



XRAY X12

1/12 PAN CAR

MADE IN
EUROPE

EUROPEAN
JUNIOR INDOOR
CHAMPION

BRCA
CHAMPION

INSTRUCTION XRAY MANUAL

BEFORE YOU START

The X12 is a high-quality, 1/12-scale 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 car 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 X12, **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. Read carefully and fully understand the instructions before beginning assembly. Make sure you review this entire manual and examine all details carefully. If for some reason you decide the X12 is not what you wanted or expected, **do not continue any further**. Your hobby dealer cannot accept your X12 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.

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

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Failure to follow these instructions will be considered as abuse and/or neglect.

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) 	Apply CA glue 	Apply oil 	Apply grease 	Ensure smooth non-binding movement 	Follow Set-up Book 
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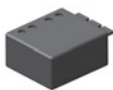
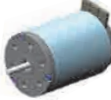









EQUIPMENT INCLUDED TOOLS REQUIRED

XRAY Premium Silicone Oil 700cSt (#359270) & Silicone Oil 3000cSt (#359303) 	Diff. Grease (HUDY #106211) 	Allen Wrench 1.5mm (HUDY #111540) 	Allen Wrench 2.0mm (HUDY #112040) 	Allen Wrench 2.5mm (HUDY #112540) 	Socket Driver 5.5mm (HUDY #170055) 
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TOOLS REQUIRED

Pliers (HUDY #189020) 	Scissors (HUDY #188990) 	Side Cutters (HUDY #189010) 	Hobby Knife 	File 	Turnbuckle 3mm (HUDY #181030) 	Turnbuckle 4mm (HUDY #181040) 	Reamer (HUDY #107600) 
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EQUIPMENT REQUIRED

Transmitter 	Receiver 	Steering Servo 	Speed Controller 	Electric Motor 	Pinion Gear and Setscrew 	Bodyshell 
LiPo Battery Pack 	Battery Charger 	Front & Rear Tires 	Tire Truer (HUDY #102003) 	Bearing Oil (HUDY #106230) 	Fibre Tape (HUDY #107870) 	Lexan Paint 

GRAPHITE PART PREPARATION

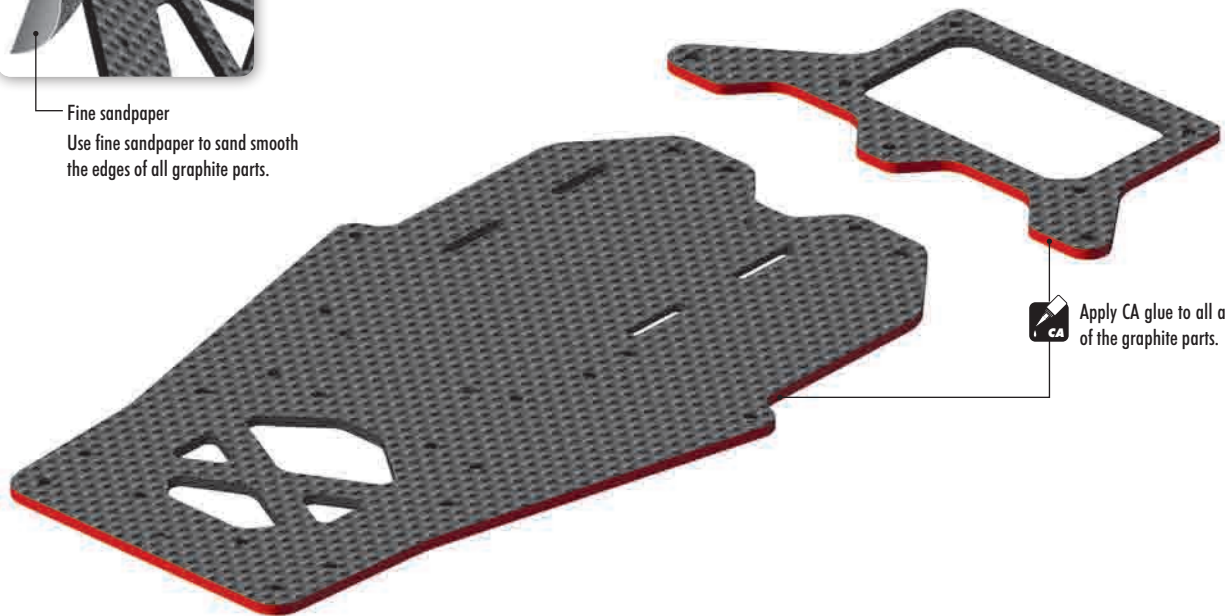
PREPARE ALL GRAPHITE PARTS

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



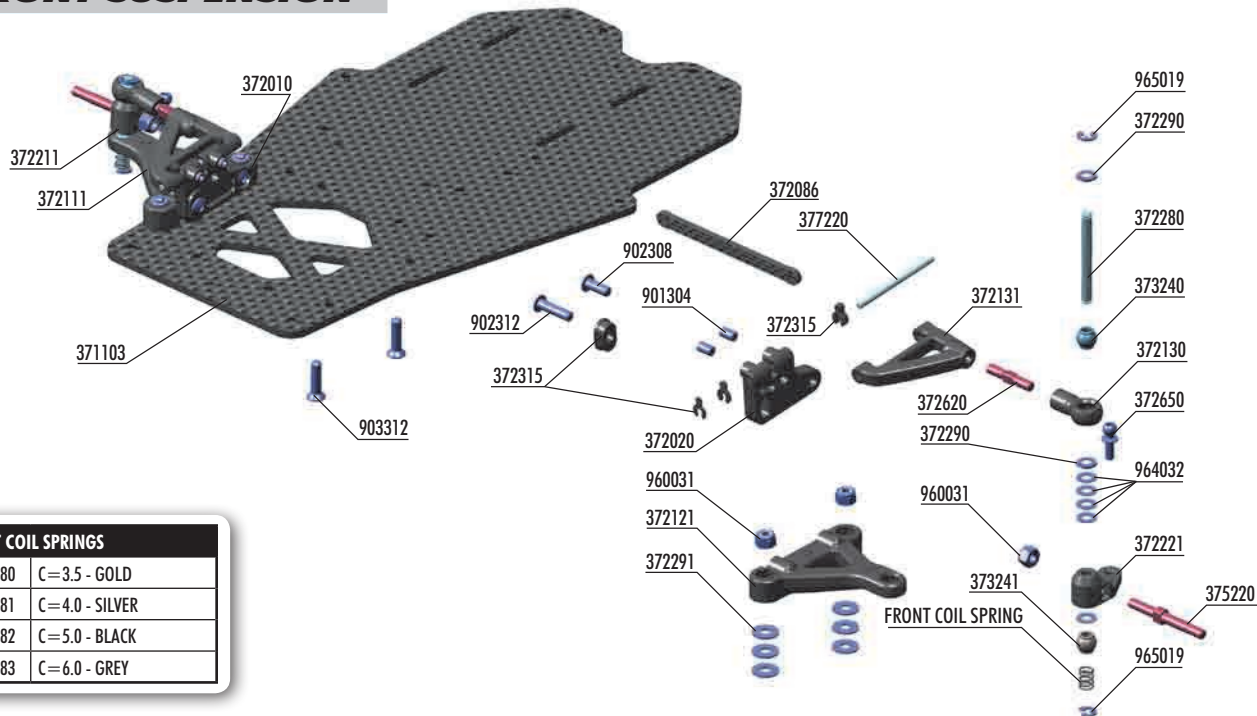
Fine sandpaper

Use fine sandpaper to sand smooth the edges of all graphite parts.



Apply CA glue to all edges of the graphite parts.

1. FRONT SUSPENSION



FRONT COIL SPRINGS

#372180	C=3.5 - GOLD
#372181	C=4.0 - SILVER
#372182	C=5.0 - BLACK
#372183	C=6.0 - GREY

BAG

01

371103 X12 LINK CHASSIS - 2.5MM GRAPHITE
 372010 COMPOSITE FRONT UPPER ARM MOUNT - RIGHT
 372020 COMPOSITE FRONT UPPER ARM MOUNT - LEFT
 372086 FRONT BRACE - GRAPHITE 2.0MM
 372111 COMPOSITE SUSPENSION ARM FRONT LOWER - RIGHT - HARD
 372121 COMPOSITE SUSPENSION ARM FRONT LOWER - LEFT - HARD
 372130 COMPOSITE FRONT UPPER SUSPENSION ARM & BALL JOINT
 372131 COMPOSITE FRONT UPPER SUSPENSION ARM - HARD
 372211 COMPOSITE STEERING BLOCK - RIGHT - HARD

372221 COMPOSITE STEERING BLOCK - LEFT - HARD
 372280 KING PIN (2)
 372290 ALU SHIM 3.2x4.8x0.5 (4)
 372291 ALU SHIM 3.1x8x0.5 (4)
 372315 COMPOSITE ECCENTRIC BUSHINGS + CASTER CLIPS (2)
 372620 ADJ. TURNBUCKET M3x17 MM - HUDY SPRING STEEL™ (2)
 372650 BALL-END 4.2MM - THREADED - HUDY SPRING STEEL™ (2)
 373240 PIVOTBALL UNIVERSAL 6.0 MM - HUDY SPRING STEEL (2)
 373241 COMPOSITE PIVOTBALL UNIVERSAL 6.0 MM (2)

375220 FRONT WHEEL AXLE (2)
 377220 FRONT UPPER PIVOT PIN 2x31MM (2)
 901304 HEX SCREW SB M3x4 (10)
 902308 HEX SCREW SH M3x8 (10)
 902312 HEX SCREW SH M3x12 (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. **2x** **L=R**

3x12 **4** 3x8 **2** Marked "L" **1** **LEFT** **3** **5** COMPOSITE BALL

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

Use same bushings in left and right sides.

ASSEMBLED VIEW

RIGHT

CASTER

902308
SH M3x8

902312
SH M3x12

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

! NOTE ORIENTATION

STEEL BALL

5.2mm 5.2mm

! NOTE ORIENTATION

ASSEMBLED VIEW

RIGHT

CAMBER

901304
SB M3x4

3. **2x** **L=R**

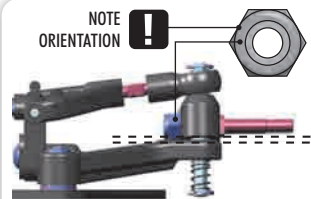
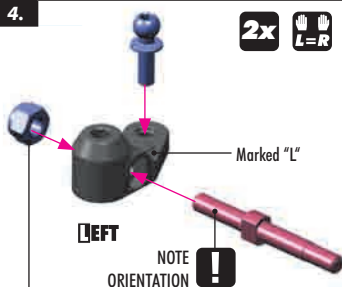
! Lightly tighten setscrews

ASSEMBLED VIEW

RIGHT

901304
SB M3x4

4.



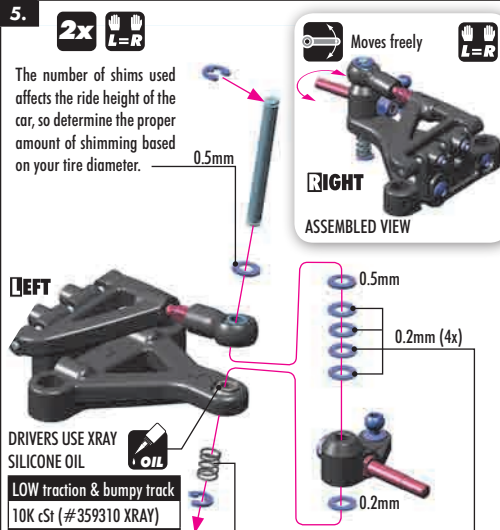
The flat of the nut must be **PARALLEL** to the lower arm.

ASSEMBLED VIEW



960031
ALU N M3

5.



DRIVERS USE XRAY SILICONE OIL

LOW traction & bumpy track
10K cSt (#359310 XRAY)

HIGH traction & flat track
30K cSt (#359330 XRAY)

FRONT RIDE HEIGHT ADJUSTMENT

INITIAL SETTING

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

FRONT COIL SPRINGS

#372180	C=3.5 - GOLD
#372181	C=4.0 - SILVER
#372182	C=5.0 - BLACK
#372183	C=6.0 - GREY



372290
S 3.2x4.8x0.5

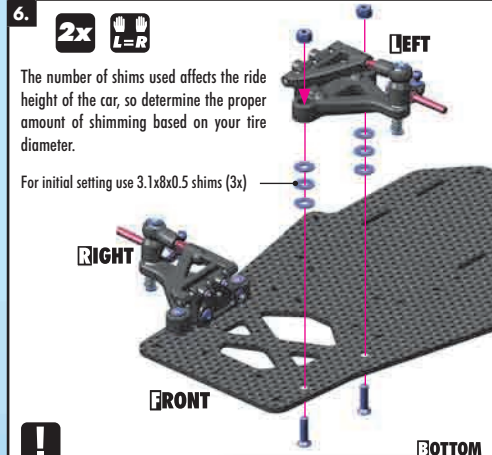


964032
S 3.2x4.8x0.2



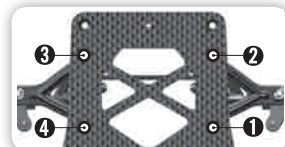
965019
C 1.9

6.



VERY IMPORTANT

The front suspension is manufactured from composite material which may slightly move or bend when the mounting screws are tightened. As such it is extremely important to follow these steps to ensure tweek-free mounting.



1. Mount the assembled left and right suspension to chassis by installing the bottom mounting screws in the order shown. Tighten the mounting screws **VERY GENTLY**, and do not overtighten the screws.

2. Fully tighten the screws in exactly the same order as you installed them.



372291
S 3.1x8x0.5

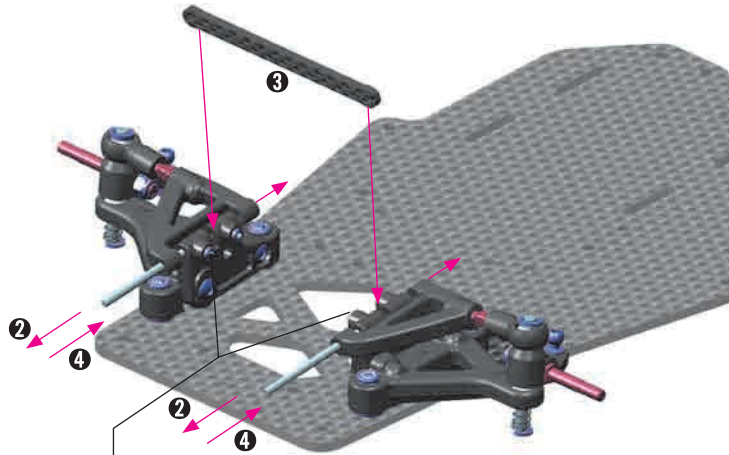


903312
SFH M3x12



960031
ALU N M3

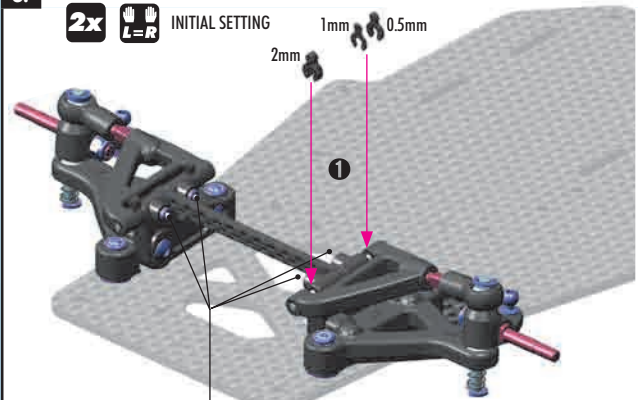
7.



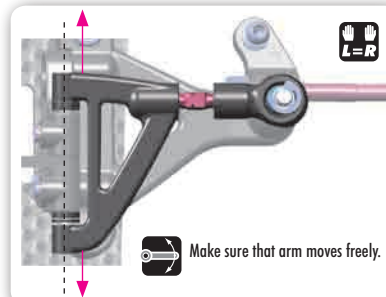
- 1 Loosen all M3x4 setscrews so you can easily remove the pins.

SET-UP BOOK
FRONT BRACE

8.



- 2 After inserting clips, carefully tighten all M3x4 setscrews so the pins will not move. Do not overtighten or you may strip the plastic.



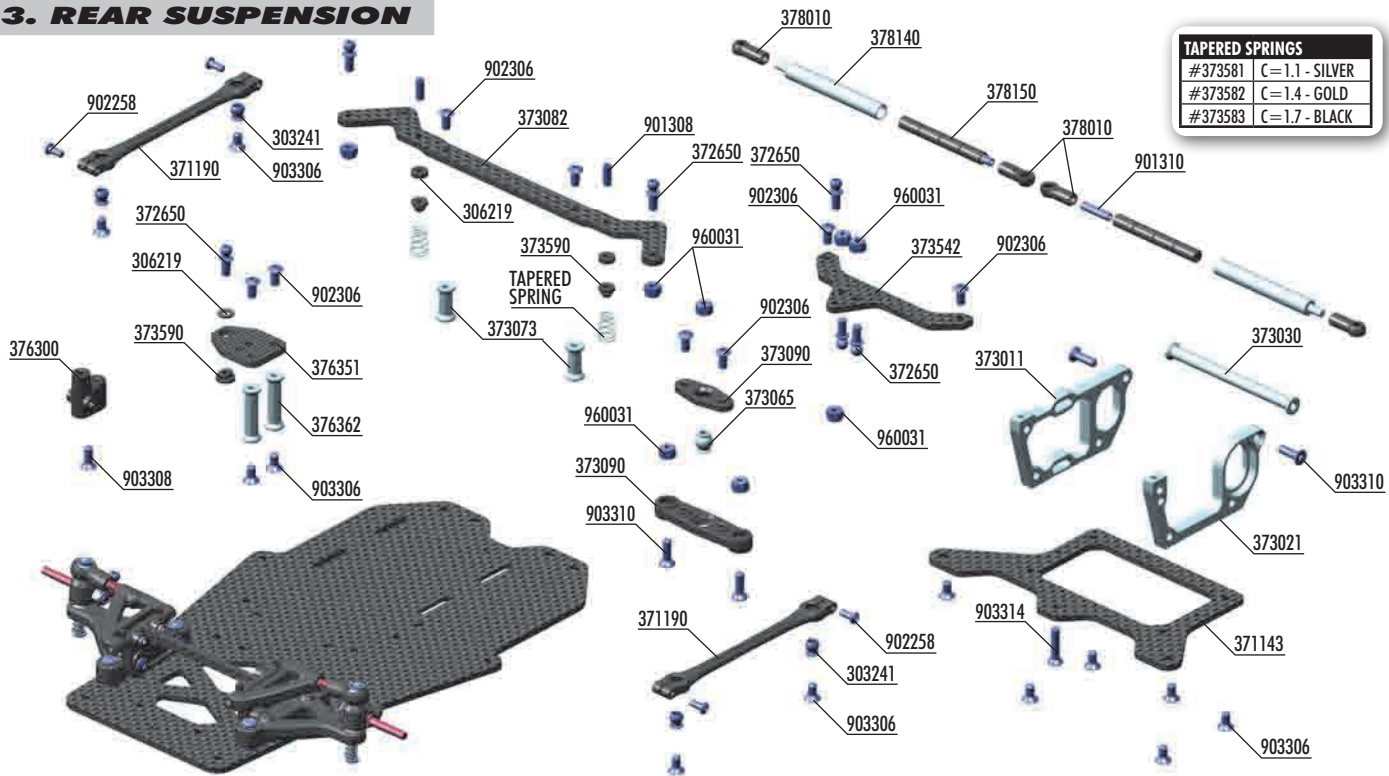
Make sure that arm moves freely.



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.

SET-UP BOOK
CASTER

3. REAR SUSPENSION



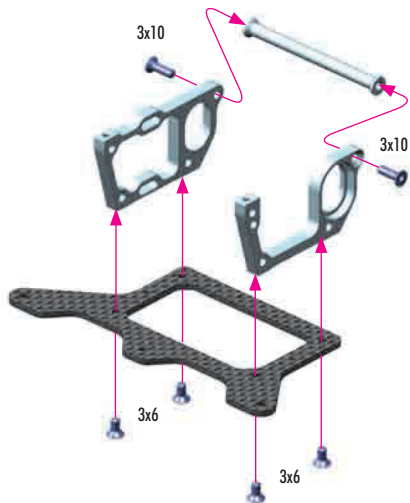
TAPERED SPRINGS	
#373581	C=1.1 - SILVER
#373582	C=1.4 - GOLD
#373583	C=1.7 - BLACK

BAG

03

- | | | | |
|---|---|--------------------------------------|---------------------------------|
| 303241 BALL UNIVERSAL 5.8 MM HEX (4) | 373065 PIVOTBALL - HUDY SPRING STEEL (2) | 376351 GR. PLATE FOR ANTENNA HOLDER | 902258 HEX SCREW SH M2.5x8 (10) |
| 306219 COMPOSITE SET OF SERVO SHIMS (4) | 373073 ALU REAR BRACE MOUNT 16MM (2) | 376362 ALU ANTENNA HOLDER MOUNT (2) | 902306 HEX SCREW SH M3x6 (10) |
| 371143 LINK GRAPHITE 2.5MM REAR POD LOWER PLATE | 373082 LINK REAR BRACE - GRAPHITE 2.5MM | 378010 COMPOSITE SHOCK PARTS - FRAME | 903306 HEX SCREW SFH M3x6 (10) |
| 371190 COMPOSITE POD LINK (2) | 373090 COMPOSITE LOWER & UPPER PIVOT BRACE | 378140 SIDE LINKAGE TUBE (2) | 903308 HEX SCREW SFH M3x8 (10) |
| 372650 BALL-END 4.2MM THREADED HUDY SPRING STEEL™ (2) | 373542 LINK REAR POD UPPER PLATE - GRAPHITE | 378150 SIDE SHOCK SHAFT (2) | 903310 HEX SCREW SFH M3x10 (10) |
| 373011 ALU REAR BULKHEAD - MOTOR (RIGHT) | 373581 TAPERED SPRING - SILVER (2) | | 903314 HEX SCREW SFH M3x14 (10) |
| 373021 ALU REAR BULKHEAD - LEFT | 373590 COMPOSITE SPRING HOLDER (2) | 901308 HEX SCREW SB M3x8 (10) | 960031 ALU NUT M3 (10) |
| 373030 ALU REAR BULKHEAD BRACE | 376300 COMPOSITE ANTENNA MOUNT | 901310 HEX SCREW SB M3x10 (10) | |

1.



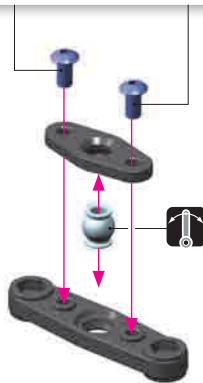
903306
SFH M3x6



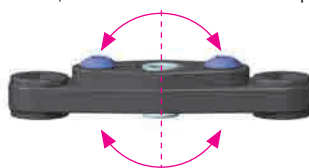
903310
SFH M3x10

2.

Lightly tighten the screws so there is no free play, but do not overtighten otherwise the pivotball will not move freely.

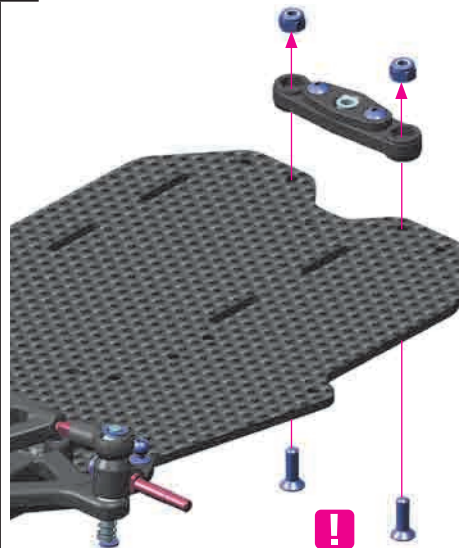


Ensure free, smooth movement without excessive freeplay.



902306
SH M3x6

3.



DO NOT TIGHTEN FULLY

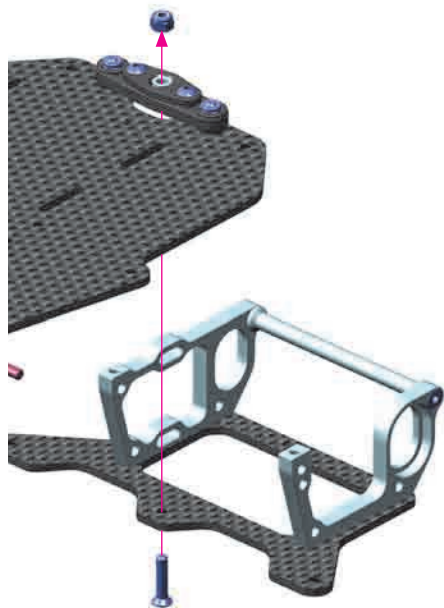


960031
ALU N M3



903310
SFH M3x10

4.



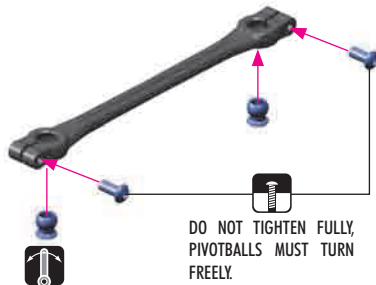
960031
ALU N M3



903314
SFH M3x14

5.

2x



DO NOT TIGHTEN FULLY,
PIVOTBALLS MUST TURN
FREELY.



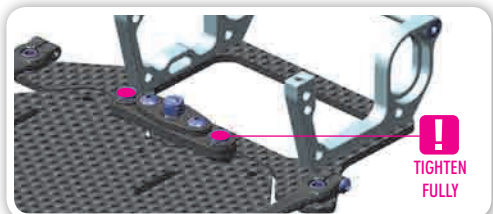
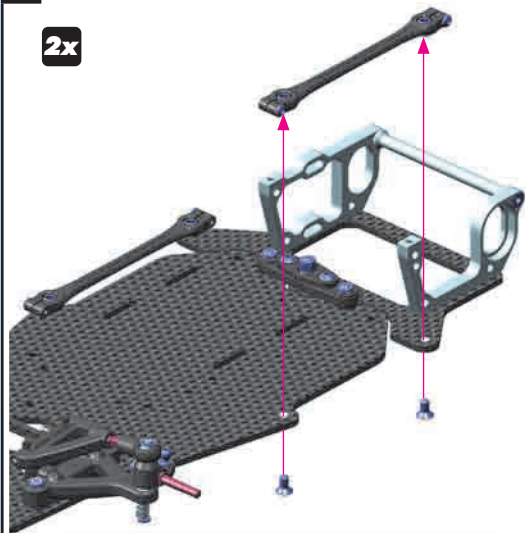
ASSEMBLED VIEW



902258
SH M2.5x8

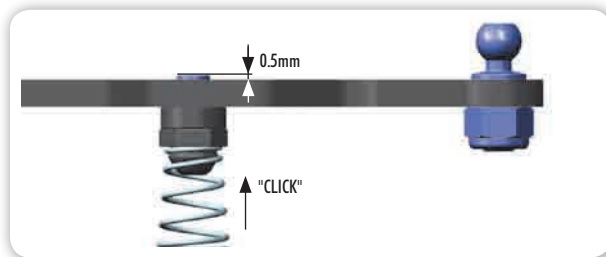
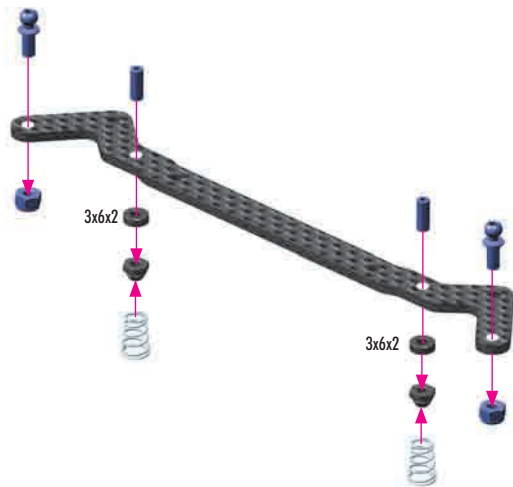
6.

2x



903306
SFH M3x6

7.



306219
SHIM 3x6x2

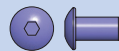
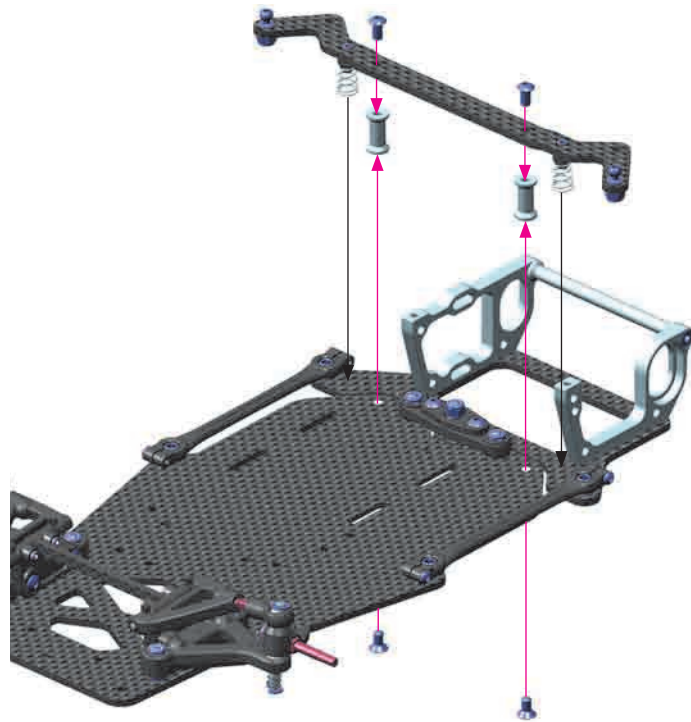


901308
SB M3x8



960031
ALU N M3

8.

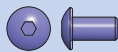
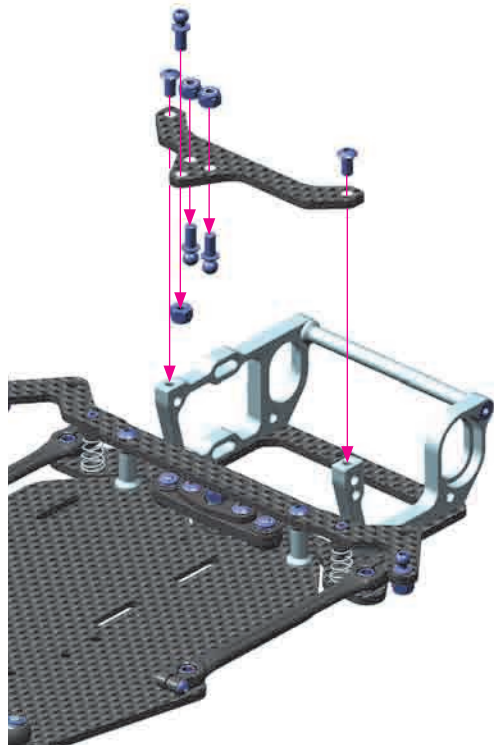


902306
SH M3x6



903306
SFH M3x6

9.



902306
SH M3x6



960031
ALU N M3

10.



3x6x1
3x6x1

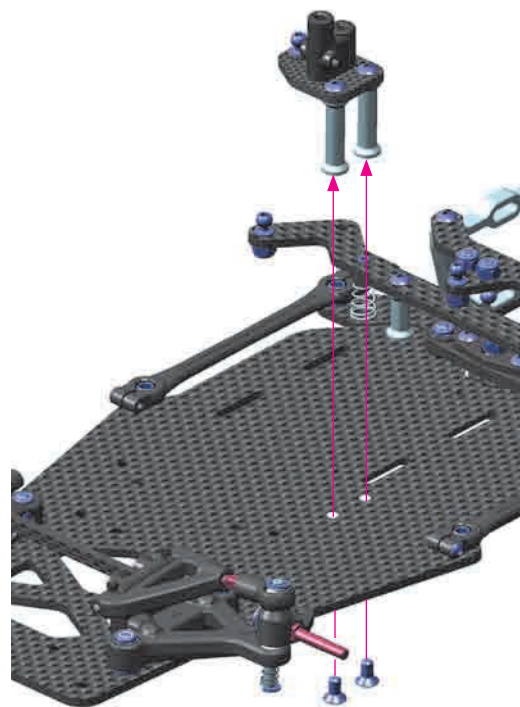


306219
SHIM 3x6x1



903308
SFH M3x8

11.

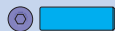
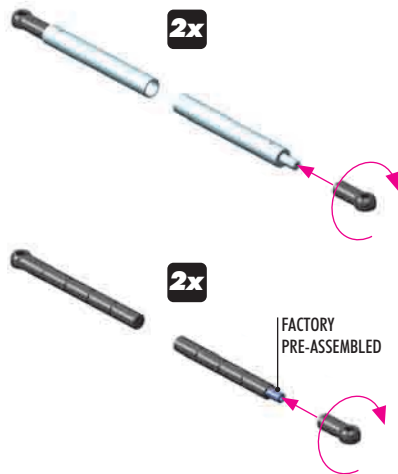


903306
SFH M3x6



902306
SH M3x6

12.



901310
SB M3x10

13.



Add oil in each slot of the derlin side shock tubes.

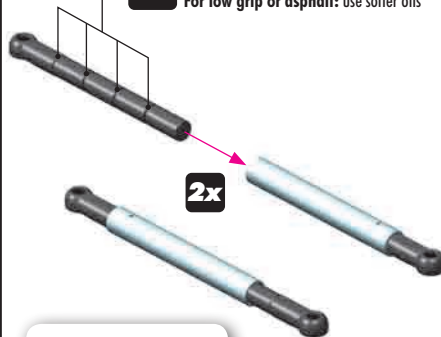
NOTE: add oil only in the slots, not on the whole tube.

After assembling the side tubes, check for smooth operation.

NOTE: It is very important to re-oil the side tubes, as least once per race day.

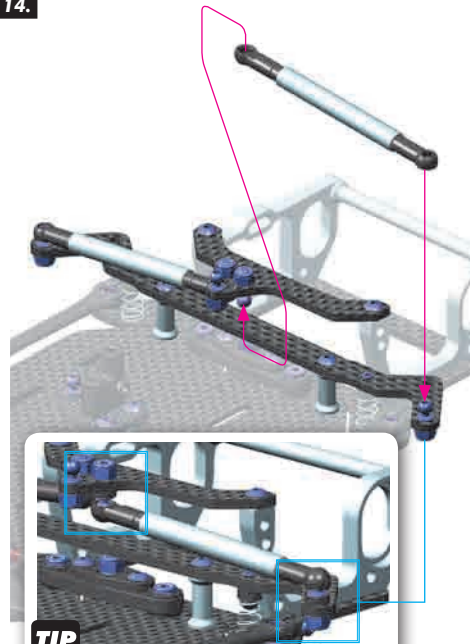
NOTE: you may use different oil thicknesses depending on track conditions.

TIP For high grip: use harder oils
For low grip or asphalt: use softer oils



OILS	
#359301	1000cSt
#359302	2000cSt
#359303	3000cSt
#359305	5000cSt
#359306	6000cSt
#359307	7000cSt
#359308	8000cSt
#359310	10000cSt

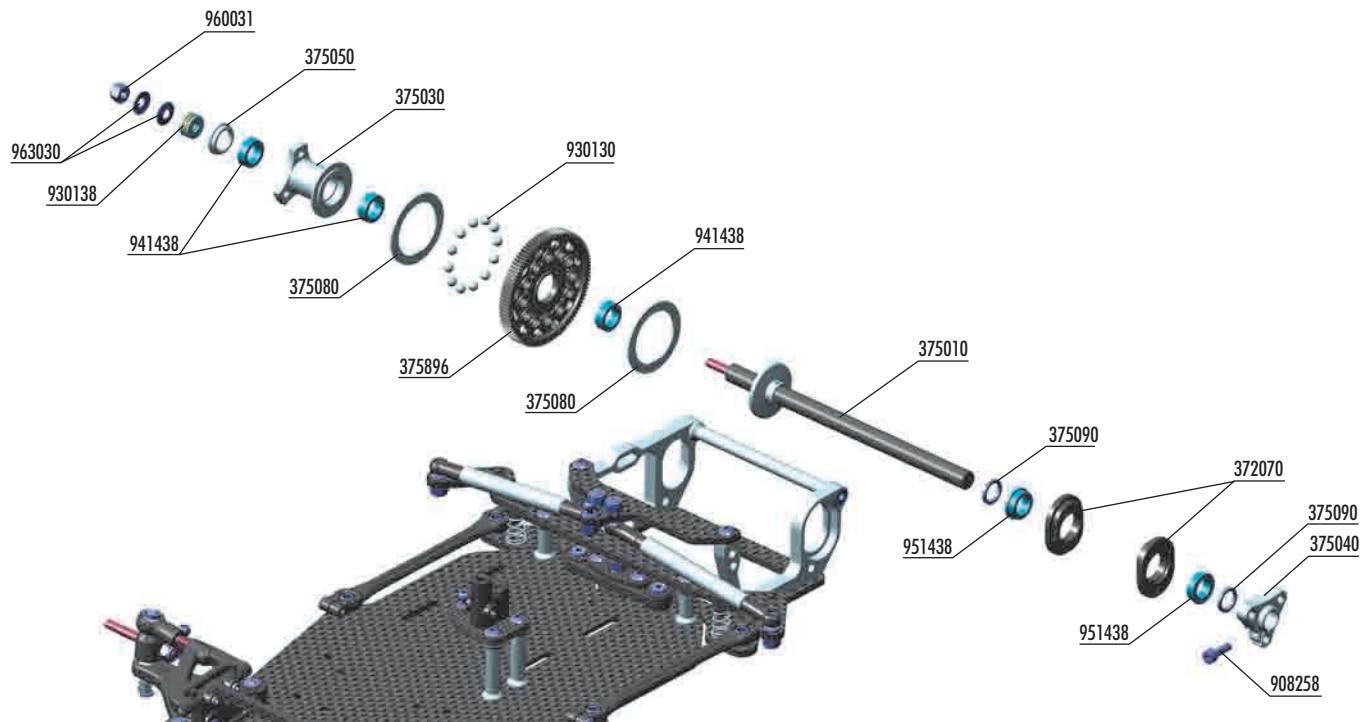
14.



TIP

The angle of the side tubes has a fine effect on car performance. The higher the angle, the stiffer it feels and the less it rolls. The less (flatter) the angle, the softer it feels and the more it rolls.

4. BALL DIFFERENTIAL



BAG

04

372070 COMPOSITE RIDE HEIGHT ADJUSTER SET (2)
 375010 REAR AXLE SHAFT - GRAPHITE
 375030 ALU REAR WHEEL HUB - RIGHT
 375040 ALU REAR WHEEL HUB - LEFT
 375050 ALU DIFF HUB
 375080 D-LOCK DIFF PLATE (2)
 375090 SET OF ALU SHIMS (0.5MM, 1.0MM, 2.0MM)
 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
 941438 HIGH-SPEED BALL-BEARING 1/4"x3/8"x1/8" RUBBER SEALED (2)
 951438 BALL-BEARING 1/4" x 3/8" x 1/8" FLANGED (2)
 960031 ALU NUT M3 (10)
 963030 CONE WASHER ST 3x8x0.5 (10)

1.

Bearing Oil
(HUDY #106230)



Flanged

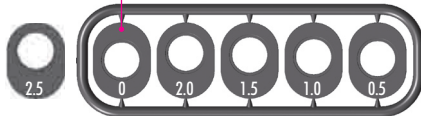


Bearing Oil
(HUDY #106230)



Flanged

Use these Ride Height
Adjusters for initial assembly.



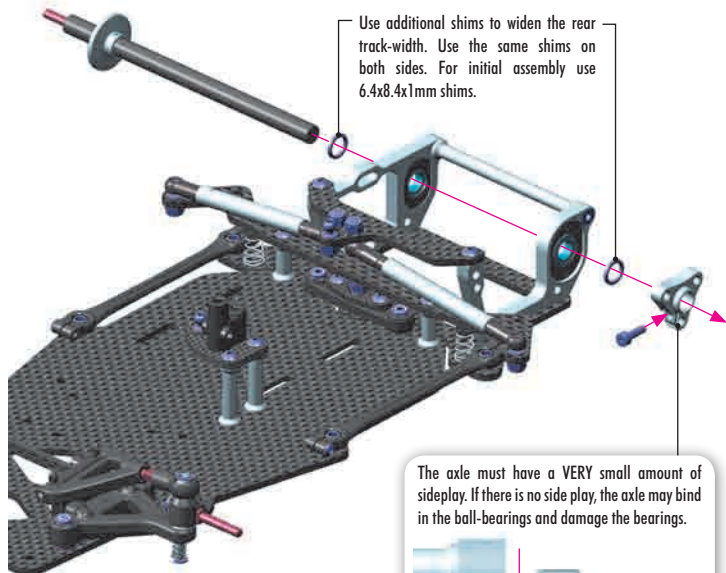
RIDE HEIGHT



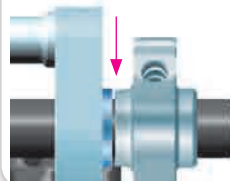
951438
BB 1/4"x3/8"x1/8"

2.

Use additional shims to widen the rear
track-width. Use the same shims on
both sides. For initial assembly use
6.4x8.4x1mm shims.



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



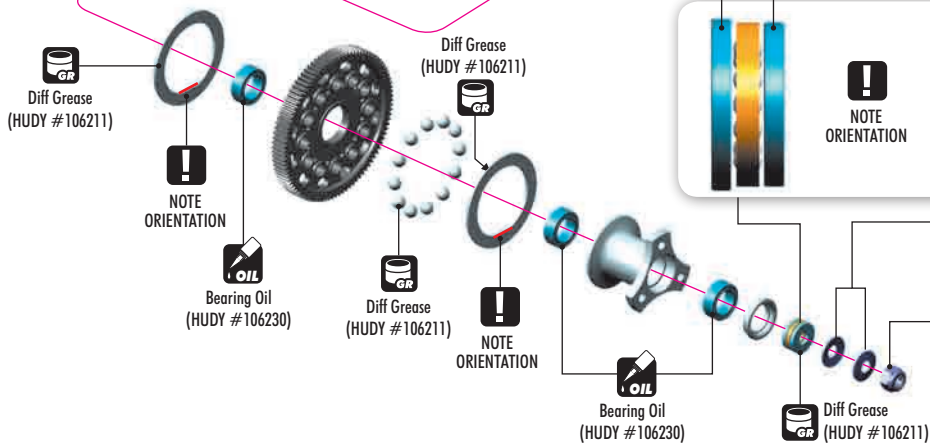
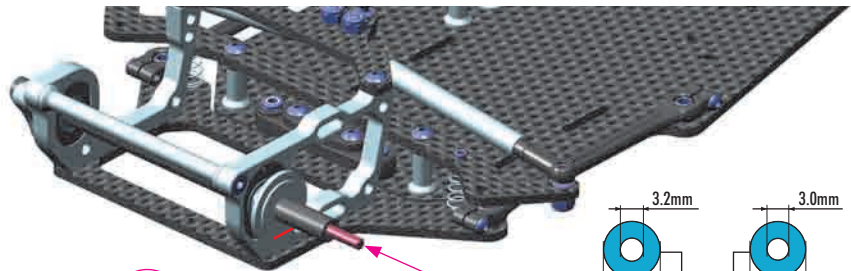
TRACK WIDTH



375090
6.4x8.4x1.0



908258
SCH M2.5x8



930130
B 3.1



930138
BA 3x8



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

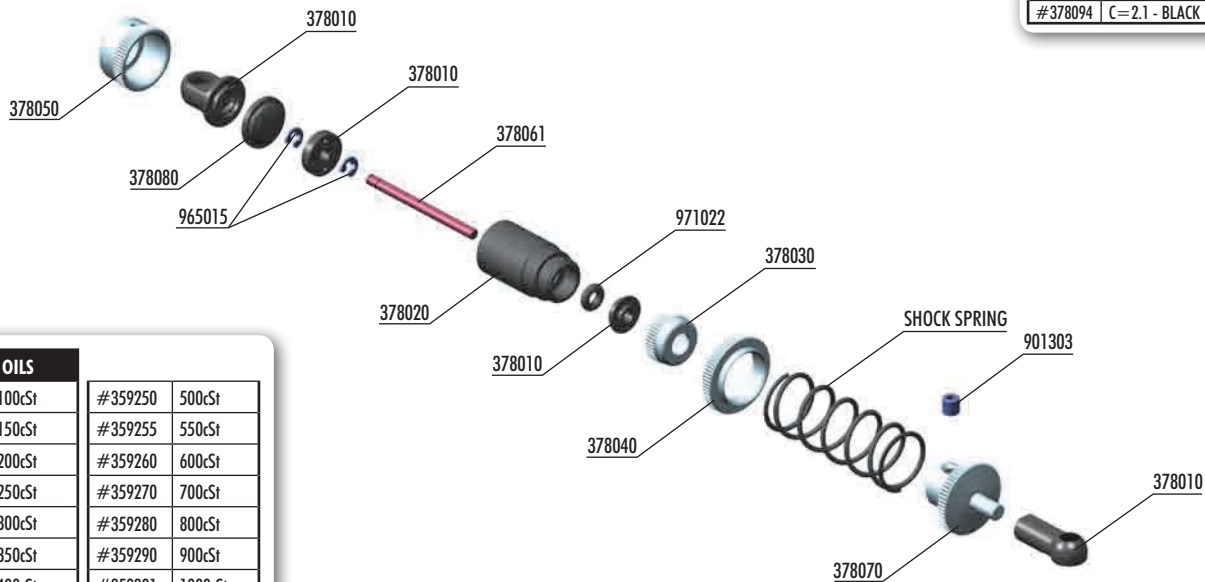


960031
ALU N M3



963030
ST 3x8

5. SHOCK ABSORBER



SHOCK SPRINGS

#378092	C=1.5 - SILVER
#378093	C=1.8 - GOLD
#378094	C=2.1 - BLACK

SHOCK OILS

#359210	100cSt	#359250	500cSt
#359215	150cSt	#359255	550cSt
#359220	200cSt	#359260	600cSt
#359225	250cSt	#359270	700cSt
#359230	300cSt	#359280	800cSt
#359235	350cSt	#359290	900cSt
#359240	400cSt	#359301	1000cSt
#359245	450cSt	#359302	2000cSt

BAG



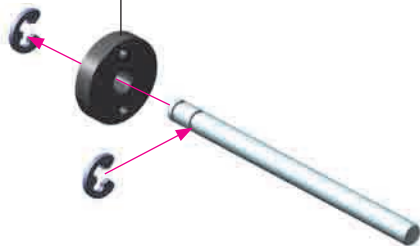
378001	SHOCK ABSORBER SET
378010	COMPOSITE SHOCK PARTS - FRAME
378020	ALU THREADED SHOCK BODY - HARDCOATED
378030	ALU SHOCK BODY CAP - LOWER
378040	ALU SHOCK ADJUSTABLE COLLAR
378050	ALU SHOCK BODY CAP - UPPER
378061	SHOCK SHAFT

378070	ALU SHOCK SPRING COLLAR
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)

1.



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



965015
C1.5

2.



Shock Oil

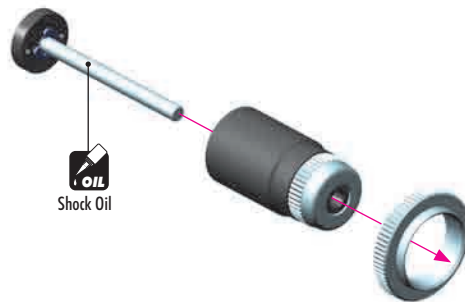


971022
0 2x2

3.



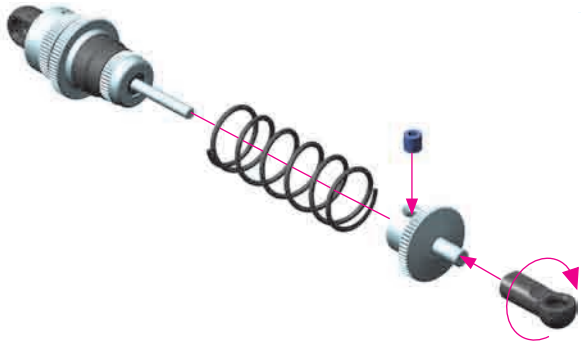
Shock Oil



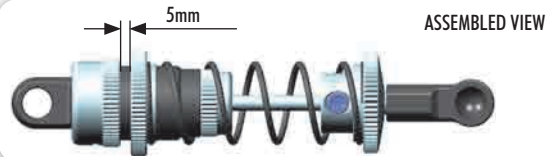
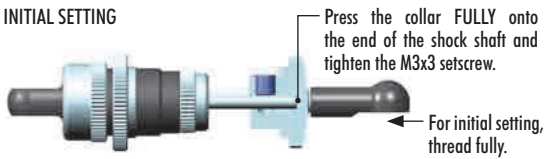
ASSEMBLED VIEW



5.

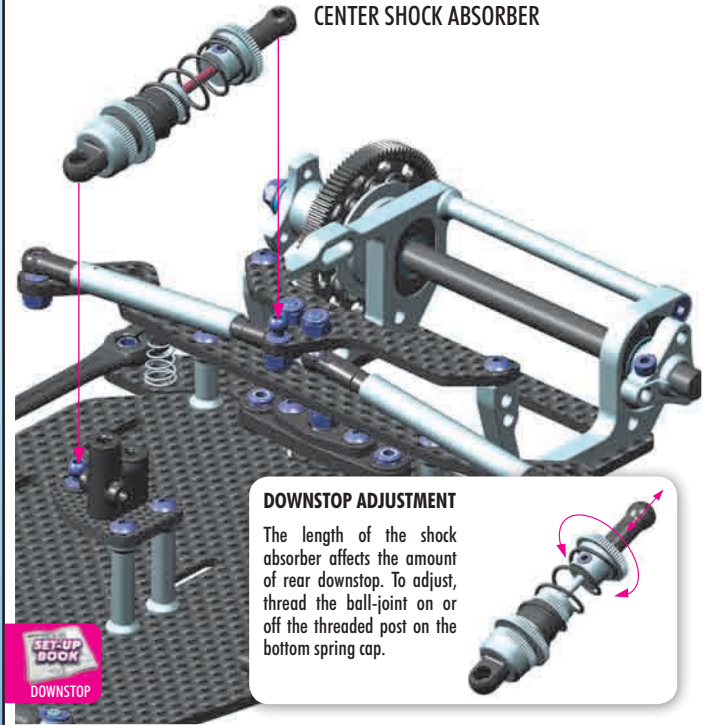


INITIAL SETTING



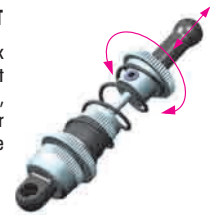
901303
SB M3x3

6.

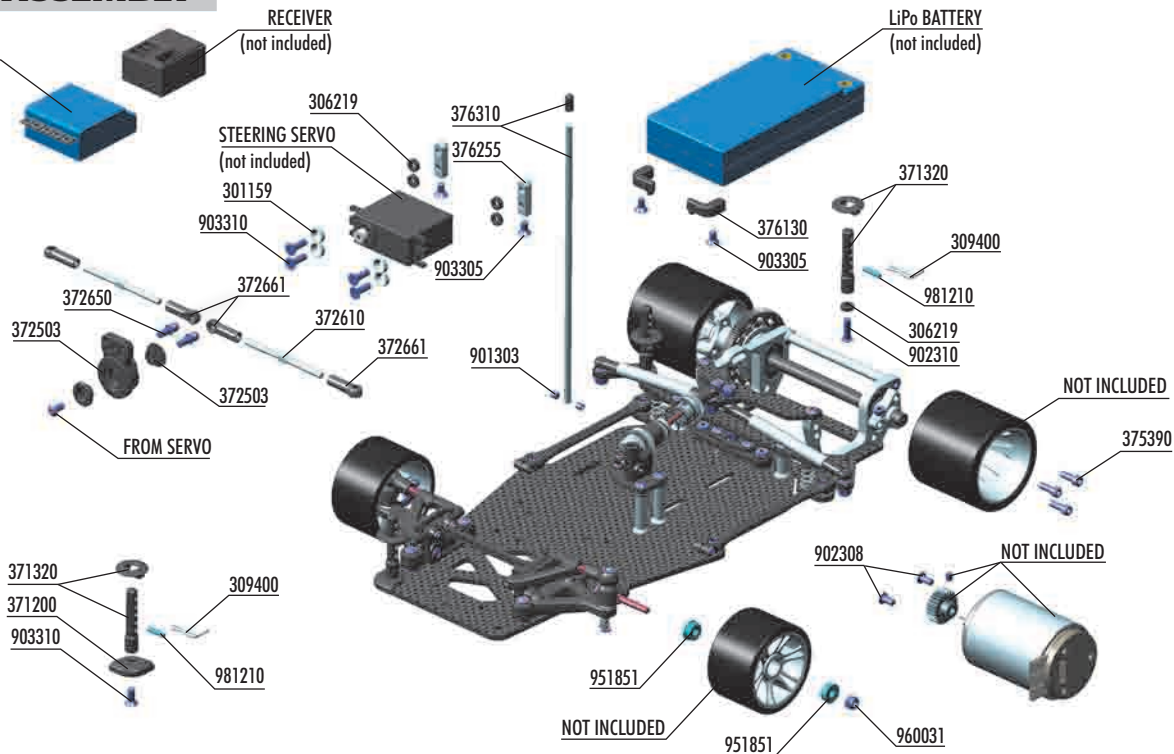


DOWNSTOP ADJUSTMENT

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



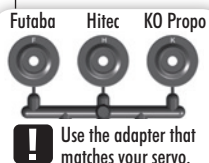
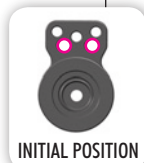
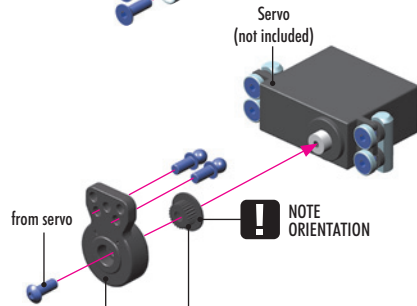
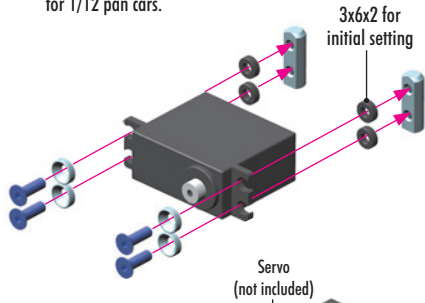
6. FINAL ASSEMBLY



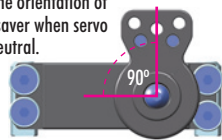
BAG

06

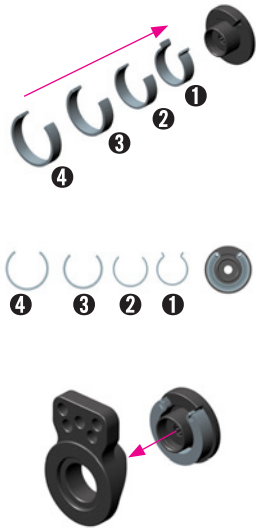
1. We recommend using a servo for 1/12 pan cars.



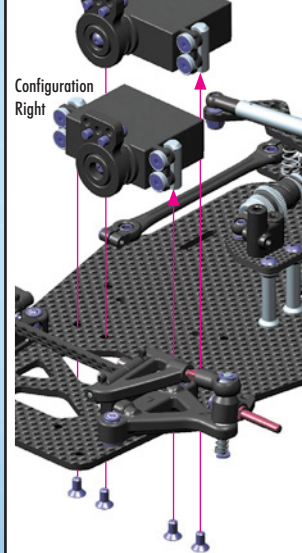
Note the orientation of servo saver when servo is in neutral.



903310
SFH M3x10



2. Configuration Left

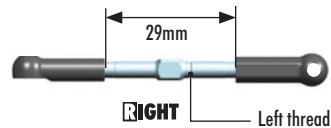
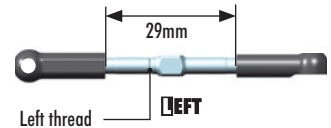
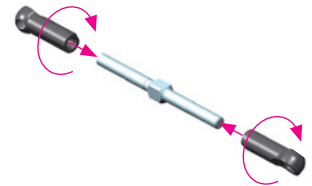


The position of the servo depends on the weight of the electronics. If the car is heavier on the right, use a left-side servo position; if the car is heavier on the left, use a right-side servo position.




903305
SFH M3x5

3. 2x L=R



4.

2x 

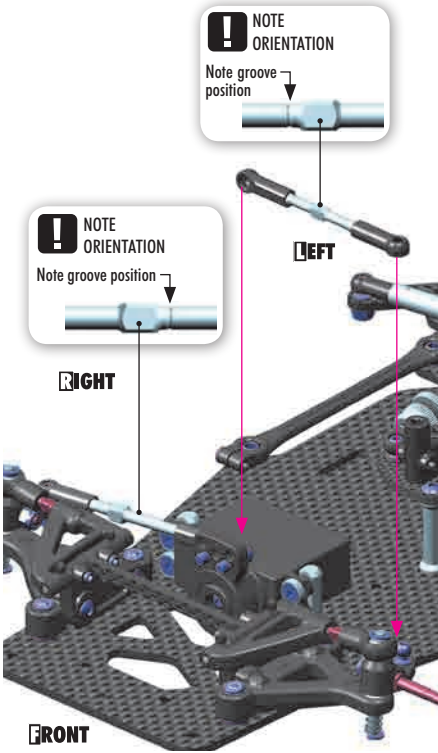
NOTE ORIENTATION
Note groove position

NOTE ORIENTATION
Note groove position

LEFT


RIGHT

FRONT

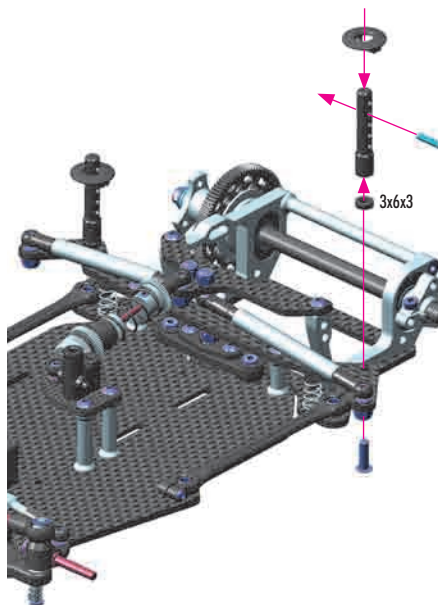


SET-UP BOOK
ACKERMANN

5.

2x 


3x6x3




306219
SHIM 3x6x3

902310
SH M 3x10

981210
P 2x10

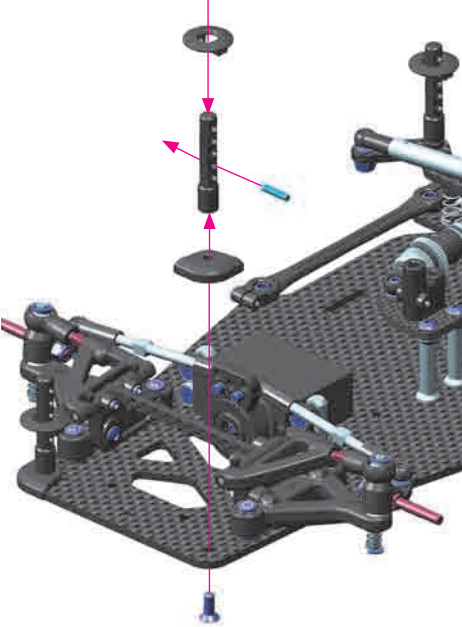


6.

2x 


903310
SFH M 3x10

981210
P 2x10

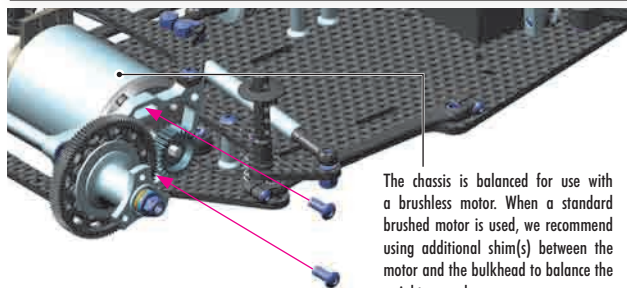
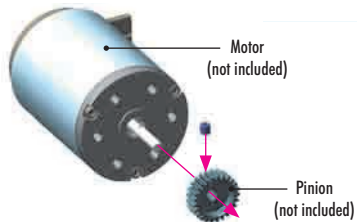


903310
SFH M 3x10

981210
P 2x10

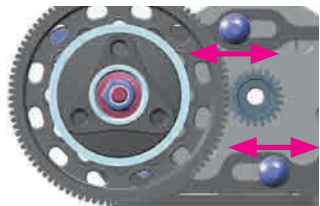


7.



The chassis is balanced for use with a brushless motor. When a standard brushed motor is used, we recommend using additional shim(s) between the motor and the bulkhead to balance the weight properly.

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



902308
SH M 3x8

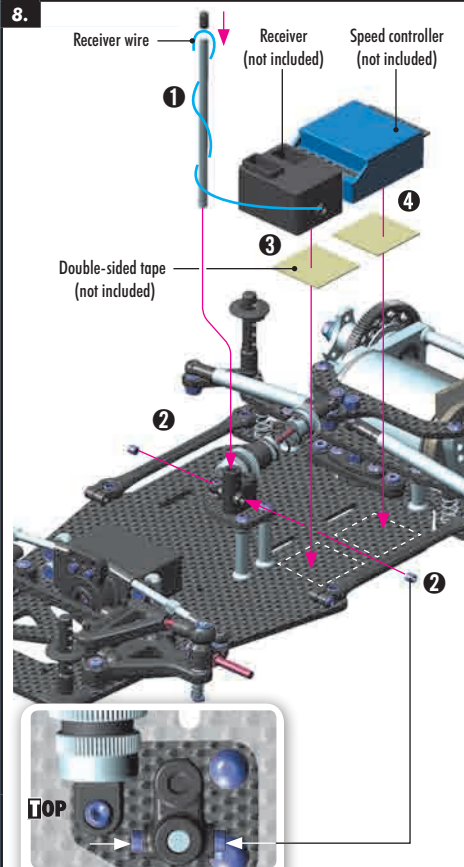


901303
SB M3x3

PINION GEARS ALU HARDCOATED

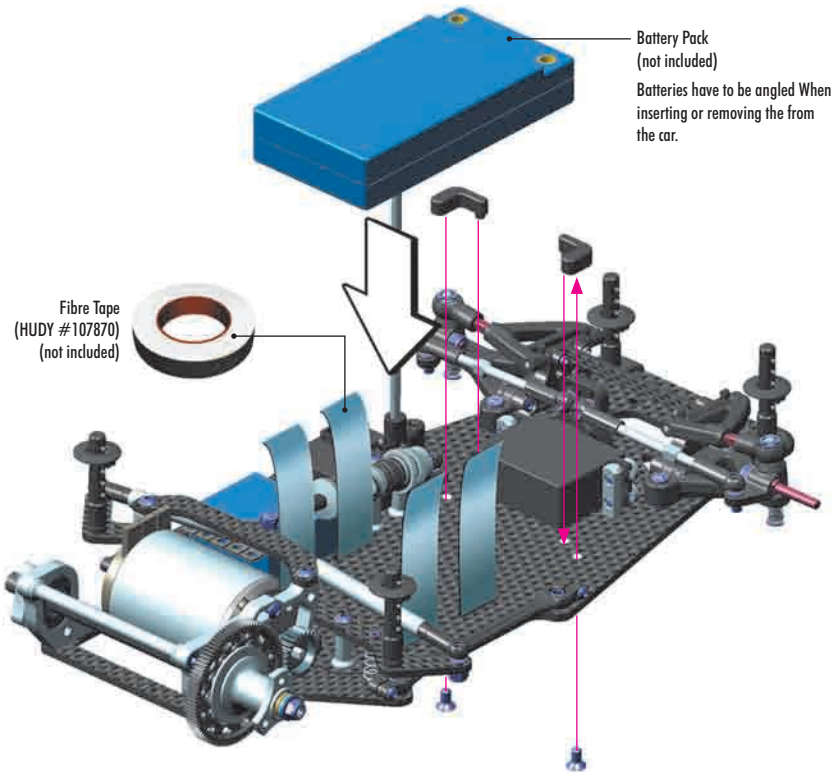
#305968	18T / 64P (option)
#305969	19T / 64P (option)
#305970	20T / 64P (option)
#305971	21T / 64P (option)
#305972	22T / 64P (option)
#305973	23T / 64P (option)
#305974	24T / 64P (option)
#305975	25T / 64P (option)
#305976	26T / 64P (option)
#305977	27T / 64P (option)
#305978	28T / 64P (option)
#305979	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)

8.

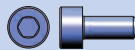
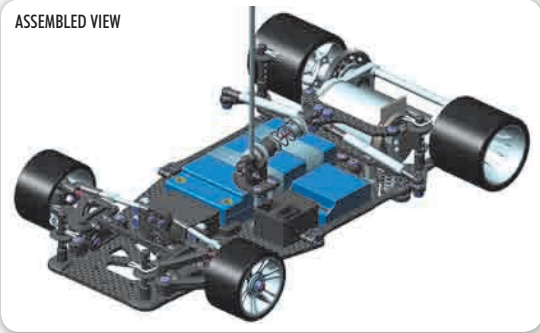
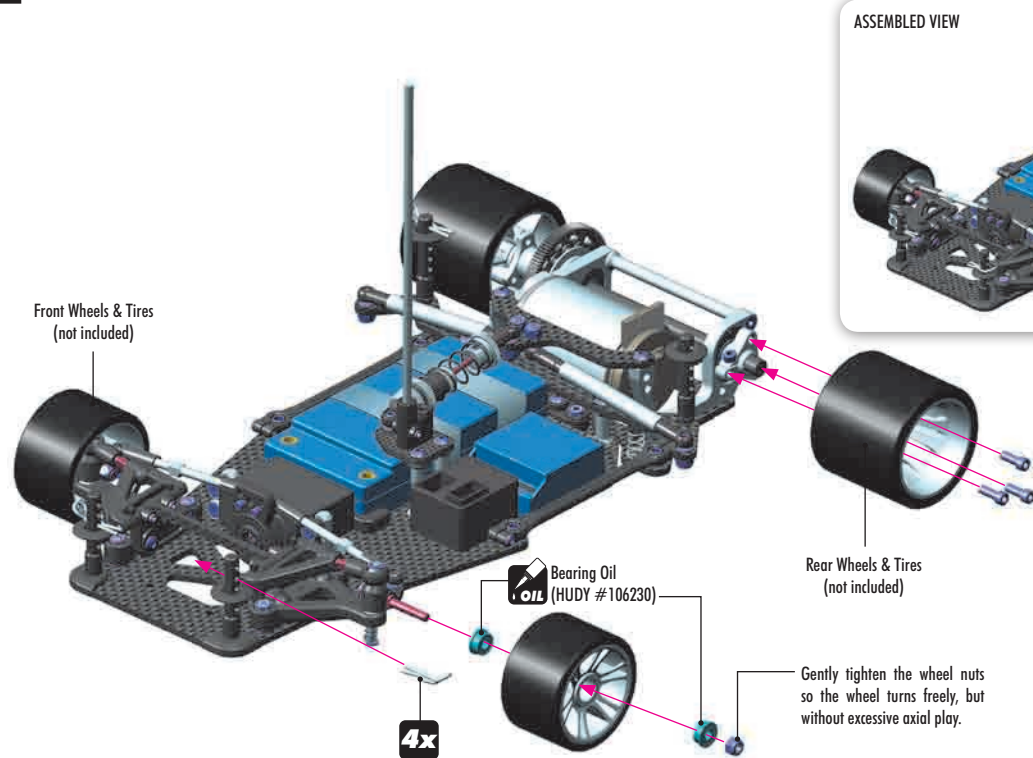


TOP

After inserting the antenna rod, fully tighten both setscrews. Do not overtighten or you may strip the plastic.



903305
SFH M3x5



375390
ALU SCH M3x8



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



960031
ALU N M3

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 Web site 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 same; we strongly recommend that you read and understand the Set-up Book completely.



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