

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. Also, please visit our Web site at 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

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.

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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 guaranty 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 to get advice, or contact us via email at 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 	Assemble in the specified order 	Assemble left and right sides the same way 	Pay attention here 	Assemble as many times as specified (here twice) 	Cut 	Apply CA glue
Apply oil 	Apply grease 	Ensure smooth non-binding movement 	Tighten screw gently 	Detail view 	Assembly view 	Follow Set-Up Book


TOOLS REQUIRED

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

 HUDY Premium Silicone Oil 700cSt (HUDY #106370 50ml) 3000cSt (HUDY #106430 50ml)	 Diff. Grease (HUDY #106211)
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NOT INCLUDED



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 www.teamxray.com. 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.

SAMPLE OF OPTIONAL PARTS	
#37XXXX	OPTION 1
#37XXXX	OPTION 2
#37XXXX	OPTION 3

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.

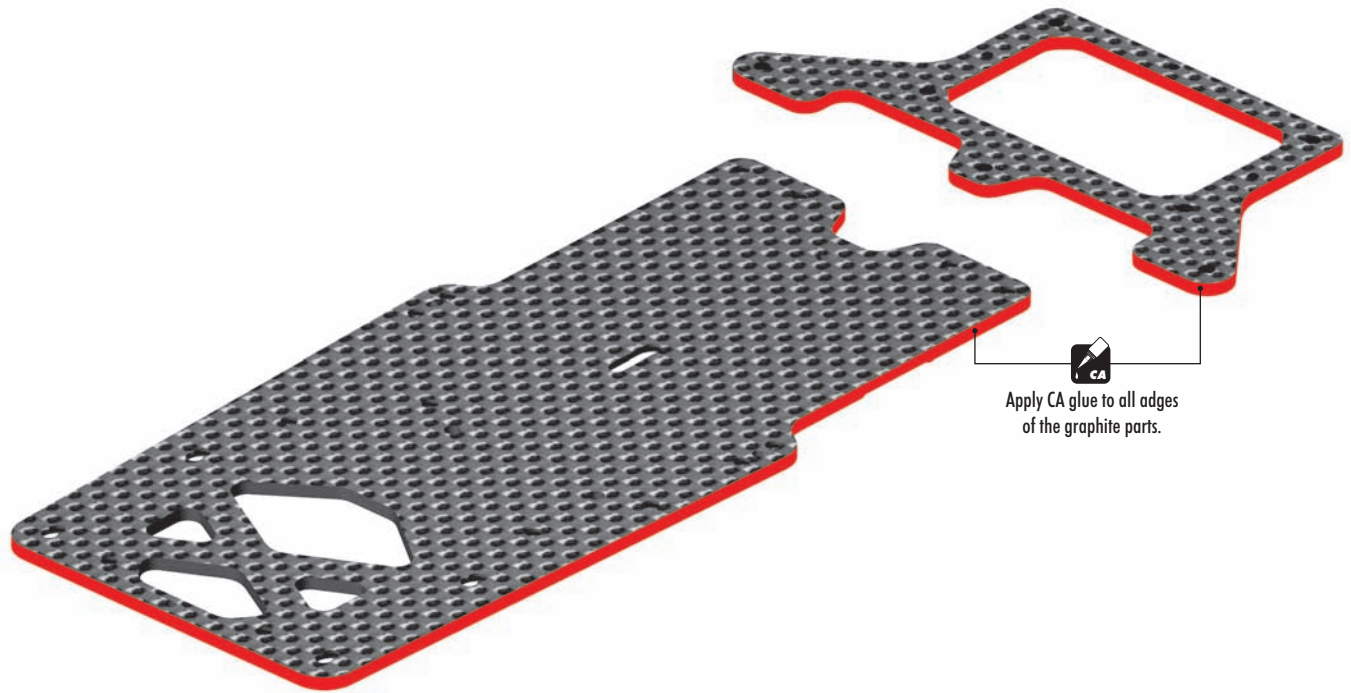
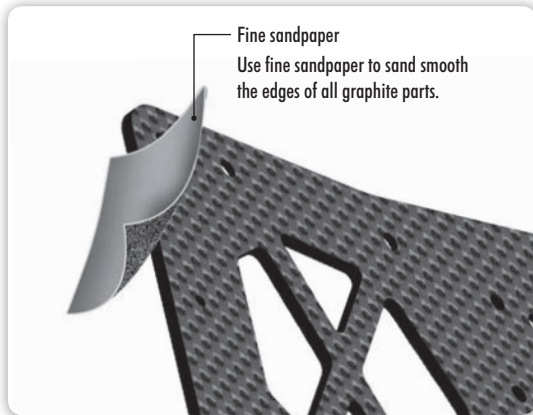
EQUIPMENT REQUIRED

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

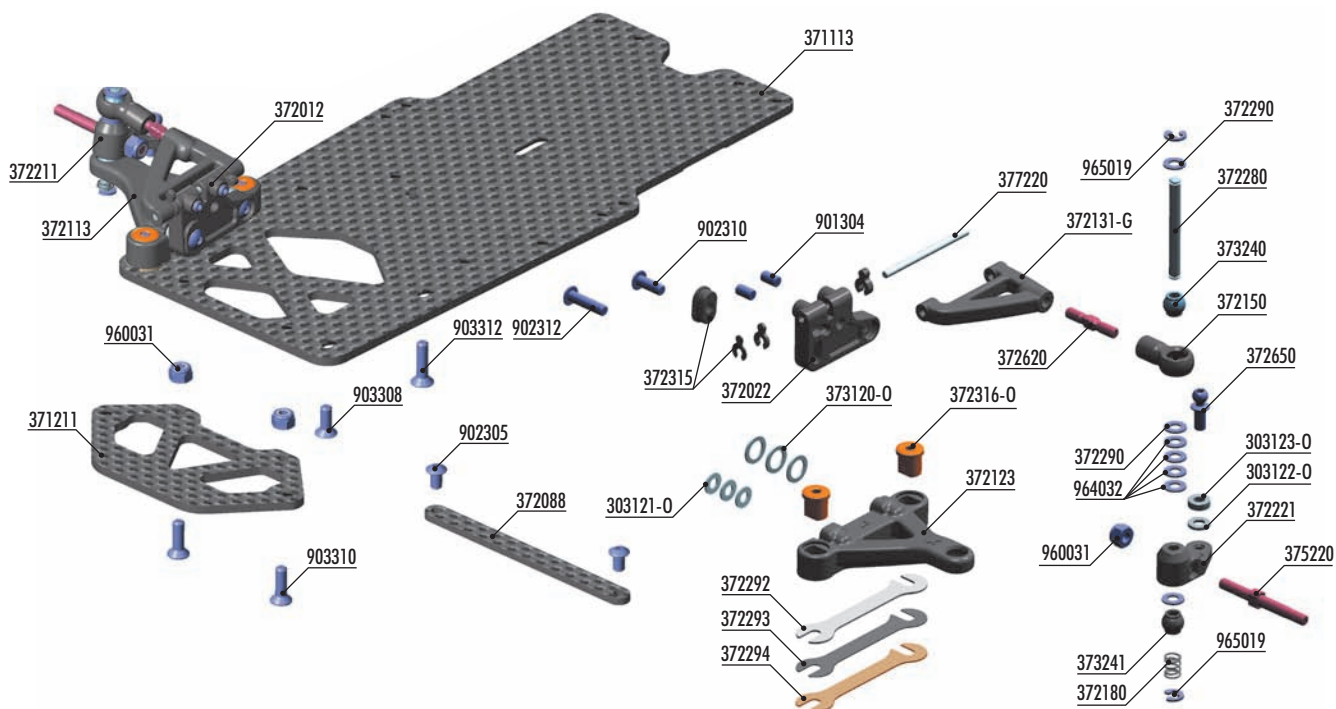
GRAPHITE PART PREPARATION **EU**

PREPARE ALL GRAPHITE PARTS

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



1. FRONT SUSPENSION



FRONT UPPER ARM

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



#371114
X12'20 ALU CHASSIS



#371115
X12'20 ALU FLEX CHASSIS



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



ALU ECCENTRIC BUSHINGS

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



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



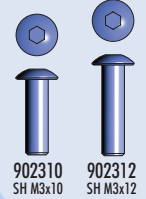
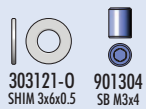
BAG

01

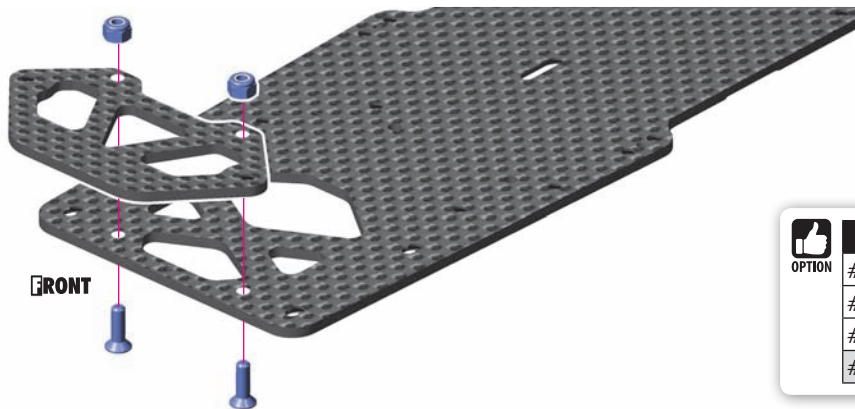
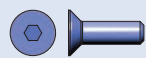
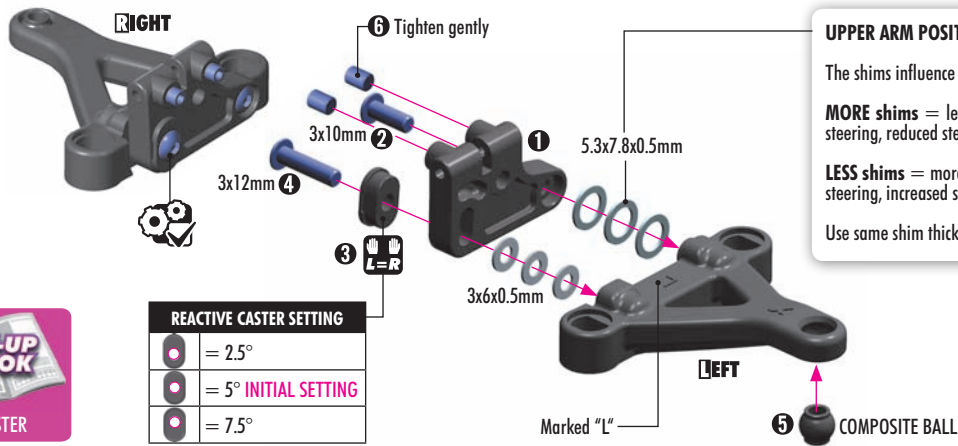
303121-0	ALU SHIM 3x6x0.5MM - ORANGE (10)
303122-0	ALU SHIM 3x6x1.0MM - ORANGE (10)
303123-0	ALU SHIM 3x6x2.0MM - ORANGE (10)
371113	X12'20 GRAPHITE CHASSIS 2.5MM
371211	GRAPHITE BUMPER LOWER HOLDER 2.5MM
372012	COMPOSITE FRONT UPPER ARM MOUNT - RIGHT - GRAPHITE
372022	COMPOSITE FRONT UPPER ARM MOUNT - 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)

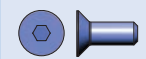
1. FRONT SUSPENSION



2x
L=R



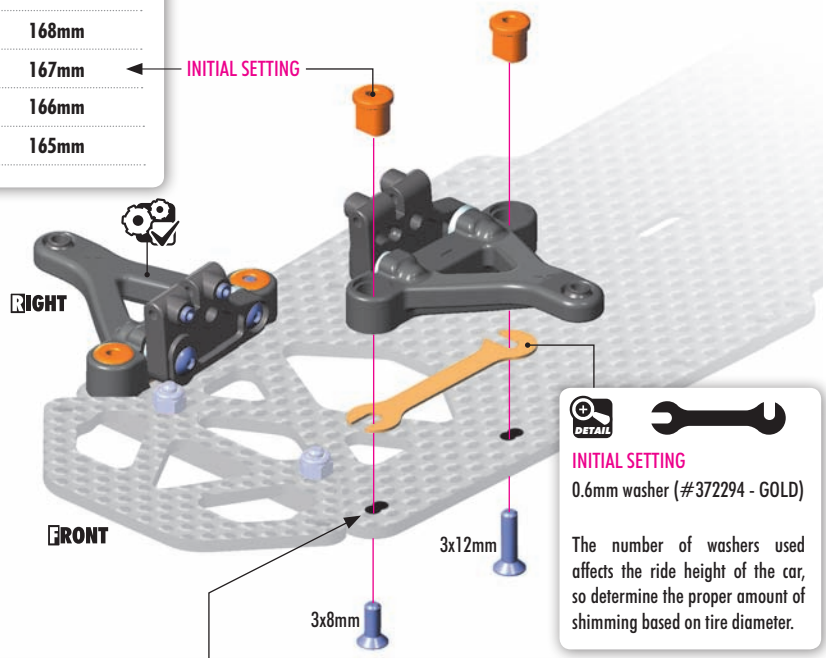
ALU NUTS M3		
#296530-B	BLUE	OPTION
#296530-K	BLACK	OPTION
#296530-O	ORANGE	OPTION
#960031	SILVER	INCLUDED



2x
L=R

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.



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

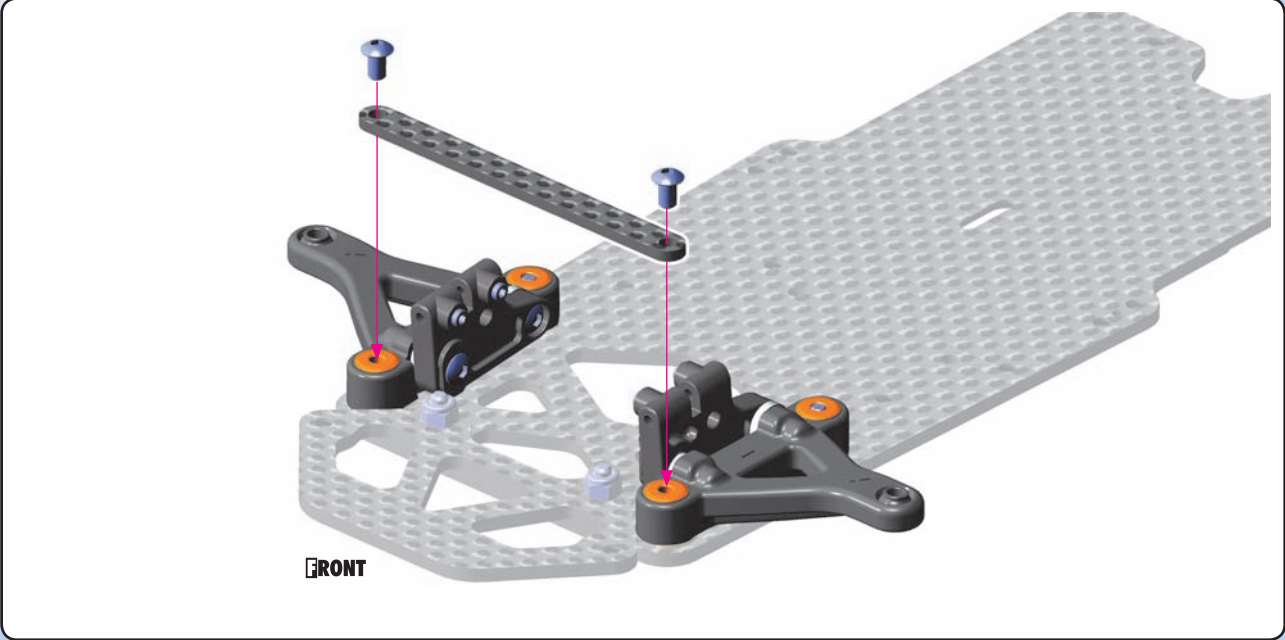
Shorter wheel base allows the car to rotate better right in the center of the corner to maintain corner speed and therefore it is recommended to use on tight technical tracks or tracks with many 180 degree corners




1. FRONT SUSPENSION **EU**




902305
SH M3x5




2x






RIGHT

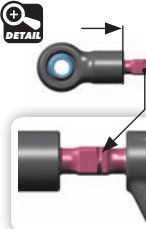


LEFT

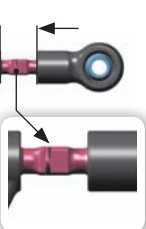
NOTE ORIENTATION



STEEL BALL




7.2mm




7.2mm

NOTE ORIENTATION



OPTION

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







CAMBER



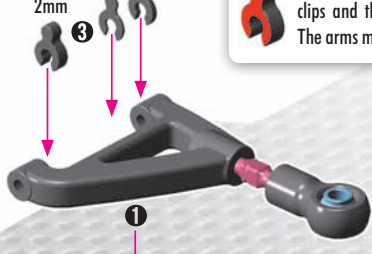
901304
SB M3x4

2x





RIGHT




LEFT

1+0.5mm

2mm

3




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.

4 Tighten

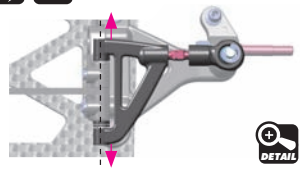
2

FRONT




L-R


Make sure that arm moves freely.



DETAIL



Moves freely



DETAIL



CASTER

1. FRONT SUSPENSION



303122-0
SHIM 3x6x1



303123-0
SHIM 3x6x2

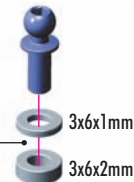


960031
ALU N M3

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**.



3x6x1mm

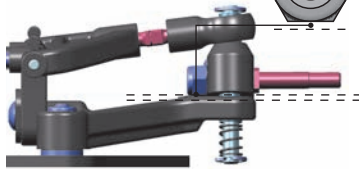
3x6x2mm

Marked "L"

LEFT



NOTE
ORIENTATION



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

NOTE
ORIENTATION



ALU NUTS M3

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

L=R

Marked "R"



RIGHT



372290
S 3.2x4.8x0.5



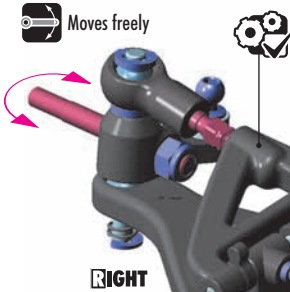
964032
S 3.2x4.8x0.2



965019
C 1.9

2x 

Moves freely



RIGHT

FRONT

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



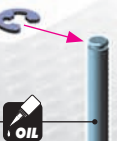
use HUDY Silicone Oil

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)



OIL

0.5mm

0.5mm

0.2mm (4x)

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

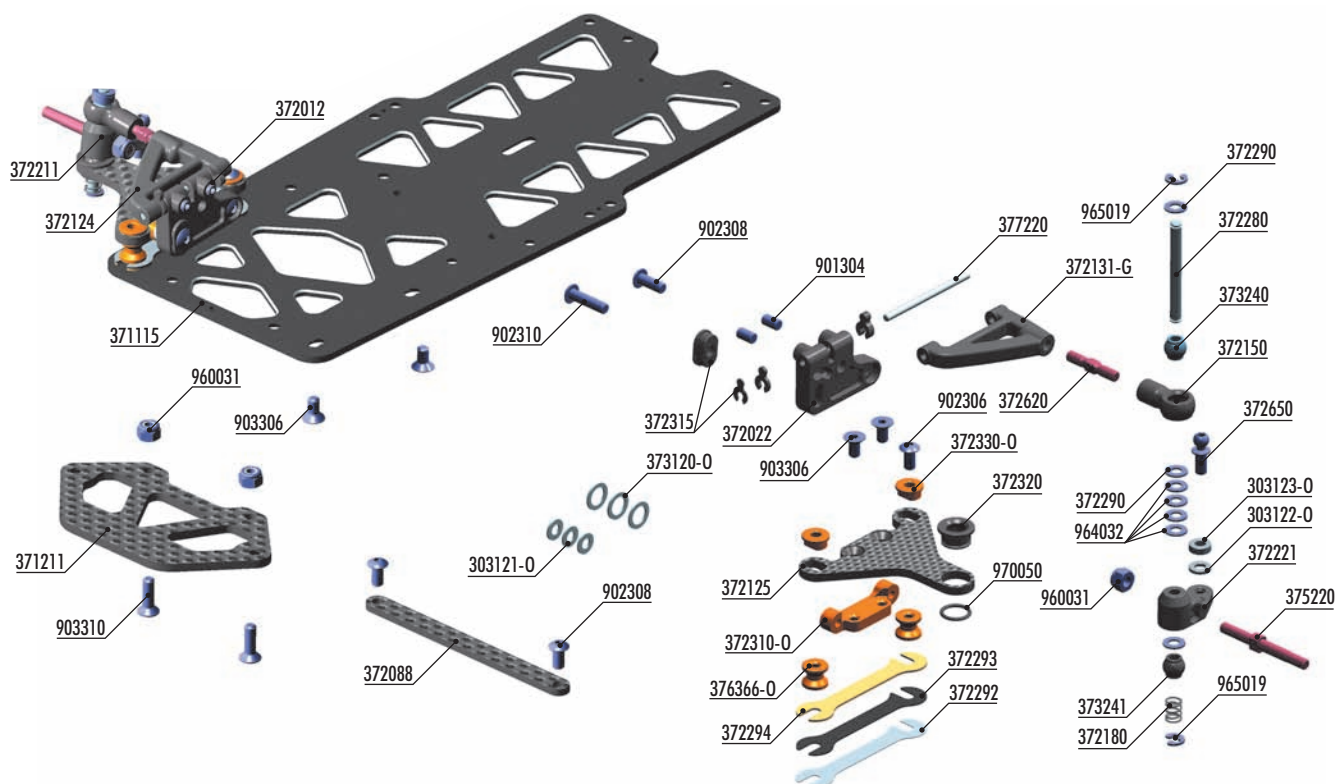
FRONT COIL SPRINGS





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

SET-UP BOOK




RIDE HEIGHT

1. FRONT SUSPENSION




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



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



FRONT UPPER ARM			
#372130	MEDIUM	OPTION	
#372131	HARD	OPTION	
#372131-G	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



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



#371114
X12'20 ALU CHASSIS



#371113
12'20 GRAPHITE CHASSIS 2.5mm



BAG

01

303121-O	ALU SHIM 3x6x0.5MM - ORANGE (10)
303122-O	ALU SHIM 3x6x1.0MM - ORANGE (10)
303123-O	ALU SHIM 3x6x2.0MM - ORANGE (10)
371115	X12'20 ALU FLEX CHASSIS 2.0MM - 7075 T6
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
372124	X12 US GRAPHITE LOWER SUSPENSION ARM - RIGHT
372125	X12 US GRAPHITE LOWER SUSPENSION ARM - LEFT
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)
372310-O	ALU LOWER GRAPHITE SUSPENSION ARM HOLDER - ORANGE
372315	COMPOSITE ECCENTRIC BUSHINGS + CASTER CLIPS (2)
372320	COMPOSITE ARM BUSHING (4)

372330-O	X12'18 US ALU BUSHING - WIDTH 0.0MM (2)
372620	ADJ. TURNBUCKLE M3x17 MM - HUDY SPRING STEEL™ (2)
372650	BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2)
373120-O	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)
376366-O	ALU MOUNT 6.0MM - ORANGE (2)
377220	FRONT UPPER PIVOT PIN 2x31MM (2)
901304	HEX SCREW SB M3x4 (10)
902306	HEX SCREW SH M3x6 (10)
902308	HEX SCREW SH M3x8 (10)
902310	HEX SCREW SH M3x10 (10)
903306	HEX SCREW SFH M3x6 (10)
903310	HEX SCREW SFH M3x10 (10)
960031	ALU NUT M3 (10)
964032	WASHER S 3.2 x 4.8 x 0.2 (10)
965019	E-CLIP 1.9 (10)
970050	O-RING 5x1 (10)

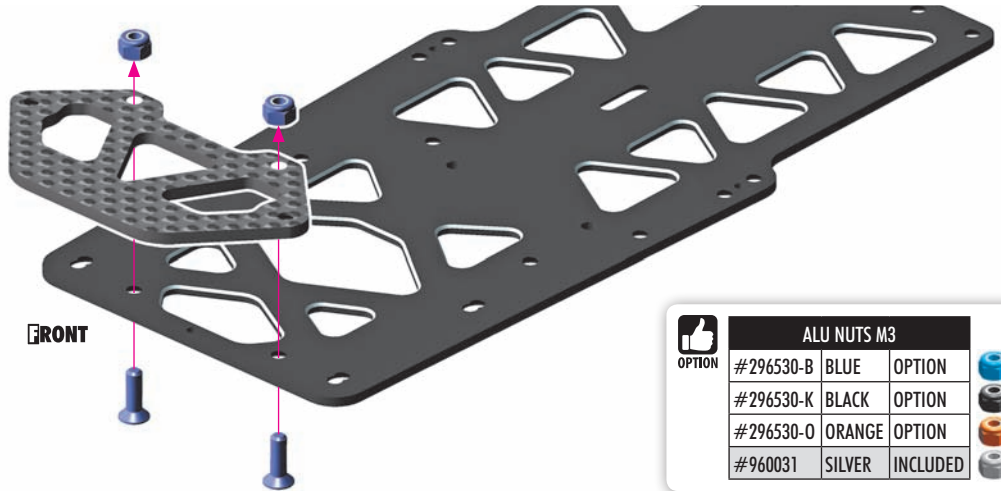
1. FRONT SUSPENSION **EU**



903310
SFH M3x10



960031
ALU N M3



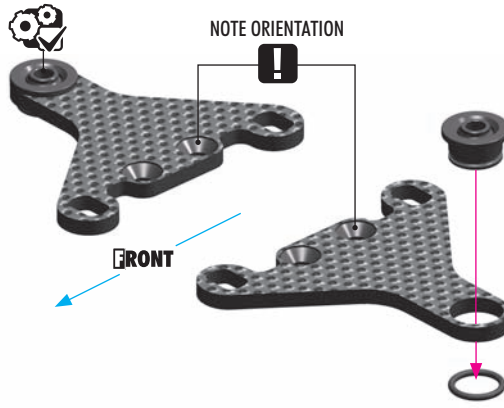
ALU NUTS M3			
OPTION	#296530-B	BLUE	OPTION
	#296530-K	BLACK	OPTION
	#296530-O	ORANGE	OPTION
	#960031	SILVER	INCLUDED



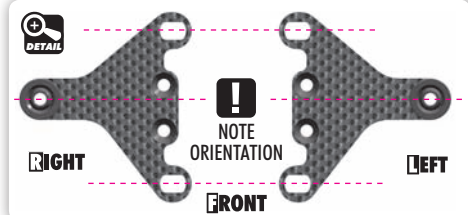
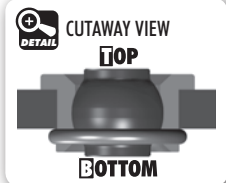
970050
O 5x1



COMPOSITE BALL

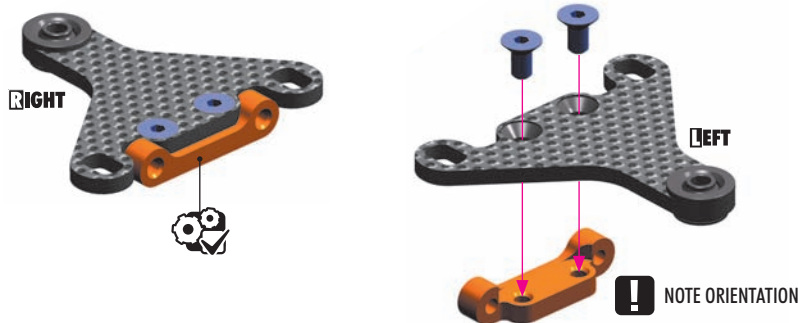


NOTE ORIENTATION



903306
SFH M3x6

2x L=R



NOTE ORIENTATION



303121-0
SHIM 3x6x0.5



373120-0
SHIM 5.3x7.8x0.5



901304
SB M3x4

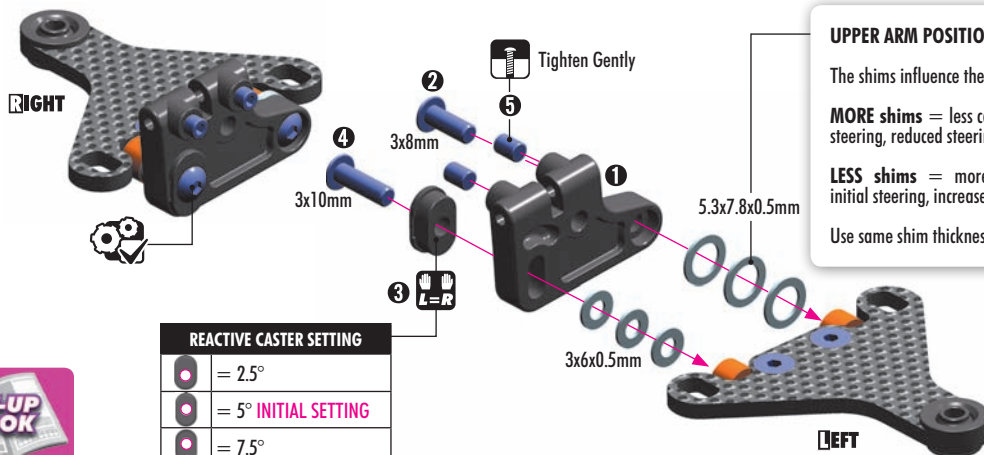


902308
SH M3x8



902310
SH M3x10

2x L=R



REACTIVE CASTER SETTING	
	= 2.5°
	= 5° INITIAL SETTING
	= 7.5°



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.


1. FRONT SUSPENSION **US**













902306
SH M3x6




903306
SFH M3x6




2x  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.

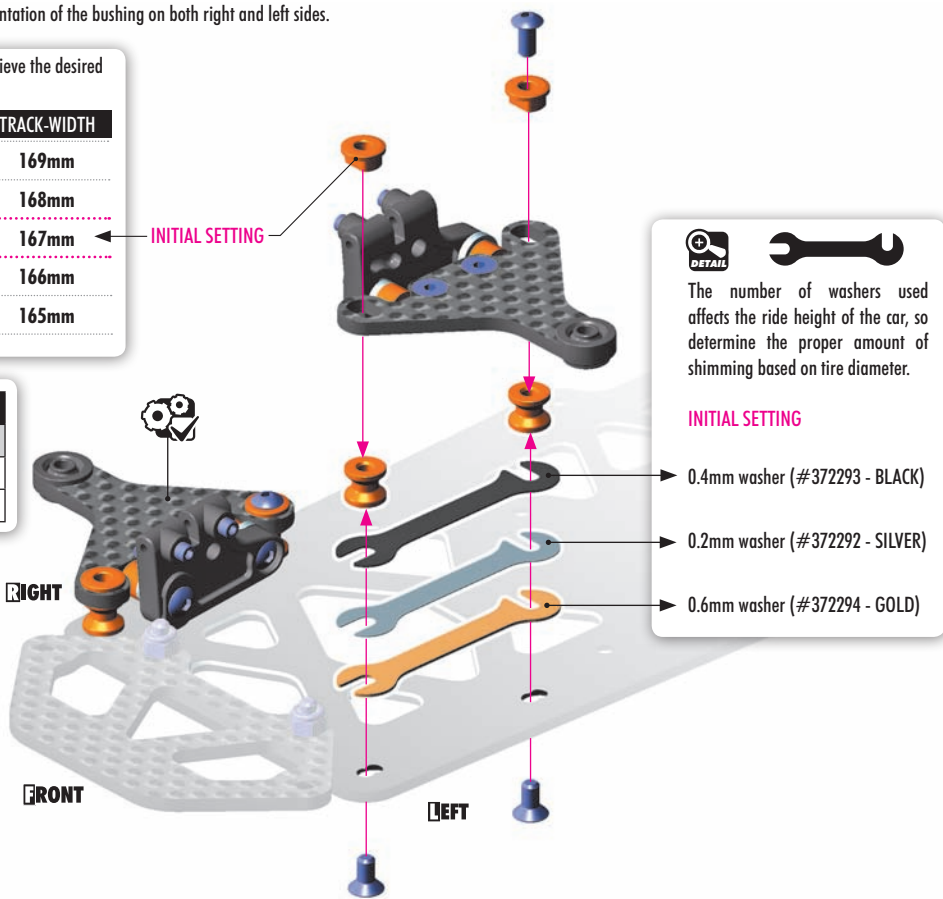
Use the proper matching bushings to achieve the desired front track-width

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



OPTION

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



INITIAL SETTING

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

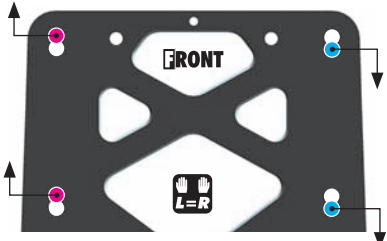
INITIAL SETTING

- 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

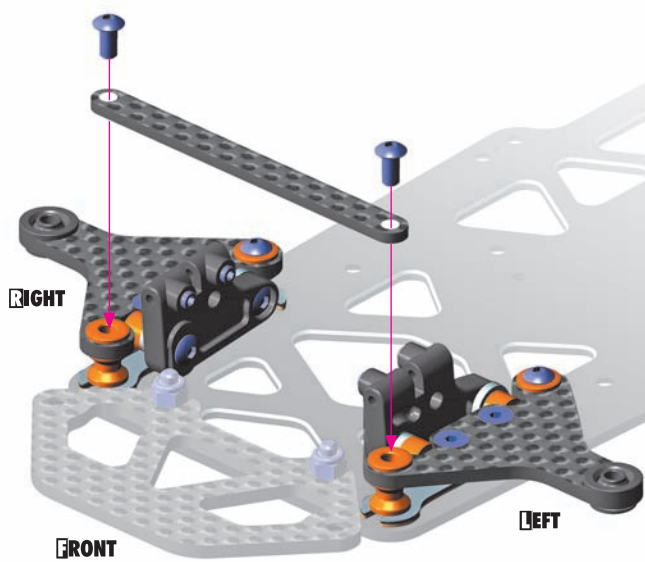


SET-UP BOOK

RIDE HEIGHT
TRACK-WIDTH

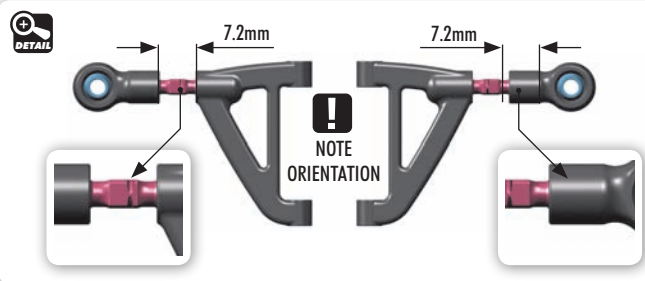
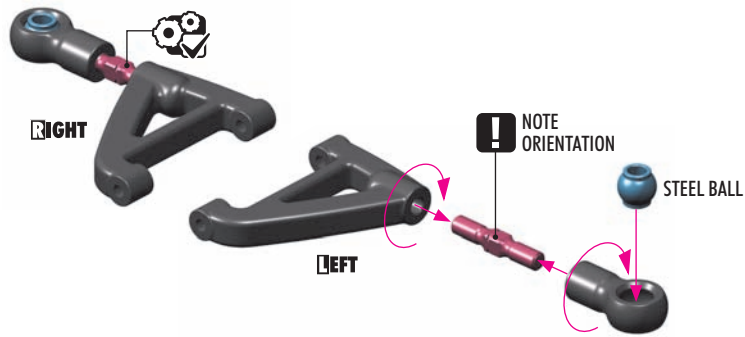


902308
SH M3x8



1. FRONT SUSPENSION

2x 



 OPTION

FRONT UPPER ARM

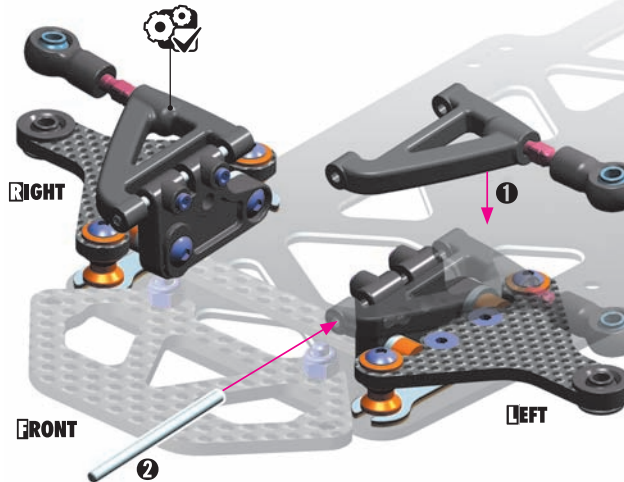
#372130	MEDIUM	OPTION
#372131	HARD	OPTION
#372131-G	GRAPHITE	INCLUDED



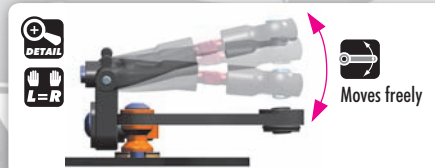
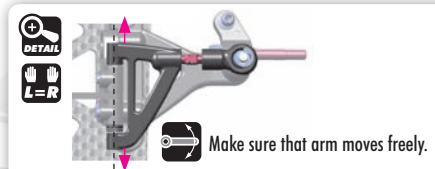
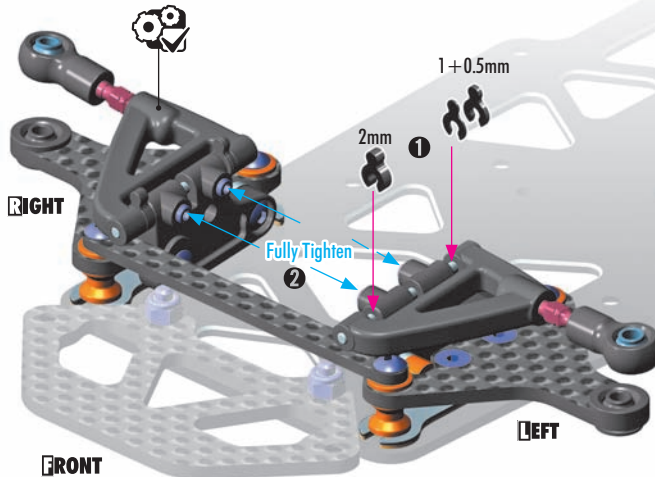
SET-UP BOOK


CAMBER

2x 

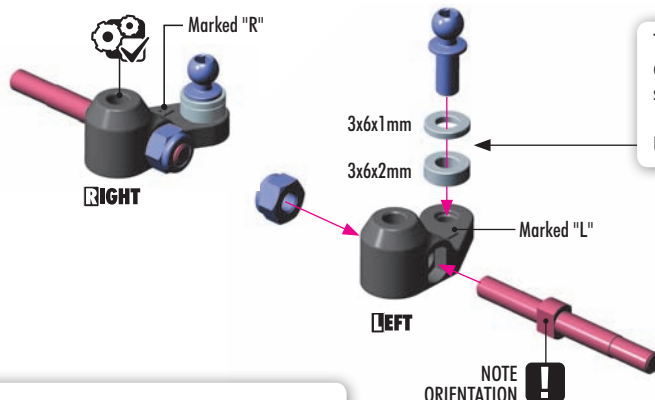


2x 



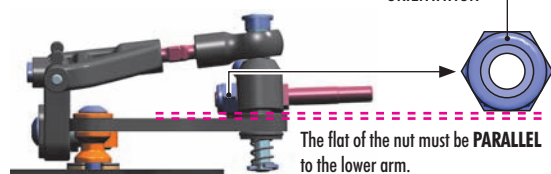
 If the arm does not have enough play, remove the clips and thin the clips slightly with sandpaper. The arms must have free movement and not bind.

1. FRONT SUSPENSION



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**.



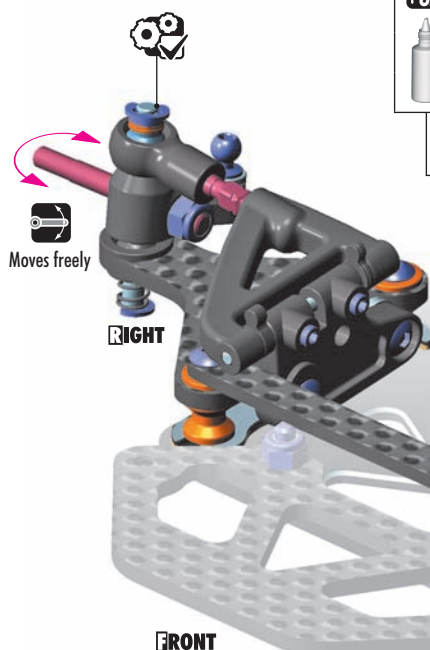
NOTE ORIENTATION !

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



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

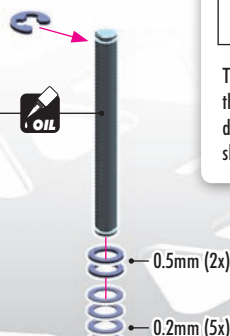
use HUDY Silicone Oil

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

OPTION			
#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

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

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



OPTION

ALU NUTS M3

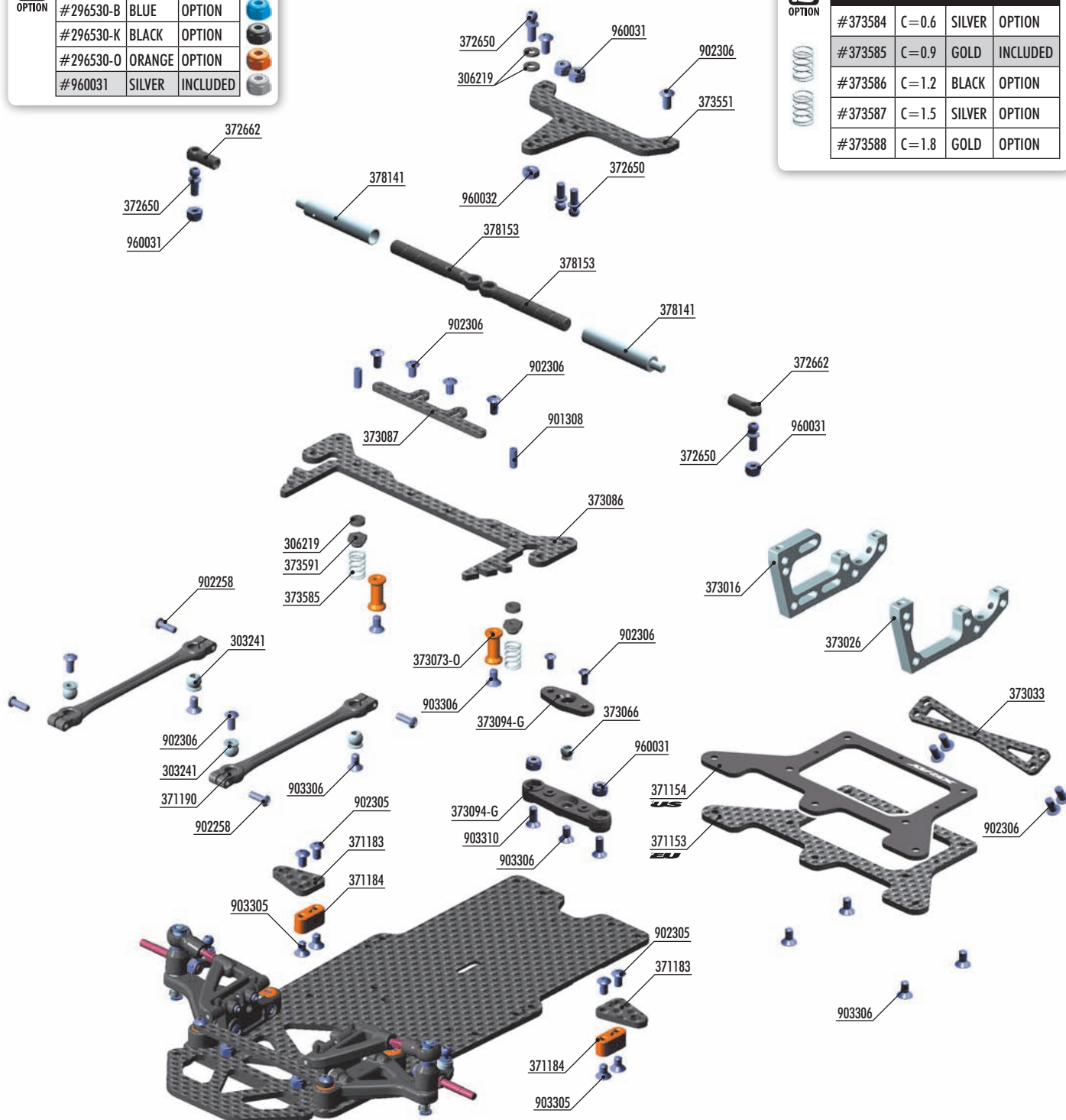
#296530-B	BLUE	OPTION
#296530-K	BLACK	OPTION
#296530-O	ORANGE	OPTION
#960031	SILVER	INCLUDED



OPTION

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)
- 306219 COMPOSITE SET OF SERVO SHIMS (4)
- 371153 GRAPHITE REAR POD LOWER PLATE 2.5MM (EU SPECS)
- 371154 ALU 2.0MM REAR POD LOWER PLATE - 7075 T6 (US SPECS)
- 371183 X12'20 GRAPHITE POD LINK PLATE 2.5MM (2)
- 371184 X12'20 ALU POD LINK GRAPHITE PLATE HOLDER
- 371190 COMPOSITE POD LINK (2)
- 372650 BALL-END 4.2MM THREADED HUDY SPRING STEEL™ (2)
- 372662 COMPOSITE BALL-JOINT 4.2 MM (4)
- 373016 ALU REAR BULKHEAD - MOTOR (RIGHT)
- 373026 ALU REAR BULKHEAD - LEFT
- 373033 GRAPHITE REAR BULKHEAD BRACE 2MM
- 373066 ALU PIVOT BALL
- 373073-O ALU REAR BRACE MOUNT 16MM- ORANGE (2)
- 373086 GRAPHITE REAR BRACE 2.5MM
- 373087 GRAPHITE BATTER BACKSTOP 2.0MM

- 373094-G LOWER & UPPER PIVOT BRACE - LOW ROLL-CENTER - GRAPHITE
- 373551 X12'20 GRAPHITE REAR POD UPPER PLATE 2.5MM
- 373585 SIDE SPRING C=0.9 - GOLD (2)
- 373591 COMPOSITE SIDE SPRING HOLDER (2)
- 378141 ALU SIDE TUBE (2)
- 378153 COMPOSITE SIDE TUBE SHAFT (2)
- 901308 HEX SCREW SB M3x8 (10)
- 902258 HEX SCREW SH M2.5x8 (10)
- 902305 HEX SCREW SH M3x5 (10)
- 902306 HEX SCREW SH M3x6 (10)
- 903305 HEX SCREW SFH M3x5 (10)
- 903306 HEX SCREW SFH M3x6 (10)
- 903310 HEX SCREW SFH M3x10 (10)
- 960031 ALU NUT M3 (10)
- 960032 NUT M3 (10)

3. REAR SUSPENSION

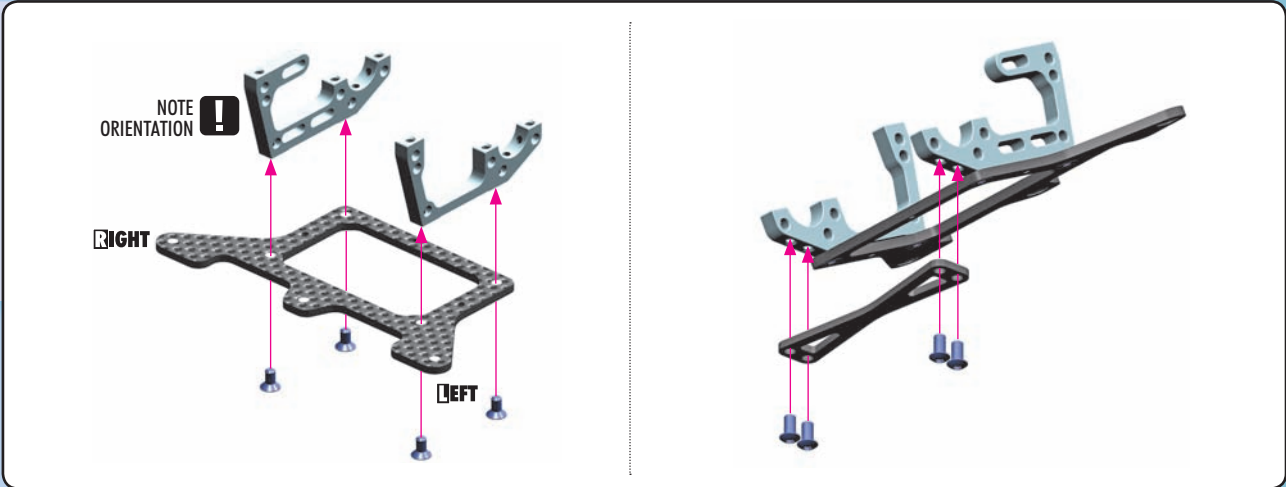
★ EU ★ US



902306
SH M3x6

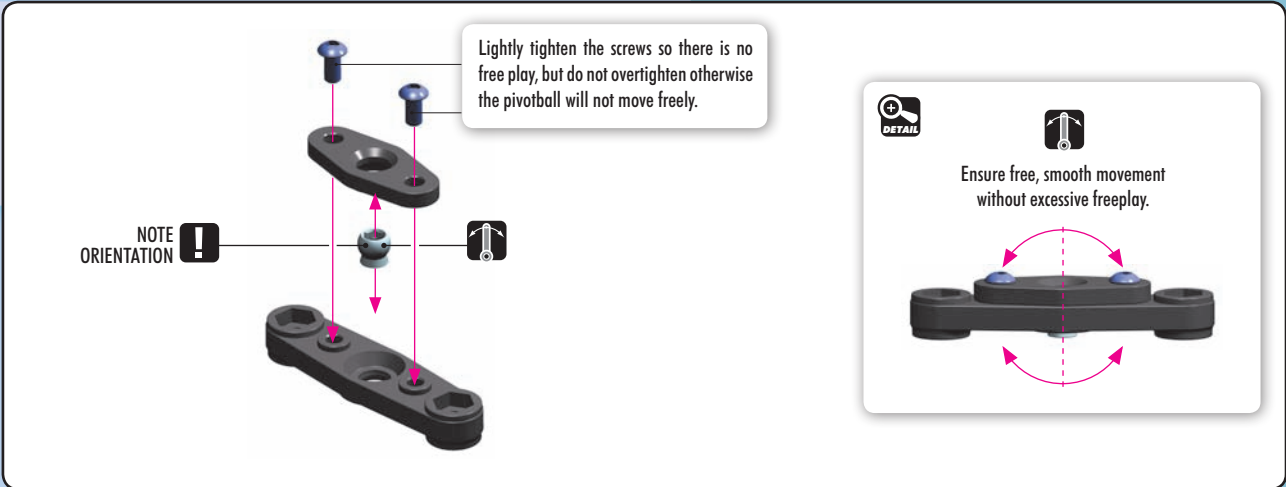


903306
SFH M3x6





902306
SH M3x6

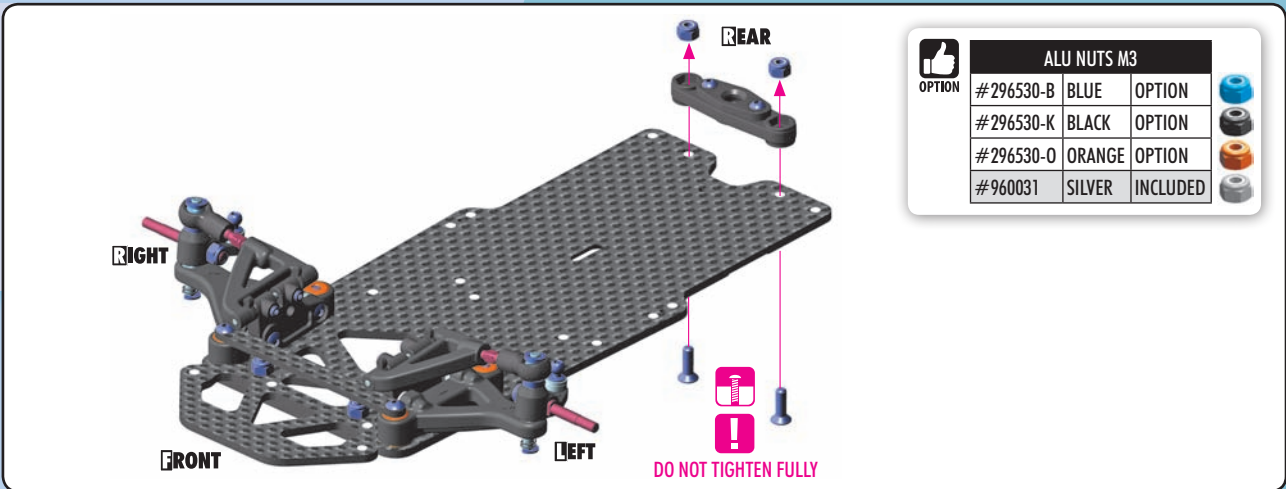




903310
SFH M3x10

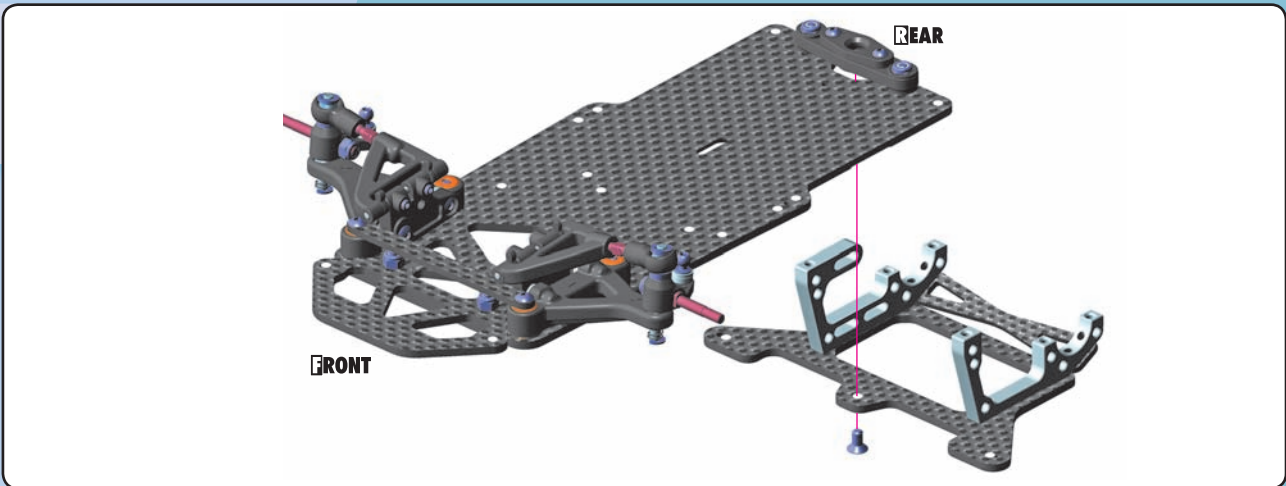


960031
ALU N M3





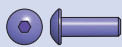
903306
SFH M3x6



3. REAR SUSPENSION

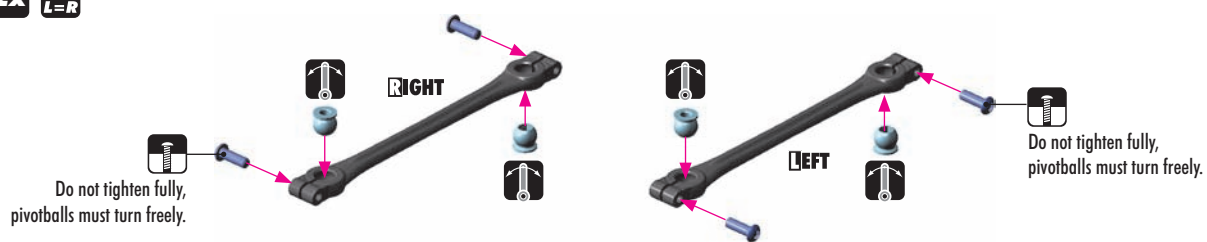
★ EU

★ US



902258
SH M2.5x8

2x L=R

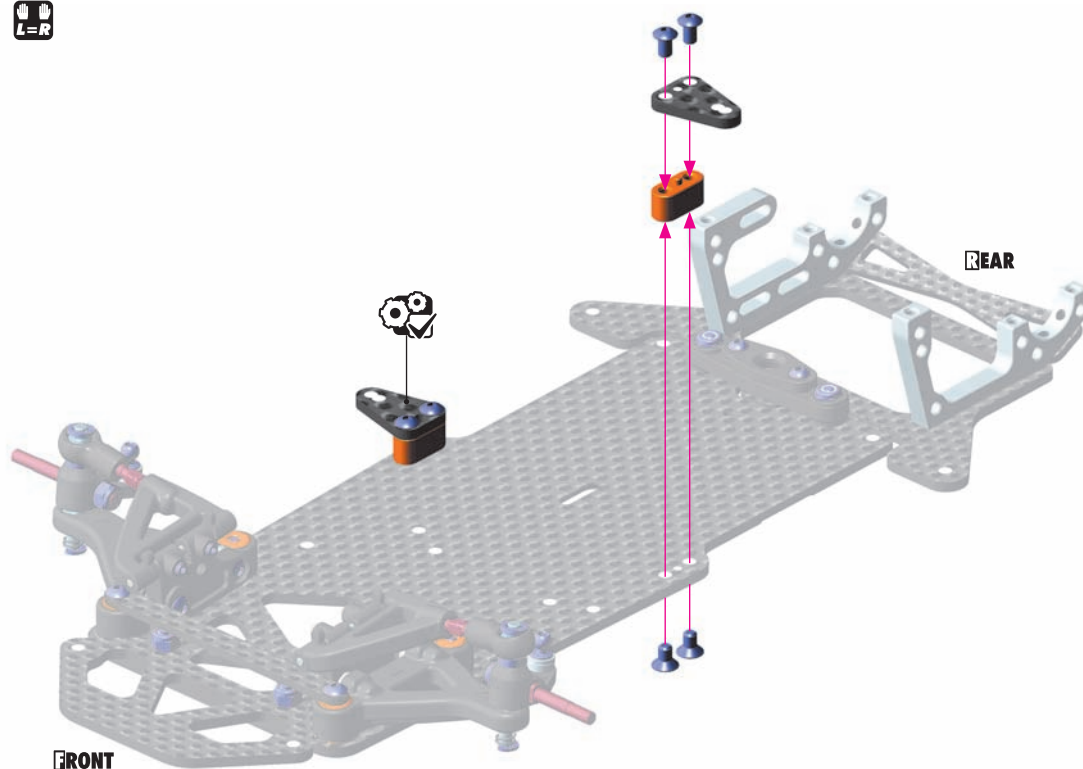


902305
SH M3x5



903305
SFH M3x5

2x L=R

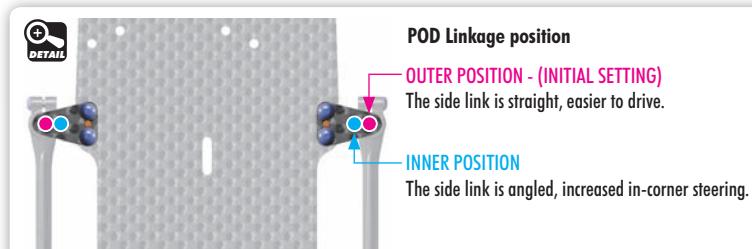
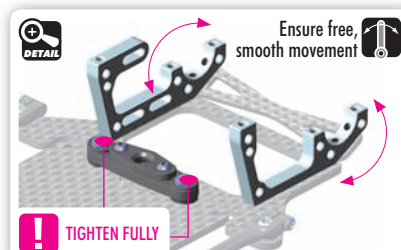
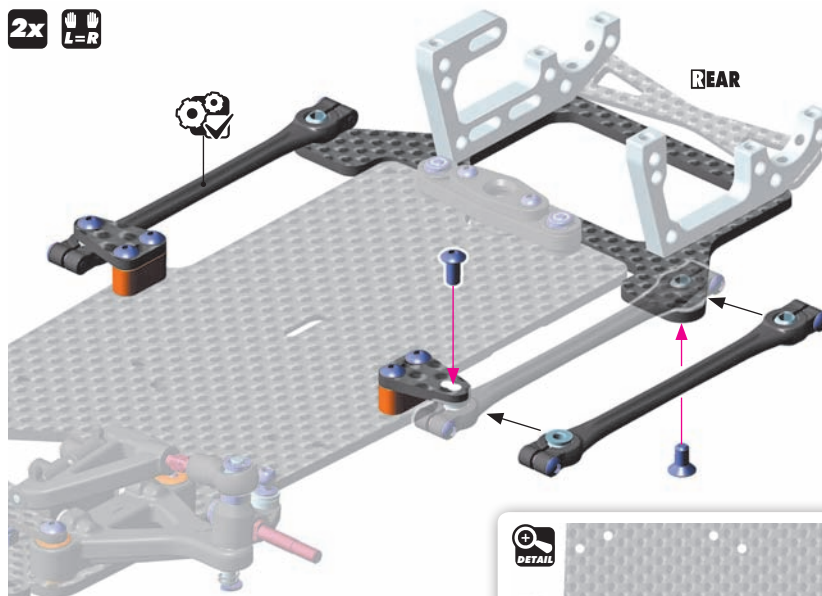


902306
SH M3x6



903306
SFH M3x6


2x L=R




3. REAR SUSPENSION

EU


US



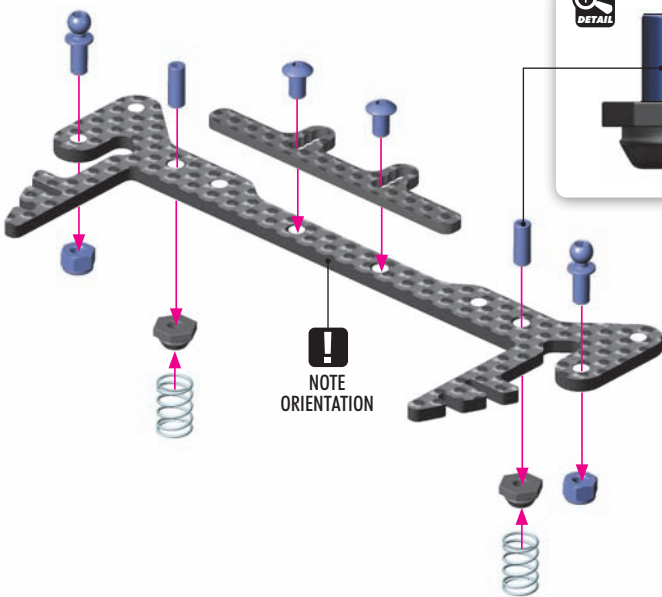
901308
SB M3x8




902306
SH M3x6



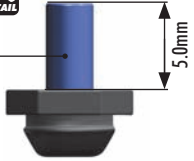
960031
ALU N M3



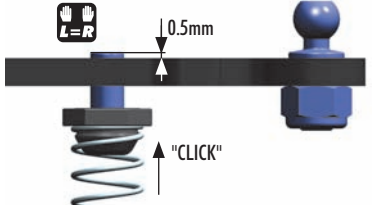
NOTE
ORIENTATION



DETAIL




5.0mm




0.5mm
"CLICK"

For battery backstop adjustment check page 26 / step 2.








INITIAL SETTING




OPTION

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

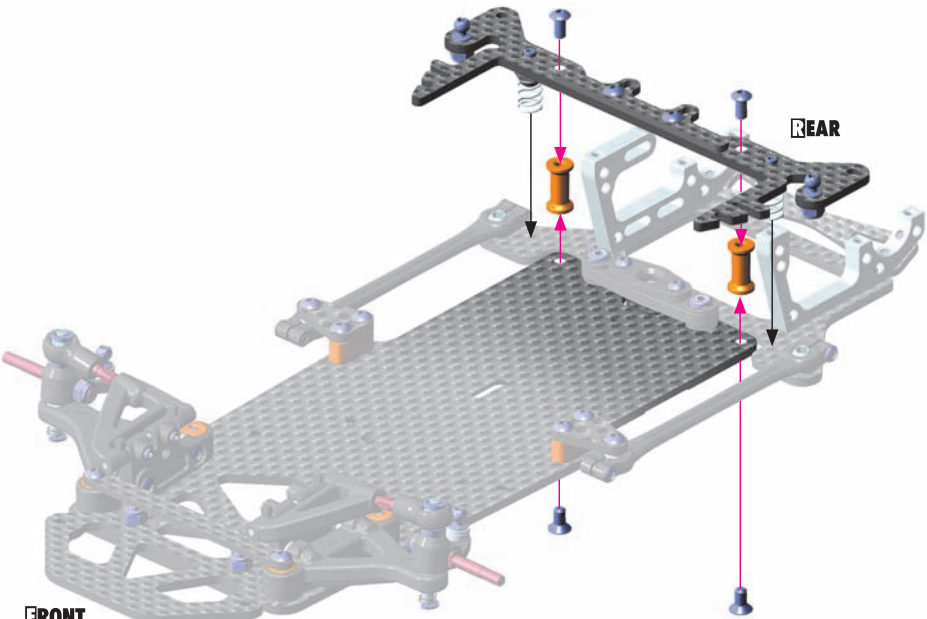





902306
SH M3x6




903306
SFH M3x6




FRONT
REAR




306219
SHIM 3x6x1



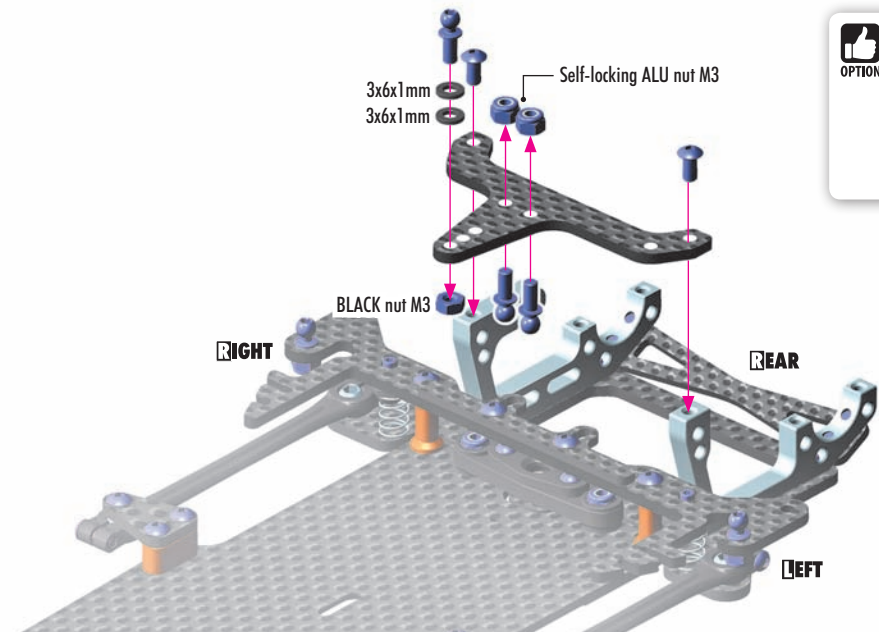
902306
SH M3x6




960031
ALU N M3



960032
N M3







RIGHT
LEFT
REAR



OPTION

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



3x6x1mm
3x6x1mm

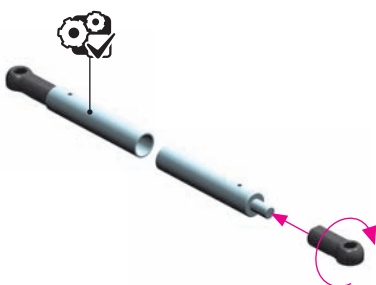
Self-locking ALU nut M3

BLACK nut M3

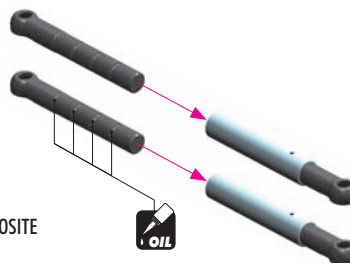
3. REAR SUSPENSION

★ EU ★ US

2x



2x



Add oil in each slot of the COMPOSITE side tubes.

NOTE:

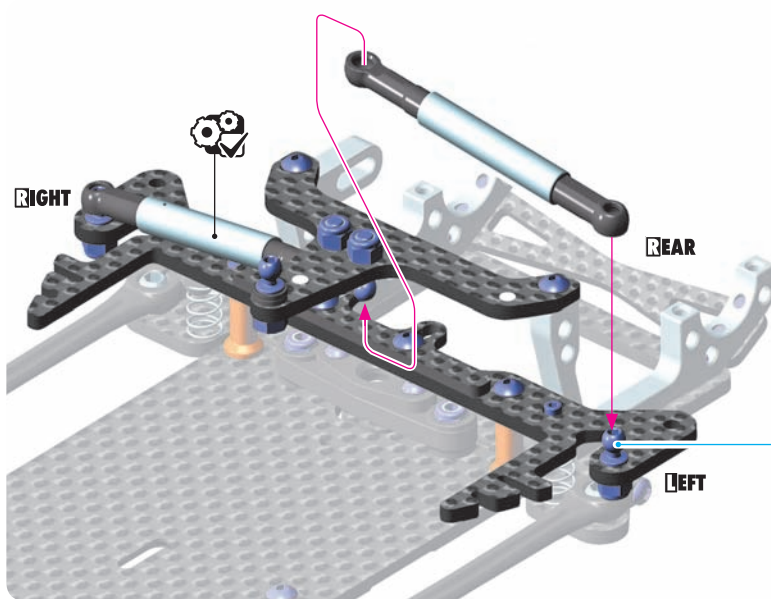
Add oil only in the slots, not on the whole tube.
After assembling the side tubes, check for smooth operation.
It is very important to re-oil the side tubes, at least once per race day.
You may use different oil thicknesses depending on track conditions.

TIP

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

HUDY OILS 50ml

#106410	1000cSt
#106420	2000cSt
#106430	3000cSt
#106440	3000cSt
#106450	5000cSt
#106460	6000cSt
#106470	7000cSt
#106480	8000cSt
#106510	10000cSt

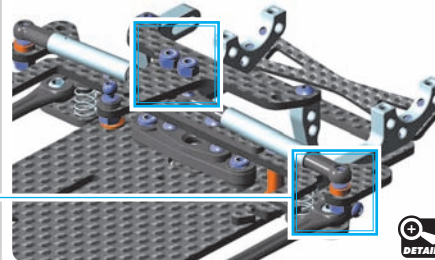


TIP

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



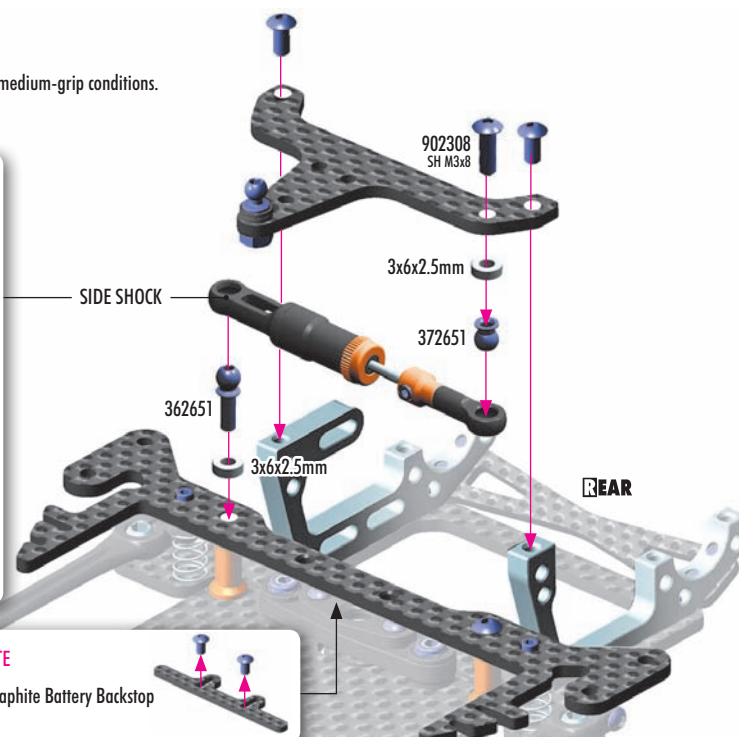
OPTIONAL SIDE SHOCK

Optional 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

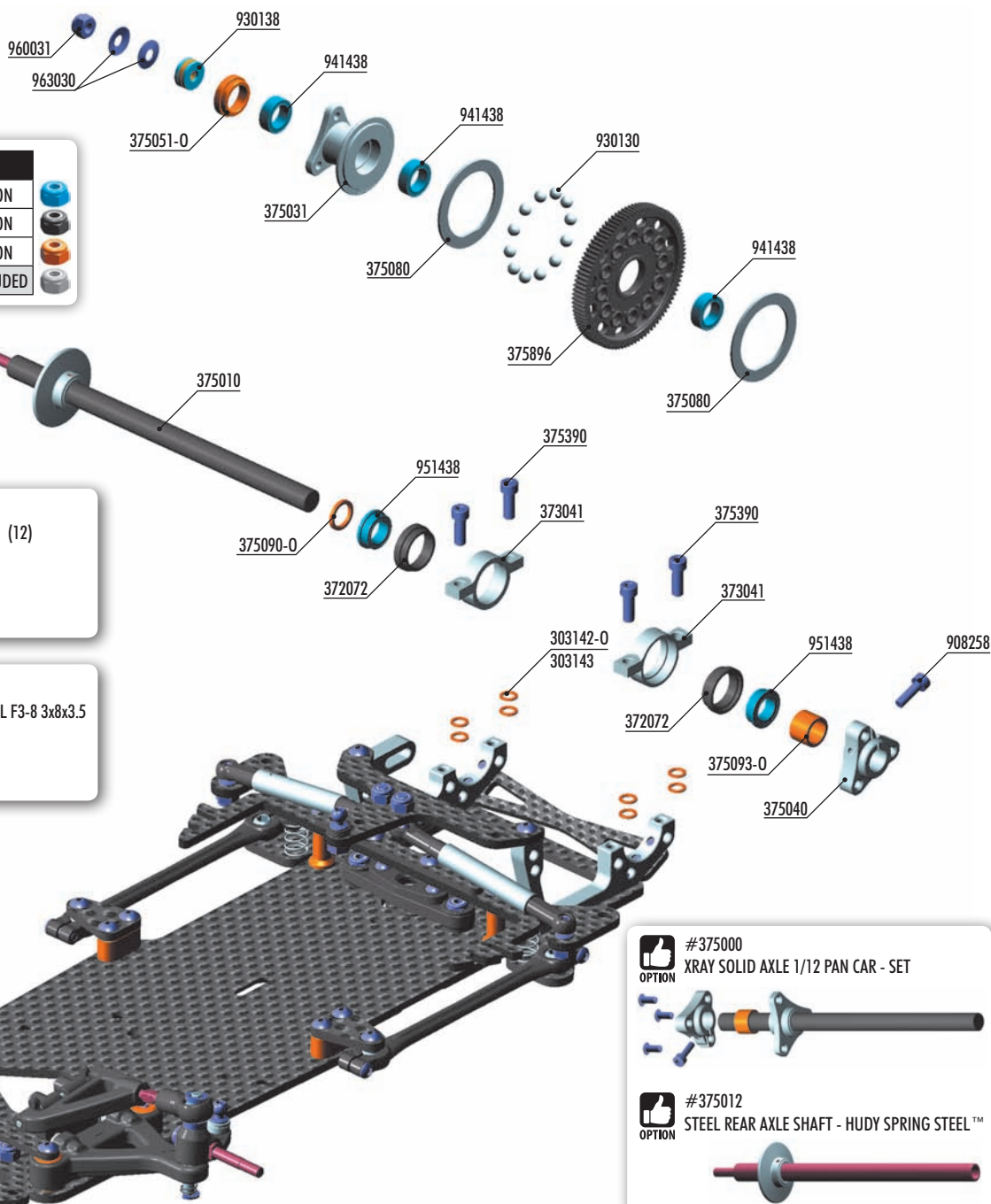
EU

US



ALU NUTS M3

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



#930230
XRAY CERAMIC BALL 3.175MM (12)



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



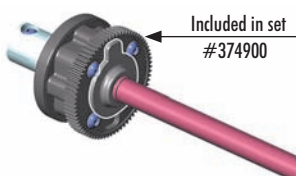
#375000
XRAY SOLID AXLE 1/12 PAN CAR - SET



#375012
STEEL REAR AXLE SHAFT - HUDY SPRING STEEL™



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



Included in set
#374900



GEAR DIFF - SPUR GEARS

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



#373042
ALU UPPER ECCENTRIC CLAMP



SPUR GEARS

#	Size	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



BAG

04

303142-0	ALU SHIM 3x5x0.5MM - ORANGE (10)
303143	ALU SHIM 3x5x0.25MM (10)
372072	COMPOSITE BALL-BEARING HUB (2)
373041	ALU UPPER CLAMP FOR BALL-BEARING WITH HUB
375010	REAR AXLE SHAFT - GRAPHITE - V3
375031	ALU REAR WHEEL HUB - RIGHT
375040	ALU REAR WHEEL HUB - LEFT
375051-0	ALU DIFF HUB - ORANGE
375080	D-LOCK DIFF PLATE (2)
375090-0	SET OF ALU SHIMS (0.5MM, 1.0MM, 2.0MM) - ORANGE
375093-0	ALU SHIM 6.37x8.4x6.0MM - ORANGE (2)

375390	ALU HEX SCREW M3x8 FOR REAR WHEELS (6)
375896	COMPOSITE SPUR GEAR - 96T / 64P
908258	HEX SCREW SOCKET HEAD CAP M2.5x8 (10)
930130	CARBIDE BALL 3.175MM (12)
930138	CARBIDE BALL-BEARING AXIAL F3-8 3x8x3.5 - V2
941438	BALL-BEARING 1/4"x3/8"x1/8" RUBBER SEALED - OIL (2)
951438	BALL-BEARING 1/4" x 3/8" x 1/8" FLANGED - STEEL SEALED - OIL (2)
960031	ALU NUT M3 (10)
963030	CONE WASHER ST 3x8x0.5 (10)

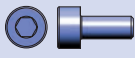
4. BALL DIFFERENTIAL EU US



303142-0
SHIM 3x5x0.5



303143
SHIM 3x5x0.25

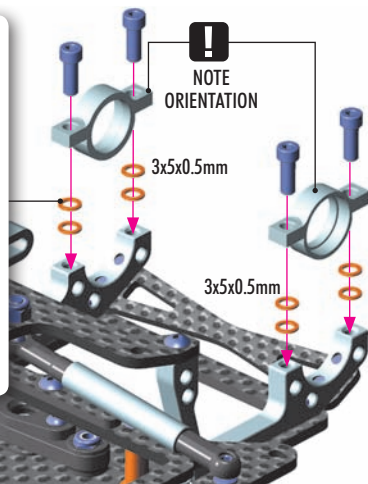


375390
ALU SCH M3x8

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

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.



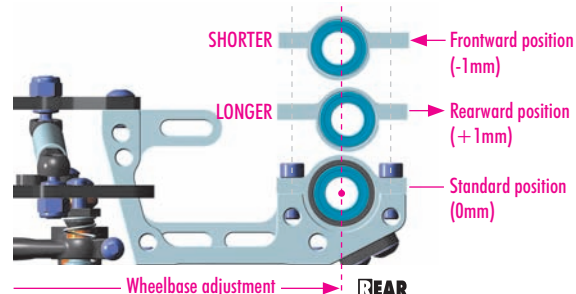
#373042

ALU UPPER ECCENTRIC CLAMP



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.



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"

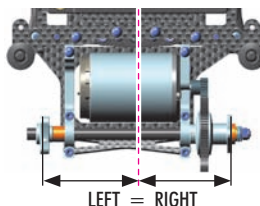


#375012

STEEL REAR AXLE SHAFT HUDY SPRING STEEL™

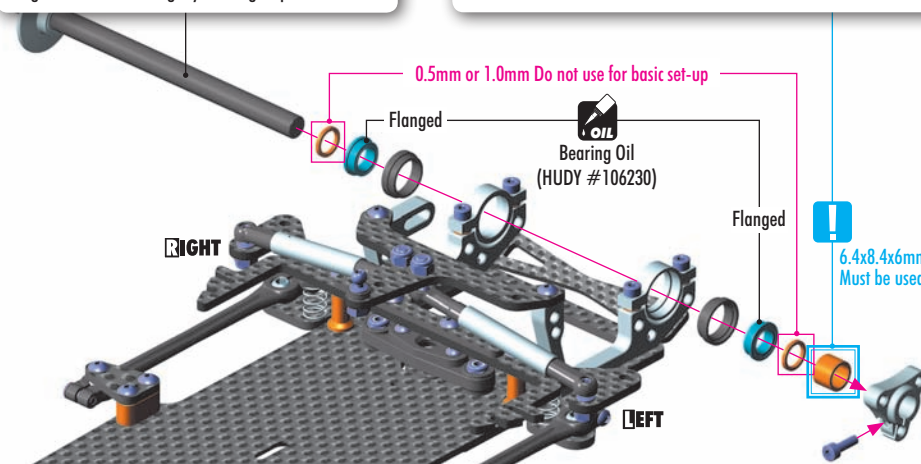


Optional steel rear axle offers better durability as it will not break even in serious crashes, however add extra weight and decreases slightly steering response

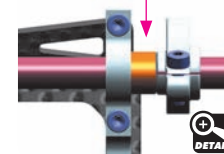


To set track-width, use the hole in the carbon pod plate as the centre point; this hole should always be centred between the two rear wheels once overall track-width is set. To set the track-width more easily, set the car on a ruler or use a digital vernier caliper.

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



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.



930130
B 3.1



930138
BA 3x8



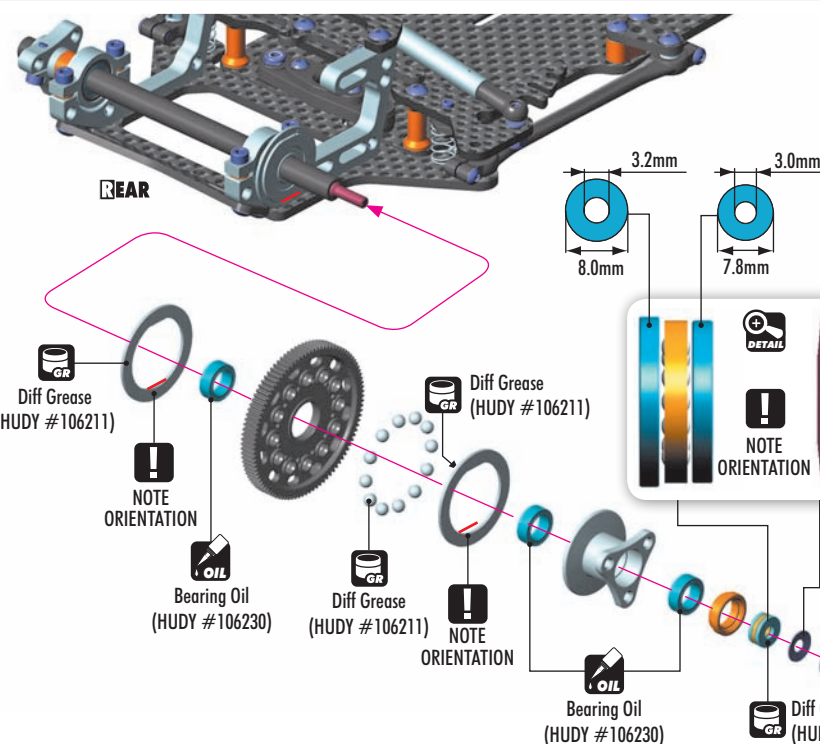
941438
BB 1/4"x3/8"x1/8"



960031
ALU N M3



963030
ST 3x8



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.

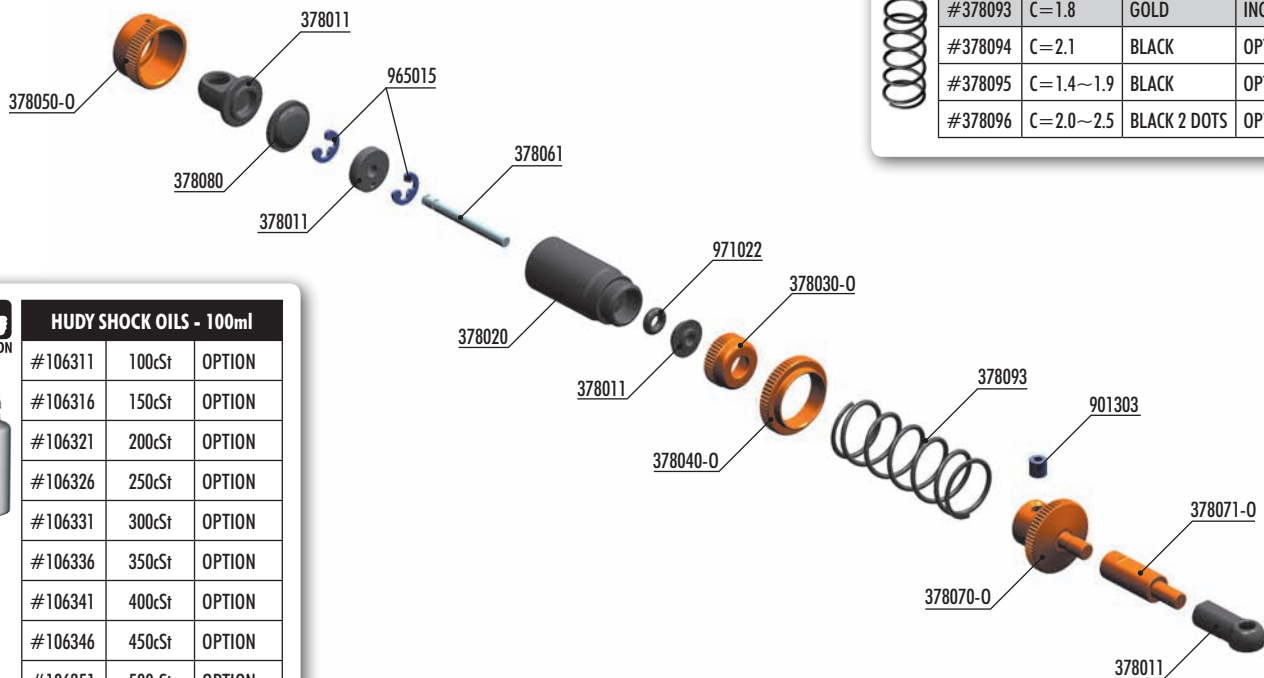


DIFFERENTIAL

5. SHOCK ABSORBER

★ EU

★ US



SHOCK SPRINGS			
#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

BAG

05

- 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

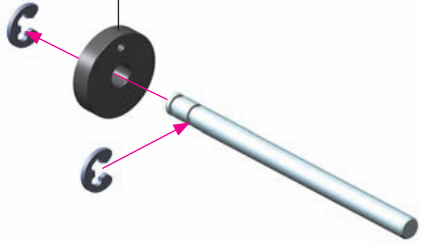
- 378071-0 ALU SHOCK ADAPTER - ORANGE
- 378080 SHOCK RUBBER MEMBRANE (2)
- 378093 SHOCK SPRING - GOLD
- 901303 HEX SCREW SB M3x3 (10)
- 965015 E-CLIP 1.5 (10)
- 971022 SILICONE O-RING 2x2 (10)



965015
C1.5



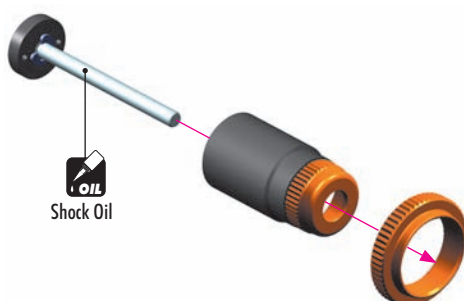
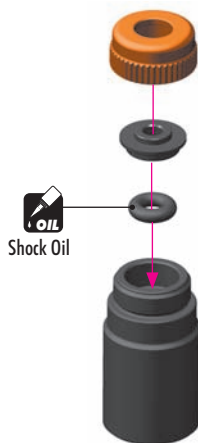
Carefully remove the shock piston from the frame, and remove all excess plastic flash.



5. SHOCK ABSORBER ★ EU ★ US

OI

971022
0 2x2



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



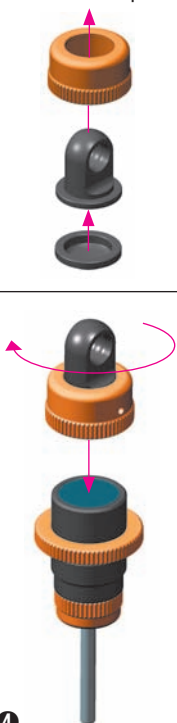
1 Extend the shock shaft completely. Fill the shock body with the shock oil.



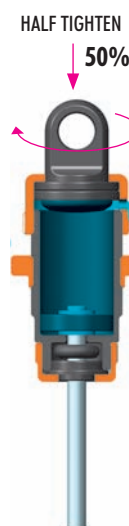
2 Move the shock shaft up and down a few times to release the air bubbles trapped beneath the piston.



3 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.



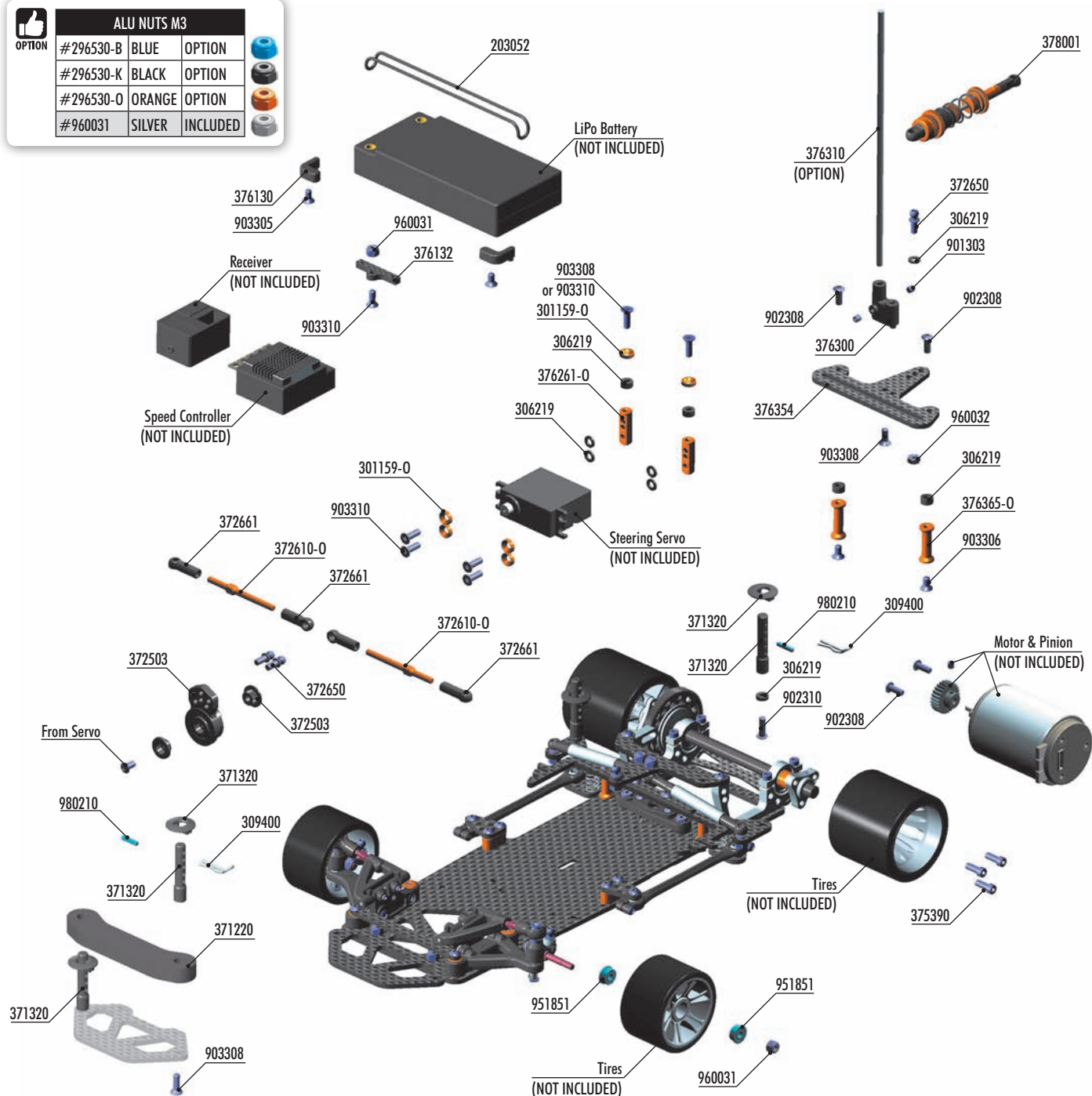
7 Keep the shock shaft pushed in the shock body and tighten the shock cap completely.

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.



ALU NUTS M3

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



BAG

06

301159-O	ALU COUNTERSUNK SHIM - ORANGE (4)	376365-O	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)		
371220	X12 FOAM BUMPER	203052	O-RING FOR 1/10 ON-ROAD SET-UP WHEEL (4)
371320	COMPOSITE BODY POST (2)	901303	HEX SCREW SB M3x3 (10)
372503	COMPOSITE SERVO SAVER - STIFF - SET	902308	HEX SCREW SH M3x8 (10)
372610-O	ALU ADJ. TURNBUCKLE M3x42 MM - ORANGE (2)	902310	HEX SCREW SH M3x10 (10)
372650	BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2)	903305	HEX SCREW SFH M3x5 (10)
372661	COMPOSITE STEERING BALL-JOINT 4.2 MM OPEN (4)	903306	HEX SCREW SFH M3x6 (10)
375390	ALU HEX SCREW M3x8 FOR REAR WHEELS (6)	903308	HEX SCREW SFH M3x8 (10)
376130	COMPOSITE LiPo BATTERY BACKSTOP (2)	903310	HEX SCREW SFH M3x10 (10)
376132	GRAPHITE BATTERY BACKSTOP 3.0MM - MIDDLE	951851	BALL-BEARING 1/8" x 5/16" x 9/64" FLANGED - STEEL SEALED - OIL (2)
376261-O	X12'20 ALU SERVO MOUNT - ORANGE (2)	960031	ALU NUT M3 (10)
376300	COMPOSITE ANTENNA MOUNT	960032	NUT M3 (10)
376354	X12'20 GRAPHITE PLATE FOR ANTENNA HOLDER	980210	PIN 2x10 (10)

6. FINAL ASSEMBLY EU US

IO

306219
SHIM 3x6x1

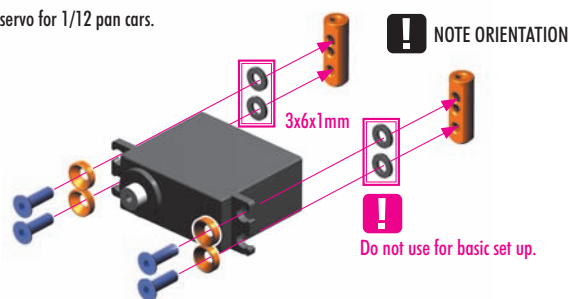


903310
SFH M3x10

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



ACKERMANN



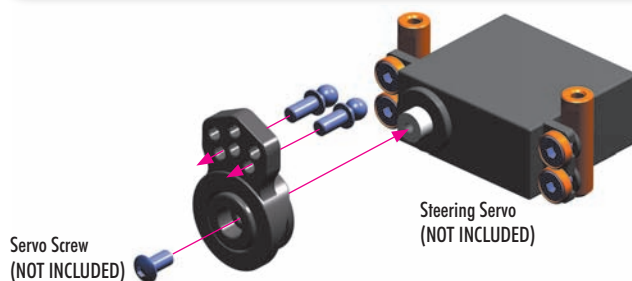
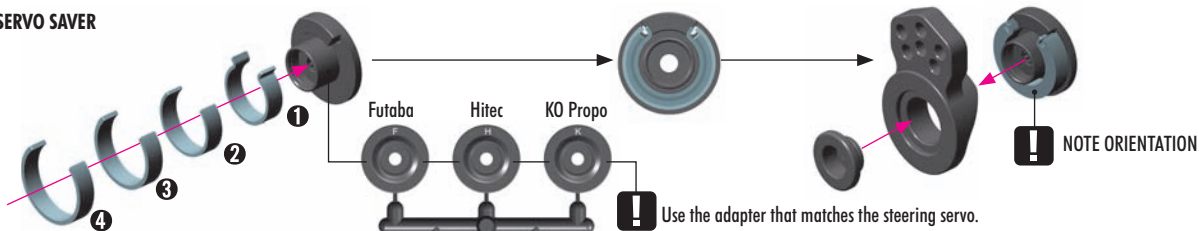
STANDARD SERVO
POSITION



MICRO SERVO
POSITION



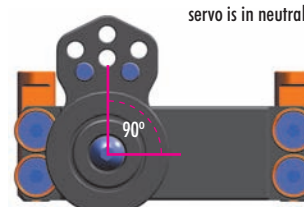
SERVO SAVER



INITIAL SETTING

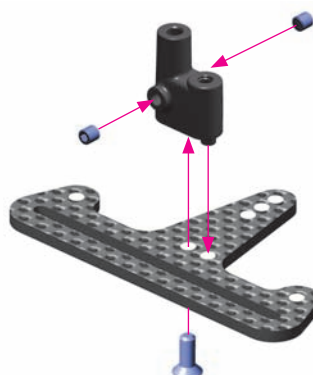


Note the orientation of servo saver when servo is in neutral.



TIP

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



901303
SB M3x3



903308
SFH M3x8

IO

306219
SHIM 3x6x3

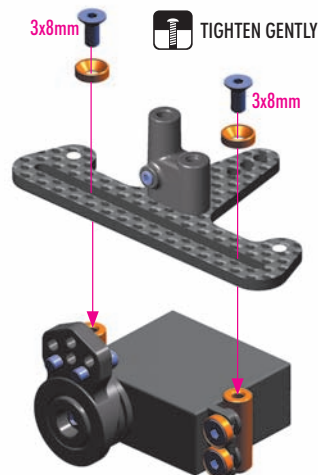


903308
SFH M3x8



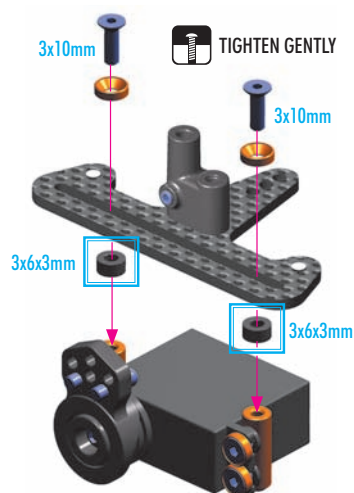
903310
SFH M3x10

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



CROSS-CHASSIS ALIGNMENT

ALTERNATIVE 2 - FOR INLINE ALIGNMENT



INLINE ALIGNMENT

IO

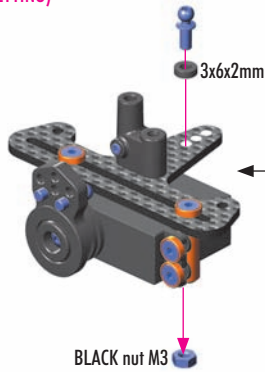
306219
SHIM 3x6x2



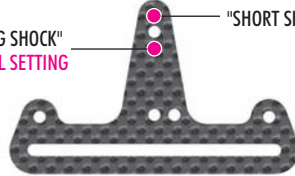
960032
N M3

ALTERNATIVE 1

LONG SHOCK - FORWARD MOUNT POSITION
(INITIAL SETTING)

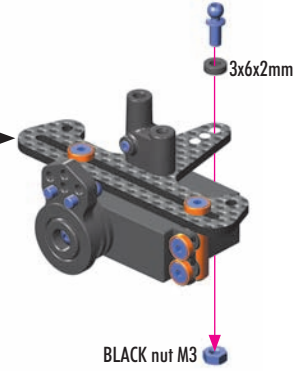


"LONG SHOCK"
INITIAL SETTING



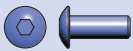
ALTERNATIVE 2

SHORT SHOCK - REARWARD MOUNT POSITION



IO

306219
SHIM 3x6x3



902308
SH M3x8

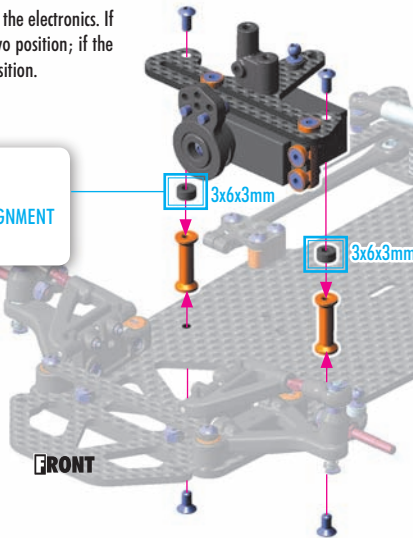


903306
SFH M3x6

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.

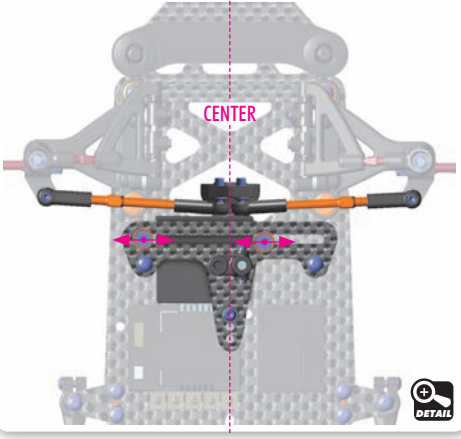
NOTE

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



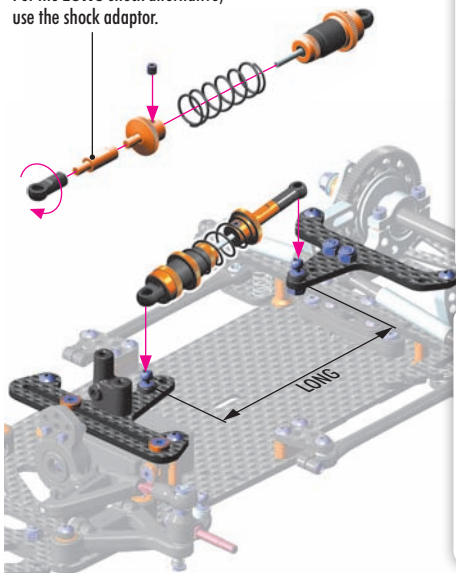
IO

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.

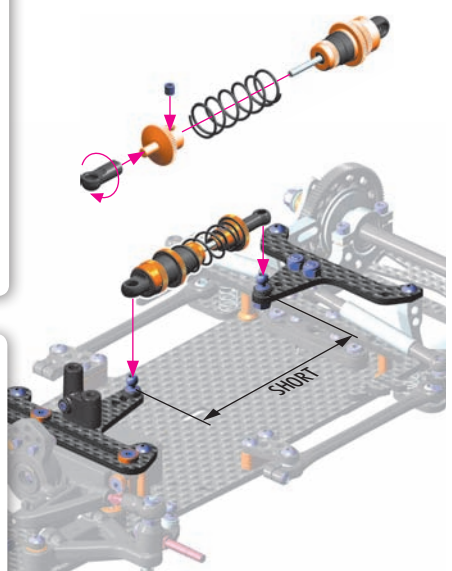
DOWNSTOP ADJUSTMENT

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.

ADAPTOR

5mm

SHORT SHOCK

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

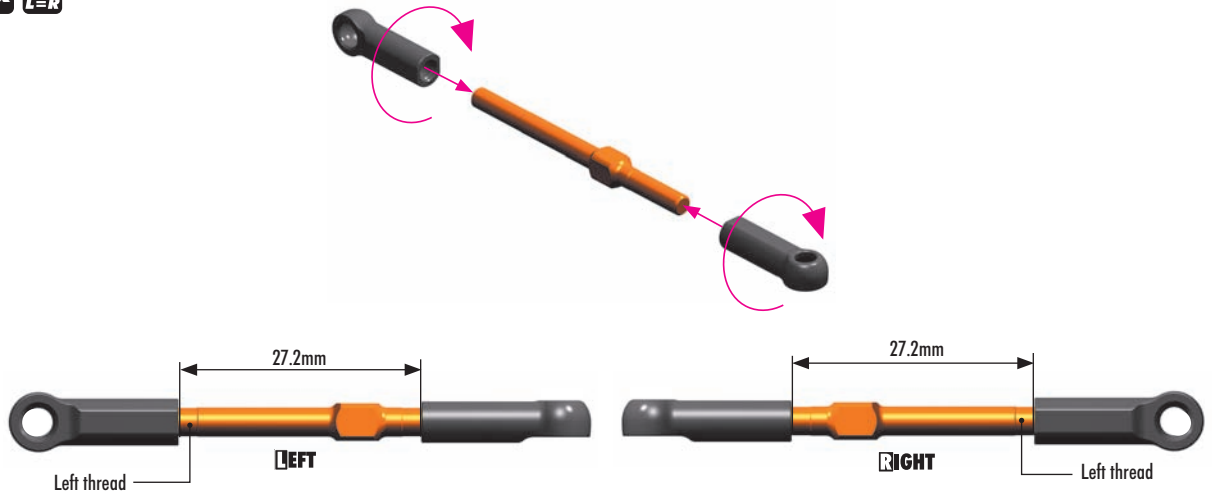


For initial setting, thread fully.

5mm

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

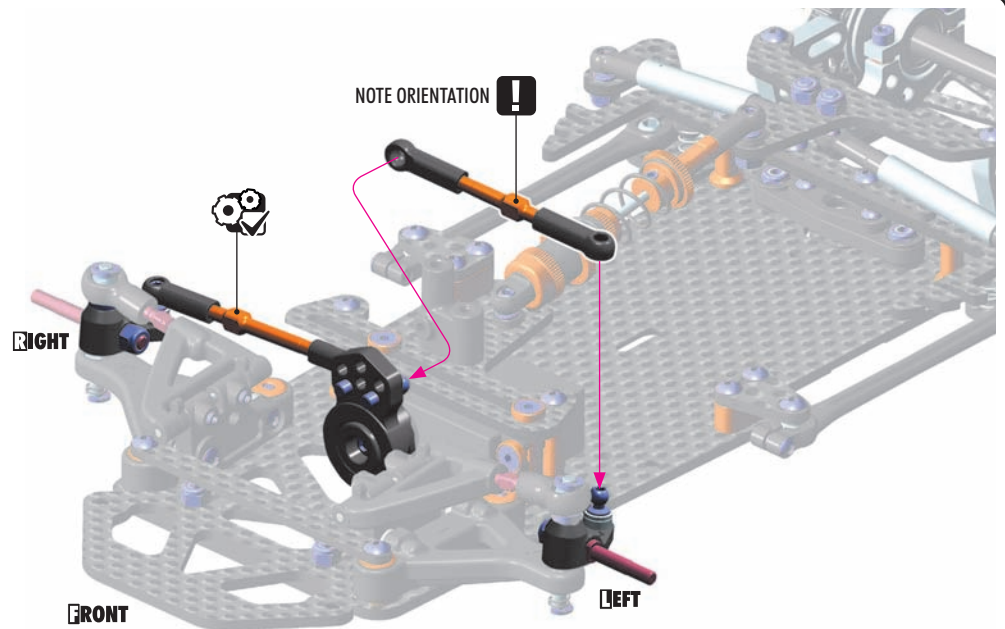
2x 



SET-UP BOOK

TOE
ACKERMANN

2x 



306219
SHIM 3x6x3

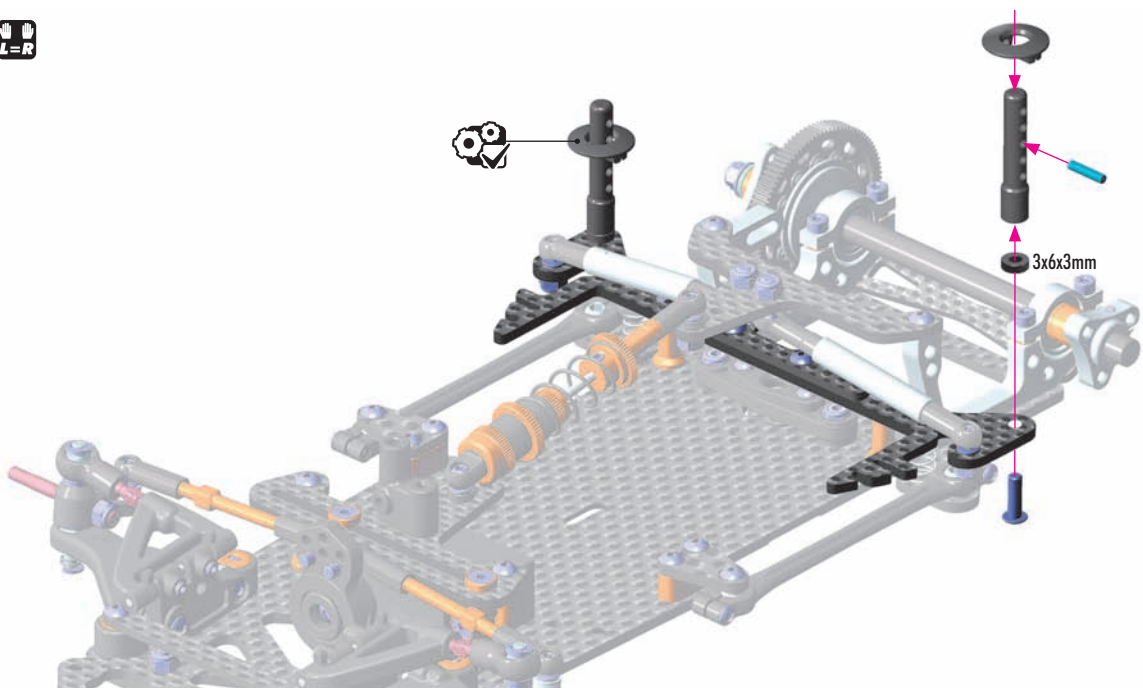


902310
SH M3x10



980210
P 2x10

2x 

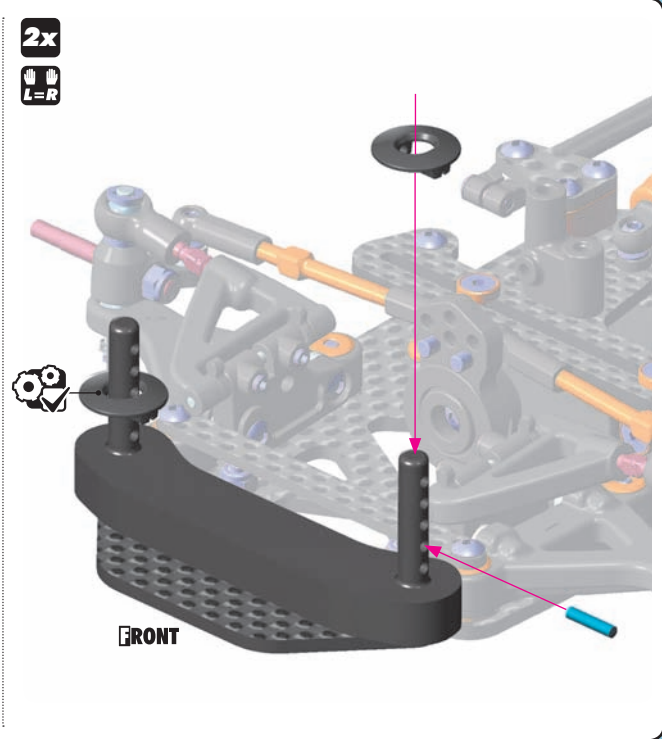
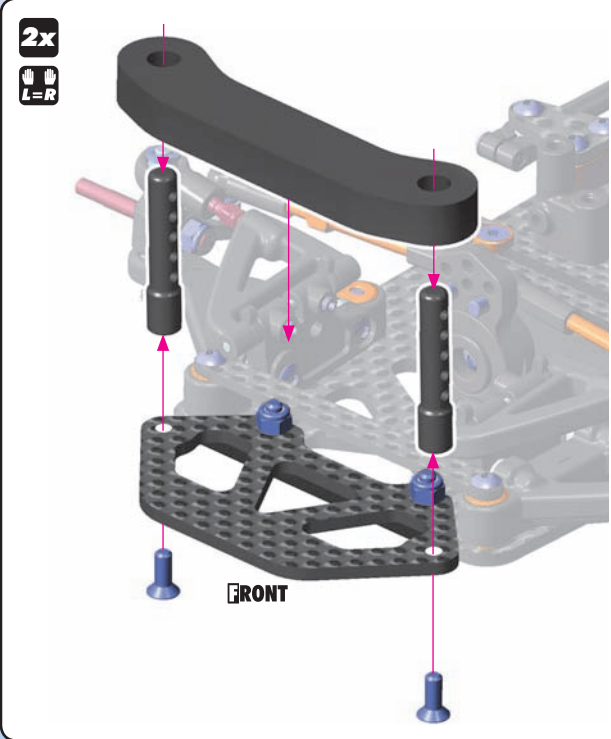




903308
SFH M3x8

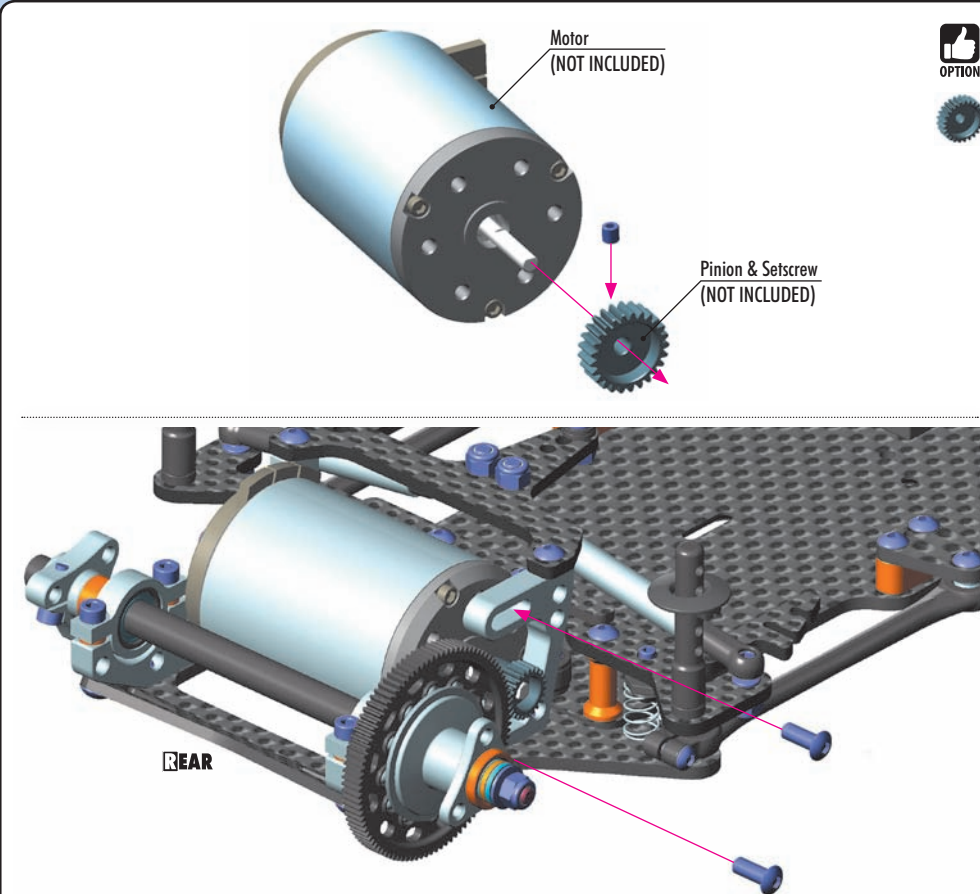


980210
P 2x10





902308
SH M3x8



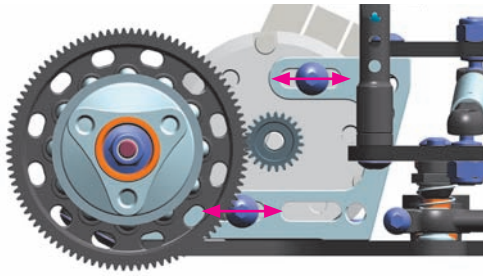
PINION GEARS ALU HARDCOATED

#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

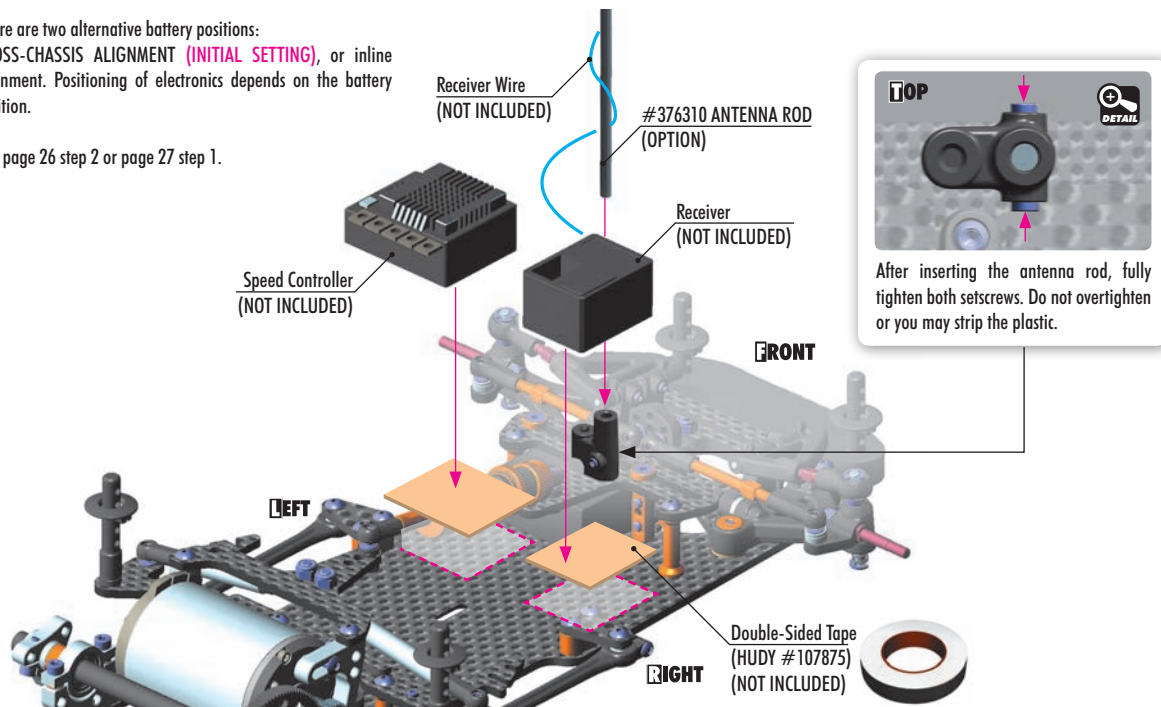
Adjust the gear mesh so there is appropriate space between the spur gear and pinion teeth. There should be a very small amount of freeplay.




SET-UP BOOK
GEAR RATIO

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

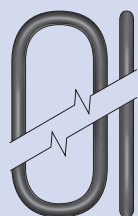
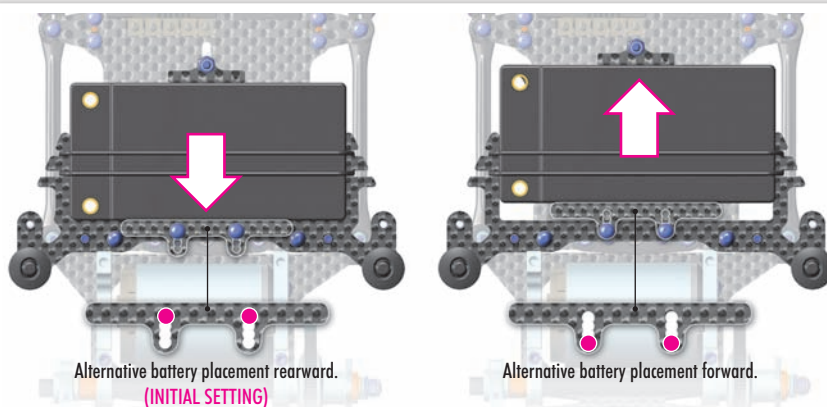
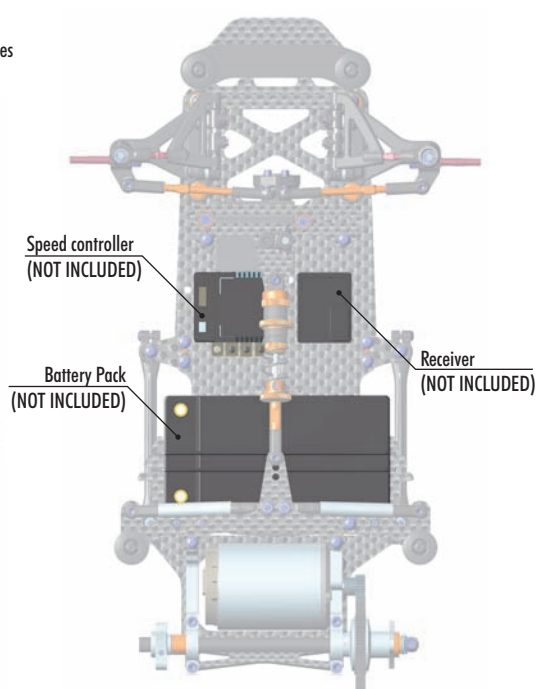
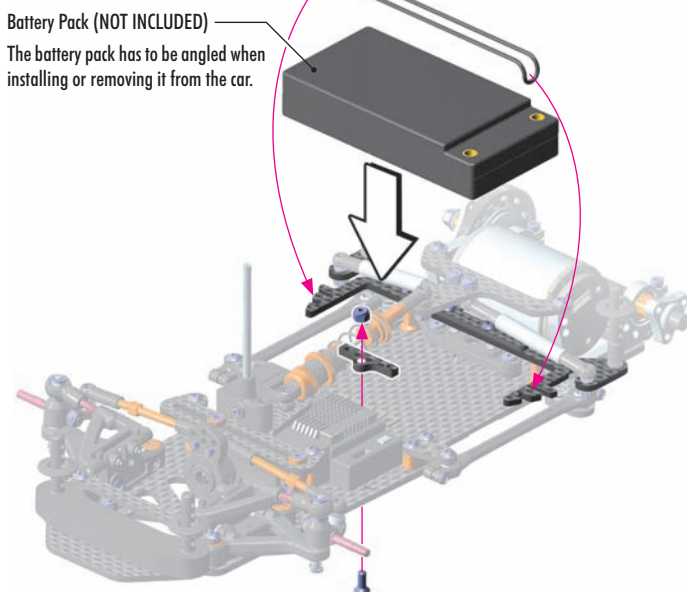
See page 26 step 2 or page 27 step 1.



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
0 50x1.8



903305
SFH M3x5



903310
SFH M3x10



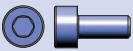
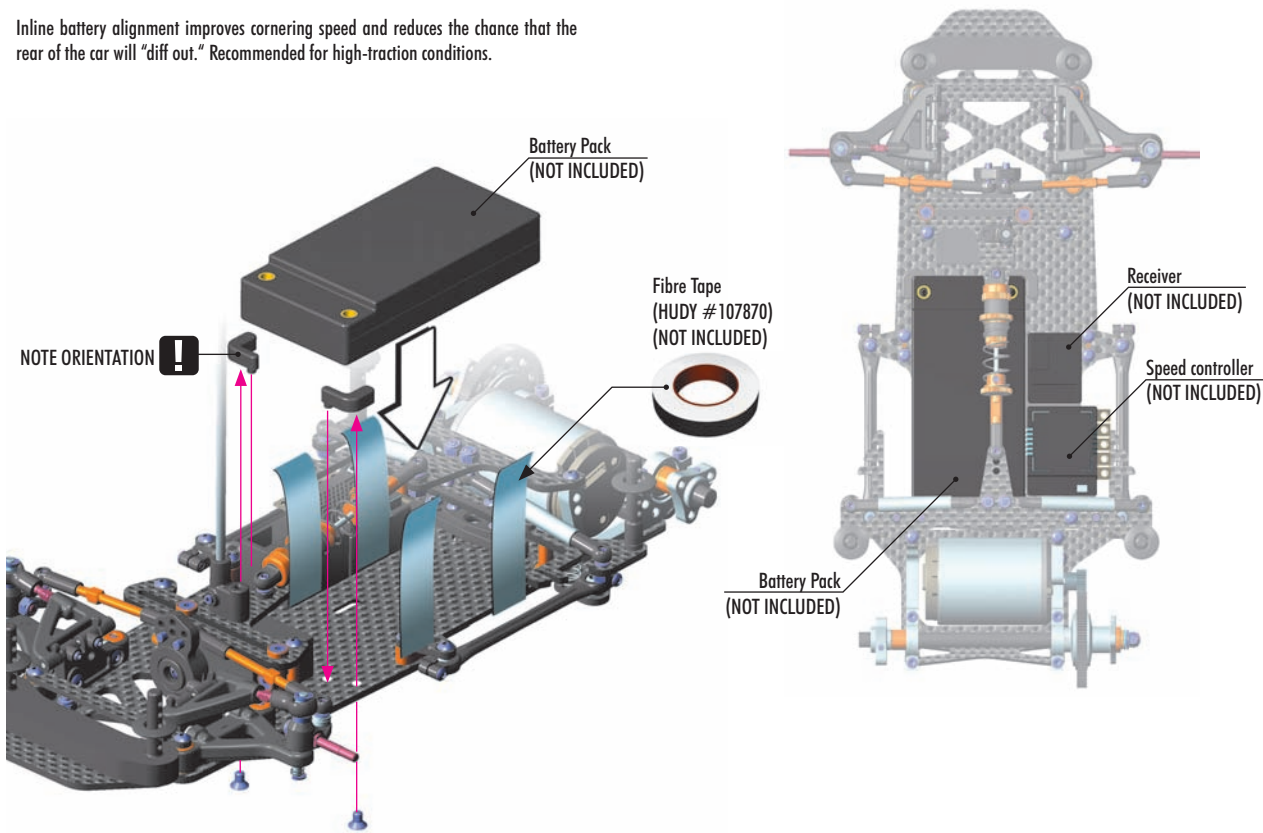
960031
ALU N M3



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.



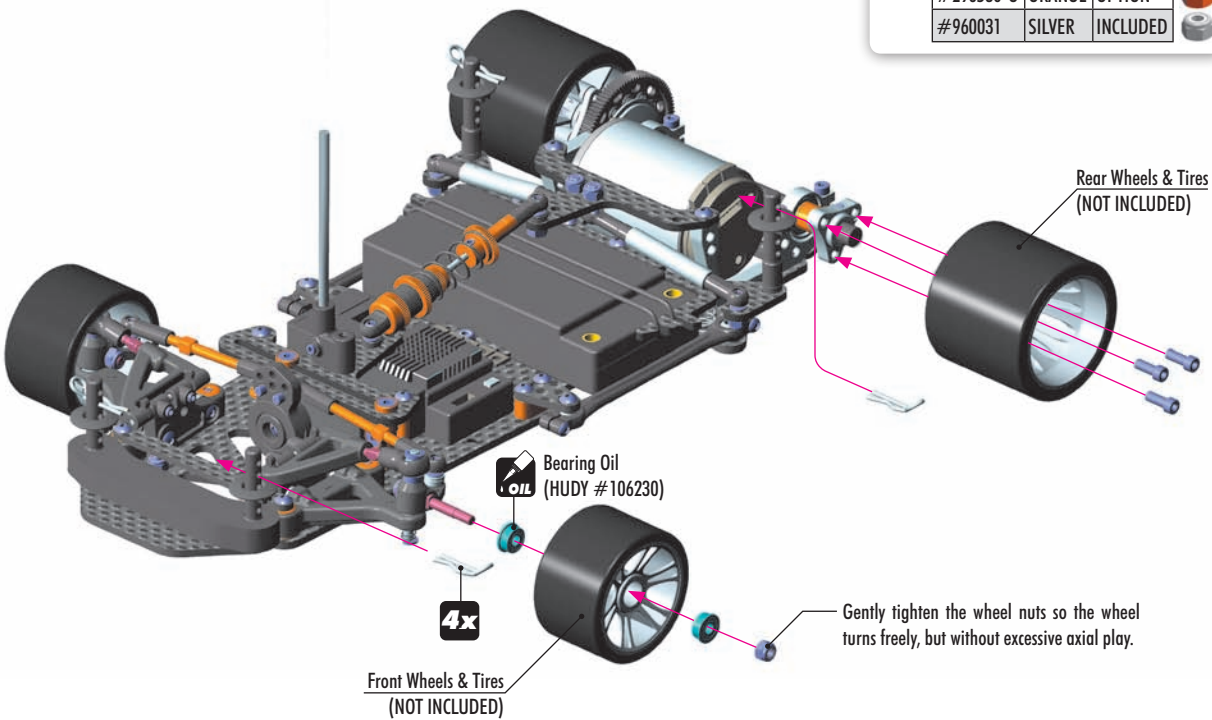
375390
ALU SCH M3x8



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 /sec

QUALIFYING POSITION

FINAL POSITION

TRACK

TRACK SURFACE

☐ CARPET

☐ ASPHALT

TRACK LAYOUT

☐ TECHNICAL

☐ MIXED

☐ FAST


TRACTION

☐ LOW

☐ MEDIUM

☐ HIGH

CENTER SHOCK ABSORBER



CENTER SHOCK OIL

CENTER SHOCK REBOUND

CENTER SHOCK SPRING

/cSt

%

☐ SILVER C=1.5

☐ GOLD C=1.8

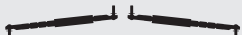
☐ BLACK C=2.1

☐ BLACK C=1.4-1.9

☐ BLACK C=2.0-2.5

SIDE DAMPING


☐ SIDE TUBE



OIL

/cSt

☐ SIDE SHOCK



OIL

/cSt

FRONT

TIRES

REAR

TIRES TYPE

DIAMETER /mm

ADDITIVE

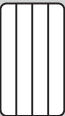
ADDITIVE TIMING


FRONT LEFT

FRONT RIGHT


REAR LEFT


REAR RIGHT





ADDITIVE TREATED AREA





TRANSMISSION

BALL DIFF

GEAR DIFF

SOLID AXLE

☐ LOOSE

☐ MEDIUM

☐ TIGHT

OIL

/cSt

☐

GEARING

PINION / T

SPUR GEAR/T

FINAL DRIVE RATIO

ROLLOUT

ELECTRONICS

MOTOR

SPEEDO

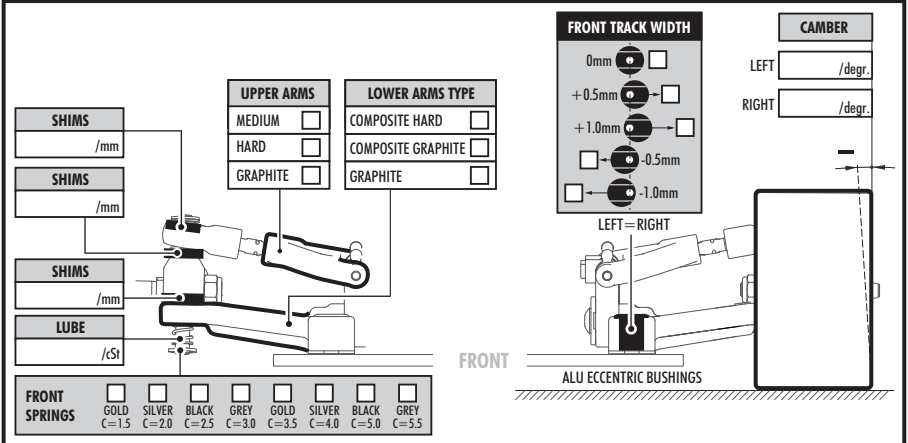
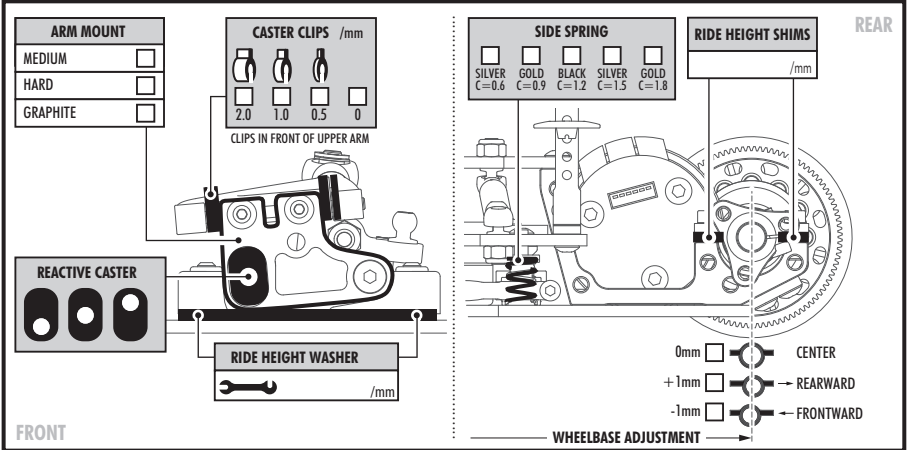
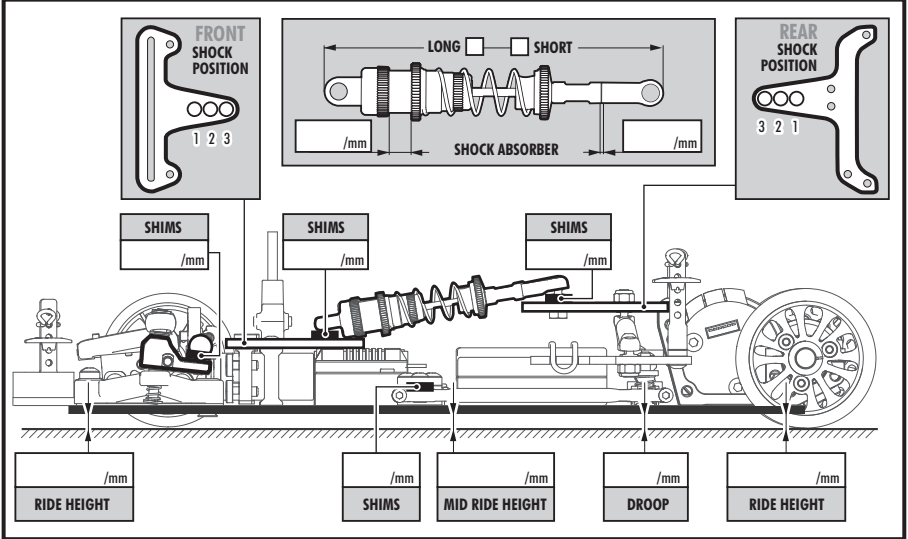
SERVO

BATTERIES

BODY

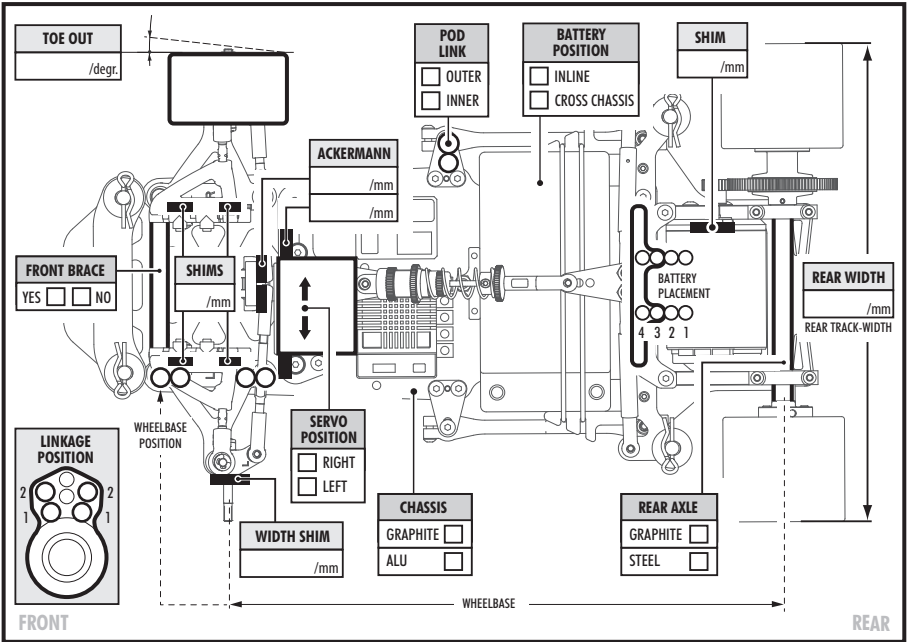
TYPE

COMMENTS



FRONT

ALU ECCENTRIC BUSHINGS



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