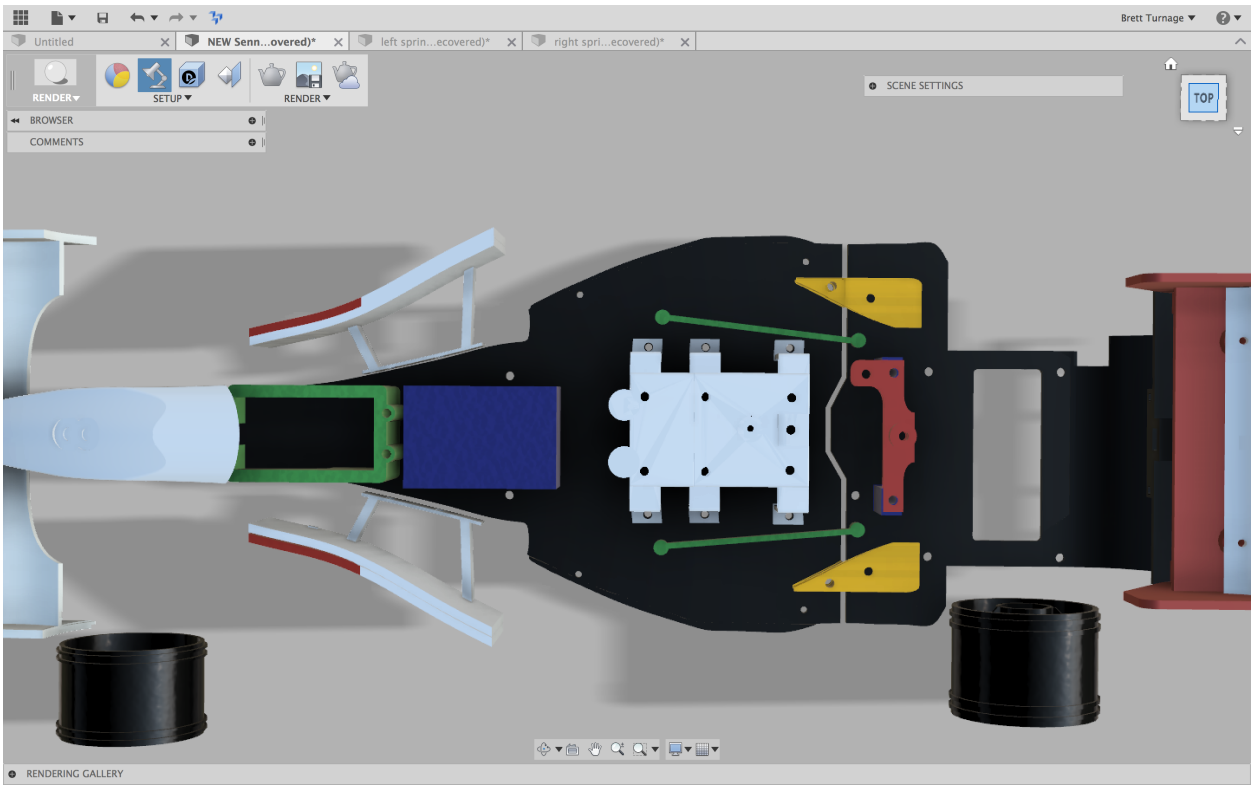
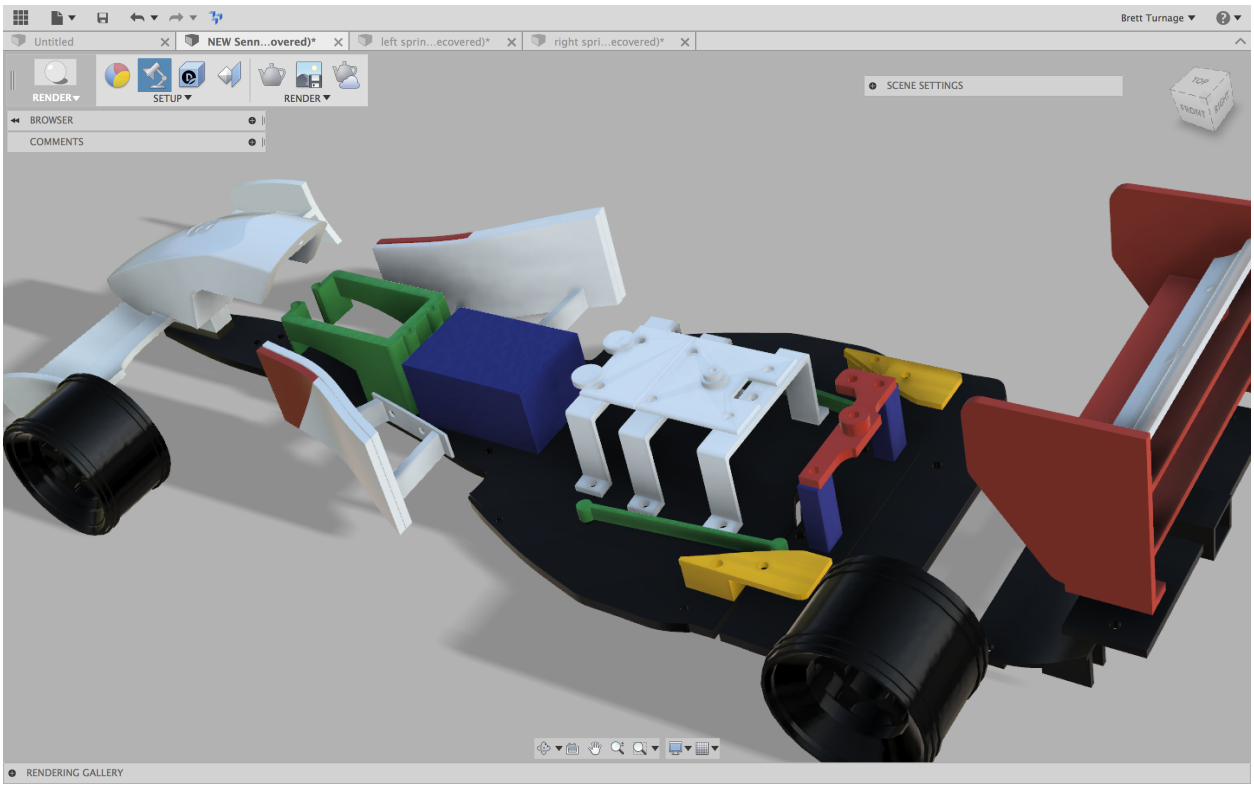
RS-01 Ayrton Senna’s 1993 McLaren MP4/8 Formula 1 RC-Car

Chassis Parts Layout

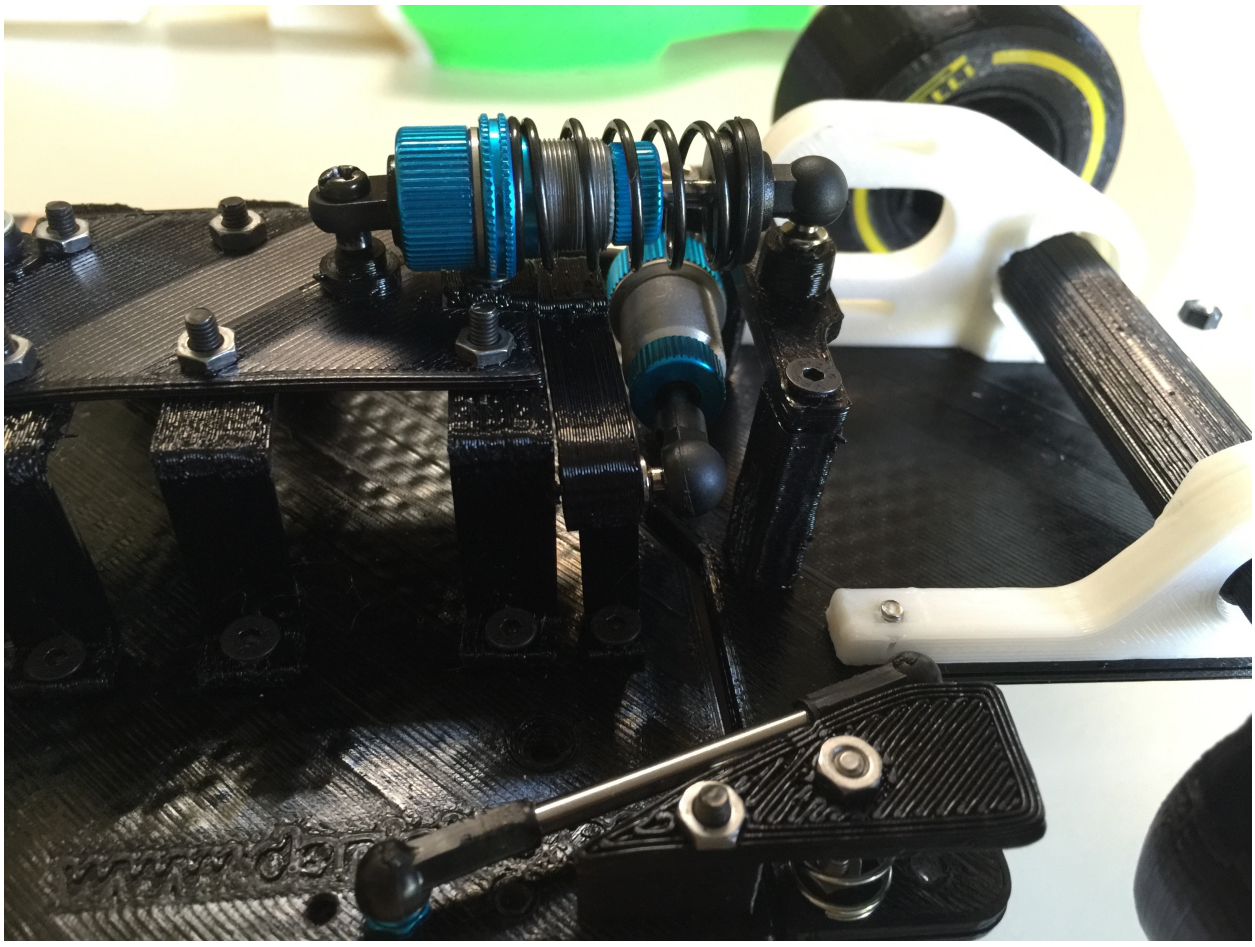




Servo Holder (green)
ESC (blue)
Battery Cage (white)
Rear Shock Mount (Red)
Rear Shock Tower (blue)
    Right tower
    Left tower
Right & Left Lower Control Arm (blue)

RS-01 Version C Full Suspension Chassis

Aluminum Unthreaded Spacers 6mm OD, 5mm Length, for M4 screw size



http://www.mcmaster.com/#94669a008/=11o0ono

Required parts

2.30mm drill bit
m3 drill bit
m3x1.0mm tap for open holes
m8 drill bit (can use 5/16 if you do not have a m8)
Tap wrench
Metric Allen wrenches
2 pieces of wood, flat and something that you can push your weight on, so it must be sturdy.
Medium sized pliers
Needle nose pliers

TAPPING

The RS-01 kit requires tapping screws to keep weight down, and because that what all modern RC cars require. Tapping is how we can put screw/bolt threads into the plastic, so that you can screw it in, instead of using a nut to fasten to parts together.

If you have never used a tap before, tapping plastic is easy! Insert the tap end into the hole and slowly apply pressure while turning. Plastic taps very fast, so try to move slowly, with constant pressure. Once you have the tap through the hole or once you have reached appropriated depth, slowly reverse the turn—keeping the tap straight—backing the tap out of the hole. You want to avoid yanking it out or you will destroy any threads that you made. Once you have the tap out, check to see if there are well defined threads, and you are done.

I. RS-01 FRONT SUSPENSION ASSEMBLY

A. Front Assembly Printed Parts

Left and Right Lower A-arms
Left and Right upper A-arms
Left and Right Rocker Arms
Left and Right Spindles and axles (if Printed car)
F109 front uprights (if using building the F109 version)
(3) printed spacers
(10) m3x10 set screws
(3) Aluminum Unthreaded Spacers 6mm OD, 5mm Length, for M4 screw size
(2) countersunk washers for m3 https://www.tqrcracing.com/shop/product_view.asp?p_id=6709
(4) 5x8x2.5mm bearings
(2) m3x14 flat screws
(3) m3x30 flat screws
(3) m3 nuts
(2) m3 nylock nuts
(2) m3x30 bolts
(2 packages of 12) Team Associated 6271 Short Ball End Set [will use 16]

(1 package of 6) Traxxas 2742X Short Rod Ends Ball Connector [will use 4]
(2) spacers m3x3.2 ID x4.5 od http://www.mcmaster.com/#92871A171
(2) M3 treaded rod cut to desired length of the shocks that yo are using

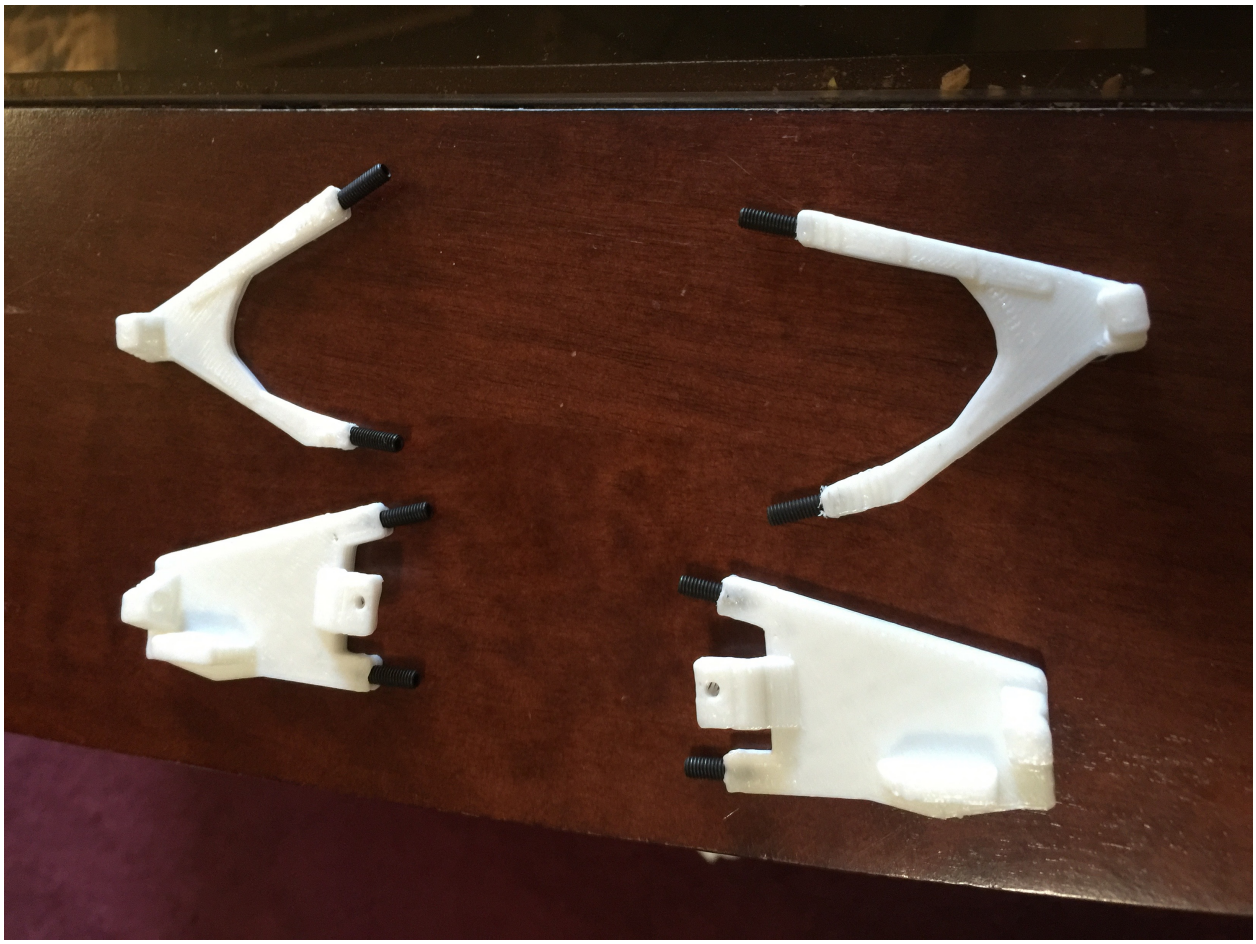
B. Assembly parts

A-Arm Assembly

1. Take the all of the arms for the front suspicions, Upper and Lower A-arms, and drill the holes on the ends with the 2.3mm drill bit.

2. Tap all the holes with the m3x1.0 tap.

3. screw in m3x10 set screws into the holes.



(an prototype version of the front suspension, but is used to illustrate the assembly and how the set screws must be placed into the lower and upper a-arms).

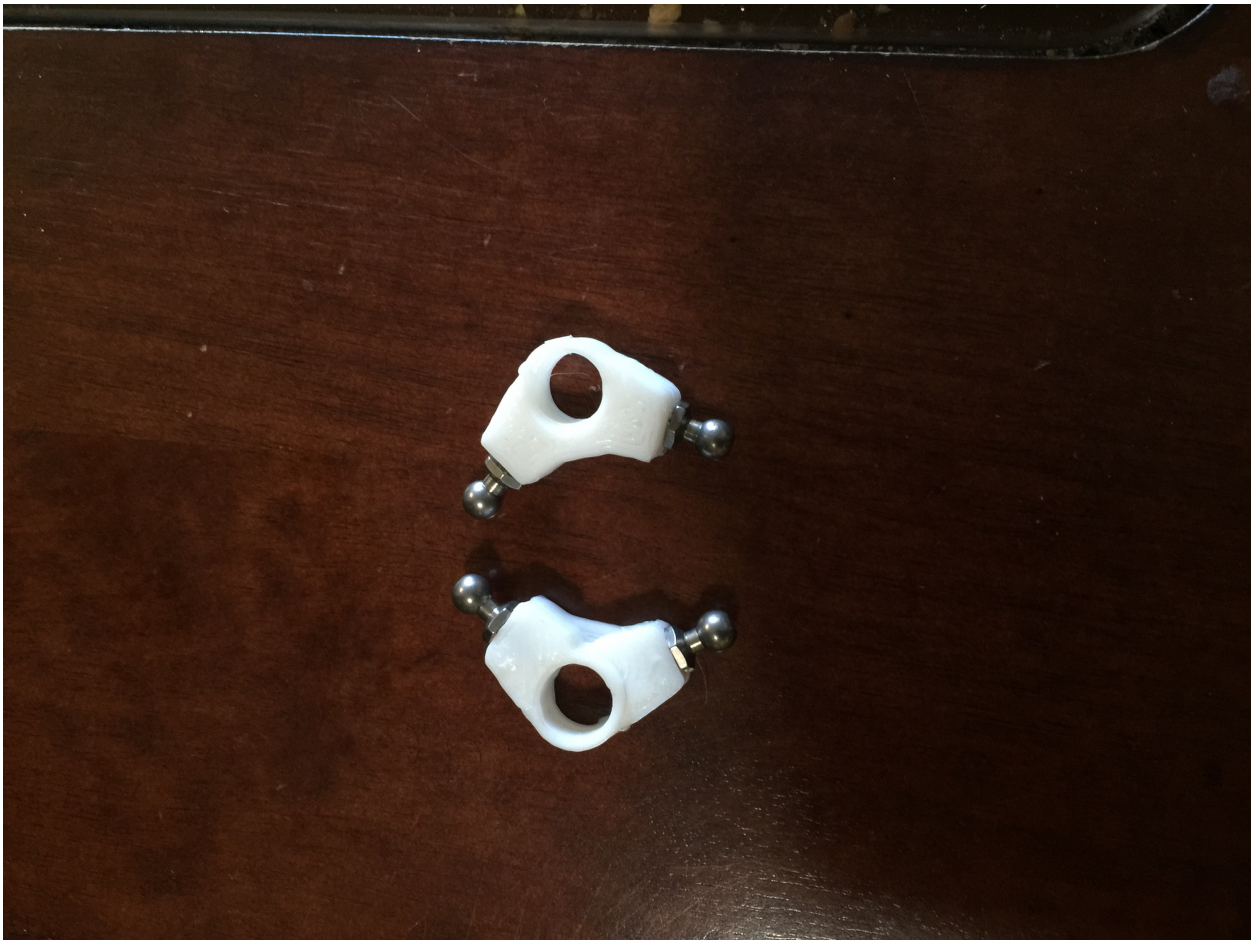
4. Insert a tap screw into the single hole on the end the arm which will support the ball end that holds the front spindles or uprights.

Rockers Assembly

5. Drill and tap the holes on the rockers.

6. Grab (4) 6271 Short Ball sockets and balls, and insert the balls into the sockets. ***** This is extremely hard unless if you use pressure. Take the wood and drill and tap it so that you can screw the ball screw into the wood. The place the ball socket above, holding the hex end with pliers. Then place another piece of wood onto of it all and press down. On most occasions you will hear an audible pop as the ball and socket are joined. Unscrew the now joined ball and socket from the wood and then you are done. ******

7. Screw these 4 ball and sockets into the rocker arms. You may need to use the pliers. Get them snug, do not try to over tighten or you may break the plastic or ruin the threads in the hole and you will have to remake the printed part.



8. Assemble the Rocker Arms. Take the printed Rocker Arm parts and, if needed, clean out the bearing hole (large hole) with an m8 or 5/16 drill bit. Place it on a piece of wood and grab it with a set of pliers so that it does not spin, and with the drill set on slow (or going slow), slowly drill out the hold so it is perfectly 8mm.

9. Insert the 5x8x2.5mm bearings into the rockers. Each rocker requires two bearings.

Center Assembly

10. Take the Center Top and Center Bottom and place (8) Team Associated 6271 Short ball nuts.

11. Drill and Tap the holes on the center top, These holes will be the holes that are on the perimeter of the part.

12. Drill and Tap the holes on the center bottom.

13. Install the ball screws into the holes that you just created on both the top and Bottom centers.
14. Screw (8) Team Associated 6271 Short ball sockets onto the the A-arm ends. 2 per each A-arm.

****IT IS A GOOD IDEA TO TAP ALL BALL SOCKET/ROD ENDS WITH THE M3 TAP FOR EASILY INSTALLATION******

15. Attach the A-arm ball socket ends on to the associating ball nut that are on both the top and bottom center sections.

16. Take (4) Traxxas 2742X Short Rod Ends and their centers and attach them by snapping them in.

17. Once attached screw these (4) short rod ends into the ends of the A-arms.

18. Place (2) m3x30 screw through the Traxxas rod ends and bolt them together with a m3 nut. this will make sure everything is aligned for the next step.

19. take (4) Team Associated 6271 Short ball sockets ends and (2) m3x10 set screws and screw in them into the rod ends. Screw them 30% in.

20. Install the remains two ball socket ends onto the opposite end of the m3 set screw. You now have a short, yet adjustable rod end for the push rod.

21. Install (2) Team Associated 6271 ball sockets into the ball sockets on the rod end that you just made, leaving the other side open.

22. Taking these newly formed rod ends and the rocker arms snap the rod end onto the one side of the rocker arm. NOTE THE ANGLE OF THE ROCKER ABOVE FOR REFERENCE! IT MUST BE ON THE APPROPRIATE SIDE.

23. Install an open ball socket on the other end of the rocker arm.

24. Drill and tap the screw holes in the upper center that hold the rocker arms.

25. Take the m3x3.2 ID x4.5 od spacers and sliced one into the bearings from the bottom.

26. Install the rockers on to center top.

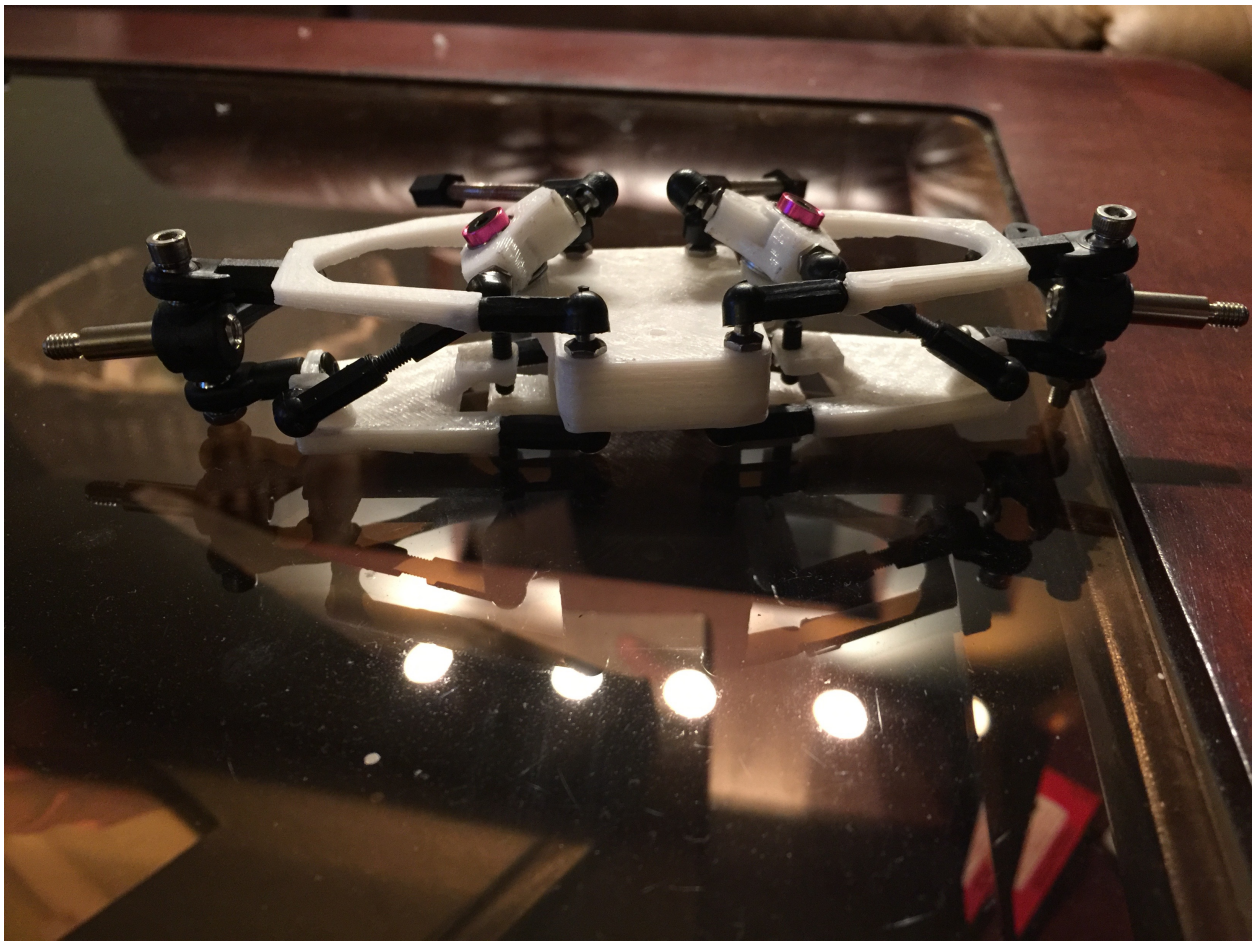
27. Attach the rod end that is located onto push rod that is attached to the rocker, and install the screw nut into the hole on the lower A-arm. If the you cannot screw it you can drill the hole with the m3 drill bit and then 5 minute epoxy the nut screw into the hole.

CHECK THAT EVERYTHING MOVES SMOOTHY BEFORE CONTINUING

28. Drill the Three holes that are in a diamond shape on both the top center section and lower center section with the m3 drill bit to clean out the holes.

29. With the upper and lower centers, rocker arms and push rods installed. Grab the (3) Aluminum Unthreaded Spacers 6mm OD, 5mm Length, for M4 screw size.

30. Drill the Three holes that are in a diamond shape with the m3 drill bit to clean out the holes.



29. Insert the 3 unthreaded spacers placing them between the center top and center bottom, aligning them with the 3 diamond bolt holes.

30. Insert (3) m3x30 screws from the bottom chassis pointing upwards.

31. Place the printed spacers onto the screws.

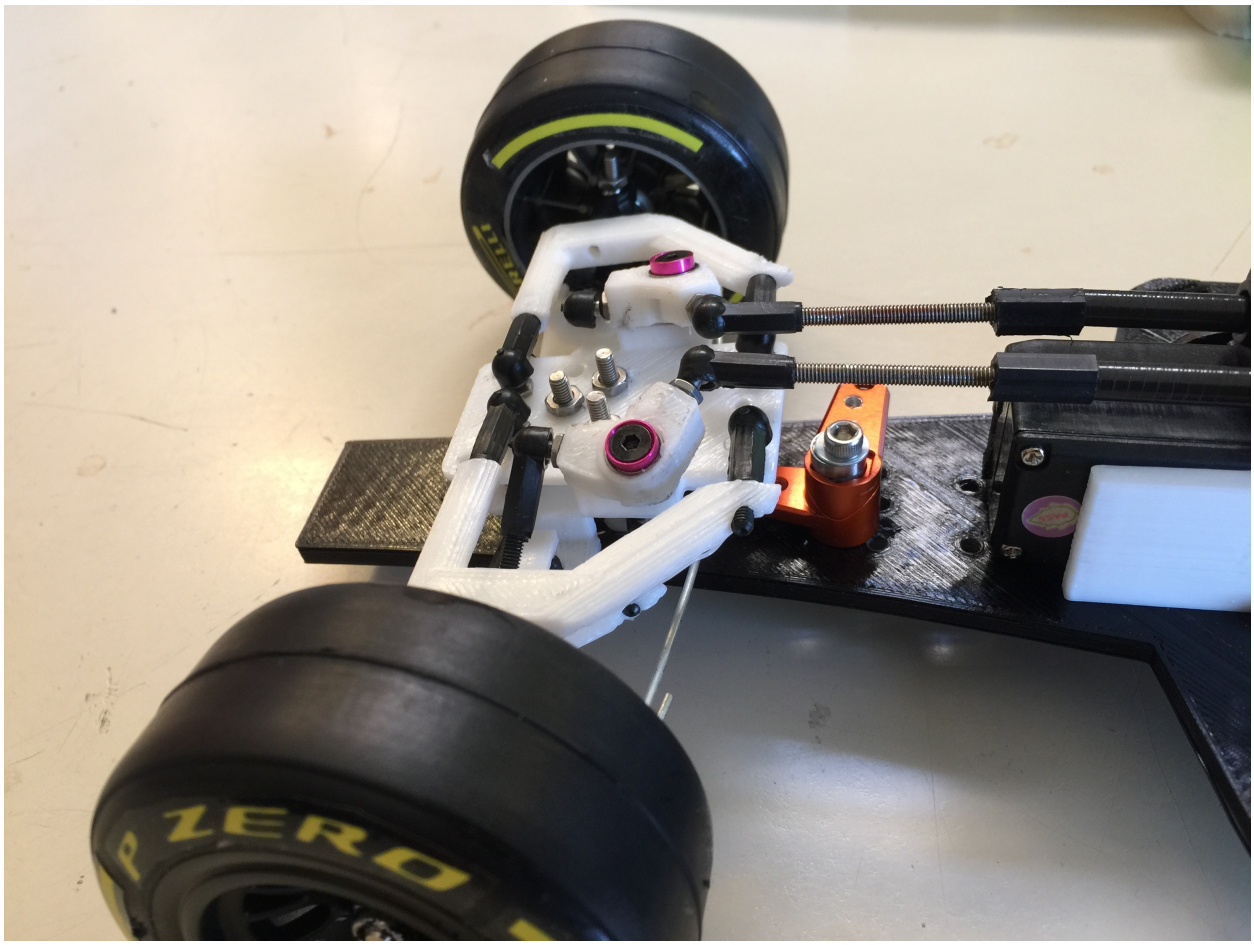
32. Holding the assembly, slowly guide the assembly onto the screws. Through the bottom center, then then unthreaded spacers, and then the top.

33. Bolt with a nuts.

34. Install the threaded rod into the rod ends.

33. flip the car over and drill and tap the two feet of the bottom center.

34. Install (2) set screws. These set screws allow you to adjust the ride height of the front suspension. Set it accordingly.



35. Install printed spindles or Carbon Reinforced Uprights into the ball joints. Reinstall the m3x30 bolts and screw on the two nylocks.

[it is a good idea to use use epoxy on set screws on the lower A-arms that connect to the carbon uprights to prevent them from backing out from vibration.]

Front Suspension is completed.

C. ADJUST THE CAMBER OF THE FRONT WHEELS
Camber or the tilt of the front wheels, which allows for better cornering can be adjusted by either screwing out the m3 set screw on the lower A-arm or by using a shorter rod ends for the upper A-arms.

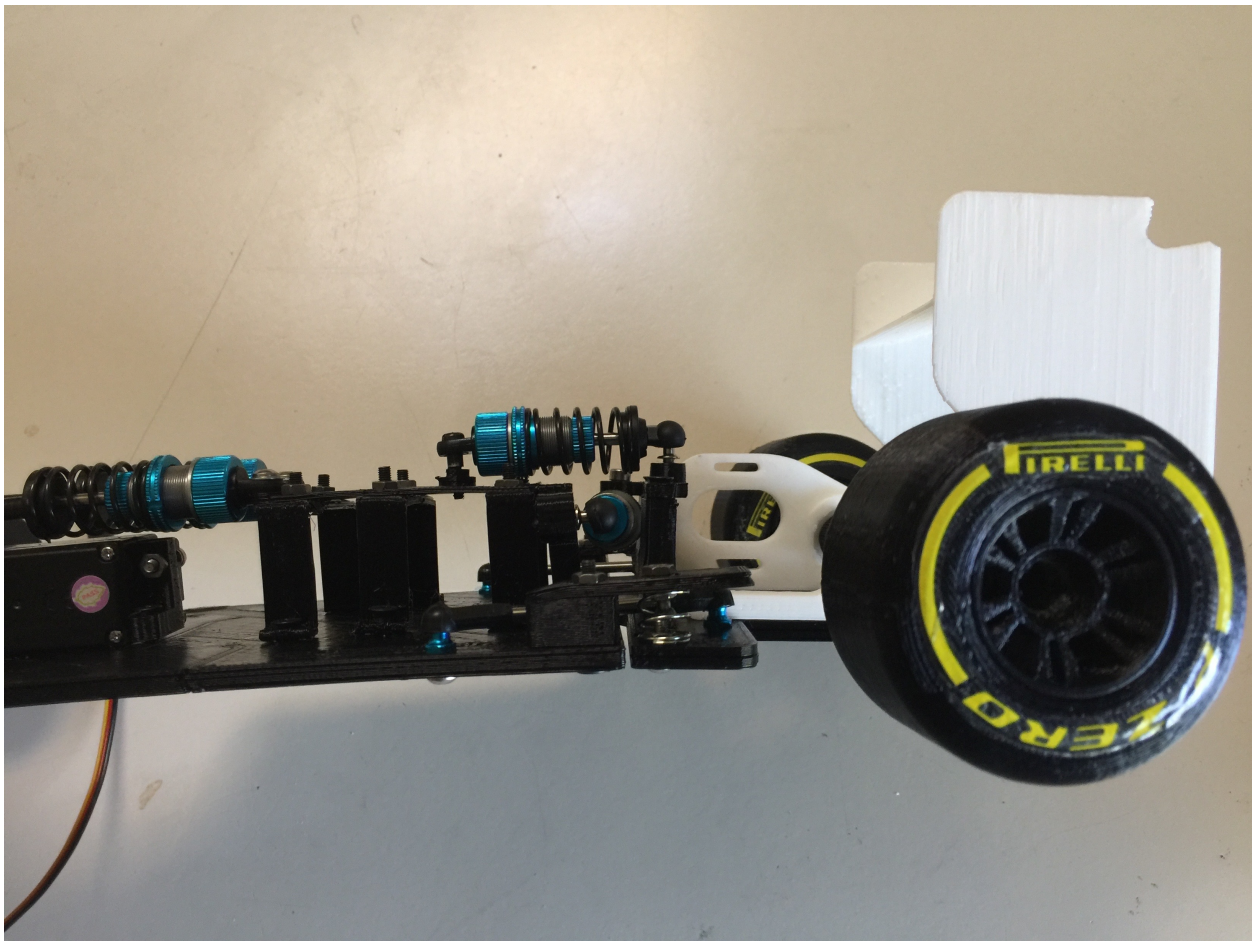
II. REAR SUSPENSION

Required

(2) 55mm shocks
(1 pack) of Yokomo Rear side roll springs (YOKR12-21SH) * can use different brand if you choose
(2) Yokomo Roll Spring Holder (YOKR12-21) *
(6) Team Associated Ball and socket nuts
(1) Tamiya RM-01 Carbon rein L Parts- Links 2pc RM01 / F104 V2
(10) m3x25 screws
(2) m3x30 bolt

I'm going to skip writing drilling and tapping and assume that you understand that is required for install screws.

1. Install Battery Cage on to the center chassis (chassis B). Placing an m3 screw into each leg of the box.



2. Install two ball socket screw (Team Associated) on the the holes on the center section. These particular holes are for the front of the rear lower control arms which are illustrated in the pictures above with blue socket nuts.
3. Install the shock on to the center hole of the battery cage with the rear ball socket facing the rear of the car.
4. Install a ball nut into the damper holder located on the far left side of the center chassis battery box cage. (it is the last section of the cage, towards the rear).
5. Install rod ends on to the m3x35 turnbuckles, and install the turnbuckle onto the center chassis.
6. take the Rear chassis bottom and install the rear shock mount and rear shock tower, install with (4) m3x25mm screws.
7. Install team Associated ball socket screw in the center rear hole on the rear shock mount. (if your shocks came with a ball and socket and a particular screw then use that screw instead for this step.
8. Install the rear damper. Damper is the the same shock with the spring removed.
9. Scew in two team associated screws nuts on to the back chassis section.
10. Join two chassis sections by attaching snapping the rear damper to the rear chassis piece and by attacking the lower control arms (m3x35 turnbuckles) by snapping them into the the ball screws.
11. Attach the rear shock to the bottom rear section by snapping it into the ball screw on the rear shock mount.

12. Take the left and right spring damper mount and attach the a Roll Spring Holder to each mount.
13. Install the Roll Spring onto the holder.
14. Instal the spring damper mounts by screwing them in with a m3x30 bolt, and placing a m3 nut on the end.

Make sure everything moves smoothly. And adjust your spring tension. The rear droop can be adjusted by adjusting the strength the spring in the shock and it's settings. Roll of the damper can be adjusted with different fluids.

Rear Assembly is now completed.

III. Front Shock Assembly

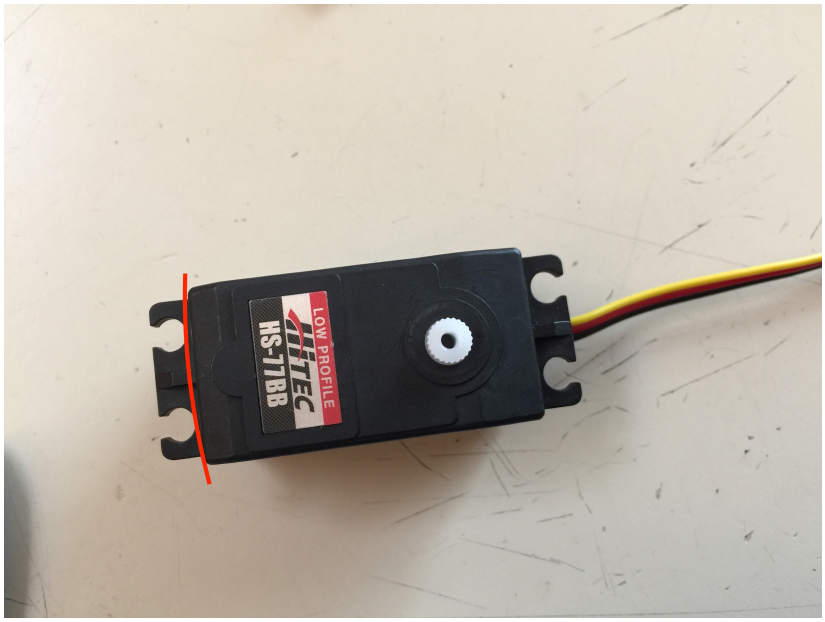
(2) 55mm Shocks
(2) m3 female to female unions
(2) m3x45mm turnbuckles

I used 2 55mm shocks with 110m shock shafts. This is not necessary. You can use the 55mm shocks as is, with longer m3 turnbuckle to reach. You can cover the shafts with carbon fiber tubing 4mm id, 6mm od to make it look nice.

1. Prepare the shocks and mount them to the battery box with 2 m3x35mm bolts and bolt them to the battery box.
2. Slip the m3 union onto the m3 threaded rod and connect the threaded rod to the shock.
3. This is easier if the threaded rod is already installed into the ball socket end that is attached to the rocker arms.
4. Join the rod and the shock shaft together.

ENSURE THAT THE THREADED ROD AND THE SHAFT ARE TOUCHING INSIDE THE UNION SO THAT THE ASSEMBLY DOES NOT BEND WITH THE SHOCK IS COMPRESSED.'

IV. Steering

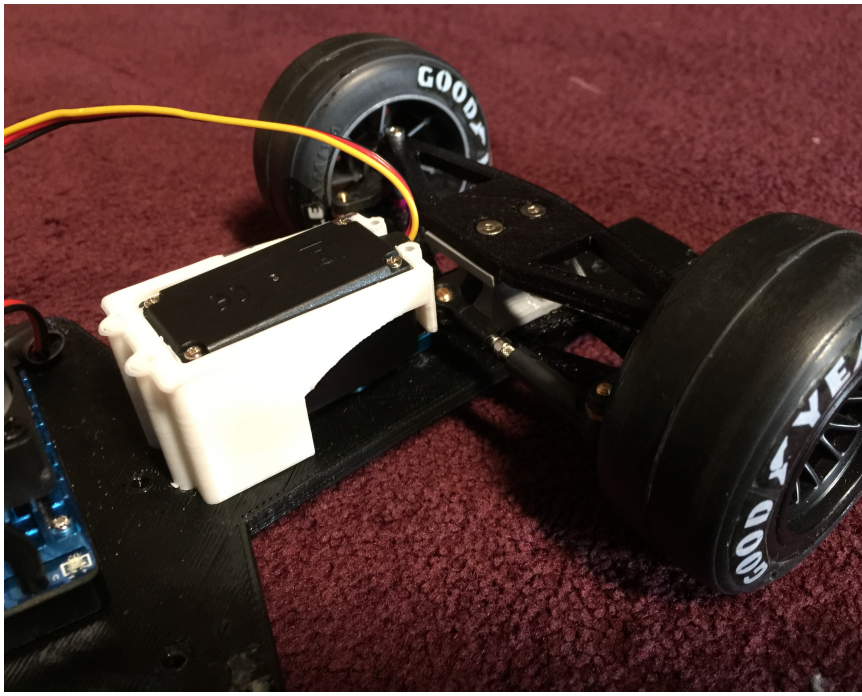


printed servo mount
(2) m3x30 screws
18 gauge steel wire or Turnbuckles (m3x32) [TT02B Full Turnbuckle set)
servo arm (I used Hitec RCD 55701 Standard Aluminum Servo Arm)

if using linkage

[TT02B Full Turnbuckle set http://www.tqrcracing.com/shop/product_view.asp?p_id=7734]
(Hitec HS-77BB servo)

Hitter Servo arm like Racers Edge RCE10384B
http://www.tqrcracing.com/shop/product_view.asp?p_id=5192

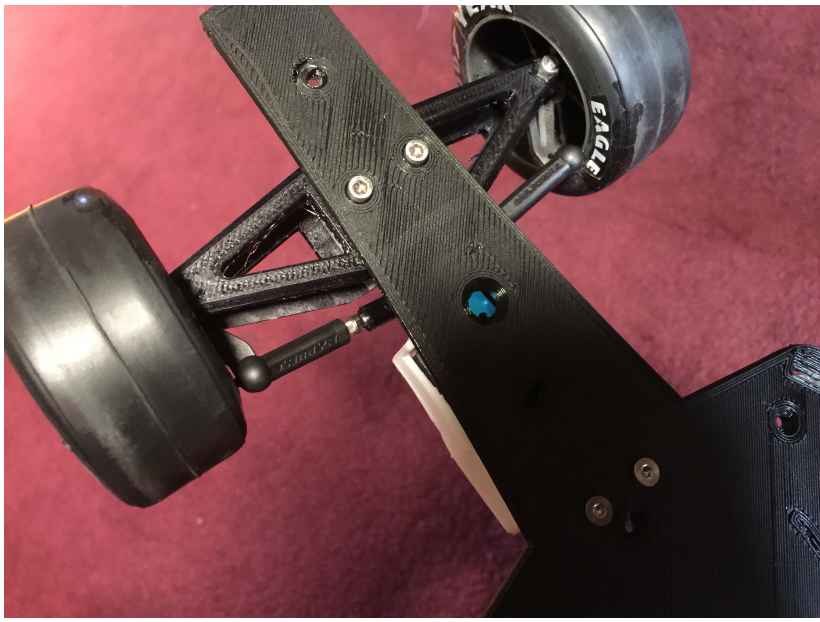


1. cut the bolt mounts on the backside of the servo along the red line in the picture.
2. Install Servo Arm onto the Servo and screw it in
3. Install the servo into the servo mount and bolt it to the servo mount.

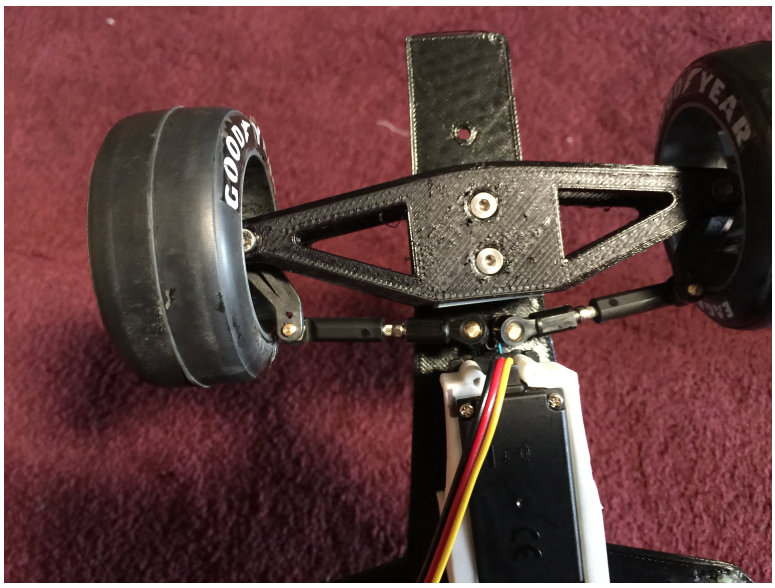
If using Steering Linkage kit

1. If using turnbuckle install the ball studs so that they face up when the servo is mounted to the car.
2. Attach another ball stud to the axle.
3. Depending on whether you are using printed axle or carbon reinforced F104 axles, the turn buckles you may need will vary.
4. Measure the distance between the servo arm when it is pointed straight towards from the from top the car, and measure to the axle where the wheels are pointed straight.
5. After determine the length, in step 3 choose your turnbuckles that you require and screw in one side into the ball socket. Remember these are turnbuckles so the opposite side will screw in the reverse.
6. Attach one side of the turnbuckle to the ball screw, and the other side to a ball screw on the axle.

If using 18 gauge wire



1. If using 18 gauge: install the 18 gauge steel wire into the car and then attach it to the bell crank's arm the tis at a 90 degree angle
2. Cut two pieces of wire and install them into the bell crank. Stretch them out to the wheels.
3. Align the wheels so they are at their farthest angle from the bell crank, or furthest lock to lock.
4. Take a maker and mark where the point is.
5. Cut the wire with wire cutters.
6. Bend the wire at a 90 degree angel with the needle nose pliers.
7. Insert that end into the hole on the uprights.
8. Check that that tire can move freely without jamming and then repeat not the other side.
9. Once done with both fronts ensure the they move freely, and point forwards. Readjust and redo as needed.



NOTES

Use wire ties to hold keep all of your wires tight and compact. After the body has been on the car for a day or two the wires will stay compact so taking the body on and off will be easier.

Location of parts in the car.

Battery Wires, ESC charger and ESC capacitor, and on/off switch may need to be lengthened via cutting and splicing the wires.

A Battery Lipo Battery charger extension wire can be used to allow you to charge the battery without having to remove the body.