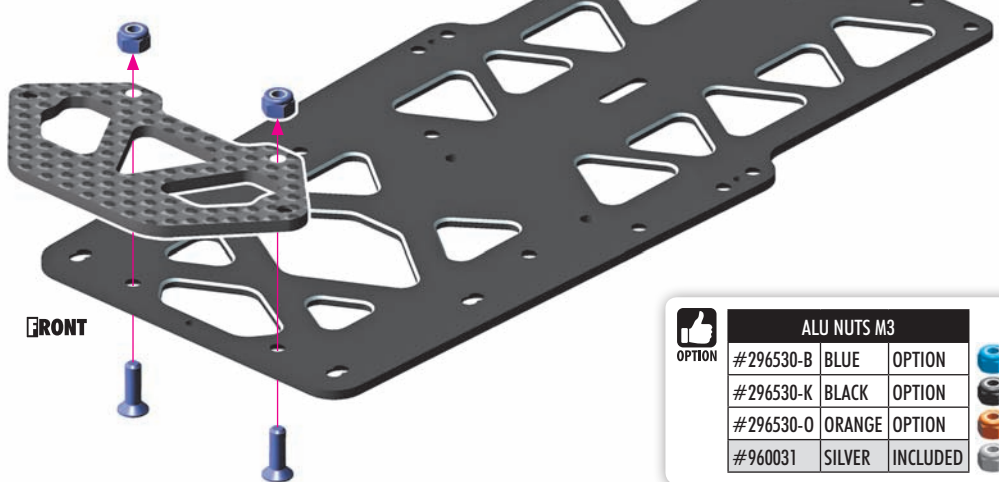


**BAG**  
**01**

- |  |  |
|--|--|
| <p>303121-0 ALU SHIM 3x6x0.5MM - ORANGE (10)</p> <p>303122-0 ALU SHIM 3x6x1.0MM - ORANGE (10)</p> <p>303123-0 ALU SHIM 3x6x2.0MM - ORANGE (10)</p> <p>371115 X12'20 ALU FLEX CHASSIS 2.0MM - 7075 T6</p> <p>371211 GRAPHITE BUMPER LOWER HOLDER 2.5MM</p> <p>372012 COMPOSITE FRONT UPPER ARM MOUNT - RIGHT - GRAPHITE</p> <p>372022 COMPOSITE FRONT UPPER ARM MOUNT - LEFT - GRAPHITE</p> <p>372088 X12'20 FRONT BRACE - GRAPHITE 2.0MM</p> <p>372124 X12 US GRAPHITE LOWER SUSPENSION ARM - RIGHT</p> <p>372125 X12 US GRAPHITE LOWER SUSPENSION ARM - LEFT</p> <p>372131-G COMPOSITE FRONT UPPER SUSPENSION ARM - GRAPHITE</p> <p>372150 COMPOSITE FRONT UPPER BALL JOINT (2)</p> <p>372180 FRONT COIL SPRING 3.6x6x0.5MM; C=3.5 - GOLD (2)</p> <p>372211 COMPOSITE STEERING BLOCK - RIGHT - HARD - V3</p> <p>372221 COMPOSITE STEERING BLOCK - LEFT - HARD - V3</p> <p>372280 KING PIN (2)</p> <p>372290 ALU SHIM 3.2x4.8x0.5 (4)</p> <p>372292 STEEL SHIM 0.2MM - SILVER (2)</p> <p>372293 STEEL SHIM 0.4MM - BLACK (2)</p> <p>372294 STEEL SHIM 0.6MM - GOLD (2)</p> <p>372310-0 ALU LOWER GRAPHITE SUSPENSION ARM HOLDER - ORANGE</p> <p>372315 COMPOSITE ECCENTRIC BUSHINGS + CASTER CLIPS (2)</p> <p>372320 COMPOSITE ARM BUSHING (4)</p> | <p>372330-0 X12'20 US ALU BUSHING - WIDTH 0.0MM (2)</p> <p>372620 ADJ. TURNBUCKLE M3x17 MM - HUDY SPRING STEEL™ (2)</p> <p>372650 BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2)</p> <p>373120-0 ALU SHIM 5.3x7.8x0.5MM - ORANGE (10)</p> <p>373240 PIVOTBALL UNIVERSAL 6.0 MM - HUDY SPRING STEEL™ (2)</p> <p>373241 COMPOSITE PIVOTBALL 6.0 MM - V2 (2)</p> <p>375220 FRONT WHEEL AXLE (2)</p> <p>376366-0 ALU MOUNT 6.0MM - ORANGE (2)</p> <p>377220 FRONT UPPER PIVOT PIN 2x31MM (2)</p> <p>901304 HEX SCREW SB M3x4 (10)</p> <p>902306 HEX SCREW SH M3x6 (10)</p> <p>902308 HEX SCREW SH M3x8 (10)</p> <p>902310 HEX SCREW SH M3x10 (10)</p> <p>903306 HEX SCREW SFH M3x6 (10)</p> <p>903310 HEX SCREW SFH M3x10 (10)</p> <p>960031 ALU NUT M3 (10)</p> <p>964032 WASHER S 3.2 x 4.8 x 0.2 (10)</p> <p>965019 E-CLIP 1.9 (10)</p> <p>970050 O-RING 5x1 (10)</p> |
|--|--|

# 1. FRONT SUSPENSION **US**

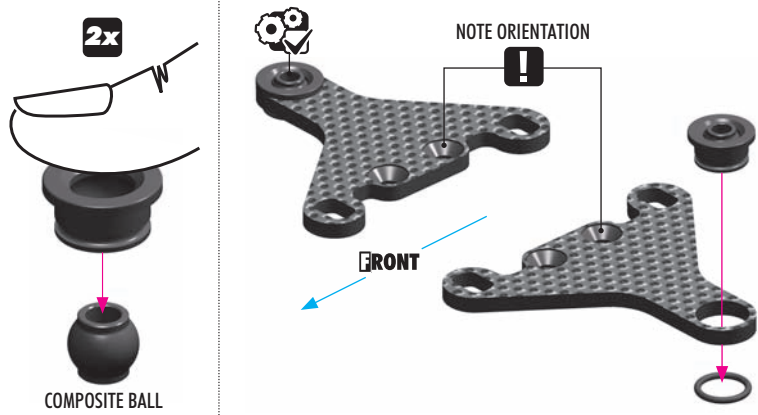
 903310  
SFH M3x10  
 960031  
ALU N M3



**FRONT**

| ALU NUTS M3 |           |        |          |
|-------------|-----------|--------|----------|
| OPTION      | #296530-B | BLUE   | OPTION   |
|             | #296530-K | BLACK  | OPTION   |
|             | #296530-O | ORANGE | OPTION   |
|             | #960031   | SILVER | INCLUDED |

 970050  
O 5x1



**2x**

NOTE ORIENTATION

**FRONT**

COMPOSITE BALL

**CUTAWAY VIEW**

**TOP**

**BOTTOM**

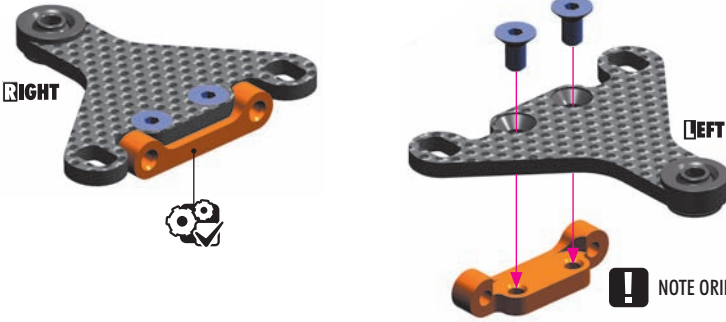
**DETAIL**

**NOTE ORIENTATION**

**RIGHT** **FRONT** **LEFT**

 903306  
SFH M3x6

**2x** **L=R**

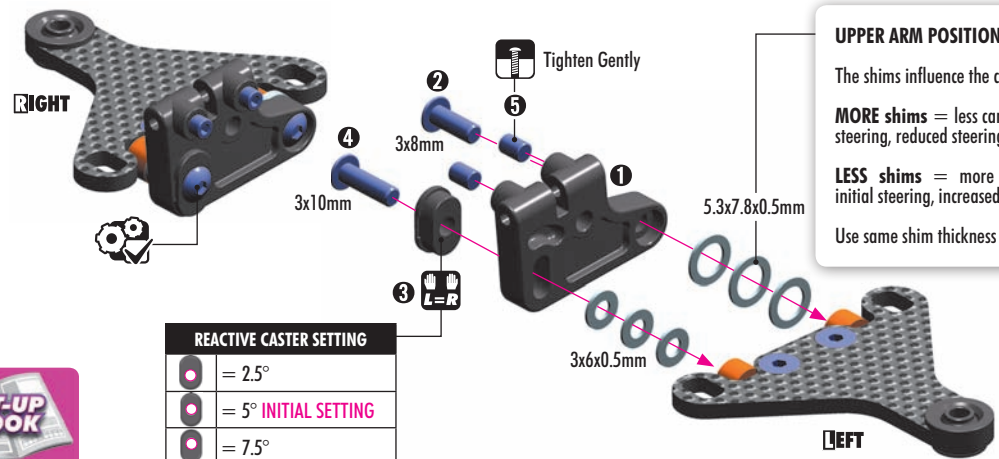


**RIGHT** **LEFT**

NOTE ORIENTATION

 303121-0  
SHIM 3x6x0.5  
 373120-0  
SHIM 5.3x7.8x0.5  
 901304  
SB M3x4  
 902308  
SH M3x8  
 902310  
SH M3x10

**2x** **L=R**



**RIGHT** **LEFT**

Tighten Gently

3x10mm

3x8mm

5.3x7.8x0.5mm

3x6x0.5mm

**UPPER ARM POSITION ADJUSTMENT SHIMS**

The shims influence the camber gain change.

**MORE shims** = less camber gain, reduced initial steering, reduced steering sensitivity (less twitchy).

**LESS shims** = more camber gain, increased initial steering, increased steering sensitivity.

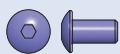
Use same shim thickness on both left & right sides.

| REACTIVE CASTER SETTING |                             |
|-------------------------|-----------------------------|
|                         | = 2.5°                      |
|                         | = 5° <b>INITIAL SETTING</b> |
|                         | = 7.5°                      |

**SET-UP BOOK**

**CASTER**

# 1. FRONT SUSPENSION **US**



902306  
SH M3x6



903306  
SFH M3x6



The X12 has adjustable front track-width. There are 3 different bushings - 0mm centric (included in kit), or 0.5mm or 1.0mm eccentric (optional). Use the same bushing in front and rear, and also use the same (mirrored) orientation of the bushing on both right and left sides.

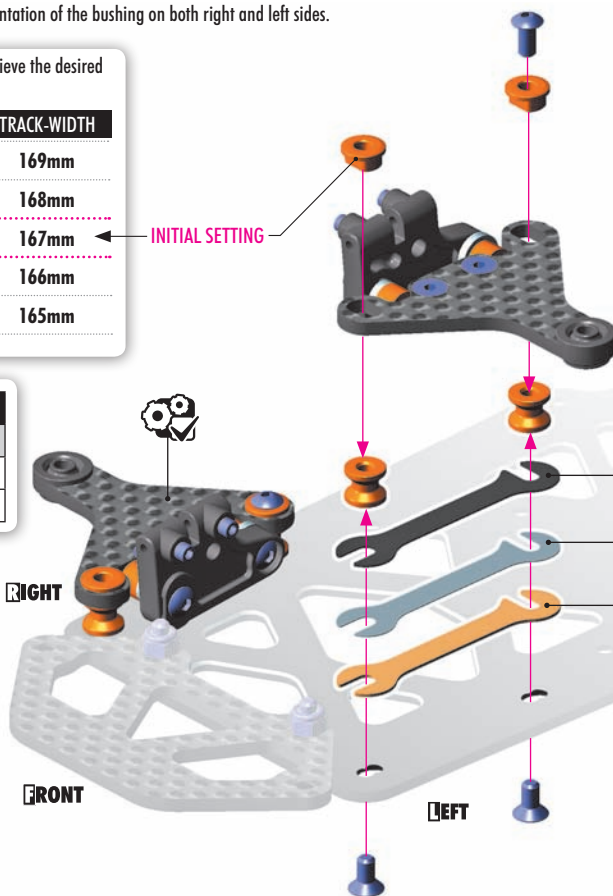
Use the proper matching bushings to achieve the desired front track-width

| LEFT | +      | RIGHT | = | TRACK-WIDTH |
|------|--------|-------|---|-------------|
|      | -1mm   |       |   | 169mm       |
|      | -0.5mm |       |   | 168mm       |
|      | 0mm    |       |   | 167mm       |
|      | +0.5mm |       |   | 166mm       |
|      | +1mm   |       |   | 165mm       |



### ALU ECCENTRIC BUSHINGS

| OPTION | #         | THICKNESS | STATUS   |
|--------|-----------|-----------|----------|
|        | #372330-0 | 0mm       | INCLUDED |
|        | #372331-0 | 0.5mm     | OPTION   |
|        | #372332-0 | 1.0mm     | OPTION   |



The number of washers used affects the ride height of the car, so determine the proper amount of shimming based on tire diameter.

### INITIAL SETTING

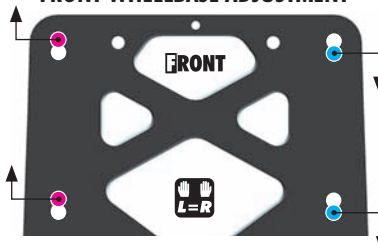
- 0.4mm washer (#372293 - BLACK)
- 0.2mm washer (#372292 - SILVER)
- 0.6mm washer (#372294 - GOLD)

### ALTERNATIVE FRONT POSITION

#### LONG WHEELBASE (INITIAL SETTING)

This position has the same wheelbase as the previous X12 car as recommended for bigger tracks and tracks with longer sweepers.

### FRONT WHEELBASE ADJUSTMENT



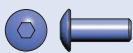
### ALTERNATIVE REAR POSITION

#### SHORT WHEELBASE

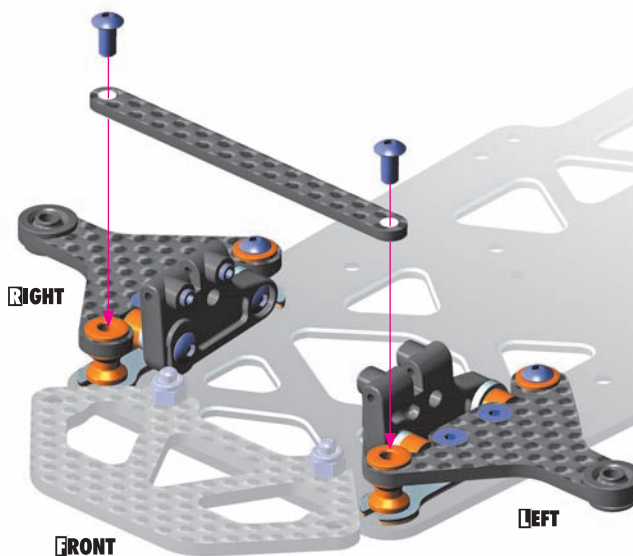
Shorter wheel base allows the car to rotate better right in the center of the corner to maintain corner speed and therefore it is recommended to use on tight technical tracks or tracks with many 180 degree corners



RIDE HEIGHT  
TRACK-WIDTH

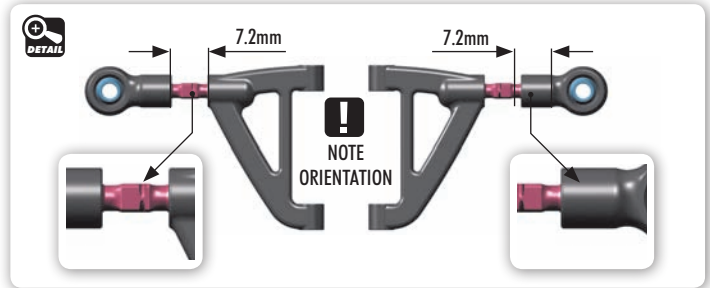
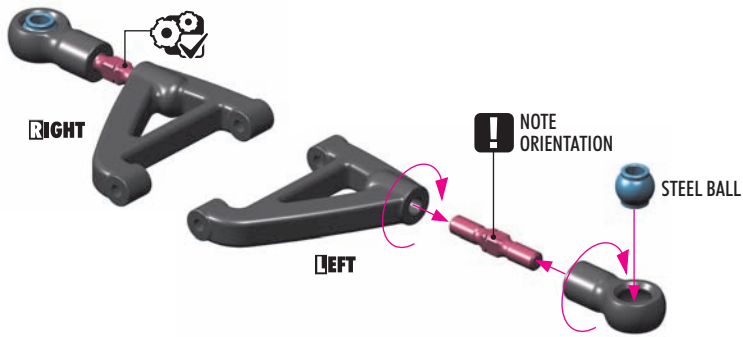


902308  
SH M3x8



# 1. FRONT SUSPENSION **US**

**2x** L=R



**OPTION**

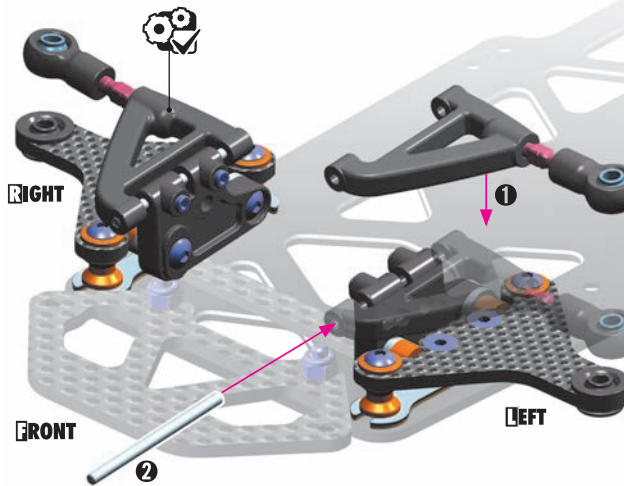
### FRONT UPPER ARM

|           |          |          |
|-----------|----------|----------|
| #372130   | MEDIUM   | OPTION   |
| #372131   | HARD     | OPTION   |
| #372131-G | GRAPHITE | INCLUDED |

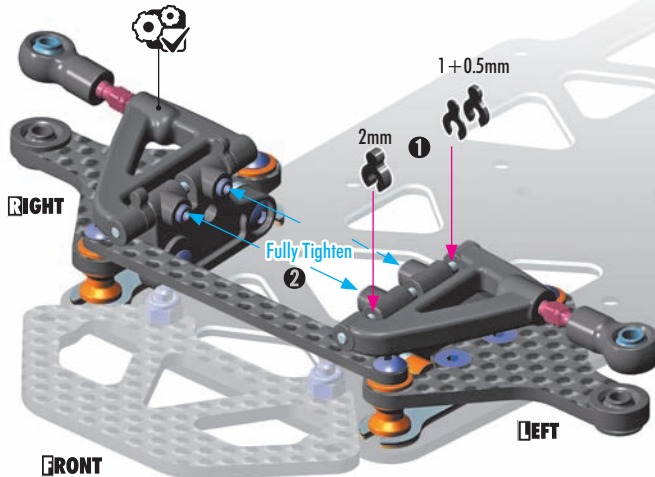


**SET-UP BOOK**  
CAMBER

**2x** L=R



**2x** L=R



If the arm does not have enough play, remove the clips and thin the clips slightly with sandpaper. The arms must have free movement and not bind.

# 1. FRONT SUSPENSION **US**



303122-0  
SHIM 3x6x1

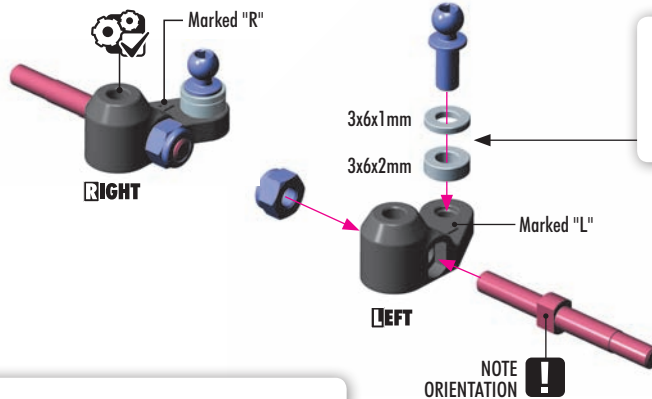


303123-0  
SHIM 3x6x2



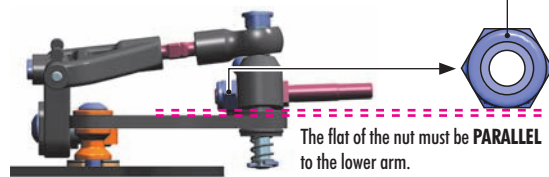
960031  
ALU N M3

2x L=R



The thickness of shims changes the steering linkage angle. Thicker shims gives decreased in-corner steering, but car becomes easier to drive.

Use 3mm bump steer as **INITIAL SETTING**.



| ALU NUTS M3 |        |          |
|-------------|--------|----------|
| #296530-B   | BLUE   | OPTION   |
| #296530-K   | BLACK  | OPTION   |
| #296530-O   | ORANGE | OPTION   |
| #960031     | SILVER | INCLUDED |



372290  
S 3.2x4.8x0.5

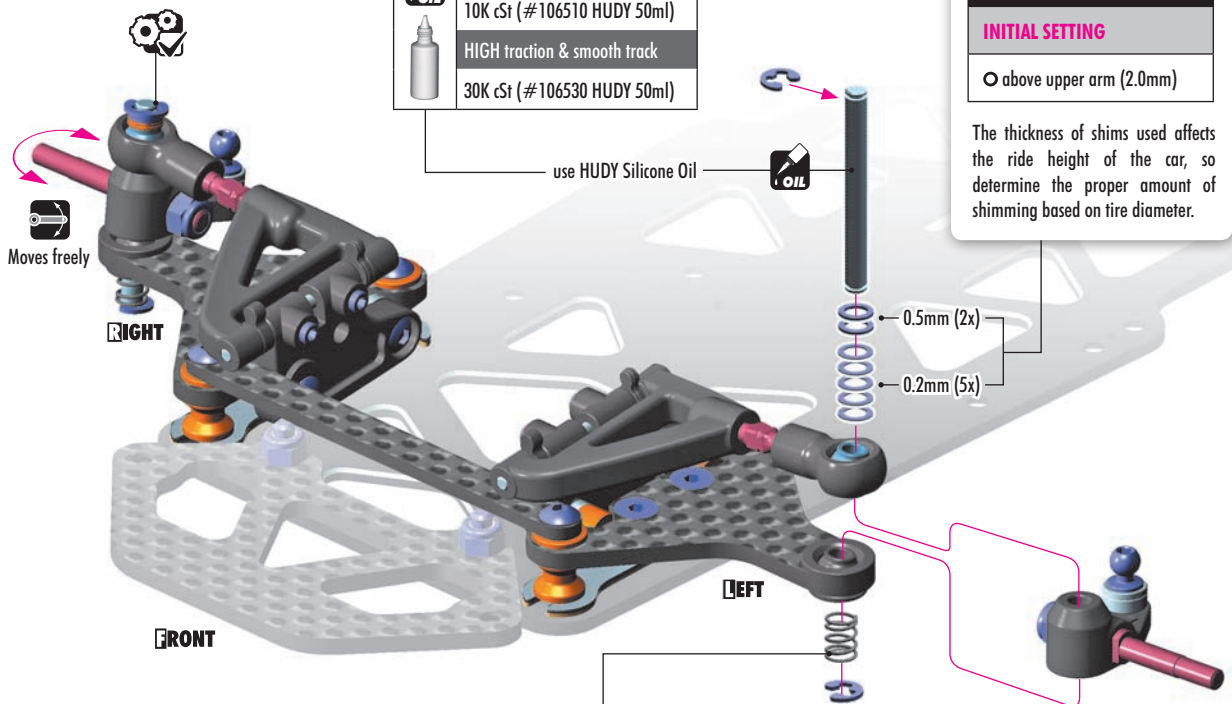


964032  
S 3.2x4.8x0.2



965019  
C 1.9

2x L=R



| LOW traction & bumpy track   |                             |
|------------------------------|-----------------------------|
|                              | 10K cSt (#106510 HUDY 50ml) |
| HIGH traction & smooth track |                             |
|                              | 30K cSt (#106530 HUDY 50ml) |

use HUDY Silicone Oil

## RIDE HEIGHT ADJUSTMENT

### INITIAL SETTING

○ above upper arm (2.0mm)

The thickness of shims used affects the ride height of the car, so determine the proper amount of shimming based on tire diameter.



| FRONT COIL SPRINGS |       |        |          |  |
|--------------------|-------|--------|----------|--|
| #372180            | C=3.5 | GOLD   | INCLUDED |  |
| #372181            | C=4.0 | SILVER | OPTION   |  |
| #372182            | C=5.0 | BLACK  | OPTION   |  |
| #372183            | C=5.5 | GREY   | OPTION   |  |

| FRONT COIL SPRINGS - SOFT |       |        |        |  |
|---------------------------|-------|--------|--------|--|
| #372176                   | C=1.5 | GOLD   | OPTION |  |
| #372177                   | C=2.0 | SILVER | OPTION |  |
| #372178                   | C=2.5 | BLACK  | OPTION |  |
| #372179                   | C=3.0 | GREY   | OPTION |  |

## TIP HUDY Arm Reamer 3.0mm

The front suspension parts were updated to eliminate play to ensure better steering performance. The updated holes in the steering blocks may cause a tighter fit of the kingpin in the steering block; it is important that the steering block moves freely but without excessive play. If the kingpin does not insert into the steering block easily, use a 3mm arm reamer to enlarge the hole. Be very careful to remove only enough material so you can insert the kingpin without a lot of force.



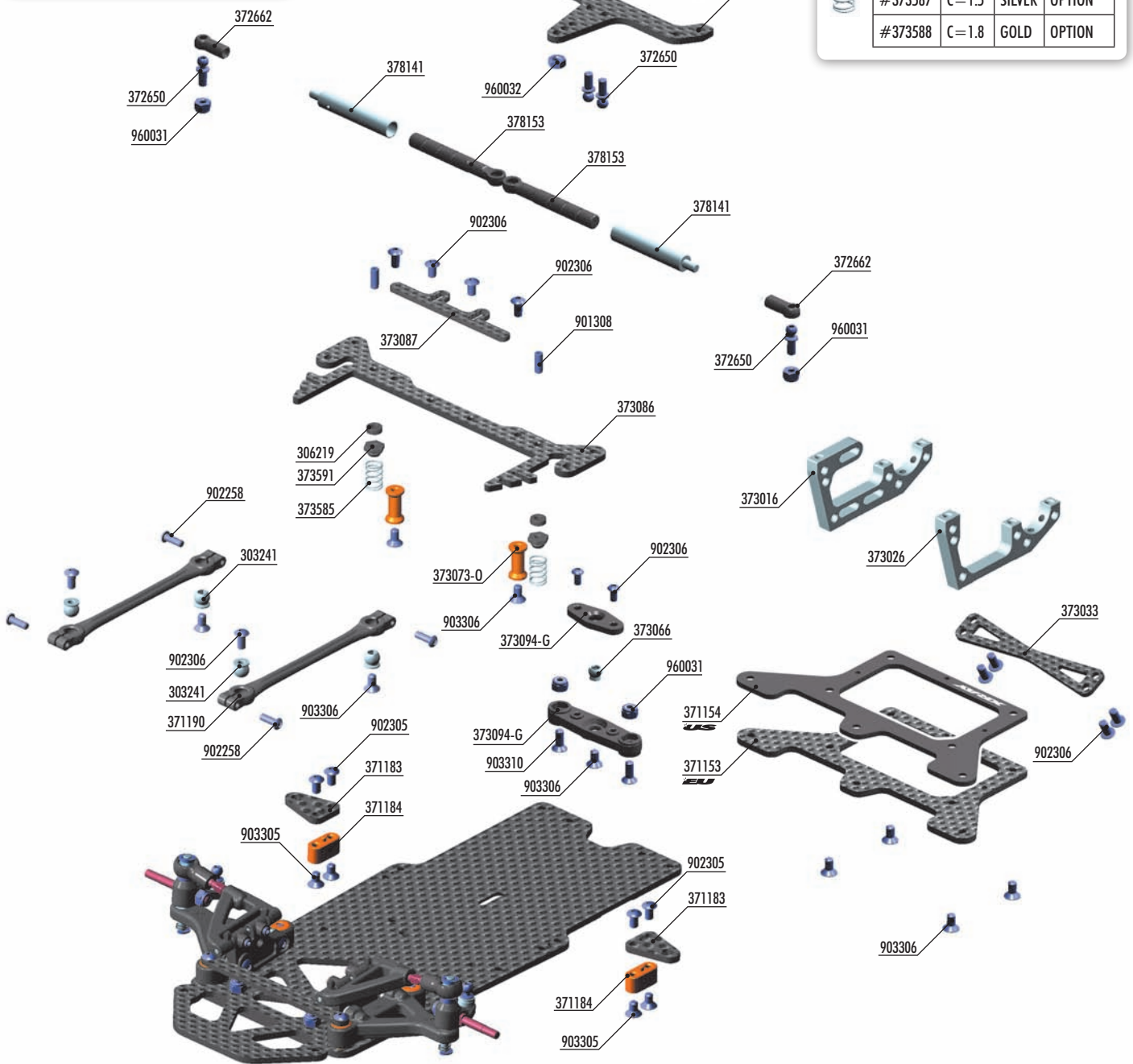
**SET-UP BOOK**

RIDE HEIGHT

# 3. REAR SUSPENSION **EU** **US**

| ALU NUTS M3 |        |          |
|-------------|--------|----------|
| #296530-B   | BLUE   | OPTION   |
| #296530-K   | BLACK  | OPTION   |
| #296530-O   | ORANGE | OPTION   |
| #960031     | SILVER | INCLUDED |

| SIDE SPRINGS |       |        |          |
|--------------|-------|--------|----------|
| #373584      | C=0.6 | SILVER | OPTION   |
| #373585      | C=0.9 | GOLD   | INCLUDED |
| #373586      | C=1.2 | BLACK  | OPTION   |
| #373587      | C=1.5 | SILVER | OPTION   |
| #373588      | C=1.8 | GOLD   | OPTION   |



## BAG

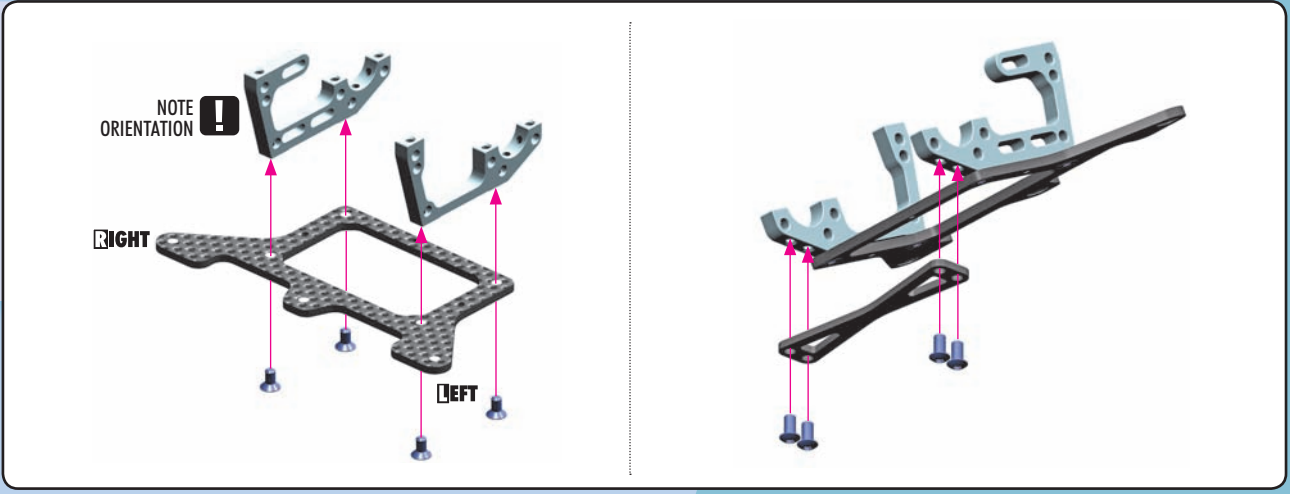
03

- |          |   |          |  |
|----------|---|----------|--|
| 303241   | BALL UNIVERSAL 5.8 MM HEX (4)                       | 373094-G | LOWER & UPPER PIVOT BRACE - LOW ROLL-CENTER - GRAPHITE |
| 306219   | COMPOSITE SET OF SERVO SHIMS (4)                    | 373551   | X12'20 GRAPHITE REAR POD UPPER PLATE 2.5MM             |
| 371153   | GRAPHITE REAR POD LOWER PLATE 2.5MM (EU SPECS)      | 373585   | SIDE SPRING C=0.9 - GOLD (2)                           |
| 371154   | ALU 2.0MM REAR POD LOWER PLATE - 7075 T6 (US SPECS) | 373591   | COMPOSITE SIDE SPRING HOLDER (2)                       |
| 371183   | X12'20 GRAPHITE POD LINK PLATE 2.5MM (2)            | 378141   | ALU SIDE TUBE (2)                                      |
| 371184   | X12'20 ALU POD LINK GRAPHITE PLATE HOLDER           | 378153   | COMPOSITE SIDE TUBE SHAFT (2)                          |
| 371190   | COMPOSITE POD LINK (2)                              | 901308   | HEX SCREW SB M3x8 (10)                                 |
| 372650   | BALL-END 4.2MM THREADED HUDY SPRING STEEL™ (2)      | 902258   | HEX SCREW SH M2.5x8 (10)                               |
| 372662   | COMPOSITE BALL-JOINT 4.2 MM (4)                     | 902305   | HEX SCREW SH M3x5 (10)                                 |
| 373016   | ALU REAR BULKHEAD - MOTOR (RIGHT)                   | 902306   | HEX SCREW SH M3x6 (10)                                 |
| 373026   | ALU REAR BULKHEAD - LEFT                            | 903305   | HEX SCREW SFH M3x5 (10)                                |
| 373033   | GRAPHITE REAR BULKHEAD BRACE 2MM                    | 903306   | HEX SCREW SFH M3x6 (10)                                |
| 373066   | ALU PIVOT BALL                                      | 903310   | HEX SCREW SFH M3x10 (10)                               |
| 373073-0 | ALU REAR BRACE MOUNT 16MM- ORANGE (2)               | 960031   | ALU NUT M3 (10)  |
| 373086   | GRAPHITE REAR BRACE 2.5MM                           | 960032   | NUT M3 (10)  |
| 373087   | GRAPHITE BATTER BACKSTOP 2.0MM                      |          |  |

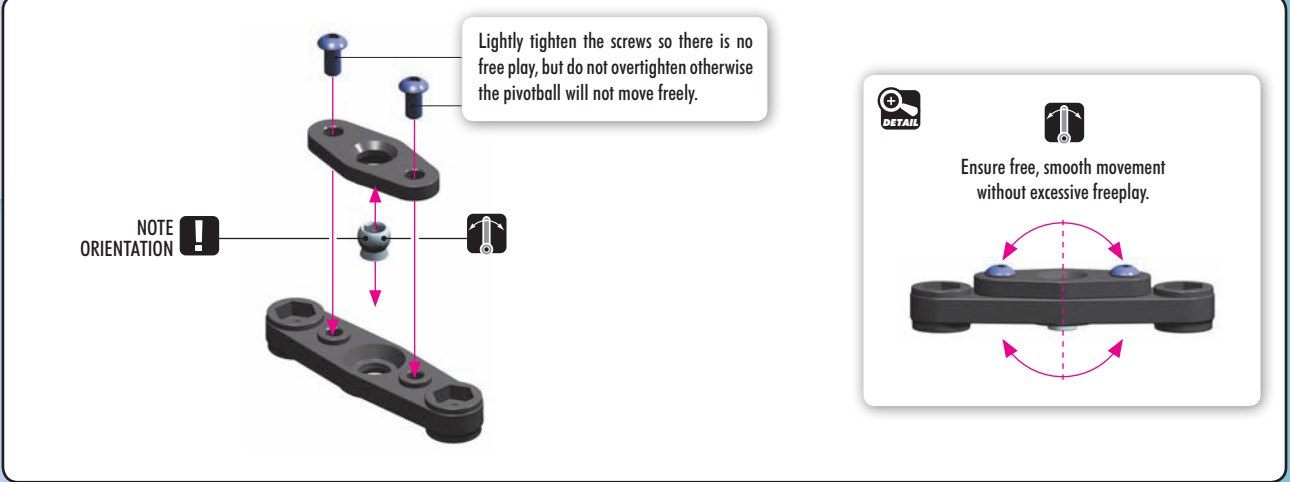
# 3. REAR SUSPENSION



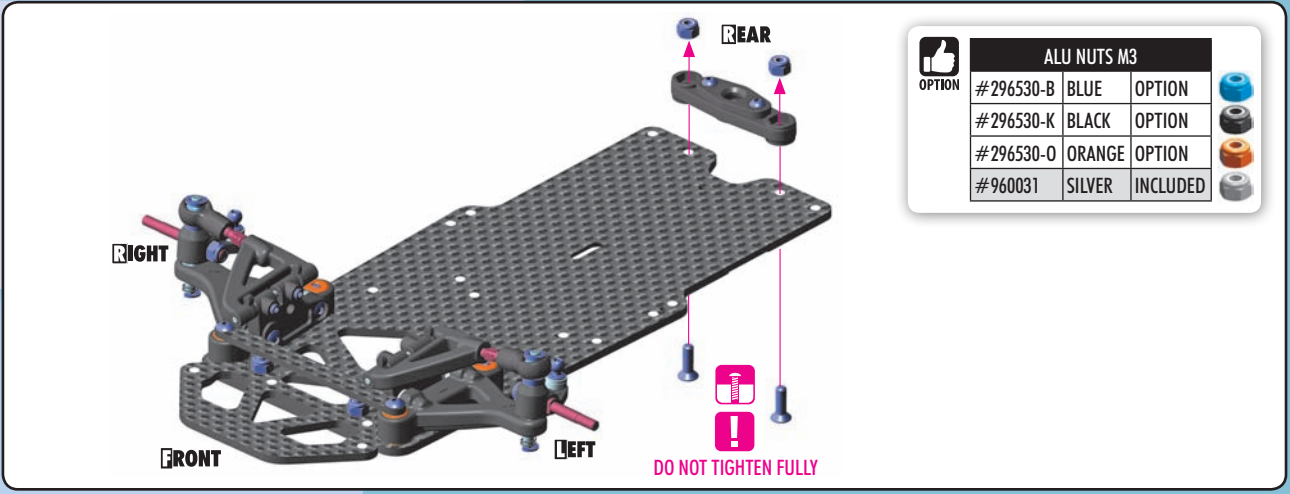
- 902306  
SH M3x6
- 903306  
SFH M3x6



- 902306  
SH M3x6

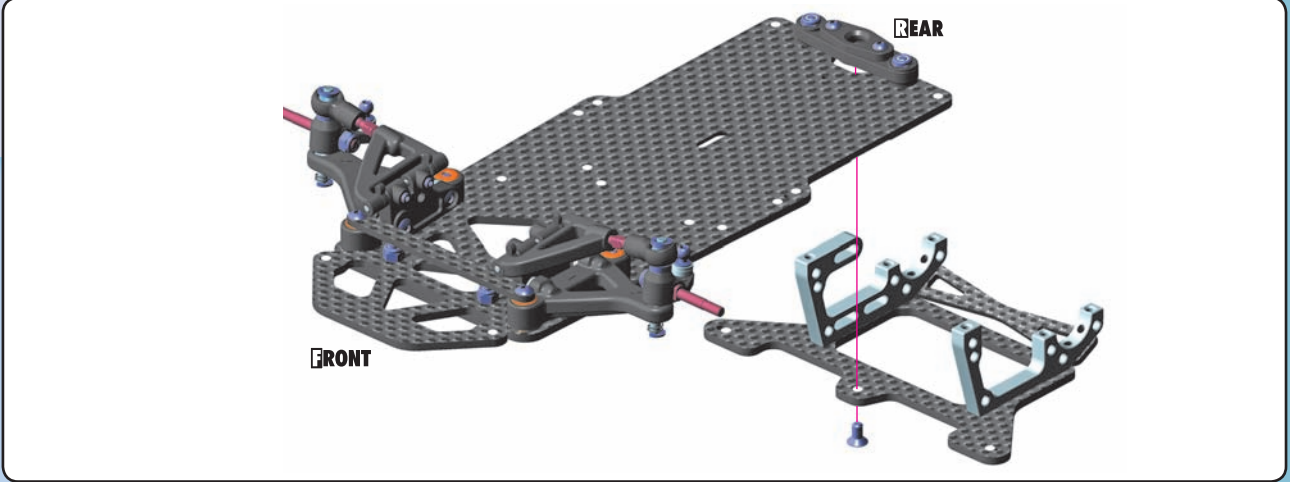


- 903310  
SFH M3x10
- 960031  
ALU N M3



| ALU NUTS M3 |           |        |          |
|-------------|-----------|--------|----------|
| OPTION      | #296530-B | BLUE   | OPTION   |
|             | #296530-K | BLACK  | OPTION   |
|             | #296530-O | ORANGE | OPTION   |
|             | #960031   | SILVER | INCLUDED |

- 903306  
SFH M3x6





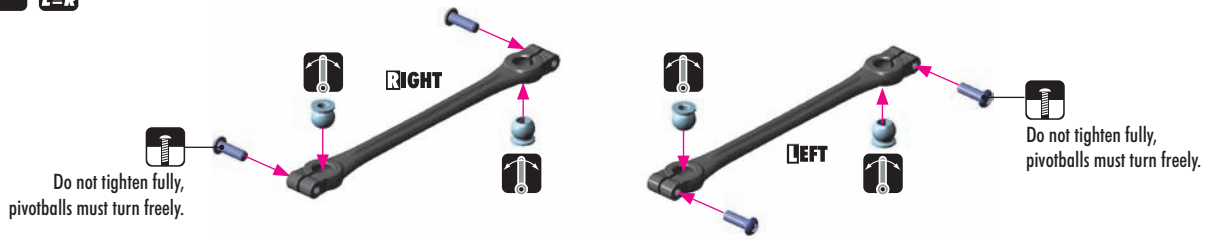
### 3. REAR SUSPENSION

★ EU ★ US



902258  
SH M2.5x8

2x L=R

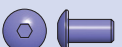
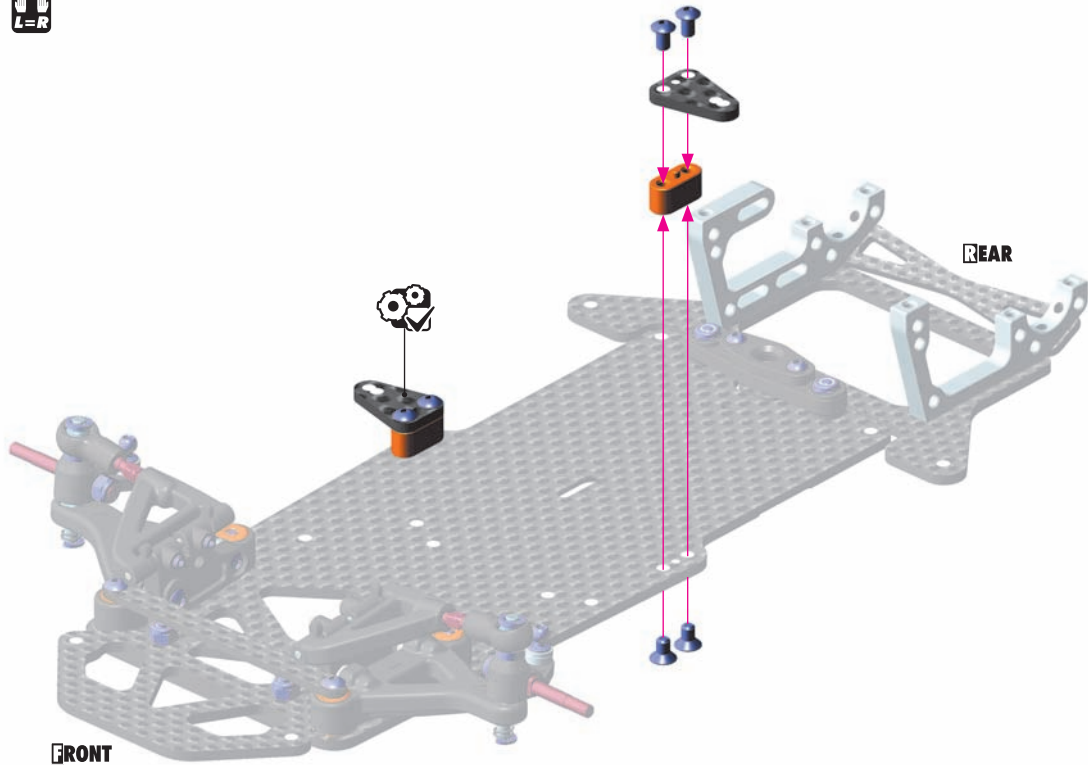


902305  
SH M3x5



903305  
SFH M3x5

2x L=R

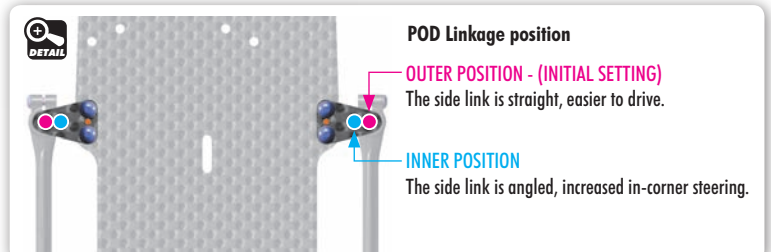
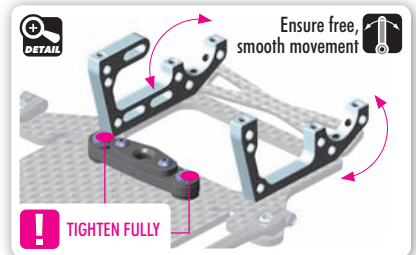
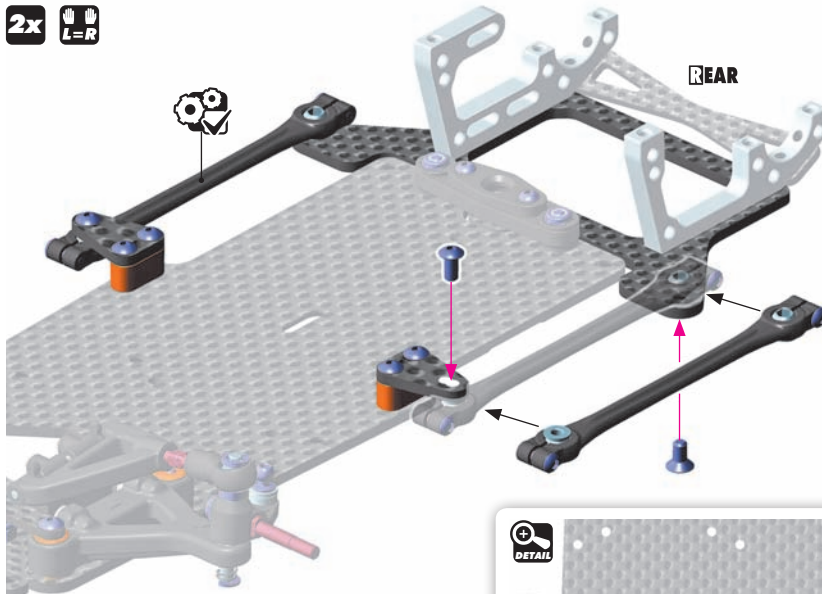


902306  
SH M3x6



903306  
SFH M3x6

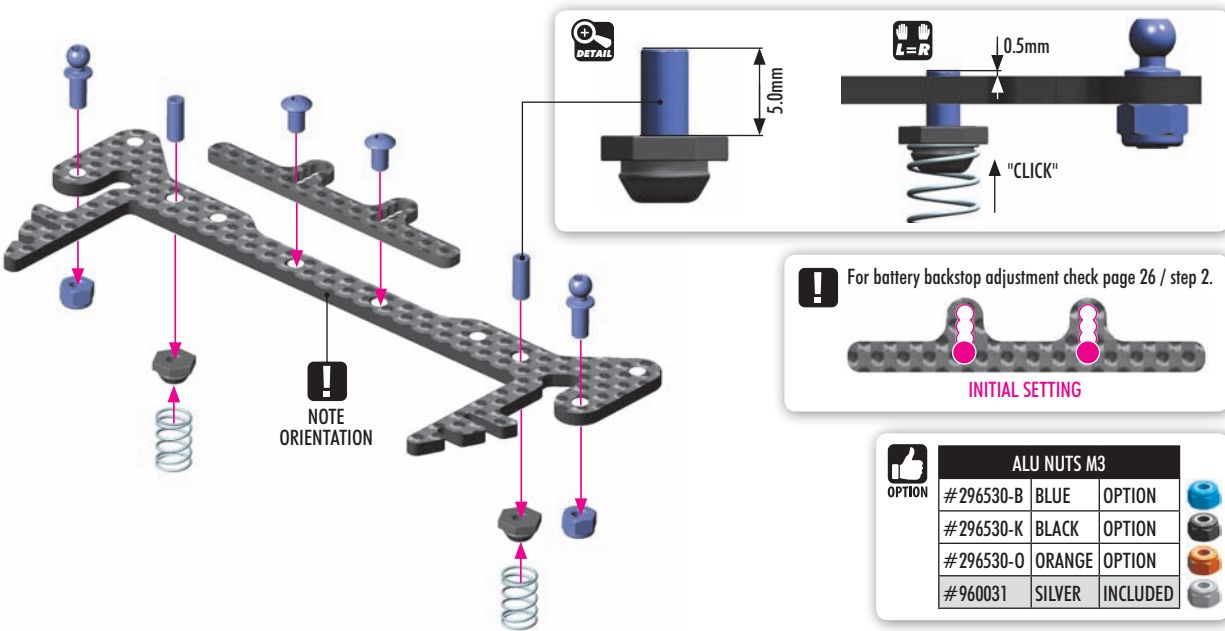
2x L=R



# 3. REAR SUSPENSION



-  901308  
SB M3x8
-  902306  
SH M3x6
-  960031  
ALU N M3







**NOTE ORIENTATION**

**DETAIL** 5.0mm

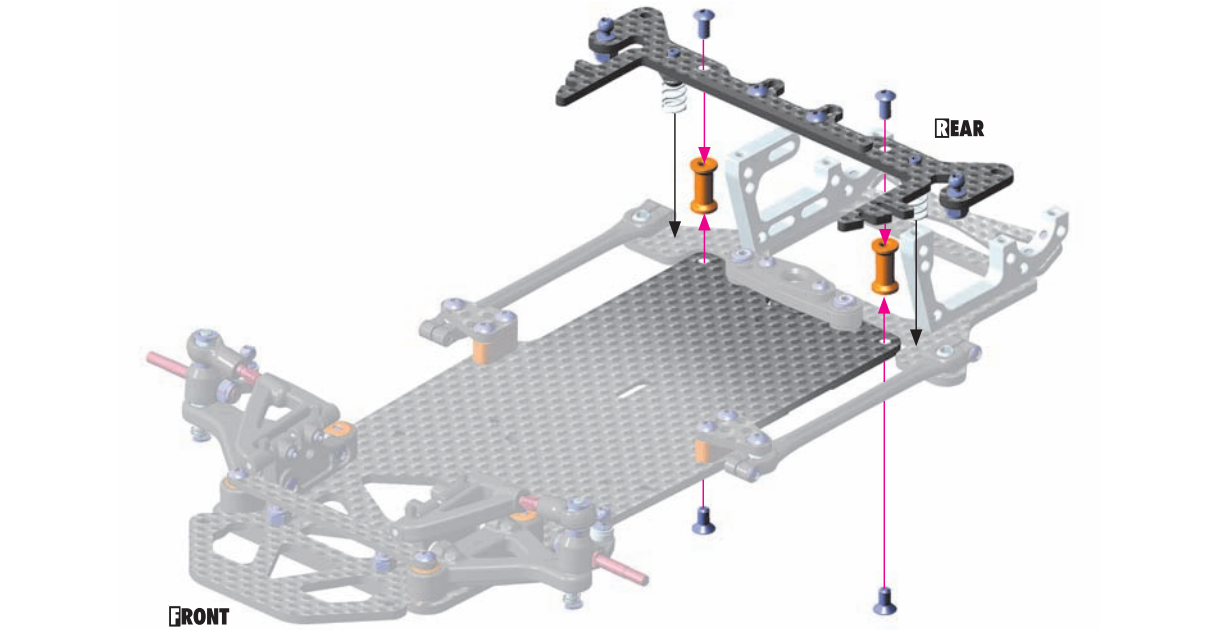
0.5mm  
"CLICK"

**!** For battery backstop adjustment check page 26 / step 2.

**INITIAL SETTING**

| ALU NUTS M3 |                  |          |   |
|-------------|------------------|----------|---|
| OPTION      | #296530-B BLUE   | OPTION   |  |
|             | #296530-K BLACK  | OPTION   |  |
|             | #296530-O ORANGE | OPTION   |  |
|             | #960031 SILVER   | INCLUDED |  |

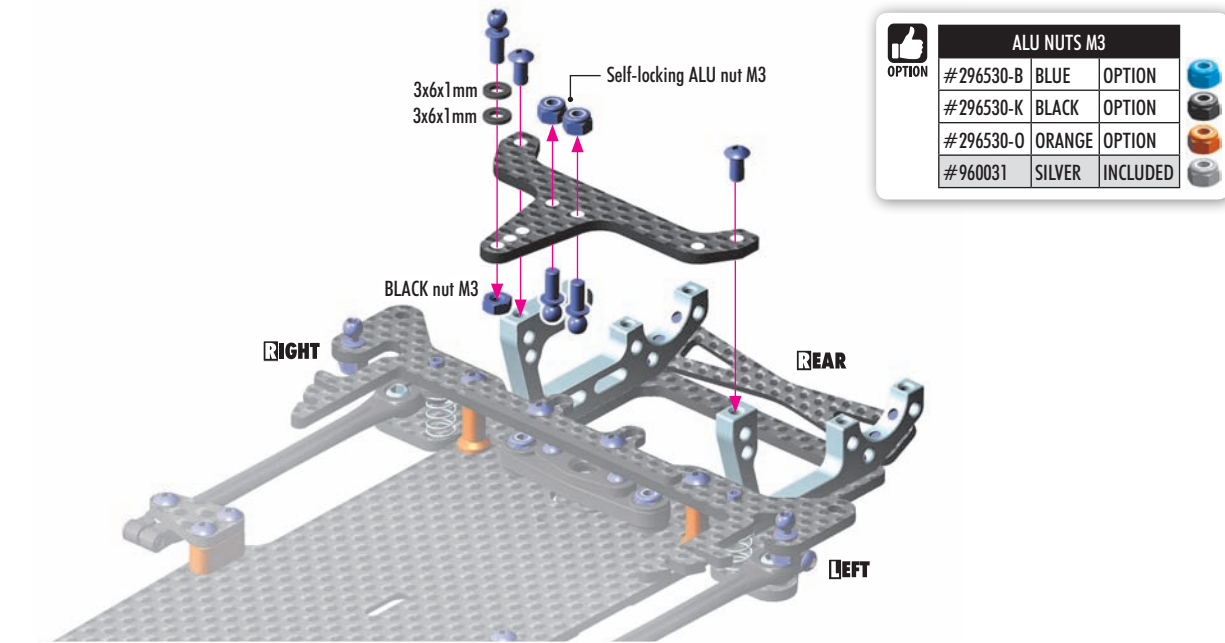
-  902306  
SH M3x6
-  903306  
SFH M3x6



**REAR**

**FRONT**

- IO**  
306219  
SHIM 3x6x1
-  902306  
SH M3x6
-  960031  
ALU N M3
-  960032  
N M3



**RIGHT**





**REAR**

**LEFT**

3x6x1mm  
3x6x1mm

Self-locking ALU nut M3

BLACK nut M3

| ALU NUTS M3 |                  |          |   |
|-------------|------------------|----------|---|
| OPTION      | #296530-B BLUE   | OPTION   |  |
|             | #296530-K BLACK  | OPTION   |  |
|             | #296530-O ORANGE | OPTION   |  |
|             | #960031 SILVER   | INCLUDED |  |

# 3. REAR SUSPENSION



**2x**

**2x**

| HUDY OILS 50ml |          |
|----------------|----------|
| #106410        | 1000cSt  |
| #106420        | 2000cSt  |
| #106430        | 3000cSt  |
| #106440        | 3000cSt  |
| #106450        | 5000cSt  |
| #106460        | 6000cSt  |
| #106470        | 7000cSt  |
| #106480        | 8000cSt  |
| #106510        | 10000cSt |

Add oil in each slot of the COMPOSITE side tubes.

**NOTE:**  
Add oil only in the slots, not on the whole tube.  
After assembling the side tubes, check for smooth operation.  
It is very important to re-oil the side tubes, at least once per race day.  
You may use different oil thicknesses depending on track conditions.

**TIP**

|                         |                 |
|-------------------------|-----------------|
| For HIGH grip           | use SOFTER oils |
| For LOW grip or ASPHALT | use HARDER oils |

**TIP** The angle of the side tubes has a fine effect on car performance.

HIGHER angle: stiffer feeling, less roll  
LOWER angle (flatter): softer feeling, more roll

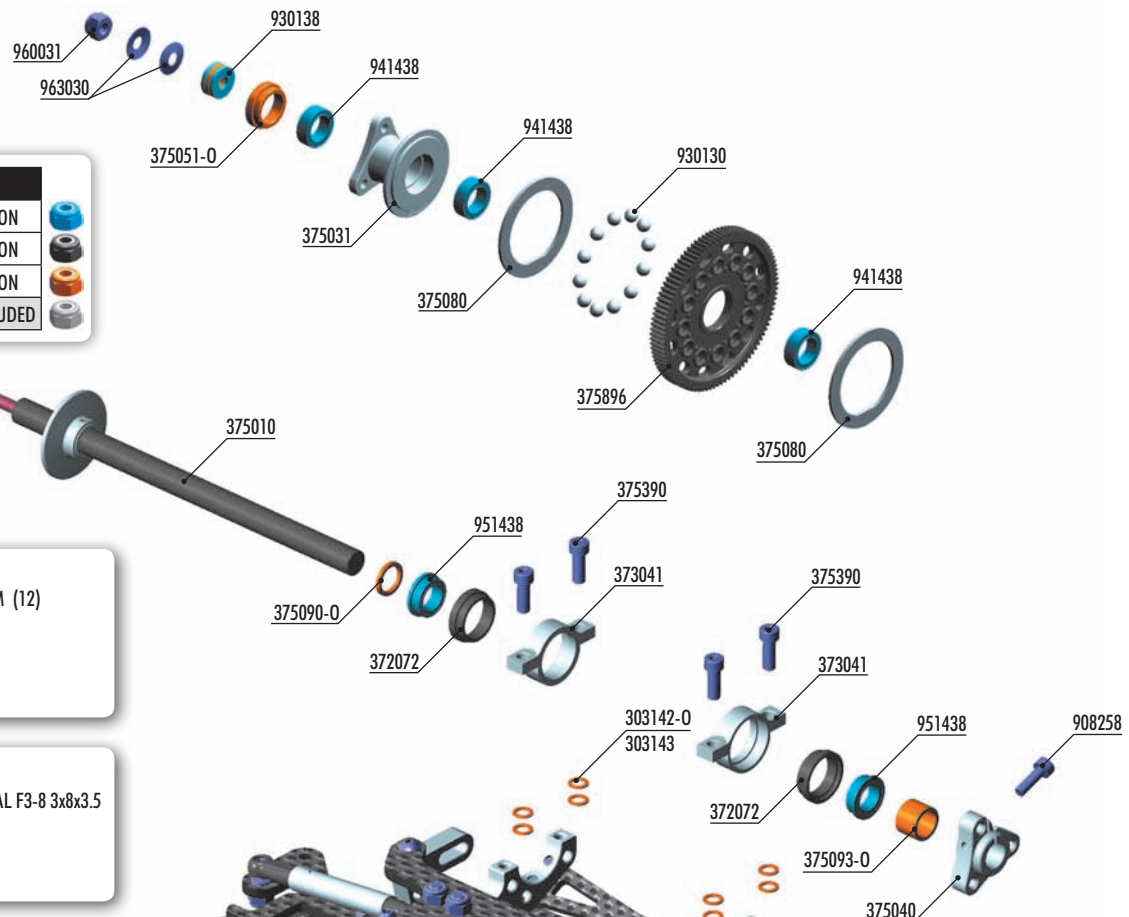
**OPTIONAL SIDE SHOCK**

OPTIONAL: Optional side shock can be used to improve traction in low- and medium-grip conditions. The optional side shock replaces the 2 side tubes.

| OPTIONAL PARTS (NOT INCLUDED) |   |
|-------------------------------|---|
| #378100                       | Side Shock Absorber Set                       |
| #362651                       | Ball End 4.9mm with 8mm Thread (2)            |
| #303120                       | Set of Alu Shims (0.5mm, 1.5mm, 2.5mm)        |
| #372651                       | Ball Universal 4.9mm - HUDY Spring Steel™ (2) |
| #902308                       | Hex Screw SH M3x8 (10)                        |

**NOTE**  
Remove Graphite Battery Backstop

# 4. BALL DIFFERENTIAL



**ALU NUTS M3**

|        |           |        |          |  |
|--------|-----------|--------|----------|--|
| OPTION | #296530-B | BLUE   | OPTION   |  |
|        | #296530-K | BLACK  | OPTION   |  |
|        | #296530-O | ORANGE | OPTION   |  |
|        | #960031   | SILVER | INCLUDED |  |

**OPTION** #930230  
XRAY CERAMIC BALL 3.175MM (12)

**OPTION** #930238  
CERAMIC BALL-BEARING AXIAL F3-8 3x8x3.5

**OPTION** #375000  
XRAY SOLID AXLE 1/12 PAN CAR - SET

**OPTION** #375012  
STEEL REAR AXLE SHAFT - HUDY SPRING STEEL™

**OPTION** #374900  
XRAY GEAR DIFFERENTIAL 1/12 PAN CAR - SET

Included in set #374900

**GEAR DIFF - SPUR GEARS**

|        |         |           |        |
|--------|---------|-----------|--------|
| OPTION | #375776 | 76T / 64P | OPTION |
|        | #375780 | 80T / 64P | OPTION |
|        | #375784 | 84T / 64P | OPTION |
|        | #375788 | 88T / 64P | OPTION |
|        | #375792 | 92T / 64P | OPTION |

**OPTION** #373042  
ALU UPPER ECCENTRIC CLAMP

**OPTION** **SPUR GEARS**

|        |         |           |          |  |
|--------|---------|-----------|----------|--|
| OPTION | #375872 | 72T / 64P | OPTION   |  |
|        | #375875 | 75T / 64P | OPTION   |  |
|        | #375876 | 76T / 64P | OPTION   |  |
|        | #375878 | 78T / 64P | OPTION   |  |
|        | #375880 | 80T / 64P | OPTION   |  |
|        | #375896 | 96T / 64P | INCLUDED |  |



|          |   |        |  |
|----------|---|--------|--|
| 303142-0 | ALU SHIM 3x5x0.5MM - ORANGE (10)                | 375390 | ALU HEX SCREW M3x8 FOR REAR WHEELS (6)                           |
| 303143   | ALU SHIM 3x5x0.25MM (10)                        | 375896 | COMPOSITE SPUR GEAR - 96T / 64P                                  |
| 372072   | COMPOSITE BALL-BEARING HUB (2)                  | 908258 | HEX SCREW SOCKET HEAD CAP M2.5x8 (10)                            |
| 373041   | ALU UPPER CLAMP FOR BALL-BEARING WITH HUB       | 930130 | CARBIDE BALL 3.175MM (12)  |
| 375010   | REAR AXLE SHAFT - GRAPHITE - V3                 | 930138 | CARBIDE BALL-BEARING AXIAL F3-8 3x8x3.5 - V2                     |
| 375031   | ALU REAR WHEEL HUB - RIGHT                      | 941438 | BALL-BEARING 1/4"x3/8"x1/8" RUBBER SEALED - OIL (2)              |
| 375040   | ALU REAR WHEEL HUB - LEFT                       | 951438 | BALL-BEARING 1/4" x 3/8" x 1/8" FLANGED - STEEL SEALED - OIL (2) |
| 375051-0 | ALU DIFF HUB - ORANGE                           | 960031 | ALU NUT M3 (10)  |
| 375080   | D-LOCK DIFF PLATE (2)                           | 963030 | CONE WASHER ST 3x8x0.5 (10)                                      |
| 375090-0 | SET OF ALU SHIMS (0.5MM, 1.0MM, 2.0MM) - ORANGE |        |  |
| 375093-0 | ALU SHIM 6.37x8.4x6.0MM - ORANGE (2)            |        |  |

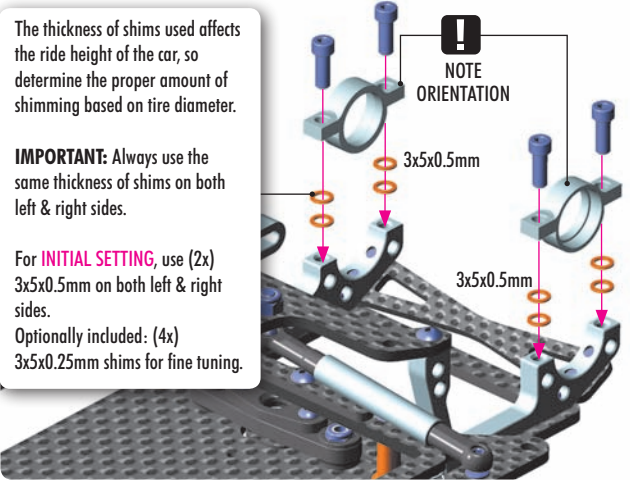


# 4. BALL DIFFERENTIAL **EU** **US**

-  303142-0  
SHIM 3x5x0.5
-  303143  
SHIM 3x5x0.25
-  375390  
ALU SCH M3x8

The thickness of shims used affects the ride height of the car, so determine the proper amount of shimming based on tire diameter.

**NOTE ORIENTATION**



**IMPORTANT:** Always use the same thickness of shims on both left & right sides.

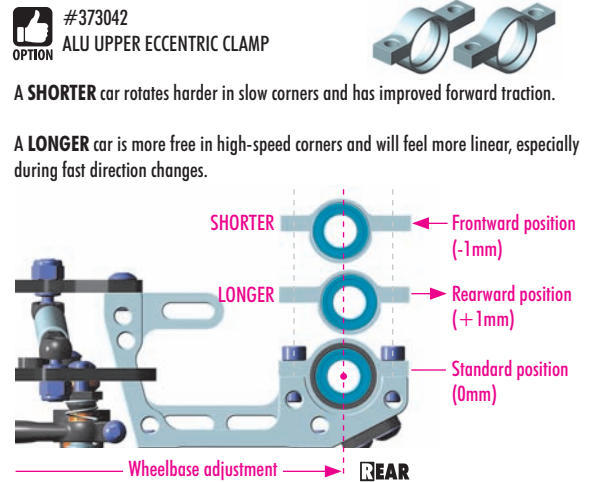
For **INITIAL SETTING**, use (2x) 3x5x0.5mm on both left & right sides.  
Optionally included: (4x) 3x5x0.25mm shims for fine tuning.

**#373042 ALU UPPER ECCENTRIC CLAMP**

**OPTION**

A **SHORTER** car rotates harder in slow corners and has improved forward traction.

A **LONGER** car is more free in high-speed corners and will feel more linear, especially during fast direction changes.



SHORTER ← Frontward position (-1mm)  
LONGER → Rearward position (+1mm)  
Standard position (0mm)

Wheelbase adjustment → **REAR**

-  375090-0  
6.4x8.4x1.0
-  375090-0  
6.4x8.4x0.5
-  375093-0  
6.4x8.4x6.0
-  908258  
SCH M2.5x8
-  951438  
BB 1/4"x3/8"x1/8"

**#375012 STEEL REAR AXLE SHAFT HUDY SPRING STEEL™**

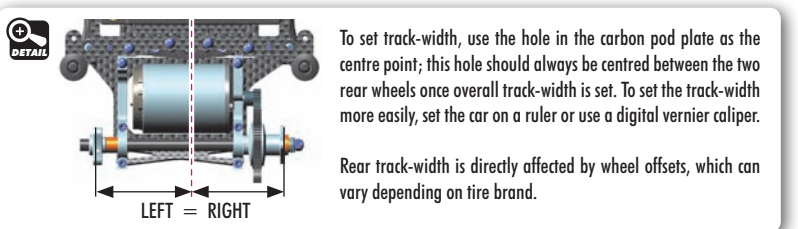
**OPTION**



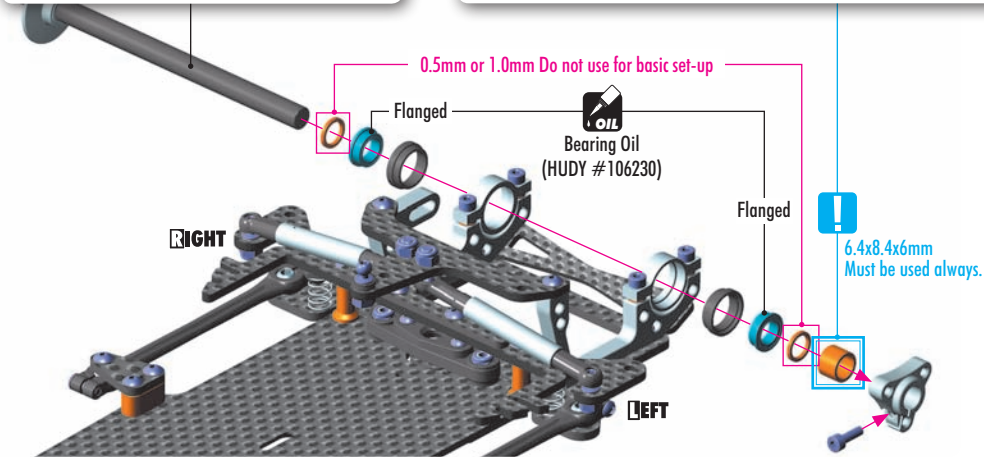
Optional steel rear axle offers better durability as it will not break even in serious crashes, however add extra weight and decreases slightly steering response

To set track-width, use the hole in the carbon pod plate as the centre point; this hole should always be centred between the two rear wheels once overall track-width is set. To set the track-width more easily, set the car on a ruler or use a digital vernier caliper.

Rear track-width is directly affected by wheel offsets, which can vary depending on tire brand.



LEFT = RIGHT



0.5mm or 1.0mm Do not use for basic set-up

Flanged

Bearing Oil (HUDY #106230)

Flanged

6.4x8.4x6mm Must be used always.


**RIGHT**

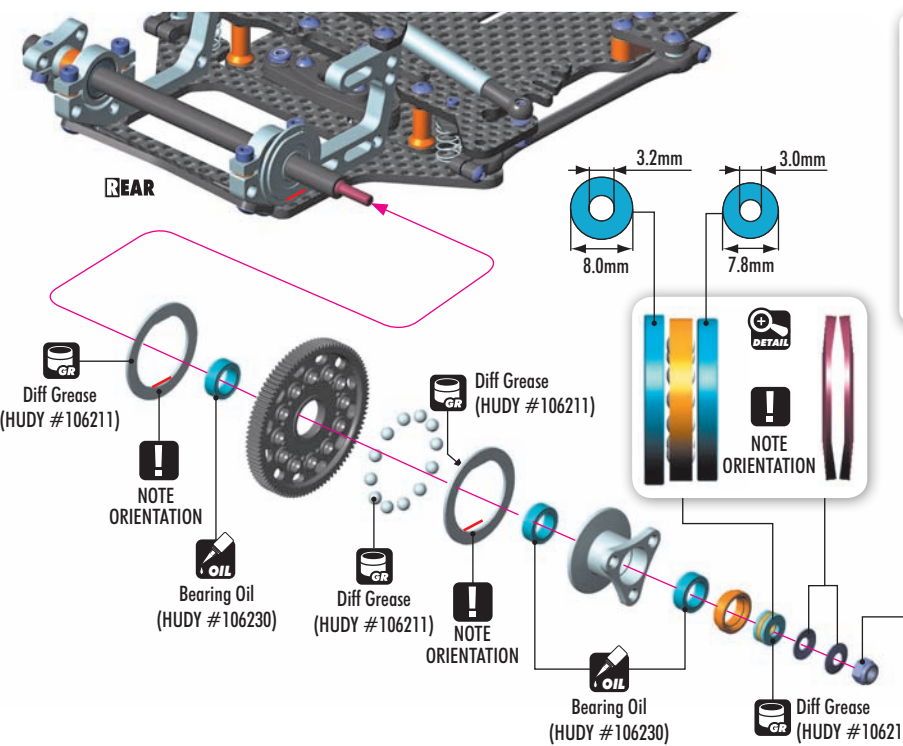
**LEFT**

**!** The axle must have a **VERY** small amount of side play. If there is no side play, the axle may bind and damage the ball-bearings.



**DETAIL**

-  930130  
B 3.1
-  930138  
BA 3x8
-  941438  
BB 1/4"x3/8"x1/8"
-  960031  
ALU N M3
-  963030  
ST 3x8



**REAR**

8.0mm 3.2mm 3.0mm 7.8mm

Diff Grease (HUDY #106211)

**NOTE ORIENTATION**

Bearing Oil (HUDY #106230)

Diff Grease (HUDY #106211)

**NOTE ORIENTATION**

Bearing Oil (HUDY #106230)

Diff Grease (HUDY #106211)

**OPTION**

| SPUR GEARS |           |          |
|------------|-----------|----------|
| #375872    | 72T / 64P | OPTION   |
| #375875    | 75T / 64P | OPTION   |
| #375876    | 76T / 64P | OPTION   |
| #375878    | 78T / 64P | OPTION   |
| #375880    | 80T / 64P | OPTION   |
| #375896    | 96T / 64P | INCLUDED |

**!** **IMPORTANT**

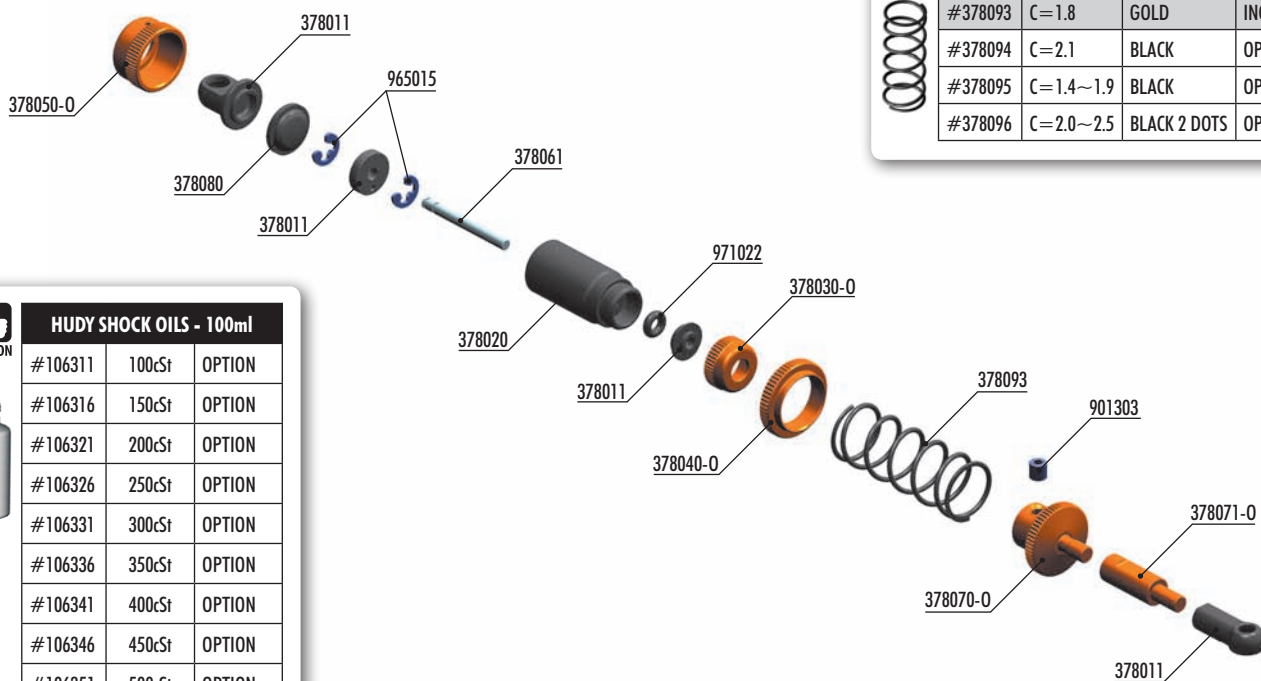
This nut affects the tightness and stiffness of the rear differential. Tighten the nut gently so the diff does not slip under power, but do not overtighten or the diff balls and/or plates may be damaged.



# 5. SHOCK ABSORBER

EU

US

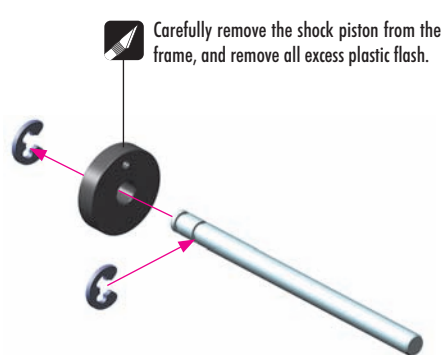


| SHOCK SPRINGS |         |           |              |          |
|---------------|---------|-----------|--------------|----------|
| OPTION        | #378092 | C=1.5     | SILVER       | OPTION   |
|               | #378093 | C=1.8     | GOLD         | INCLUDED |
|               | #378094 | C=2.1     | BLACK        | OPTION   |
|               | #378095 | C=1.4~1.9 | BLACK        | OPTION   |
|               | #378096 | C=2.0~2.5 | BLACK 2 DOTS | OPTION   |

| HUDY SHOCK OILS - 100ml |         |          |
|-------------------------|---------|----------|
| #106311                 | 100cSt  | OPTION   |
| #106316                 | 150cSt  | OPTION   |
| #106321                 | 200cSt  | OPTION   |
| #106326                 | 250cSt  | OPTION   |
| #106331                 | 300cSt  | OPTION   |
| #106336                 | 350cSt  | OPTION   |
| #106341                 | 400cSt  | OPTION   |
| #106346                 | 450cSt  | OPTION   |
| #106351                 | 500cSt  | OPTION   |
| #106356                 | 550cSt  | OPTION   |
| #106361                 | 600cSt  | OPTION   |
| #106366                 | 650cSt  | OPTION   |
| #106370                 | 700cSt  | INCLUDED |
| #106376                 | 750cSt  | OPTION   |
| #106381                 | 800cSt  | OPTION   |
| #106391                 | 900cSt  | OPTION   |
| #106411                 | 1000cSt | OPTION   |
| #106421                 | 2000cSt | OPTION   |



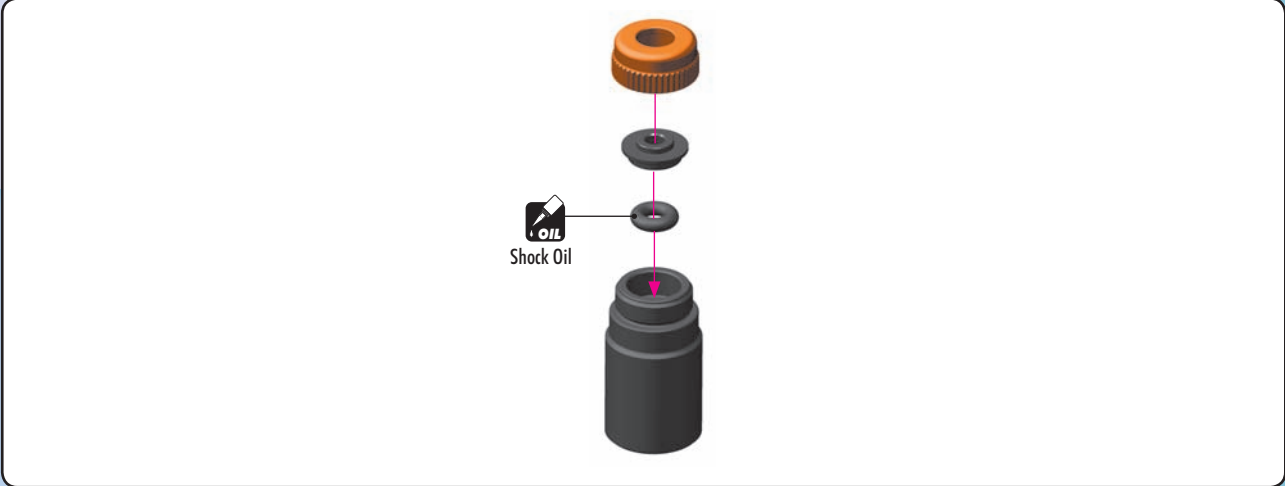
- 378001 SHOCK ABSORBER SET
- 378011 COMPOSITE SHOCK PARTS - FRAME
- 378020 ALU THREADED SHOCK BODY - HARDCOATED
- 378030-0 ALU SHOCK BODY CAP - LOWER - ORANGE
- 378040-0 ALU SHOCK ADJUSTABLE COLLAR - ORANGE
- 378050-0 ALU SHOCK BODY CAP - UPPER - ORANGE
- 378061 SHOCK SHAFT
- 378070-0 ALU SHOCK SPRING COLLAR - ORANGE
- 378071-0 ALU SHOCK ADAPTER - ORANGE
- 378080 SHOCK RUBBER MEMBRANE (2)
- 378093 SHOCK SPRING - GOLD
- 901303 HEX SCREW SB M3x3 (10)
- 965015 E-CLIP 1.5 (10)
- 971022 SILICONE O-RING 2x2 (10)



# 5. SHOCK ABSORBER **EU** **US**

**01**

971022  
0 2x2



## DEFAULT SHOCK SETTING FOR CENTER SHOCK ABSORBER Follow the steps below to set the shock.

**Oil 700cSt**

**HALF TIGHTEN**  
**50%**

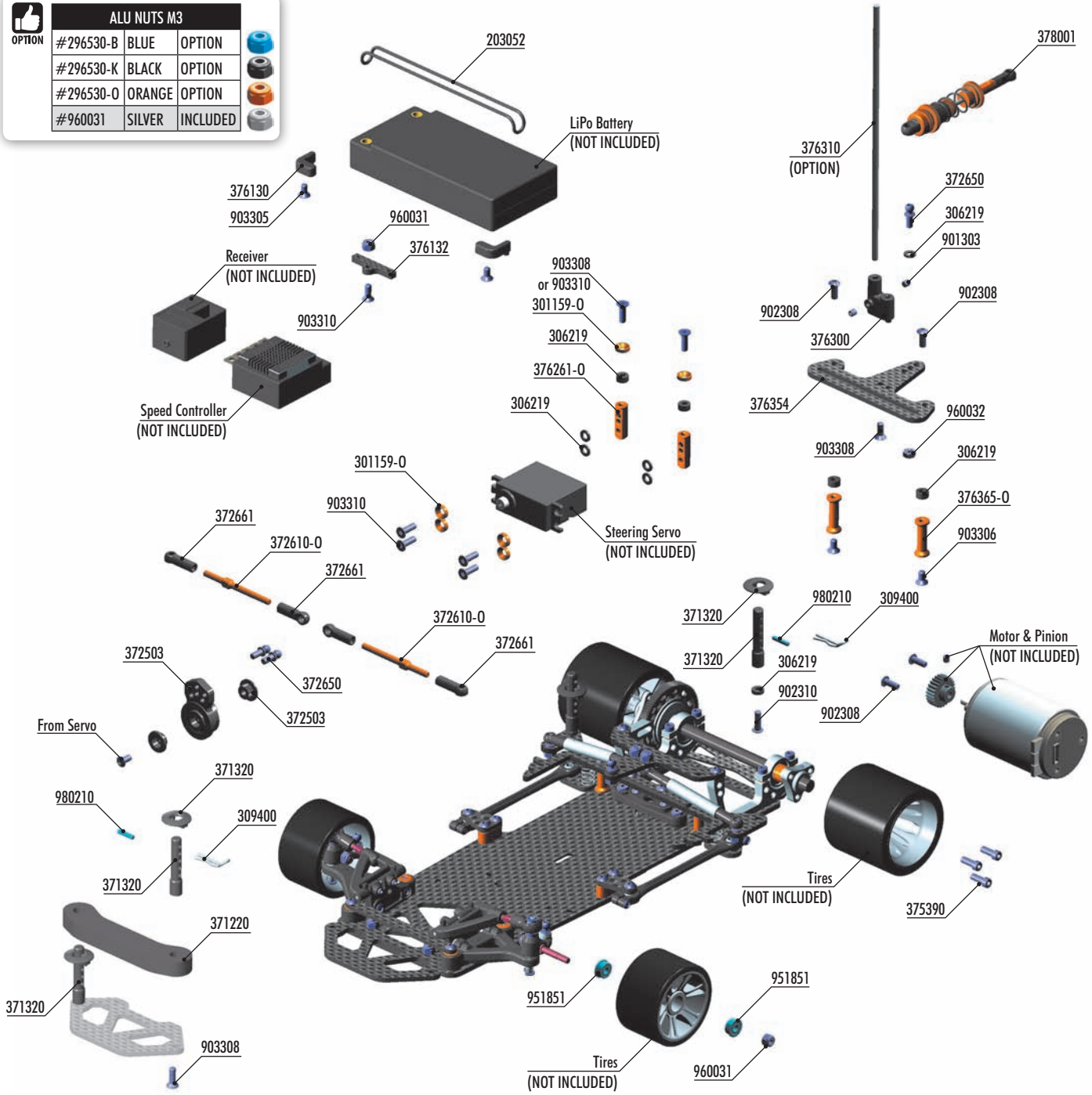
**TIGHTEN FULLY**  
**100%**

- 1** Extend the shock shaft completely. Fill the shock body with the shock oil.
- 2** Move the shock shaft up and down a few times to release the air bubbles trapped beneath the piston.

3~5x  
UP & DOWN
- 3** Orient the filled shock vertically for several minutes with the shock shaft fully extended. The remaining air bubbles will release.
- 4** Install the shock membrane into the groove in the upper shock cap.
- 5** Gently place the shock cap assembly onto the filled shock body. Excess oil will spill from the shock. Screw the shock cap onto the body by only a few turns, approx. 50%. Excess oil will flow through the hole in the shock cap.
- 6** Gently push the shock shaft completely into the shock body. Excess oil will flow through the hole in the shock cap.
- 7** Keep the shock shaft pushed in the shock body and tighten the shock cap completely.

Tighten the cap fully but do not overtighten or the rubber membrane may be damaged. Make sure that there is no oil leakage after the cap is tightened.

| OPTION    | ALU NUTS M3 |          |  |
|-----------|-------------|----------|--|
| #296530-B | BLUE        | OPTION   |  |
| #296530-K | BLACK       | OPTION   |  |
| #296530-O | ORANGE      | OPTION   |  |
| #960031   | SILVER      | INCLUDED |  |



**BAG**  
**06**

|               |  |          |  |
|---------------|--|----------|--|
| 301159-0      | ALU COUNTERSUNK SHIM - ORANGE (4)                  | 376365-0 | ALU MOUNT 18.0MM - ORANGE (2)                                      |
| 305968~306000 | PINION GEAR HARDCOATED 18~50T/64P (OPTION)         | 376310   | FIBERGLASS SOLID ANTENNA ROD + CAP (OPTION)                        |
| 306219        | COMPOSITE SET OF SERVO SHIMS (4)                   | 378001   | SHOCK ABSORBER SET   |
| 309400        | BODY CLIP FOR 5MM BODY POST (8)                    | 203052   | O-RING FOR 1/10 ON-ROAD SET-UP WHEEL (4)                           |
| 371220        | X12 FOAM BUMPER                                    | 901303   | HEX SCREW SB M3x3 (10)   |
| 371320        | COMPOSITE BODY POST (2)                            | 902308   | HEX SCREW SH M3x8 (10)   |
| 372503        | COMPOSITE SERVO SAVER - STIFF - SET                | 902310   | HEX SCREW SH M3x10 (10)  |
| 372610-0      | ALU ADJ. TURNBUCKLE M3x42 MM - ORANGE (2)          | 903305   | HEX SCREW SFH M3x5 (10)  |
| 372650        | BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2) | 903306   | HEX SCREW SFH M3x6 (10)  |
| 372661        | COMPOSITE STEERING BALL-JOINT 4.2 MM OPEN (4)      | 903308   | HEX SCREW SFH M3x8 (10)  |
| 375390        | ALU HEX SCREW M3x8 FOR REAR WHEELS (6)             | 903310   | HEX SCREW SFH M3x10 (10)   |
| 376130        | COMPOSITE LiPo BATTERY BACKSTOP (2)                | 951851   | BALL-BEARING 1/8" x 5/16" x 9/64" FLANGED - STEEL SEALED - OIL (2) |
| 376132        | GRAPHITE BATTERY BACKSTOP 3.0MM - MIDDLE           | 960031   | ALU NUT M3 (10)  |
| 376261-0      | X12'20 ALU SERVO MOUNT - ORANGE (2)                | 960032   | NUT M3 (10)  |
| 376300        | COMPOSITE ANTENNA MOUNT                            | 980210   | PIN 2x10 (10)  |
| 376354        | X12'20 GRAPHITE PLATE FOR ANTENNA HOLDER           |          |  |



# 6. FINAL ASSEMBLY **EU** **US**

- IO**  
306219  
SHIM 3x6x1
- 903310**  
SFH M3x10

**!** We recommend using a servo for 1/12 pan cars.

**!** NOTE ORIENTATION

3x6x1mm

**!** Do not use for basic set up.

STANDARD SERVO POSITION

MICRO SERVO POSITION

**SET-UP BOOK**  
ACKERMANN

**SERVO SAVER**

1 2 3 4

Futaba Hitec KO Propo

**!** NOTE ORIENTATION

Use the adapter that matches the steering servo.

**INITIAL SETTING**

Note the orientation of servo saver when servo is in neutral.

90°

Servo Screw (NOT INCLUDED)

Steering Servo (NOT INCLUDED)

- 901303**  
SB M3x3
- 903308**  
SFH M3x8

**TIP**

If you do not plan to use the antenna #376310 (OPTION), the entire step can be skipped.

- IO**  
306219  
SHIM 3x6x3
- 903308**  
SFH M3x8
- 903310**  
SFH M3x10

**ALTERNATIVE 1 - FOR CROSS-CHASSIS ALIGNMENT (INITIAL SETTING)**

3x8mm

**TIGHTEN GENTLY**

3x8mm

CROSS-CHASSIS ALIGNMENT

**ALTERNATIVE 2 - FOR INLINE ALIGNMENT**

3x10mm

**TIGHTEN GENTLY**

3x10mm

3x6x3mm

3x6x3mm

INLINE ALIGNMENT



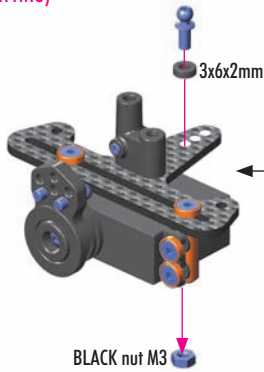
306219  
SHIM 3x6x2



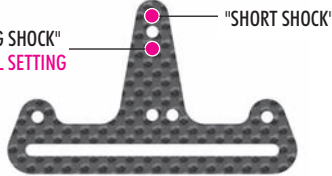
960032  
N M3

## ALTERNATIVE 1

**LONG SHOCK** - FORWARD MOUNT POSITION  
(INITIAL SETTING)

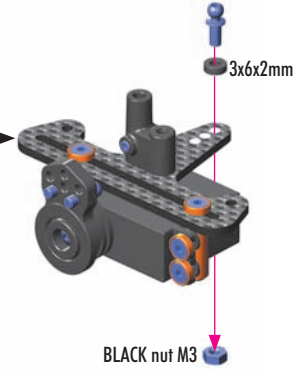


"LONG SHOCK"  
INITIAL SETTING



## ALTERNATIVE 2

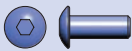
**SHORT SHOCK** - REARWARD MOUNT POSITION



BLACK nut M3



306219  
SHIM 3x6x3



902308  
SH M3x8

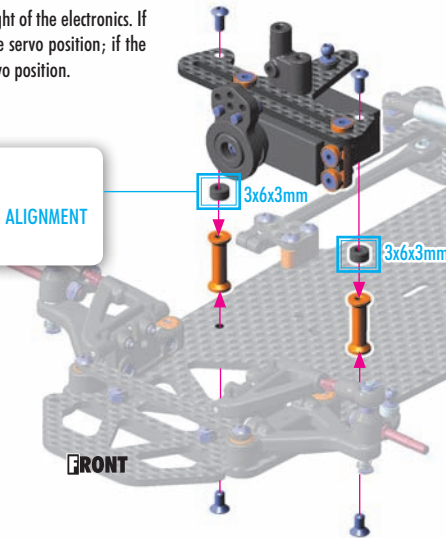


903306  
SFH M3x6

The position of the servo depends on the weight of the electronics. If the car is heavier on the right, use a left-side servo position; if the car is heavier on the left, use a right-side servo position.

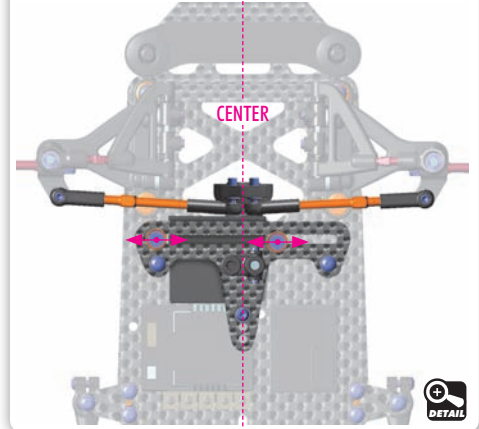


**NOTE**  
Use these shims only when you use **INLINE ALIGNMENT** battery configuration.



The floating servo mount eliminates unwanted tweak, and also allows you to adjust any 1/12 servo to the centerline of the chassis.

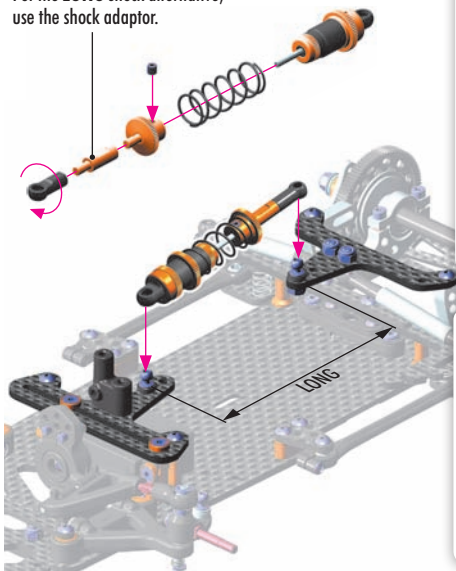
**FRONT**



901303  
SB M3x3

## ALTERNATIVE 1 (INITIAL SETTING) LONG SHOCK

For the **LONG** shock alternative, use the shock adaptor.



An innovative new feature is to change the center shock length (and front mounting position). By using longer or shorter shock, the damping and steering characteristics can be changed.

### LONG SHOCK (INITIAL SETTING):

Shock is built **WITH** adaptor.  
Front mount is **FORWARD**.  
Improves driveability over bumps, improves on-power traction.

### SHORT SHOCK:

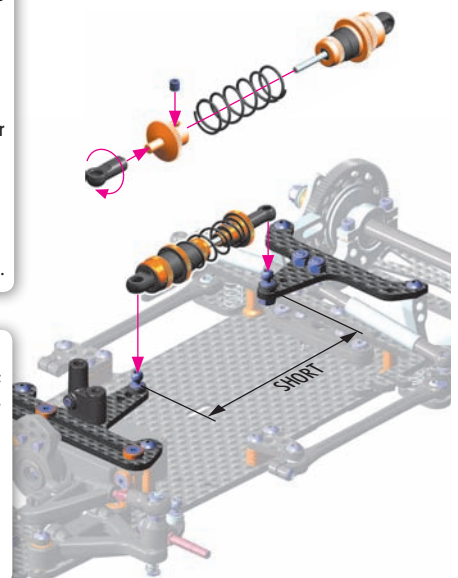
Shock is built **WITHOUT** adaptor.  
Front mount is **REARWARD**.  
Improves steering response, quicker direction changes.

### DOWNSTOP ADJUSTMENT

The length of the shock absorber affects the amount of rear downstop. To adjust, thread the ball-joint on or off the bottom spring cap or adaptor.

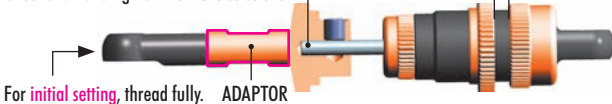


## ALTERNATIVE 2 SHORT SHOCK



### LONG SHOCK (INITIAL SETTING)

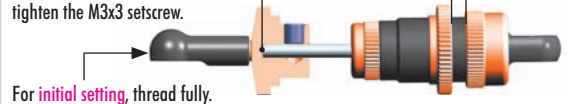
Press the collar **FULLY** onto the end of the shock shaft and tighten the M3x3 setscrew.



For **initial setting**, thread fully.

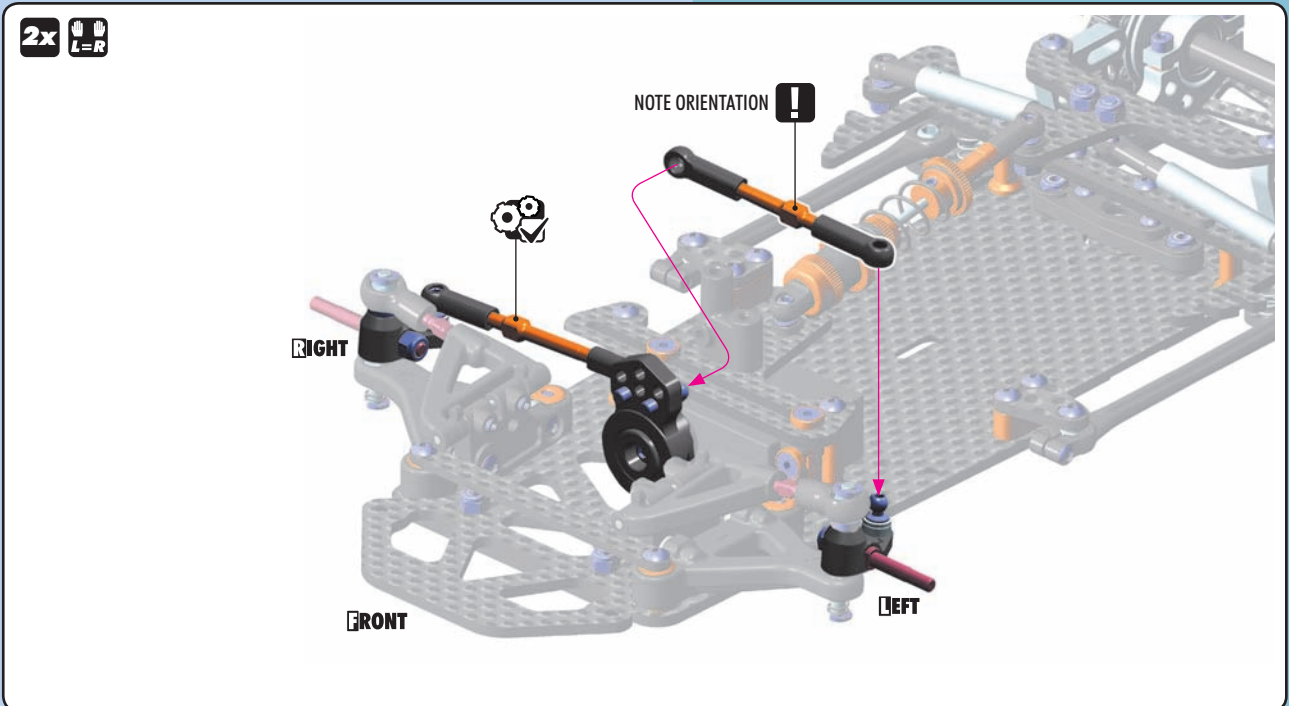
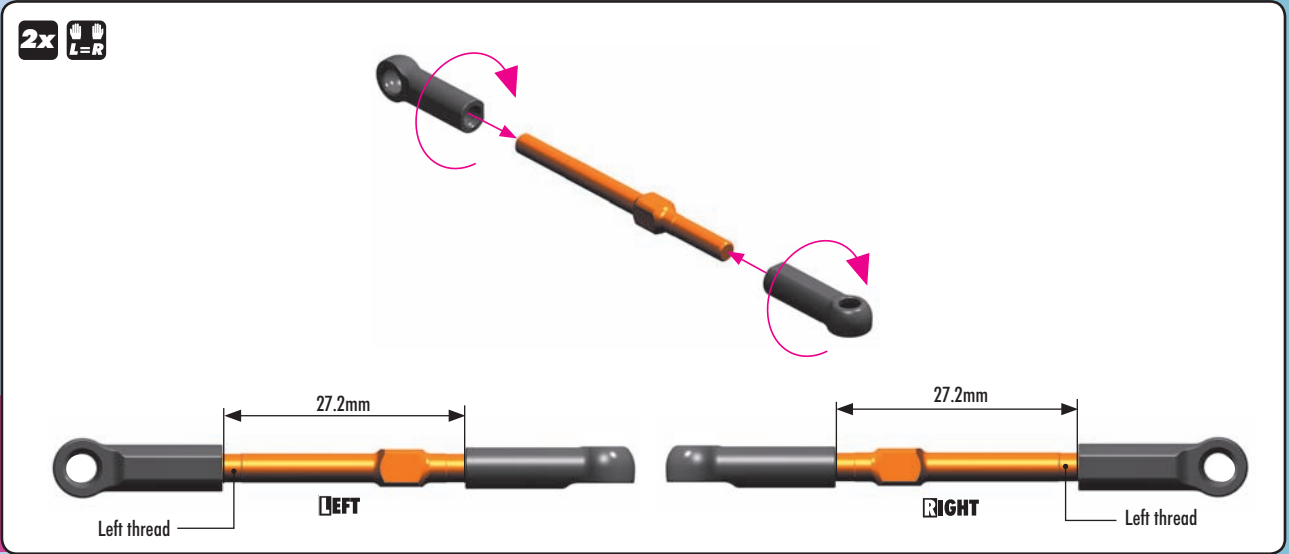
### SHORT SHOCK

Press the collar **FULLY** onto the end of the shock shaft and tighten the M3x3 setscrew.

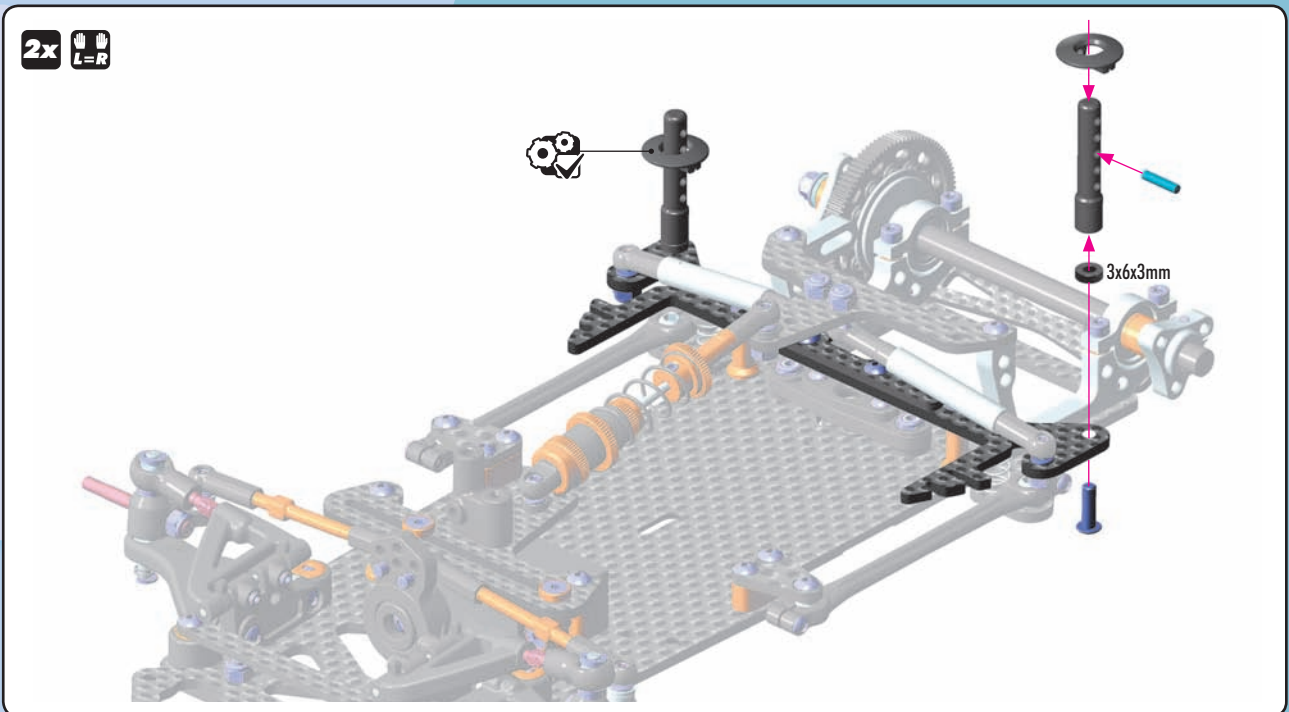


For **initial setting**, thread fully.

# 6. FINAL ASSEMBLY **EU** **US**

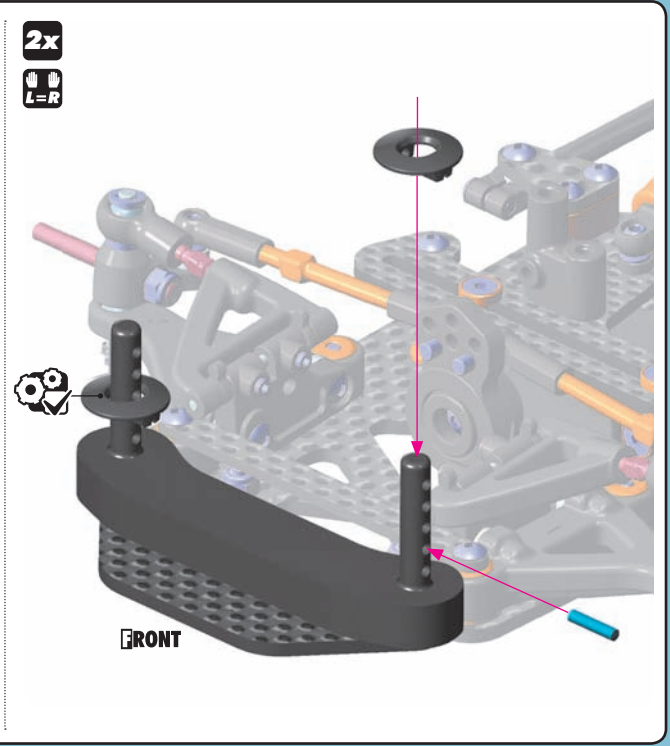
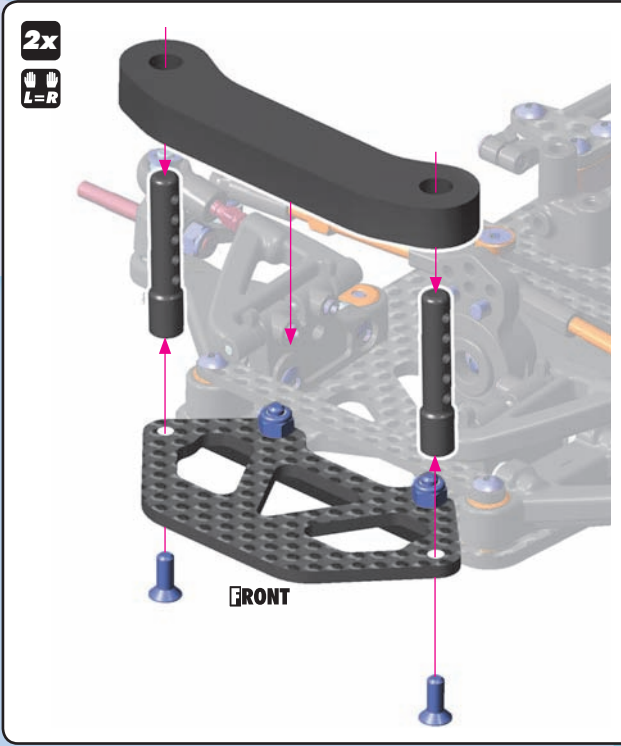


- 306219 SHIM 3x6x3
- 902310 SH M3x10
- 980210 P 2x10

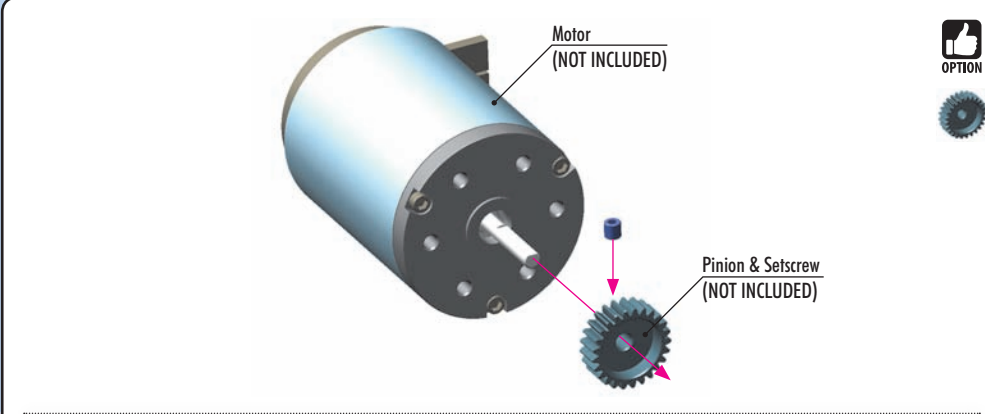



  
**903308**  
 SFH M3x8

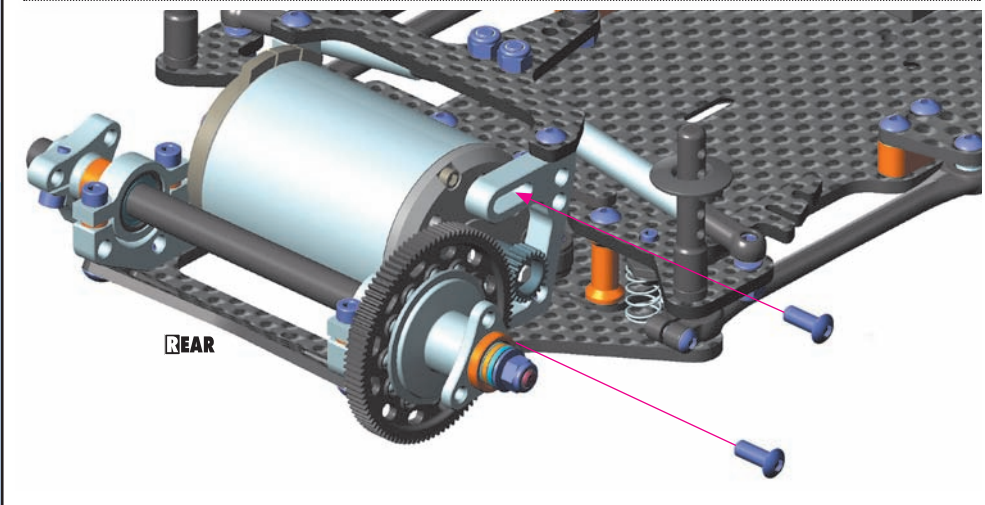

  
**980210**  
 P 2x10




  
**902308**  
 SH M3x8

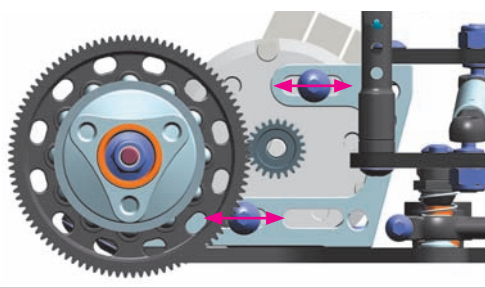


| PINION GEARS ALU HARDCOATED |           |        |
|-----------------------------|-----------|--------|
| #305968                     | 18T / 64P | OPTION |
| #305969                     | 19T / 64P | OPTION |
| #305970                     | 20T / 64P | OPTION |
| #305971                     | 21T / 64P | OPTION |
| #305972                     | 22T / 64P | OPTION |
| #305973                     | 23T / 64P | OPTION |
| #305974                     | 24T / 64P | OPTION |
| #305975                     | 25T / 64P | OPTION |
| #305976                     | 26T / 64P | OPTION |
| #305977                     | 27T / 64P | OPTION |
| #305978                     | 28T / 64P | OPTION |
| #305979                     | 29T / 64P | OPTION |
| #305980                     | 30T / 64P | OPTION |
| #305981                     | 31T / 64P | OPTION |
| #305982                     | 32T / 64P | OPTION |
| #305983                     | 33T / 64P | OPTION |
| #305984                     | 34T / 64P | OPTION |
| #305985                     | 35T / 64P | OPTION |
| #305986                     | 36T / 64P | OPTION |
| #305987                     | 37T / 64P | OPTION |
| #305988                     | 38T / 64P | OPTION |
| #305989                     | 39T / 64P | OPTION |
| #305990                     | 40T / 64P | OPTION |
| #305991                     | 41T / 64P | OPTION |
| #305992                     | 42T / 64P | OPTION |
| #305993                     | 43T / 64P | OPTION |
| #305994                     | 44T / 64P | OPTION |
| #305996                     | 46T / 64P | OPTION |
| #305997                     | 47T / 64P | OPTION |
| #305998                     | 48T / 64P | OPTION |
| #306000                     | 50T / 64P | OPTION |



**GEAR MESH**

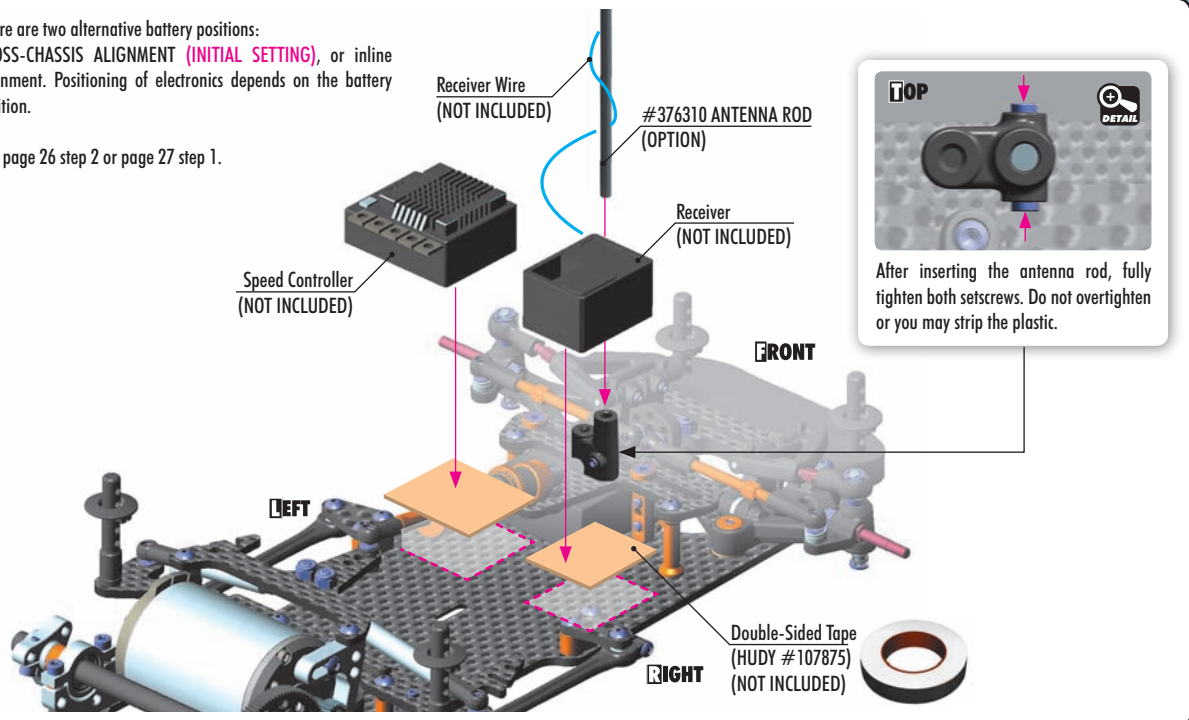
Adjust the gear mesh so there is appropriate space between the spur gear and pinion teeth. There should be a very small amount of freeplay.




  
**SET-UP BOOK**  
 GEAR RATIO

**I** There are two alternative battery positions: CROSS-CHASSIS ALIGNMENT (**INITIAL SETTING**), or inline alignment. Positioning of electronics depends on the battery position.

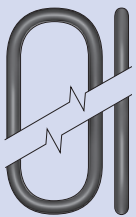
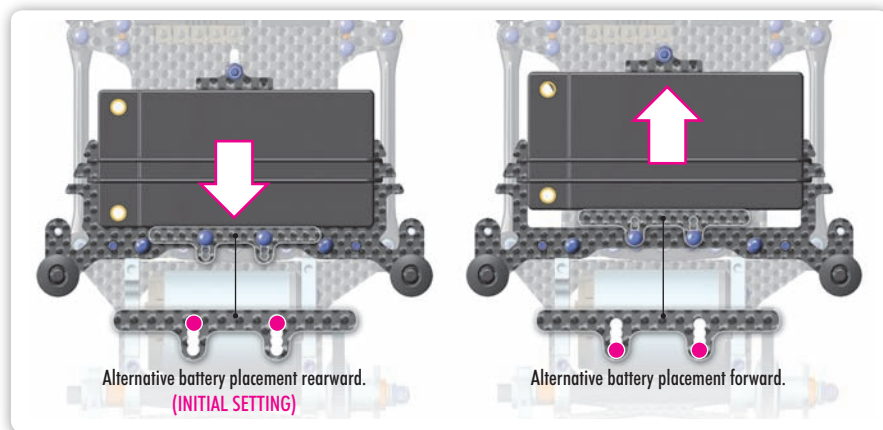
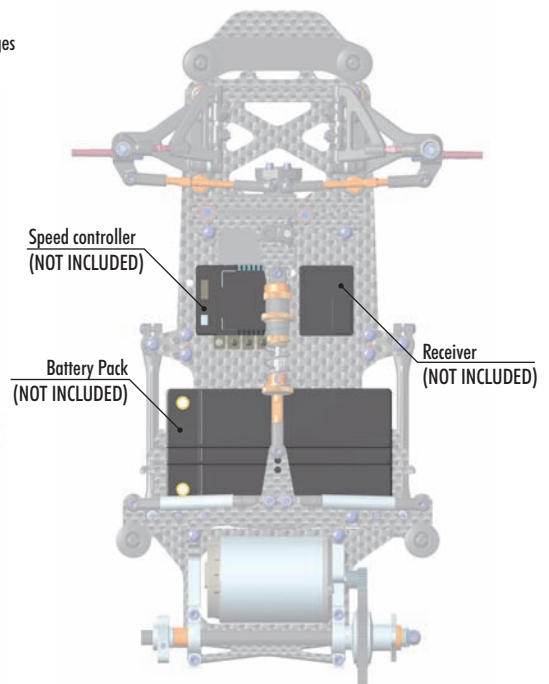
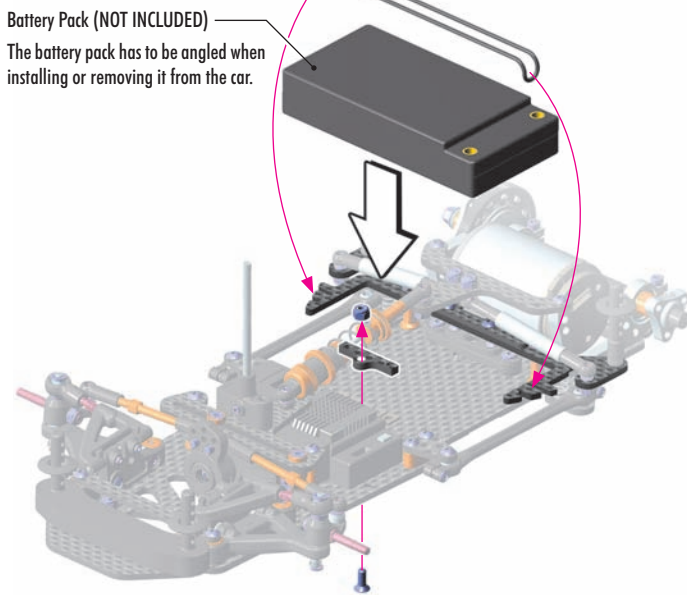
See page 26 step 2 or page 27 step 1.



## LIPO BATTERY CONFIGURATION 1 CROSS-CHASSIS ALIGNMENT:

### INITIAL ASSEMBLY

Cross-chassis alignment provides more neutral handling, making the car less sensitive to set-up changes and gives reduced steering responsive. Recommended for low- and medium-traction conditions.



203052  
Ø 50x1.8



903310  
SFH M3x10



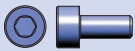
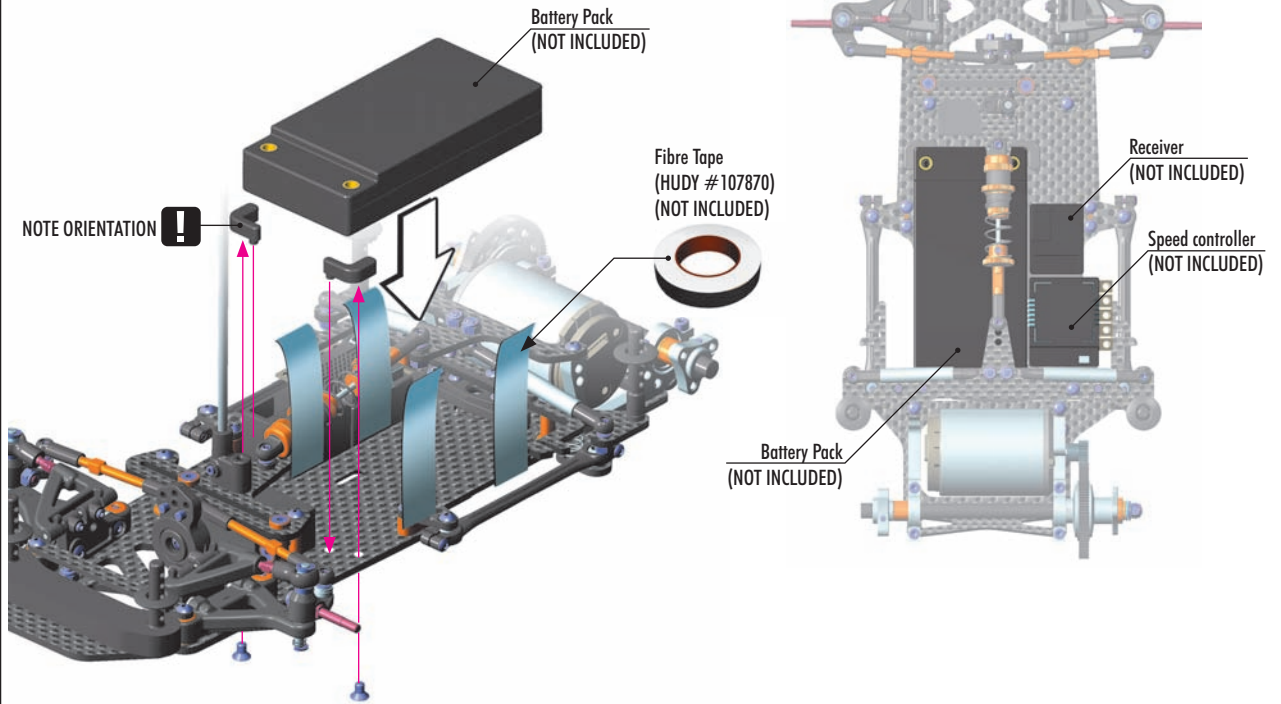
960031  
ALU N M3



903305  
SFH M3x5

## LIPO BATTERY CONFIGURATION 2 INLINE ALIGNMENT:

Inline battery alignment improves cornering speed and reduces the chance that the rear of the car will "diff out." Recommended for high-traction conditions.



375390  
ALU SCH M3x8



951851  
BB 1/8"x5/16"x9/64"



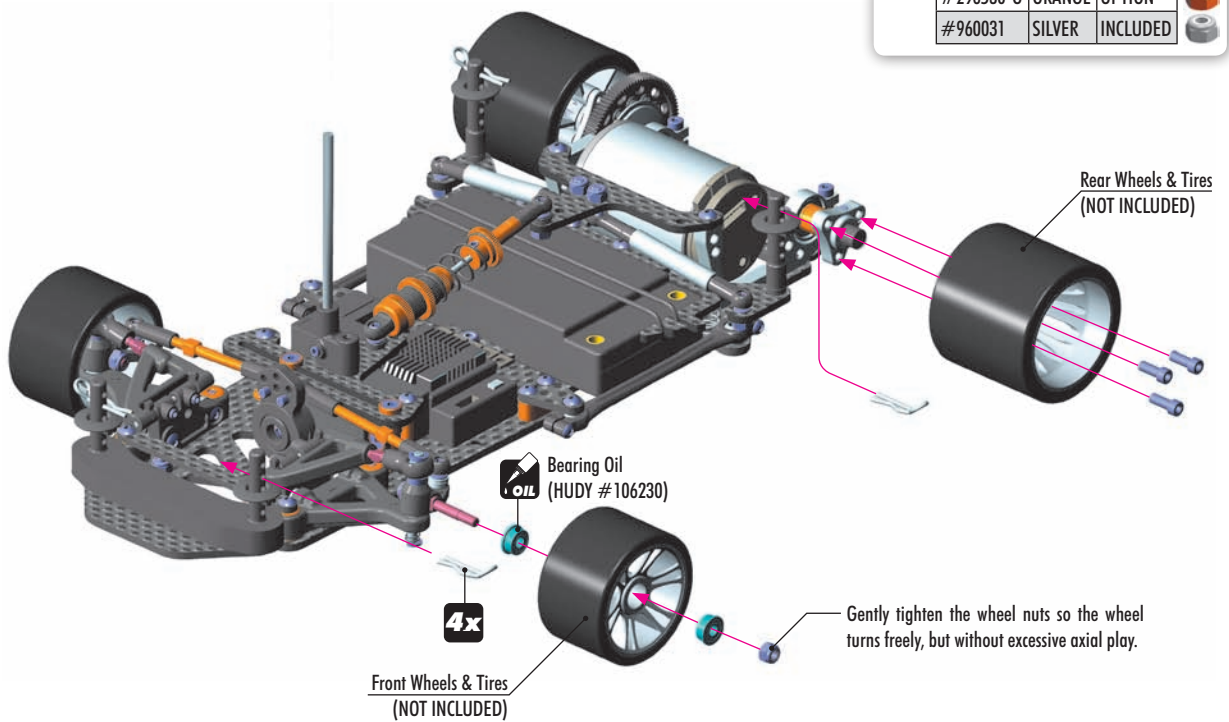
960031  
ALU N M3



OPTION


### ALU NUTS M3

|           |        |          |  |
|-----------|--------|----------|--|
| #296530-B | BLUE   | OPTION   |  |
| #296530-K | BLACK  | OPTION   |  |
| #296530-O | ORANGE | OPTION   |  |
| #960031   | SILVER | INCLUDED |  |



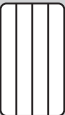



|                     |      |                   |
|---------------------|------|-------------------|
| RACE                |      |                   |
| TRACK               |      |                   |
| NAME                |      | DATE              |
| TEMPERATURE AIR     |      | TEMPERATURE TRACK |
| RACE LENGTH         | /min | BEST LAP TIME     |
| QUALIFYING POSITION |      | FINAL POSITION    |

| TRACK         |   |
|---------------|---|
| TRACK SURFACE | <input type="checkbox"/> CARPET <input type="checkbox"/> ASPHALT                                |
| TRACK LAYOUT  | <input type="checkbox"/> TECHNICAL <input type="checkbox"/> MIXED <input type="checkbox"/> FAST |
| TRACTION      | <input type="checkbox"/> LOW <input type="checkbox"/> MEDIUM <input type="checkbox"/> HIGH      |

| CENTER SHOCK ABSORBER  |  |
|--|--|
|  |  |
| CENTER SHOCK OIL   | /cSt                                     |
| CENTER SHOCK REBOUND   | %  |
| CENTER SHOCK SPRING  |  |
| <input type="checkbox"/> SILVER C=1.5  | <input type="checkbox"/> GOLD C=1.8      |
| <input type="checkbox"/> BLACK C=2.1   | <input type="checkbox"/> BLACK C=1.4-1.9 |
| <input type="checkbox"/> BLACK C=2.0-2.5   |  |

| SIDE DAMPING                        |          |
|-------------------------------------|----------|
| <input type="checkbox"/> SIDE TUBE  | OIL /cSt |
| <input type="checkbox"/> SIDE SHOCK | OIL /cSt |

| FRONT | TIRES           | REAR |
|-------|-----------------|------|
|       | TIRES TYPE      |      |
|       | DIAMETER /mm    |      |
|       | ADDITIVE        |      |
|       | ADDITIVE TIMING |      |

| FRONT LEFT   | FRONT RIGHT   | REAR LEFT   | REAR RIGHT  |
|--|---|---|---|
|  |  |  |  |
| ADDITIVE TREATED AREA  |   |   |   |

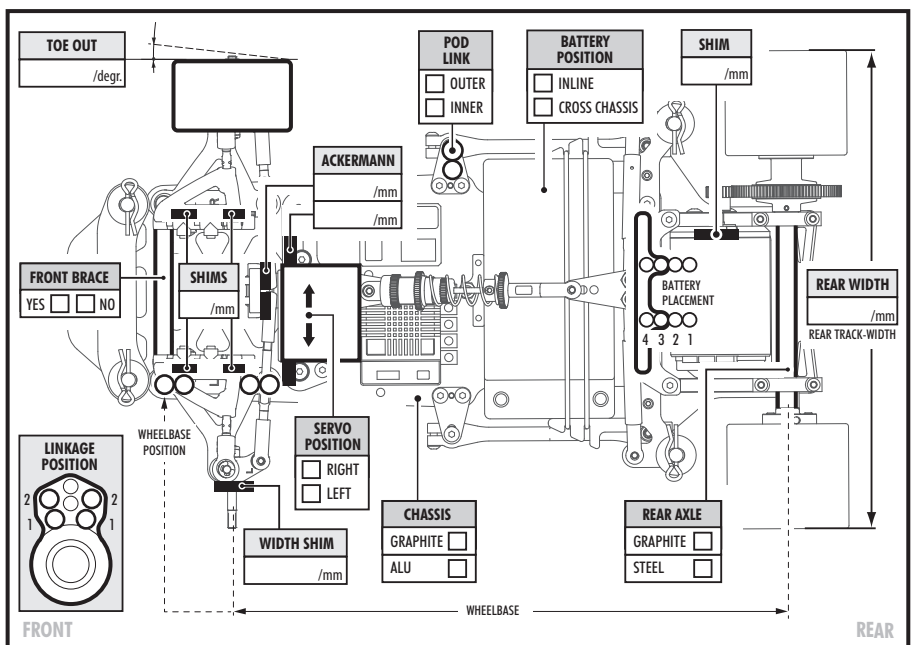
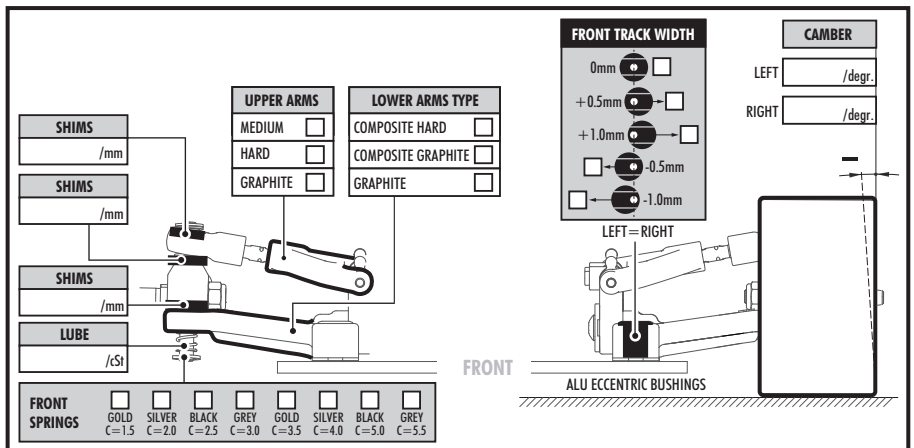
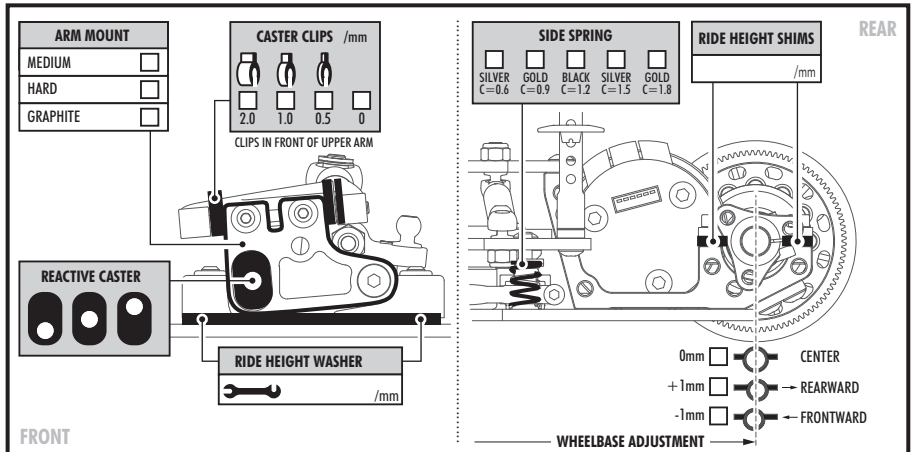
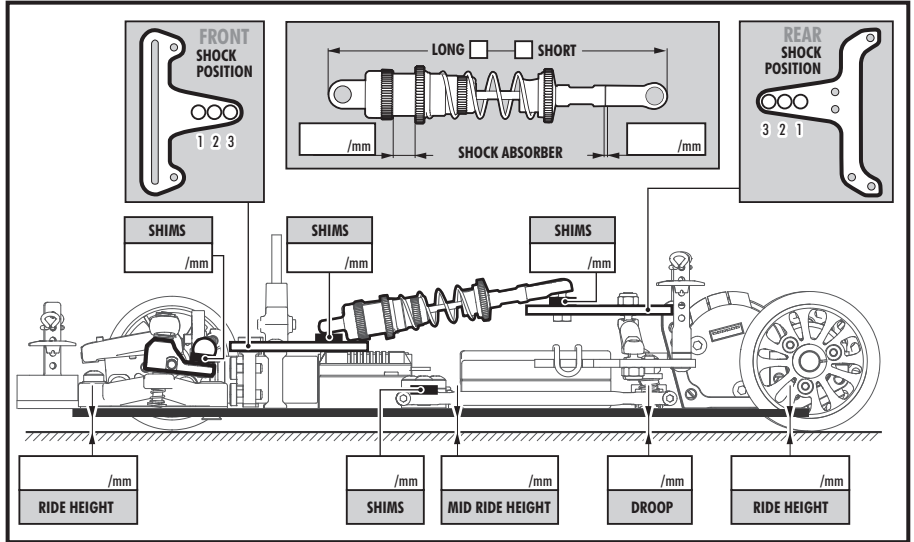
| TRANSMISSION  |           |                          |
|---|-----------|--------------------------|
| BALL DIFF   | GEAR DIFF | SOLID AXLE               |
| <input type="checkbox"/> LOOSE <input type="checkbox"/> MEDIUM <input type="checkbox"/> TIGHT | OIL /cSt  | <input type="checkbox"/> |

| GEARING           |             |
|-------------------|-------------|
| PINION / T        | SPUR GEAR/T |
| FINAL DRIVE RATIO | ROLLOUT     |

| ELECTRONICS |  |
|-------------|--|
| MOTOR       |  |
| SPEEDO      |  |
| SERVO       |  |
| BATTERIES   |  |

| BODY |  |
|------|--|
| TYPE |  |

COMMENTS



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/TeamXray



/TeamXray



/TeamXray



/XrayRacing



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