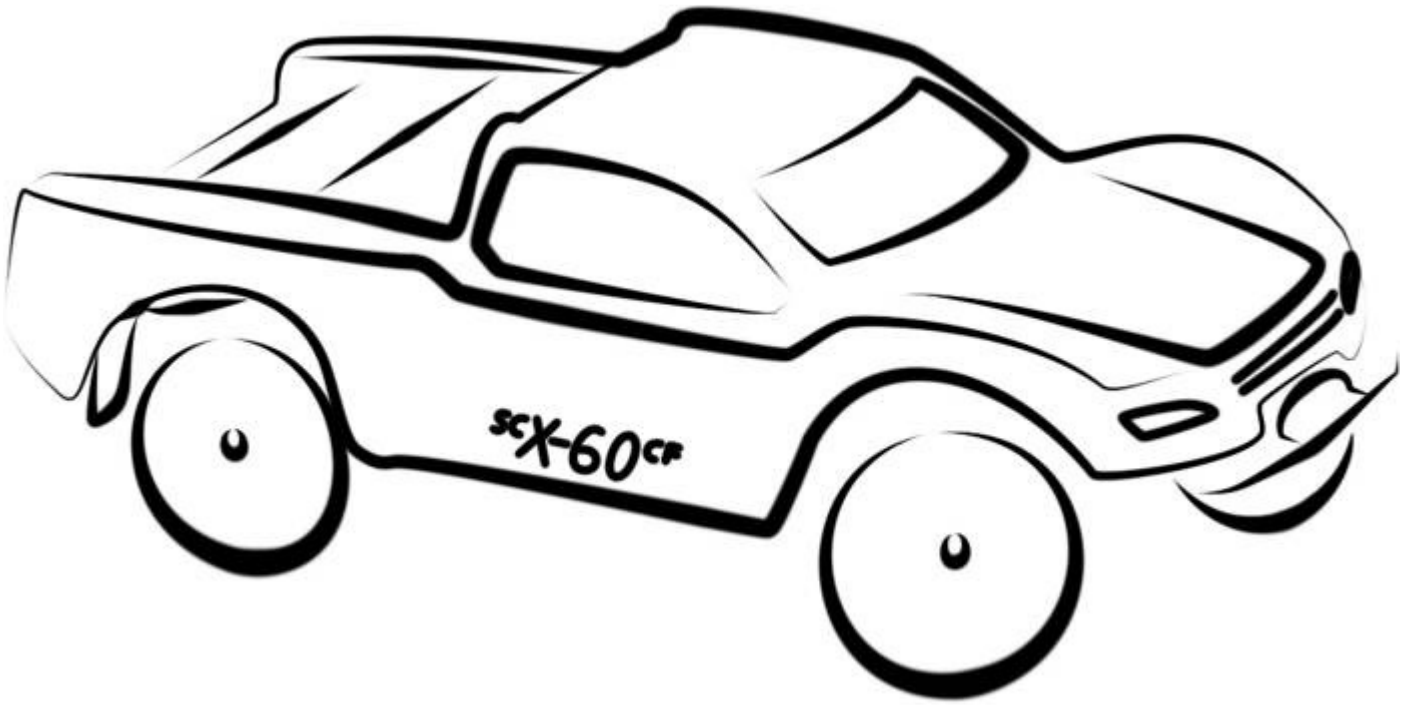
SCX – 60CF

K 026 CONVERSION KIT

INSTRUCTION MANUAL

Version 1.0



SCX – 60CF CONVERSION KIT

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SCX – 60CF ASSEMBLY INSTRUCTIONS

FIRST THINGS FIRST

A) ASSUMPTIONS These instructions assume several things:

1. You have at least some experience building R/C cars. These instructions are not written for a first-timer.
2. You have the usual assortment of R/C tools.
3. You have a Team Associated SC 10 rolling chassis, any model.

If you do not meet all the assumptions above, please contact us immediately. Contact information is on Page 5.

WE WANT YOU TO HAVE A PLEASANT EXPERIENCE BUILDING THIS KIT, AND HOPE YOU HAVE MANY PLEASURABLE DAYS DRIVING YOUR NEW SCX – 60CF. Please contact us with the slightest problem. We want to help. Talking with the Family is so much more fun than work.

B) We suggest you have a clean, well-lit work area with enough space to simultaneously do three things: Work on the truck; Store sub-assemblies for later use; Store parts no longer needed.

C) Before threading screws into any plastic part, tap holes with a 4-40 tap.

D) Many drivers use thread locking fluid when mounting aluminum parts to the CF chassis. Others do not, and make a ritual of checking these screws. Take your pick.

E) You will want to re-build many components, for example shocks, or to disassemble some assemblies for inspection and cleaning. We include no instructions for this – refer to your SC10 manual.

F) All references to right and left are from the viewpoint of the driver sitting in the car facing forward.

G) Throughout this manual the names of many parts are followed by a number in parenthesis. This is the X Factory or AE part number.

H) To photograph this manual, we assembled the truck several times. In some photos, parts you have already assembled are “missing.” We have done this deliberately so you may clearly see this particular step. Follow the steps in order and you’ll get to the end quickly.

THANK YOU SPEEDY DAD

Chris “Speedy Dad” Krieg designed the SCX – 60CF, made & assembled the first prototype (#0), engineered changes, made and assembled the second prototype (#1), and gave us the C.A.D.
Chris, we hope you like how your baby has turned out!

CARE AND FEEDING OF CARBON FIBER

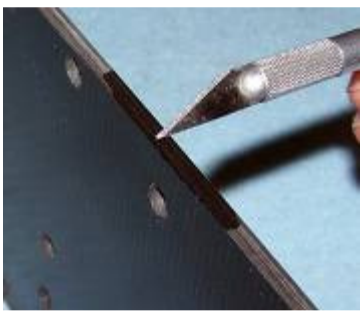
Throughout your Kit we have deliberately cut the bolt holes in the CF parts on the small side for a good tight fit. Thread them up through and then give an extra twist or two so they will be snug but free.

Carbon fiber is a laminate, much like plywood, and is produced similar to laying up fiberglass. While the material is extremely strong and light, without proper attention it can begin to delaminate, leaving a “frayed” appearance around the edges. All carbon fiber parts used in your SCX – 60CF have been CNC machine cut from flat sheets, so the edges are unfinished.

In a well ventilated area we suggest you run some fine-grit emery cloth or sand paper around the edge of all your new carbon fiber pieces. Wear a dust mask while you sand. Then, blow off the dust and run a small bead of C.A. glue, the same stuff you use to glue tires, around the edge. Spread the glue out with a hobby knife so it covers the entire edge of the part, but don’t let any drip on the shiny front or back of the part. A little dab’ll do ya. This will seal the edges.

Every few weekends take a look at the carbon fiber parts and, if any fraying appears, sand and glue to keep it to a minimum. Your CF parts will last many years.

Some drivers who race on abrasive surfaces use a protective film under their chassis to keep that carbon fiber looking great.



SOME IMPORTANT INFORMATION

We are not perfect. If you experience the slightest difficulty assembling your SCX – 60CF, either because a part does not fit properly or because you have difficulty with the instructions, please contact us immediately. Even if you figure out what needs to be done, or make a modification that allows the part to fit, we want to make changes that help the next person.

You are much more than a customer at X Factory. You have become a member of a world-wide Family of R/C racing enthusiasts who love working on their cars, trying new things, and helping others at the track. We communicate with our Family constantly, and the Family gives us ideas every day for new products and improvements on existing products. We welcome and encourage this input. Thanks in advance for your help!

Contact us by:

Web Site: www.XFactoryRC.com
FaceBook: www.facebook.com/XFactoryRC

E-Mail: youngchazz@gmail.com

Snail mail: X Factory R/C Racing Products
P.O. Box 2361
Whitehouse, Ohio 43571

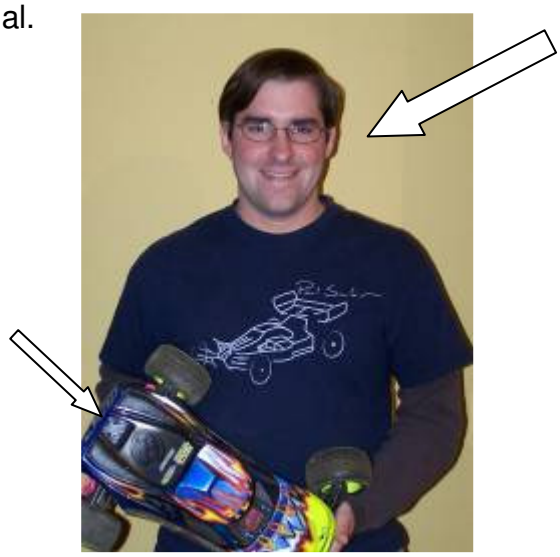
Phone: 419-887-1787 (USA)

Some bags are assembled at NorWesco Industries, Tiffin, Ohio.

These instructions are available on our web site, www.xfactoryrc.com . The photos are in color. In many instances, the color photos on the web are better than the black and white in this printed manual.

THANK YOU FOR YOUR
CONFIDENCE IN THE SCX – 60CF!

X Factory's Chief Engineer
Paul Sinclair (large arrow)
With his X – 60 (small arrow)



WELCOME TO THE

X FACTORY FAMILY!

SC 10 DISASSEMBLY

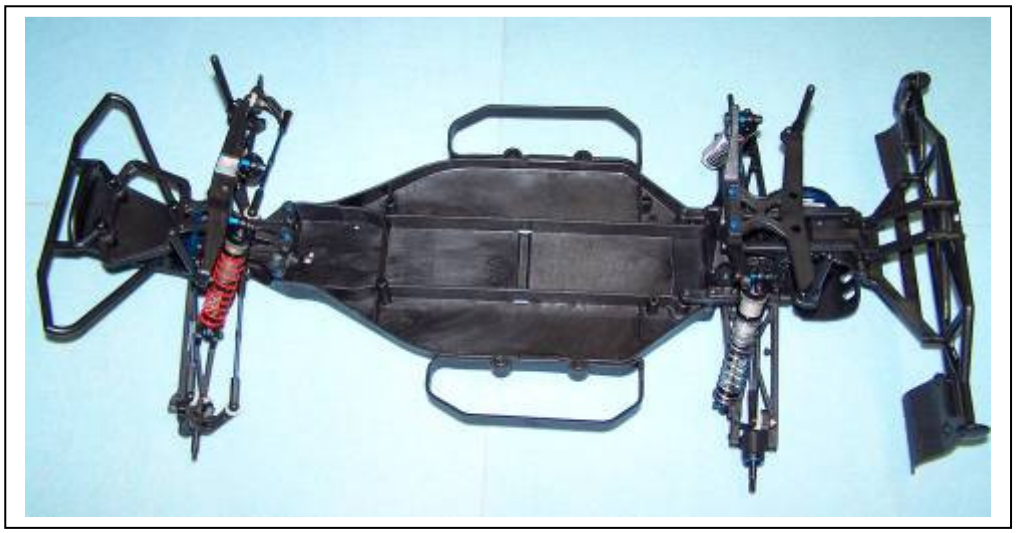
GENERAL

1) Remove the body and wheels. We suggest you store the body clips by re-installing them in the mounts, and the wheel nuts by putting them back on the axles. We will not insult you with photos for the first few instructions…

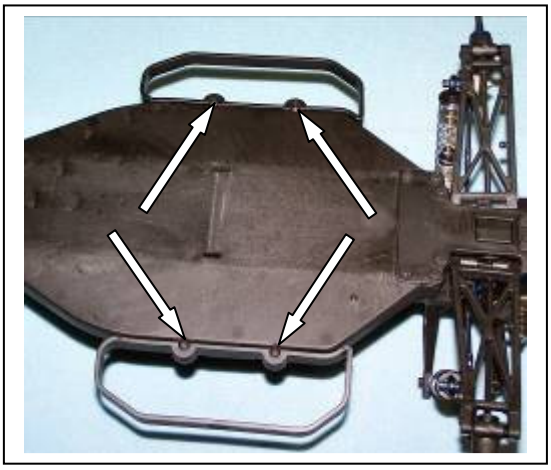
2) Remove the gear cover. You will not need this part or the screws. Take the pinion off the motor, then unsolder and remove the motor. You will need the motor and its mounting screws, and will want to save the pinion, so we suggest you put the pinion away and put the screws back in the motor for storage.

3) Remove the electronics. This includes the battery, servo, ESC, radio receiver, and antenna tube. Save these parts for re-use. Do not remove the servo mounts from the servo, simply remove the two flat head screws from underneath the chassis. Save the screws by re-installing them into the servo mounts. Disconnect the servo link from the steering bellcrank; leave the link connected to the servo horn. Do not disconnect the horn from the servo. The battery strap may be discarded. We suggest you clean the servo tape off the electronics.

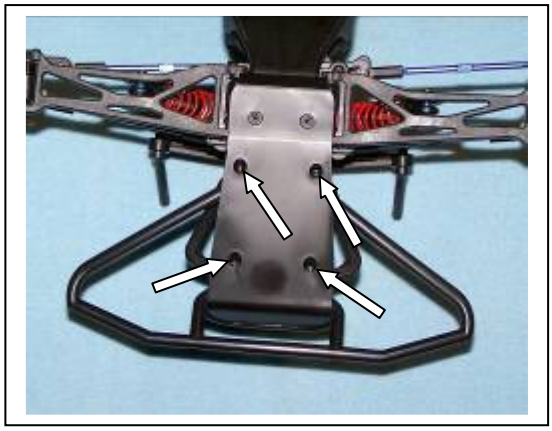
Your truck should now look like this photo:



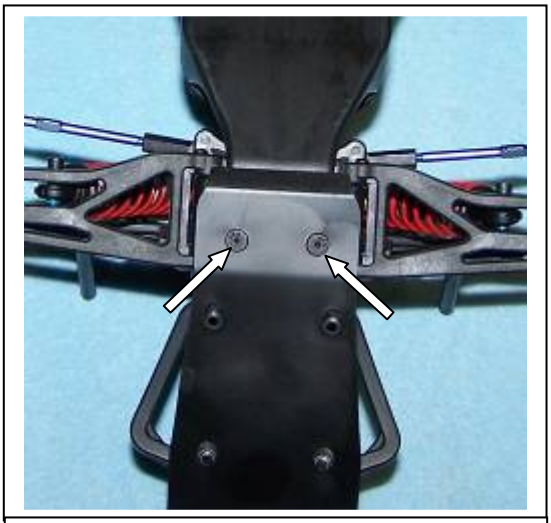
4) Remove the nerf bars by unscrewing the four button head screws from beneath the chassis. Then use a flat blade screw driver to pry up from the bottom. Save the bars & screws for re-use.



5) From beneath the chassis, remove the four cap head screws which hold the nerf bar to the front bumper. Save the bar and screws for re-use. If you put the screws a few turns back into the bars, they'll be right where you need them later.

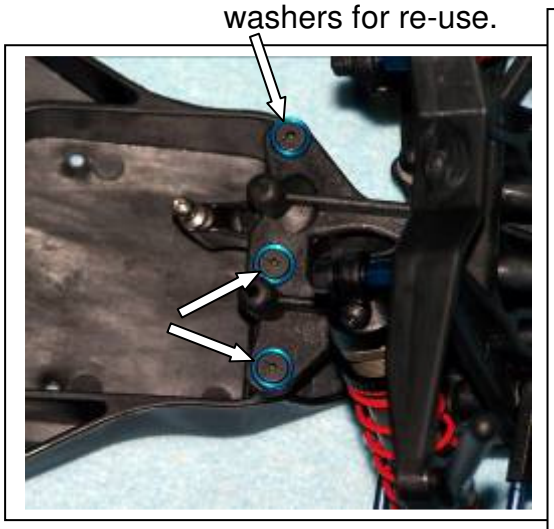


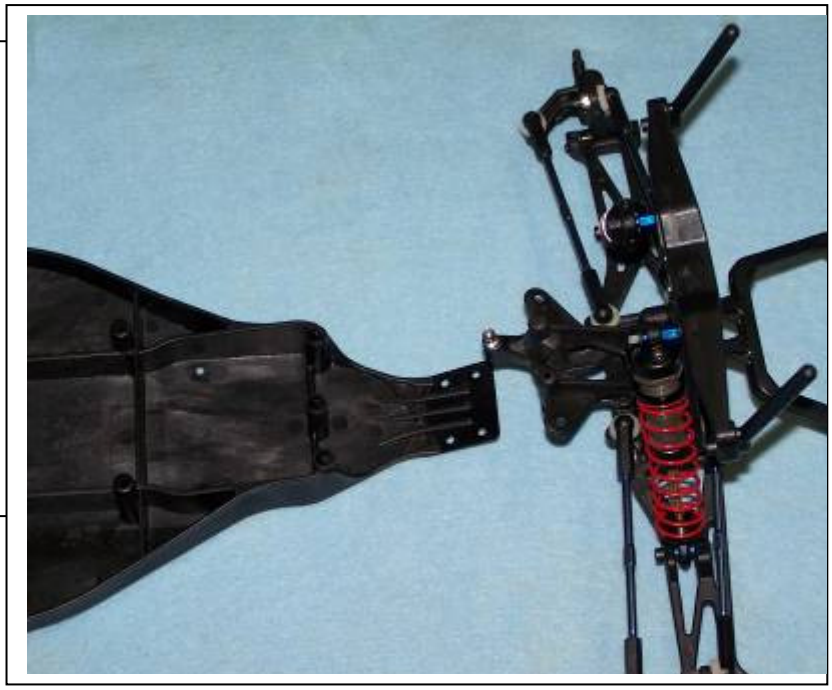
6) From beneath the chassis, remove the two flat head screws which hold the front bumper to the bulkhead. Save the bumper and screws for re-use.



7) Still working beneath the chassis, remove the two flat head screws which hold the bulkhead to the chassis. Save these screws for re-use.

8) Remove the three flat-head screws and counter-sink washers which hold the top plate to the chassis. The entire front end and steering assembly should now come off the SC 10 as a unit. Save the assembly, screws & washers for re-use.

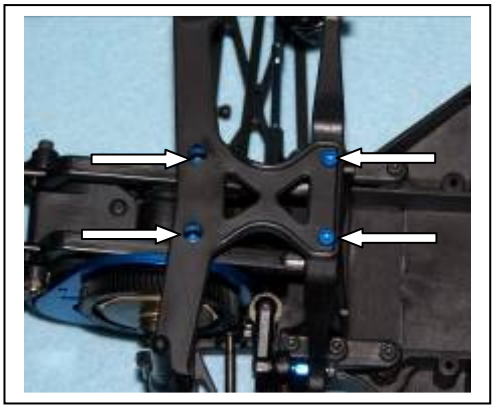




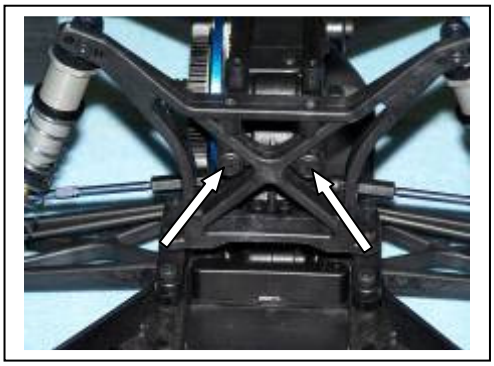
REAR END

9) Remove the four aluminum cap head screws that hold the rear body mount. Keep the body mount, but the aluminum screws will not be needed.

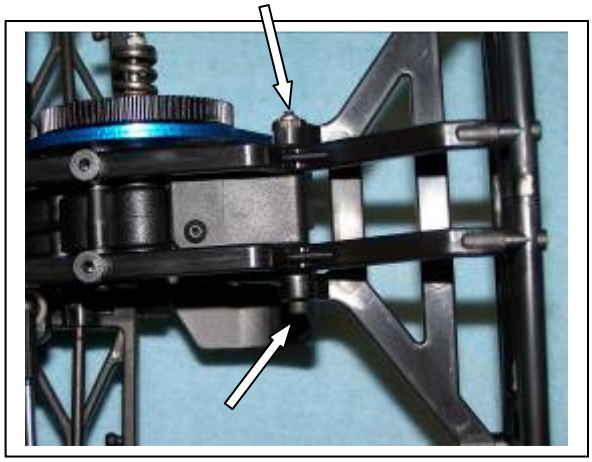
Note: We suggest you discard all aluminum screws on the truck and replace them with steel. Not only is the aluminum weak, but it tends to break when threaded into carbon.



10) Remove the two flat head screws holding the rear bumper to the shock tower.

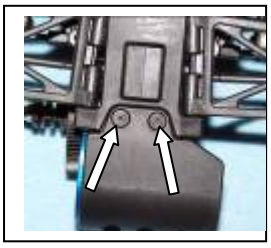


11) Remove the long bolt and captured nut that hold the two pieces of the bumper together. These will not be used.

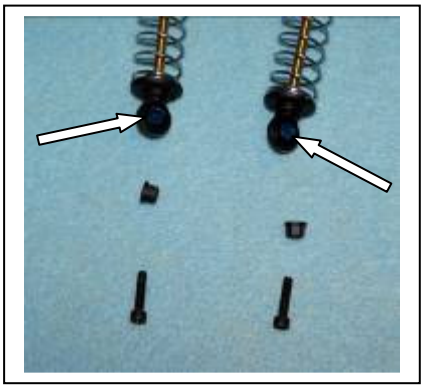


12) Remove the long bolt (long arrow) which goes through the transmission and holds the bumper brace. Loosen the three remaining bolts (short arrows) that go through the transmission into the motor plate, and twist out the bumper brace and bumper assembly. The long bolt will not be used, but leave the three trans case bolts threaded into the motor plate for now.

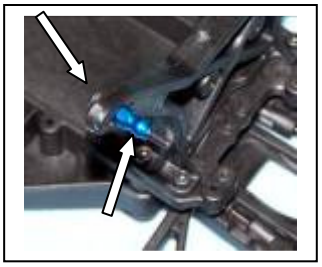
13) Remove the two button head screws from the top and two flat head screws from the bottom to take off the motor guard. Discard the motor guard, but hang onto the bolts.

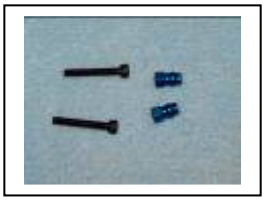


14) Remove the rear shock assemblies. From each side, take out the bottom bolt, then remove the plastic nut from the top. Save shocks and their bolts & nuts. Don't lose the aluminum bushing in the bottom shock eyelet!

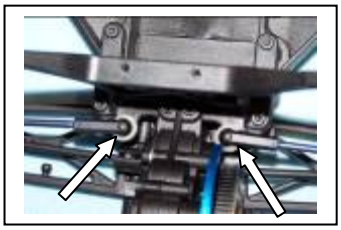


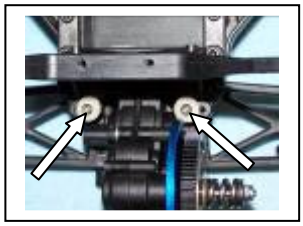
15) Remove and save the upper shock bolts and bushings.



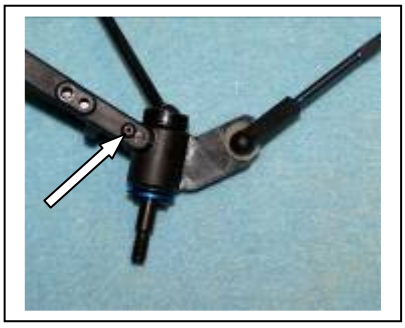


16) Twist the camber link inner ball cups off their ball studs, then remove the ball studs. Leave the camber links attached to the hub carriers; save the ball studs and any washers that were under them.



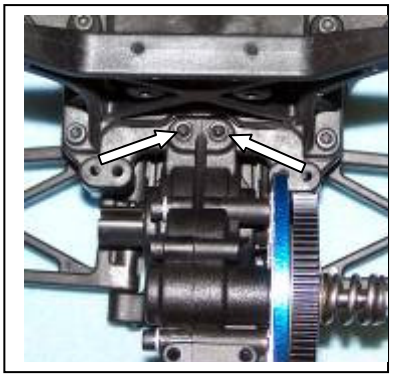


17) Remove the rear hub carriers with the C.V.D. assemblies still in them and the camber links attached to the hubs. Do this by removing the tiny 2-56 button head screw (left photo) and pushing the hinge pin out with an Allen driver. Be very careful not to lose the shims on the hinge pins. Save these entire assemblies for re-use: The hub carriers, shims, hinge pins, and especially those pesky little screws.



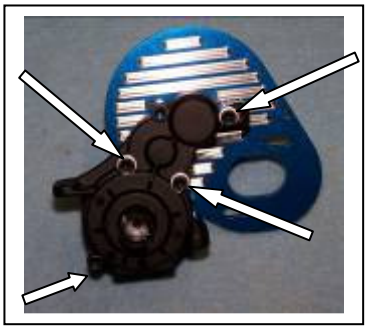
TRANSMISSION

18) Remove the two cap head screws that hold the transmission in the truck, and remove the transmission, motor plate, and slipper assembly as a unit.



19) Remove the 5-40 nut which secures the slipper assembly, and pull off the nut, spring retainer, spring, outer slipper plate, outer slipper pad, spur gear, inner slipper pad, and inner slipper plate. Put away the spur gear, then save all the other slipper parts for re-use.

20) Remove the three long cap head screws (long arrows) from the transmission and take off the motor plate. Then remove the last shorter cap head screw (short arrow), and separate the transmission case halves. You may discard the motor plate; save the bolts and washers for re-use.



21) Remove the transmission components. The case will not be needed, but you will need the top shaft and spacer, two 3/16" X 3/8" bearings, idler gear with its two 3/16" X 3/8" bearings and shaft, and the differential assembly. The outdrive bearings will not be retained.

That's it for disassembly. Now let's build a really dialed race truck!

BAG A

TRANSMISSION

We've got all the parts in front of us, so let's build the tranny.

BALL DIFFERENTIAL

The SC10 diff uses metric outdrives and the X Factory 4-Gear transmission uses the U.S. measurement, so we'll re-build the whole thing now.

A1) Hold the outdrive with the T-nut (AE6575) in one hand and insert the Allen driver through the white protector cap (AE6575) and into the head of the diff thrust bolt (AE6573). Unscrew the bolt. Use the T-nut to push the bolt through the diff and out. The white cap will come with it; set it aside for re-use. Make sure the thrust bearing stays on the diff bolt – and don't lose any of the six little balls! Take the thrust balls (AE6574) and washers (AE6573) off the bolt. Clean the balls, washers, and bolt, and set them all aside with the cap

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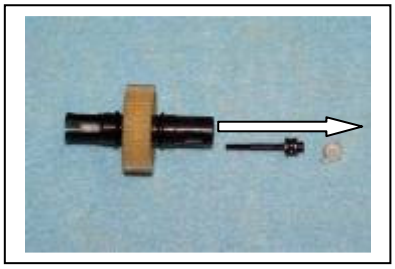
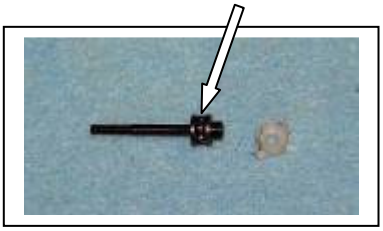
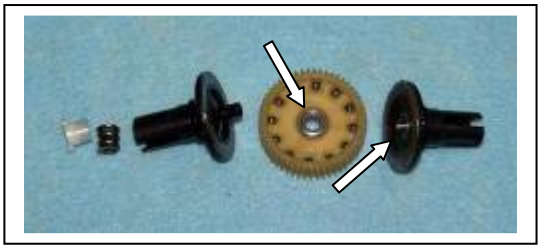


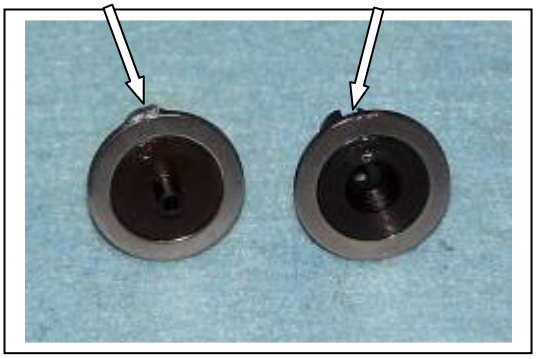


A2) Take the rest of the diff apart. Be sure to remove the T-nut and spring (AE6582) from the male outdrive. One diff bearing (XF 6204) should stay in the diff gear. The other may fall out or it may stay in the female outdrive. Whatever…

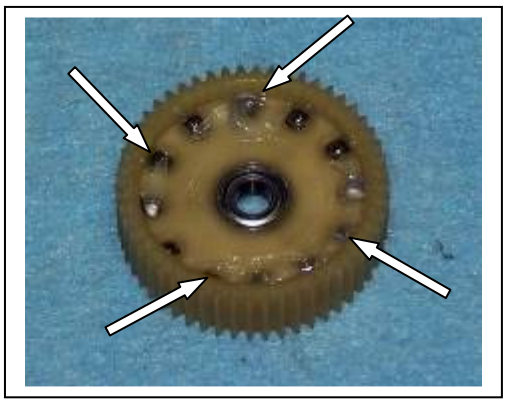


A3) Remove the 12 diff balls (XF6500) and bearing from the gear (AE7664). Clean the balls and gear and set them aside to air dry. Clean and re-lube the two diff bearings, using just a drop of good bearing oil. Set the spring and T-nut aside with the gear, balls, and bearings. This leaves the outdrives in front of you. Remove the diff rings and clean them. Our second diff bearing wanted to stay in the outdrive, so we removed it now. The rings will be used in step A4 below. Metric outdrives can be discarded.

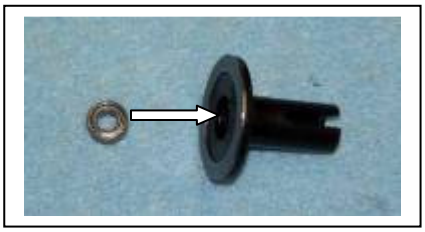
A4) Check your diff rings for wear. If they're not new, there will be a thin line on the face of each one where the balls run. Darker line = more wear. You can use both sides of the rings, so if one side has not been used, flip them over. Carbide diff balls like X Factory's #6500 are much harder than the rings, so one set of balls should last through several sets of rings. Many X Factory drivers prefer B Fast diff rings for smoother, longer-lasting diffs. Take the new outdrives (AE7667 & 7668) from Bag A and on each one put a small drop of diff lube on one part of the edge where the ring will go (left photo). This grease does not lubricate, it merely holds the ring on during assembly. Grease attracts dirt (bad) so use as little as possible here. Wipe off any excess grease (right photo).



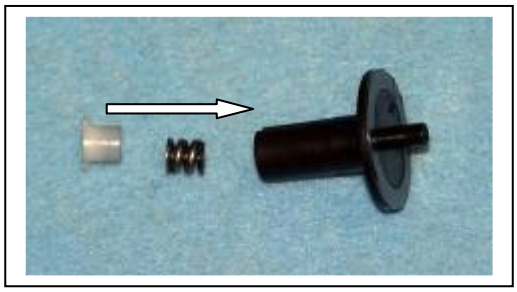
A5) Re-install the diff balls and one diff bearing into the diff gear. Put a small amount of diff lube on one side of each of the balls. We used too much in the photo so you can see the lube. You need surprisingly little lube, and excess is just thrown off inside the transmission case. Many X Factory Team drivers use B-Fast Pro Lube.



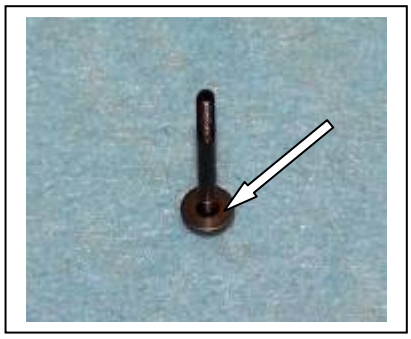
A6) Install the second diff bearing into the female outdrive.

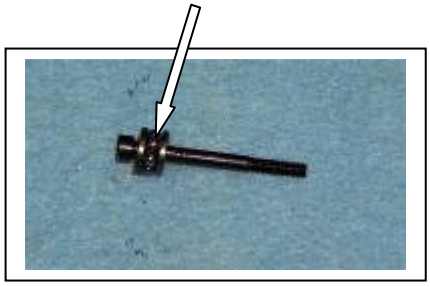


A7) Install the spring and T-nut into the male outdrive. Be certain the lugs on the T-nut engage properly in the slots of the outdrive. Set aside until A10.

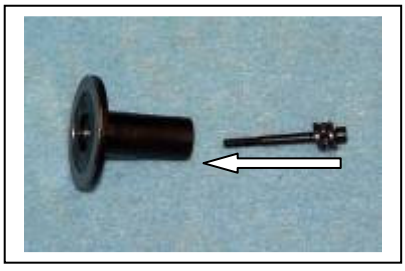


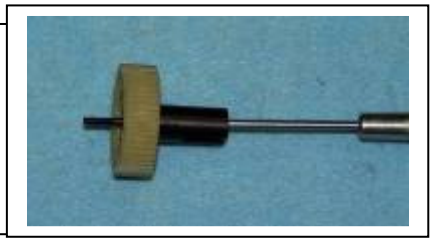
A8) Check the thrust washers for wear. They wear just as the diff rings do, and are also reversible. Stand the diff bolt up on end and install one washer on it with a new side up (left photo). Put some thrust grease all around the exposed surface of the washer and place the six thrust balls on the washer (center photo). We use a magnetized screw driver to pick up and place the balls. Then slide the other washer over the bolt, good side down (right photo). Don't use too much grease here – the assembly must be well lubricated BUT excess grease cannot escape and can cause the diff to malfunction! So after the inner washer is installed run your finger around the outside of the bearing assembly to remove any excess grease.



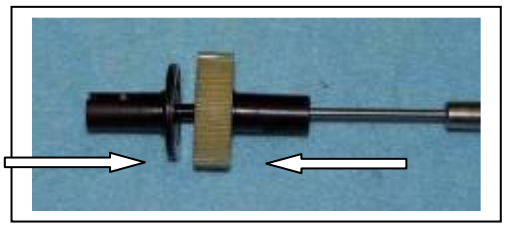


A9) Put the thrust bolt, with thrust bearing, on your Allen driver, and install the bolt into the female outdrive (center photo). Leave the driver engaged in the bolt through step A 10. Now put the diff gear, with balls and bearing, over the bolt so the diff balls contact the diff ring (right photo).

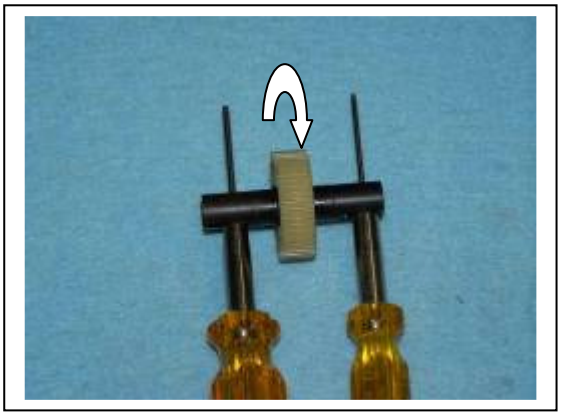




A10) Now slide the male outdrive from step A7 into the female outdrive assembly from step A9. Slide the diff bolt through the male ourdrive and screw it into the T-nut. Do not tighten very much yet. See A11 below.



A11) As the bolt begins to tighten, stop every revolution or two, remove the wrench, and rotate the two outdrives at the same time in opposite directions while pushing them together (left photo). This helps seat the balls, rings, and thrust bearing while it distributes the grease. Keep tightening and rotating until there is a bit of tension on the bolt. Now put an Allen wrench through the slots of each outdrive, hold the wrenches still, and rotate the diff gear, Continue tightening the diff bolt, twisting the outdrives and checking with the wrenches, until the gear will no longer rotate at all between the outdrives. (right photo). As soon as the gear is driving the outdrives, stop right there. Be sure the outdrives will still rotate against each other. This will be a starting point for diff break-in and final adjustment.



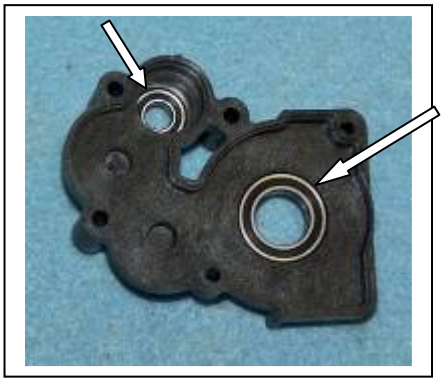
CLEAN & INSPECT

A12) We suggest you clean and inspect the rest of the SC10 transmission parts at this time. If you re-lube the bearings, make sure the outside is clean and dry so they do not attract dirt. You need the following items from your SC10: the assembled diff with both outdrive bearings (XF6903), the idler gear (AE9360) with its shaft (AE9361) & two 3/16 X 3/8 bearings (XF6202), and the top shaft (AE9601) with its spacer (AE9602) & two 3/16 X 3/8 bearings (XF6200). Replace parts as necessary.

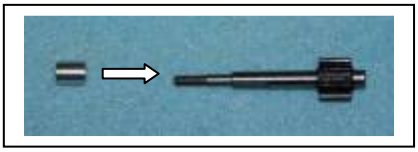
ASSEMBLE THE SCX – 60CF TRANSMISSION

A13) Remove the transmission case (XF5001) from Bag A and separate the two halves. Note the small round ejector pin bosses on the mounting tabs. You may wish to file these flat for ease of installation in the truck.

A14) Install a 3/16" X 3/8" rubber sealed bearing (XF6200) all the way into the top shaft boss in the left transmission case half (short arrow) and a 3/8" X 5/8" rubber sealed bearing in the boss for the differential. The Team pushes them in with the shank of an Allen driver or, better yet, with a socket. See Inst. A16.

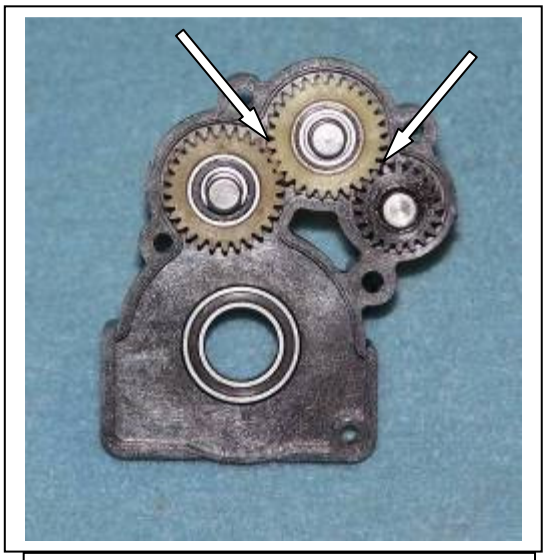


A15) Make sure the spacer (AE9602) is on the top shaft (AE9601) and slide the shaft with spacer through the bearing in the transmission case. If your top shaft is worn, you will want to try our one-piece steel top shaft (XF5210) made for us by M.I.P. No more spacer to lose and longer wearing too!



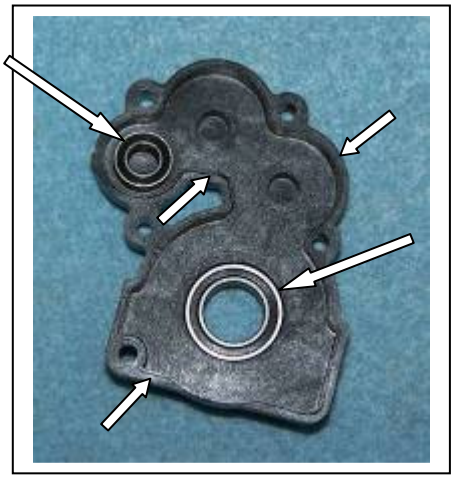
A16) Gather together the idler gear from the SC10 (AE9360) along with its 3/16” X 3/8” bearings (XF6202) and shaft (XF5201) along with the same parts from bag A so you have two gears, two shafts, and four bearings. Install a bearing into each side of both idler gears. Team drivers do it by pushing on the outer race with a socket.

A17) Slide an idler shaft through the bearings in each idler gear, then place the shafts in their bosses in the left transmission half. Be certain all gears mesh properly and the transmission turns smooth and free.

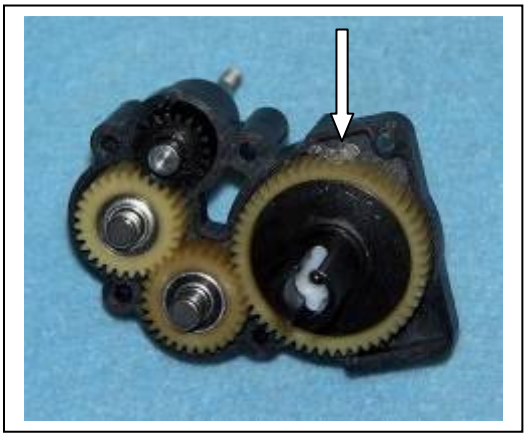


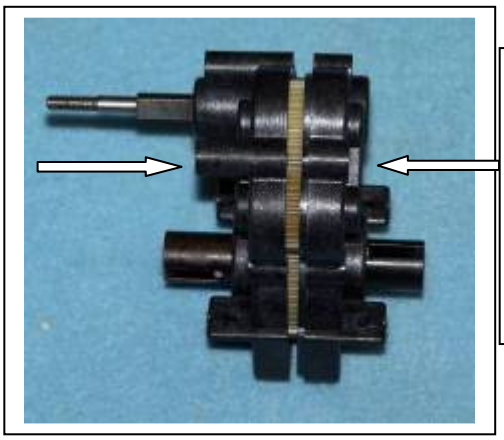
A18) Install the diff in the left transmission case bearing, ensuring it meshes properly with the idler gear. The head of the diff bolt should be up. Again, the transmission should be free and smooth.

A19) Install the remaining 3/16” X 3/8” rubber seal bearing and 3/8” X 5/8” bearing into their bosses in the right transmission case half. (long arrows) There is a small hole in the case where the top shaft bearing goes so you can use a hex wrench to push out the bearing. Some drivers like to run a small bead of inexpensive grease around the mating surface of the right transmission case half. (short arrows) This grease is to seal out dirt, not to lubricate anything, so be thorough but don’t over-do it. Other Team drivers have discovered that the X Factory 4-Gear transmission case seals so tightly that they do not use the grease. It’s your choice.



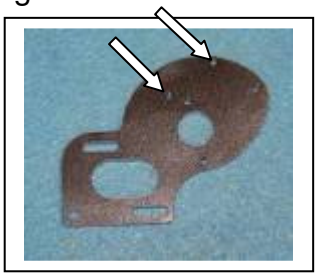
A20) Some Team drivers put a small glob of grease on the diff gear to lubricate the transmission. That little glob will be spread throughout all the gears as the trans turns, so one little one is all that’s needed. Other Team drivers use no grease, saying the trans is freer that way. Pay your money and take your pick. Carefully put the two halves of the transmission together, sliding the outdrive through its bearing, the two idler shafts into their bosses, and the top shaft into its bearing. Make sure everything rotates very free and smooth. No hitches, no slow-downs. Now is the best time to fix any problem. Wipe any excess grease from the outside of the case.

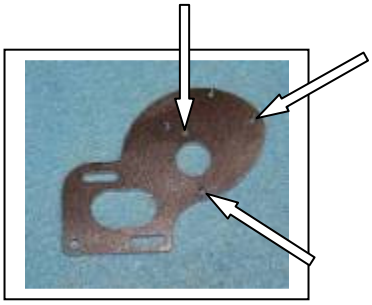




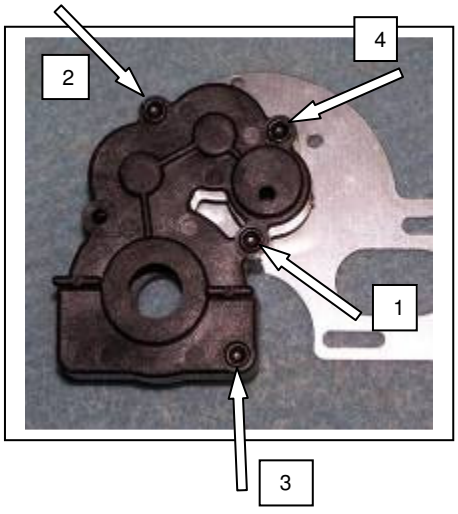
A21) Install the 4-40 X 3/8” cap head bolt (XF6001) in the lower corner of the trans case, just finger tight for now to hold things together.

A22) The X Factory 4-Gear motor plate (XF1232) has two “extra” holes (left photo) which are useful to install the optional ES008 heatsink and fan. Arrows in the right photo point to the three holes that attach the motor plate to the transmission. Team drivers put a drop of threadlock now in these three holes. Don’t put the threadlock on the bolts as it will come off going through the transmission.

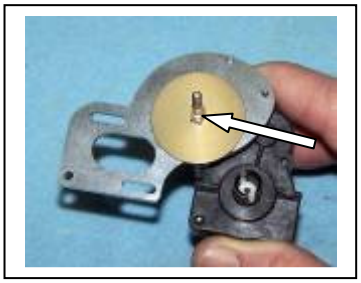




A23) Insert the three 4-40 X 1” screws through the three holes that go into the motor plate and attach the motor plate (arrows). The center rear hole will not be used on the SCX – 60CF due to a clearance issue. Use a crossing pattern to tighten all four trans bolts to equal tightness. Check one last time that the transmission rotates free and smooth. This is your last chance!

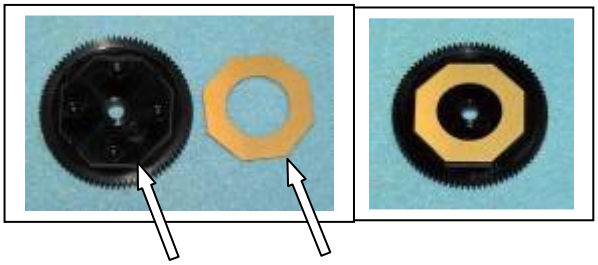


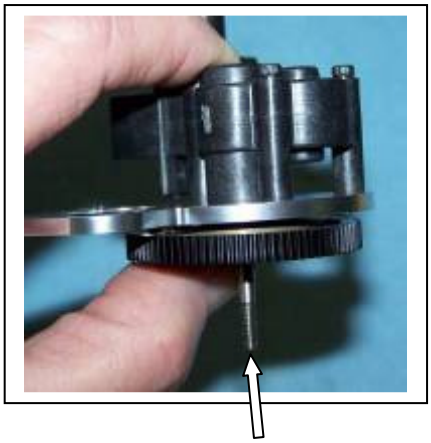
SLIPPER INSTALLATION



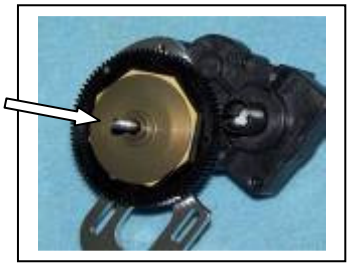
A24) Install a slipper plate onto the top shaft, flat side out. The flats inside the plate will key to the flats on the shaft.

A25) Put a slipper pad on the 78 tooth spur gear supplied in your Kit – the larger one from the SC10 will not fit. (left & center photos). The hex of the pad fits into the molded hex in the gear. Now turn the transmission so the top shaft with slipper plate is facing down. Hold the plate on with your thumb and slide the spur gear, pad side up, onto the shaft so the pad & gear are tight against the plate. Keep pressure on the spur so the pad stays in its hex until step A27 below. This is so much easier to do now than when the transmission is in the truck!

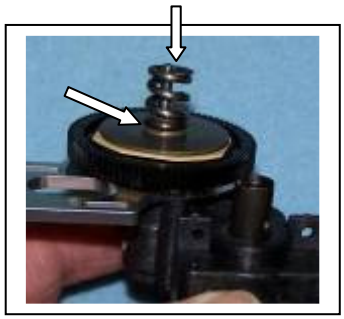


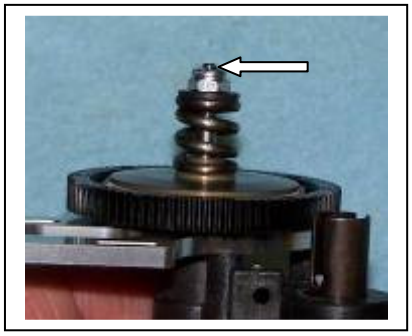


A26) Turn the transmission back over so the top shaft is pointing up, but be certain the slipper pad remains engaged in the spur and the spur is tight against the plate. Put the second slipper pad in its place on the spur and slide the second slipper plate, flat side down, onto the shaft.



A27) Install the spring on the shaft so it goes around the slipper plate's hub, then place the black retainer over the spring, flat side up. Install the 5-40 nut to hold it all together, tightening until there is one thread of the shaft showing. Final adjustment later.





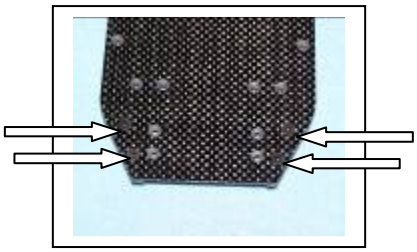
Whew! Hardest bag is done. Longest bag we've ever written!

Set the trans aside and let's do the front end.

BAG B

NOSE PIECE

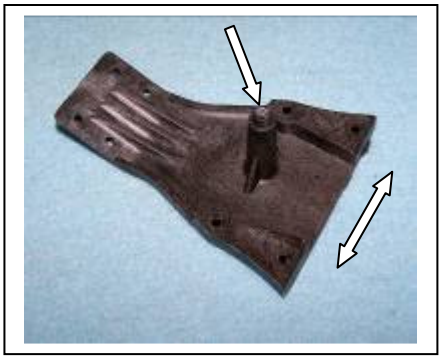
B1) Thread the four 4-40 X 5/8" flat head screws up from the bottom of the chassis through the outside front holes.



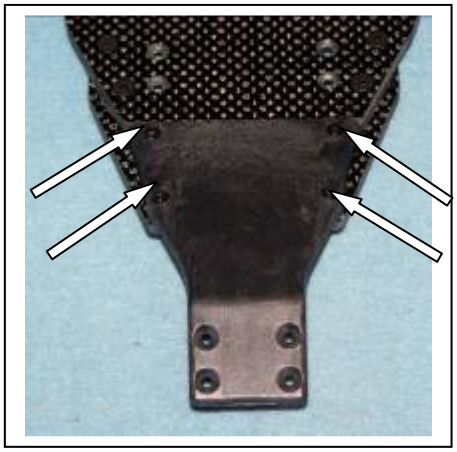
B2) Place the nose bridge spacers (XF1531) over the screws from B1 above.

B3) Place the nose bridges (XF 1530 long arrows) over the spacers & screws and secure with locking nuts (XF6071 short arrows).

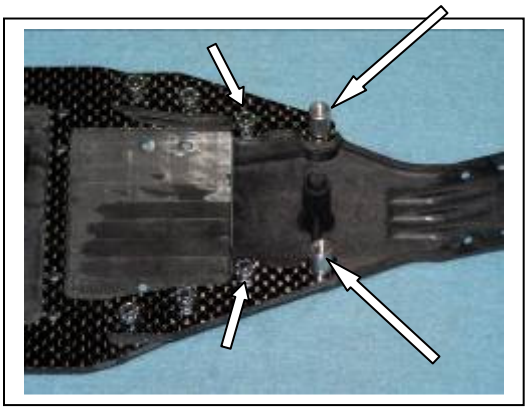
B4) Take the nose piece (XF1002) out of Bag B and check it for flashing, especially at the rear and on top of the post. We need good snug fit with the chassis and especially where the top deck fits on the post.



B5) Turn the chassis over and put the nose piece in place. Secure to the nose bridges with four 4-40 X 1/2" cap head screws (XF6002).



B6) From above the chassis, place locking nuts on the two rear screws that hold the nose piece (short arrows). If you use thread lock, place a drop in one end of each 13/32" stand-off (XF6803) and screw that end onto the front two screws (long arrows). Tighten the stand-offs securely.

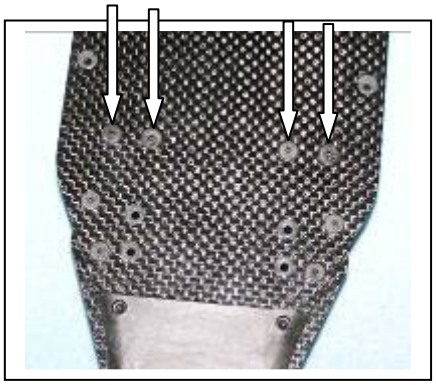


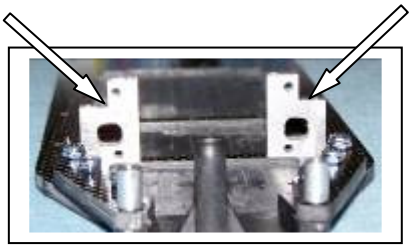
BAG C

FRONT END ASSEMBLY

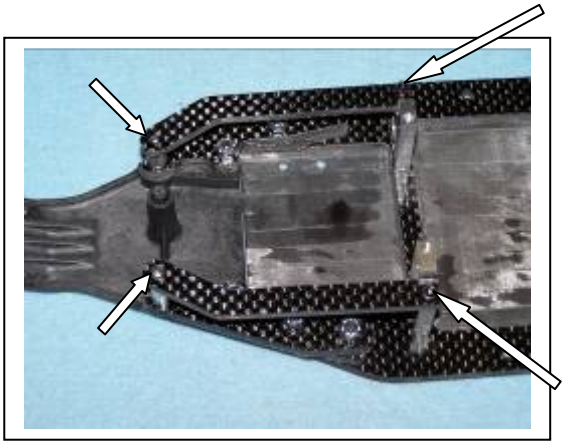
FRONT DECKS

C1) If you use thread lock, put drops in the bottom holes of the front top deck supports. Insert four 4-40 X 3/8" flat head bolts up from under the chassis and attach the front top deck supports (XF1400) to the top of the chassis. We suggest you locktite these screws.





C2) Now use the two 4-40 X 3/8" cap head screws (XF6001) to attach the rear of the front decks (XF1500) to the lower part of the top deck supports (long arrows). Leave these screws finger tight for now so the front of the parts will move a bit. The hole in the front should line up with the stand-off (short arrows) but no screws in here yet.



FRONT END & BUMPER

C3) Place the complete SC10 front end on the nose piece so the AE top deck (AE9566) is above the front decks and ready to screw into the stand-offs. It doesn't matter what order you use to screw in the front end assembly; we find it easiest to put the two 4-40 X 5/8" flat head screws you saved up from under the nose piece first because this holds it all together. Finger tight for now.

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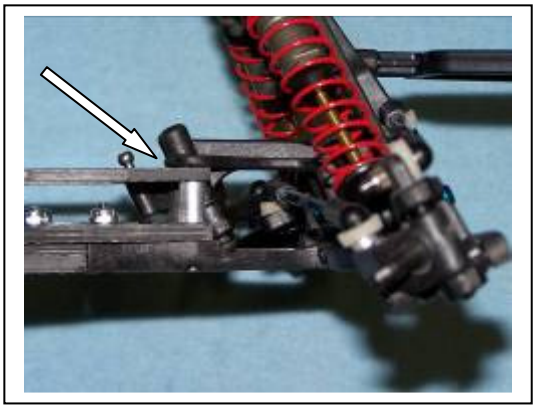
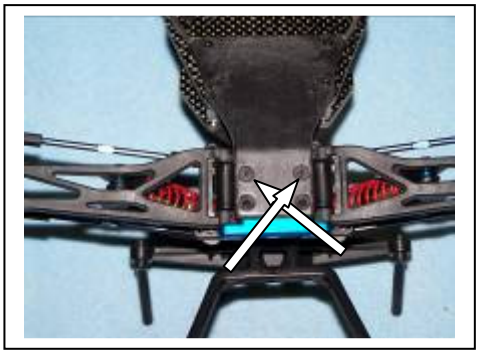
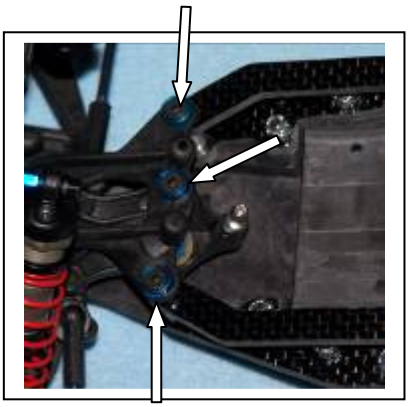
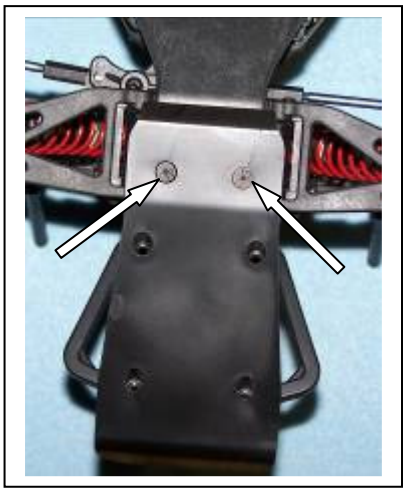




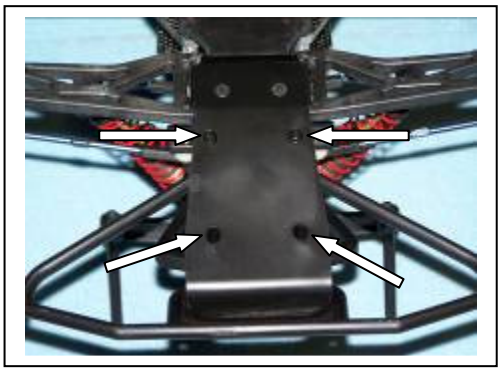
C4) Install the three bolts to hold the top deck to the front deck & standoffs and to the nose piece. Then put final torque on the two rear top deck bolts from C2.



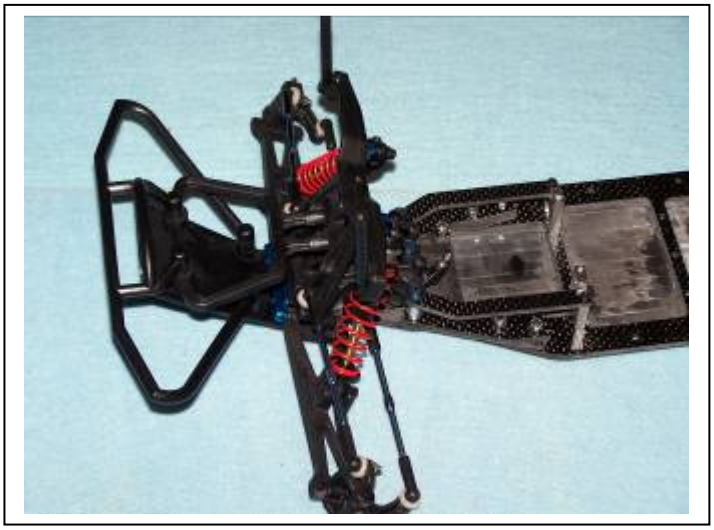
C5) Put the front bumper on the truck using the two 4-40 X 5/8" flat head bolts you saved.



C6 Position the nerf bar over the front brace and on the bumper surface just as it was on the SC10 and secure it with the four 4-40 X 3/8” cap head bolts you saved.



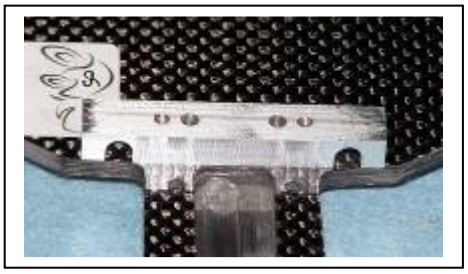
That’s it – front end is done!



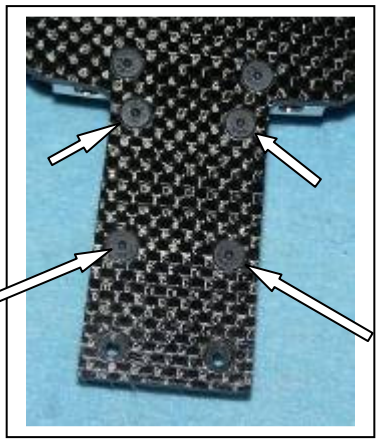
BAG D

TRANSMISSION INSTALLATION

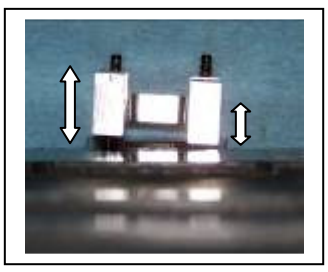
D1) If you use thread lock, do the two tapped holes of the hinge pin brace. Put two 4-40 X 3/8" flat head screws up from the bottom of the chassis to install the hinge pin brace.

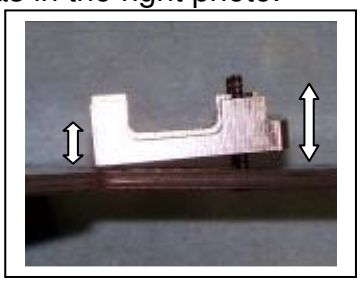


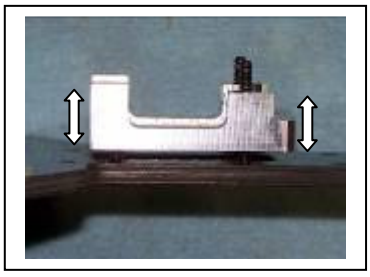
D2) Put two 4-40 X 1" flat head bolts (long arrows) and two 4-40 X 3/8" flat head bolts (short arrows) up from the bottom of the chassis to bolt on the transmission cradle. 1" bolts to the rear, 3/8" to the front. The very back chassis holes will be used later.



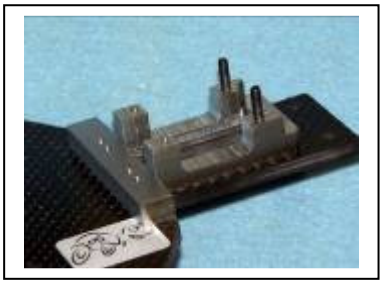
D3) Now install the transmission cradle (XF5030). If you use thread lock, do only the two front holes. The two rear holes are not tapped, but you will want to twist the 1" bolts to help the cradle slide down. You want to twist a little bit on each bolt in order to keep the cradle level as you install it. "Walk" it down. Don't let it get on a large angle as in the left and center photos. Keep it level, as in the right photo.





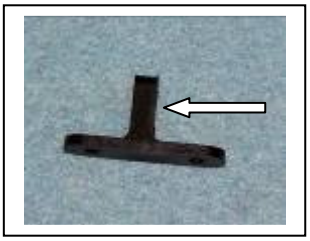


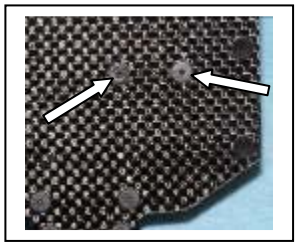
D4) When installed properly, the brace and cradle look like this.

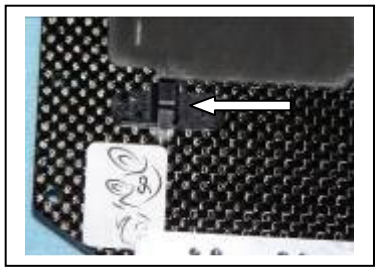


ONWARD TO THE TRANSMISSION!

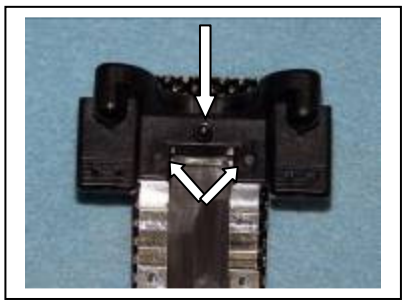
D5) Install the motor plate brace (XF1130) with two 4-40 X 3/8" flat head screws coming up from under the chassis. Leave them finger tight for now. Note that the brace is offset to the left.

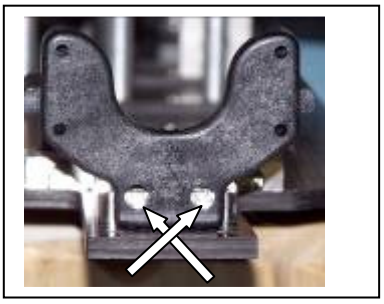




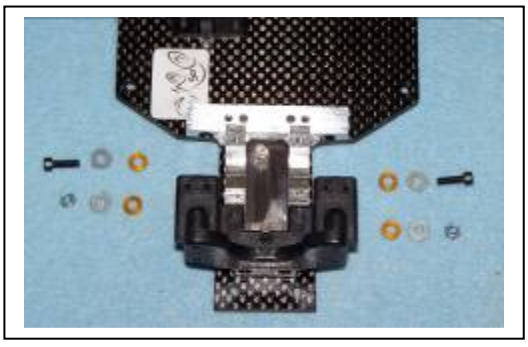


D6) Install the rear bulkhead (XF1310) onto the rear of the transmission cradle with a 4-40 X 1/2" cap head screw (long arrow). The bulkhead should slide over the two screws extending up through the cradle. The two holes at the bottom rear of the bulkhead are not used on the SCX – 60CF.



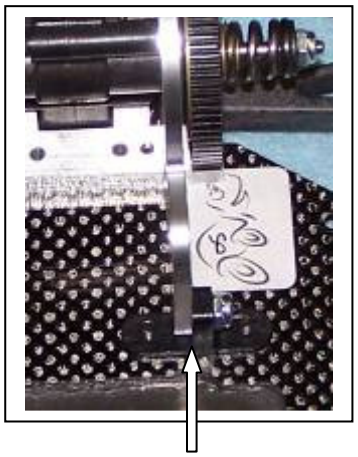


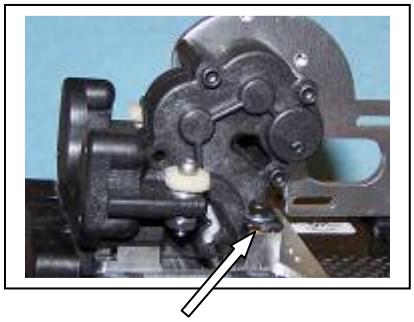
D7) Gather together two 4-40 X 3/8" cap head screws, two 4-40 mini nuts (XF6073), and four #4 flat washers (XF6080). Check the tuning section and set-up sheet to determine which transmission shims (XF5702) you will use, get those four shims out of the bag, and save the others. Here we are



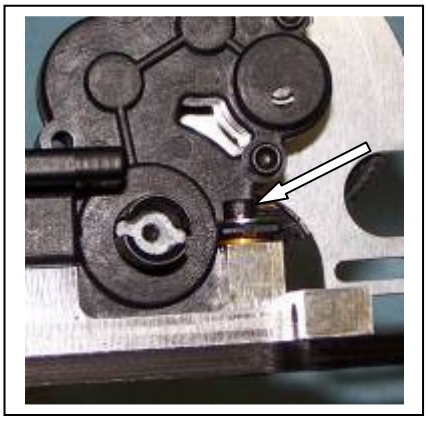
using the 0.060” shims.

D8) Place the four shims on the four posts of the cradle and put the transmission into the cradle. Be sure the shims stay in place (bottom photo) and the motor plate lines up correctly with its bracket (right photo).

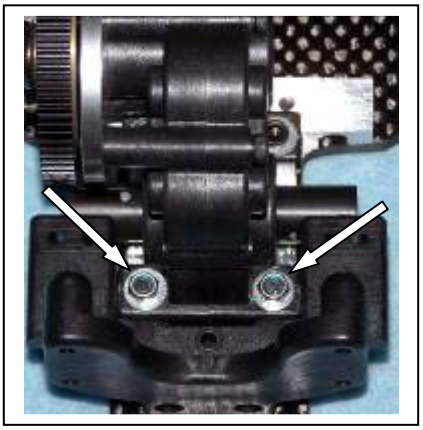




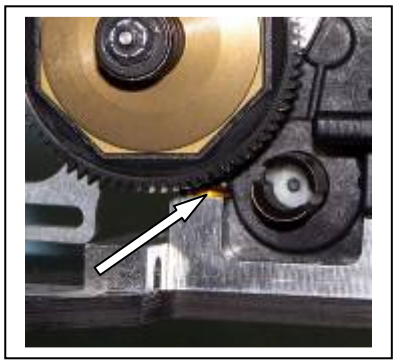
D9) We’ll do the easy one first. Place a flat washer on a 4-40 X 3/8” cap head bolt, insert the bolt through the hole in the right front transmission tab, through the shim, and screw it finger tight into the cradle.

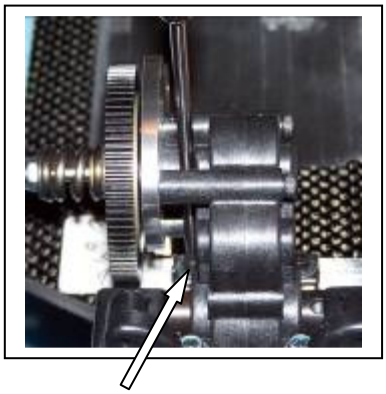


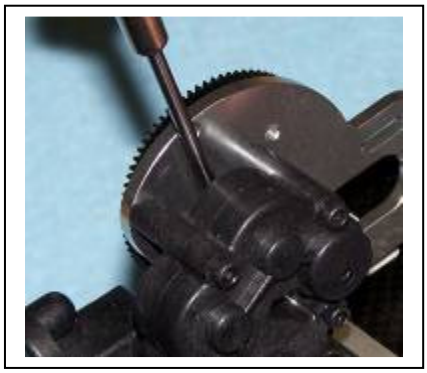
D10) In the rear, place flat washers over the two studs which should protrude through the rear transmission tabs. The shims should be in place. Install the two 4-40 mini locking nuts.

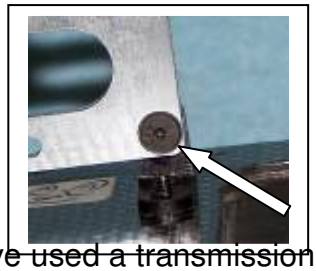


D11) Place a flat washer over a 4-40 X 3/8" screw, put the screw on your wrench, and fit it down between the transmission and the motor plate to secure the left front tab. Be sure the shim is in place (left photo). Now tighten both bolts and both nuts.









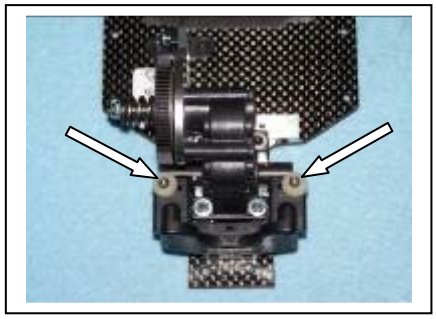
12) If you have used a transmission height [illegible] flat washers between the motor plate support bracket and the chassis. Secure the motor plate to its bracket with a 4-40X1/2" flat head screw and 4-40 locking nut. Now tighten the brace's bolts from D6.

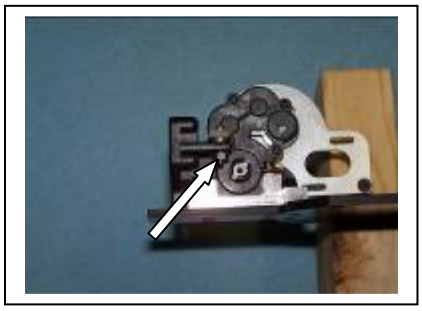
OK! The hardest part is done. It's all easy from here!

BAG E

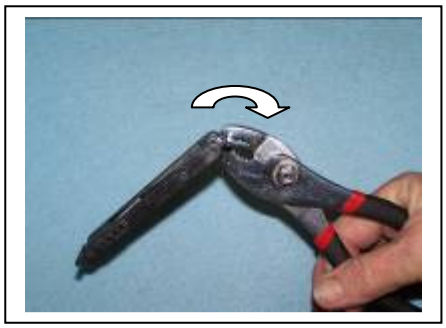
REAR SUSPENSION

E1) Install a 3/8” ball stud in the land on each side of the bulkhead. Here we have used the outer, #2 holes. We suggest you place a flat washer and #4 nut under the stud to reduce stress on the bulkhead.

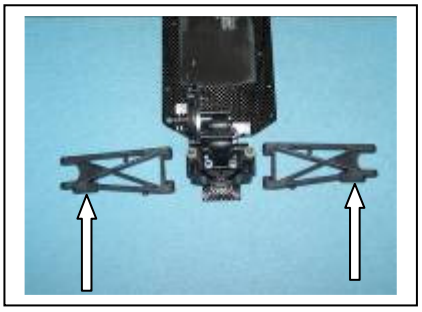


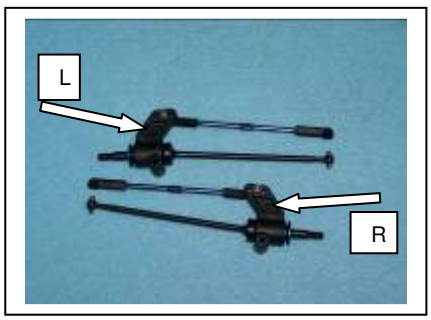


E2) Take the control arms (XF3012) from Bag E and remove the gurfelmurgles. A pair of pliers and a twisting motion seems to work best.

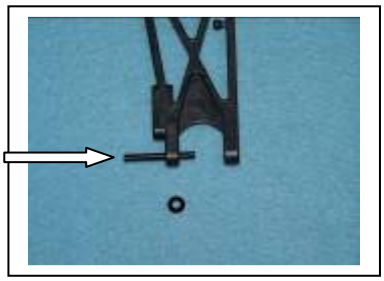


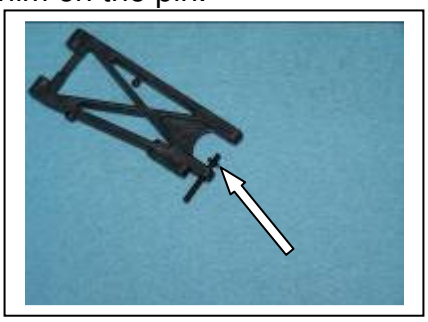
E3) The two arms are identical; when the arms are assembled to the truck, the shocks mount on the rear. However, we reverse the AE hub carriers, putting the right carrier (marked with an “R”) on the left arm and the left carrier (marked with an “L”) on the right arm. This makes the camber links line up better.



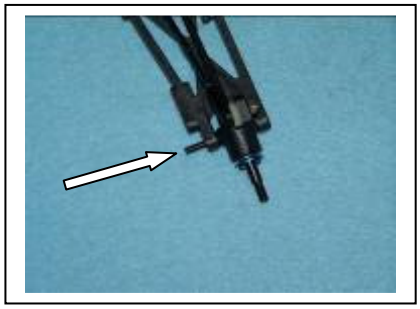


E4) Let's do the left arm first. Check the set-up sheet and tuning section to determine whether you will mount the hubs rear, middle, or forward. Here we show the middle position. Begin sliding the hinge pin through the outer end of the control arm, and place one shim on the pin.

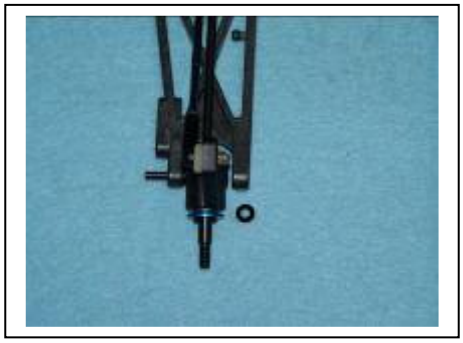


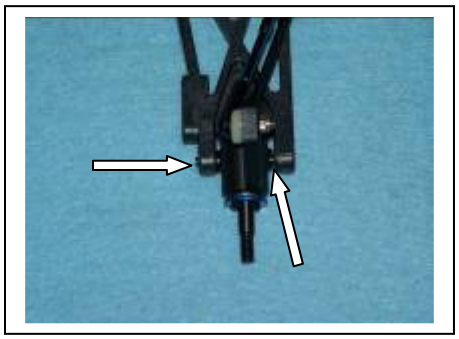


E5) Put the *right* hub carrier on the hinge pin.



E6) Put another spacer between the hub carrier and the arm, then slide the pin the rest of the way through.





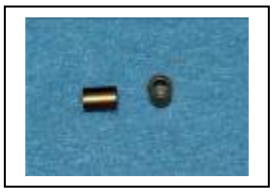
E7) Install the 2-56 X 1/8" button head screw to secure the hinge pin. (Now where did you put that little thing???)

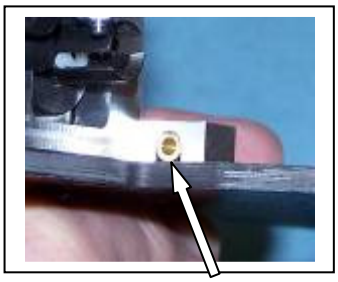
E8) Repeat steps E4 – E7 to install the left hub carrier on the right arm.

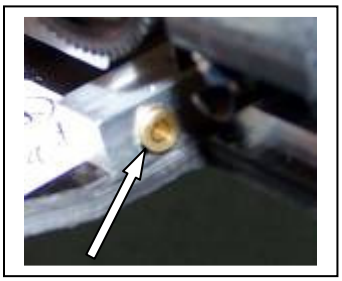
INSTALL THE ARMS

We are using a new build sequence for this operation.

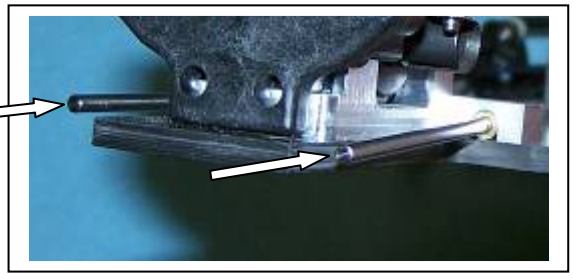
E9) Place the hinge pin bushings (XF6142) in their slots in the hinge pin brace.



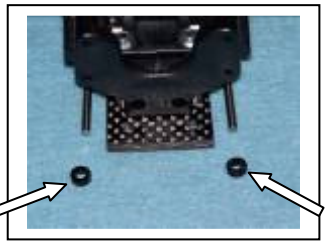


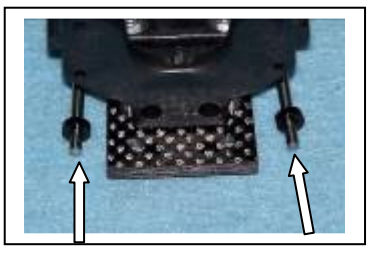


E10) Place the hinge pins into the bushings.



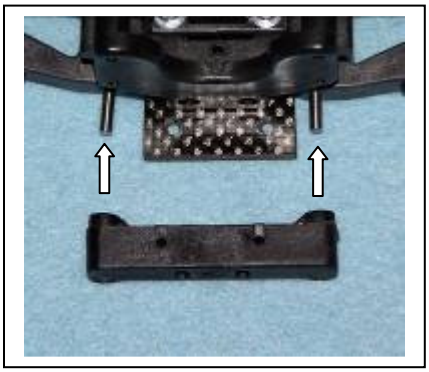
E11) Check the set-up sheet and tuning section to determine whether your control arm inner pivot will be forward, center, or rear. Here we are using arms rear, so the shims go on the front. We use some extra 0.090" transmission shims; shock limiters, flat washers, almost any shim of the correct size will do. If your set-up is arms back, slide the shims on the hinge pins now.





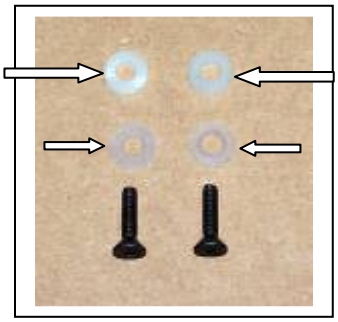
E12) Slide the control arms on the hinge pins. Shock mounting holes to the rear.

E13) Check the set-up sheet and tuning section to determine which toe-in bar (XF3211) you will use. Select the 3° or 4° toe-in bar and slide it onto the hinge pins. It will go above the chassis.

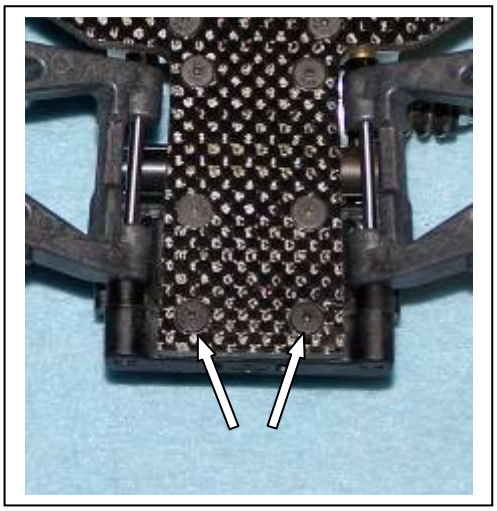


E14) In this photo we have inserted a pencil between the toe-in bar and the chassis to illustrate how the bar will slide up and down.

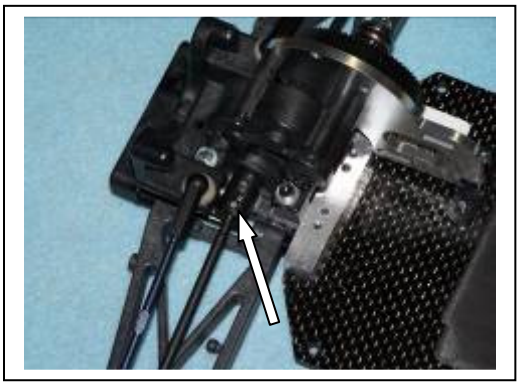
E15) Check the set-up sheet and Tuning Section to determine how much anti-squat you will run. There is a packet of small round shims in Bag E, four 0.060" thick (long arrows) and two 0.030" thick (short arrows) (XF3250). This allows 6 different anti-squat settings: 0, .030", .060", .090", .120", and .150" Place two sets of shims between the bar and chassis. Here we show .090".

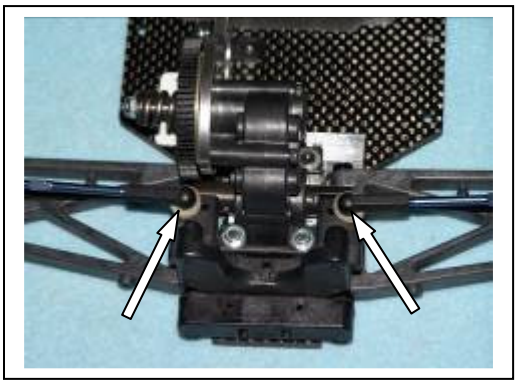


E16) Secure the toe-in bar and shims with two 4-40 X 1/2” flat head screws up from under the chassis. The screws go in the rearmost chassis holes, through the shim packs, and thread into the toe-in bar.



E17) Be certain the dogbones are in the outdrives, then snap the ball cups over the ball studs.





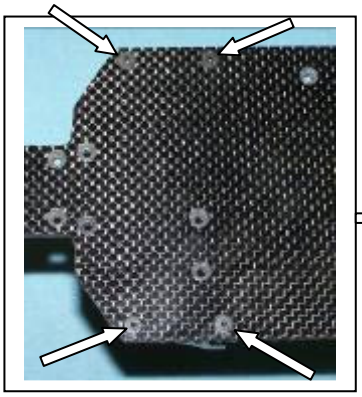
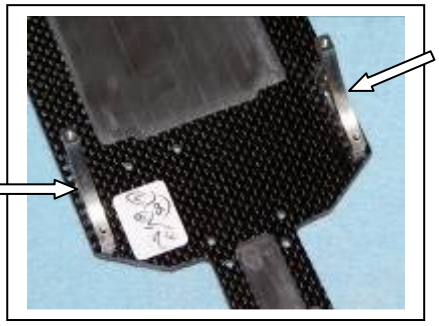
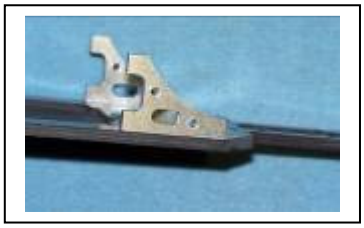
Almost through now. Let’s do the top deck.

Sooo dialed!

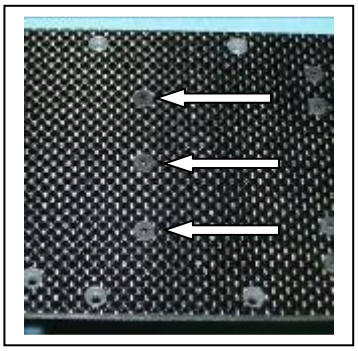
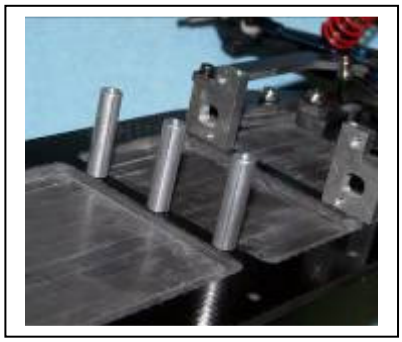
BAG F

TOP DECK

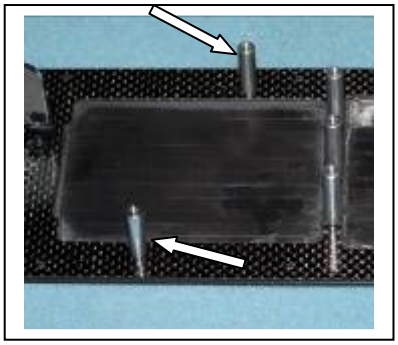
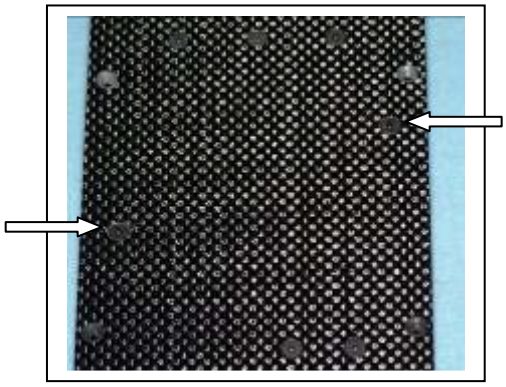
F1) If you use thread lock, put a drop in the four bottom holes of the rear top deck supports. Placing 4-40 X 3/8" flat head screws up from under the chassis, bolt on the two rear top deck supports (XF1311) as shown.

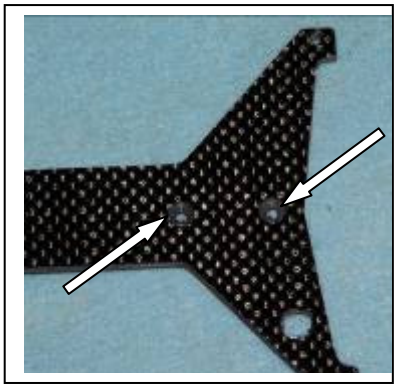
F2) If you use thread lock, put a drop in one end of each stand-off. Install the three 1" stand-offs (XF6801) in the center of the chassis using three 4-40 X 3/8" flat head bolts. These stand-offs are for the top deck.

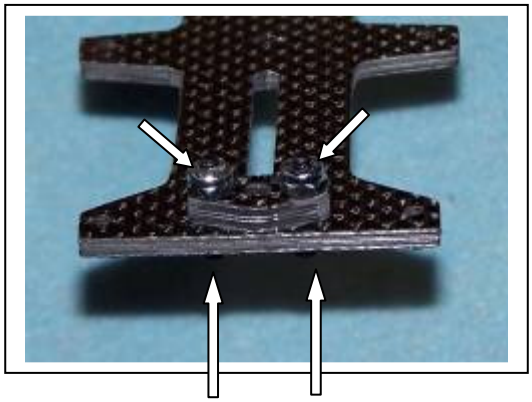



F3) Again, if you are using thread lock, a drop in one end of each 7/8" stand-off. (XF6802) Install one 7/8" stand-off on each side of the battery compartment using two 4-40 X 3/8 flat head bolts. These stand-offs are for the battery strap.

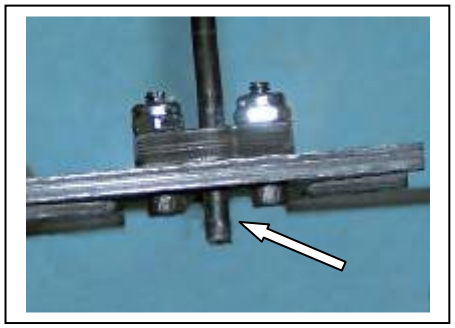



F4) Assemble the antenna mount (XF9001) to the top deck (XF1501). The bottom of the top deck is the side with two counter-sunk holes which are used if you have the DDP023 transmission brace (left photo). If you have the brace, put the bracket on the top deck using these holes. For the antenna mount, use two 4-40 X 1/2" bolts coming up from the bottom of the deck, put the antenna mount over the bolts, and secure with two 4-40 locking nuts.

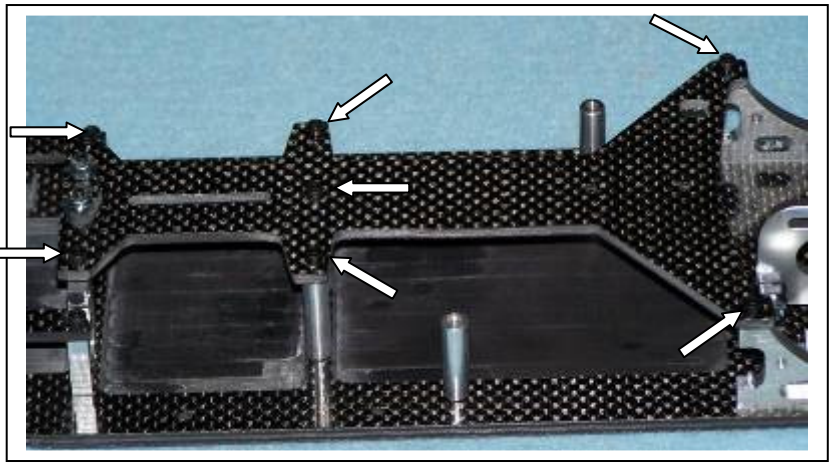




F5) A note here: If the antenna wire touches any carbon fiber part, the result could be glitching, so we must keep the wire off the CF. When you install the antenna tube, be certain a portion of tube protrudes below the top deck.



F6) Most Team drivers do not install the top deck yet; they do this after the electronics are in. The top deck is held in with seven 4-40 X 3/8" cap head screws.

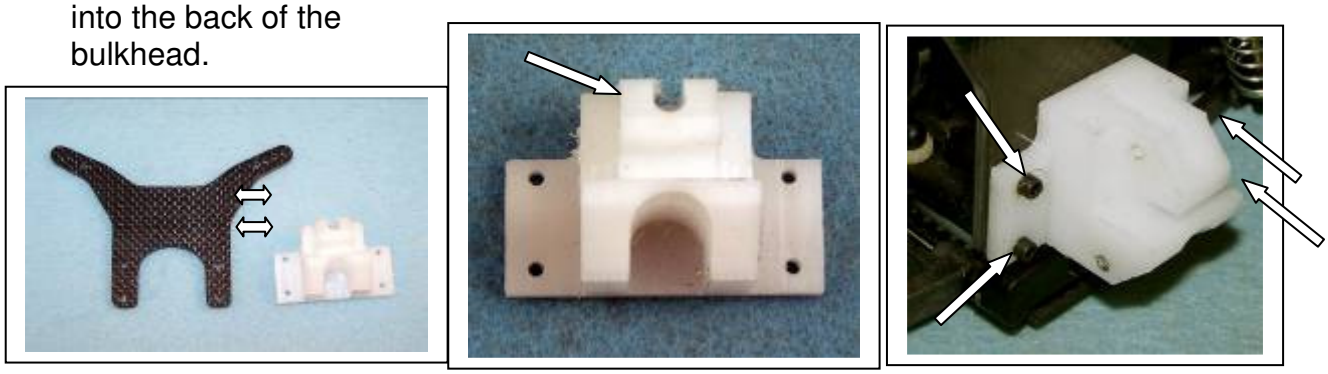


BAG G

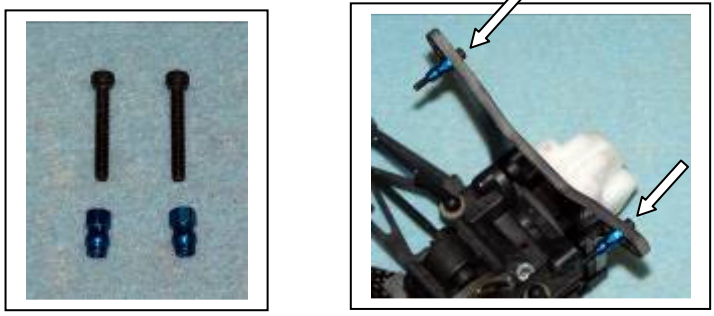
REAR SHOCKS, BUMPER, BODY MOUNT

REAR SHOCKS

G1) You may want to use a bit of sandpaper to de-bur the bumper mount. It is made of Delrin, so you can dye it if you want. Install the bumper mount (XF8360) and rear shock tower (XF3014) with four 4-40 X 5/8" cap head screws. The "little" side of the bumper mount goes up. (arrow, center photo) The screws go into the back of the bulkhead.

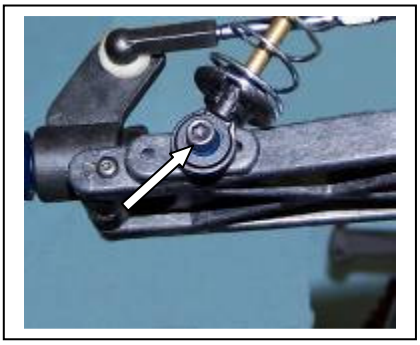


G2) Check the Set-Up Sheet and Tuning Section to determine where your shocks will go. Install the upper shock mounts to the front of the tower by screwing on the aluminum bushings. Here we use the #2 hole.

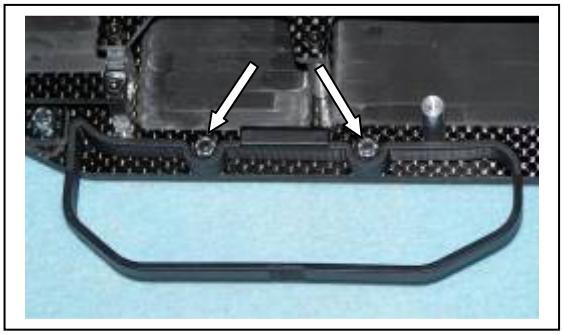


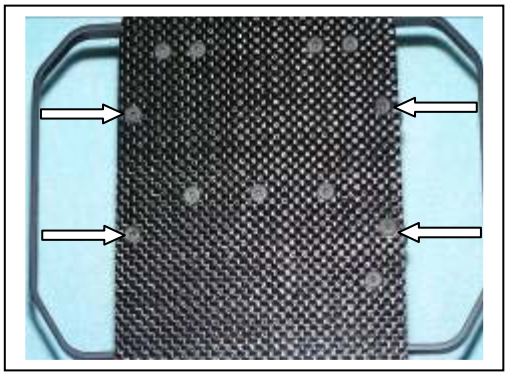
G3) Using the plastic nut, install the upper shock eyelet over the mount.

G4) Check the Set-Up Sheet and Tuning Section again, then install the shock bottom with the 4-40 cap head screw you took out. Don't forget the bushing! Here we are using the #2 hole.



G5) We will install the nerf bars on the opposite side – right bar on the left side, left bar on the right. Use the 4-40 X 1/2" flat head screws and 4-40 locking nuts.

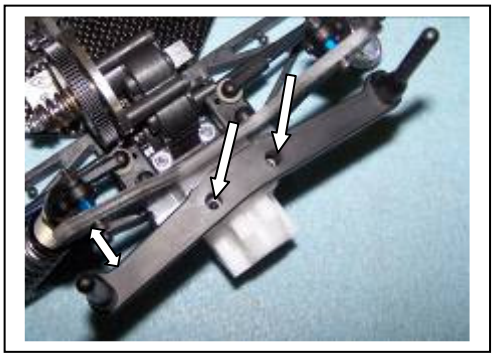


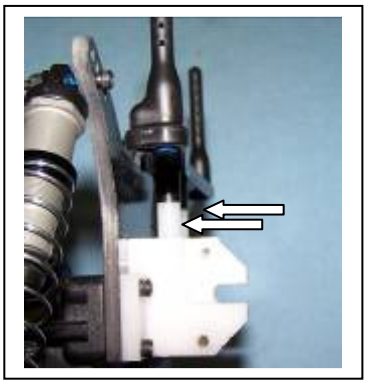


BODY MOUNT & BUMPER

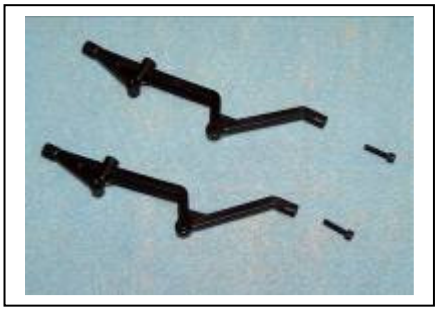
G6) We will turn the body mount around, so we must cut off the back of it. Always wear safety goggles when operating a rotary tool.

G7) Use the two 3/8” spacers and two 4-40 X 3/4” cap head screws to install the body mount to the bumper mount. The body mount extends to the rear now.

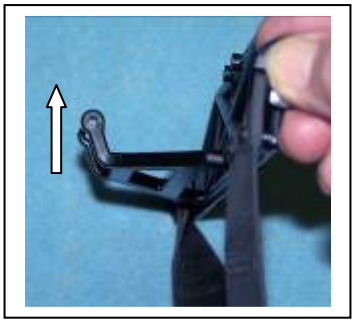


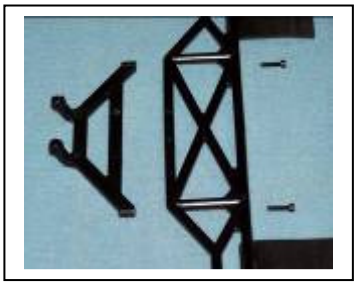


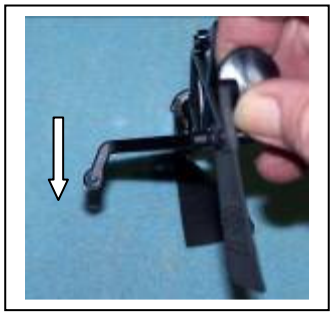
G8) Remove the upper bumper mounts from the bumper. Save the screws,



G9) Notice that the lower bumper mount is pointing up (left photo). Unscrew the mount, turn it over so it is facing down, and re-install (right photo).







G10) Cut off the top bumper mounts just above the middle mounting hole. We leave the gusset on the mount. If you use a rotary tool for this, always wear safety goggles.

G11) Re-install the top bumper mounts just as they came off using the same bolts. You can throw away the front part which you cut off.

G12) Install the bumper on the bumper mount using four 4-40 X 5/8" cap head screws.

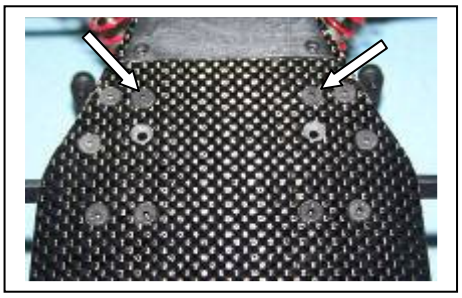
That's it! We're done!

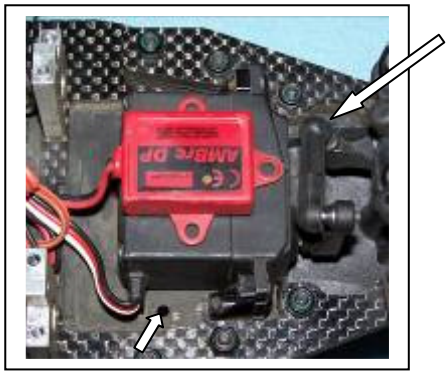
Check Paul's Race Prep & Tuning Sections, then Let's hit the track!

INSTALL THE ELECTRONICS

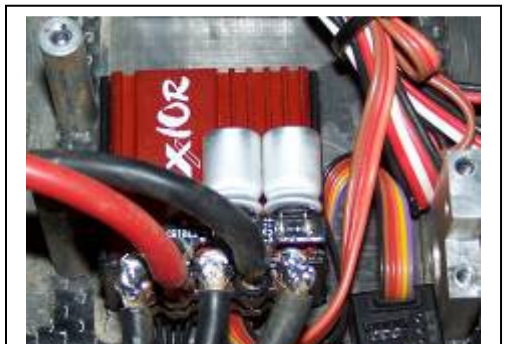
Photos in this section are of Paul's truck fresh from the 2012 Motorama race.

EL1) Check the Tuning Section and set-up sheet to determine where you will install the servo. We offer two different locations, forward and back. Here we have used the forward mounting holes. Use the flat head screws you saved and the servo mounts, which should still be attached to your servo. Arrows in the left photo point to the front two holes, which is where the screws are. In the right photo, the short arrow points to the rear hole, which is not used here. Connect the servo link to the steering bellcrank as before on your SC10 (long arrow). Paul mounts his transponder on top of the servo with double-sided tape.





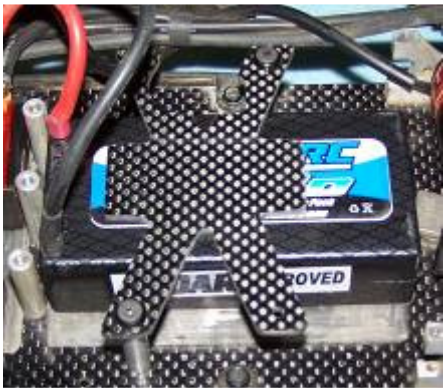
EL2) Mount the speed control on the right side of the chassis with double-sided tape behind the front top deck support. Paul puts the wires to the right so he has the shortest distance to the motor and puts the switch flat on the chassis with double-stick tape just ahead of the E.S.C.



EL3) Mount the receiver on the left side of the chassis with double-sided tape behind the front top deck support. The antenna wire faces forward so the tube is close by. To prevent glitching, be certain the antenna wire touches only the tube.

EL4) Install the motor on the motor plate using the two 3mm screws you saved. Check the set-up sheet to determine which pinion you will use and install the correct one, tightening the set screw securely. Slide the motor in its slots until the pinion is meshed securely with the spur; however there must be a small amount of backlash (arrow). Paul uses our optional Real Men Wear Black motor plate (XF1233) and also places a small amount of weight just in front of the motor to improve handling.

EL5) Your SCX – 60CF is configured to accept either a conventional saddle pack (left photo) or the newer 96mm "shorty" pack (right photo). The same battery strap holds either one with two 4-40 X 3/8" bolts.



FINISH IT UP

EL6) Your SC10 body fits the SCX – 60CF. The front holes will line up correctly; however you will have to make new holes for the rear. Make sure to get rid of any ugly stickers; change them to a big SCX – 60CF! Everyone knows the right decals are worth at least 1/2 second per lap.

EL7) Put the wheels on and let's go clean some clocks!

FINAL SET-UP AND PREP

ELECTRONICS

Now that the truck is built and electronics installed, it's time to make certain it runs straight and well. First, familiarize yourself with the set-up procedures of your various electronics: how to bind the receiver to the radio transmitter, how to set the speed controller to the radio, and how to adjust the steering settings on your transmitter.

Binding the receiver to your transmitter loads a unique identification number into your receiver, so it will only recognize your transmitter and not the others running at the same time. Each manufacturer has its own process for this. Even if this receiver is from your SC10, a re-do never hurts. Once the radio and receiver are having fun together, set the ESC. Make sure the throttle and brake endpoints are at 100 on your transmitter and follow your ESC's guide. Again, there's no standard procedure across the board, but it generally involves entering a set-up mode on the ESC then modulating the throttle in a set way to 'teach' the ESC the radio's endpoints.

With all that out of the way, it's time to set the steering. First move the steering left and right, and make sure the wheels move the same direction. If not, you'll have to reverse the steering channel on your radio. Second, adjust the trim or sub-trim so that the steering rack is centered under the top plate. It's important to watch the steering rack, not the wheels, as different length tie-rods could throw off your center. You don't need to go berserk here with calipers and all, just use your eyes and get it close. Once the rack is centered, adjust your steering tie-rods so the wheels are approximately straight (0^o of toe).

The third steering setting to adjust is your steering end points, or EPA. Position some blocks or your car stand such that the front wheels can move freely but the front arms are 'level' (not at full extension). Turn the right endpoint waaaay down on your radio, and the turn the steering wheel or stick all the way to the right. Look at the steering block of the right wheel – you'll see a bump where it stops against the caster block. If it's touching right now, turn the end point down more until there's a gap. Then *slowly* turn up the right end point until the steering block just touches the caster block. Repeat this procedure for the left side. A lot of gorillas like to run their EPA so the servo is straining at full lock – this just causes excess load on the entire steering system, including your servo. Cage the gorilla in your radio; if you want more steering, adjust the setup!

BREAK IN THE DIFF

We're ready to run now, right?! Not Quite. The next thing to do is break in the differential. This is exceedingly important to the truck's performance and diff life. With the truck all prepped as above, install a charged battery and put the car back on its stand with the rear wheels off the ground. Turn on the transmitter and car, then adjust the trim on the throttle so that, with no throttle input, the motor begins running at a slow constant speed. You want this to be low enough that the tires don't expand at all. Using a block, the car stand, or something similar, stop the rotation of one of the rear tires. The other tire should continue to turn with the motor, nice and easy. Leave the car like this for two or three minutes.

By holding one outdrive/diff ring still, you force the balls in the diff gear to roll, slowly flattening the microscopic surface features of the diff ring and creating a smooth 'polish' where they will operate for the life of the diff. Too much throttle would cause the balls to just slip along the surface, grinding and wreaking havoc on the diff rings. Letting them run in slowly creates a nice mirror finish. After two or three minutes, switch the block from the one rear tire to the other, and let the motor run for another few minutes. Doing this procedure on the bench creates a much smoother and more consistent feel than trying to break the diff in on the track. Bring the throttle trim back to neutral to stop the rear wheels.

Now we'll set a starting point for diff adjustment. Turn everything off, hold the spur gear with your left hand, and give the right tire a light flick of the wrist. The tire will probably rotate 1.5 or 2 turns; you'll want to tighten the diff so with a similar input it only rotates once. Pop off the right rear turnbuckle, swing the hub and tire out of your way, and use your 5/64" hex driver. The diff screw is on the right side of the car; slip the wrench into the head of the screw to hold the screw steady. Rotate the left rear wheel backwards slightly to tighten the diff. Pop the right side back together and 'feel' the diff again; adjust it in small increments so as not to over-tighten.

NEVER run the car with a slipping diff. If you hear the diff 'bark' or 'chirp' – kind of a screech sound usually out of corners or landing jumps – immediately stop running and tighten your diff (check your slipper setting too, but we'll get to that). Even in a race, is finishing a run really worth replacing the diff balls and rings before the next one? It's a quick adjustment now rather than a lengthy and expensive tear-down.

RACE PREPARATION

The 5 Ps: *Proper Preparation Prevents Poor Performance*. You want a well-built car when you arrive at the track, but top drivers also have a routine before *every* run to make sure the car's settings are consistent each time out. This makes sure the car on the track is indeed what you want, and any performance difference is the result of deliberate changes. Here is a list of things we check each time the car hits the track, for practice or racing. It's meant to be a quick reference list; for a more comprehensive discussion of each setting check the Tuning Section. After a few times, the list should be routine and only take a few moments; you'll be rewarded with a car that's consistent, more responsive, and faster overall. Start with a car ready to run, body off.

1 – Check ride height. Find a flat and level surface; if you're going to use a gauge make sure the surface is hard, as a pit towel could throw off your readings. Check the front height, then the rear, and from the side take a look at the 'rake' of the car. Even little changes – anti-squat adjustment, shock mounting holes, different tires, etc – will change the ride height, so it's very important to check this every time the car hits the track.

2 – Look over your SCX – 60CF. This is easily done as you adjust ride height above. Just keep your eyes open as you go through the list. Feel the shocks, inspect the ballstuds, etc. You'd be amazed how many times we find a ballstud or shock nut working loose, or a loose/cracked part before a qualifier or race.

3 – Check camber front and rear. The one thing that can throw off camber measurements more than anything else is bent rims. If the top of your wheel wobbles in and out as you rotate the tire your rim is probably bent slightly. This isn't the end of the world; you don't have to replace the tire. Simply identify a spot between the extremes, rotate the tire so that point is on the top, and set your camber from there.

4 – Check the front Toe-in. Center the steering rack under the top plate, then look at the front wheels. If you don't have a toe-in gauge, stand up and look down at the front of the car for a better perspective.

5 – Set your slipper clutch and diff. We generally recommend the 'hold the rear tires and punch it' method: Turn the car and transmitter on, hold the rear wheels securely, and give the transmitter a quick burst of 100% throttle – don't be shy! You should hear a high-pitched whine as the front end lifts off your pit table; that's the slipper working. If the diff slips (a screech sound) stop immediately and tighten it a 1/4 turn or so. Back off the slipper and try again. Besides listening, watch the front end of your SCX – 60CF as you do this. The higher off the table your front tires get the tighter your slipper is set.

TUNING SECTION

ABOUT ADJUSTMENTS

R/C race trucks, in general, are some of the most adjustable racing machines of any scale. What's really amazing is just how easy and quick it is to make all of our changes: remove a ball stud to change roll center, one screw to change springs, or tape in some weight to change the truck's distribution. On top of that, the SCX – 60CF is even more adjustable, adding options like the transmission height and the servo position that many other trucks don't have. It's easy to get lost though, so here's some advice from one of the best in R/C racing, Brian Kinwald: "At any given track, only a few adjustments will help the truck get around the track faster. 90% of set-up changes just alter how the truck feels. The trick is to find those changes that really make a difference, and use the rest of them to get the truck to suit your driving style." If you ever feel lost, like the truck isn't working at all and you can't seem to get it back on track, change completely back to a standard set-up or something that worked previously and start again – it's how we learn!

When there are lap times available, pay attention to both your fastest lap and consistency (how close the other fast laps are to the fastest one). If your fast lap is significantly quicker than average, work on making the truck easier to drive; if you can run close to that fast lap the whole race, add some more steering or power and see if you can go faster.

Finally, don't be afraid to acknowledge if a set-up change didn't seem to affect the truck on the track. Some adjustments are subtle, and different driving styles are sensitive to various adjustments. Learning that an adjustment didn't change much for you is a valuable result – focus on other things, and perhaps try it again later as your driving experience accumulates and set-up evolves.

DRIVING THE SCX – 60CF

The mid-motor SCX – 60CF much different than a rear-motor truck, and it can take a bit of practice to get used to. With its weight more central the SCX – 60CF naturally carries more corner speed. With no "pendulum effect" from the motor hanging off the rear axle, the truck likes taking smoother racing lines, while the rear end stays more planted. Watch out that you don't slam into the back of other trucks through the infield!

The initial disadvantage of the mid-motor concept was a lack of forward bite out of corners, especially on slick tracks. X Factory designed the 4-gear transmission to help solve this problem: by turning the motor so it rotates in the same direction as the wheels, the motor itself helps transfer weight to the rear under acceleration, dramatically increasing forward bite. Further, the X Team has put a lot of work into set-ups, developing trucks that often have more rear bite than our competitors!

The starting set-ups in this manual have several features that add rear traction to help ease the transition to driving a mid-motor truck. These include starting with the 4^{o} rear toe-in block, running the rear hubs all the way forward, and using 30^{o} front caster blocks. As you become more familiar with the truck, you may find yourself surprised to be searching for steering. Read through the rest of this Tuning Section; check the set-ups posted by team drivers on our website, and feel free to post questions in the forum about your truck. We love talking about this stuff!

TIRES

Tires are the most important tuning element by far: they're the truck's only connection to the ground, and all other suspension or chassis changes must act through them. That said, tires are obviously very track- and condition-specific, so there's not much we can tell about them here. If you don't already have the right tires for your local tracks, see what the fast guys there are running. That's usually it.

SLIPPER AND DIFFERENTIAL

In previous sections we described breaking in your diff, adjusting it, and how to test your slipper clutch. Now, a few words about setting them! The diff and slipper can have a big impact on how your truck corners and lays down the power.

The slipper clutch allows some 'give' in the driveline, which both protects the rest of the driveline from shock loads and takes the edge off the truck in the high-torque range of the motor's rpm. Off the line and out of corners the slipper will slip some, just as its name implies, which helps prevent wheelspin and lets the truck hook up. On slippery or looser tracks, we generally run a 'looser' slipper: back the nut off so that, when checking on the bench, the front end barely rises off the table. As traction comes up, you can tighten the slipper accordingly. On super high-bite surfaces, you'll actually back the slipper off some to prevent the truck from pulling hard wheelies. The nice thing about

slippers is the ease of adjustment: have a friend take a ¼" wrench out to the track, and a few brief pit stops later you can have the truck completely dialed.

Adjusting the differential for track performance is a tougher science, especially since the adjustment window is pretty small – less than full turn on the diff screw can go from too loose to locked up. The idea is, the looser your diff is, the more corner speed the truck will carry. A tighter diff will have more forward bite – similar to running a locked diff in a drag car. Diff adjustment isn't changed often but can be useful; always be sure the slipper gives before the differential barks.

FRONT CASTER

We suggest you begin with 30° caster blocks (ASC #9593). These give the truck great corner entry steering while keeping it stable on exit. There are also 25° and 20° blocks available (ASC #9580 and #9592, respectively), which will progressively take away from turn in while adding exit steering. Honestly, the X Team worldwide runs the 30° blocks almost exclusively; there are usually better ways to gain steering without losing stability.

ANTI-SQUAT

Rear anti-squat is the angle of the rear hinge pins relative to the ground. Lowering the rear toe-in block by removing spacers increases the amount of anti-squat in the truck. With no spacers, the truck has 4° of anti-squat; with approximately .120" (3 mm) of spacing the truck has 0°, so every .030" (.74 mm) of spacers is a degree less. The thin white nylon shims included in the kit are .030"; the thicker ones are .060".

More anti-squat will generally take away rear side bite, add forward bite, and let the truck spring more off jumps, generating a higher arc in the air. A truck with more anti-squat will 'rotate' easier in sharp corners. Less anti-squat will make the truck feel more stable and locked-in. Generally anti-squat is a "feel" adjustment, changing the way the truck drives more than the fastest lap. It's another set-up change that's really quick and easy to do, so have a play with it and see what you like best.

REAR WHEELBASE

The wheelbase of your SCX – 60CF can be adjusted by moving the shims on the inner or outer rear hinge pins. As the pins are parallel to each other, moving the arm or the hub carrier by the same amount will have the same effect.

Moving the hub carrier forward increases rear traction in two ways: Primarily you are adding more 'angle' to the driveshaft, so there's more scrub between the dog bone and the outdrive as well as in the CVD joint. All this friction locks in the rear end and creates traction. Moving the hub carrier forward also increases the percentage of weight on the rear tires, further increasing bite.

Moving the hub carriers back is probably the easiest way to add steering and corner speed to the SCX – 60CF. It's one of the most commonly used adjustments for UK Champion Ellis Stafford. Moving the hub carrier or arm back some will increase steering throughout the corner. It also makes the truck more stable in bumps, and because the driveshaft isn't as bound up, the truck will "pop" better over jumps.

TRANSMISSION HEIGHT

The SCX – 60CF features X Factory's adjustable-height transmission. While not the easiest adjustment, it's a very powerful tuning tool to adapt the truck to different surfaces. Included in Bag D (step D9) are several sets of transmission shims, four each of .030" (silver), .060" (gold), and 090" (black). Counting zero, that's four transmission height positions. When you change transmission height, make sure to re-check rear ride-height (remember the race preparation list?). Keeping the ride height the same will allow you to feel the isolated effect of the transmission height.

Important Note: For settings above .060", you'll want to shim up the motor plate support. We generally use #4 flat washers for this. Also, as you adjust the transmission height keep an eye on the driveshafts' position in the outdrive: there are small shims between the outer wheel bearing and the wheel spacer which can be moved to the inside, keeping the CVD engaged in the outdrive at full droop without bottoming out on compression.

Adjusting the height of the transmission changes several things at once. Primarily, it sets the distance between the inner hinge pins and outdrives; a greater distance allows the CVD to exert greater force on the suspension. It also changes the truck's center of gravity slightly, as you're adjusting the height of the motor too.

Raising the transmission will give your truck more forward bite. It effectively stiffens the rear of the truck, which means the truck will break loose sooner in corners and will bounce more over washboards or small bumps. A softer rear shock package is generally recommended when running the transmission high. Lowering the transmission does the opposite: less forward bite, but greater side bite and a smoother, more stable truck over rough sections.

FRONT AND REAR TOE ADJUSTMENTS

Toe-in (or out) is the angle of the tires to parallel when viewed from above. Zero degrees of toe is when the tires are parallel to each other; toe-in is when the front of the tires point toward each other, and toe-out is when the front of the tires point away. Toe in the front of the truck is very easily adjusted by turning the steering tie-rods between the steering rack and the steering blocks. The front tires are generally run with zero degrees of toe. Adding some toe-out will increase the initial steering in the truck, but can feel twitchy and wander-y. Toe-in will stabilize the truck, especially out of turns, but slows down the steering response and slightly decreases corner speed.

The rear tires are always run with toe-in, but the amount can be changed. It is adjusted by switching the rear toe-in block (installed in step E13). More rear toe-in (the 4^{o} block) gives the truck more forward traction but makes it harder to pivot the truck. Less rear toe-in (the 3^{o} block) will let the truck flow through corners and pivot well, but at a loss of stability off the line and out of corners.

CAMBER

Camber describes the angle of the tire from vertical when viewed from the front or back. If the top of the tire leans out past the bottom you have positive camber; if the tire leans in at the top it has negative camber. A good starting point is to have -1^{o} of camber all around; the team generally runs between 0 and -3^{o}. In general, more negative camber

will give more traction in the corners, while less gives more bite while the truck is level. A good method of adjusting camber is actually watching tire wear or dirt build-up: if the tire looks even or uniform coming off the track, then you're close to spot-on.

RIDE HEIGHT

Ride height is how high the truck sits off the ground at rest. Pick up the whole truck and drop it from a height of 6 inches (15 cm) or so onto a flat surface, letting the shocks settle. To check ride height by eye, look at the molding seams in the middle of the control arms: are they parallel with the ground (called "level") or do they angle up or down? If the center of the truck is lower than the hub carriers/caster blocks, so the arms angle up as they go out, that is referred to as 'below level', and vice-versa if they're angled down. If you have a ride-height gauge, touch off just behind the front bumper for the front and just under the transmission for the rear (the chassis will wear underneath the rear toe-in block through the chassis life; measuring under the transmission will be more consistent).

The standard ride height is with the front arms level, or about 31mm off the ground using a gauge (gauge measurement will vary based on the diameter of front tires); and the rear arms just below level, or roughly 29mm with similar considerations for tires. Raising the whole truck up will add traction, feel better on rough tracks, and jump better. It also makes the truck more prone to traction-rolls, though. When the traction comes up, it's better to lower the truck some. This makes the truck feel more direct, with faster reactions, and helps prevent roll-overs.

Check the truck from the side using the same drop technique. This lets you see the "rake" of the chassis: the angle from front to back. In general you want to keep the truck flat front-to-rear, or perhaps a touch higher in the back. Lowering one end of the truck will give that end a little more grip, but extreme differences can make the truck hard to control on the track.

CAMBER LINKS

Camber links are one of the more complicated adjustments on any R/C vehicle, and your SCX – 60CF is no different. On X Factory's set-up sheets, the inside hole groups are referred to by numbers, and the outside holes are called by letter. The more inside the hole is, the lower the value. Thus a "2B" rear camber link is in the outside hole of the rear bulkhead (2) and the middle hole in the rear hub carrier (B); a "1A" link would be the inside holes in both.

Camber links adjust the truck's roll centers – points critical to understanding how the suspension and chassis will roll through a corner. Without going through the geometry here, remember this: the shorter and more angled down the camber links are (inside lower than the outside), the higher the roll centers are. A higher roll center reacts more quickly but with less overall effect. Thus, removing washers or shortening links makes the truck react more quickly but have less total roll. Adding washers or lengthening the link will slow down the reactions but make the truck feel stiffer. Changing washers is generally a smaller effect than changing the length of the link. Remember:

Less washers (inside) = shorter link = higher roll center = more aggressive
More washers (inside) = longer link = lower roll center = slower, stiffer

If the above is the theoretical look at camber links, here's a more direct view: In the front, removing washers/shortening the link will quicken steering response but give the front less roll, leading to a possible mid-corner push, or steering which seems to wash out. A longer link will slow the reaction but give you more mid-corner steering. In the rear, removing washers/shortening the link means the back end will roll less and square up out of corners better. A longer link will give more rear traction in corners.

For a more systematic approach: Think about the outside ball studs first. The further out in the hub carrier or caster block you run, the more "square" that end of the truck will run. This is especially felt in the rear: the 'C' hole in the rear hub carrier has more side bite in the corner, but when the truck does break loose it will break hard. The 'A' hole will let the rear end slide more, but it's much easier to control with throttle. The inside holes go through bumps a little better, too. Second, inside ball stud location: the inside hole (longer links) will give more traction and feel safer while the outside hole is more aggressive. Last, find the number of ball stud washers you like: more washers will give that end of the truck more corner traction but slow down its response.

A final note about camber links: keep an eye on the balance of the front and rear links. Having a short link up front and a long one in the back can make the truck feel less confident and consistent. If you find yourself liking a long rear link, try a longer front one to go with it, and vice versa.

SHOCKS

The shock absorbers on your SCX – 60CF pack quite a lot of adjustment potential, and with good reason: they're working all the time, through corners, bumps and jumps, even just going straight! On R/C cars we can change the spring rate, the damping and pack, mounting locations, and travel limits.

Changing the spring rate is pretty easy: change the springs. In general, stiffer springs will make the truck feel more direct and jump a little better; they're suitable for high traction surfaces. Softer springs are better for bumpier surfaces, and can help generate traction on low-traction tracks. That holds true for each end of the truck. Stiffer front springs will take away steering but can make it easier to drive, while soft springs add steering. Too soft will make the truck hook spin mid-corner. Stiff rear springs will add steering, especially in long sweepers, but at a loss of rear traction. Going softer in the rear will add bite, good on bumpy tracks, but take away steering.

The damping in your shocks is a combination of the pistons inside and the oil they travel through. Heavier damping (thicker shock oil) will make the truck smoother on the track, and better landing jumps, but will make the truck bouncy in bumpy or choppy sections. Lighter damping makes the truck more reactive overall and better through bumps, but it will tend to bottom out landing jumps and be slightly harder to drive.

You should also consider the "pack" your shocks have. Due to fluid dynamics, the resistive force of our dampers greatly increases at high shock speeds. The smaller the shock piston holes, the more quickly the shock will pack and the greater the force will be. Large shock piston holes are the opposite. By adjusting the shock pistons and oil together, you can tune both the static damping and pack. To change the pack while leaving the static damping similar, adjust the oil 5 wt for each piston change. So if you started with #2 pistons and 30 wt oil, you could:

Increase pack with #3's and 25 wt
Decrease pack with #1's and 35 wt

and all three shocks would feel very similar on the bench (static damping). Increased pack is good over smooth tracks and very good for big jumps with flat landings; it also carries more corner speed. If your truck is bottoming out hard landing jumps, try increasing pack in the rear. Less pack is good for bumpy sections, as the suspension can soak up high speed movement better.

Suspension travel is controlled by adding limiters inside and outside of the shock. Limiting inside the shock (where the oil goes) reduces the amount of downtravel in the suspension: how far down the arms can go. More downtravel (fewer limiters inside) is better for rough tracks, as it goes over bumps and lands jumps better. Less downtravel (more limiters) makes the truck corner flatter, change directions quicker, and prevents traction rolls, all at the expense of rough-track handling. In the rear, make sure you limit downtravel enough that the CVD's cannot pop out of the outdrives; especially when using the inside shock hole on the rear arm, the SCX – 60CF has quite a bit of travel.

Limiting uptravel (adding spacers outside the shock body) is rarely used, usually only in the rear to prevent the CVD bone from bottoming out in the outdrive.

Finally, we discuss shock mounting. Changing the bottom shock mounts affects quite a lot: the further inside the shock is mounted on the arm the softer the suspension feels (because the wheel has longer lever arm on the shock) and the more travel you have. To keep downtravel the same, it's generally recommended to add .060" (1.5mm) of spacers inside the shock for every hole you move in on the arm (and take out spacers when you move out, obviously). Running the front shock on the inside hole will add low speed steering at the expense of stability. The more in the rear shock is mounted, the "safer" the truck will feel around the track: it's softer and soaks up bumps better. Moving the rear shocks out on the arm will add steering and is generally recommended for high traction, smoother tracks.

The upper shock mounts are much easier: the shocktower's holes are designed in an arc so that the suspension travel doesn't change as much. Inclined shocks (mounted in on the tower) have a progressive feel to them. They're smoother around the track and provide more side bite. Vertical shocks have more forward bite and are better over jumps.

CHASSIS FLEX

All materials have some give to them, what we in R/C commonly refer to as flex. Most often racers pay attention to how much and where their main chassis plate flexes, as this can have a subtle but important effect on the truck's overall handling.

Pure bench-racing theory suggests that having zero flex is ideal: by making all the components as rigid as possible, everything the truck does will be strictly controlled by the tires, shocks, and suspension geometry (all the things we've discussed so far). This is desirable because all those things above are easily measured and deliberately set. However, when the rubber hits the dirt, racing experience has shown that some chassis flex can be a powerful tuning tool, and setting and controlling the right amount of flex leads to a faster truck overall.

You can tune the flex in your SCX-60CF by loosening or removing some of the screws in the top deck. For more rear traction on bumpy, loose, or slick surfaces, you can remove the two rear-most screws in the top deck and/or the motor plate's T-shaped brace. To allow more torsion flex (allowing the chassis to twist), you can remove the two outer screws from the middle three posts. Both of these changes will take away a bit steering and make it more forgiving, which is great on blown-out "gas-style" tracks.

The downside is less overall consistency, as any chassis flex is un-damped: the chassis bends some to accommodate a bump or rut, but when and how it flexes back is unpredictable. Adding and removing screws is easy: experiment and see what works best on your home track.

DO NOT run without the top deck and at least the forward two and the middle screw installed. Don't risk that $100 chassis!

On smoother and/or higher-bite surfaces you'll want the whole top deck securely mounted to really lock the truck in. This gets back to the racing ideal we started with: lock down the chassis and let the suspension and shocks do the work. Like the rest of X Factory's Kits, your SCX-60 CF will fit the transmission brace hop-up for the ultimate high-traction situation.

CONCLUSION

We hope you find the above info helpful, that it aids in your fun with your new truck. If you have any questions or suggestions, please E-mail or call. We love talking about and working on this stuff with The Family.

Now let's go whoop up on the pack!