



VECTOR

V-SERIES

1/8-SCALE ON-ROAD GAS RC RACING CAR

INSTRUCTION MANUAL

99
SPEC



EXCITEMENT IN THE FAST LANE

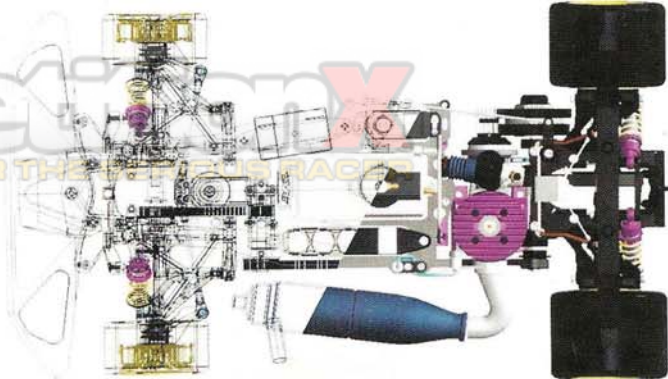
CompetitionX
A WEB SITE FOR THE SERIOUS RACER



VECTOR
V-SERIES

COMPETITION
A WEB SITE

FOR THE BEST RACER



Congratulations.

You are now the owner of the most advanced 1/8-scale on-road gas model racing car ever produced. The Vector was engineered using sophisticated computer design equipment, and it represents everything Serpent has learned about model gas cars in the last 20 years.

The Vector is no ordinary car, and this is no ordinary instruction manual. You hold in your hands what we justifiably feel is the best manual made to date. Bar none. We have used perfectly-accurate computer-rendered images to present the building steps. Using the computer images has allowed us to provide clarifying cut-away views that help explain complicated assembly steps. These views would be almost impossible to render using conventional drawing methods. Most assembly steps are explained using numbers for easy readability, but where necessary we have made clarifications in text (all the little racer tricks to build a perfect car are in here). And, perhaps most impressively, we have printed the manual in brilliant full color.

The colors are not merely for appearance sake. We have carefully chosen the coloring so that it helps you understand what is taking place in any particular step. If you are having difficulty understand a step, you should be able to figure out what is taking place simply by looking at the photo before and/or after the step – the colors and relative positions of the different parts will probably be enough to clear things up.

All the assembly steps have large exploded-view drawings. Each part is identified and all the hardware (screws, nuts, bearings, etc.) can be compared to the fold-out full size pictures for quick and easy confirmation.

We strongly recommend that you use this manual together with the Vector Tech Book - the 100-page, 200+ photo technical guide for the car. The Tech Book presents all the information you need to tune the Vector for maximum performance after construction is complete. At certain points while building, you may find it helpful or interesting to refer to the relevant Tech Book page.  At these points we have included a small icon:

The lower number in purple refers to the relevant page you should turn to in the Tech Book. We should stress that it is not absolutely necessary to refer to the Tech Book at these points. If you prefer, you can simply proceed ahead in the construction and then, once your car is assembled, refer to the Tech Book for final set-up of the car.

If, despite all our efforts, you have any difficulties or questions, we encourage you to visit our TSN web site (<http://www.serpent.com>), or contact us by mail, phone, fax or e-mail.

We thank you for racing with the Vector and are certain it will give you many hours of real racing excitement.

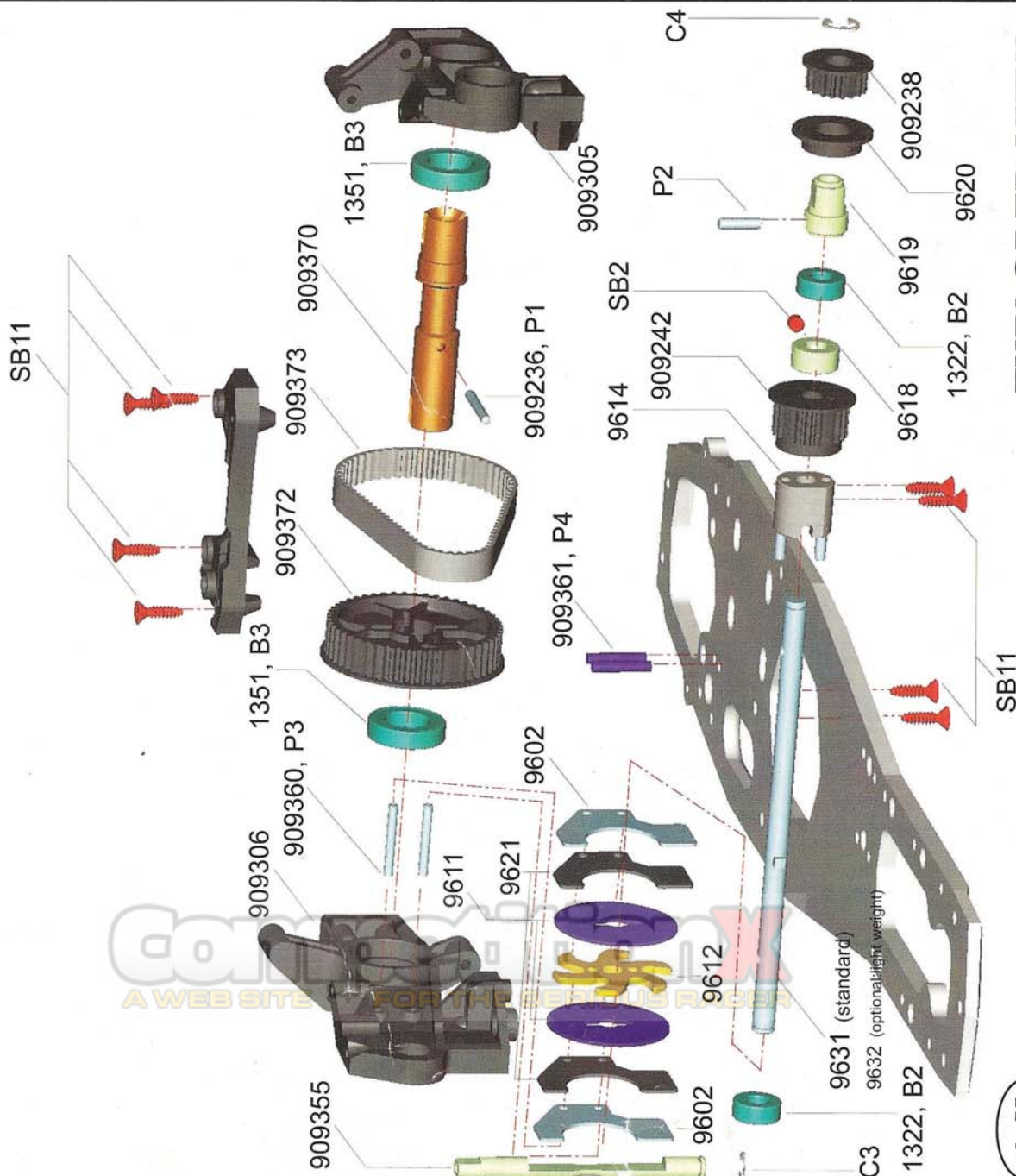
Serpent Model Racing Cars by

CONTENTS:

- 1. REAR END, part I**
- 2. REAR END, part II**
- 3. REAR END, part III**
- 4. TWO SPEED - ROLL BAR**
- 5. FRONT END, part I**
- 6. FRONT END, part II**
- 7. SHOCK ABSORBERS**
- 8. CENTAX CLUTCH**
- 9. SERVO LINKAGE**
- 10. FINAL ASSEMBLY**

MISCELANEOUS MATERIALS

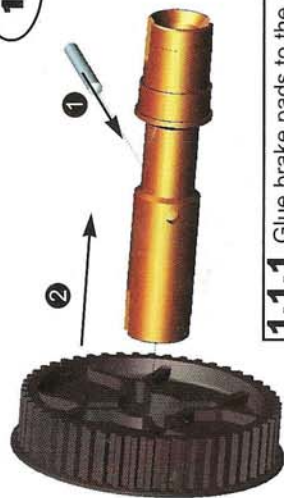
1. REAR END, part I (Rear axle - Brake assembly - Two speed shaft)



1.X

EXPLODED VIEW

1.1

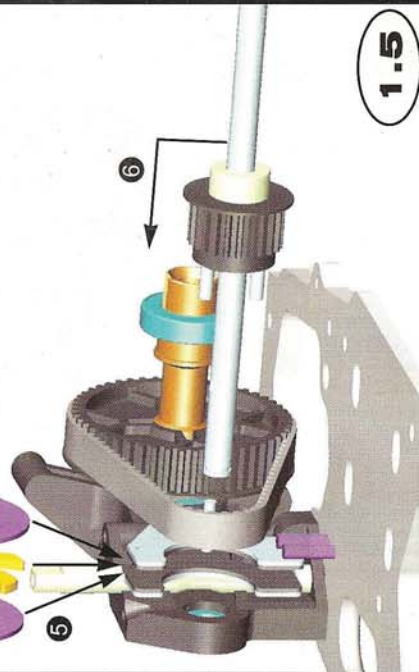
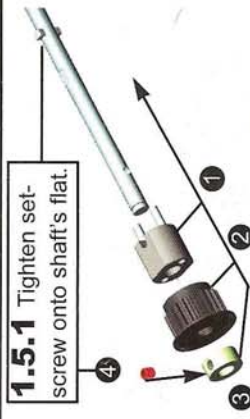
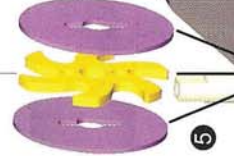


1.1.1 Glue brake pads to the steel plates with quick CA/super glue. Scratch the steel with light sandpaper before glueing to strengthen bonding.

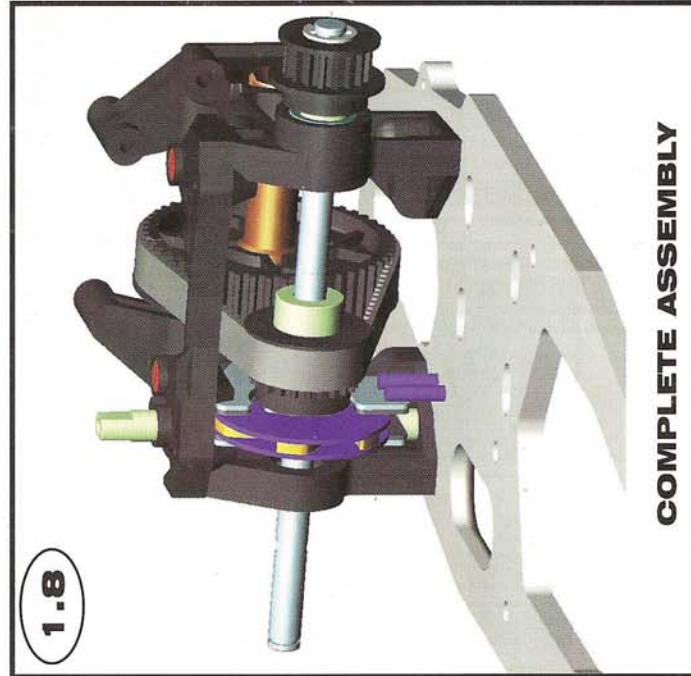
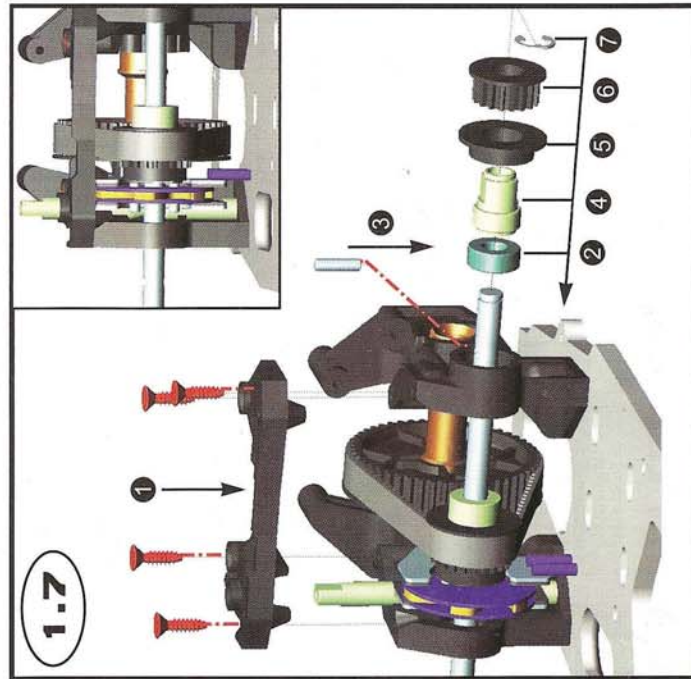
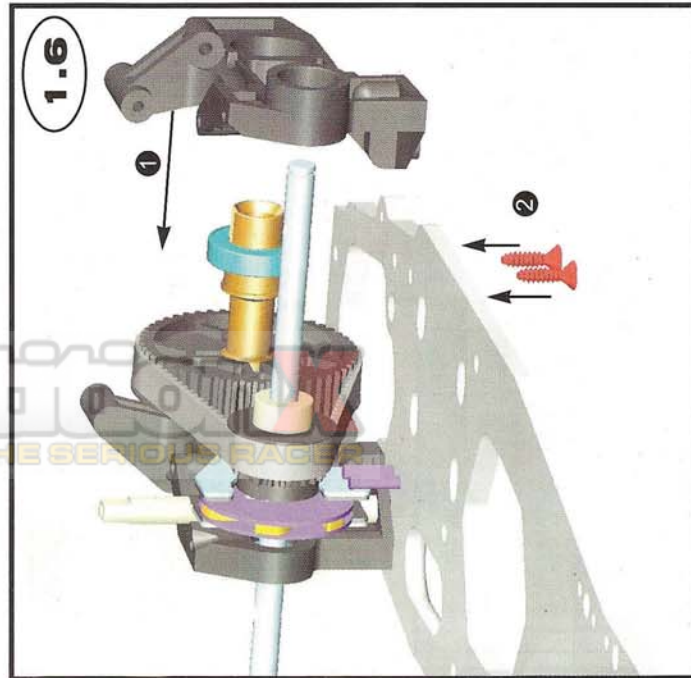
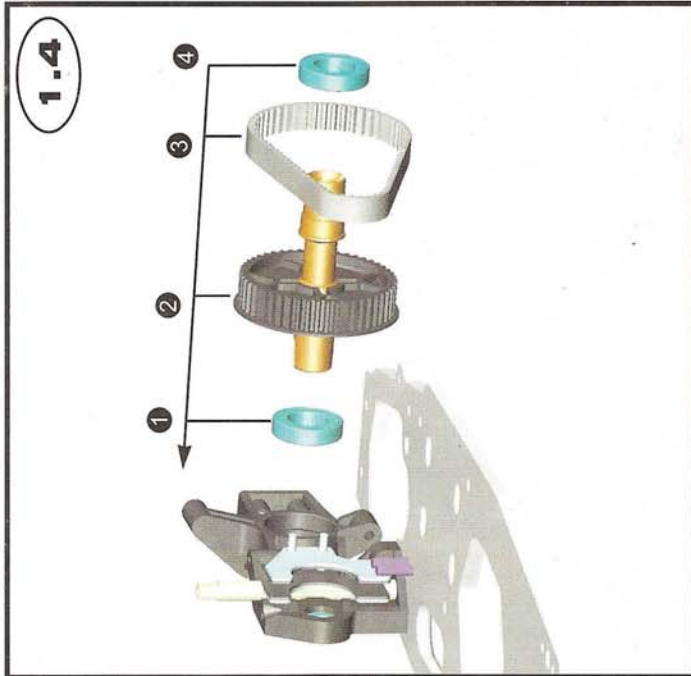
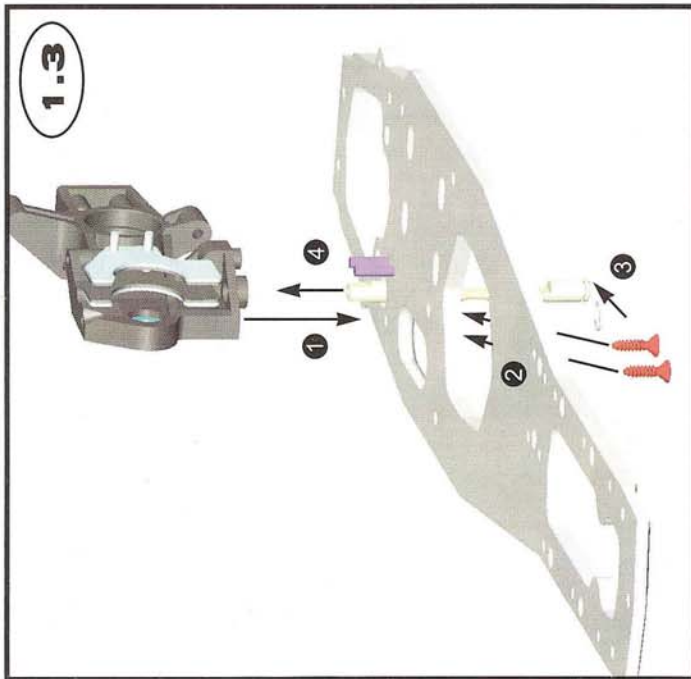
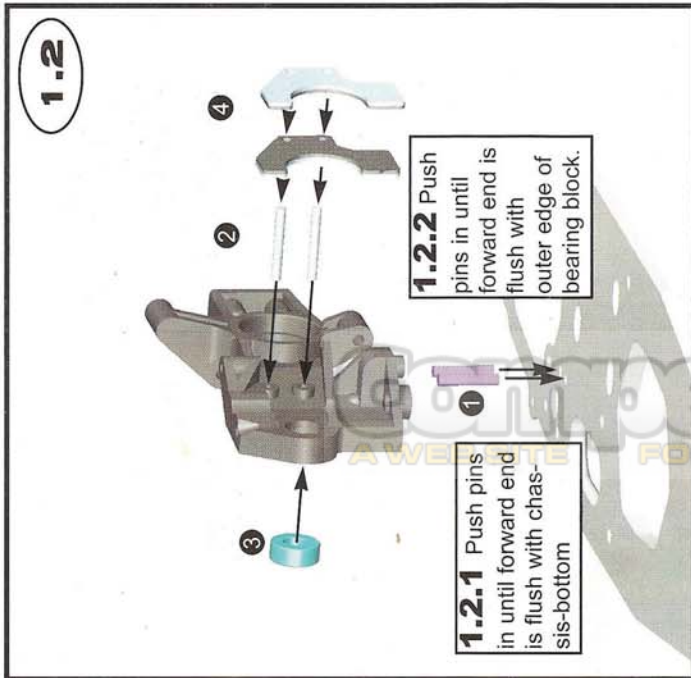


1.5.1 Tighten set-screw onto shaft's flat.

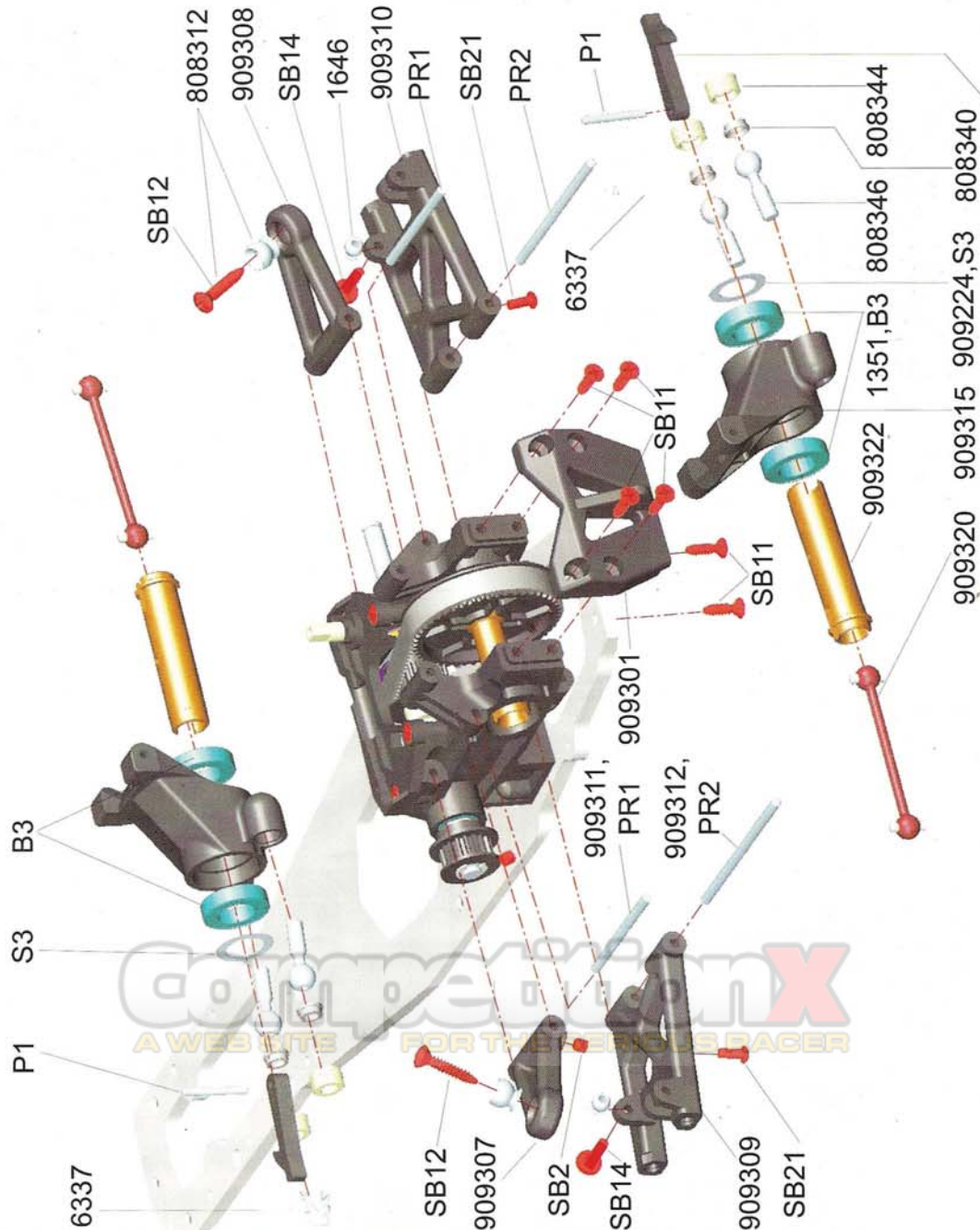
1.5.2 Note orientation of brake ventilator.



1.5



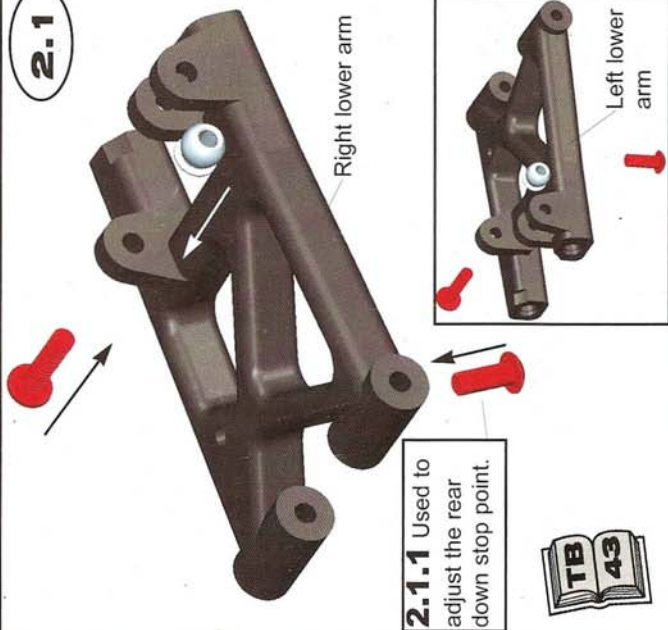
2. REAR END, part II (Suspension - Uprights)



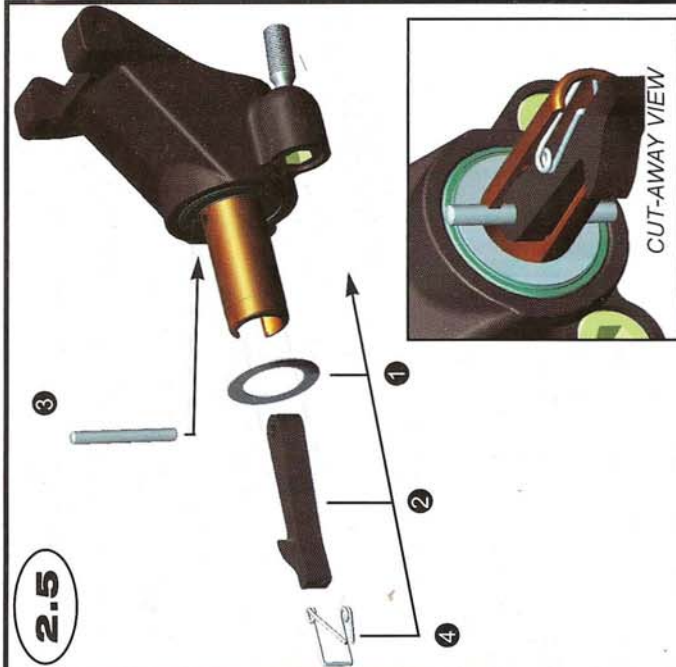
2.X

EXPLODED VIEW

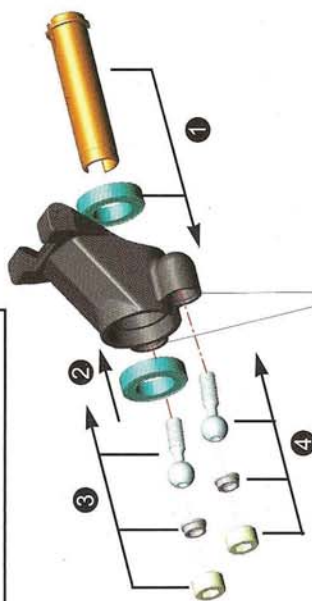
2.1



2.5



2.4.2 Adjust to minimum



2.4.1 Sometimes small pieces of plastic ("flashing") can remain in these holes. Remove them with tweezers.

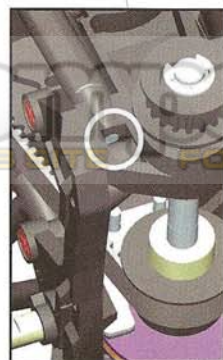
This diagram shows an exploded view of a mechanical assembly. The main assembly is a complex mechanism with a central gear and a large flywheel. Four callouts are present: 1 points to a small pin, 2 points to a bracket, 3 points to a larger bracket, and 4 points to a screw. An inset in the bottom right corner shows a close-up of a pin and a bracket.

2.3.1 Note position of bolt to cock wishbone on pin



An exploded view diagram of a mechanical assembly. The central component is a dark, complex housing with a large gear and a central shaft. Eight numbered callouts (1-8) point to various parts: 1 points to a small pin at the bottom; 2 points to a long, thin rod on the right; 3 points to a small pin on the left; 4 points to a small pin at the top; 5 points to a small pin on the right; 6 points to a long, thin rod on the right; 7 points to a small pin at the top; 8 points to a small pin at the top. A large, faint watermark 'A WEE' is visible in the background.

2.2.1 Use this hole to push the upper pin out.



COMPLETE ASSEMBLY

2.7.1 Screw this in until the upper arm snaps around the ball or press them into the upper arms using a vise and a small socket

2.7.1 Screw this in until the upper arm snaps around the ball or press them into the upper arms using a vise and a small socket

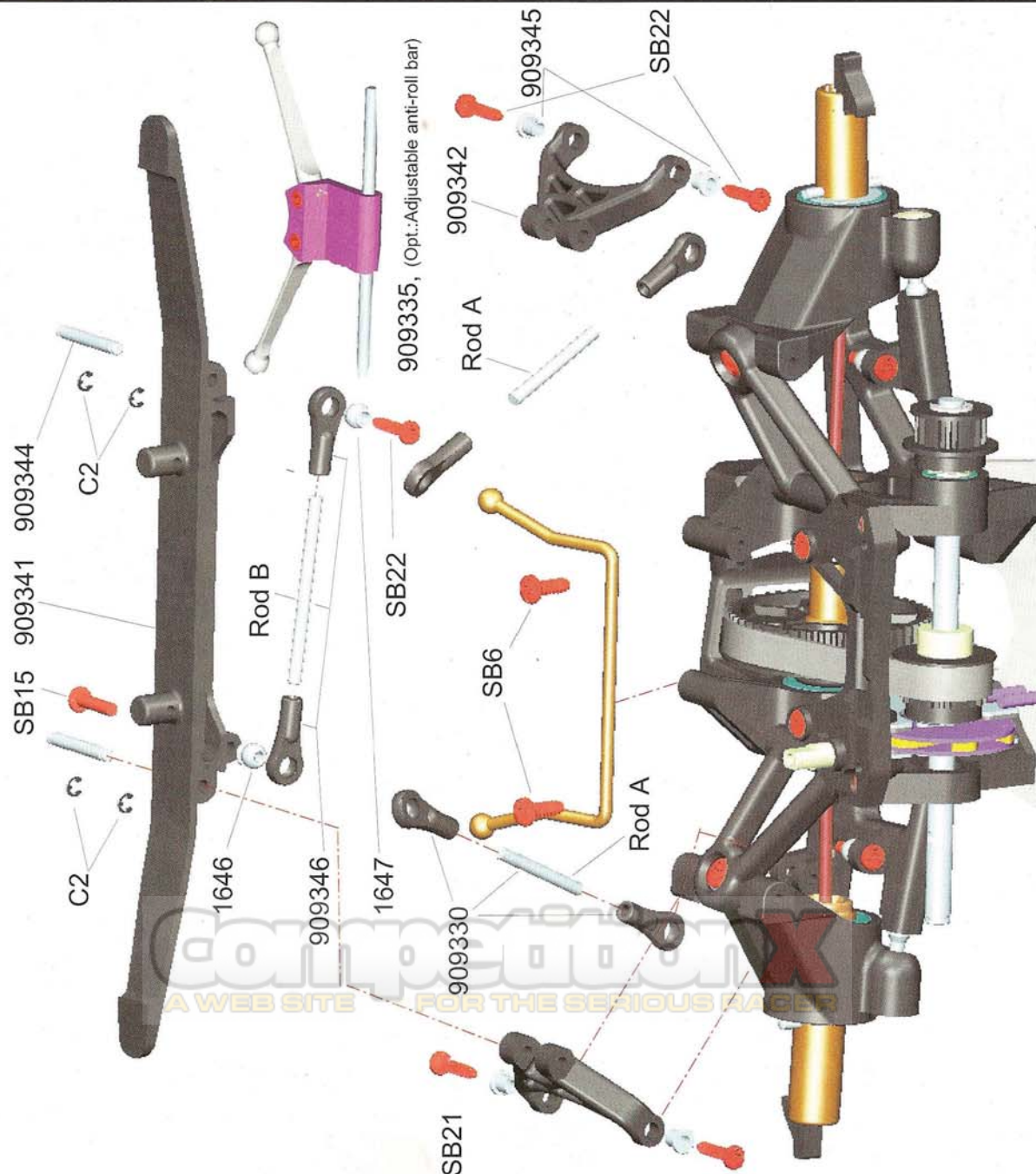
2.6.1 Important:
Lubricate the driveshaft ends with a heavy grease or graphite spray, before inserting.

2.6.1 Important: Lubricate the driveshaft ends with a heavy grease or graphite spray, before inserting.

2.6.2 These balls adjust toe-in and elevated camber.



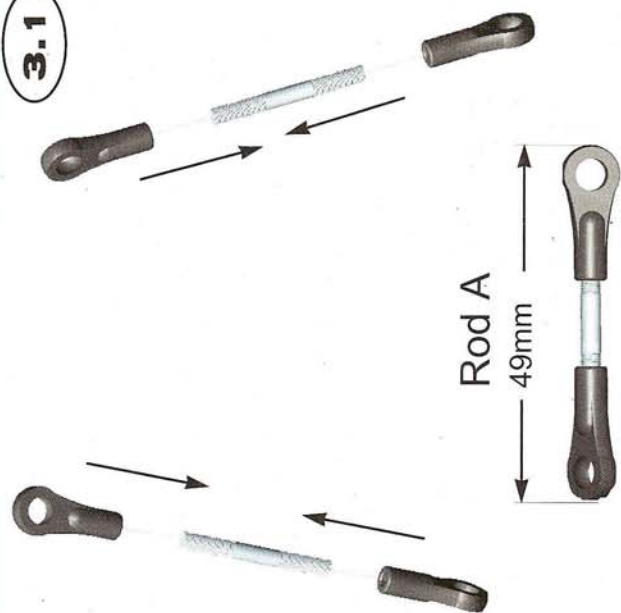
3. REAR END, part III (Anti-roll bar - bodymount)



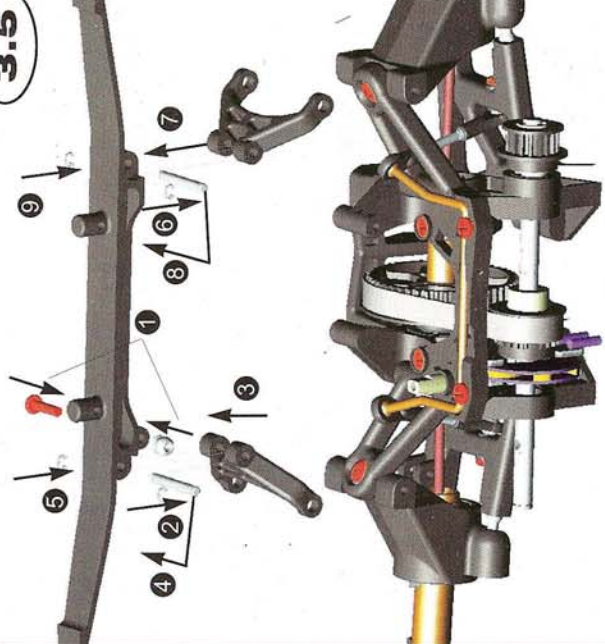
EXPLODED VIEW

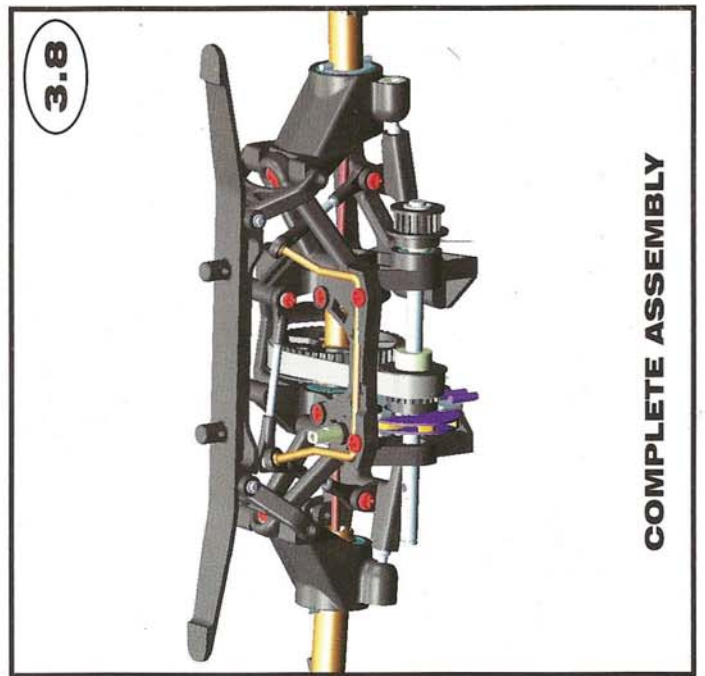
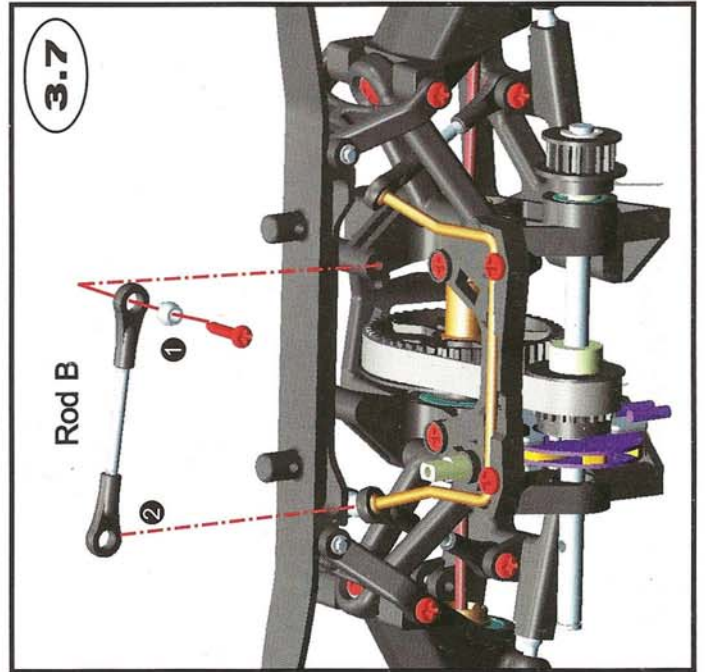
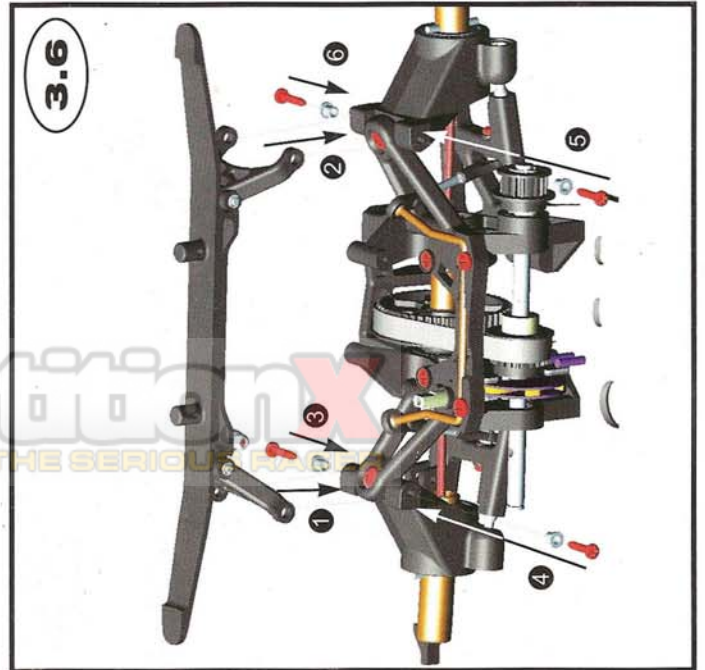
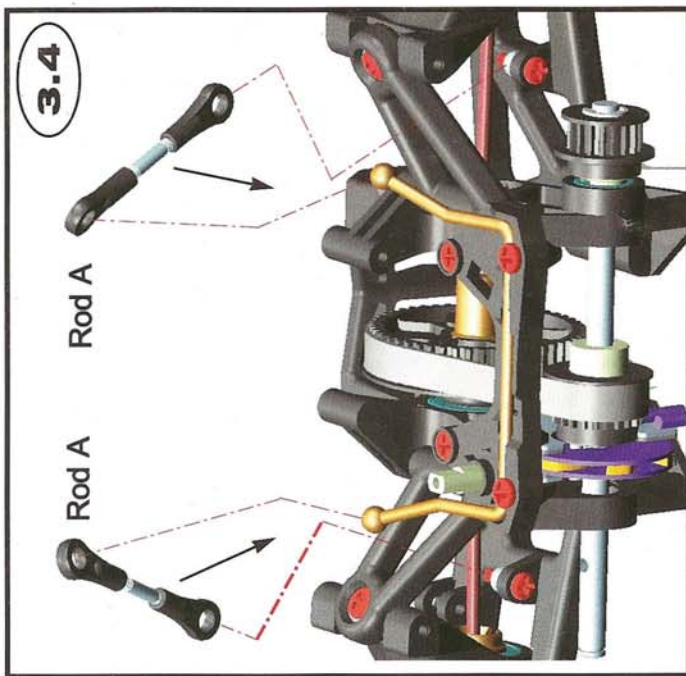
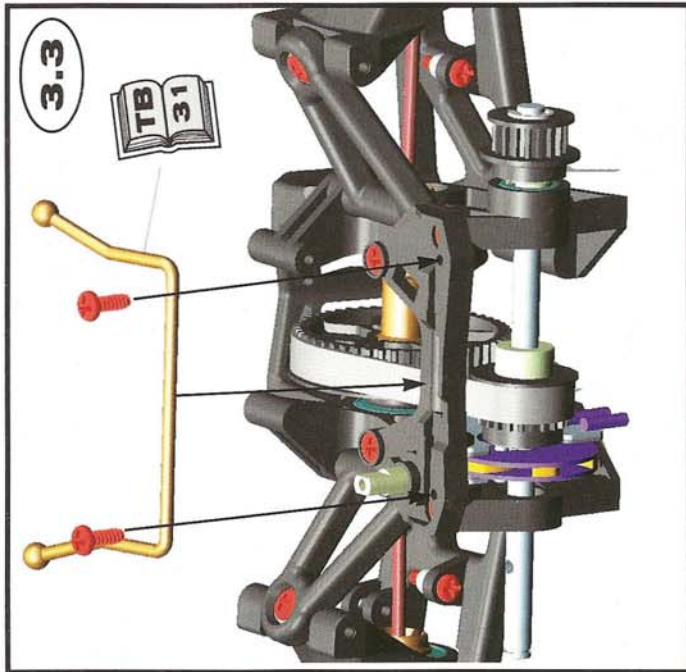
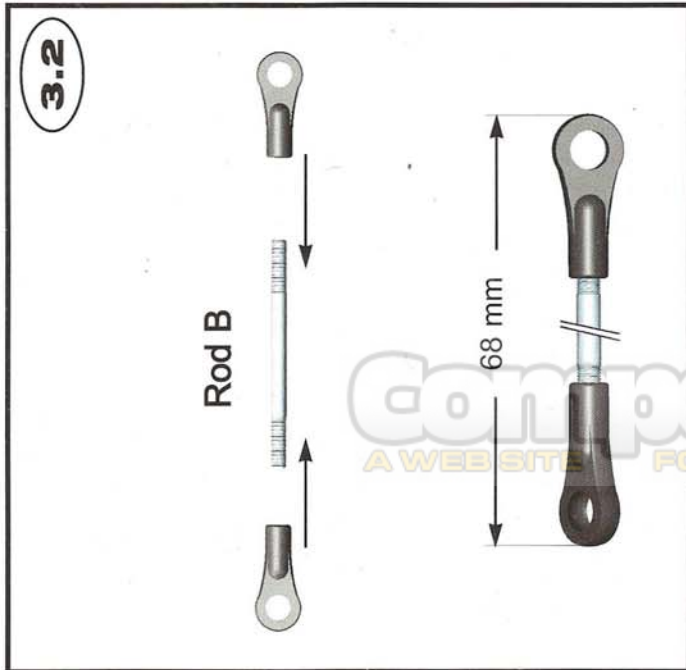
3.X

3.1



3.5

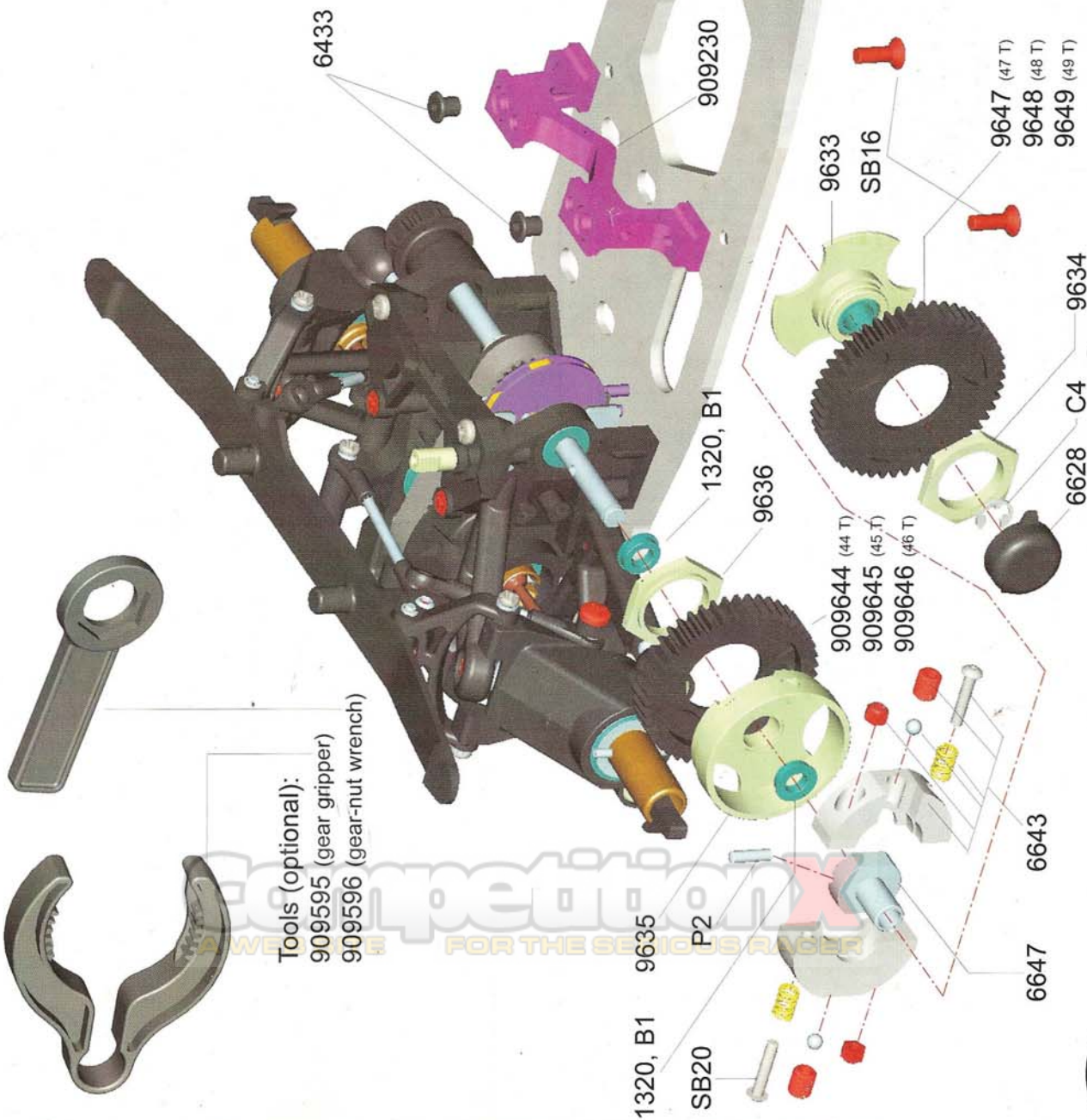




4. TWO SPEED TRANSMISSION



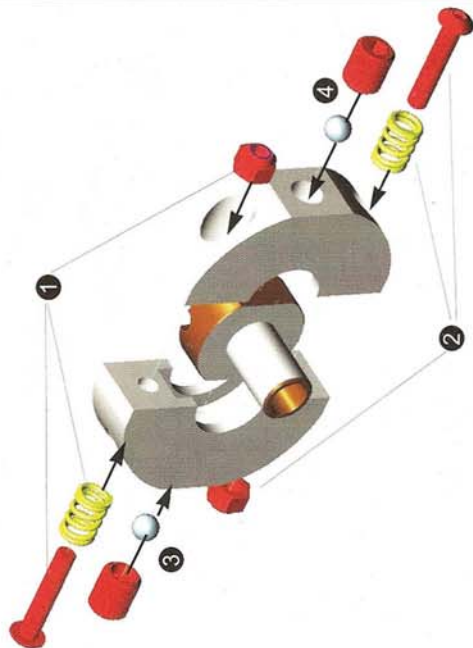
Tools (optional):
 909595 (gear gripper)
 909596 (gear-nut wrench)



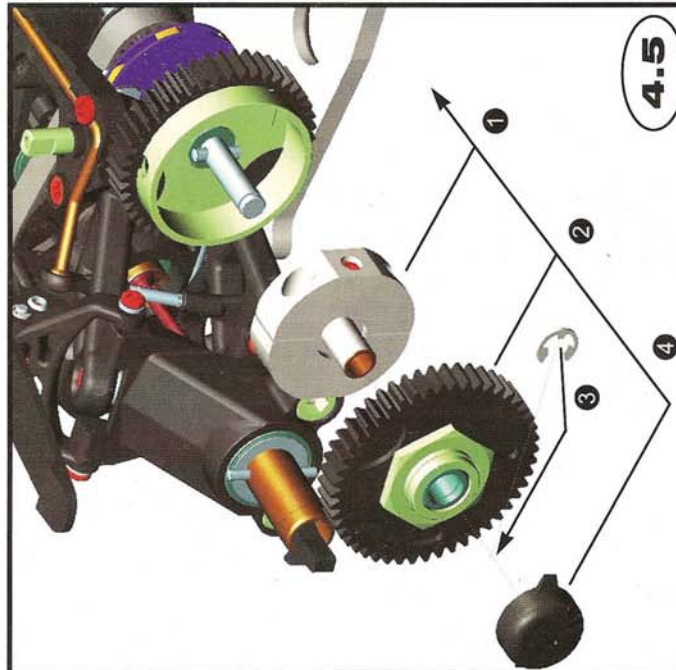
4.x

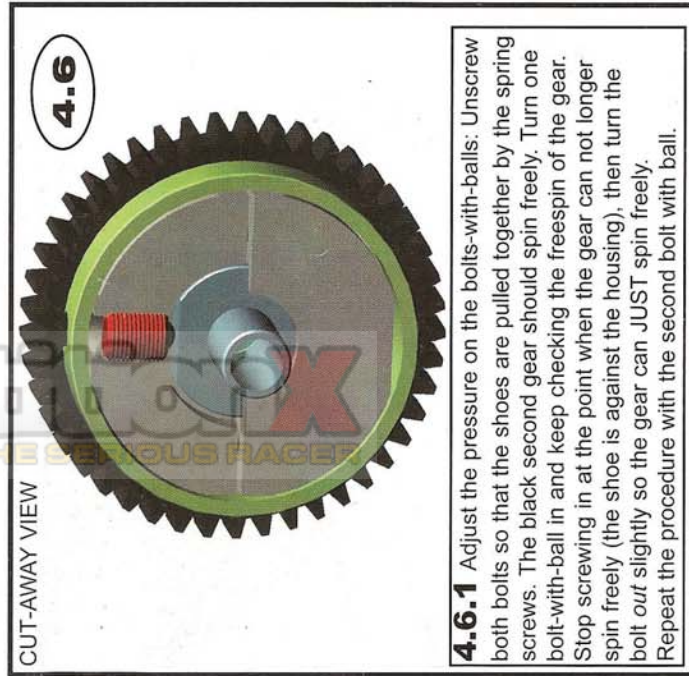
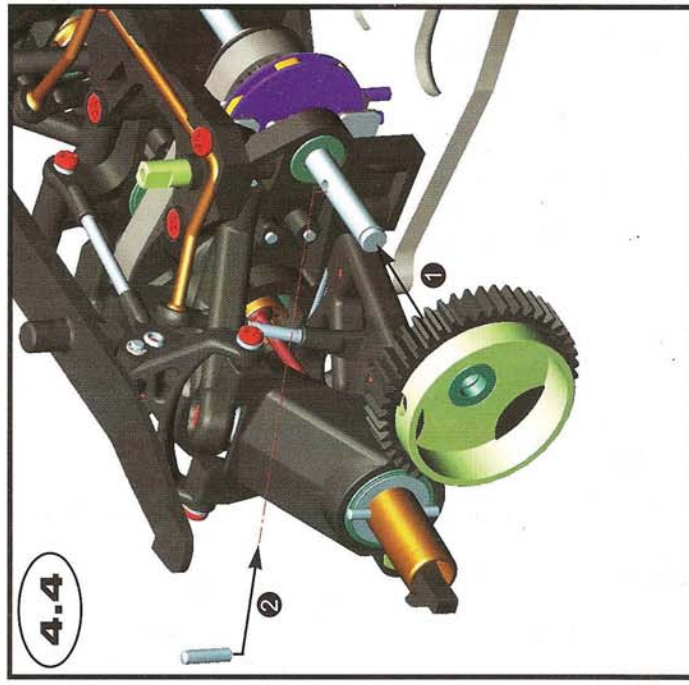
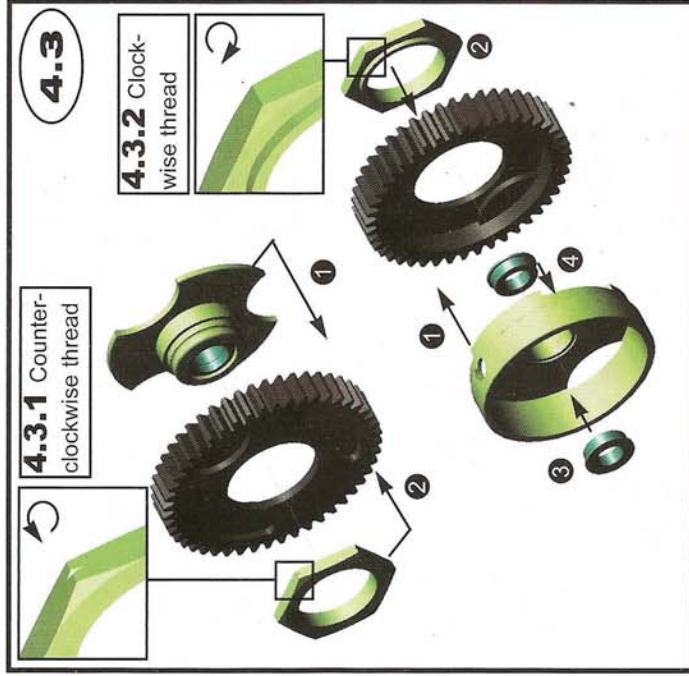
EXPLODED VIEW

4.1

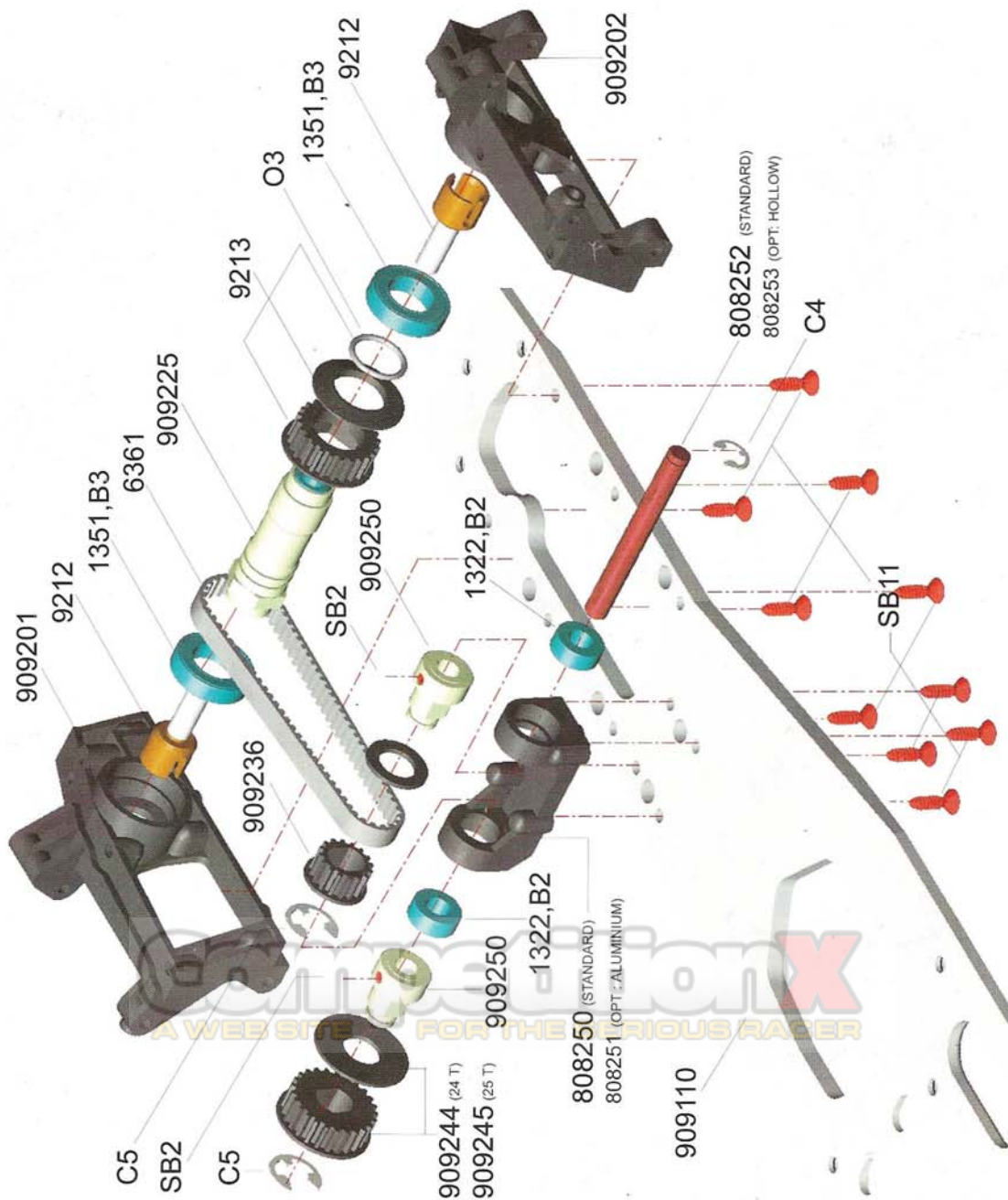


4.5





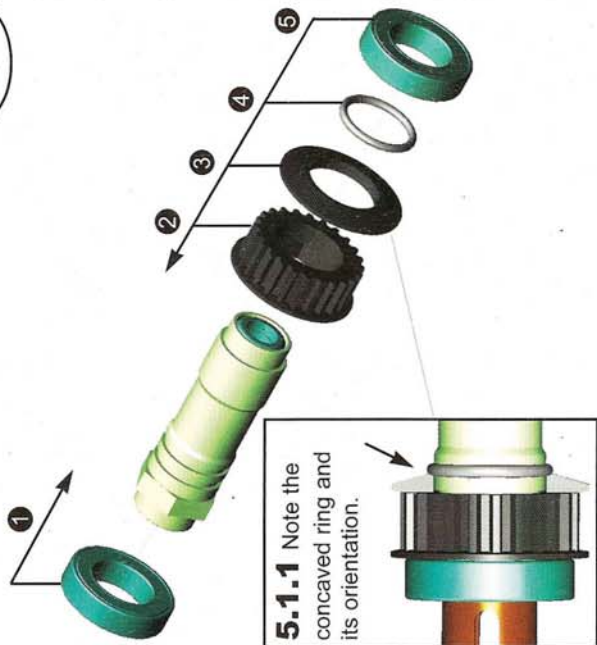
5. FRONT END, part I (Axle - Bearing blocks - Mid shaft)



EXPLODED VIEW

5.X

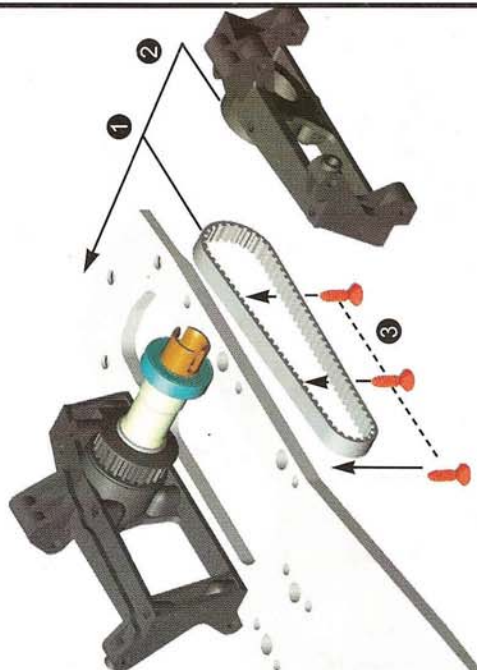
5.1



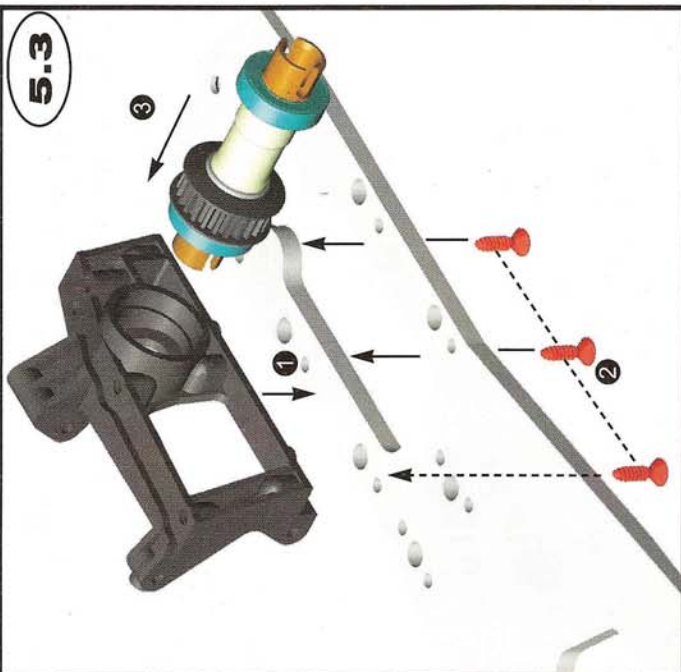
5.5



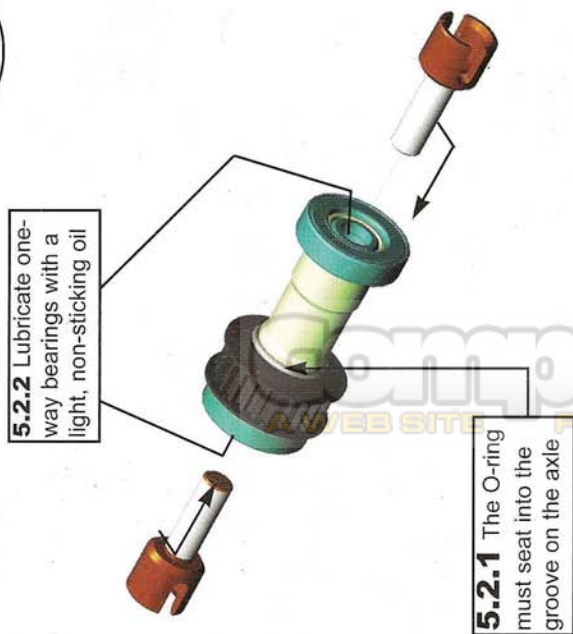
5.4



5.3



5.2

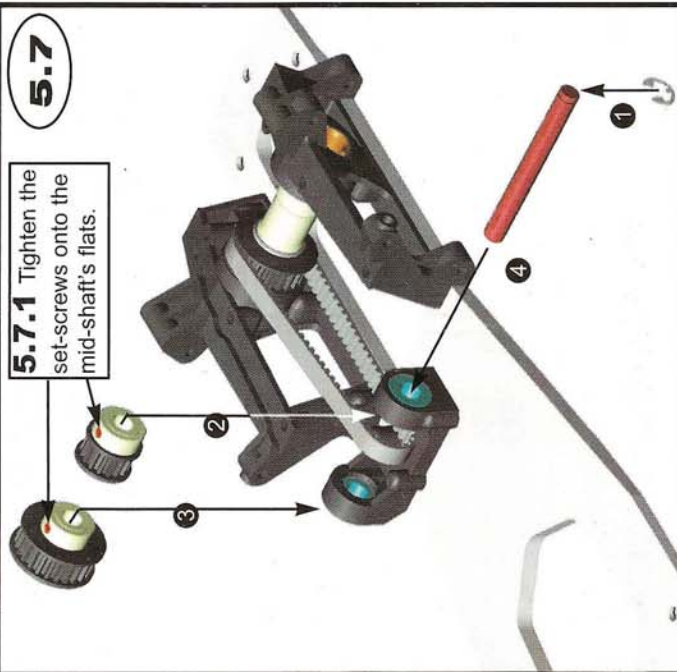


5.8



COMPLETE ASSEMBLY

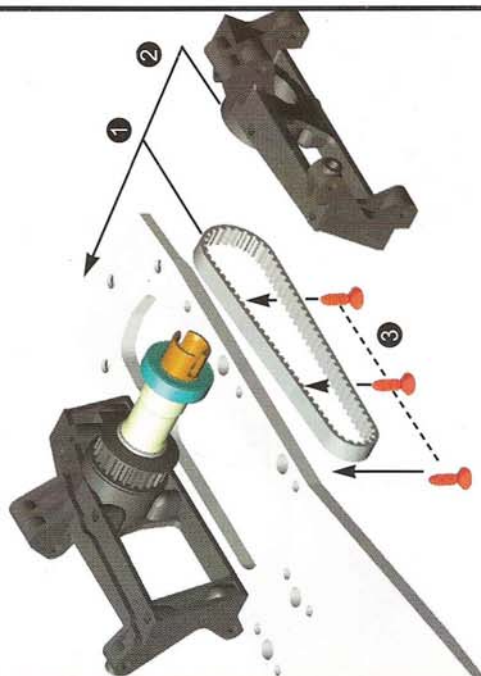
5.7



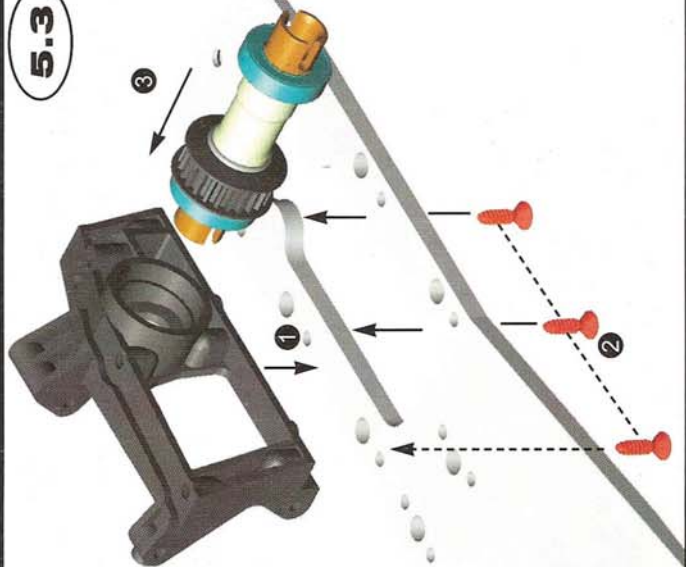
5.6



5.4

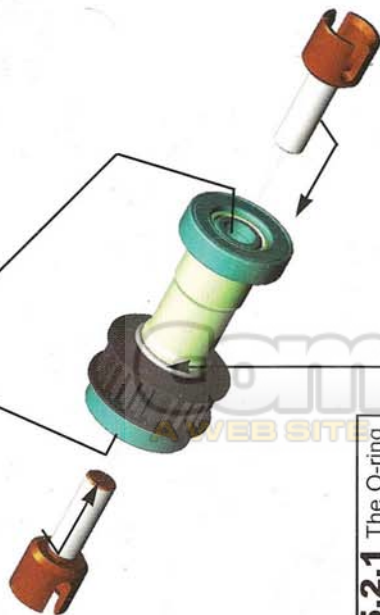


5.3



5.2

5.2.2 Lubricate one-way bearings with a light, non-sticking oil



5.2.1 The O-ring must seat into the groove on the axle.

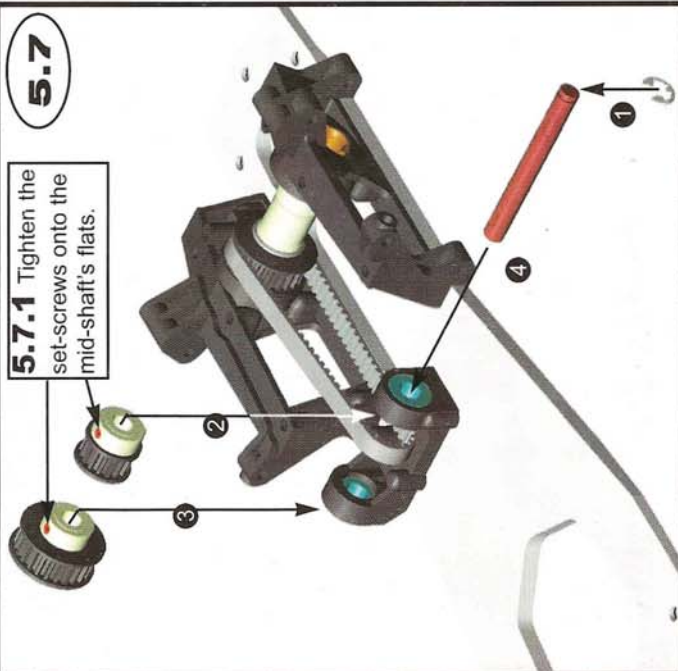
5.8



COMPLETE ASSEMBLY

5.7

5.7.1 Tighten the set-screws onto the mid-shaft's flats.



5.6

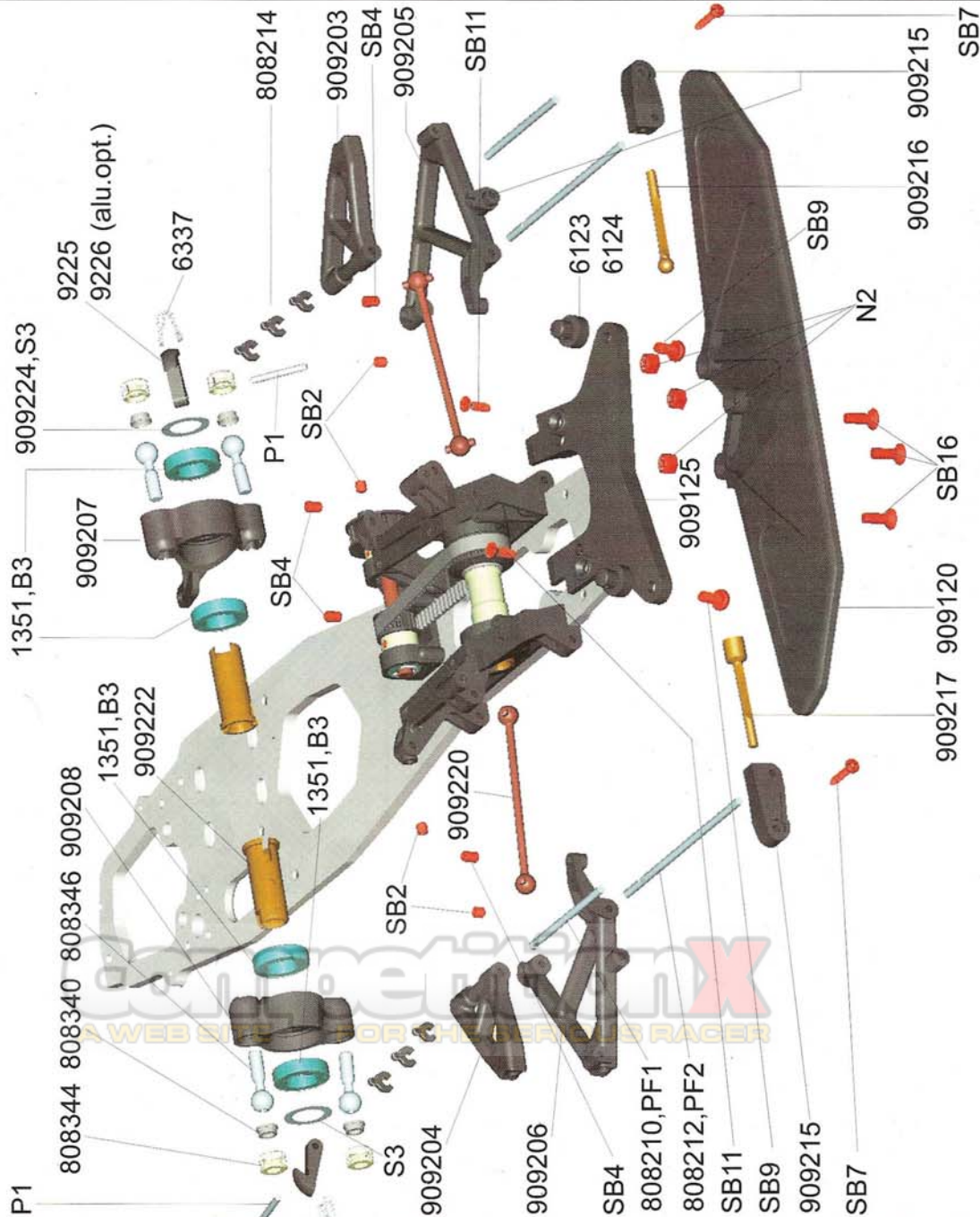
5.6.1 This can be used to adjust overdrive ratio. Start with the standard 25-tooth gear

5.6.2 Don't tighten the allen-screws yet. Turn them in for only 2-3 strokes

TB 49



6.FRONT END, part II **(Suspension - Steering blocks - Finalizing)**



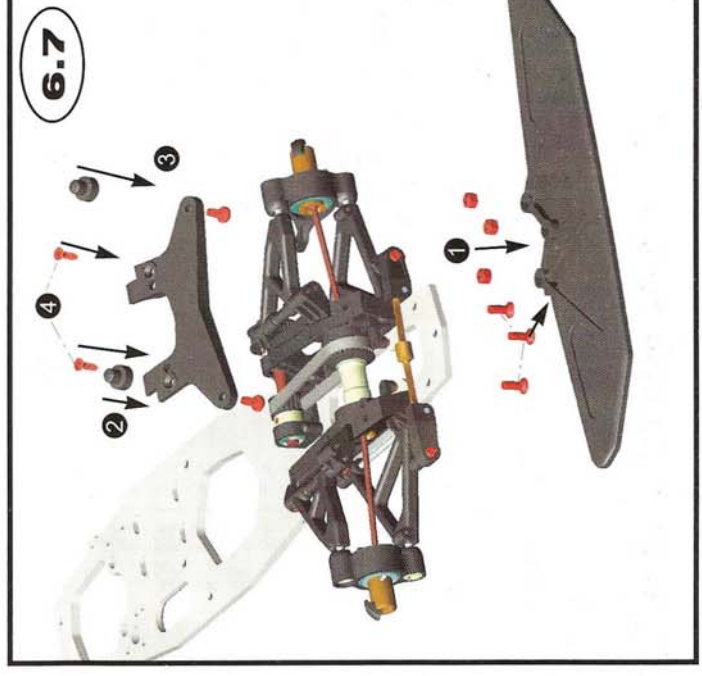
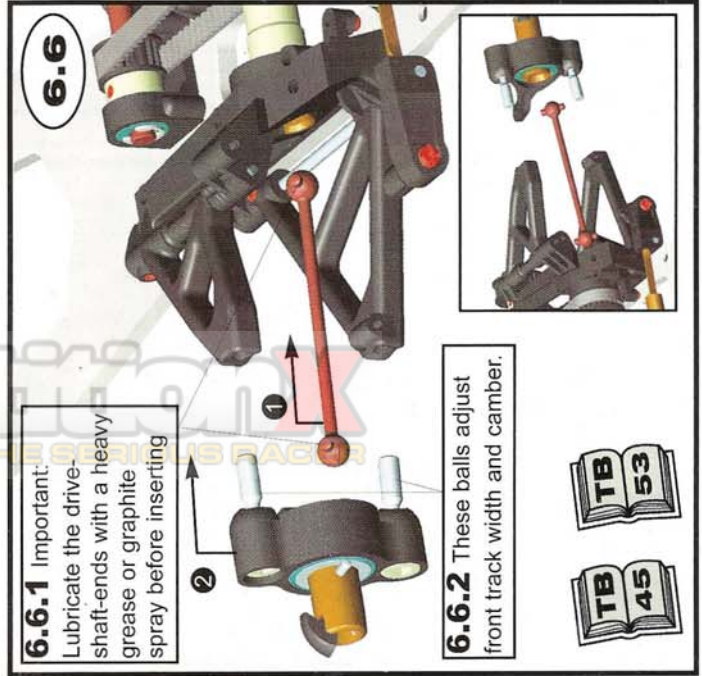
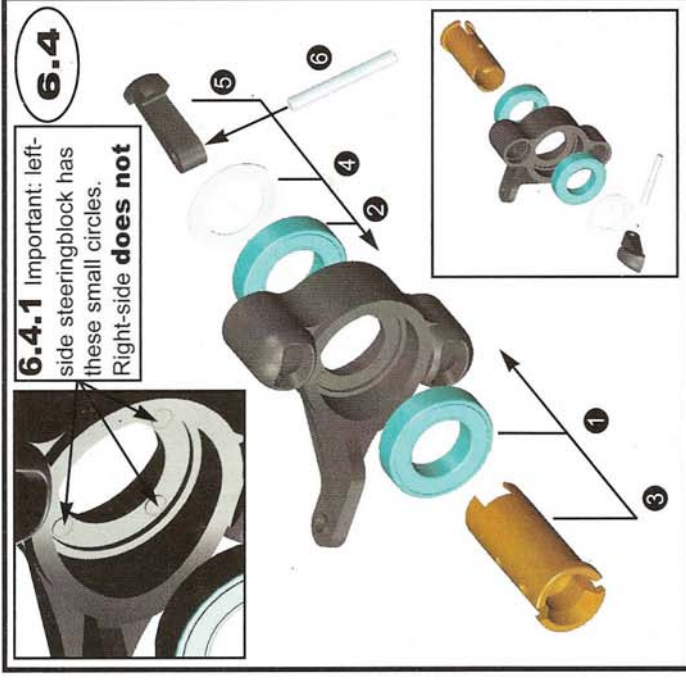
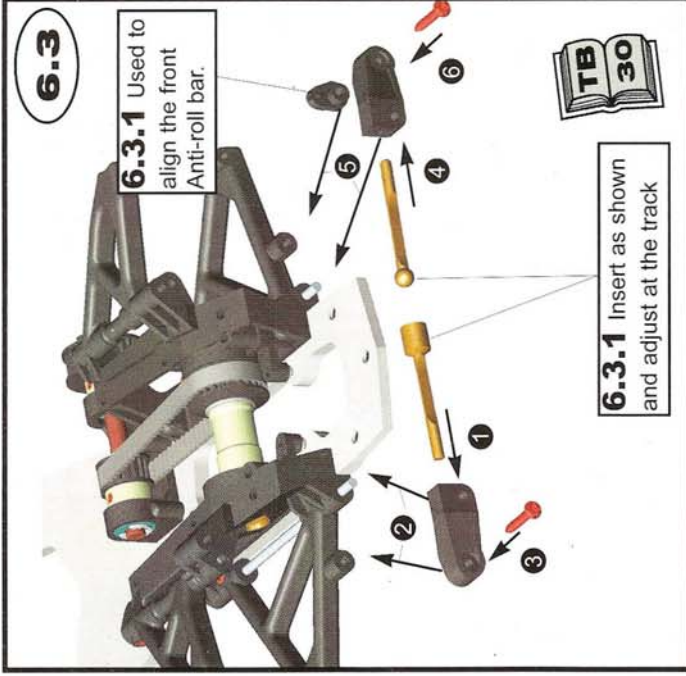
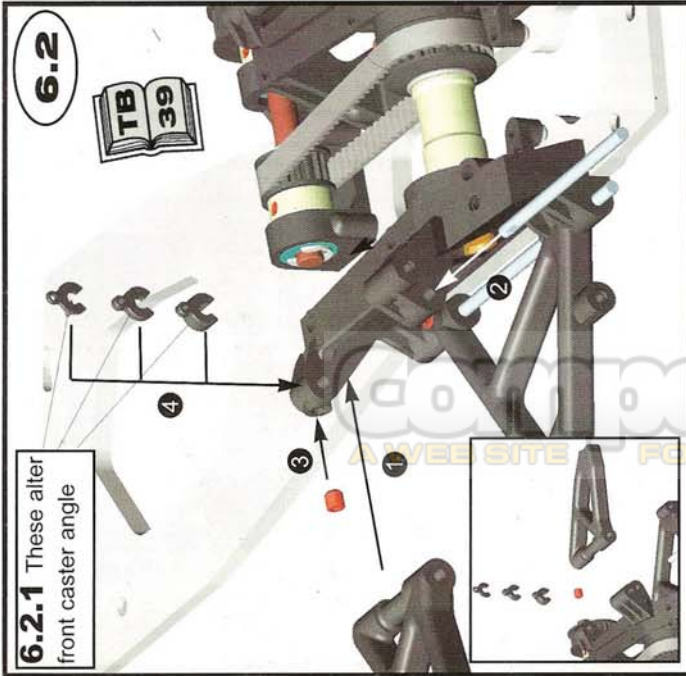
6.X

EXPLODED VIEW

6.1.1 Used to adjust front down-stops.

6.1.2 Used to adjust front up-stop.

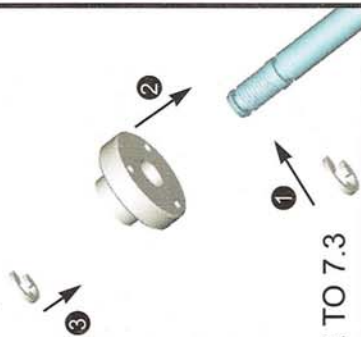
6.5.1 Sometimes small pieces of nylon ("flashing") can remain in these holes. Remove them with tweezers



7. SHOCK ABSORBERS

FIXED PISTON

(Easy assembly: assures equal dampening between left- and right-side shock absorbers).

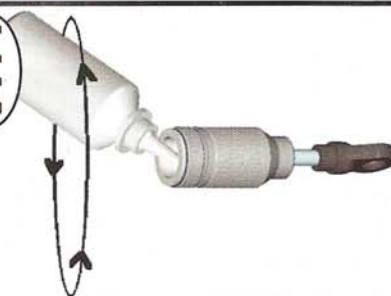


CONTINUE TO 7.3

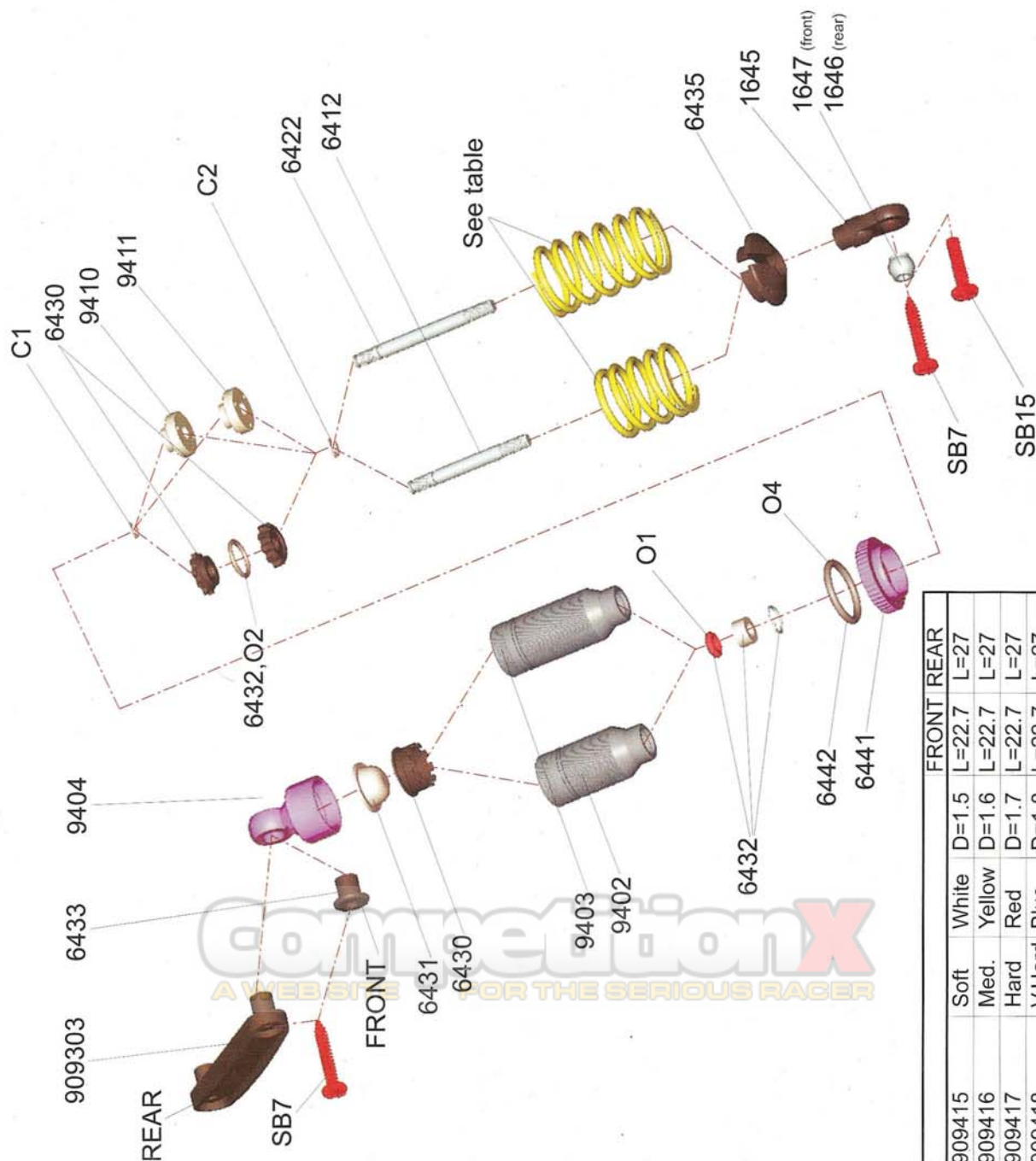
7.6



7.11



7.11.1 Gently press the tip of the oilbottle against the bladder's inner curved surface. Swirl the tip of the bottle while pressing the bladder down into position. Excess oil will be squeezed out. Wipe this excess off with a rag. This action will create a proper seal between the bladder and shock body.



	FRONT				REAR			
909415	Soft	White	D=1.5	L=22.7	L=27			
909416	Med.	Yellow	D=1.6	L=22.7	L=27			
909417	Hard	Red	D=1.7	L=22.7	L=27			
909418	V.Hard	Blue	D=1.8	L=22.7	L=27			

EXPLODED VIEW

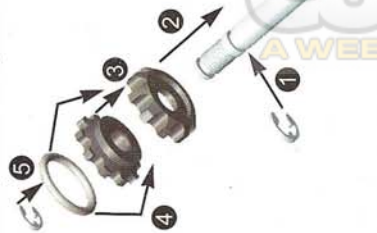
7.X

ADJUSTABLE PISTON

(Fast dampening changes. Requires careful attention to equalize left- and right-side dampening.)



7.2.1 Note proper orientation of the plastic pieces



7.2

7.3



7.3.1 Steel ring must seat into the groove.

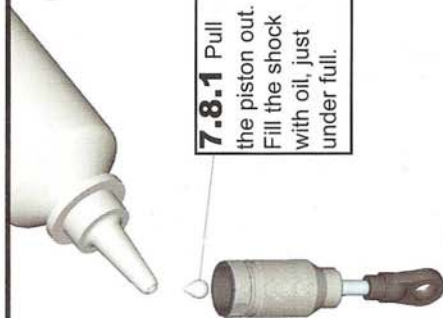


7.7



7.7.1 Grip the highest thread with wire cutters to attach the ball end. Be careful not to damage the thread.

7.8



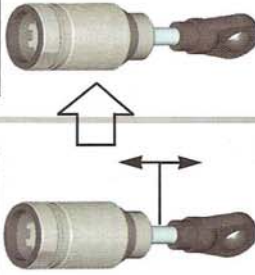
7.8.1 Pull the piston out. Fill the shock with oil, just under full.

7.9

7.9.1 Agitate the oil by moving the piston up and down several times.



7.9.2 Wait about 5 minutes for the oil's air bubbles to rise and burst.



7.10

7.10.1 Place the bladder onto the shock top. There should be enough oil in the shock so that some excess oil spills out now.



Tip: Before putting the bladder on the top, place the piston about halfway up the cylinder. After placing the bladder, pull down the piston so the seal gets pushed on the rim.

7.12

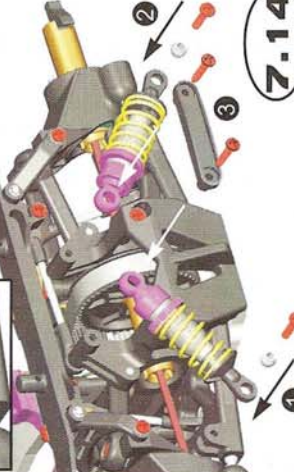
7.12.1 Screw on the shock cap. Be careful not to disturb the bladder seal.



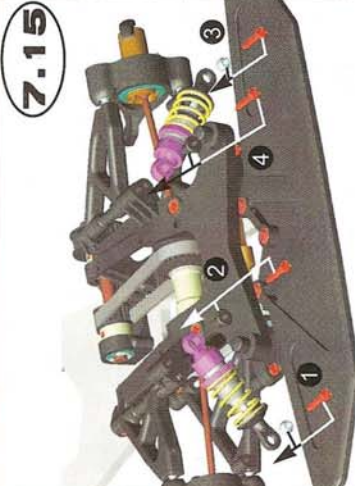
FRONT: 67 mm
REAR: 76 mm



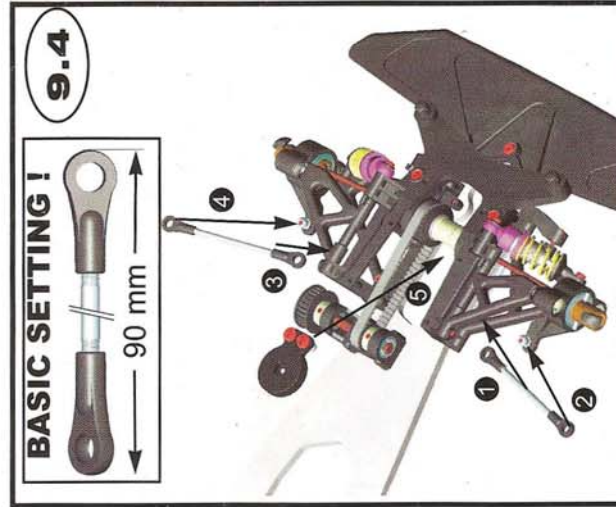
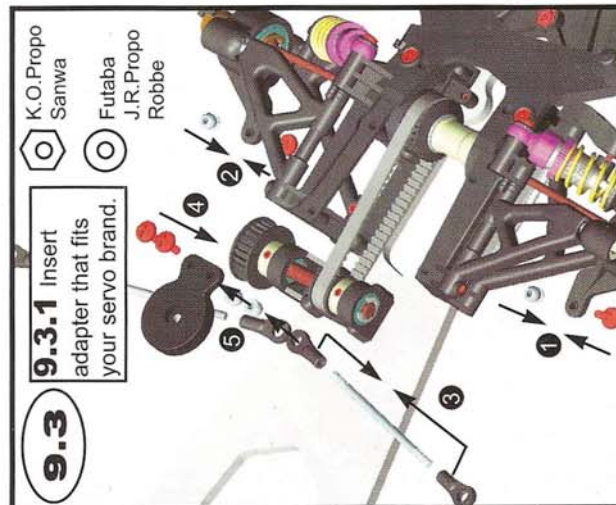
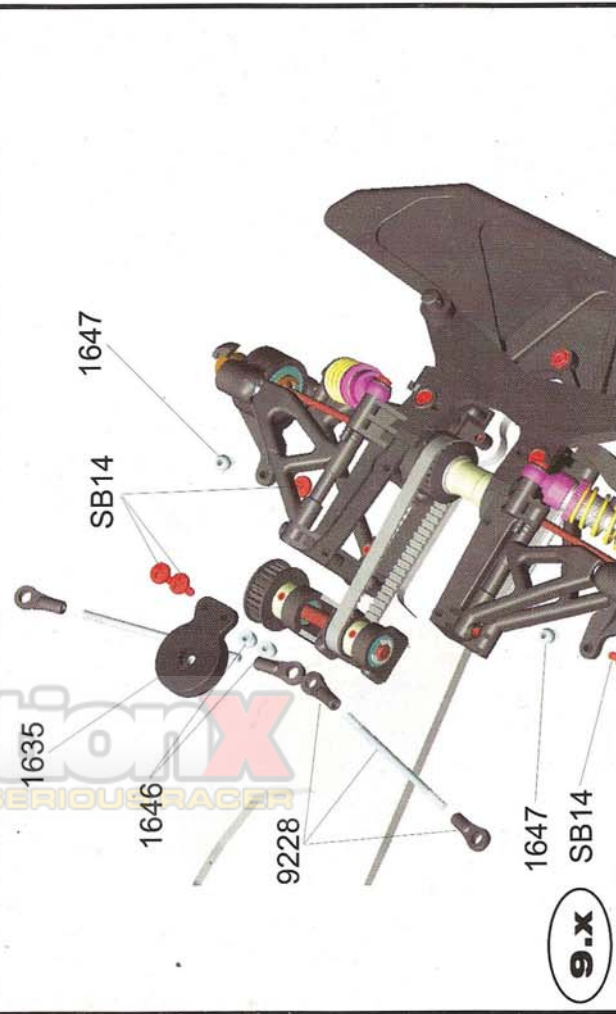
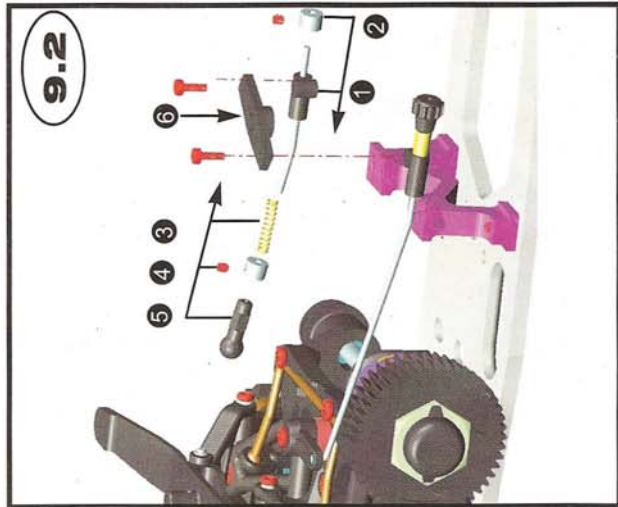
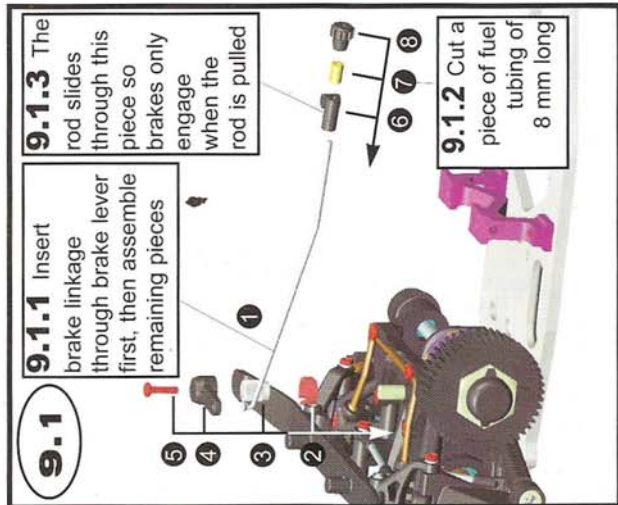
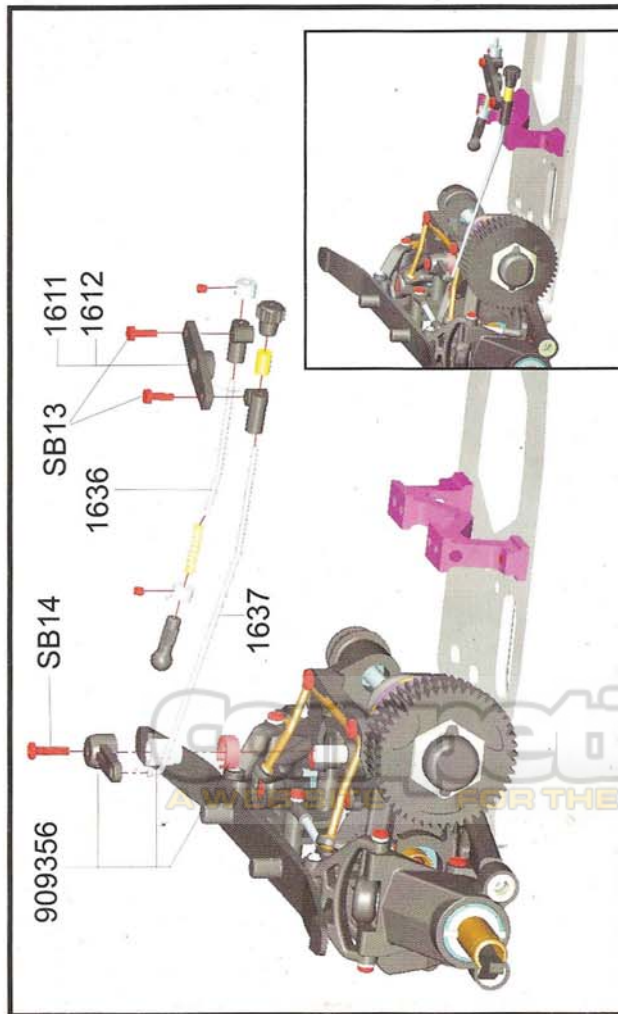
7.14.1 Position the pivot points of the rear shocks **between** the two lips.



7.15



9. SERVO LINKAGE



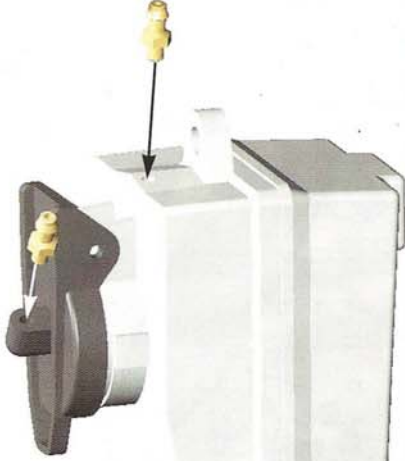
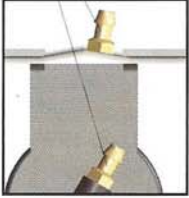
(Radio installation - Fuel Tank - Belt tensioner - Engine - Exhaust - Tubing - Tire & Wheels)



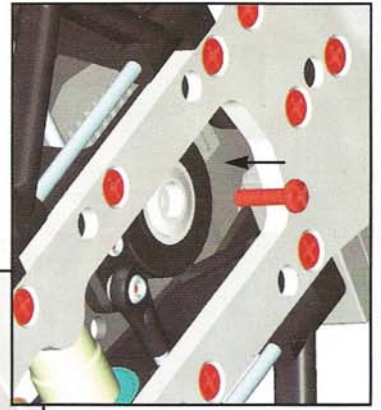
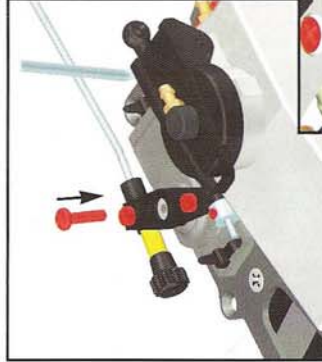
10.3

10.3.1

Note the angle

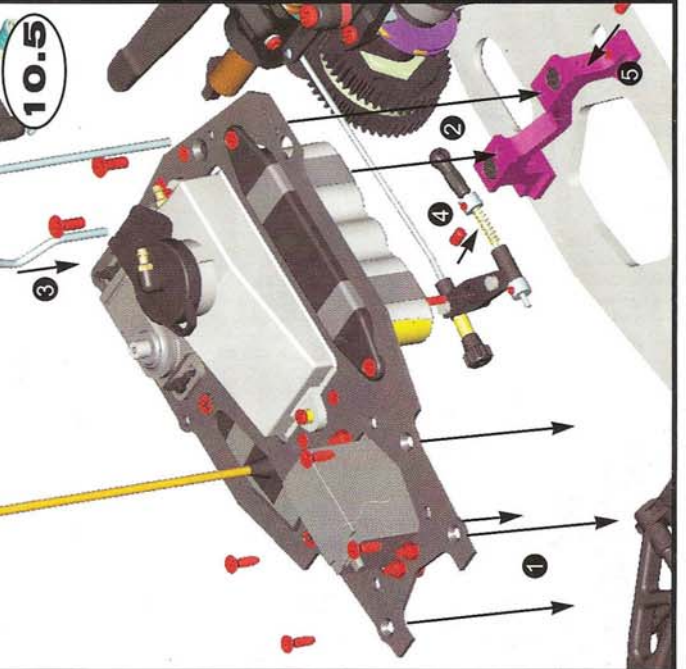
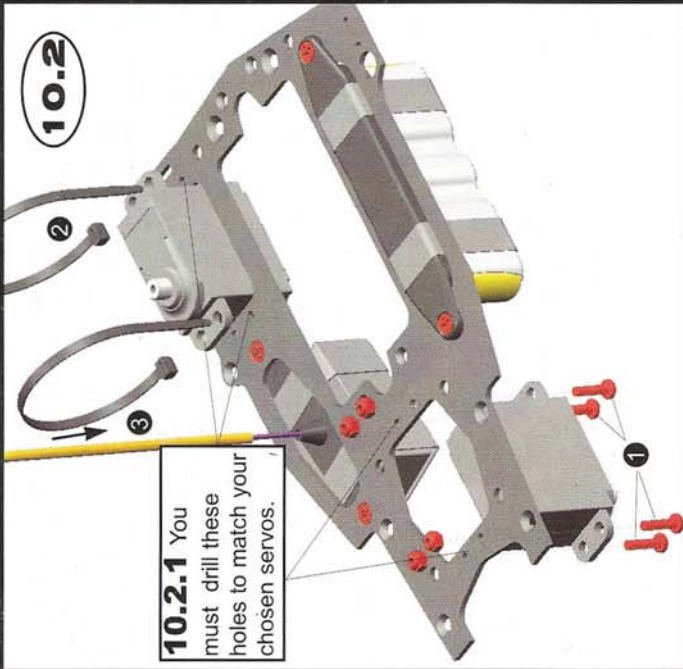


10.6



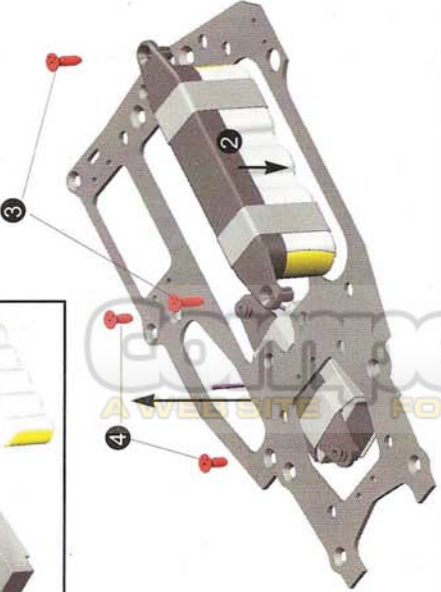
10.2

10.2.1 You must drill these holes to match your chosen servos.



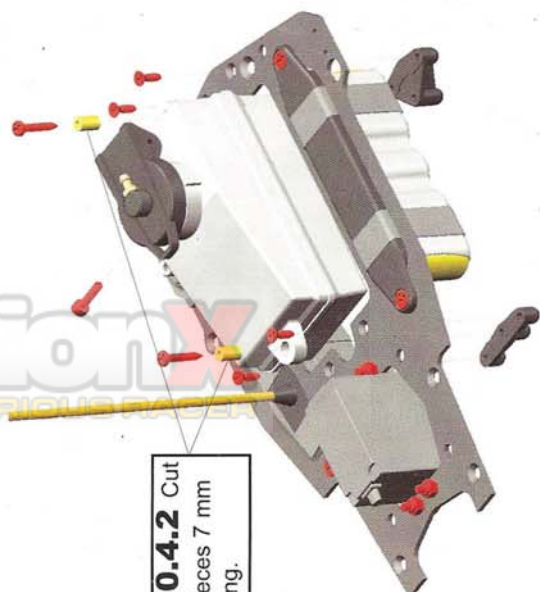
10.1

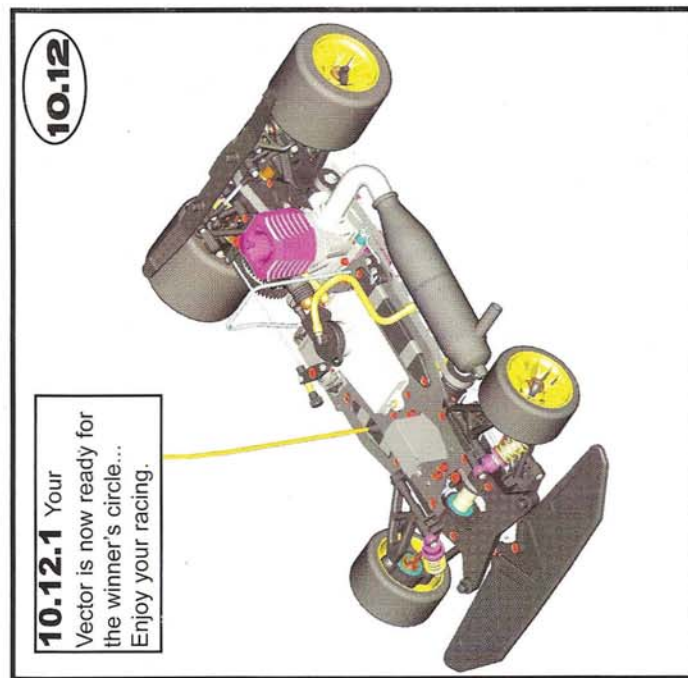
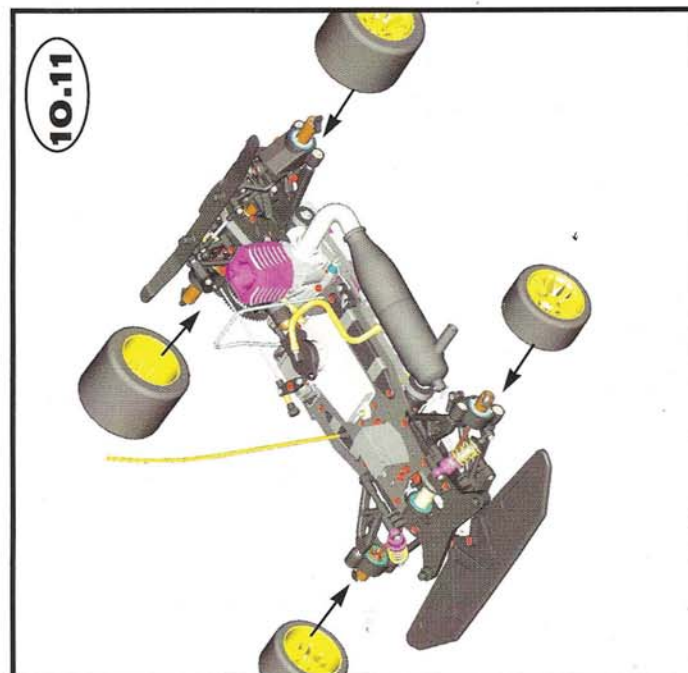
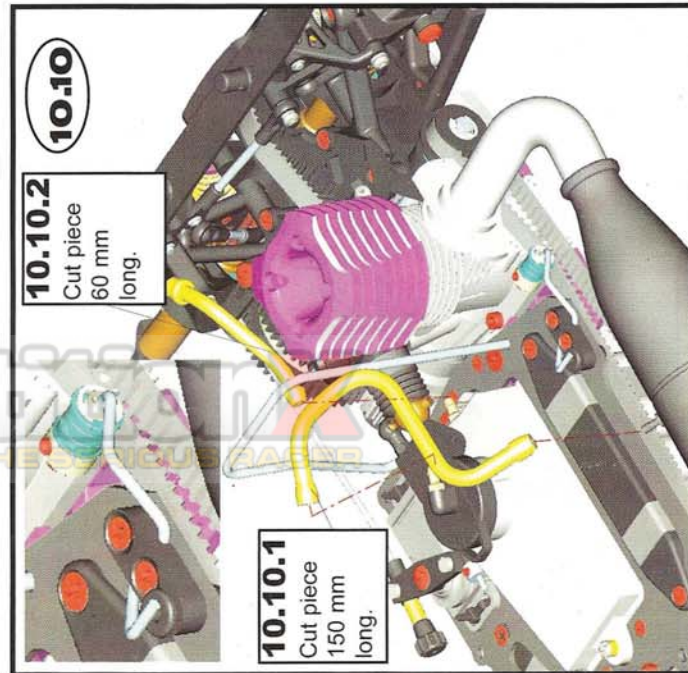
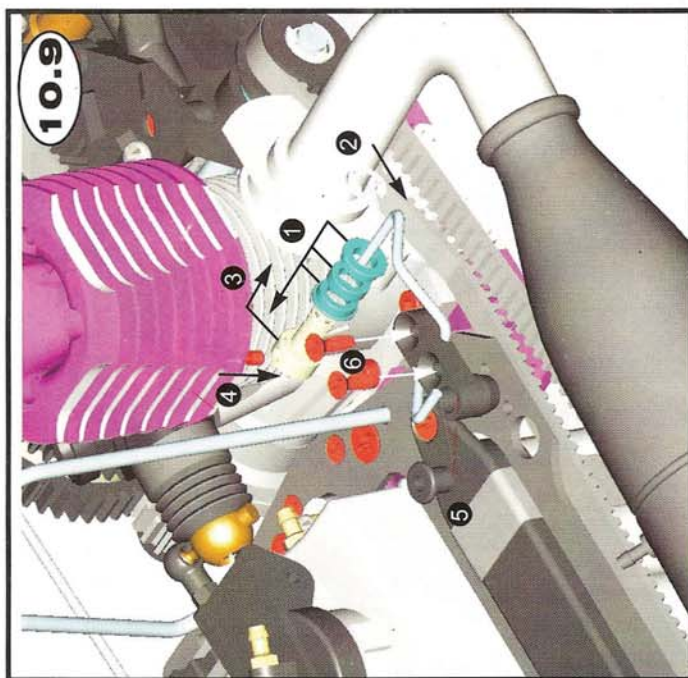
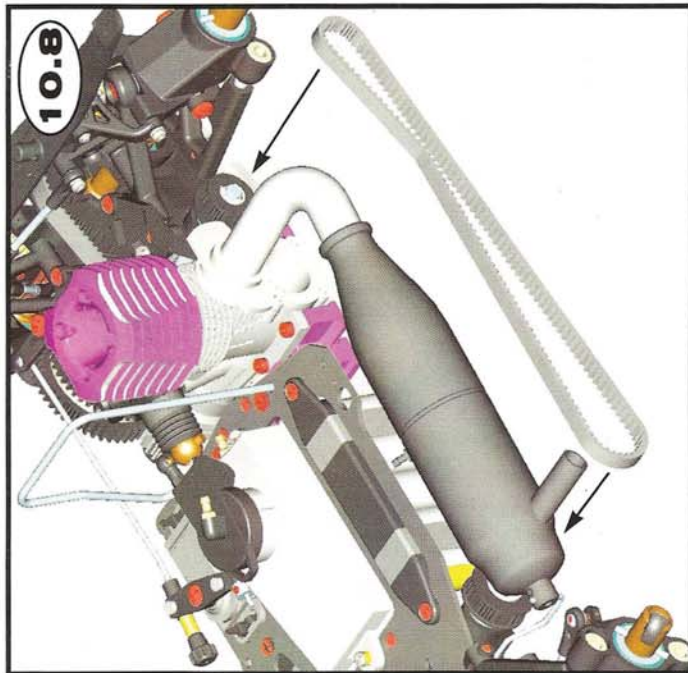
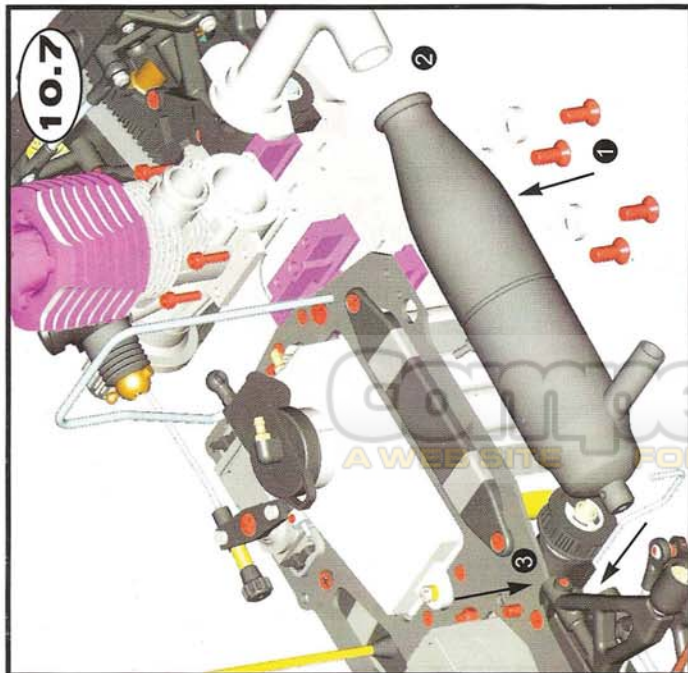
10.1.1 Attach with strong tape, shrink wrap tubing or other means.



10.4

10.4.2 Cut pieces 7 mm long.





ENGINE, STARTING, DATA-LOGGING



POWER START
COMPACT STARTERBOX FOR RC CARS



DRX-2000
DATA LOGGING SYSTEM



MEGA Racing Engines: Serpent's choice for power

Developed by Serpent's leading racer and engineer, Michael Salven, and manufactured by Nova Rossi, Mega engines offer the perfect combination of racing performance and manufacturing quality. The SX-21 series engines feature exclusive 5-transfer technology, not found in any other .21-size engine manufactured by Nova Rossi. With the 5-transfer crankcase design, gas flow is optimized for ultimate performance. The availability of both 7-and 5-port liners give you a choice of enhanced high-end or bottom-end torque characteristics. Serpent MEGA tuned pipe systems are designed especially for the MEGA SX-21 engines, and feature the smooth and reliable MasterFix header/pipe joint. MEGA Turbo glowplugs come in six heat-grades and are packed in handy plastic containers.

POWERSTART: Starting has never been easier

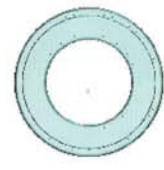
With the ultra-light, compact, high-torque Power Start you can easily fire up your engine all weekend long. Over and over again. With dimensions of only 1.9 kg (4.2 lbs.) and 12x10x31cm (5"x4"x12"), the Power Start is easily stored in your equipment cases. Two 540-type motors and two 6-cell battery packs give it outstanding, long-lasting performance. Special chassis alignment fixtures position your Vector chassis directly over the rubber starting wheel, giving you a quick and easy start. Battery power is not wasted, because the starter wheel doesn't contact the chassis. The Glow-Tronic ignitor is specially made to be fitted inside the Power-Start. It's easily mounted using two screws. This electronic glowplug ignitor is powered by the two 6-cell packs and adjusts itself to any type of glow-plug.

DATA-LOGGING: Performance through knowledge

With Serpent's unique DRX-2000 miniaturized datalogging system and the sophisticated START software package, RC racing is more exciting than ever before. With the datalogger you can record your cars' performance on the track, measure cornering speeds straight-away speed, engine temperature, servo angle, and of course, lap times. The information you record can then be evaluated in respect to the precise chassis and engine set-up information stored in the START software. You can also download sessions and set-up files from TSN on the Internet. This will enable you to compare set-ups and even track performance by overlaying speed curves. Make datalogging part of your hobby. Don't leave your experience on the track, take it home.

MISCELLANEOUS MATERIALS

(o-rings, shims, c-clips, pins, bearings, screws, bolts, nuts)

O-RINGS:	SHIMS:	BEARINGS:	SCREWS & BOLTS:	C-CLIPS:	PINS:	NUTS:	PIVOT-PINS front:	PIVOT-PINS rear:	SCALE 1 : 1
 O1, O-ring, 8x 3.1 x 1.6 mm  O2, O-ring, 4x 6 x 1 mm  O3, O-ring, 1x 10.8 x 1.8 mm  O4, O-ring, 4x 12.1 x 1.6 mm	 S1, Shim, 2x 2.5 x 6 mm  S2, Shim, 4x 7 x 13 mm (thick: 0.1, 0.3, 0.5 mm)  S3, Shim, 4x 12 x 18 mm  S4, Shim, 3x 5 x 7 mm thick 0.1, 0.3 mm  S5, Shim, 1x 10 x 16 x 0.3 mm	 B1, Ball bearing, 2x 6 x 10 mm, flanged  B2, Ball bearing, 4x 6 x 13 mm  B3, Ball bearing, 12x 12 x 21 mm  B4, Ball bearing, 3x 5 x 8 mm; flanged  B5, Ball bearing, 1x 5 x 10 mm  B6, Thrust bearing, 1x F4-9  B7, Ball bearing, 1x 5 x 8 mm	 SB1, Bolt, allen, 2x M3 x 4 mm  SB2, Bolt, allen, 10x M4 x 4 mm  SB3, Bolt, allen, 3x M4 x 6 mm  SB4, Bolt, allen, 4x M4 x 10 mm  SB5, Screw, Phillips, 4x 2.9 x 6.4 mm, r.h.  SB6, Screw, Phillips, 4x 2.9 x 9.5 mm, r.h.  SB7, Screw, Phillips, 2x 2.9 x 16 mm, r.h.  SB8, Screw, Phillips, 2x 3.5 x 9.5 mm, r.h.  SB9, Screw, Phillips, 2x 4.2 x 9.5 mm, r.h.  SB10, Screw, Phillips, 10x  SB11, Screw, Phillips, 38x 3.5 x 13 mm, c.s.h.  SB12, Screw, Phillips, 2x 3.9 x 19 mm, c.s.h.  SB13, Bolt, normal, 1x M2 x 8 mm, f.h.  SB14, Bolt, Phillips, 7x M3 x 8 mm, r.h.  SB15, Bolt, Phillips, 8x M3 x 12 mm, r.h.  SB16, Bolt, Phillips, 7x M4 x 12 mm, c.s.h.  SB17, Bolt, Phillips, 4x M5 x 12 mm, c.s.h.  SB18, Bolt, allen, 1x M3 x 10 mm  SB19, Bolt, allen, 4x M3 x 12 mm  SB20, Bolt, allen, 2x M3 x 16 mm, r.h.  SB21, Bolt, allen, 2x M3 x 8 mm, r.h.  SB22, Screw, Phillips, 8x 2.9 x 13 mm, r.h.  SB23, Bolt, normal, 2x M2 x 6 mm, f.h.	 C1, C-clip, 4x 1.9 mm  C2, C-clip, 14x 2.3 mm  C3, C-clip, 2x 4.0 mm  C4, C-clip, 4x 5.0 mm  C5, C-clip, 2x 7.0 mm	 P1, Pin, 5x 2.5 x 21.8 mm  P2, Pin, 2x 3 x 11.8 mm  P3, Pin, 3x 2.5 x 20 mm  P4, Pin, 2x 3 x 16 mm  N1, Nut, 2x nylock, M3  N2, Nut, 3x nylock, M4	 PF1, Pivot Pin, 2x 3 x 54 mm  PF2, Pivot Pin, 2x 3 x 88 mm	 PR1, Pivot Pin, 2x 3 x 46 mm  PR2, Pivot Pin, 2x 3 x 64 mm		SCALE 1 : 1



CompetitionX
A WEB SITE FOR THE SERIOUS RACER