

SERPENT 710 FAQ v0.5

Updated 9 March 2004

Compiled from members' postings to the rctech 710 Forum.

Serpent shopping:

- Europe

www.rccarinternational.com (next to the serpent factory - good supply!)

www.serpent.at (good prices on tyres)

Manuals and Setup help @ Serpent:

710 Product Page:

<http://www.mytsn.com/products/desc.asp?prid=3293>

710 Default setup sheet:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2337&fnm=710setupsheetDEFAULT%2Epdf>

710 Blank setup sheet:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2336&fnm=710setupsheetEDITABLE%2Epdf>

Setup book:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2279&fnm=710setupbookletSAMPLE%2Epdf>

710 Additional sheet:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2180&fnm=Additionalsheet%2Epdf>

710 Reference guide:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2145&fnm=710RefGuideSAMPLE%2Epdf>

710 Manual:

<http://www.mytsn.com/products/dnlfile.asp?prid=3293&flid=2144&fnm=710manualSAMPLE%2Epdf>

What tools do I require for the 710?

The correct wrenches are listed as the following below. If you want to get Hudy tools (they are one of the best for RC use but a little expensive), I have mentioned the part numbers too.

1.5mm Hex Allen Wrench (111540)

2.0mm Hex Allen Wrench (112040)

2.5mm Hex Allen Wrench (112540)

3.0mm Hex Allen Wrench (113040)

7.0mm Hex Socket Wrench (170070)

4 mm Phillips Screwdriver Wrench (164040 (18mm))

5 mm Phillips Screwdriver Wrench (165000 (22mm) or 165040 (18mm))

You may also want to get the 2.5 mm ball tip allen (132540) to access the engine crankcase mounting screw onto the engine mounts.

The Hudy Glowplug / Clutchnut Wrench is also very useful. Part number is 107581. One of my favourite tools. It includes a wrench for your clutch nut, glow plug and the 5mm allen to screw in the pivot ball into the knuckles. I also suggest a flywheel holder like the one made by Ofna to lock the Centax flywheel when you tighten the flywheel nut with the 107581 wrench.

For tie rods, you can get the Hudy turnbuckle wrench 181030. I find this useful especially when you want to set the front toe in / toe out. For exhaust spring or caster clip remover, Hudy makes a tool for this too. Get it if you want. I have not needed to use this. Part number is 107610. If you do not want to get

your hands all sore when building shocks (which is not a big matter anyways), you can also get the Hudy shockabsoreber assembly tool. Part number is 183010.

If you're using a Nova based engine (RB, Novarossi and NovaMega included), I suggest you get the slotted screwdriver specially for engine head. Part number is 155830.

Fur engine tuning screw, you can also get a Hudy one. Very nice but a normal inexpensive one will do fine. If you're interested, the 4 mm slotted 154050 or the long version 154060 is perfect for the job.

In addition to the above tools, you probbaly also need normal pliers, long nose pliers etc.

What lubes/oils and where to use them:

Required:

Graphite grease - a dry fine powder lubricant which doesn't attract dust - should be available from car shops.

Silicone oil/Serpent's Bearing Lube Oil (#1682)

General grease, i.e. Mugen Super Grease (#B0308) or AE Stealth diff lube (#6591)

A spray degreases for cleaning out bearings.

Usage:

For pillow balls and hinge pins - fine graphite grease

For the main shaft and middle shaft where the shafts make contact with the bearings AND for dog bones - a small amount of silicone oil/bearing oil

Thrust bearings and diff bearings - Mugen super grease or AE stealth diff lube, use sparingly.

For all other bearings, Serpent's bearing lube oil is recommended.

Drivershaft lube tip from Rob Kuijper:

<http://www.mytsn.com/publ/publ.asp?pid=9215>

Bearing service:

<http://www.mytsn.com/publ/publ.asp?pid=9214>

Additional Centax III instructions:

<http://www.rctech.net/forum/attachment.php?s=&postid=629596>

Side stiffner fitting:

tighten both side stiffener first than X bracket and top deck.
coz the stiffener design is flush with chassis and top deck

Better front and rear assembly:

JULIUS' COMMENT TO BELOW TIPS: *"In general, build the entire car (leave shocks off) and then check the freedom of movement. Like Goldfinger said, intalling all parts can sometimes make a huge difference. The fit of the car is very good (I think) but we did not want to create free movement with excessive play. As some parts need others to construct the complete suspension it will sometimes seem to bind until you install all parts."*

IN FRONT

- Should be no problem since both arm(lowr and upper) is hold by 1 piece part.
If still, loosen every screw by half turn. Tighten the all the screw that will

make "bulkhead assy" in 1 piece. Then tighten the lower 2 screw that holds "bulkhead" on chasis.

- Remove caster clip and check arm moving.

IN REAR

- I was tempting to use my "luxurius file", the problem in the insert. Clean all the flash in the insert even a little flash, especially in the back end (where you going to put inside back plate or front mount) Coz if still in there, it will reducing the arm "play".

- Loose and tighten the screw like in the front. But this time dont tighten lower(on chassis) then. Install and tighten the top carbon (brake and stab. holder) mount. This carbon is playing a major role of the rear assembly. After that tighten the screw on chasis.

Diff Building:

There is no real need to grease the large rings. If you chose to, then use only very little.

The way you have set the diff is correct. To be sure of the setting check if you need a considerable amount of force to make the diff slip when you try and turn the first gear of the 2-speed while holding the rear wheels.

Centax clutch assembly:

1) First of all make sure that the gears on the clutchbell are tight enough. Assembl and disassemble these a few times. Clean between each assembly.

2) Place only the 0.5mm shim behind the "Brass cone". Make sure you use the Brass one and not any other.

3) Assemble the clutch as described and record your A & B measurements, as per manual page 28.

4) Now the correct gap between the clutch shoe and the bell is 0.7mm. If its closer then your motor will bog down, and if too much then the clutch will have a delayed action and your clutch shoe wont last long as its just grabbing and may even slip too much. This is very important in the Centax Clutch. Get this wrong and you might as well use a electric car.

5) With these 2 measurements take the difference $A - B = \text{Clutch Gap}$ of 0.7mm.

6) Find the right shims that will give you 0.7mm difference and then place them per diagram.

7) Say you measured 1mm for B and 3mm for A. then the difference will be 2mm. Now there is a total gap of 2mm. You must reduce this to 0.7mm for the right amount of clearance. So you must add 1.3mm of shims to achieve this.

8) Now add the smallest shims so that you minimise the endplay leave about 0.2mm gap.

9) You should always be able to spin the clutchbell when the motor is held vertically with the clutch facing up or in the down position. If the clutch doesnt spin for at least 5 seconds recheck your adjustments. Do this without any lubrication on the thrustbearing. Then when your happy lubricate the thrustbearing.

Set the spring collar as per manual. Try this. If it is still a little slugish as I doubt it will be then turn it clockwise 1/4 of a turn at a time and try it till the setting suits you.

You can do this without taking the motor out with a allen key if you didnt know. Just place the key in one of the holes on the clutch bell, locate the spring collar recess and turn.

NOTE: Others recommend the end float be set to 0.4mm instead of 0.7mm

Shock assembly:

1. Don't fill the shock with the oil, just enough were the piston is fully covered (1/4 full).
2. Tilt the shock body so that when you pull the piston up and down (slowly), there's one big bubble that goes out of one of the holes in the piston. The bubbles rises up faster than having the shock filled up with the oil.
3. Once you see no more bubbles, it's now time to fill it up and do the normal procedure.

Shock rebounding adjustment:

Instead of pressing the rubber bladders onto the shock body, I press it nicely and fit it in the plastic cap together with the aluminum ring over the plastic cap before screwing it onto the shock body. While the shock body is filled with shock oil to the brim, I quickly and carefully mount the plastic cap (together with the aluminum ring and rubber bladder) and screw it down onto the shock body. Some excess shock oil will spil out. This is normal.

The shock may be hard after assembly but what I do is slowly compress it till excess oil bleeds out from the bottom of the shocks. Then I adjust rebound on both left and right shocks (first by eyeballing it and then on the Losi shock tool) by releasing / unscrewing the top plastic cap and pressing the shock shaft in. After that is done, tighten down the caps on both shocks and put springs on it.

Mine last very long. I find no air leaks into my shocks and the shock oil remains clean after I take it out to refill them after 3 or 4 weekends of running.

Oh, I use the optional foam inserts 909447. They help a lot to maintain consistant rebound. Hope that helps.

Clutch mod:

Ok, this is a clearer picture of what and how it is done. I took the opportunity to take pictures when I mounted a spare Centax III clutch onto a spare engine. That's why it's clean and nice.

Please note that this is not a Serpent sanctioned mod and will not take any responsibility if anything bad happens. It worked wonderful for me and for Jack too.



Top flyweight is modded. Bottom is original and shows approximately where and how much you need to cut.



After the 3 flyweights are shortened, install it like this on the flywheel. They sit in nicely.

710 Internal ratio:

The internal gear ratio is 1.875.

710 Spur gear options:

Pinion (1st gear)

16T, 17T (stock) and 18T

Pinion (2nd gear)

21T, 22T (stock) and 23T

Spur (1st gear)

61T, 60T (stock) and 59T

Spur (2nd gear)

57T, 56T (stock) and 55T

Drop for larger tyres:

The kit stock setup recommends 62 mm at 6 mm front / rear ride height with 0 front and 7 rear droop. If you use 66 mm, set the car to 6 mm ride height for the front and rear as per the stock setup and decrease the front and rear droop by 2 ($66-62 = 4$, $4/2 = 2$). So you should use +2 front and +9 in the rear when

you use new out of the box uncut tires with 6 mm ride height.

Rollout chart:

<http://www.rcotech.net/forum/attachment.php?s=&postid=722766>

Kit tyre hardness and push/understeer:

My durometer indicated that the kit tires were probably F/R 40/37. The car understeered alot. I didn't have any red springs, so I changed to F/R 40/40, and this helped a little. Then I changed the DRS to the "above" position and there was a noticable lessening of the push in the high speed sweepers, but it was also better in the infield. Then I shortened the position on the anti-roll bar about 2mm, and the car is now nearly dead neutral when it drifts at high speed, with just a little too much front push left.

Tyre selection - things to bear in mind!

To determine when to change to a different hardness, bear in mind that there are two types of tyre traction: forward traction and side bite. Forward traction dictates how hard the car can accelerate and side bite is the amount of traction obtained when the tyre is loaded due to cornering forces. Generally soft tyres give more forward traction and harder tyres give more side bite. And this is why fronts are generally harder than rears. There are obviously limits to this and going too far in either direction will result in loss of traction.

Tyre selection to achieve equal wear front and rear:

Julius: „With the 710 I find using same shore front and rear gives close to perfect wear. With 40 shore and harder you may want to use one step softer fronts to get the wear to be even. Use the roll center and other settings to balance the handling.“

Front Sway bar adjustment:

You can use a 2mm hexdriver to adjust the front anti-roll bars!
Just put it in the end of the 2 blades and you can turn like you want.

DRS Positions:

The DRS suspension has three main positions.
- Neutral, No change in toe.
- Up, The wheel gets less toe-in when the suspension compresses. This makes the rear steer more in corners.
- Down, opposite to up. It will make the car more stable under acceleration and braking (just using more static toe-in would make braking more difficult) but reduces the steering in fast corners.

Steering linkage:

Julius: „I made it slightly shorter than in the book. I made it around 42mm. To do so I used a plain m3 threaded rod. Then you can use the ball joints unmodified and thread them on till they touch each other. You'll have the correct lenght then.“ NOTE: This regards the fitment for Sanwa servos.

Weight balance:

Rene C calculated that when using about 20 grams of weight on the chassis just left of the tank the chassis would close to perfect balance.

To be honest I think only very few drivers would notice the difference. Often a small tweak in the spring settings is more noticeable....

The 20 grams is not accurate for all engine/radio setups - some may require more weight!!!

Why does my car turn right/left under breaking:

This is due to the car being tweaked.

This can be caused by the following:

- 1) Without the shocks attached, do the suspension arms drop down freely.
- 2) Check the shock lengths are correct and the left and right sides are equal.
- 3) Check the droop settings front left and right are equal, and the droop settings rear left and right are equal.
- 4) Follow the instructions given here in the section „Sequence for setting tweak“.

Why tweak-boards don't work:

The problem with a tweak board is you have no idea which side of the car is off!

Lets try this mind experiment: Take a perfectly adjusted car (no tweak) and set the left front and left rear shock one turn stiffer. On a tweak board you will see no difference as front and rear are equal, but the chassis is no longer horizontal.

experiment #2: Take a perfectly adjusted car (no tweak) and set only the left front shock one turn stiffer. On a tweak board you will see tweak. If you would turn the left rear shock stiffer the tweak is gone even though you actually turned the wrong spring.

Using the method of lifting the car on a flat surface (with equal downstops) gives not only perfect tweak, but also a level chassis!

Remember that tweak boards are made for straight rear axle cars where you'd normally only adjust the t-plate.
Good thing is: a flat wooden board is a lot cheaper and easier to come by than a tweak board!

Tweak Cam/Droops:

In the 710 the cam that "untweaks" the front sway bar effects downstop. So I set downstop then I connect the front sway bar (still on Hudy blocks) and mess around with the cam and downstop screws till droop is equal and both sides have the same play on the sway bar.

There is always a little play on the bar so make sure whether you lift the left or the right arm both sides create the same movement on the other arm.

Then I connect the shocks and tweak the car using the lifting method.

Droop:

More droop (more movement of arms) will make more contact path for tires to the ground, thus more grip when cornering with speed.

NOTE REGARDING REAR TRACK WIDTH:

The narrower the rear track width is set the less the rear suspension will travel in the upwards direction. It is therefore recommended to keep the rear track as close as possible to 200mm. Also, it can occur that the right rear DRS arm can rub against the centax gear if the rear track is greater than 200mm or the right-hand side track width is greater than 100mm (i.e. measured from the centre to the edge of the wheel rim). Ensure both left and right track widths are equal!!

Sequence for setting tweak - follow sections A or B below.

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A. Julius' method for tweak/droop/sway bar setting (front only!!):

Connect the sway bar. Set droop using the screw for the right side of the suspension only. Measure on the right side.

If the right side is correctly set for droop, use the cam of the sway bar to set left side droop. In theory the left side droop should be set a fraction lower to compensate for play in the sway bar (no more than 0.2mm so it's not really important).

Then by sliding the sway bar in it's holder disconnect the sway bar.

Now set the left side droop screw to the same droop as the right.

Reconnect the sway bar.

Now droop is equal and the sway bar is aligned. Use lifting method.

B. InitialD's tweak/droop/sway bar setting:

Firstly, when I set rear droop and making sure left and right were the same on the droop blocks (reading taken from the lower knuckles), they lifted uneven (right was lifting earlier than left) when I did the lifting method with just the rear tires attached (new equal size tires, no shocks and no sway bar) and with the front end on a solid block. I made it equal left and right by limiting the left rear droop and making sure left and right lifted at the same time. This was still without shocks and sway bars on.

Next, I fitted the rear sway bars, without shocks and with the same equal sized new rear tires. Again the right side lifted earlier than the left. It looked like the right side lower arm could not fall freely so that the droop screw would hit the chassis. Took out the rear sway bar and left and right lifted the same. So it must have something to do with the rear sway bar then... I proceeded to lengthen the right rear sway bar linkage. Did not check how much longer I needed to make but it was probably like 3 to 4 mm more than the left linkage. So the rear was lifting equally left and right with the rear sway bars on and without shocks.

Fitted the shocks together with the rear sway bars on and did the lifting method again. Slight minor adjustments to the rear shocks were made to make sure left and right lifted equally. All this done with the front end chassis still supported on a solid block.

Next, I did the front end. Still have not used the front sway bars yet so setting the front tweak was simple and straight forward. Did it like what I did for the rear with now the rear end chassis supported on a solid block. Front end lifted equally left and right with and without shocks.

Just to satisfy myself and perhaps also "justify" the tweakstation purchase and put it to "good" use , I put the car with one end of the chassis on a solid block (to ensure that the front part is not hanging on springs) while the other on the water bubble cantilever. Did it for the front and rear and it was smack on the middle.

Next, I put all 4 wheels with shocks (no solid block on either end) on the tweakstation and see what the bubble tells me. Balanced front and rear side !

Modification to the front bumper:

This should help to stop damage to the downstops during a frontal impact
<http://www.rctech.net/forum/attachment.php?s=&postid=750456>

Spring info:

The yellow spring that comes with the 710 is fine. The yellow spring that came with the 705 is the one coming from Veteq. It is longer and softer as well than the stock shorter rear yellow springs that come with the Impulse Streetspec and the 710. Rene cornella mentioned that the longer rear yellow Veteq springs are equivalent to the short orange rear springs. The rule of thumb is that the Veteq rear springs are always 2 colors softer.

Yellow springs are pretty neutral and standard for most tracks. I guess that is why Serpent included them in the 705 and 710 kit. For high speed tracks, red springs are the way to go.

Still looking at the 710, it is much lighter than the 705. With the 705, my personal feeling was that yellow springs were too soft. Putting red spring on the 705, you need to mount the shocks more horizontal. This makes the shocks softer and more progressive. Whereas on the 710, the shocks are mounted more vertical. In some ways, the yellow springs will be "harder" on the 710 than it is on the 705.

The 5th damper hole:

Is the damping with 4 holes and 35wt oil the same as 5 holes with 40wt oil?

No it is not the same. Because part of the oil goes through the holes and part around the piston.

The 5th hole is the same size as the others. It was done so you'd have 2-5 holes instead of 1-4 holes. This means the adjustment steps are smaller. The initial damping is slightly softer (always 2 holes).

Drive shafts:

SER-808220 Impact front drive shaft (63mm) is also usefull to make your front track width at 199mm EXACTLY (with 2deg camber) without dog bones binding on wheel axle.

Centax-3 Gear Pinion Shim:

SER-802511 Centax-3 Gear Pinion Shim

Fule Tank Filter:

Comment from Julius:

„With the "new" tank I still use an external filter. No in tank filter I know of will keep all particles out. In the .12 engines even the smallest particles

can cause tuning problems. Better safe than sorry."

Useable tyre sizes:

The setup in the book will work with tires anywhere between 64-58. As with any setup it's a compromise. The roll center is affected by the change in setup you propose. But the change is small and in my opinion does not require compensation.

We tested the car with 64-55mm tires. We used a setup for 61mm and just ran the tires to the rim The change in handling was surprisingly small.

Drag break:

I learned the drag brake trick the hard way.. waited and waited and finally watching burch and cyrul and those guys tuning in their brakes and making the corners i just could not get the car to do .. I understood.. you want to tune it on the track, i use the trim on my throttle to adjust the drag brake.. most radios will not have any effect on end point so you can just trim to brake and fine tune it while you drive and you want to have the tires warm as the car will handle different after 5 or 6 laps from cold.... but tune the drag brake in so you can drive the majority of the track without having to reach for the brake.. and adjust for the extremes later, areas were you need not brake or area were you need a touch more, you will find you can tune your lines in better and become more consistent with your corner entry and exit and with that you build confidence and go faster.. end result the fun factor goes way up...

Post winternats tips from molzermoweryracing:

Here is what we found with the 710 that was worth changing:

1. InitialD's (or whoever was the inventor)'s clutchmod is definately an improvement. Serpent is working on new flyweights that will improve how the clutch engages.
2. Shocktower mod: Ammdrew and I found that the front shocks did not take much to brake if you contacted the boards in Ft Myers. (shafts snap). To prevent this from happening, we put spacers between the shocktower and front bulkheads and monited the shocks behind the tower instead of in front (used the spacer that comes on the shck tree, it use to be used instead of the balls that we have on the ends of the shocks, old serpent leftover, but it is a perfect spacer). This allows the shocks to flex backward on impact and put a definate end to the shafts breaking. The rear shocktower seems just fine, can't see anything wrong with it. I acctually beoke one, but that was when an 8:th scale car tried to drive through me in happy hour. Other than that, the car is a huge improvement in terms of set-up, handling and wrenching over the 705.

Choosing the right glow plug:

<http://www.mytsn.com/publ/publ.asp?pid=8538&ccid=8>

Who are the famous guys around here (rctech):

1. InitialD - see next section.
2. Julius - dare devil stunt pilot for KLM and was involved in the 710 design
3. Rene.C - 710 Designer and german regional champion
4. Michaels - 710 Designer and one of the top 200mm and 1/8th drivers.

Just who is this InitialD guy who keeps hogging the lime-light? ;-)

Base on current facts, we can report that he:

1. Is a woman
2. Has hairy legs
3. Has a big pot belly
4. Has a moustache
5. He's very old
6. Has some kind of fetish to do with polka dots!
7. Likes bermudas
8. Likes to be close to snakes!

And is somewhere in these pictures:

<http://www.rctech.net/forum/attachment.php?s=&postid=615644>

<http://www.rctech.net/forum/attachment.php?s=&postid=507744>