Symsteer instruction manual:
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Foreword:

Thank you for purchasing a genuine SYMSTEER by Rok rc. Symsteer has been designed to improve steering performance and add new braking dimension to your HPI baja. Symsteer’s push/pull symmetrical design uses the equilibrium of push/pull force to improve steering performance by a large degree. The push/pull servo saver is not a new concept, it has been used incredibly successfully by large-scale cars in Europe for many years but the way it has been incorporated into Symsteer’s uniquely accessible, plug-in design is a first. The ‘race-orientated’ design is the first complete steering and braking system of its type for hpi Baja that a general user can install with minimal expertise and no chassis modification.

It is designed to be used with or without front brakes. Rear brakes are now controlled by the opposite side servo than the throttle servo.

If you choose to install front hydraulic brakes, Symsteer’s dual brake servo positions will lend themselves to work with a number of different hydraulic master cylinder positions. Cable front brakes are also possible but all styles are not entirely supported by Symsteer design and the user will be required to assess their suitability or improvise their own cable pull mounting connection that will work with the Symsteer throttle/brake servo. If you are considering front brakes after purchasing Symsteer please note: We highly recommend hydraulic front brakes for off road use as they are less problematic in themselves and require far less continual adjustment. Brake balance and modulation of left and right wheel braking force is much better controlled with hydraulic calipers and most users with front cable brakes find them almost impossible to use reliably in race conditions.

Rear cable pull lay-shaft brake on the other hand is very reliable and does not suffer the left/right balance issue because it works evenly through the transmission using one calliper. Cable pull rear brakes are as simple as using a solid connecting rod. Symsteer chooses to mount the rear brake servo on the opposite side to the throttle servo and uses a heavy duty cable arrangement to achieve the off-centre pull to the rear brake cam lever. Our testing has proven that rear brake performance is better than a standard arrangement because it does not suffer from the usual radio box movement during braking because the pulling force is encapsulated within the cable system therefore adding zero pull force on the Symsteer chassis mounting points. Opposite side rear brake servo was chosen for our design because most of all available hydraulic front brake systems for HPI baja mount the master cylinder on the throttle side. To utilize effective brake bias and mixing steering input with front brakes you must utilize another servo on a different radio channel. This is why we put the rear brake servo on the opposite side of throttle. Brake mixing and bias adjustment will minimize under-steer during heavy braking entering a corner. It is the only way to get complete benefit from front brakes. To understand more about this please see our Website and YouTube videos.

If you do not use front brakes you will also appreciate the redundancy of using a separate brake servo and an isolated throttle servo. It is a well-known fact that braking force is what what shortens the life of the throttle/brake servo in a conventional system. By isolating the throttle you will rarely need to replace the throttle servo because it is under very little load from throttle duties alone. This could be the difference between finishing a race or getting a DNF result. Even if you don’t race, the redundancy advantage of two servos is a bonus. With front brakes the advantage is obvious. Three individual servos is far superior than trying to do three jobs (throttle, rear brake, and front brake) all with one servo. At best, the idea of using one servo for three jobs is ambitious, at worst, you will destroy servos regularly and never achieve the full benefit of front and rear braking potential.

It is also possible to use the throttle servo to do rear braking by flipping the top plate over and using the cable and throttle on the throttle side. A double throttle rod servo post and some modification to the roll cage front cross-member will be required to do this successfully. This option might also allow the use of front brakes on the opposing side to the throttle servo in order to use them as line lockers for drag racing.

THIS INSTRUCTION MANUAL WILL ATTEMPT TO SHOW YOU A BASIC REAR BRAKE ONLY SETUP WITH PUSH/PULL STEERING SERVO SAVER. FOR FRONT AND REAR BRAKE SETUP WE RECOMMEND AT LEAST A THREE CHANNEL RADIO WITH MIXING CAPABILITY IN ORDER TO FULLY UTILIZE SYMSTEERS BRAKE MIXING AND BRAKE BIAS ABILITY THROUGH RADIO ADJUSTMENT. TWO CHANNEL RADIO IS POSSIBLE WITH A ‘Y’ SPLITTER BUT YOU WILL NEED TO SOURCE A SERVO REVERSING LEAD IN ORDER TO REVERSE THE BRAKE SERVO IN RELATION TO THE THROTTLE SERVO.

For more tips on installation please visit ROK rc's YouTube channel. Just search "Rok rc Symsteer". Or "rokrcube" to find our video channel.
Installation:

Your Basic Symsteer comprises of the following parts:

- Top plate
- Bottom plate
- Battery tray and straps
- Radio box and antenna rod
- Front and rear standoffs
- Rear brake cable and brake blocks
- Large stainless steel steering turnbuckle connecting rods for wheel hub to servo saver (6mm ball ends not supplied, user should re-use ball ends from their Hpi baja or replace if they are in poor condition)
- Stainless steel servo turnbuckle with ball ends throttle linkages and ball ends
- Collets, screws, nylock nuts and chassis captured nuts

Optional purchases are; servo saver (different styles available), full length servo horn for HPI (quarter scale futaba) style steering servo or Hitec (Rhino) large scale steering servo. You may also purchase a master cylinder linkage rod assembly if you have front brakes.

Step 1.
Remove existing radio box and servo saver from your HPI Baja.

Keep existing rod ends and balls which connect your existing steering tie rods to the wheel hub and old servo saver. The old Tie rods will not be used. Just the ball ends and pivot balls on the wheel hubs and servo saver.

Step two:
- Assemble new heavy duty stainless steel (longer) tie rods with your rod ends to suit Symsteer approximate length of 71 mm between the plastic ends. Ball ends not supplied. Pic 1.
- Make up new stainless steel heavy duty servo tie rods to exact 87mm overall (some minor adjustment may be required once steering servo is fitted, adjust both rods evenly). 7mm plastic ball ends and balls are supplied. Pic 2.
- Connect rod balls and rod ends to servo horn. Ensure screw heads face down so that thread points up and does not bind on chassis. Pic. 3.
Step 3:
Install servos as per image. Note: 2 x Sticky plastic cable guides are now supplied for underside of servos. You can also apply strong tape or hot glue or Zap goo II to wires on underside of throttle and brake servos to direct servo wires rearward toward the radio box. This ensures they do not get tangled in your steering linkages.

(Race tip 1: Do not over-tighten servo screws. They should be just snug to allow some flex on their rubber grommets supplied with the servo. This will lessen the chance of servo case mounts cracking.) Spline on throttle and brake servos are closest to the front of the car. Steering servo requires cross-member to be fitted as shown. Spline of the steering servo is closest to the rear of the car. Screws connecting cross-member to the servo should be left loose until the servo is fitted to the underside of the top plate. For longer servos like standard HPI and Futaba ¼ scale servos, the cross-member and top plate become sandwiched between the servo screws. For shorter servos like Hitech and Rhino Digi4 slide the crossmember backward and screw servo retaining through the cross-member as shown.

Step 4.
Install rear brake cable stop block on top plate shown in pics above. Two M4 screws from underside of top plate as shown on photos above. Cable end caps are plastic and can be threaded into the cable stop with a pair of plyers. Ensure they seat all the way in.

Step 5.
Install servo saver on the centre position of the triple position hole in the top and bottom plate. Other positions are generally there for non-typical servo savers and Ackerman angle adjustment if clearance allows it. For the time being, do not be concerned with these alternate positions and install it on the middle hole.

Highly important! Ensure that you fit the shims supplied for your servo saver in the positions shown in the pic. These shim washer/s ensure a smooth rotation of the servo saver. If you do not fit them in the exact position shown you will likely experience binding of your servo saver as the centre housing of the servo saver pivots on the hardened centre post and must have shims to enable free movement at the top and/or bottom plate. These shims may require replacing after considerable use. At the first sign that they might be worn from the pivoting friction please replace them to ensure smooth operation of your steering. It is a small price to pay for perfectly smooth steering.

Note: Elcon Competition Servo saver requires shims at the top and bottom between the servo saver and the top and bottom plate. FG competition servo saver requires only one shim at the top between the servo saver and the top plate. Shims are specific size for top and bottom. The size of these shims is absolutely critical. Please don’t mix them up or use plain washers. We do not provide warranty for servos so please ensure that the servo saver always pivots freely.

ELCON Competition Servo Saver:

[Images showing the placement of shims and notes on fitting the shims correctly.]
**Note: 1.** Elcon servo saver requires Thread locker (Loctite) to top and bottom screw but it may cause difficulty when removing the servo saver at a later time. Therefore to remove the servo saver - apply heat to screws with a small pen size gas torch before unscrewing. Always remove the top screw first when removing the servo saver for servicing, especially if you use Loctite.

**FG Competition Servo Saver**

![Image 1](image1.png)

![Image 2](image2.png)

![Image 3](image3.png)

![Image 4](image4.png)

**Note: 2.** FG competition servo saver. It is OK to put thread locker on the top and bottom screw of this unit. Use sparingly. Apply heat to screws with a small pen size gas torch if thread locker proves difficult to unscrew later. Always remove the top screw first when removing the servo saver for servicing.

**Step 6.**
Fit Throttle linkage and brake cable post to your throttle and brake servo horn. *This post must pivot freely.*
Drill out the hole on the servo horn with a 3mm drill bit if required and do not over-tighten the post nylock nut.

![Image 5](image5.png)

Before switching power on make sure you remove the servo horns to allow the servo splines to centre themselves. Then re-attach the horns and adjust servo reversing, EPA, trim, bias etc through your TX.

**Step 7.**
Install your rod balls to the servo saver. (not supplied) Use the existing HPI ones. The HPI plastic rod ends are also required. We have supplied new longer stainless steel rod ends to fit to these parts. If they are worn please source new rod ends to ensure that there is no slop introduced into the Symsteer steering setup.
Step 8.
Screw bottom plate onto the posts and finish fitting the servo saver. Apply a small dab of thread locker to the base countersink screws. Ensure that the countersink side is facing down. Two Stainless steel threaded inserts at the front will be protruding downward. These locate in the two 9mm holes already in your chassis.

Step 9. Time to fit Symsteer complete with steering rods to the vehicle. It has been designed to be installed and removed in a complete package. Even the steering rods should come out together with the symsteer if you need to remove the steering box and electrics from you car for cleaning and maintenance. 4 chassis top-front brace screws will need removal or loosening to allow some room during installation.

Note: Some clearance filing of top brace may be required for the servo saver top bolt. (Elcon servo saver only) Here. Not necessary with Tutle racing top plate or SymSteer Specific Top plate.

Slip Symsteer into position. Locate the front thread inserts into the two front 9mm holes of your chassis. Fix with four screws under chassis. Shorter m6 button head screws at front holes. A small amount of medium strength thread locker on chassis screws is advised. Remember to re-affix your chassis top brace screws. Once inside the vehicle, place radio box in position shown. It will sit loose until battery tray is fitted over it.
Route power wire through the small notched-out sections on the back edge of your top plate. Next - Install battery tray captured-nut to existing hole in side rail. They will self install if you trial fit them without the tray.

Utilize re-usable plastic straps provided to strap down the battery securely. Battery tray has internal dimension of 97 x 49mm. We recommend Lipo or LiFe battery. They are light weight and energy dense. These are ideal for any serious enthusiast. Use the Nylon strap connector if using Original Hump pack Battery. Please properly insulate the tray from any potentially exposed battery terminals or from any chance of potential short-circuits due to battery terminals or exposed wires touching the aluminium tray.

**Step 10.** Install brake and throttle linkages to the servos as shown in pics. The centred position should be approximately 10 degrees forward. Install your carburettor throttle linkage on the throttle rod. Route throttle rod under roll cage front cross-member.

**Step 11.**
Connecting the cable to the rear brake cam lever. Note the new ‘flipped position of the brake cam lever.

Note:
Some non-standard brake housing top plates (Like; Turtle racing brake housing) will require a small amount of filing as shown in the following pictures to allow the brake block to line up correctly and seat in its rebate.
Snip a small square of plastic from the plastic spur gear rear cover where the main bolt passes through the brake block. You could also file or use a Dremel ™ tool to make the small notch which creates extra clearance for the screw head once the brake block is fitted.

When removing SymSteer from your car it is advisable to simply remove the brake cam lever and rear brake stopper block so that you do not need to readjust or re-center your brakes every time you remove it. The alternative would be to remove the brake cable from the servo horn post. It is advisable if you do this to mark the cable with a marking pen so that you can find your original adjustment point.

Note: It is advisable to check the wear on your brake pads at this stage and replace pads or install brake shims as required to ensure that you have minimal play on the brake cam lever. If your lever travels too far forward and touches the brake cable block you will definitely need to do this step. It is regarded as routine maintenance and not a flaw in the Symsteer braking design if your brake cam lever does not fully engage the brakes.

When removing SymSteer from your car the whole unit should come out if your car with front steering arms fully attached. It will be possible to bench test your servo and receiver without the unit inside the car if you connect a battery to it.

**On a final note:**

It is advised that you pay particular attention to your power lead and wiring situation. Use a larger gauge wire than a normal servo lead (14g multi-strand silicon wire is advised) and splice it to a servo power ‘Y’ lead. Ensure that spliced end with the small gauge wire does not exit your receiver box. Let the large gauge power wire exit the receiver box and use a cable tie inside the box to stop the power wire from pulling the thinner gauge wire outside the box. Now use good quality Deans (TM) plugs or similar as your battery plugs. This will give you a reliable power source and a wire/plug combination that will not break when handled. Watch videos on wiring tips and installation on our Youtube Channel. Simply Search YouTube for “rokrctube” to find our video page.

**About Switches.**

Quite simply, we do not recommend using power switches. We simply unplug our quality battery connectors to switch-off our cars - but if required, use only a high quality switch. More races are lost and cars destroyed in run-a-ways due to switch failure and sub-standard wiring than all other problems combined so please do a quality job of your wiring first time and enjoy racing for a long time!

All the Best,

From the ROKrc race team!