Carpet Knife Generation XL Assembly Manual and Tuning Guide

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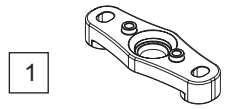
Center Pivot

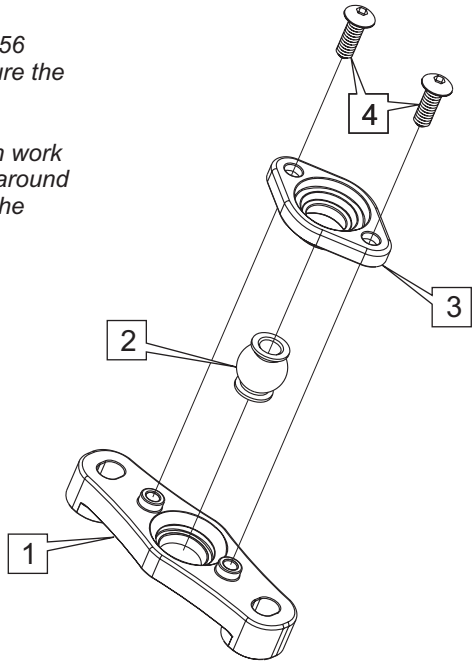
Bag 1



Center Pivot Base

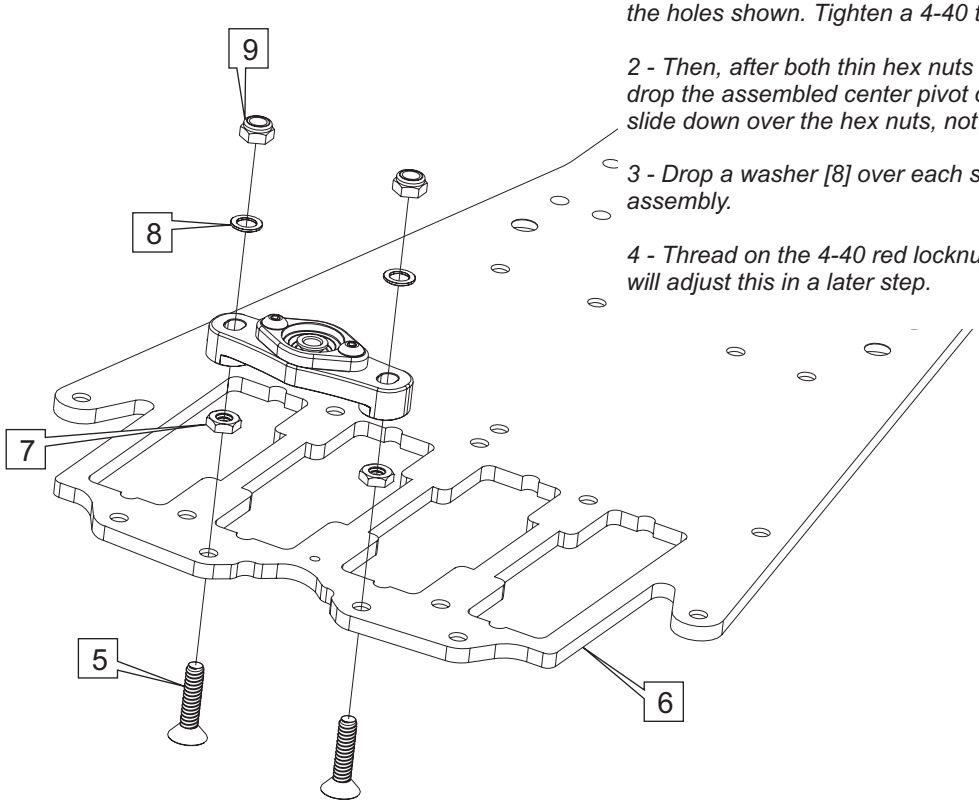
Assemble the Molded Center Pivot assembly as shown. Tighten the 2-56 button head screws [4] enough to remove any up and down play, be sure the flanged pivot ball [2] pivots freely.

Note - Sometimes it is helpful to **slightly over-tighten the screws, then work the ball around by hand, and then loosen the screws so the ball floats around very free. Do not over-tighten the screws too much or you could warp the pivot socket.*



Center Pivot

Bag 1



1 - Place the 4-40 x ½" screws [5] through the graphite chassis [6] in the holes shown. Tighten a 4-40 thin hex nut [7] down fairly tight.

2 - Then, after both thin hex nuts are tight on the 2 mounting screws, drop the assembled center pivot over the screws. The assembly should slide down over the hex nuts, not sit on top of them.

3 - Drop a washer [8] over each screw above the center pivot assembly.

4 - Thread on the 4-40 red locknuts [9]. Do not tighten them yet as we will adjust this in a later step.

Bag 2

13 *4-40 x 5/16" FH steel*

Red Low-Profile Ball 12

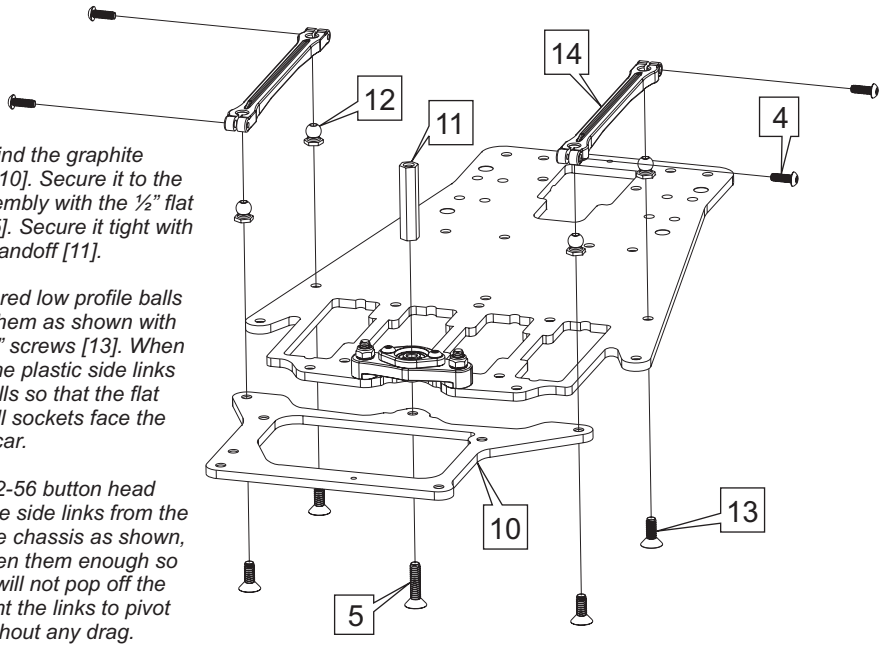
9 *Red Locknut*

5 *4-40 x ½" FH Steel*

Graphite Bottom Plate 10

2-56 Button Head 4

14 *One-Piece Side Links*

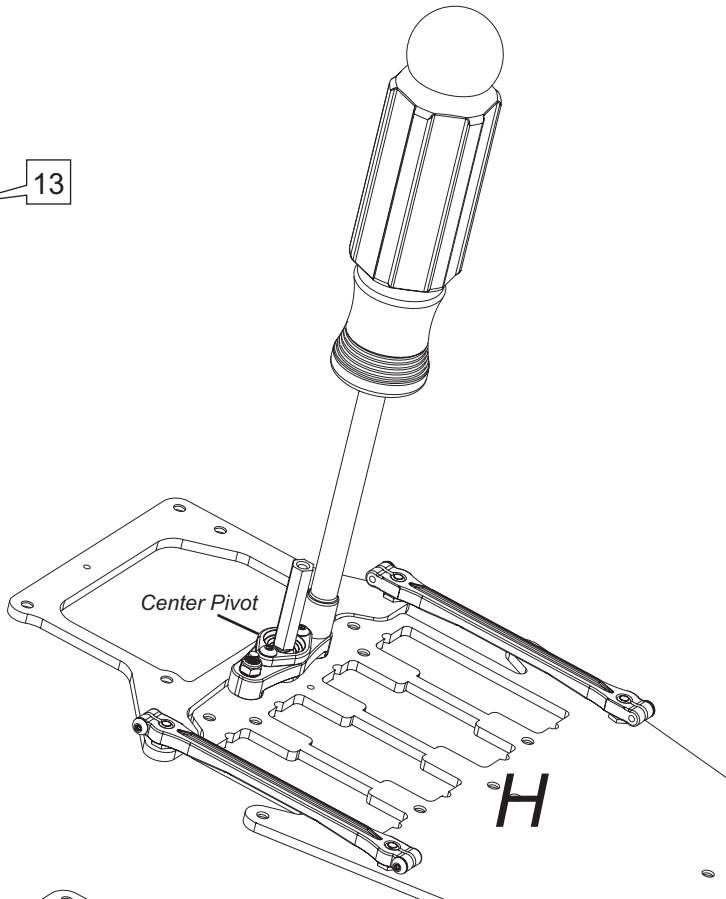


1 - In Bag 2, find the graphite bottom plate [10]. Secure it to the pivot ball assembly with the ½" flat head screw [5]. Secure it tight with the red hex standoff [11].

2 - Find the 4 red low profile balls [12]. Secure them as shown with the steel 5/16" screws [13]. When secure, pop the plastic side links [14] on the balls so that the flat side of the ball sockets face the center of the car.

3 - Insert the 2-56 button head screws into the side links from the outsides of the chassis as shown, and only tighten them enough so that the links will not pop off the balls. You want the links to pivot very freely without any drag.

Setting the One-piece links



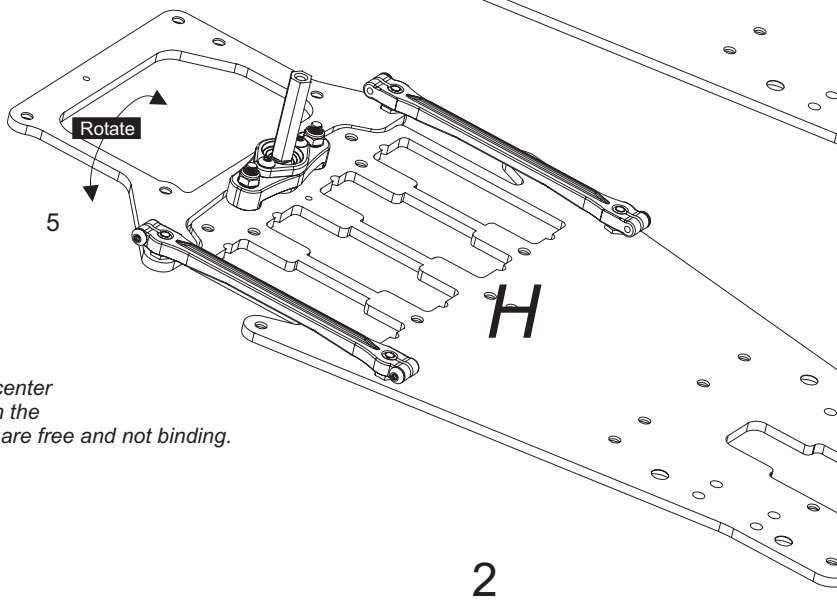
1. *Be sure the 2 aluminum locknuts on top of the center pivot are slightly loose. There should be a washer under each alum locknut. Notice that the center pivot "floats" or moves slightly on the 2 screws. This "floating" allows the links to "free up". This ensures that the rear bottom plate pivots freely on the links and center pivot ball. This is a crucial step when setting up the Gen-XL.*

2. *Snap the 2 links on the balls as shown above. They should rock freely on the pivot balls.*

3. *Place the chassis/backplate on a flat surface. No tires and no diff on the car! A smooth table or desk should do. Be sure that the rear bottom plate and chassis are in a straight line, flat against the table, again, no tires on the car. Lightly "tap" the chassis and rear pod releasing any tension in the links. Keep the chassis flat on the table for step 4.*

4. *Holding the chassis at the hold point "H" (not the rear pod) by pressing the chassis down to the table. Slowly tighten the 2 locknuts that secure the center pivot. For now, just lightly snug one side then the other.*

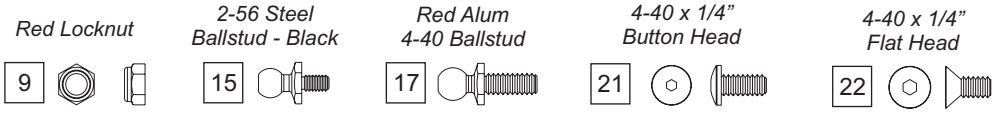
5. *Pick up the car and check the pivoting action of rear lower plate. Rotate the rear plate from side-to-side. It should move free without binding or "clicking". If it does not, loosen the pivot locknuts and repeat steps 3+4.*

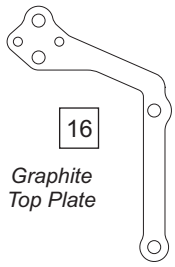


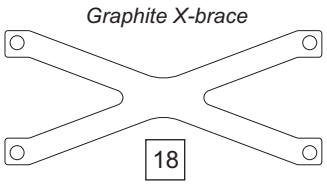
If it rotates smoothly, tighten the locknuts on the center pivot more securely. Do this by again holding the chassis down to the table at the hold point "H". Slowly and carefully fully tighten the locknuts that hold the center pivot to the chassis. The handling of the Gen-XL hinges (pun intended!) on the free movement of this rear plate. Be sure that the rear links and rear plate are free and not binding.

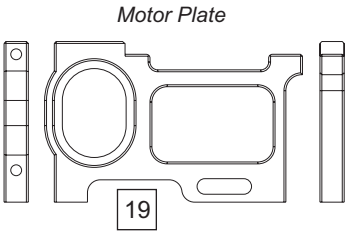
Rear X-Pod

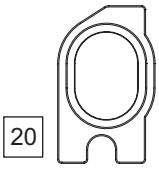
Bag 3





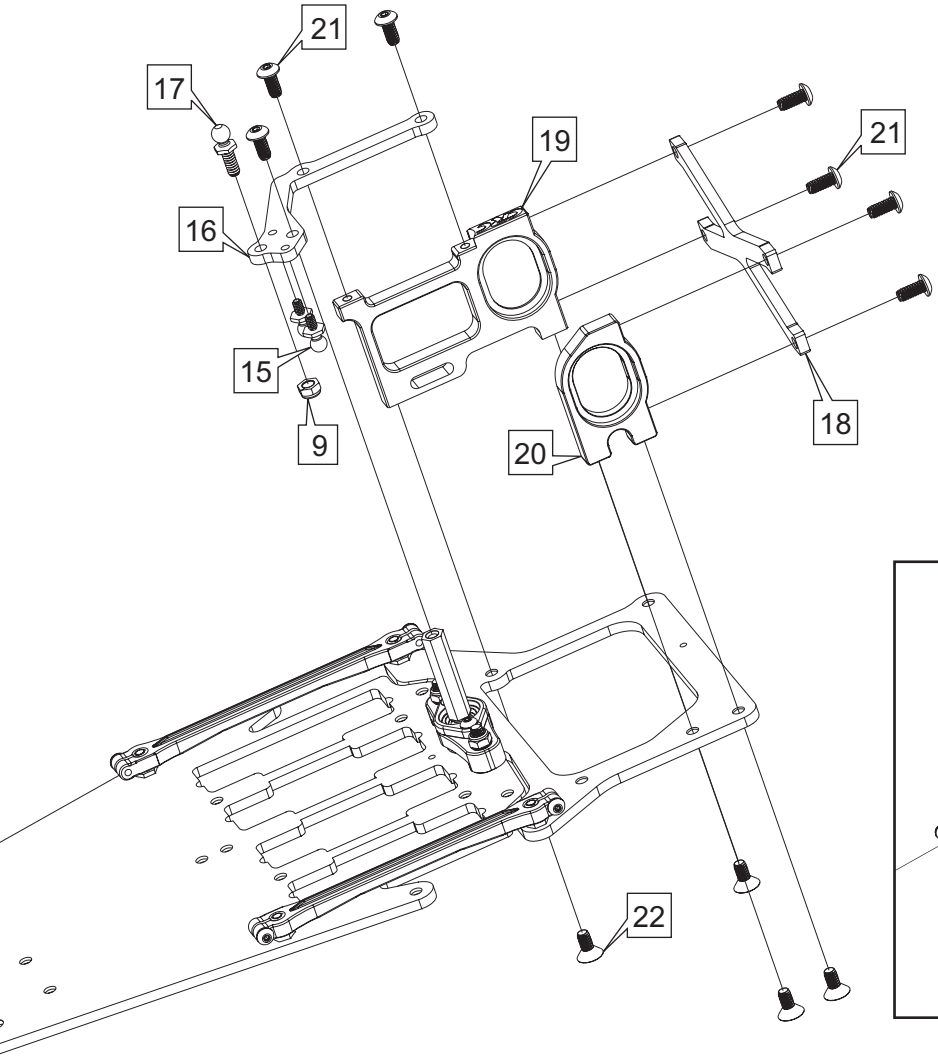






1 - Install the black 2-56 ballstuds [15] into the graphite top plate [16]. These steel balls thread into the graphite, no nut is needed. Be sure to start them straight and square and turn them in slowly so they do not strip or break.

2 - Push the red ballstud [17] through the graphite plate [16]. Use a red locknut [9] to secure it. Attach the assembled top plate to the Motor plate [19] using 3 1/4" button head screws [21].

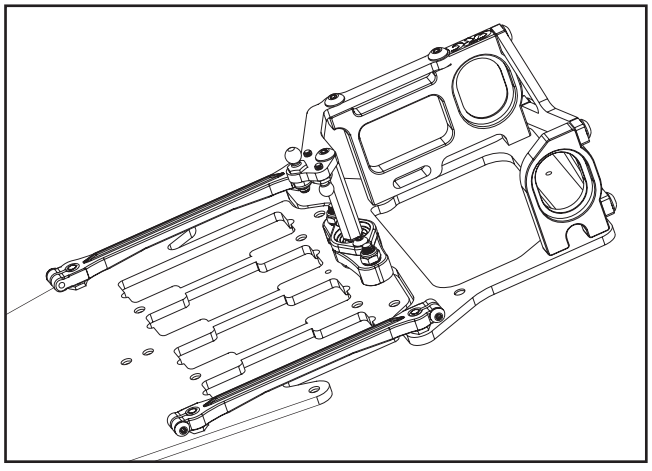


3 - Install the Graphite X-brace [18] to the back of the Motor Plate [19] and left side pod plate [20]. Use 4 1/4" button head screws [21] to attach the graphite piece to the pod plates.

4 - Install the completed rear pod assembly to the rear bottom plate using 4 1/4" flat head screws [22]. Keep an eye on these screws during the first few runs of your car. They tend to loosen until they take a "set" and then they WILL stay tight.

**Note - Although we are using steel screws in this kit, you may opt to use optional aluminum screws in the future. We do NOT recommend using thread lock in any aluminum to aluminum application. The best way to keep these tight is by keeping a close watch on their tightness after your first few runs.*

In time, the screw will naturally "seat" and stay tight.



Tweak Plates

Bag 4

4-40 x 3/8" set screw

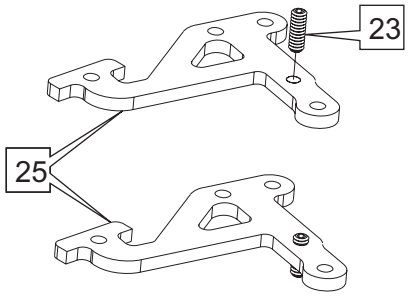
23

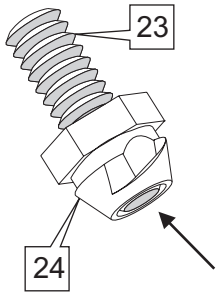
Molded Plastic Spring Holder

24

25

Graphite Tweak Plate (x2)





Thread the set screw in until flush with the bottom of the holder.

Insert Tweak Screws in Brace Assembly

1 - Place the Tweak Brace [25] on a smooth, flat table and thread the Tweak set screws [23] into the brace per the illustration. Try to be careful to thread it in straight and perpendicular.

With the tweak screw threaded through the brace, thread spring holder [24] onto the tweak screw as shown in the illustration. The tweak screw should thread in until flush with the bottom of the spring holder. These new spring holders do not require super glue to hold them to the tweak screws, but a small dot can be added as a precaution if you wish.

Tweak Plates

Bag 4

Red Locknut

9

Red Alum 4-40 Ballstud

17

White Side Spring

26

4-40 x 3/8" Button Head

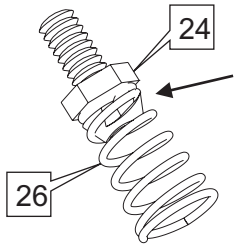
27

½" Plastic Standoff

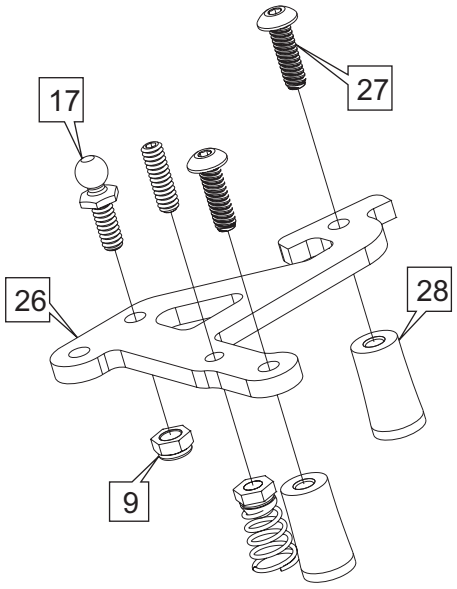
28

Attach Spring to Holder

Push the spring [26] into the groove on the plastic holder [24]. Make sure that the first coil sits into the angled groove. This allows the spring to sit flat on the bottom plate. If the spring coil is not properly seated in the groove, the spring will sit on an angle and make the car difficult to tweak properly.



Make sure spring coil is seated into groove on spring holder.



Assemble the Tweak Plates

1 - Use the 3/8" button head screws [27] to fasten the plastic standoffs [28] to the graphite tweak plate [26].

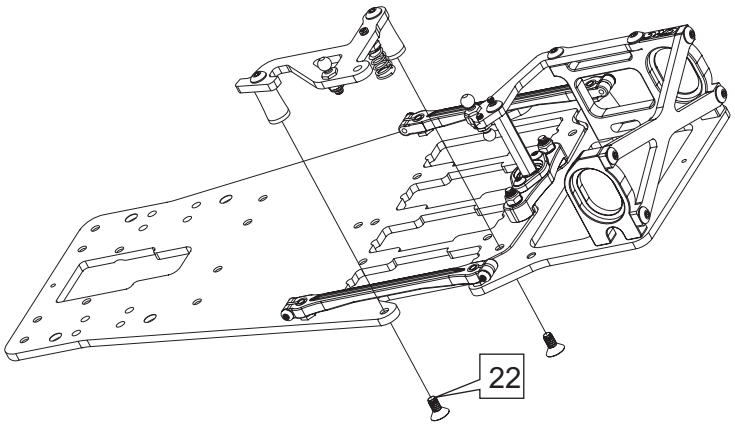
2 - Put the red ball stud [17] through the tweak plate and secure with a red locknut [9] as shown in the illustration.

Tweak Plates

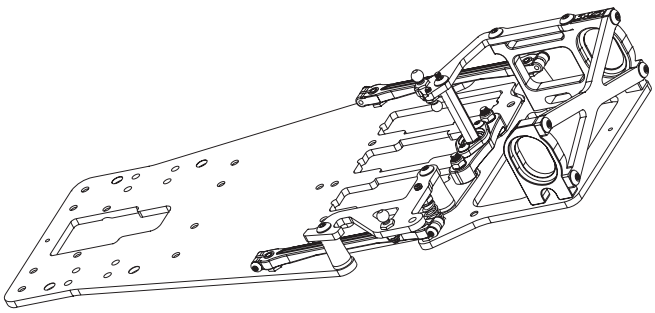
Bag 4

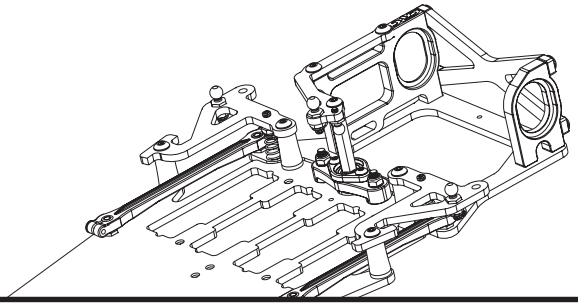
4-40 x 1/4" Flat Head

22



1 - Mount the completed tweak brace assembly to the chassis as shown using the 4-40 x 1/4" flat head screws [22]. Do this for both left and right side tweak plates.





Damper Tubes

Bag 5

2-56 set-screw stud

30

4-40 x 5/16" set screw

76

2-56 Plastic Ball Cup

31

Short 4-40 Plastic Ball Cup (on tree)

32

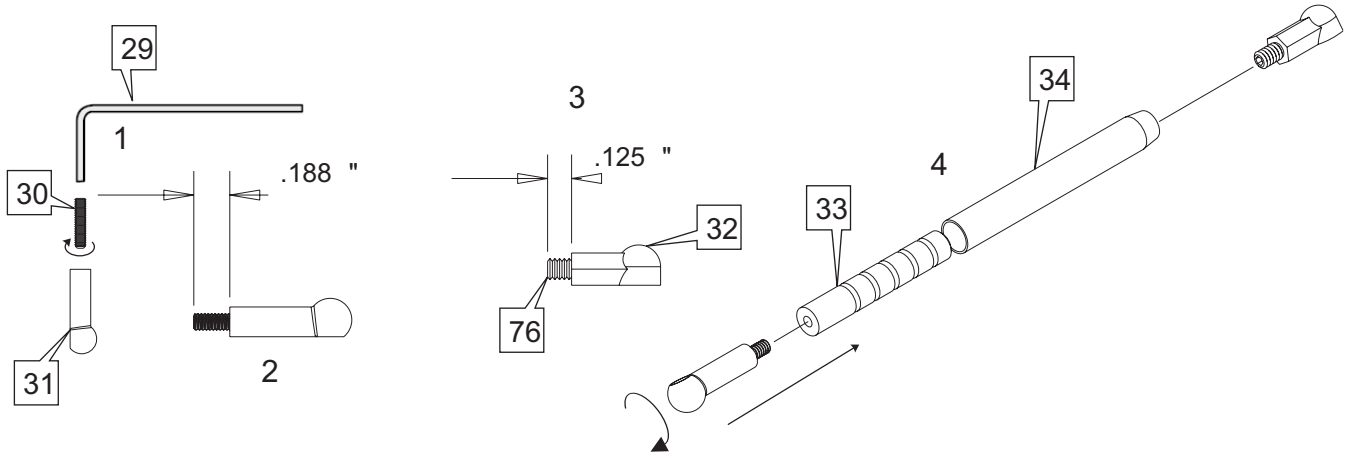
29 *.035" Allen Driver*

Delrin Plunger

33

Aluminum Tube

34



1 - Use the small allen key [29] to drive the 2-56 set screw stud [30] into the thin plastic ball cup [31].

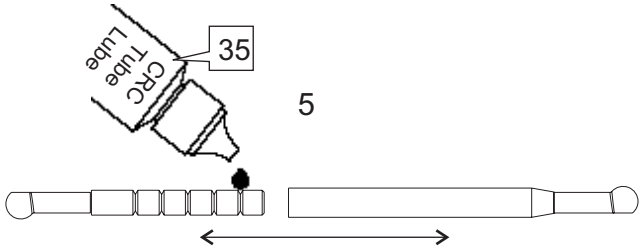
2 - Leave about 3/16" (half the set screw length) protruding from the ball cup.

3 - Do the same for the short 4-40 ballcup [32]. Use the 4-40 x 5/16" set screw [23] and the slighty larger .050" allen key. Leave about 1/8" protruding.

4 - Thread the 2 ball cups into their respective tube halves per the diagram. Finger tighten.

Damper Tubes

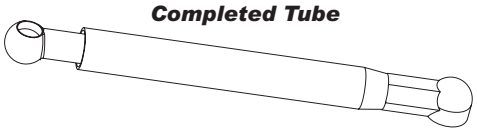
Bag 5



5 - Add CRC Tube Lube [35] to each slot on the delrin plunger [33]. Build the tube and be sure it has smooth, damped action.

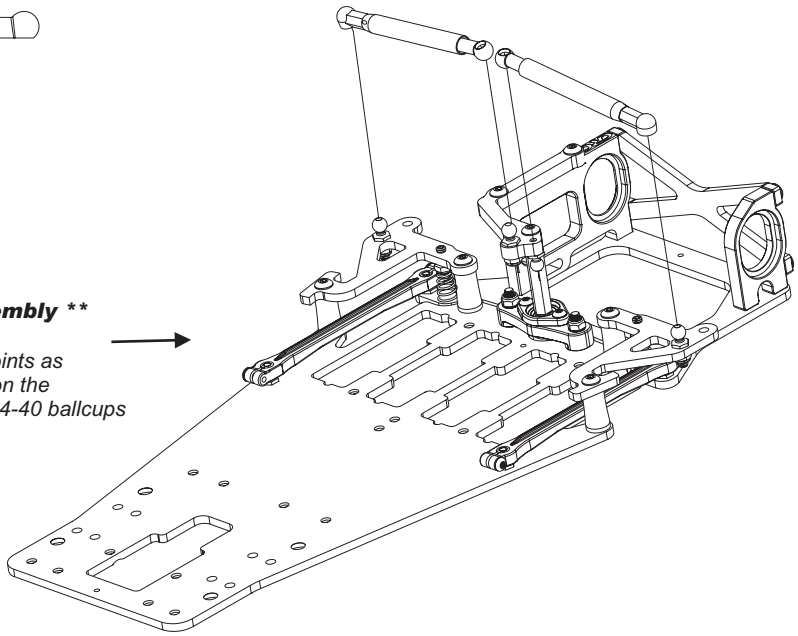
**** **Note**: fill only the slots, not the entire aluminum tube [34]. ****

Completed Tube



***** Adding the Damper Tubes to the Chassis assembly *****

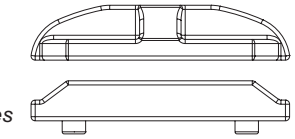
Snap the assembled & lubed damper tubes on the respective points as shown in the diagram to the right. You will find it easier to snap on the centered, smaller 2-56 ball studs first, then pop the outer, larger 4-40 ballcups



Adjustable Battery Position

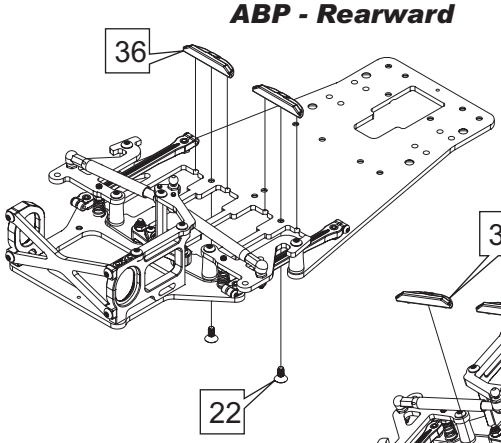
Bag 6

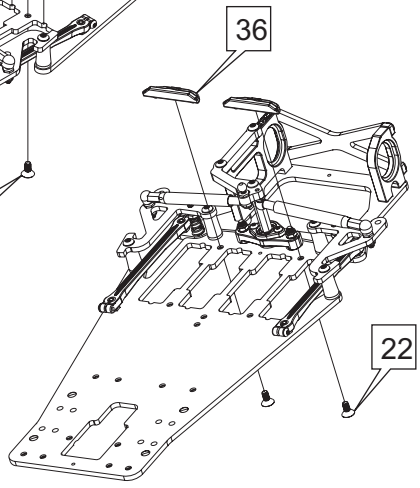
4-40 x 1/4" Flat Head



Molded ABP Braces

ABP - Rearward



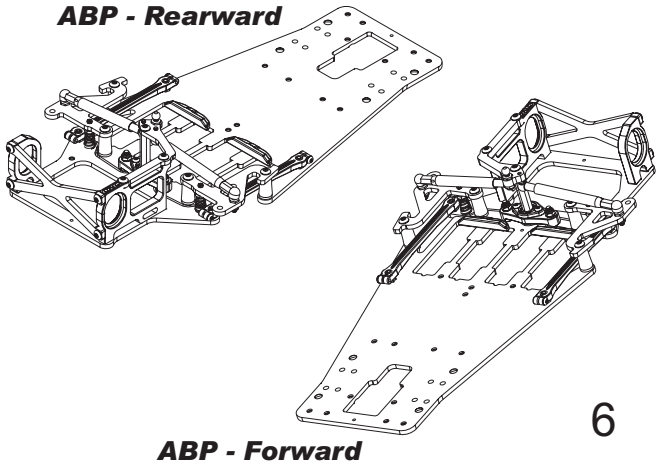


ABP - Forward

Your new Gen-XL continues to have CRC's Adjustable Battery Positioning (ABP). This adjustability gives the car a wide range of handling possibilities. We recommend running the battery to the rear for the most steering entering the corner. However, if the car is over aggressive on entry or tries to flip, moving the battery forward will smooth it out.

Using the 4-40 x 1/4" flat head screws [22], push the screws through the chassis [6] and then thread them into the plastic ABP braces [36] as shown in the diagram.

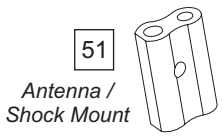
ABP - Rearward

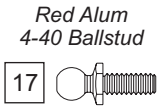


ABP - Forward

Center Shock

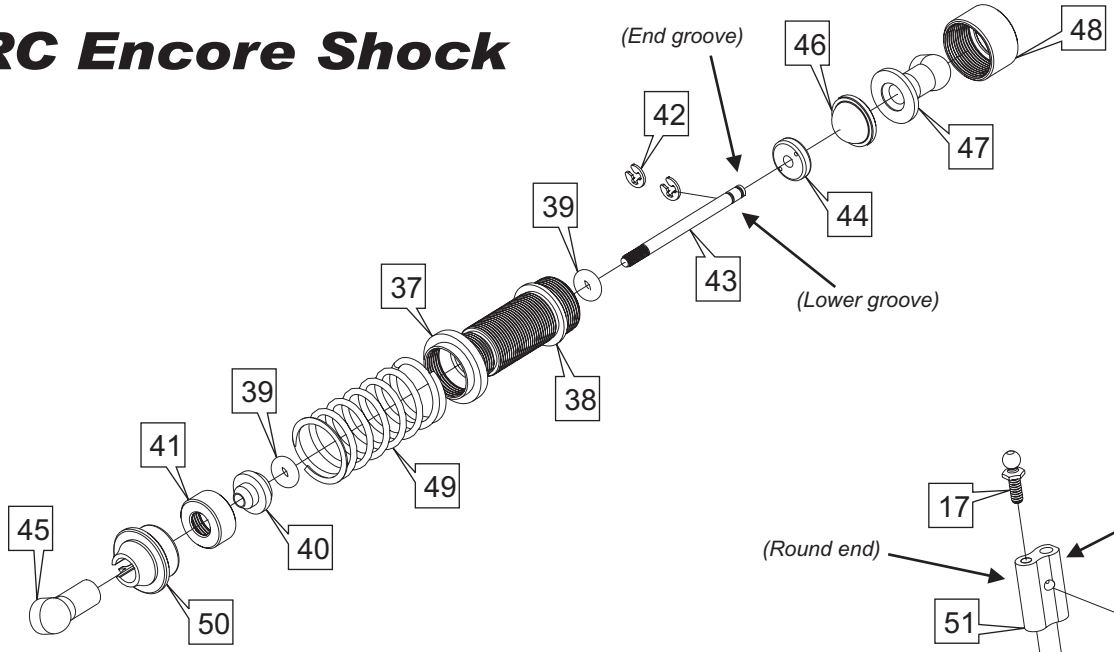
Bag 7





*1 - Thread the spring adjuster nut [37] onto the shock body [38] as shown above. *This needs to be installed first or you will not be able to get it on later after the lower end of the shock is assembled!**
2 - Insert only 1 of the small o-rings [39] into the lower end of the shock body [38]. Next, install the bottom shock plug [40] and tighten the bottom shock cap [41].
3 - Insert 1 of the small e-clips [42] into the lower groove of the shock shaft [43]. Slide the piston [44] over the shaft until it stops against the e-clip and then secure it in place with the other e-clip in the end groove. Next, slide the other small o-ring [39] over the shock shaft and up against the piston. This o-ring acts as a travel limiter.
4 - Put a small dab of the included shock oil on the threads of the shock shaft to lube it and then slide the shock shaft through the bottom end of the shock carefully so you do not damage the o-ring with the threads on the shock shaft. Pull the shaft all the way through until the piston bottoms out in the shock body.
*5 - Wipe off any excess oil from the threads of the shock shaft and then thread on the shorter of the 2 included ballcups [45]. *If you need to hold the shaft with pliers, be sure to wrap a rag around the shaft first so the pliers do not damage the shaft. If there is any damage to the shaft, the sharp edges will damage the o-ring and cause the shock to leak.*
6 - Now with the shaft still fully extended, hold the shock body upright and fill with the included shock oil. Press the shaft in about half way and then return it to full extension. Look inside the shock and you will notice small air bubbles in the oil. This is the rest of the air that was trapped below the piston. Allow enough time for the air bubbles to work their way to the surface and pop.
7 - Once satisfied that all of the air is out of the shock, top off with oil and then insert the shock bladder [46] by laying one side into the oil and then rolling your finger across the top of the bladder to expel any excess air and/or oil.
*8 - Insert the flanged ballcup [47] into the upper shock cap [48] and then tighten this down over the shock bladder, being careful to not knock the bladder off its seat and allowing air to enter the shock. *Double check that the shock is working smoothly through its range of motion and that you can fully compress the shock. If it binds up before being fully compressed, then it has too much oil and you will need to crack the top cap loose and expel a very small amount of oil and retighten.*
9 - Slide the shock spring [49] over the shock body and keep in place by clicking the spring retainer [50] over the shock shaft and sliding it down over the short ballcup to keep it in place.

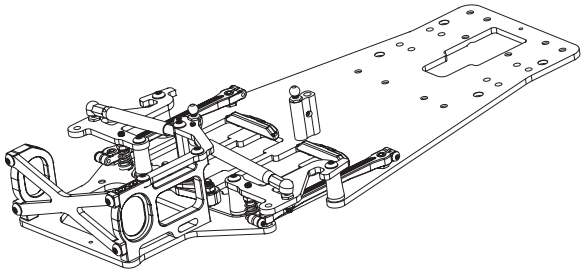
CRC Encore Shock

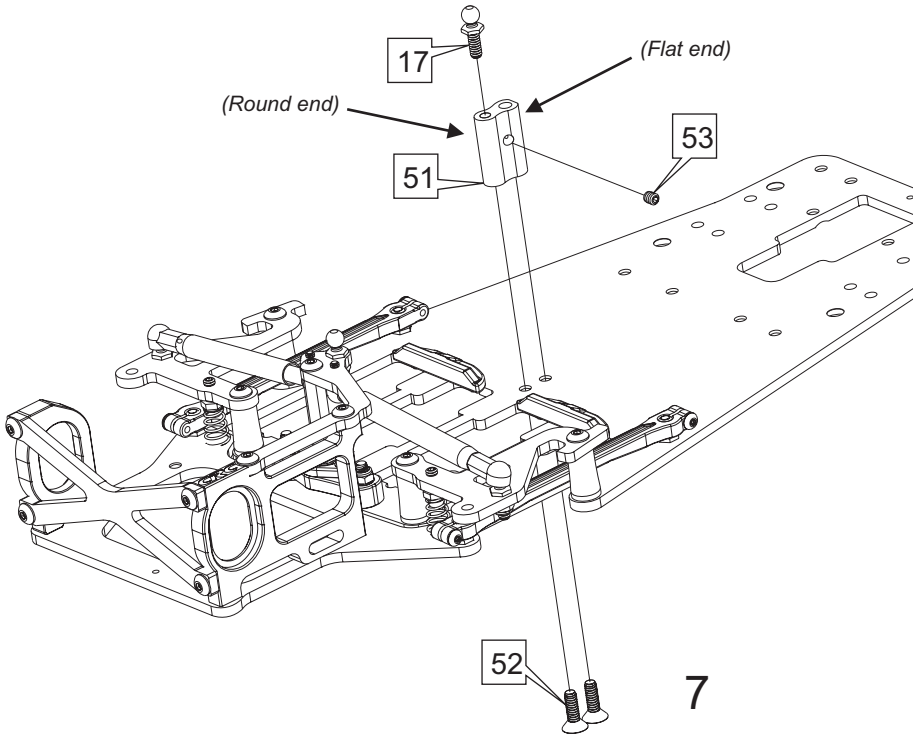


1 - Install the Antenna / Shock mount [51] using the 4-40 x 3/8" flat head screws [52] so that the flat end points toward the front of the car.

2 - Thread the red ballstud [17] into the rear hole of the shock mount.

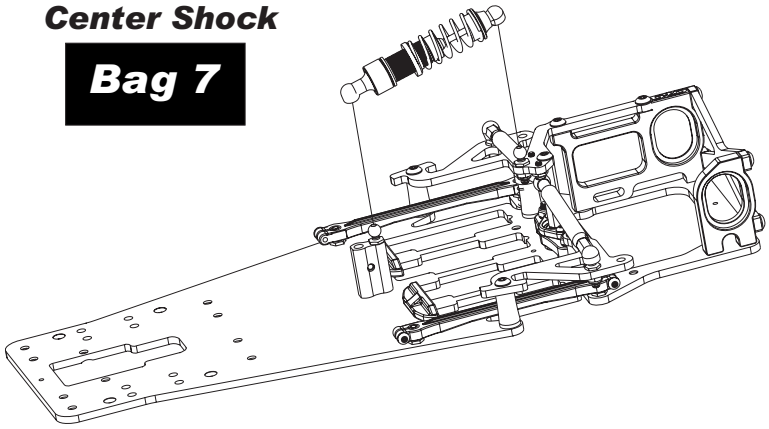
3 - Insert the white fiberglass antenna rod (not pictured) into the front hole of the shock mount and lock it in place using the 1/8" set screw [53].



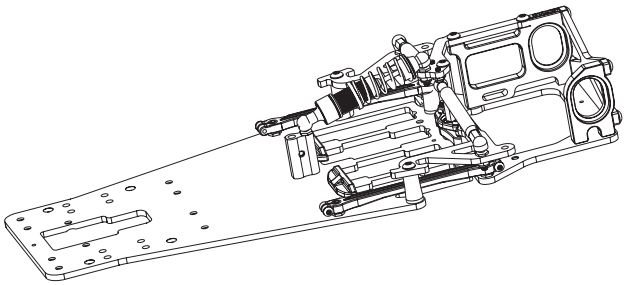


Center Shock

Bag 7

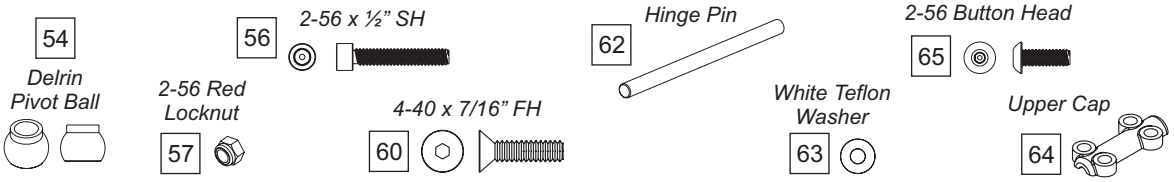


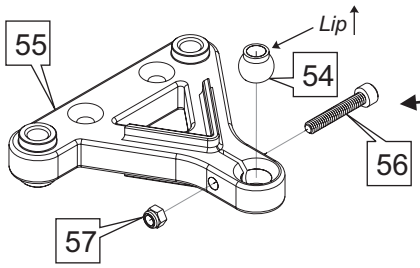
Install the shock on the ball studs as shown. Squeeze the ballcups over the ball studs with pliers. Do not push down on the shock in the center and try to pop both ballcups on at once or damage to the shock will occur.



CRC Pro-Strut Front End

Bag F





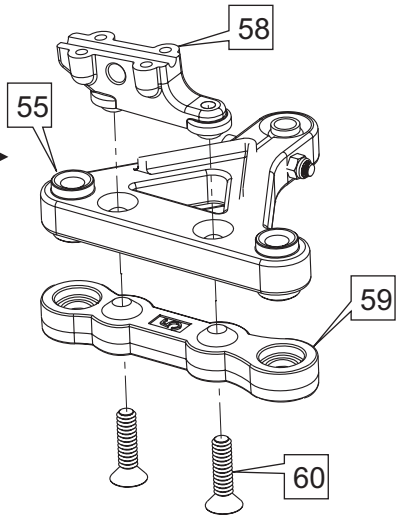
1 - Pop the delrin pivot ball [54] into the lower arm [55]. Place the arm on a strong table and push the ball in with the back of screwdriver handle. Or preferably, you can use CRC's 4279 Ball popper pivot ball tool. Notice the "lip" of the delrin pivot ball is pointing upward. The diagram to the left represents a right side lower arm. For the left side, flip the second arm over and be sure the pivot ball is installed with the lip again facing up.

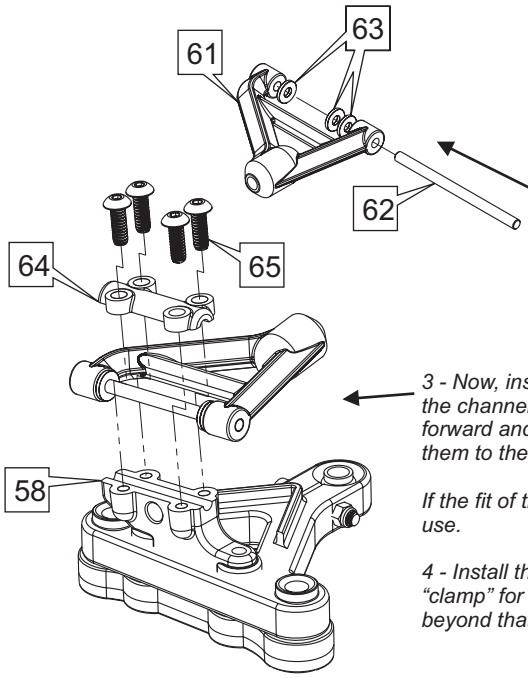
2 - Once the ball is popped in, insert the black 2-56 clamp screw [56] through the hole in the lower arm. Thread the 2-56 red locknut [57] onto the black screw. Tighten the screw slowly, continuously checking the pivot ball. When it begins to bind, back the 2-56 screw off a bit. The ball should be free to pivot with just a bit of drag. There is no need to have this ball super loose, a slight drag will be just the right amount of clamping force.

Check this fit after a few runs as the ball will wear and require additional clamping force.

1 - Install the upper A-arm mount [58] with the amount of Dynamic Caster desired. The options are 0, 5 and 10 degrees. The part shown to the right is the 5 degree version and is a good starting point. The 10 will angle down more toward the front of the car with the 0 being parallel to the chassis. The general thought is the more Dynamic Caster, the more steering the car will have at corner entry.

2 - Locate the 3, 4, and 5 mm spacers [59]. Use the 5 mm thickness for stock CRC High Roller tires trued to 1.8". For smaller tires, use the 4 and 3 mm versions. For finer ride height adjustments, use the CRC #4262 optional front shim set. This set contains .25, .5 and .75mm plastic ride height shims. After selecting the proper spacer, push the 4-40 x 7/16" screw [60] through the plastic ride height spacer [59], then through the lower arm [55], and then thread the screw into the upper A-arm mount [58]. Be sure NOT to over tighten.





1 - Break the mold tree from the upper A-arm [61]. You can clean up the mold gates with an X-acto or Dremel tool.

2 - Locate the upper arm hinge pin [62] and slide it into one half of the upper arm. Locate 3 small white teflon washers [63]. Push the hinge pin through the 3 washers. Then continue to push the hinge pin all the way into the upper arm.

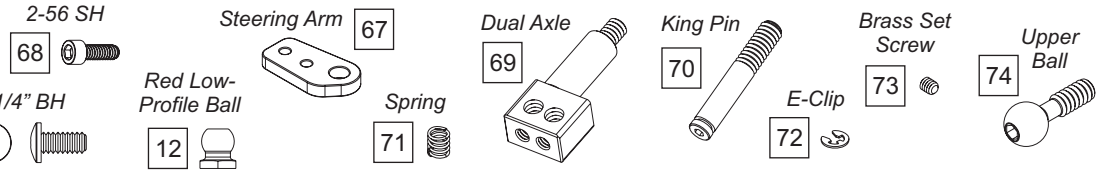
3 - Now, install the arm/pin/washer assembly onto the upper arm mount [58]. Put the hinge pin in the channel. At this point you can set your starting caster setting by moving these washers forward and back. The position shown to the left will result in a competitive handling. Moving them to the rear will increase steering from the center and exit of the corner.

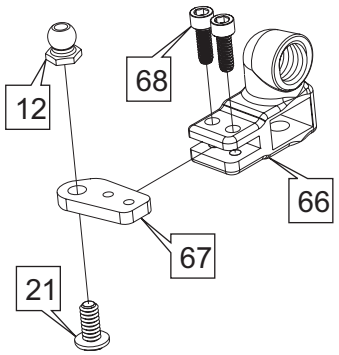
If the fit of the upper arm is tight, these washers are made from teflon and will flatten slightly with use.

4 - Install the upper cap [64] with 4 black 2-56 button head screws [65]. The upper cap is the "clamp" for the hinge pin. Be sure to tighten so that any gap is gone, however, do not tighten beyond that point as damage can occur to the upper a-arm mount holes.

Pro-Strut Front End

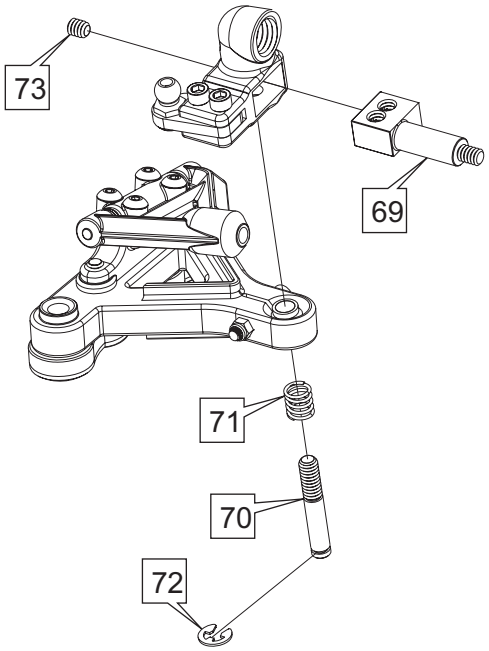
Bag F





1 - Build up the left and right steering blocks [66] as shown to the left. Start by threading the 1/4" button head screw [21] through the steering arm [67] and into the red low profile ball [12].

2 - Then, slide the steering arm assembly into the steering block, lining up the 2 mounting holes. Using the black 2-56 socket head screws [68], fasten the arm to the steering block. DO NOT OVER tighten. You will drive the screw through the steering block, deforming the part.

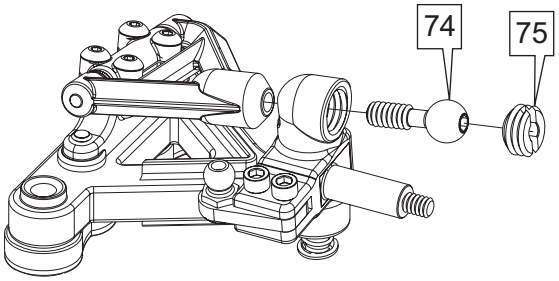


1 - Push the Dual aluminum axle [69] into the plastic steering block [66]. Push it all the way in firmly. Notice you can install the axle inline or trailing. Typically, this is installed trailing for 1/12th road racing. This will slightly slow the steering response as compared to inline.

2 - Take the King pin [70] on the end of the Allen key and slide it through the lower arm pivot ball [54], & then thread it into the steering block. Thread it in until some resistance is met. This is the King pin beginning to thread into the top of the steering block after traveling entirely through the dual axle.

3 - Add the spring [71] to the king pin. The preload on the spring can be adjusted with the king pin length. When on the king pin, you want the end of the spring flush with the e-clip groove. Start by adjusting the king pin so you have to slip the e-clip [72] under the spring to get it in the groove. Just a bit of preload.

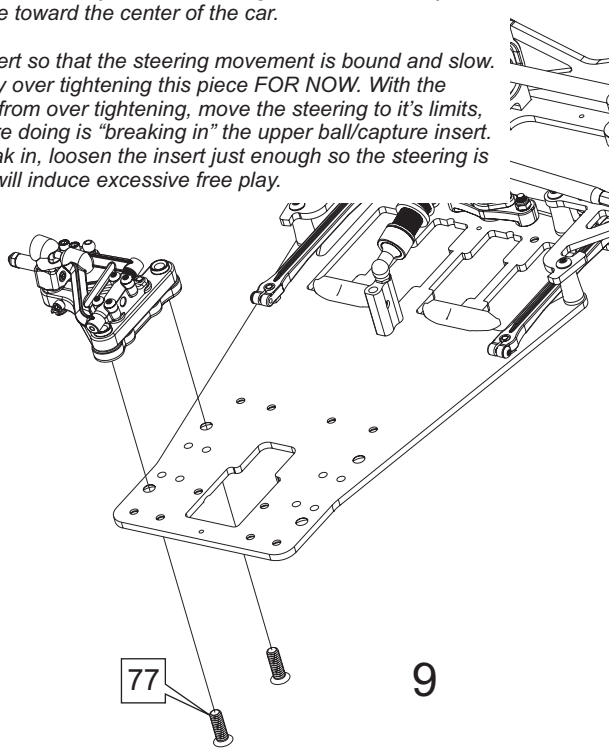
4 - Once happy with the preload position, lock the king pin with the 4-40 brass set screw [73] through the back of the steering block.



1 - Take the upper pivot ball [74] and push it though the steering block and thread into the upper arm. Thread it in so there are no threads showing.

2 - Take the slotted capture insert [75] and thread it into the steering block. THIS IS A BIT TRICKY .... as the insert must be fitted at a down angle as shown to the left. DO NOT try to insert it horizontally into the steering block. It is actually threaded in at a down angle toward the center of the car.

3 - Tighten this capture insert so that the steering movement is bound and slow. Yes, we are actually slightly over tightening this piece FOR NOW. With the steering movement bound from over tightening, move the steering to it's limits, back and forth. What we are doing is "breaking in" the upper ball/capture insert. After a minute or so of break in, loosen the insert just enough so the steering is free. Not too much or you will induce excessive free play.



1 - Use the large 8-32 screws [77] to mount the front suspension assembly to the chassis. Push the screw through the chassis and then screw into the lower front suspension arm.

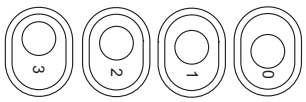
2 - Tighten both screws firmly. Be careful not to strip the head of the screw or the threads in the arm.

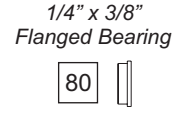
3 - Do both left and right.

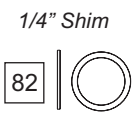
4- You can change ride height spacers or use CRC's 4262 plastic shim kit for fine ride height adjustments.

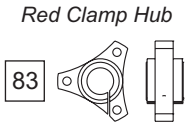
Bag 8

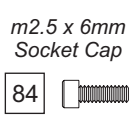
Differential Axle

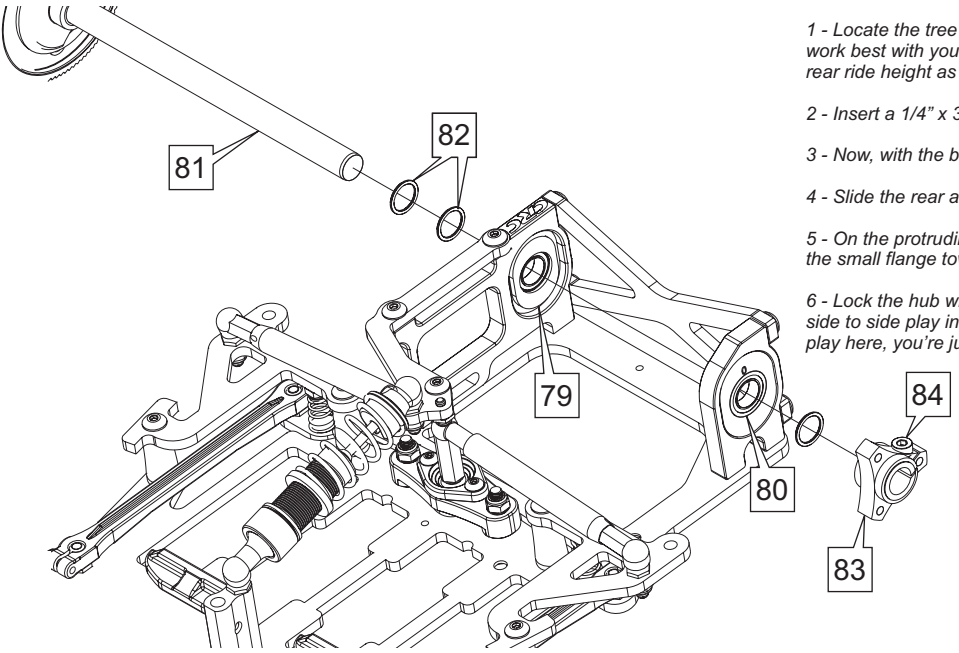












1 - Locate the tree of rear bearing carrier / ride height inserts [79]. Select the insert that will work best with your tire size. (save the left over inserts as you will use these to increase the rear ride height as the tires wear.) The #0 ride heights will work with full size CRC tires.

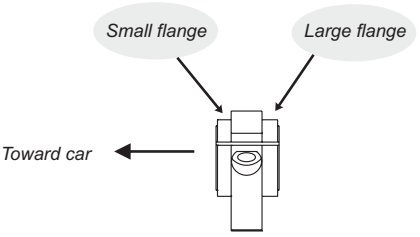
2 - Insert a 1/4" x 3/8" [80] Flanged Bearing into each of the ride height spacers.

3 - Now, with the bearings installed, insert the ride height spacers into the rear pod plates.

4 - Slide the rear axle [81] through two 1/4" shims [82] and into the 2 rear pod bearings.

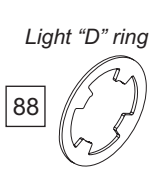
5 - On the protruding axle, slip another 1/4" shim over the axle. Then slip the hub [83] on with the small flange toward the bearing. The larger flange should face out.

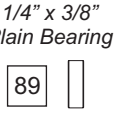
6 - Lock the hub with the small cap screw [84] so that the axle has a very small amount of side to side play in it. The thickness of 2 sheets of paper is plenty. You don't want excessive play here, you're just making sure to not pinch the bearings.

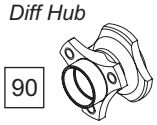


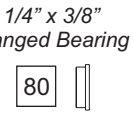
Bag 9

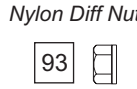
Differential



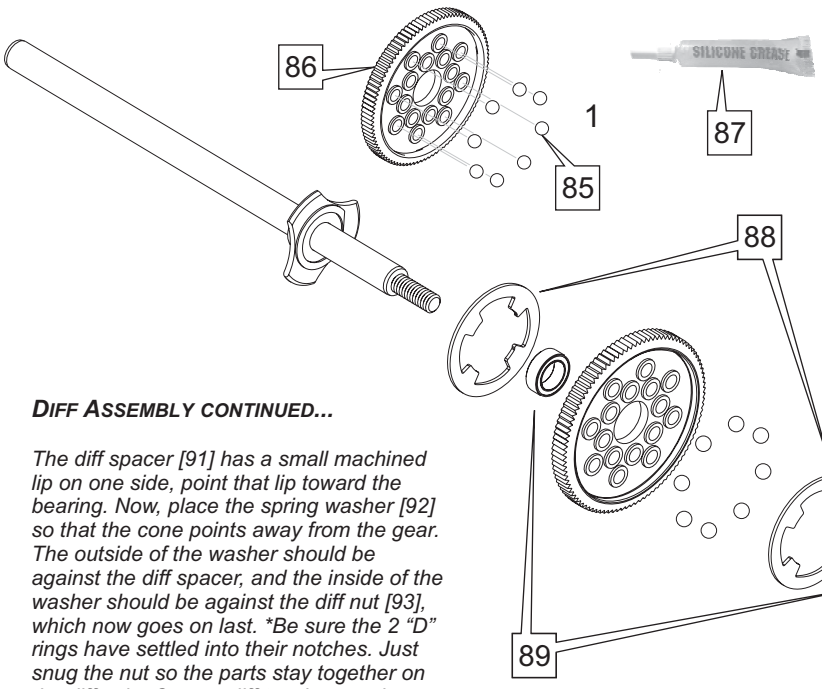








*** Balls in outer ring of holes in gear ***



1 - Install and grease the diff balls

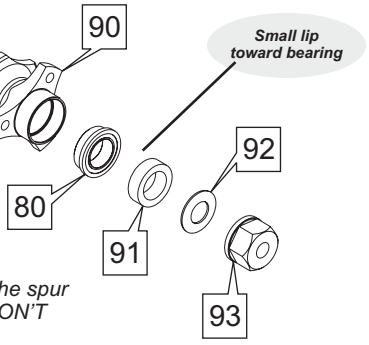
Pop the 1/8" diff balls [85] into each of the outer ring of holes in the diff gear [86]. The balls snap into the socket. Place a small dab of silicone diff grease [87] on each ball. Use very little!

2 - Diff Assembly

**(Holding the car on it's side, with the rear axle pointing upright will ease assembly of the diff.) Place 1 diff ring [88], and then a 1/4" x 3/8" plain bearing [89] over the end of the axle. Align the diff ring so that it notches into the axle flange. Place the assembled gear with the greased diff balls over the axle and push it down over the plain bearing. Next, insert the other plain bearing into the back of the diff hub [90]. Then, align the second diff ring with the notch on the back of the diff hub. *(place a small dab of the diff grease on the hub first to hold the ring in place.)* Now, slide the hub, bearing, & diff ring down over the axle. Next, slide a flanged bearing [80] over the axle and into the front of the diff hub.*

Diff Assembly continued...

*The diff spacer [91] has a small machined lip on one side, point that lip toward the bearing. Now, place the spring washer [92] so that the cone points away from the gear. The outside of the washer should be against the diff spacer, and the inside of the washer should be against the diff nut [93], which now goes on last. *Be sure the 2 "D" rings have settled into their notches. Just snug the nut so the parts stay together on the diff axle. Correct diff tension needs to be set with tires on the car.*

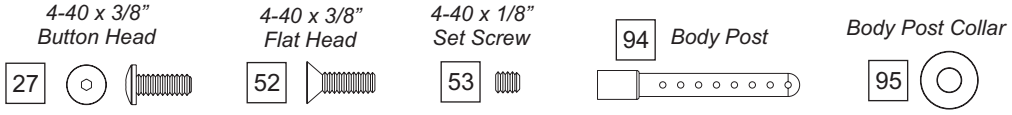


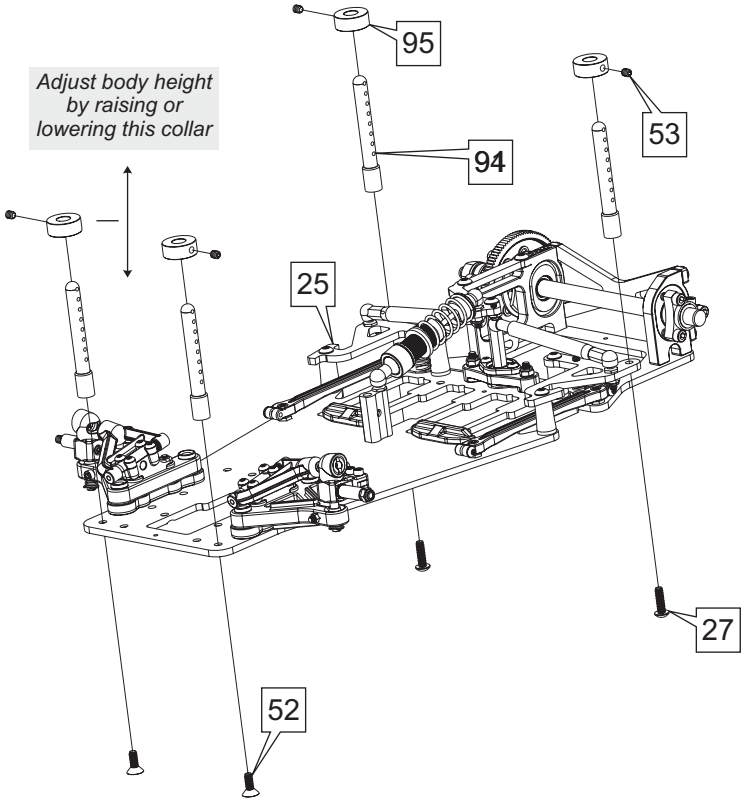
3 - Setting the Diff

Once the tires are on: Adjust the diff nut so that the tires spin back and forth freely when holding the spur gear, but it is very difficult to slip the spur gear with your thumb when holding both tires. Again - DON'T over-tighten so the outer diff hub bearing gets crushed! Re-check diff tension after the first run.

Body Posts

Bag 10





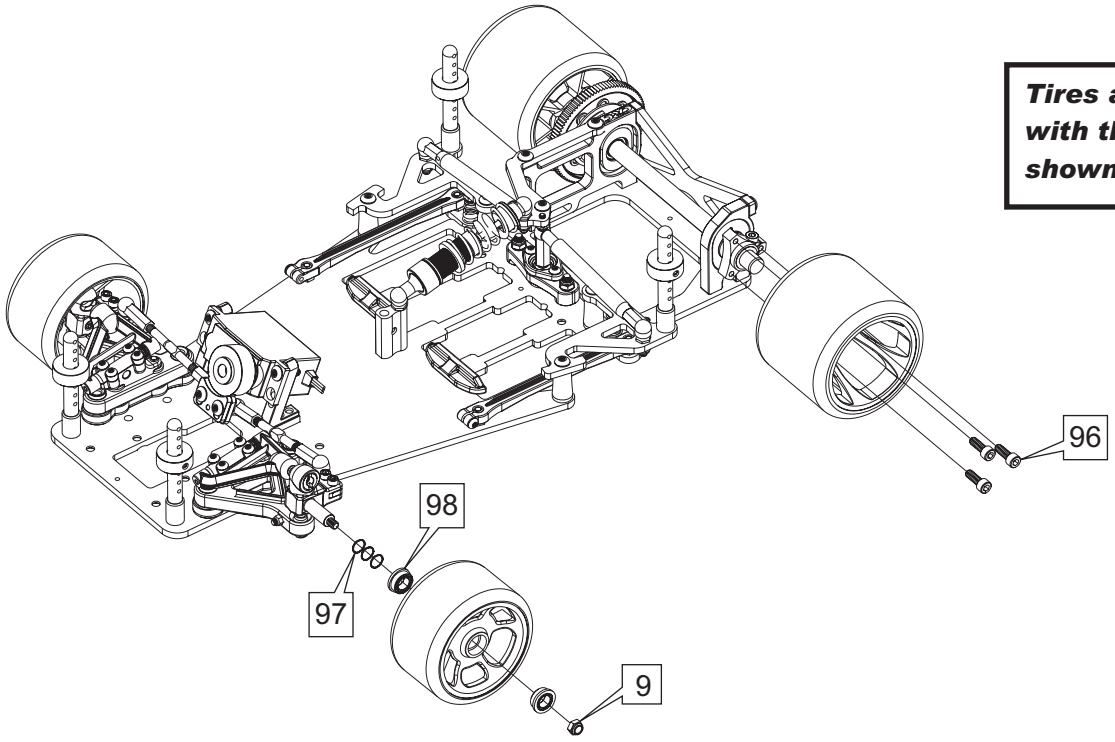
Body Posts

Secure both front body posts [94] to the chassis with the 4-40 x 3/8" flat head screws [52].

For the rear body posts, use the 4/40 x 3/8" button head screw [27]. Mount the body post to the Tweak Plate [25].

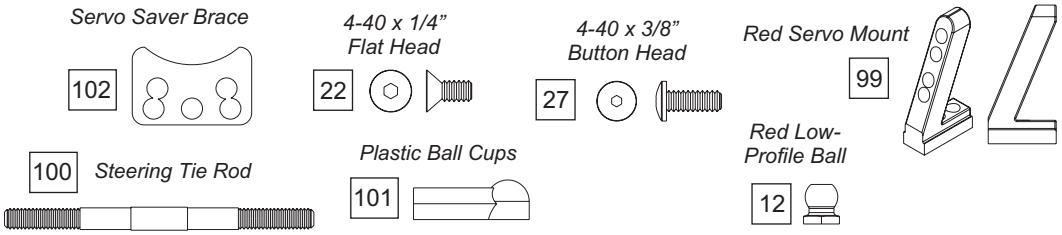
Thread the 1/8" set screw [53] into the plastic collar [95]. Adjust the collar up and down the body post to accommodate the body shell used. Lock the collar with the set screw.

Bag 11



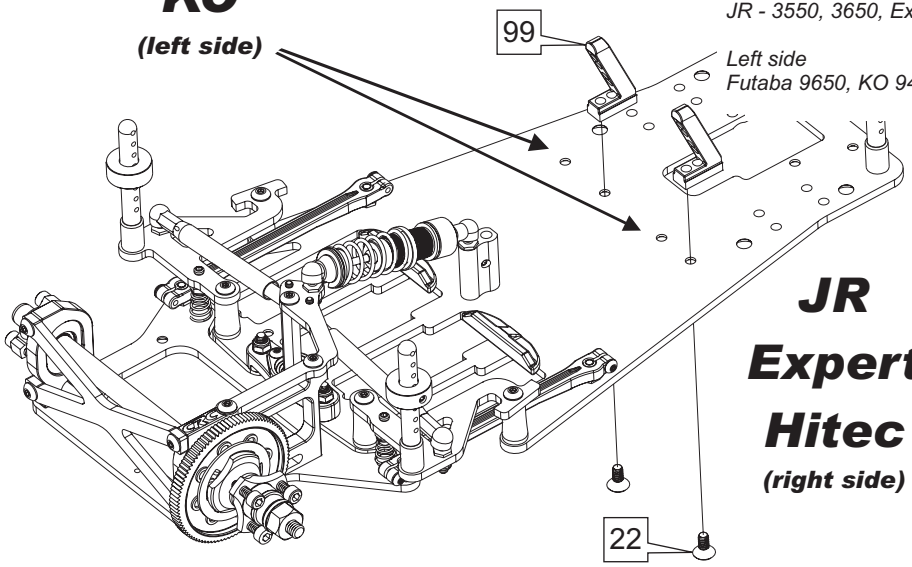
Tires are not included with the Gen-XL, and are shown for reference only.

Electronics



Air/Sanwa Fut KO

(left side)



Red Aluminum Servo Mounts

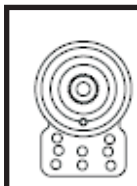
CRC has pre-drilled the Gen-XL for both JR, Expert and Hitec on one side, and Futaba/KO/Sanwa on the other side. Refer to the diagram below for instructions on what brand to use and in which locations.

Right side
JR - 3550, 3650, Expert 451, Hitec 225

Left side
Futaba 9650, KO 949, Air/Sanwa 94141,94145

JR Expert Hitec

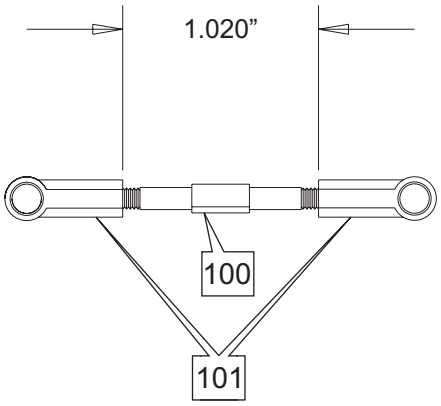
(right side)

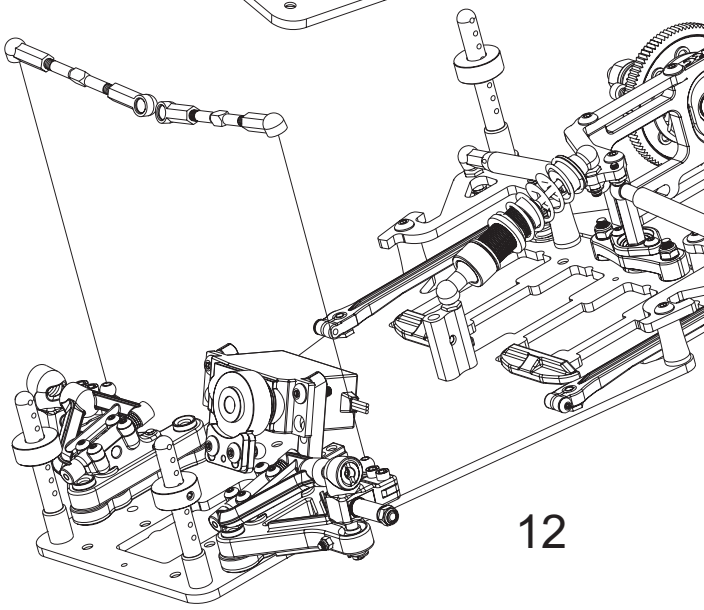


NOT Included:

Kimbrough Servo Saver:

113 - Airtronics, JR, KO
114 - Futaba
131 - Hitec





Tie-Rods

Make 2 tie rods as shown above. This 1.02" gap should be a good starting point for toe-in adjustment. You will need to adjust the final length after the car is fully ready to run.

Install the servo saver (not included) and assorted hardware in the order shown above to the right. Put the 4-40 x 3/8" button head screws [27] through the middle holes of the servo saver as shown and tighten the red low-profile balls [12] onto them.

Gen-XL Spare Parts List

(Sorted by kit ID#)

ID#	Kit / Part Description	Part #	Packaged Part Description
1	Center Pivot Base	3374	Molded Center Pivot
2	Flanged Pivot Ball	4019	Aluminum Pivot Balls
3	Center Pivot Cap	3374	Molded Center Pivot
4	2-56 Button Head	3374	Molded Center Pivot
		3254	2-56 x 1/4 BH-for upper cap (10)
5	4-40 x 1/2 steel flat head	1430	1/2 x 4-40 FH Allen-SS
6	Graphite Main Chassis	3256	Gen-XL 2.5 mm Graphite Chassis
7	4-40 thin hex nut	12772	Small Hex Nuts CK Pivot Plate (10)
8	Small Washer	1209	Servo Mount Washer (10)
9	4-40 red locknut	1412	Alum Locknuts-Red Anodized (10)
		1410	Andzd Alum Screw Set - bulk
10	Graphite Bottom Plate	1766	Rear Bottom Plate - GX10/12BL
11	red hex standoff	3337	Open-X Hex Standoff-Gen-X
12	Red pivot Ball	13615	Anodized Low Roll Center Balls (4)
13	4-40 x 5/16 steel flat head	1426	5/16 x 4-40 FH Allen-SS (4)
14	One-Piece side links	3281	XL One-Piece Clamp links-GXL
15	Black 2-56 ballstud	1384	2-56 Ballstuds & Ballcups for Damper tubes (4)
16	Graphite Top Plate	1765	Rear Top Plate - GX10/GXL
17	Red Ball Stud	1409	Anodized 4-40 Ball Studs (4)
18	X-Brace	1774	Rear X-Brace, Wide - BA/GX10
19	Aluminum Pods	3340	Low Profile Motor Pod-Gen X
20	Molded Left Pod	3353	Molded Micro Left BL Pod
21	4-40 x 1/4 button head screw	1434	1/4 x 4-40 BH - SS
22	Steel 4-40 x 1/4" flathead	1424	1/4 x 4-40 FH Allen-SS (4)
23	Tweak Screw	3288	3/8 x 4-40 twk screw - X cars
24	Molded Spring Holder	3387	Molded Spring Retainers-CRC
25	Graphite Tweak Plate	3270	Tweak plate- Gen X (1)
26	Side Spring	1296	Side Spring- White - Med
		1280	Rear Side Spring Set
27	4-40 x 3/8 button head screw	1436	3/8 x 4-40 BH - SS
28	Plastic Standoff	3375	Molded 1/2 Standoffs (4)
29	.035 allen wrench	13695	.035 Allen wrench
30	2-56 set screw stud	1397	2-56 Stud for Damper Tubes w/ .035 hex head
		3269	Red Torpedo Tube (1) Gen X
31	2-56 Plastic Ball Cup	1384	2-56 Ballstuds & Ballcups for Damper tubes (4)
		3269	Red Torpedo Tube (1) Gen X
32	Short 4-40 Ball Cup	32694	Short ball cup-(4) Gen X damper tube
		3269	Red Torpedo Tube (1) Gen X
33	Delrin Plunger	32693	Delrin Plunger for Short Gen X Damper Tube
		3269	Red Torpedo Tube (1) Gen X
34	Aluminum Tube	32691	Red Aluminum Tube - Gen X (Tube Only)
		3269	Red Torpedo Tube (1) Gen X
35	CRC Tube Lube	4212	CRC Tube Lube - Heavy (white cap)
36	Molded ABP Braces	3373	GXL Adj. Batt Position Pieces
37	Spring adjuster nut	3291	Encore Shock-Body+alum parts
38	Shock body	3291	Encore Shock-Body+alum parts
39	Small O-ring	3295	Encore Shock Rubber Parts
40	Bottom shock plug	3293	Encore Shock Plastic Parts
41	Bottom shock cap	3291	Encore Shock-Body+alum parts
42	Small e-clip	3294	Encore Shock E-clips (10)

Gen-XL Spare Parts List

(Sorted by kit ID#)

ID#	Kit / Part Description	Part #	Packaged Part Description
43	Shock Shaft	3292	Encore Shock Shaft-hardened
44	Shock piston	3293	Encore Shock Plastic Parts
45	Short ballcup	3293	Encore Shock Plastic Parts
46	Shock Bladder	3295	Encore Shock Rubber Parts
47	Flanged ballcup	3293	Encore Shock Plastic Parts
48	Top Shock cap	3291	Encore Shock-Body+alum parts
49	Shock Spring	1348	Gold Spring - VCS
50	Spring retainer	3293	Encore Shock Plastic Parts
ID#'s 37-50 (less 49) are all in 3290 also.		3290	Encore Micro Shock (complete, less spring)
51	Antenna / Shock Mount	3354	CRC Shock/Ant Mount
52	4-40 x 3/8 Flat head screw	1428	3/8 x 4-40 FH Allen-SS (4)
53	4-40 x 1/8 set screw	13783	1/8th Set Screw (6)
54	Delrin Pivot ball	3246	Delrin pivot ball (4) Pro Strut
55	Lower Arm	3247	CRC Front Arm set-up and low
56	2-56 Clamp Screw	3242	Clamp screw+nut-Pivot ball (2)
57	2-56 Locknut	3242	Clamp screw+nut-Pivot ball (2)
		1472	2-56 mini locknuts (red) (8)
58	Upper A-arm Mount	3243	Upper Arm mnt set-0,5,10 (2)
59	Plastic Ride Height Spacers	3233	Molded ride height spacers - 3, 4, & 5mm
60	4-40 x 7/16" Red FH	1453	4-40 x 7/16" FH Alum 7075-Red
61	Upper A-arm	3247	CRC Front Arm set-up and low
62	Upper Hinge Pin	3245	CRC FE Hinge Pin (2)
63	White Teflon Washer	1253	Front Hinge pin Teflon washers - (8)
64	Upper Cap	3243	Upper Arm mnt set-0,5,10 (2)
65	2-56 Button Head	3254	2-56 x 1/4 BH-for upper cap (10)
66	Steering Blocks	3251	CRC Steering Block set
67	Graphite Steering Arm	3252	Graphite Steering arm (pr.)
68	Socket Head 2-56 screw	3253	2-56x1/4 SH-steering arm (10)
69	Dual Aluminum Axle	3235	CRC Dual Front Axle (pr.)
70	King Pin	3250	CRC 1/12 King Pin set-polished
71	Front End Spring	3392	Front End Spring .50mm (pr.)
72	E-Clip	1382	1/8 E-clips-100 pieces
73	Brass Set Screw	3234	Brass 4-40 Set screws-2 pr.
74	Upper Pivot Ball	3244	CRC Big Upper Ball Stud (2)
75	Capture Insert	3251	CRC Steering Block set
76	4-40 x 5/16" Set screw	1288	5/16 x 4-40 set screw - tubes
77	Red 8-32 Front End Screws	12392	8-32 Front End screws (red)
		1410	Andzd Alum Screw Set - bulk
79	Axle Carrier / Ride Height Spacer	1385	Plastic Ride Heights 1-4
80	1/4 x 3/8 Flanged Axle bearing	13861	1/4 x 3/8 Flanged Axle bearing (1)
		1386	1/4 x 3/8 Flanged Axle bearing (10)
81	Rear Axle	4228	Large D-ring Axle - Red
82	1/4" rear axle shim	4732	1/4 Shim Set (20)
83	Left Clamp Hub	3333	Super light left clamp hub-red
84	Socket Head Clamp Screw	3332	M2.5 x 6mm Cap Head Screw (6)
		3333	Super light left clamp hub-red
85	1/8" Diff Balls	1229	Diff Balls for gear (100 pcs.)
86	Diff Gear	64076	76T 64P Spur Gear
87	Silicone Diff Grease	4205	Diff Lube - Silicone 4cc
88	Diff Ring	4202	Lightened Large D-rings

Gen-XL Spare Parts List

(Sorted by kit ID#)

ID#	Kit / Part Description	Part #	Packaged Part Description
89	1/4 x 3/8 Unflanged Axle bearing	13871	1/4 x 3/8 Unflanged Axle bearing (1)
		1387	1/4 x 3/8 Unflanged Axle bearing (10)
90	Diff Hub	4227	Narrow Diff Hub - GenX B/L Pod
91	Diff Spacer	4121	Aerodiff Spacer collar
92	Spring Washer	4123	Belleville Spng wash-3 bolt(2)
93	Plastic Locknut	4126	8-32 Nylon Locknut (2)
94	Body Mounts	1378	Body Post Set-for CK
95	Plastic Collar	1378	Body Post Set-for CK
96	4-40 x 5/16 Cap Head Screw	1460	4-40 x 5/16 SH Alum 7075 T6RED
97	3/16 front wheel shim	4745	3/16 Shim Set (20) x .010
98	3/16 x 5/16 Flanged Bearing	32481	3/16 x 5/16 Flanged Bearing (1)
		3248	3/16 x 5/16 Flanged Bearing (10)
99	Servo Mount	1715	Alum Servo Mnt - Multi-Hole
100	Steering Tie Rod	3217	Steering Tie Rod (2)
101	Plastic Ball Cup	1231	Steering Plastic Ballcups (8)
102	Servo Saver Brace	3376	Molded Servo Saver Brace+Spcrs

Gen-XL Option Parts List

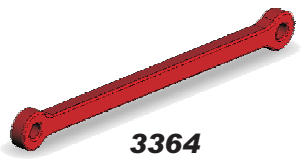
Part #	Packaged Part Description
1260	Red Aluminum "sexy" standoffs - (2)
1280	Rear Side Spring Set (all)
1295	Blue Side Spring - soft
1297	Red Side Spring - firm
1298	Green Side Spring - X firm
1299	Purple Side Spring - XX firm
1339	Blue Center Spring
1340	Red Center Spring
1341	Copper Center Spring
1764	4mm Top Plate- GX10,12BL
3259	Mini Foam Bumper-12th cars
3260	Large Foam Bumper-12th cars
3277	Graphite front Stifffener and brace
3317	Titanium Steering Tie Rod-Gen X
3344	Titanium ProStrut Upper Pivot Ball-2
3348	Long Upper Arm-Dual mnt, long + short (requires 3277)
3351	Alum Left side Bulkhead
3360	Aluminum Upper arm mnt (red) - 0 degree
3361	Aluminum Upper arm mnt (red) - 5 degree
3362	Aluminum Upper arm mnt (red) - 10 degree
3363	Long Pin Brace - Red - for short upper arm (best used w/ 3360-62)
3364	Short Pin Brace - Red - For long upper arm (best used w/ 3360-62)
3390	.45 mm Front Spring
3394	.55 mm Front Spring
3396	.60mm Front Spring
4020	Wire Keepers -Clips and Ties, self stick wire clips
4167	Audi R8C Ltwt 1/12th Body
4262	Front Ride Height Shim Set
4732	1/4 Shim Set (20)
4745	3/16 Shim Set (20) x .010
13615	Hard anodized teflon coated link balls (4)
13862	Ceramic Rear Axle Bearings-Flanged (10)
13872	Ceramic Rear Axle Bearings-Plain (10)
32462	Bronze Lower Arm ball-ProStrut
32482	Ceramic Front Wheel bearings (10)
40194	Hard anodized teflon coated center pivot ball (2)

1260

13615

3351

3362



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Tuning the Front Suspension of the Gen-XL

Springs: The Gen-XL comes with .50mm front springs. Going to a softer front spring will allow the car to roll more, which will yield more overall steering, but will be most noticeable on corner entry. Using a stiffer spring will do just the opposite. The car will stay flatter and transition less weight side to side giving you less total steering, but again most noticeably on corner entry. Preloading the front springs should not be used as a tuning aid (if you need the front end to be stiffer, use a stiffer spring), but rather just to correct ride height. As an example, sometimes when using soft front springs, you will notice that the car sits down into the spring (or "sags"), creating a gap between the spring and lower pivot ball, causing loss of ride height. You do want the car to "set" into the spring slightly (never bound tight at the top of its travel). But if this gap is more than .010" (or .25mm), you can preload the spring slightly (either by turning the king pins in farther, or adding a thin shim) to get the ride height back up.

Caster: Caster is the angle of the king pin in relation to vertical when viewing it from the side of the car. Zero caster is having the king pin perfectly straight up & down. Adding caster tilts the king pin back (top of king pin towards rear of car). Caster is adjusted on the Gen-XL by moving the white spacers on the upper hinge pin forward or back. Moving them back adds caster. Adding caster adds more mid-corner & exit steering. Decreasing caster makes the car react faster off center (or also called making it "twitchy"), but decreases mid & exit steering.

Dynamic Caster: This refers to the angle of the upper arm hinge pin in relation to the lower arm hinge pin (in this case, since there is no lower hinge pin, it is always in relation to level, or horizontal). (*This would vary on other vehicles such as off-road or touring cars where the lower arm hinges as well and the angle of kick-up/anti-dive is adjustable.*) This is adjusted on the Gen-XL by changing the upper arm mount blocks (or, dynamic caster blocks). The car comes with all 3 options in the kit. The 0 degree block, or 0 degrees of dynamic caster, is having the upper hinge pin parallel with the chassis so that when the suspension compresses, the upper arm pivots straight up & down, having no effect on your caster setting. Increasing dynamic caster (changing to the 5 or 10 degree blocks) tilts the front of the hinge pin down toward the chassis. By increasing this angle, the upper arm pivots forward slightly, decreasing the amount of caster as the suspension compresses. This option is designed to give you the "best of both worlds". *(see above section on effects of Caster.)*

Camber: Camber refers to the angle of the wheel/tire in relation to the track surface when viewing from the front or rear. Negative camber means that the top of the tire leans in toward the chassis. Positive camber means the top of the tire leans out, away from the chassis. Camber can be precisely measured with after market camber gauges, sold at a local hobby shop. It can be measured roughly using any square (to the ground) object *(such as a credit card, business card, hotel door key, etc.)* by checking the gap between the square edge and the top of the tire. Increasing negative camber (in the range of 0-2 degrees) will increase steering. Changing the camber has a tremendous effect on the handling of the car. This is, most often, a very critical adjustment in tuning your car.

Camber Gain: Camber gain refers to the amount of camber that is added as the suspension moves through its range of motion. This can be adjusted by changing the height of the upper arm hinge pin and/or changing the length of the upper arm (by moving the upper arm mount in/out). The stock location for both height and length will yield the most camber gain. *(Both height & length are only adjustable with the addition of optional parts.)* Moving the upper arm hinge pin upward or inward will decrease the amount of camber gain. Running the upper arm mount in the stock location gives the most on and off-power steering, however the car may seem a little aggressive to some drivers. If the upper arm hinge pin is raised, or moved inward, the car will lose some steering but will feel smoother and easier to drive.

Toe In/Out: This is the parallel relationship of the front tires to one another. Toe-in/out adjustments are made by changing the overall length of the steering tie-rods. Toe-in (the front of the tires point inward) will make the car "lazy" around center and will decrease steering on corner entry, but will help the car to "track" better on long straights. Toe-out (the front of the tires point outward) will make the car more aggressive and increase steering on

corner entry, but has a tendency to make the car wander on the straights. On the Gen-XL, we recommend setting your toe between 0 (parallel) and 1 degree of toe-out at the most.

Bump-In/Out: Bump-out (front of the front tires toe-outward under suspension compression) will result in more off-power steering. This effect is obtained by adding washers under the ball stud on the steering block. Bump-In (front of the front tires toe-inward under suspension compression) will result in less off-power steering and running too much bump-in can make the steering feel very inconsistent. This effect is obtained by mounting the servo flat on the chassis with the servo saver pointing upward. This method is NOT recommended. Testing has shown that running the kit setup offers the most consistent performance, but adding bump-out in some instances can have positive results.

Tuning the Rear Suspension of the Gen-XL

Center Shock: The center shock on the Gen-XL can be tuned just like shocks on other types of cars (via spring-rate & oil viscosity). On a smooth track, a stiffer spring and oil combination will result in more overall steering, but will be most noticeable from mid-corner to exit. If the track is bumpy, being too stiff here will cause the car to be "bouncy", losing contact with the racing surface and handling very unpredictably. Softening the center shock will not only help the car perform better in the bumps, but it will also help generate more rear traction (exiting the corner) on low to medium grip surfaces (such as asphalt), even when the track is smooth.

Shock Angle: On the Gen-XL, you can alter the shock angle by adding washers under either of the two ballstuds that the shock mounts to. Raising the front ballstud (on the antenna mount) will reduce steering slightly, but will help make the car feel more connected to the track in bumpy sections. Raising the rear ballstud (on the rear pod top plate) makes the car have more overall steering. Keep in mind that as you alter this angle, you will also alter the *rear pod droop*. This can be corrected by shortening or lengthening the ballcups on the center shock.

Pod Droop: This refers to the amount of down travel the rear pod has in relation to the chassis when the car is off the ground. The amount of droop on the Gen-XL is adjusted by changing the shock length. A longer shock will allow the rear pod to have more droop. Droop is measured by the amount of "lift" the center of the car has (when picking up on the rear ball cup of the shock) before the rear tires leave the ground. *(This can simply be measured with a tapered or stepped ride height gauge, and should be measured from the side of the chassis, all the way in the rear, underneath the side link.)* Zero droop would be when the chassis and rear bottom plate are perfectly flat when the car is lifted off the ground, and there is no shock extension before the tires leave the ground. 1mm of droop would be when the center of the car lifts 1mm before the tires come off the ground. (In order to properly measure droop, the car must be race ready with motor, batteries, tires, etc. installed, and set to proper ride height.) The Gen-XL stock setup has about 1mm of pod droop. Adding rear droop (up to about 3mm max) can give the car more rear grip and a more consistent feel on bumpy tracks. On smooth tracks, the car will not use this extra travel and you will notice very little difference, if any.

Side Springs: Going to a softer side spring will give the car more rear grip and a smoother steering feel around center. A stiffer side spring makes the car more aggressive off center, and in low bite conditions could make the car loose, or oversteer. Preload on the side springs should only be just enough to get the pod to return to center (about ½ turn per side), so you can accurately tweak the car flat. Just like what was mentioned for the front end – if you want the sides stiffer, you should use a stiffer spring, not add more preload.

Damper Tubes: The effects of dampening are not always the same and will change with different levels of grip in the track. On high bite carpet tracks, where traction rolling is sometimes an issue, using a thicker damper tube fluid will slow the side to side weight transfer and prevent traction rolling, giving a smoother, more consistent steering feel. On low bite carpet (or on asphalt), too thick of a damper fluid will actually cause the car to be loose,

or oversteer, because the weight can not transfer quickly enough. Going to a thinner fluid here will tighten the car up by allowing more weight transfer. *Helpful Hint* – A quick way to determine which way to adjust the dampening is to go out and run a few laps (preferably on the clock), bring the car in and pull 1 of the tubes off and go back out and run again. You can then make a decision (based on lap times and feel) on which way to go with your dampening, saving yourself a couple of re-lubes.

Tuning the Chassis of the Gen-XL

Differential: The diff on 12th scale cars (not only the Gen-XL, but all 12th cars) is NOT meant to be a tuning option. There is ONE way to properly set the diff. The spur gear should be locked (meaning the motor can not slip the spur gear), while still having free & smooth rotation of the rear tires (in opposite directions) while holding the spur gear. The handling of 12th cars greatly depends on the smooth, free operation of the diff without it slipping at all. When the diff slips, it flat spots the balls, making the diff action very "gritty" and this will turn a good handling car into a poor handling car real quick. A low turn modified motor may require more tension on the diff nut than a 27T stock motor to keep the diff from slipping, but over tightening the diff nut will cause premature diff failure as well, as this will crush the outer bearing in the hub. The key is to ***never*** have the diff slip on the track, while maintaining that ***smooth, free rotation*** of the tires.

Battery Placement: The Gen-XL comes equipped with CRC's ABP *(Adjustable Battery Position)* chassis *(first introduced as an option part for the CK3.2R)*. Testing has shown that moving the battery forward actually smoothes out initial steering input and will help prevent traction rolling on high bite carpet. Forward battery will also make the car rotate more from mid-corner to exit while on-power. Rear battery will actually steer more off-power on corner entry, but does not rotate as much on-power.

Track Width: The rear end of the Gen-XL is already maxed out at 172mm *(when using CRC High Roller wheels & tires)*, however you can alter the front track by adding or removing shims between the inner front wheel bearing and the steering block. Widening the front track width is a good way to add some stability on corner entry as it will slightly reduce front grip. This is especially helpful when there is a problem with traction rolling.

Ride Height: This is the height of the chassis in relation to the surface of the track. Ride height needs to be measured with the car "race ready" (all electronics, motor, battery, etc. installed). A higher ride height may be used on bumpy or slick surfaces, improving overall handling by generating more weight transfer and chassis roll. A lower ride height will make the car change direction quicker and should be helpful on high-bite surfaces such as carpet. Testing has shown that offsetting the ride height, front to rear (running the rear ride height 1/2mm higher than the front) will increase steering into the turn. Generally for carpet racing, the desired ride height is 3mm. On lower grip surfaces, such as asphalt, the ride height is kept between 3.5 to 4mm. Please check with your local track for their minimum ride height requirements.