1/12 LUXURY PAN CAR



INSTRUCTION MANUAL
FOR X12'23 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.

Carefully read 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

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

### **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:

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RC America, 2030 Century Center Blvd #15

Irving, TX 75062

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### www.teamxray.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 alasses 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
  - 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.



## A

### **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 shortcircuit 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 excess 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 addictions 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.



### **TOOLS REQUIRED**





### NOT INCLUDED



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Alexander Hagberg (Factory Driver)

When a QR CODE is found in the instruction manual, scan the code to be directed to an online video that explains that feature or adjustment in more detail. Make sure to watch all of the instructional videos to get the most performance out of your car.



	SAMPLE OF OPTIONAL PARTS				
N	#37XXXX	TYPE1	OPTION 1		
	#37XXXX	TYPE2	OPTION 2		
	#37XXXX	TYPE3	INCLUDED		

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 part is included in the kit while all other parts are available only as an optional part and must be purchased separately.

### **COLOR INDICATIONS**

At the beginning of each section is an exploded view of the parts to be assembled. There is also a list of all the parts and part numbers that are related to the assembly of that section

The part descriptions are color-coded to make it easier for you to identify the source of a part. Here are what the different colors mean:

371212 STYLE A - indicates parts that are included in the bag marked for the section.

371119 STYLE B - indicates parts that are included in the box.

378002 STYLE C - indicates parts that are already assembled from previous steps.

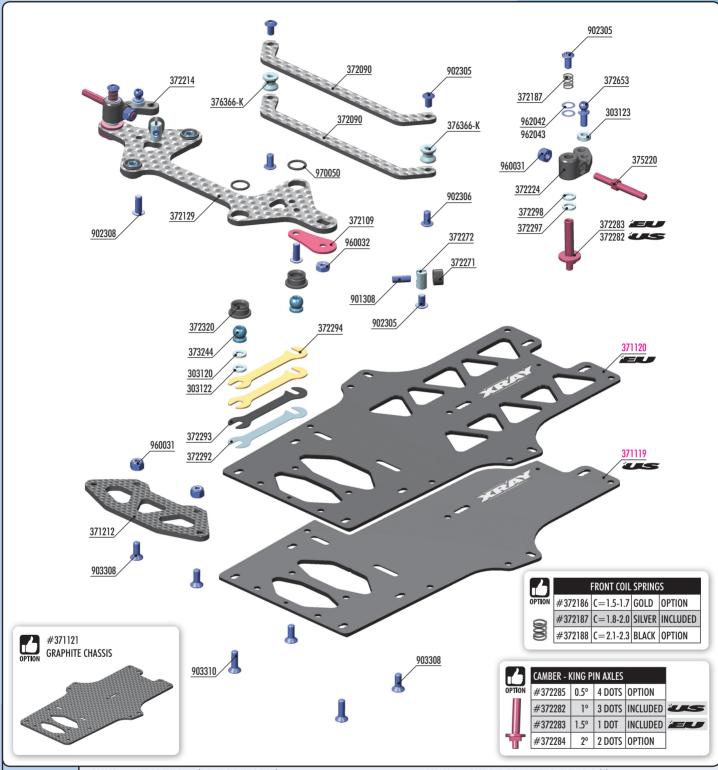
### INCLUDED



### ALSO REQUIRED

Transmitter	Receiver	Speed Controller	Steering Servo		
Electric Motor & Pinion Gear with Setscrew	LiPo Battery	Battery Charger	Bearing Oil (HUDY #106230)		
		9.9 7 7 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	in the second se		
Tires	1/12 Bodyshell	Lexan™ Paint	Double-sided Tape (HUDY #107875)		
			Age		







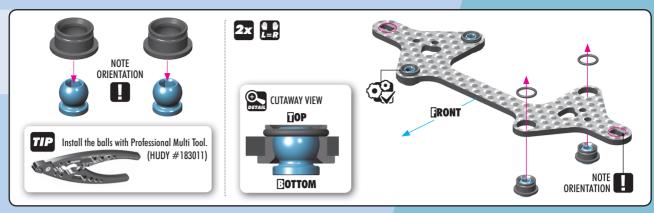


303120	SET OF ALU SHIM (0.5MM, 1.5MM, 2.5MM)
303122	ALU SHIM 3x6x1.0MM (10)
303123	ALU SHIM 3x6x2.0MM (10)
371212	GRAPHITE BUMPER LOWER HOLDER 2.5MM
372090	FRONT BRACE - GRAPHITE 2.2MM
372109	STEEL LOWER SUSPENSION ARM BRACE (2)
372129	GRAPHITE LOWER SUSPENSION ARM PLATE FOR STEERING LOCK 2.5MM
372187	FRONT COIL SPRING FOR 4MM PIN C = 1.8-2.0 - SILVER (2)
372214	COMPOSITE STEERING BLOCK FOR 4MM KING PIN - RIGHT - GRAPHITE
372224	COMPOSITE STEERING BLOCK FOR 4MM KING PIN - LEFT - GRAPHITE
372271	COMPOSITE STEERING BLOCK BACKSTOP (2)
372272	ALU STEERING LOCK (2)
372282	X12 KING PIN 4MM - 1° - NICKEL COATED (2)
372283	X12 KING PIN 4MM - 1.5° - NICKEL COATED (2)
372292	STEEL SHIM 0.2MM - SILVER (2)
372293	STEEL SHIM 0.4MM - BLACK (2)
372294	STEEL SHIM 0.6MM - GOLD (2)
372297	ALU SHIM 4x6x1.0MM (10)
372298	ALU SHIM 4x6x0.5MM (10)
372320	COMPOSITE ARM BUSHING (4)

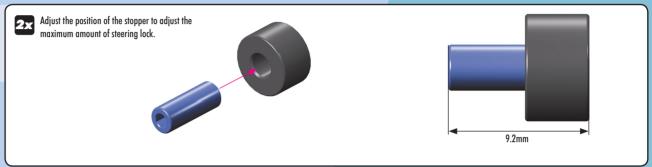
	" 0/2201   1   1   1   1   1   1   1   1   1
372653	BALL END 4.2MM WITH 8MM THREAD (2)
373244	BALL END 6.0MM WITH HEX - HUDY SPRING STEEL™ (2)
375220	FRONT WHEEL AXLE (2)
376366-K	ALU MOUNT 6.0MM - BLACK (2)
901308	HEX SCREW SB M3x8 (10)
902305	HEX SCREW SH M3x5 (10)
902306	HEX SCREW SH M3x6 (10)
902308	HEX SCREW SH M3x8 (10)
903308	HEX SCREW SFH M3x8 (10)
903310	HEX SCREW SFH M3x10 (10)
960031	ALU NUT M3 (10)
960032	NUT M3 (10)
962042	WASHER'S 4x6x0.1 (10)
962043	WASHER S 4x6x0.2 (10)
970050	O-RING 5x1 (10)
371119	X12 ALU SOLID CHASSIS 2.0MM - 7075 T6
371120	X12 ALU FLEX CHASSIS 2.0MM - 7075 T6





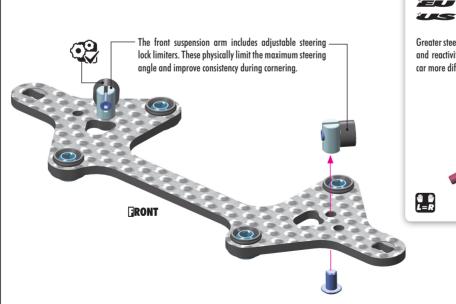


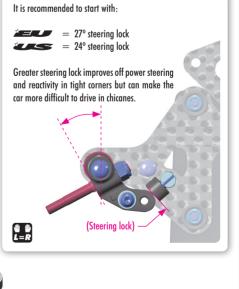














STEERING SYSTEM







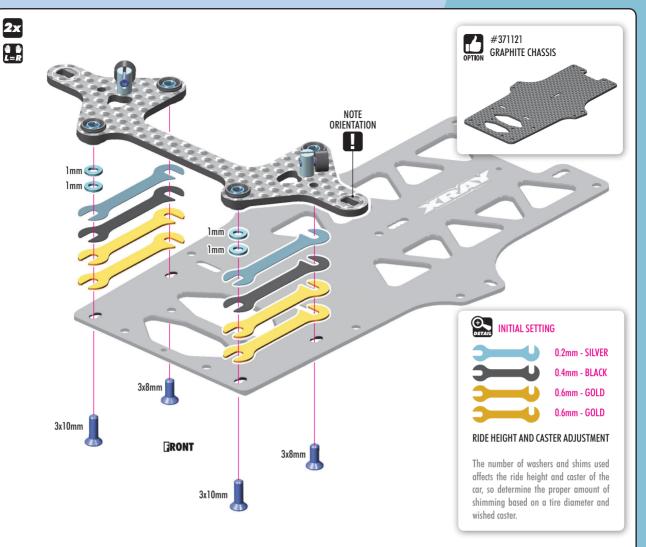


303123 SHIM 3x6x2





SFH M3x10



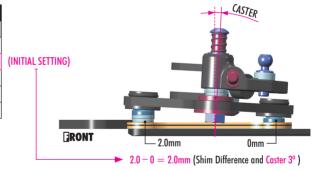


#### **CASTER ADJUSTMENT SETTING**

Caster is adjusted by the shims placed under front ball.

Please see the table beneath the to understand how to set caster.

EXTRA SHIM UNDE	R FRONT BALL
SHIM DIFFERENCE	CASTER
1mm	1.5°
2mm	3º
3mm	4.5°
4mm	6°
5mm	7.5°



# ALTERNATIVE FRONT POSITION LONG WHEELBASE

(INITIAL SETTING)

Longer wheelbase is recommended for bigger tracks with longer sweepers. Makes the car more stable and easier to drive.

### FRONT WHEELBASE ADJUSTMENT



#### **ALTERNATIVE REAR POSITION**

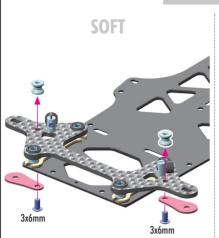
**SHORT WHEELBASE** 

Shorter wheelbase allows the car to rotate better in corner to maintain cornering speed. Recommended for tight, technical tracks or tracks with numerous 180° hairpin corners



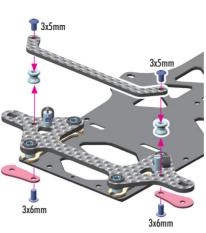


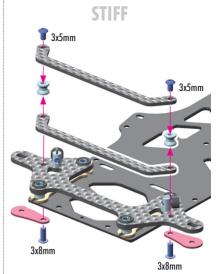
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### FRONT SUSPENSION FLEX SETTING

**MEDIUM** 





#### SOFT - (NO BRACE)

Makes the car initially less responsive, but will provide more mechanical grip. Recommended for low-grip carpet conditions, and asphalt.

### **MEDIUM** (INITIAL SETTING)

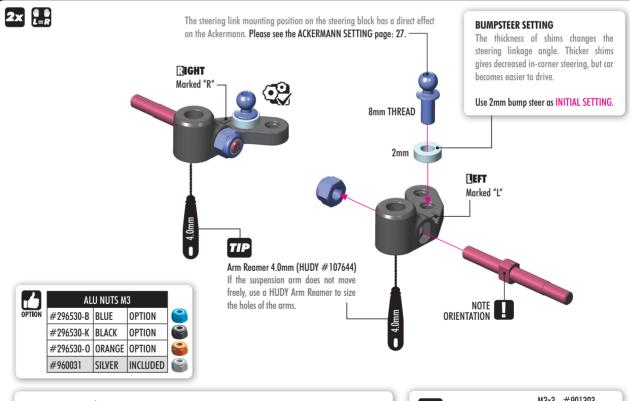
Brace mounted to the graphite arm with posts provides a balance between initial response and mechanical grip. Recommended for most conditions.

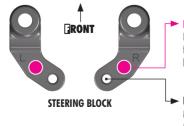
#### STIFF

Both braces mounted to the graphite arm gives maximum responsiveness but decreases mechanical grip. Recommended for high-traction conditions (such as US black carpet).









DETAIL

#### FORWARD POSITION (INITIAL SETTING)

Initial setting for most tracks provides a neutral steering feel similar to that of the old X12. Provides a good balance between initial response and cornering speed.

#### ► REARWARD POSITION

Makes the car freer because of increased Ackermann (less steering lock on the outer wheel in relation to the inner). Recommended for medium- to high-traction tracks.

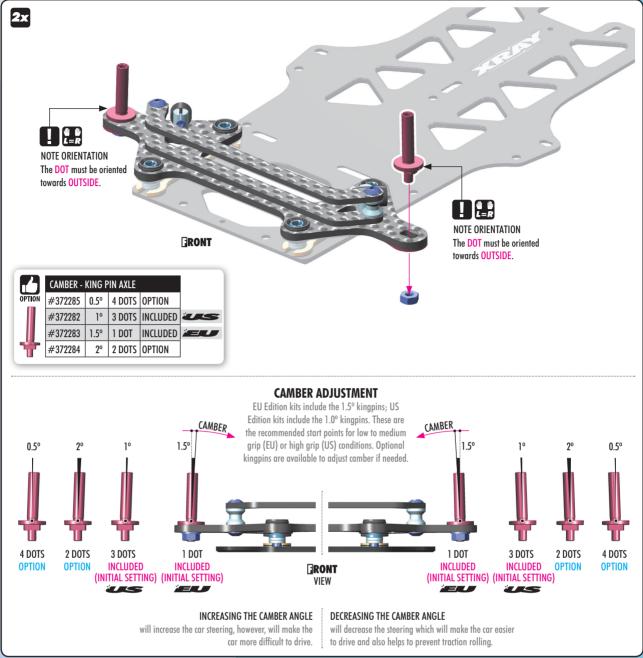


When using rearward hole, you can reinforce the steering block (for hard crashes) by installing an M3x3 setscrew in the forward hole.





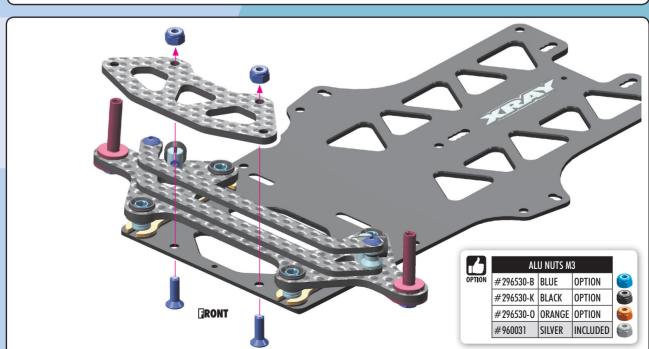




















902305 SH M3x5

962042





Alexander Hagberg
(Factory driver)

#### RIDE HEIGHT AND DROOP ADJUSTMENT SHIMS:

The ride height is adjusted with the supplied long shims that can be fitted under the arms (silver/black/gold). I recommend using as low of a ride height as you possibly can, unless you race on a bumpy or rough surface, then the car can benefit from having a slightly higher ride height, to increase stability, and improve the handling over bumps.

The front axle height can be adjusted with shims under the steering block. You can't change the roll center on the front end of the X12, simply because there is no upper arm. Adding shims under the steering block (raising the steering block) will raise the front axle height, and at the same time, decrease bump steer. Removing shims will lower the steering block, and increase bump steer. For more information about Ackermann & Bumpsteer, see PAGE 27 (servo mounting).

### RIDE HEIGHT ADJUSTMENT

#### **INITIAL SETTING**

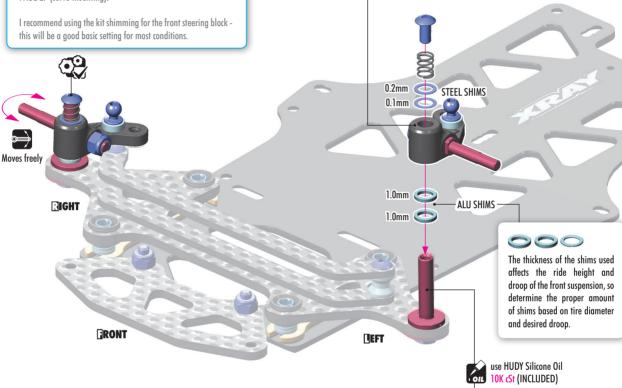
O above upper arm (0.3mm)
O below steering block (2.0mm)

#### FRONT DROOP

Front droop is adjusted by the preload of the front spring. More shims between the steering block and the spring will increase preload - and decrease droop. Removing shims will have the opposite effect.

MORE DROOP will make the car initially less responsive, but it will give the car more front grip, especially in the middle of the corner. The car will be less precise and more difficult to drive, because of increased roll. More droop is best suited for low- to medium-traction carpet, or asphalt.

LESS DROOP will decrease roll but the car will change direction quicker. Less droop is best suited for high-traction surfaces such as US black carpet, especially when traction rolling is an issue (and particularly when a rear solid axle is used).







FRONT KINGPIN OII



O VIDEO TECH TIP

FRONT DROOP & RIDE



	FRONT COIL SPRINGS					
	#372186	C=1.5-1.7	GOLD	OPTION		
	#372187	C=1.8-2.0	SILVER	INCLUDED		
3	#372188	C = 2.1 - 2.3	BLACK	OPTION		

#### SOFTER SPRINGS

Makes the car easier to drive over bumps and increases steering as it makes the car roll more, especially in the middle of a corner.

### HARDER SPRINGS

Makes the car more responsive and increases initial steering. Recommended for high-traction and flat tracks.



#### Arm Reamer 4.0mm (HUDY #107644)

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 4mm 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.



### LOW traction & bumpy track

 $7 \text{K} \sim 10 \text{K} \text{ cSt}$ 

HIGH traction & smooth track

FRONT DAMPING with different oils.

### TRACK CONDITIONS

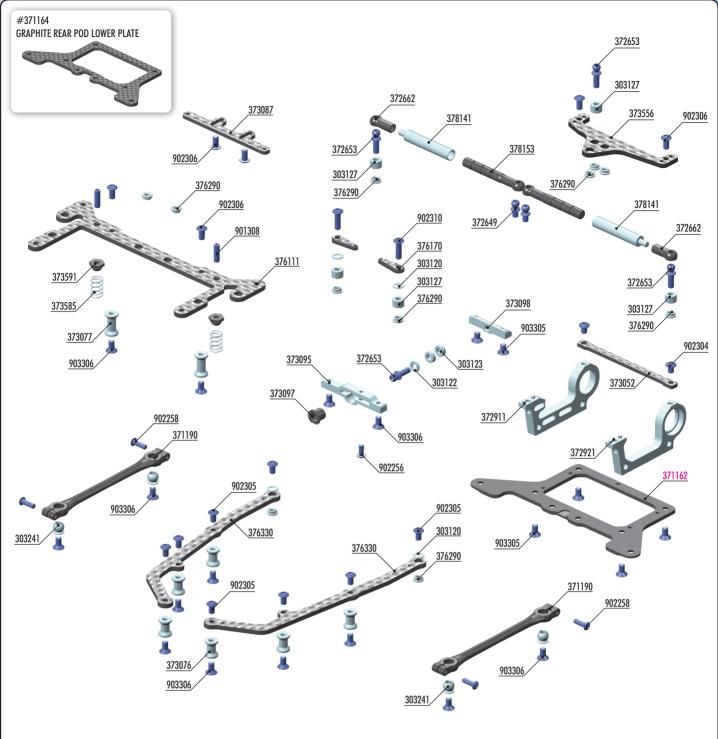
Thinner oil is recommended for low-traction tracks, while thicker oil is recommended for high-traction tracks.

#### DAMPING

Using thicker oil on the king pin axle makes the car less responsive but easier to drive. Thicker oil oil also increases stability but decreases cornering speed.









○ BUILD VIDEO

REAR SUSPENSION

303120	SET OF ALU SHIM (0.5MM, 1.5MM, 2.5MM)
303122	ALU SHIM 3x6x1.0MM (10)
303123	ALU SHIM 3x6x2.0MM (10)
303127	ALU SHIM 3x6x4.0MM (10)
303241	BALL UNIVERSAL 5.8 MM HEX (4)
371190	COMPOSITE POD LINK (2)
372649	BALL END 4.2MM WITH 4MM THREAD (2)
372653	BALL END 4.2MM WITH 8MM THREAD (2)
372662	COMPOSITE BALL JOINT 4.2 MM (4)
372911	ALU REAR BULKHEAD - MOTOR - RIGHT
372921	ALU REAR BULKHEAD - LEFT
373052	GRAPHITE REAR BULKHEAD BRACE 2.2MM
373076	ALU REAR BRACE MOUNT 9MM - BLACK (2)
373077	ALU REAR BRACE MOUNT 12MM - BLACK (2)
373087	GRAPHITE BATTERY BACKSTOP 2.2MM
373095	ALU CHASSIS PIVOT HOLDER - SWISS 7075 T6
373097	COMPOSITE PIVOT BRACE BUSHING
373098	ALU POD PLATE PIVOT HOLDER - SWISS 7075 T6
373556	GRAPHITE REAR POD UPPER PLATE 2.5MM
373585	SIDE SPRING C=0.9 - GOLD (2)

373591	COMPOSITE SIDE SPRING HOLDER (2)
376111	GRAPHITE REAR BRACE WITH BATTERY BACKSTOP 2.5MM
376170	GRAPHITE BATTERY CLAMP 2.2MM (2)
376290	LOW PROFILE ALU SELF-LOCKING NUT (2)
376330	GRAPHITE SIDE BRACE 2.5MM - RIGHT & LEFT
378141	ALU SIDE TUBE (2)
378153	COMPOSITE SIDE TUBE SHAFT (2)
901308	HEX SCREW SB M3x8 (10)
902256	HEX SCREW SH M2.5x6 (10)
902258	HEX SCREW SH M2.5x8 (10)
902304	HEX SCREW SH M3x4 - STAINLESS (10)
902305	HEX SCREW SH M3x5 (10)
902306	HEX SCREW SH M3x6 (10)
902310	HEX SCREW SH M3x10 (10)
903305	HEX SCREW SFH M3x5 (10)
903306	HEX SCREW SFH M3x6 (10)

ALU 2.0MM REAR POD LOWER PLATE - 7075 T6

371162

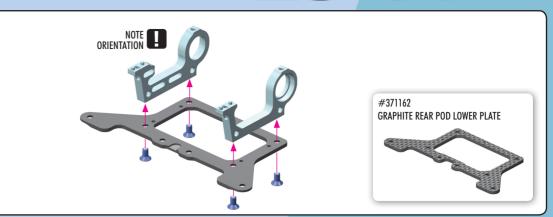
F 5 2 5 2 5 3



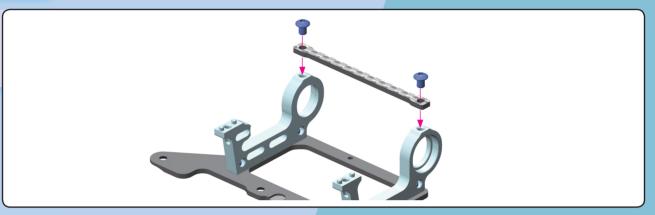




REAR POD & PIVOT BUILD





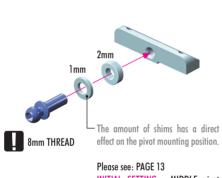




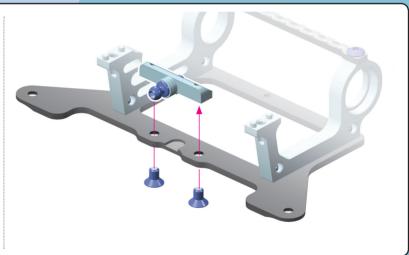




SFH M3x5



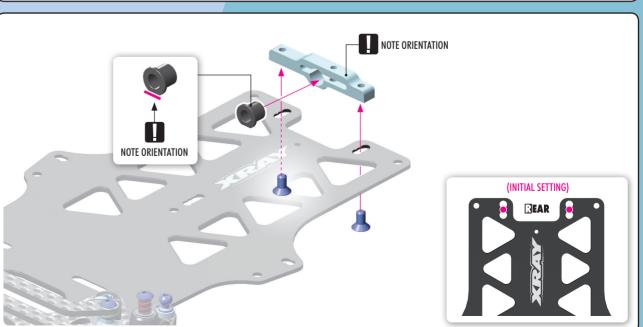








REAR POD & PIVOT BUILD







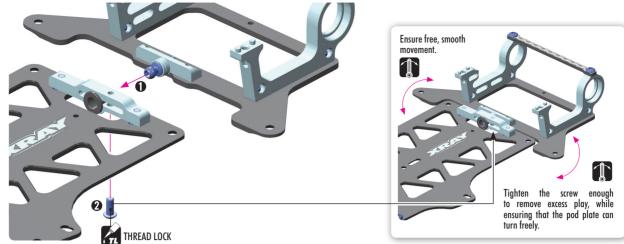


**REAR POD & PIVOT** 

BUILD

303122 SHIM 3x6x1

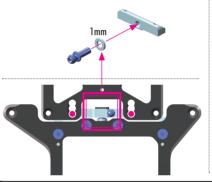
303123



### **PIVOT MOUNTING ALTERNATIVE**

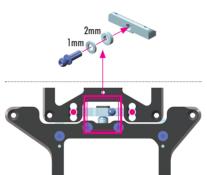
#### **REARWARD:**

Pivot mounted in rearward chassis holes, and 1mm shim used under the pivot ball. The rearvard pivot mounting gives the most neutral handling. Recommended for low to medium traction tracks.



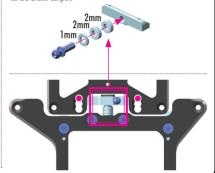
#### **MIDDLE: (INITIAL SETTING)**

Pivot mounted in middle chassis holes, with 3mm shims under the pivot ball. The middle pivot position gives a good balance between front and rear traction and is well suited for most conditions.



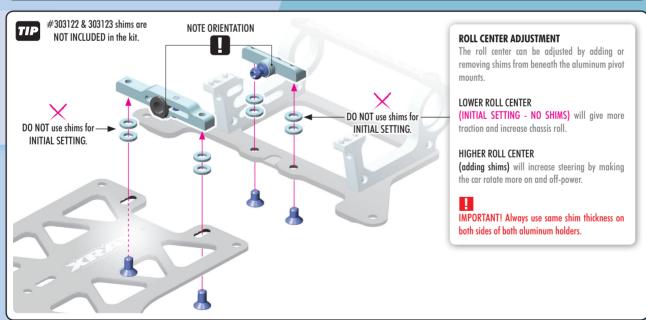
#### FORWARD:

Pivot mounted in forward chassis holes, with 5mm shims under the pivot ball. improves rotation thanks to the longer rear pod geometry. gives the most initial steering as well as rotation, especially suited for high traction conditions such as US black carpet.

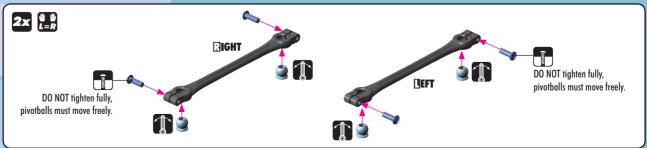






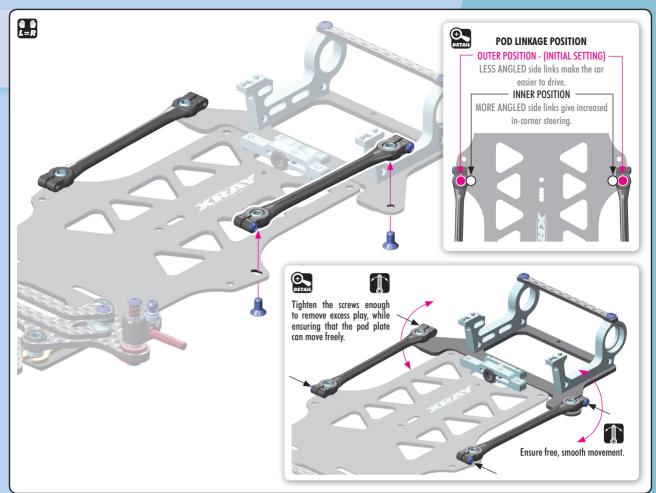




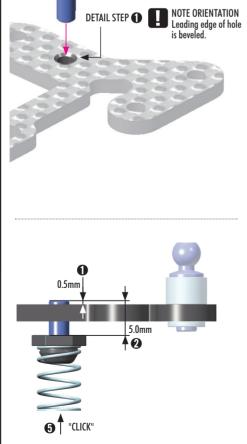


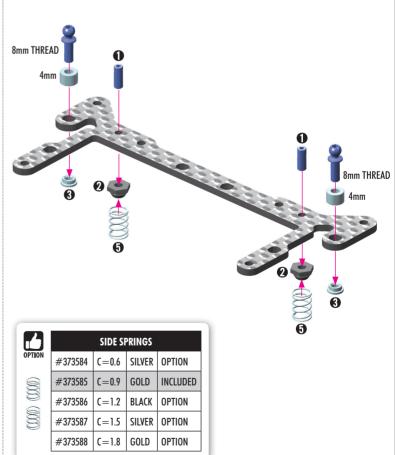








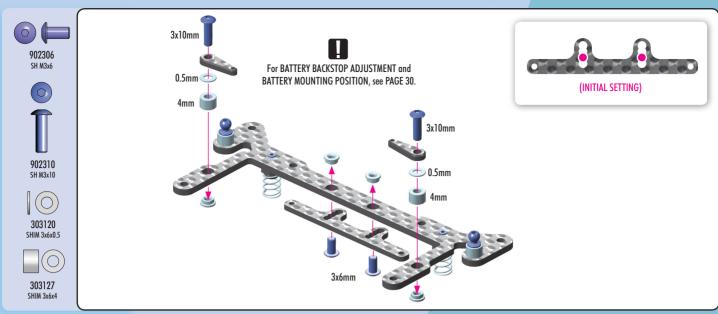






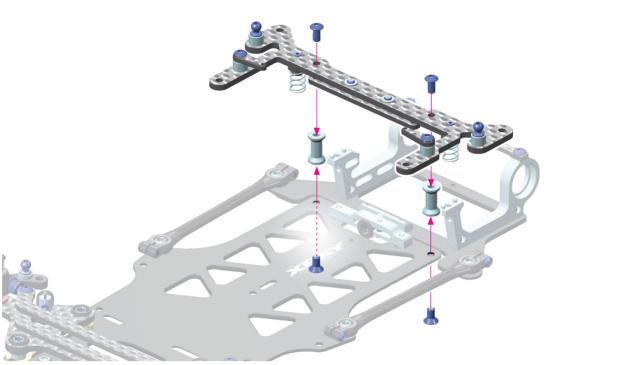


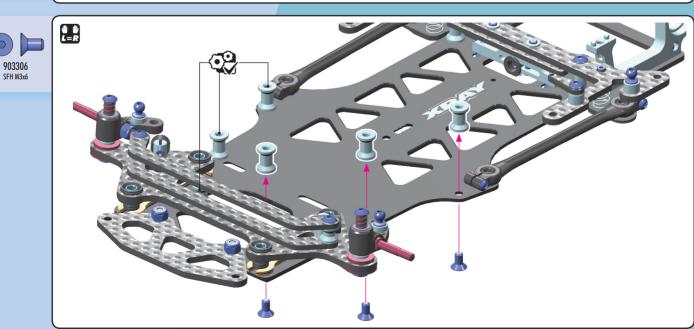












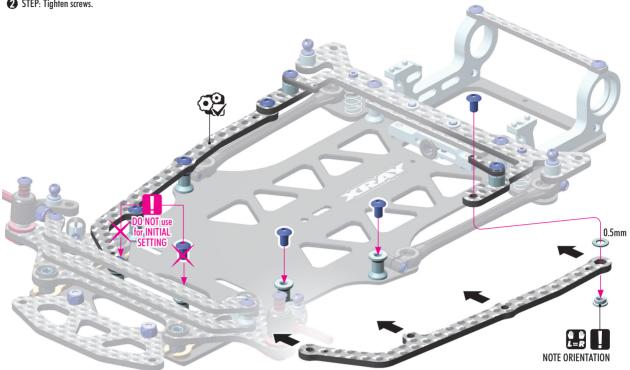








- STEP: Install the Graphite Braces.
- STEP: Tighten screws.



**CHASSIS FLEX ADJUSTMENT** 

## SOFT (NO BRACES)

Generates more mechanical grip. Recommended for low- to medium-traction carpet as well as asphalt.

### MEDIUM

Braces installed, attached at middle & rear only. This setting is a good compromise between mechanical grip and steering response. Ideal for most conditions.

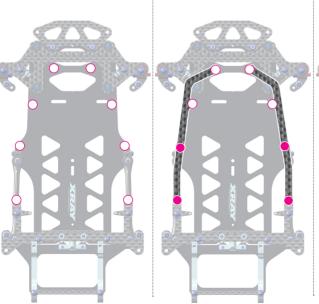
### **MEDIUM STIFF (INITIAL SETTING)**

Braces installed, attached at middle-front, middle, and rear. A good compromise between mechanical grip, and steering response. A good option for higher grip conditions.

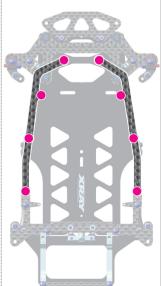
Braces installed, attached at front, middlefront, middle and rear. This is the stiffest, most stable setting. Recommended for high-traction carpet (such as US black carpet). The car will have less roll but will also have less overall grip.



GRAPHITE SIDE BRACES

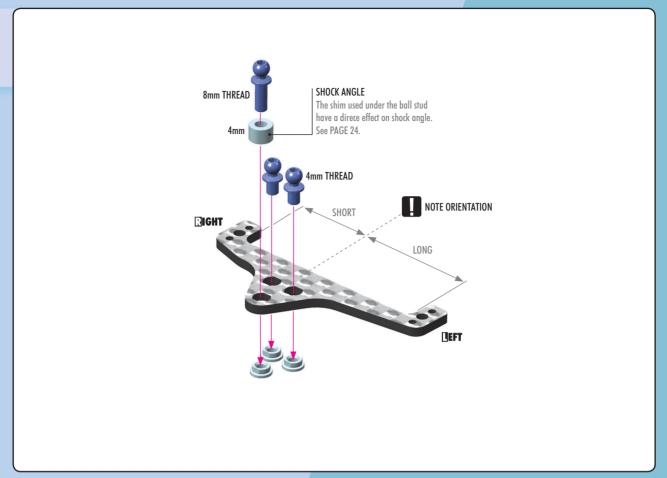




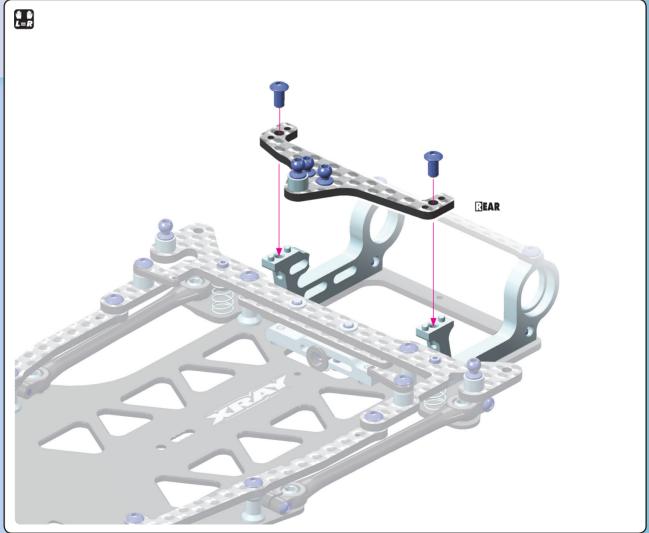








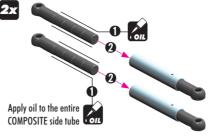








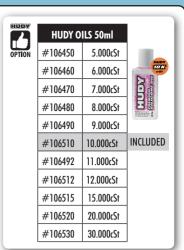


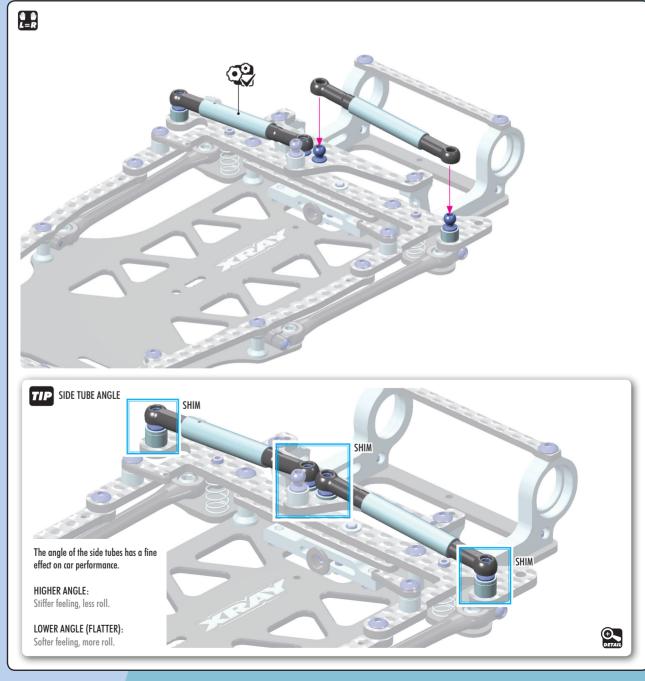


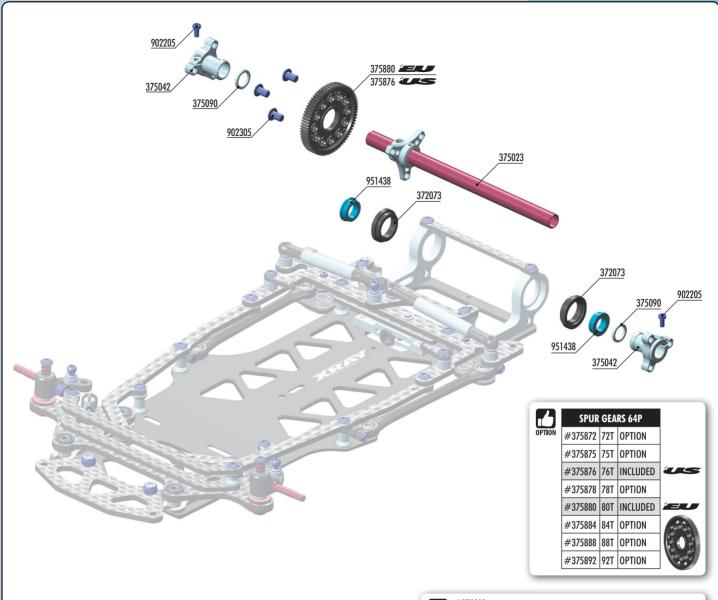
Apply oil to the entire composite side tube before installing in the aluminum tube. After assembly, check for smooth operation. It is very important to check and re-oil the tubes at least once per race day. Oil thickness can be adjusted depending on the track conditions.

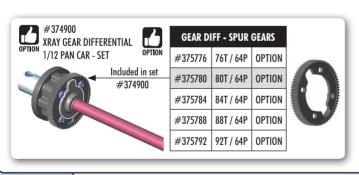


For HIGH grip	use SOFTER oils
For LOW grip or ASPHALT	use HARDER oils













372073 COMPOSITE ECCENTRIC RIDE HEIGHT ADJUSTER SET (2)

375023 REAR SOLID AXLE SHAFT - SHORTER - LIGHTWEIGHT - HUDY SPRING STEEL™

375042 ALU REAR ONE-PIECE WHEEL HUB - LIGTHWEIGHT

375090 SET OF ALU SHIMS (0.5MM, 1.0MM, 2.0MM) 375876 COMPOSITE SPUR GEAR - 76T / 64P

375880 COMPOSITE SPUR GEAR - 80T / 64P

902205 HEX SCREW SH M2x5 (10)

902305 HEX SCREW SH M3x5 (10)

951438 BALL-BEARING 1/4" x 3/8" x 1/8" FLANGED - STEEL SEALED - OIL (2)

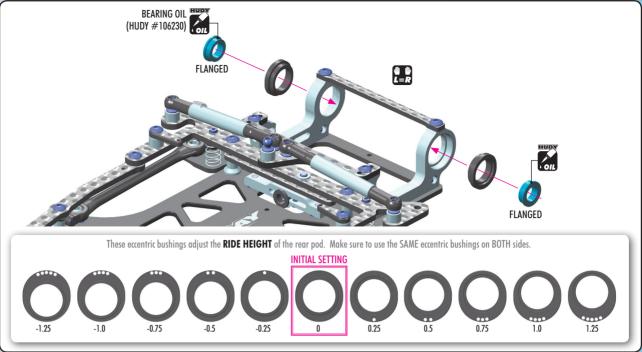


**SOLID AXLE** 

### 3. SOLID AXLE





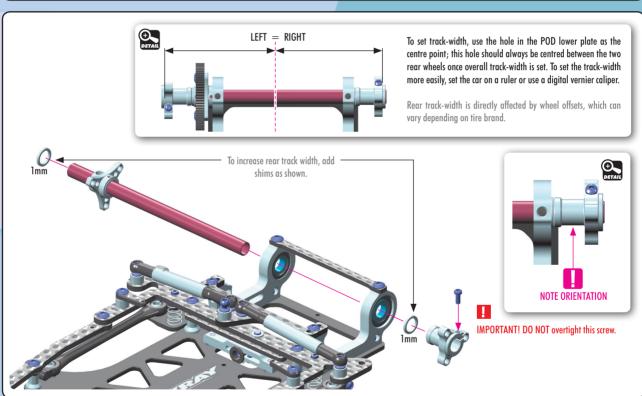




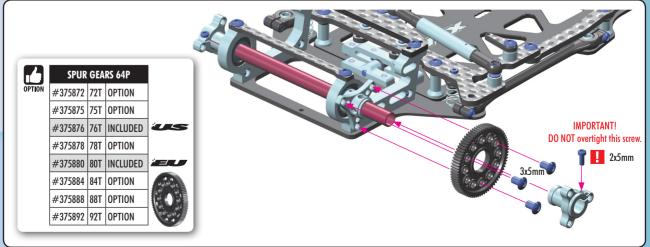




902205 SH M2x5





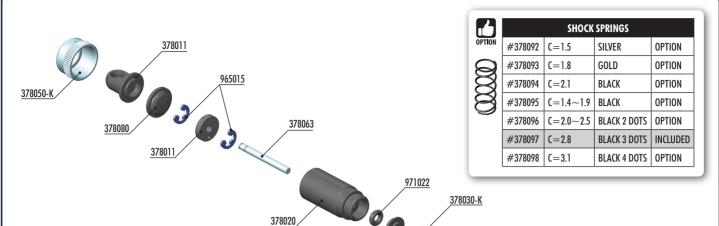




### 4. SHOCK ABSORBER



901303



378097 378011 378070-K 378011

5	HUDY SILICONE OILS - 50ml							
TION	#106310	100cSt	OPTION		#106342	425cSt	OPTION	
	#106315	150cSt	OPTION		#106345	450cSt	INCLUDED	
	#106320	200cSt	OPTION		#106347	475cSt	OPTION	
	#106325	250cSt	OPTION		#106350	500cSt	OPTION	
	#106330	300cSt	OPTION		#106355	550cSt	OPTION	
	#106335	350cSt	OPTION		#106357	575cSt	OPTION	
	#106337	375cSt	OPTION		#106360	600cSt	OPTION	
	#106340	400cSt	OPTION		#106362	625cSt	OPTION	

#106365	650cSt	OPTION	
#106367	675cSt	OPTION	
#106370	700cSt	OPTION	
#106375	750cSt	OPTION	
#106380	800cSt	OPTION	
#106390	900cSt	OPTION	
#106410	1000cSt	OPTION	
#106420	2000cSt	OPTION	



378002



SHOCK ABSORBER

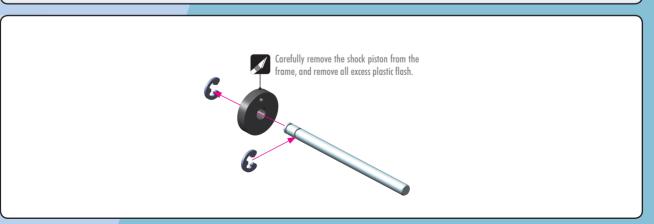
378011 COMPOSITE SHOCK PARTS - FRAME 378020 ALU THREADED SHOCK BODY - HARDCOATED 378030-K ALU SHOCK BODY CAP - LOWER - BLACK 378040-K ALU SHOCK ADJUSTABLE COLLAR - BLACK 378050-K ALU SHOCK BODY CAP - UPPER - BLACK 378063 SHOCK SHAFT 24MM 378070-K ALU SHOCK SPRING COLLAR - BLACK

SHOCK ABSORBER SET - BLACK

378080 SHOCK RUBBER MEMBRANE (2) SHOCK SPRING C=2.8 - BLACK - 3 DOTS 378097

901303 HEX SCREW SB M3x3 (10) 965015 E-CLIP 1.5 (10) SILICONE O-RING 2x2 (10) 971022

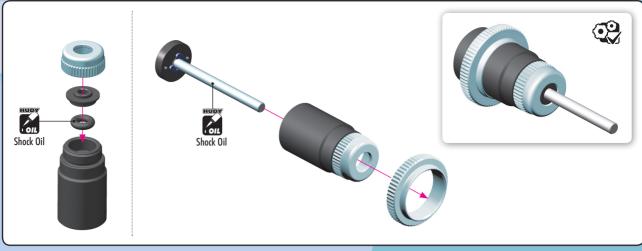


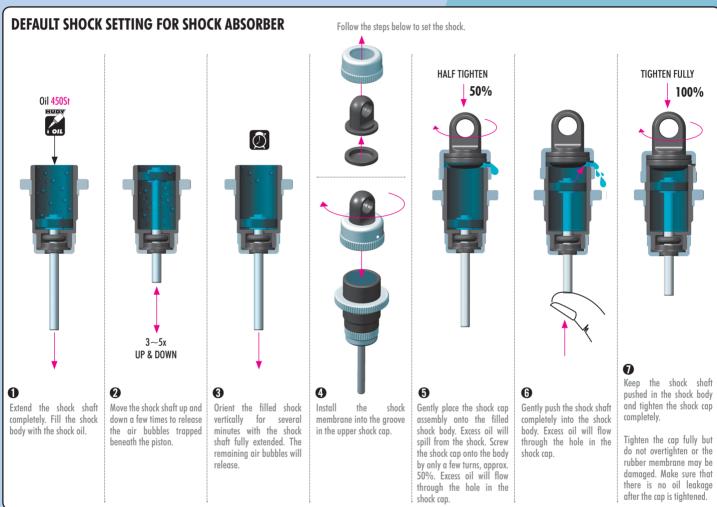


### 4. SHOCK ABSORBER

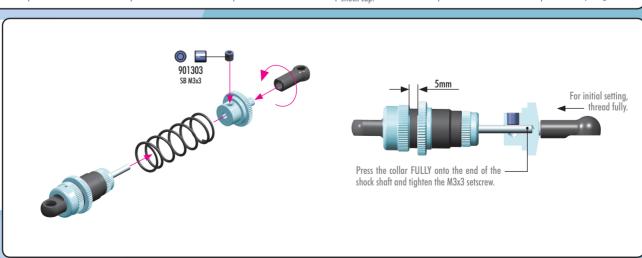




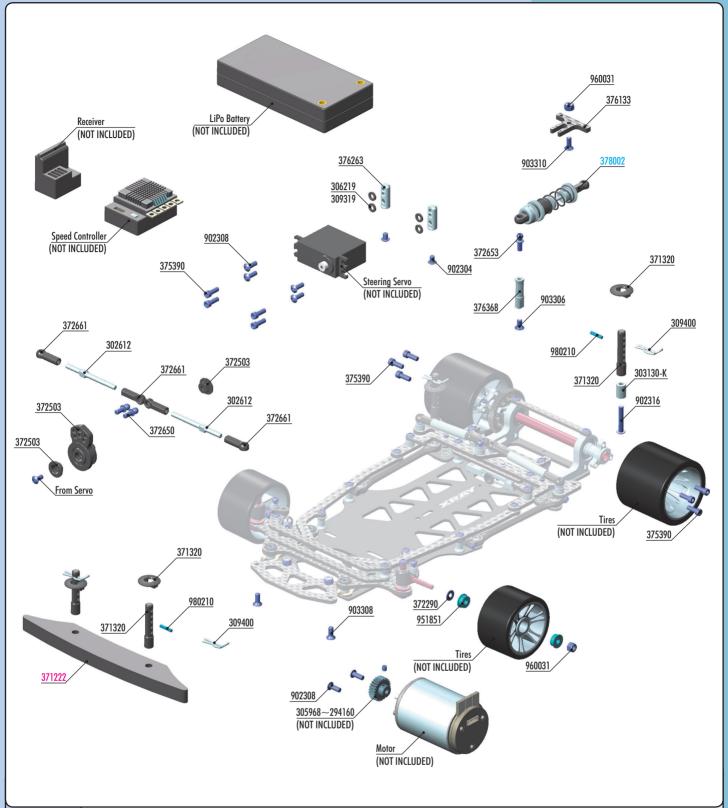












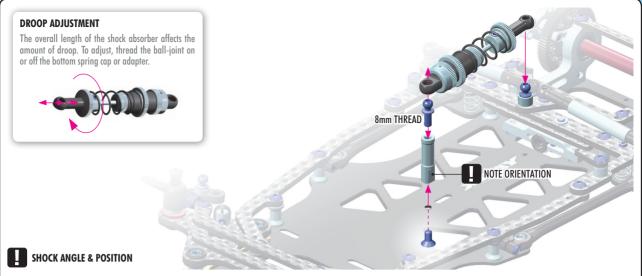




305968~294160	PINION GEAR HARDCOATED 18~60T/64P (OPTION)	375390	ALU HEX SCREW M3x8 FOR REAR WHEELS (6)
302612	ALU ADJ. TURNBUCKLE M3 L/R 39 MM - SWISS 7075 T6 (2)	902304	HEX SCREW SH M3x4 (10)
303130-K	ALU SHIM 3x6x9.0MM - BLACK (10)	902308	HEX SCREW SH M3x8 (10)
306219	COMPOSITE SET OF SERVO SHIMS (4)	902316	HEX SCREW SH M3x16 (10)
309319	COMPOSITE SET OF SHIMS (4)	903306	HEX SCREW SFH M3x6 (10)
309400	BODY CLIP FOR 5MM BODY POST (8)	903308	HEX SCREW SFH M3x8 (10)
371320	COMPOSITE BODY POST (2)	903310	HEX SCREW SFH M3x10 (10)
372290	ALU SHIM 3.2x4.8x0.5 (4)	951851	BALL-BEARING 1/8" x 5/16" x 9/64" FLANGED - STEEL SEALED - OIL (2)
372503	COMPOSITE SERVO SAVER - STIFF - SET	960031	ALU NUT M3 (10)
372650	BALL END 4.2MM WITH 6MM THREAD (2)	980210	PIN 2x10 (10)
372653	BALL END 4.2MM WITH 8MM THREAD (2)		
372661	COMPOSITE STEERING BALL-JOINT 4.2 MM OPEN (4)	378002	SHOCK ABSORBER SET - BLACK
376133	GRAPHITE BATTERY BACKSTOP 4.0MM - MIDDLE		
376263	ALU SERVO MOUNT - BLACK (2)	371222	FOAM BUMPER
376368	ALU MOUNT 20MM - BLACK		









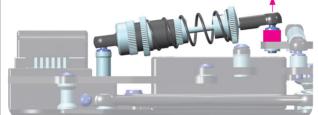
**VIDEO TECH TIF** 

POD DROOP & RIDE HEIGHT

#### **MORE SHOCK ANGLE**

#### Less shim in front, more shim in rear.

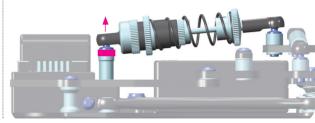
Makes the damping more progressive and increases on-power steering. Recommended for high-traction conditions when you need to free up the rear.



#### **LESS SHOCK ANGLE**

#### More shim in front, less shim in rear.

Makes the damping more linear. Increases stability, decreases on-power steering. Recommended for low- to medium-traction conditions.



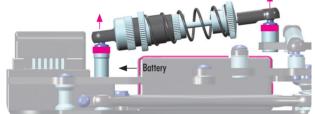
#### FORWARD BATTERY POSITION

**INITIAL SETTING** 

**INITIAL SETTING** 

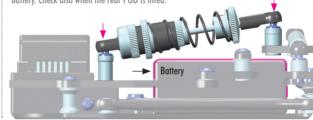
(MICRO servo)

When the forward battery position is used, make sure that the shock absorber is not touching the battery. Check also when the rear POD is lifted. If the shock is touching, use the same amount of shims under both ball ends on the shock absorber.



#### REARWARD BATTERY POSITION

When the rearward battery position is used, the shock can be placed lower to decrease the CG as much as possible. Make sure that the shock absorber is not touching the battery. Check also when the rear POD is lifted.











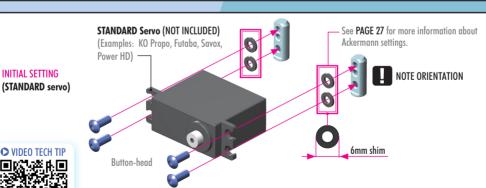


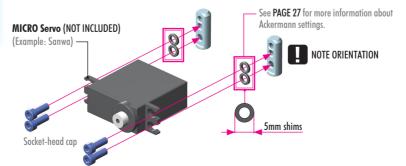










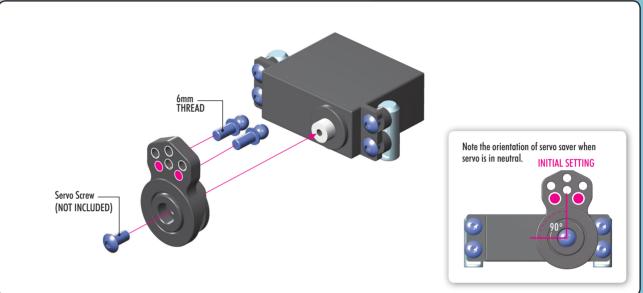




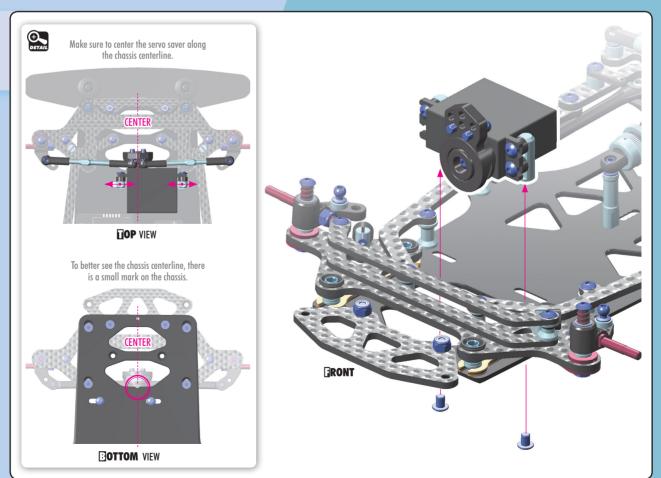
STANDARD SERVO



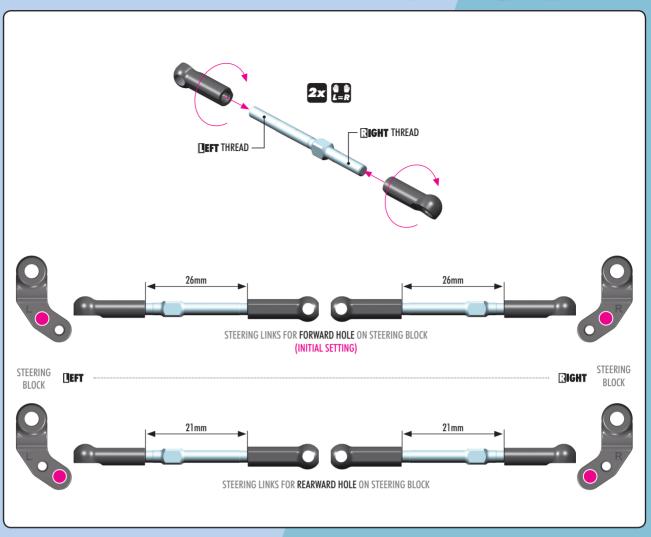


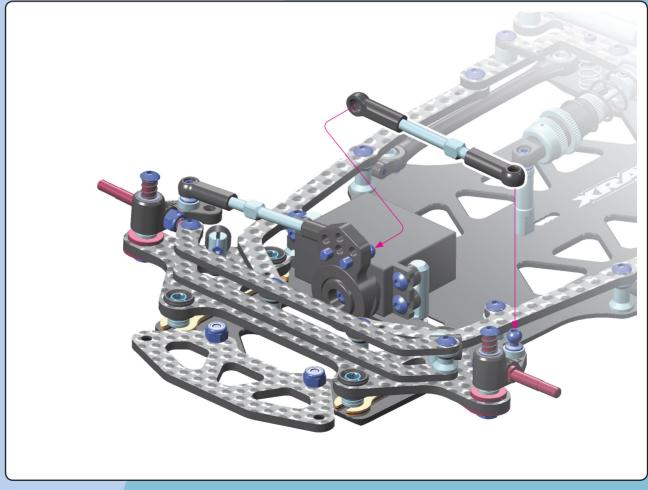
















REAR HOLE

LONG

### **ACKERMANN SETTING**

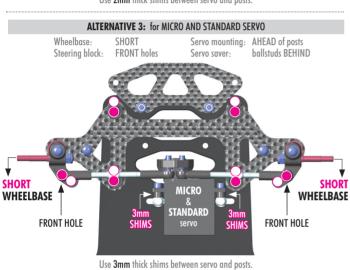
Ackermann is directly affected by wheelbase length and linkage position on the steering blocks. The configurations below are based on the use of a standard servo.

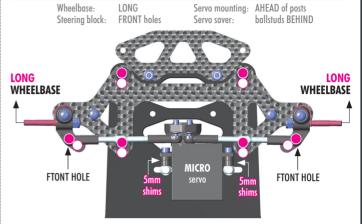
#### **ALTERNATIVE 1:** for MICRO AND STANDARD SERVO Servo mounting: AHEAD of posts Wheelbase: LONG **REAR** holes ballstuds BEHIND Steering block: Servo saver: LONG WHEELBASE WHEELBASE

Use 2mm thick shims between servo and posts.

STANDARD

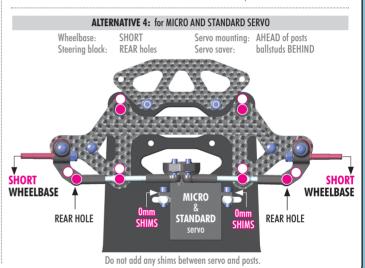
**REAR HOLE** 

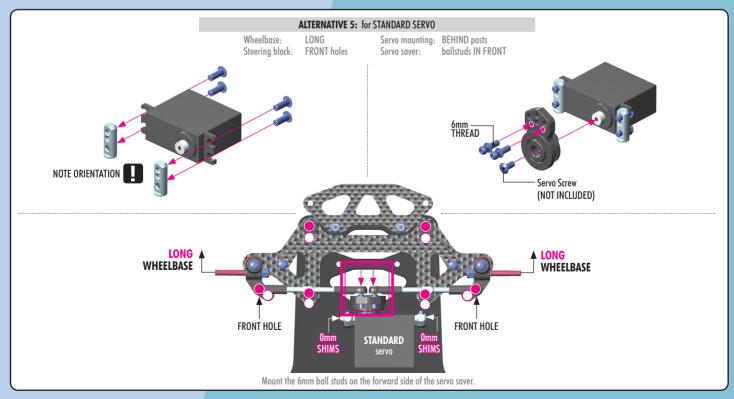




**ALTERNATIVE 2:** for MICRO SERVO

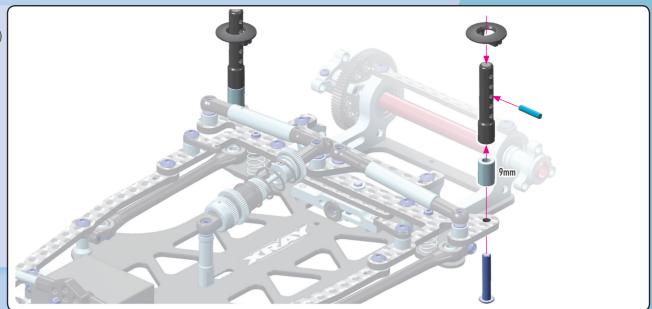
Use 5mm thick shims between servo and posts.



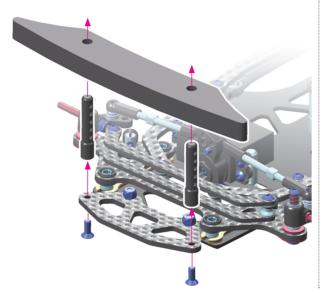


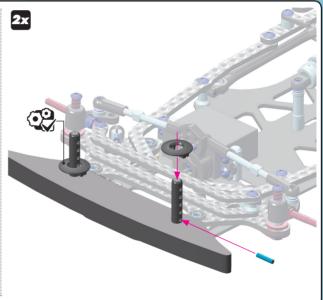


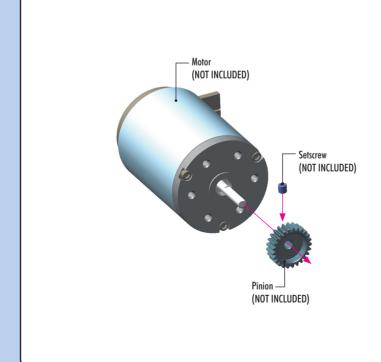


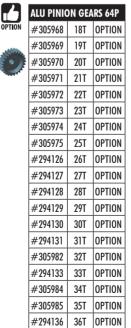








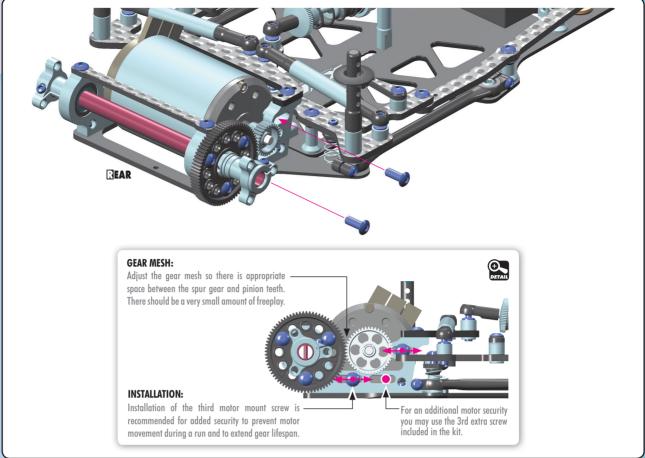




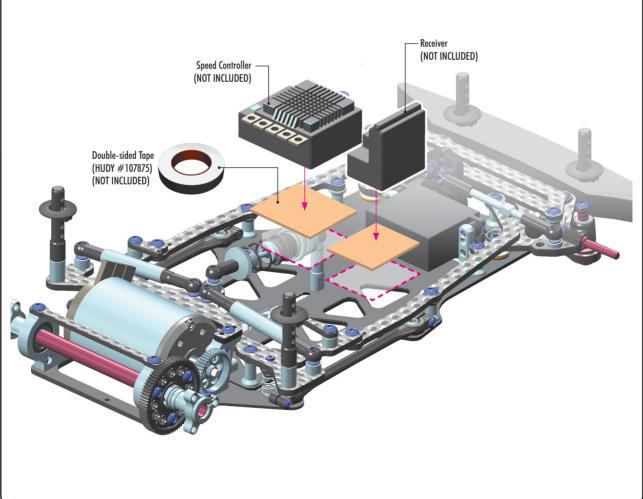
#294137	37T	OPTION
#294138	38T	OPTION
#294139	39T	OPTION
#294140	40T	OPTION
#294141	41T	OPTION
#294142	42T	OPTION
#294143	43T	OPTION
#294144	44T	OPTION
#294145	45T	OPTION
#294146	46T	OPTION
#294147	47T	OPTION
#294148	48T	OPTION
#294149	49T	OPTION
#294150	50T	OPTION
#294152	52T	OPTION
#294154	54T	OPTION
#294156	56T	OPTION
#294158	58T	OPTION
#294160	60T	OPTION













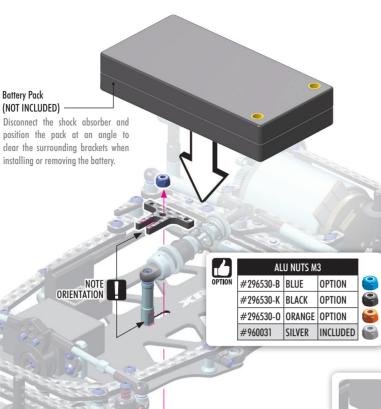




903310



960031 ALLI N M3

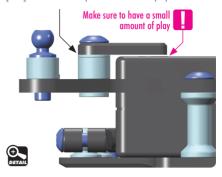


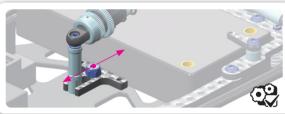
#### BATTERY BACKSTOP

The new adjustable battery backstop system secures the battery in the car in a tweak-free, non-fixed manner to help improve traction and makes it more stable and easier to drive.

It is very important that battery has a very small amount of play in all directions so it does not tweak the car, but the play cannot be too much otherwise the battery may fall out in crashes.

Adjust the shim thickness to match battery pack height. If there is no play between the backstop and pack, use a thicker shim. If it is too loose, use a thinner shim to reduce the gap. [note] Make sure to keep a small amount of play









BATTERY MOUNTING SYSTEM

### **BATTERY MOUNTING POSITIONS**

The X12 has 4 battery positions. The further forward the battery is positioned in the car, the easier it will be to drive but less responsive. The further rearward the battery is located, the more aggressive it will feel with more steering.

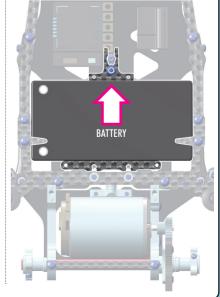


**BATTERY** 

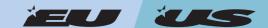
















**375390** ALU SCH M3x8



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



960031



**○** VIDEO TECH TIP



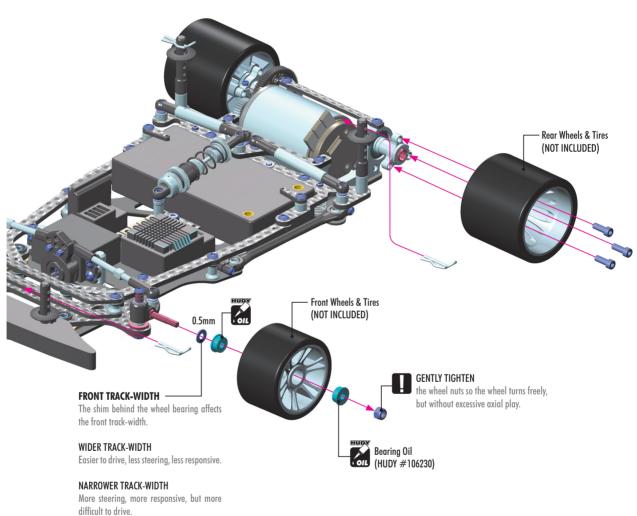
FRONT DROOP & RIDE HEIGHT



TWEAK & SIDE SPRINGS SETTING



BODYSHELL MOUNTING



#296530-B BLUE

#296530-K BLACK

#960031

#296530-0 ORANGE OPTION

OPTION

OPTION

SILVER INCLUDED

## www.feamxray.com

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RC AMERICA, 2030 Century Center Blvd #15, Irving, TX 75062, USA PHONE: 214-744-2400, FAX: 214-744-2401, xray@rcamerica.com











