

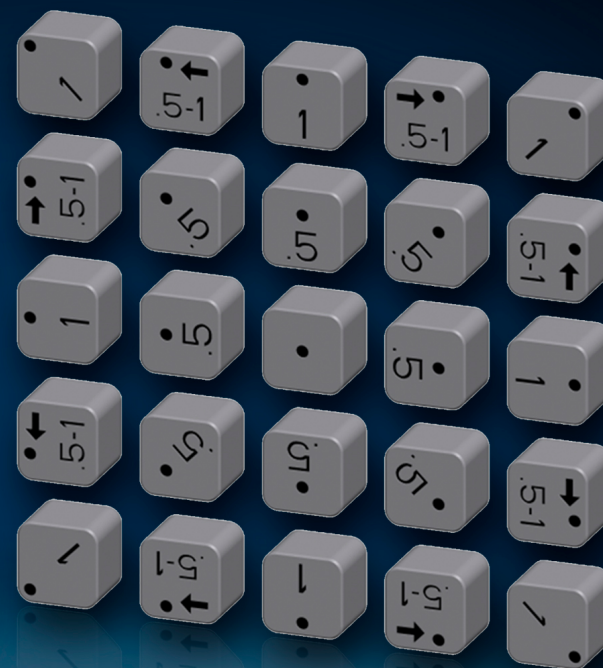
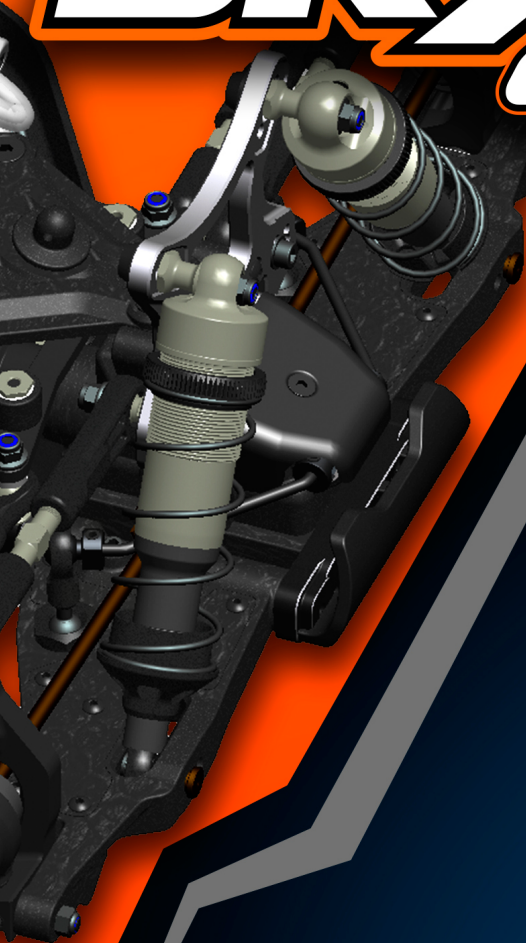
1/8 OFF ROAD SCALE

SRX8 GEN4

GEO-MATRIX

SUSPENSION GEOMETRY SYSTEM

/// INSERTS MANUAL ///



25- POSITION
INDEXED SYSTEM



PRECISION
SQARE INSERTS



REPEATABLE
GEOMETRY



RACE PROVEN
PERFORMANCE

SERPENT

REAR 25-POSITION INDEXED GEOMETRY SYSTEM

INTRODUCTION

The SRX8 Gen-4 is now fully equipped with the all new Serpent Geo-Matrix™, a indexed suspension geometry platform that delivers 25 precise, repeatable setup positions using rotating square inserts. The insert's can be rotated in 90 degrees increments, creating an orientation-based indexing system that will give you a defined suspension geometry setup.

Using the standard settings as a starting reference position you will be able to fine tune the cars handling for virtually every track condition you will ever face.

With this system, adjustments to anti-squat, toe-in, roll center, kick up, and track width can be made easily and accurately. When winning matters, the Serpent Geo-Matrix™ Insert System delivers precision, repeatability, and confidence in every setup change.

INSERT TYPES AND POSITION LOGIC

There are seven inserts used in this system. Each insert is clearly identified by markings and a directional dot.

- The centered insert has no text making and only uses a dot.
- All other inserts are marked with 0.5, 1, or a combination of numbers and letters, along with a dot.
- These numbers indicate how much the geometry is altered in 0.5 or 1 degree increments.
- The dot indicates orientation and shows the direction the hinge pin will move when the inserts is installed.

For clarity, the inserts shown in the following diagram are color-coded and labeled with black text and a white orientation dot (the actual parts are all gray color).

INSERT BREAKDOWN:

Please find attached below the complete list and description of each pill supplied in the kit:



0° CENTERED Offset: 0/0



0.5° CENTERED OFFSET Offset: 0.5 used horizontally or vertically.



1° CENTERED OFFSET Offset: 1.0 used horizontally or vertically.



0.5° DIAGONAL OFFSET Offset: 0.5 used diagonally.



1° DIAGONAL OFFSET Offset: 1.0 used diagonally.



0.5° LEFT X 1° DIAGONAL OFFSET Offset: 1.0 Diagonal + 0.5 Diagonal Right used asymmetrically.



0.5° RIGHT X 1° DIAGONAL OFFSET Offset: 1.0 Diagonal + 0.5 Diagonal Left used asymmetrically.

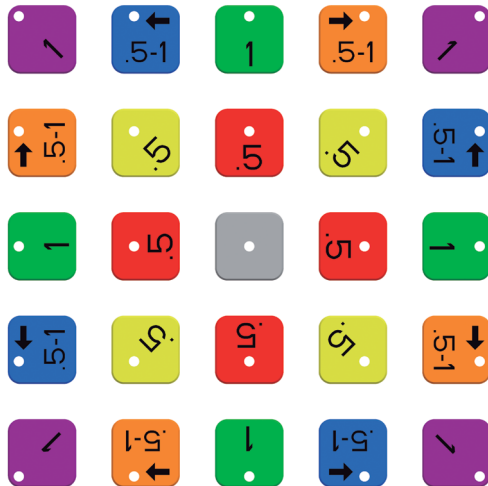
REAR 25-POSITION INDEXED GEOMETRY SYSTEM

POSITION CHART

The chart below illustrates all 25 possible hinge-pin locations and shows which insert and orientation are required to achieve each position. It is important to note, the chart is color co-ordinated to help you fully visualize each inserts position and orientation.

- The centered insert, identified by a single dot, can only be used in 1 position
- The remaining six inserts can each be used in four orientations, resulting in 25 total positions.
- Each inserts position moves outward from the centered insert. The degree of change and what setting is being changed is based on the insert type and the dots orientation.

The chart uses a color-coding system so that way you can locate the insert you are currently using and easily select the correct insert that would give you the desired geometry change.



HOW TO USE SYSTEM:

- 1) Select an insert based on what you wish to change, how much and in which direction you want to change the geometry.
- 2) Locate the dot on the insert.
- 3) Rotate the insert so the dot points in the direction you want the hinge pin to move.
- 4) Verify the position using the chart.
- 5) Mirror the inserts left to right in the suspension brackets to retain proper suspension geometry symmetry.

REAR 25-POSITION INDEXED GEOMETRY SYSTEM

REAR SUSPENSION GEOMETRY

In the rear of the SRX8 Gen.4, there are 4 key adjustments you can make to fine tune your suspension. You can achieve all of these adjustments using the insert system.

- Toe-in Angle
- Anti-squat
- Roll-Center
- Track Width

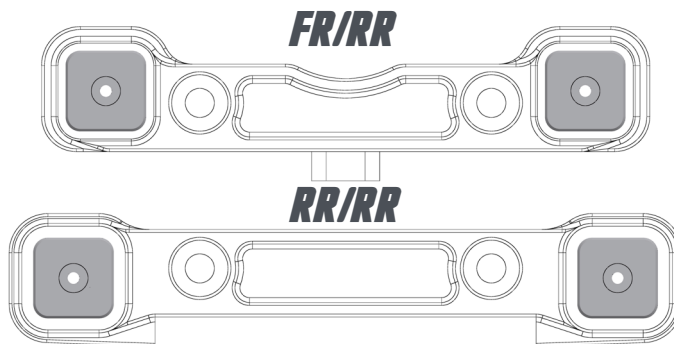
To visualize how to use the system, remember that there are 25 positions and on the rear you are starting at the centered position on the Front/Rear and Rear/Rear suspension brackets.

It is important to note that you can change one or both suspension bracket inserts to achieve different or similar results. It is recommended to only make a change to the inserts in one suspension bracket at a time.

DEFAULT REAR SUSPENSION SETUP:

Before we begin it's very important to note what the standard rear suspension geometry of the SRX8 Gen 4 is using the manual setup.

- Toe-in Angle: 3°
- Anti-squat: 2°
- Roll-Center: +/-0mm
- Track Width: +/-0mm

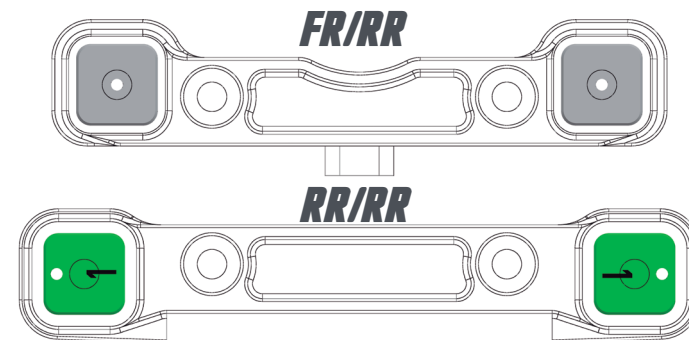


CHANGING REAR TOE-IN ANGLE:

In order to increase **ONLY** the rear Toe-in angle of the vehicle by 1 degree per side, let's take a look at one way to achieve that.

In the illustration below you can see that we chose the 1 degree centered insert that can be used horizontally or vertically. Now we just had to check the position chart to determine how we can use this insert. When adjusting Toe-in, we must orient the dot in or out. Since we were adding Toe-in to the Rear/Rear suspension bracket the dot must orient to the outside (This would have been the opposite, if we were adjusting the Front/Rear suspension bracket, in order to increase Toe-in on the Front/Rear bracket we would have had to orient it in.) This change results in:

- Toe-in Angle: 4°
- Anti-squat: 2°
- Roll-Center: +/-0mm
- Track Width: +/-0mm



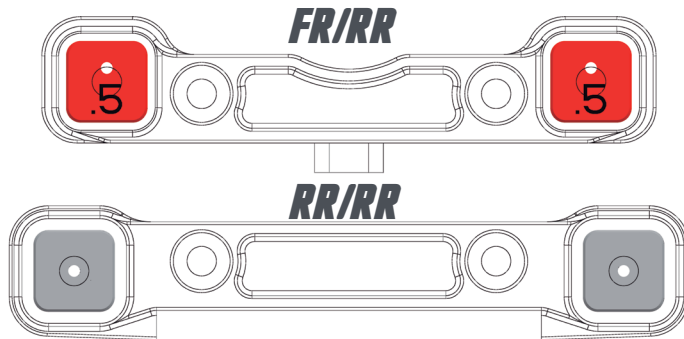
REAR 25-POSITION INDEXED GEOMETRY SYSTEM

CHANGING REAR ANTI-SQUAT ANGLE:

In order to increase ONLY the Anti-squat of vehicle by 0.5 degree, let's take a look at one of the ways you can achieve this.

In the illustration below, you can see that we chose the 0.5 degree centered insert, which can be used in the horizontal or vertical position. We chose to adjust the Anti-squat in the Front/Rear suspension bracket. In this case we wanted to add 0.5 degree more Anti-squat and in this case the dot must orient up to do so. (In the case you wanted to add more Anti-squat in the Rear/Rear suspension bracket the dot would have oriented down.)

- Toe-in Angle: 3°
- Anti-squat: 2.5°
- Roll-Center: +/-0mm
- Track Width: +/-0mm

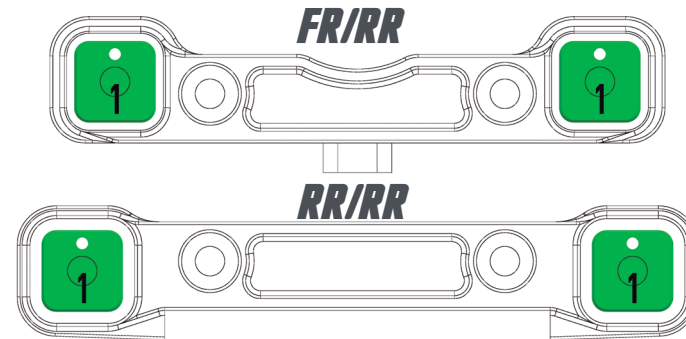


CHANGING THE REAR ROLL CENTER:

Let's assume that your car might be too stiff when it rolls, or maybe too soft. You have determined that your car feels too soft, you want to raise ONLY the rear roll center using the inserts to reduce chassis roll. Let's take a look at how to achieve this. We will adjust this from the Standard Geometry.

In the illustration below, we wanted to raise the rear roll center 1mm. We chose the 1 centered insert and placed all four inserts with the dot oriented upwards in the Front/Rear and Rear/Rear suspension Brackets. (Had we wanted to lower the RC, we would have placed the dots oriented downward, essentially lowering the hinge pin).

- Toe-in Angle: 3°
- Anti-squat: 2°
- Roll-Center: +/-0mm
- Track Width: +1mm HIGH



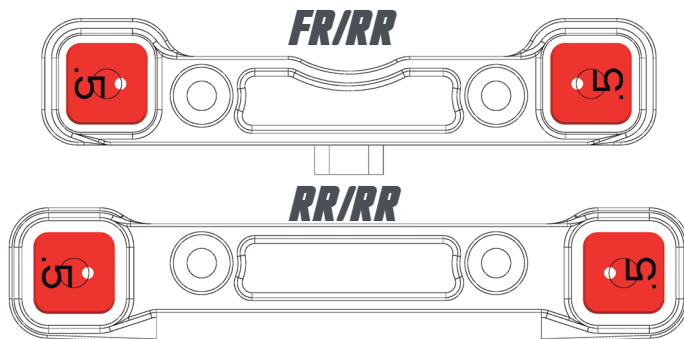
REAR 25-POSITION INDEXED GEOMETRY SYSTEM

CHANGING THE REAR TRACK WIDTH:

Now, let's talk about track width. There are many reasons why you might want to adjust the track width of the vehicle, using the pivots. Maybe you want it to lean more/less, or the car with specific tires on it is too wide and does not fit in the Technical inspection box. As always we will start with the standard geometry and try in this instance to narrow ONLY the track width.

In the illustration below, the vehicle was too wide and we needed to narrow the rear track width by 1mm. In order to do this we need to use the 0.5 centered insert on each side (0.5+0.5=1mm) and orient the dot's inward. (Had we needed to widen the car we would have oriented the dot's outward.) As usual we checked the position chart to confirm our insert and its orientation to confirm our assumption.

- Toe-in Angle: 3°
- Anti-squat: 2°
- Roll-Center: +/-0mm
- Track Width: -1mm TRACK WIDTH



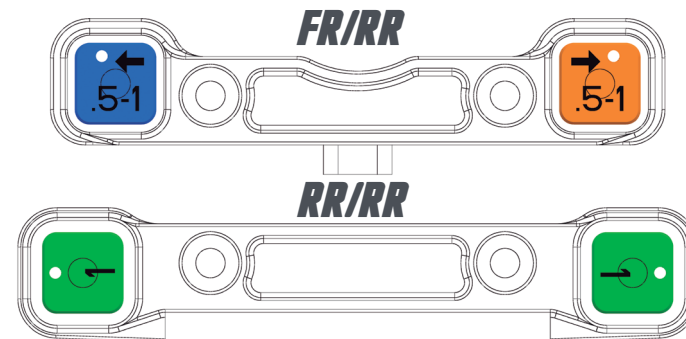
REAR GEOMETRY COMBINATION CHANGES:

It is possible to do a combination of changes all in one go. Let's assume that you feel you need more Toe-in, more Anti-squat, and you also want to widen the car. In this case, we will increase the Toe-in 0.5 degree per side, and increase the Anti-squat by 1 degree, and also widen the car by 1mm (0.5mm per side).

In the illustration below, you can see we had to use a very specific combination of inserts to achieve this goal. It was paramount to use the position chart to get a visual on how to achieve this. It can be easy to get lost just guessing.

We had to use the Asymmetrical 0.5/1 mixed Diagonal left/Right bias inserts to get the desired Anti-Squat and Track Width Adjustment on the Front/Rear suspension block, while we used just the 1 centered offset in the Rear/Rear suspension block for the Toe-in.

- Toe-in Angle: 3.5°
- Anti-squat: 3°
- Roll-Center: +/-0 mm
- Track Width: +1mm TRACK WIDTH



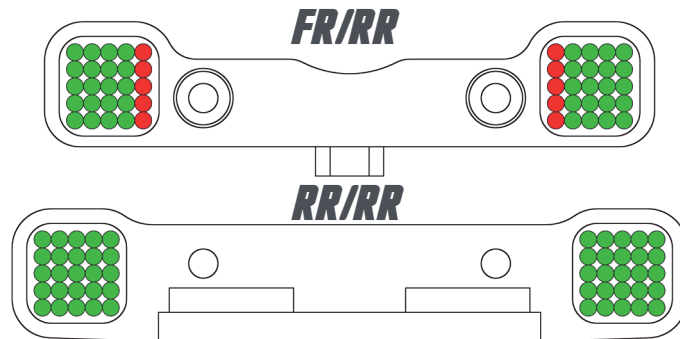
REAR 25-POSITION INDEXED GEOMETRY SYSTEM

REAR INSERT POSITIONS WITH CLEARANCE ISSUES:

If you take a look at the Position chart you can see its 5 rows of 5 inserts. In this Illustration below each insert and its orientation is represented by a dot. The dots that are green are useable positions; the dots that are red have suspension arm interference issues.

On the Front/Rear suspension bracket, the red dots represent positions that can be used, but you must modify the suspension arm. On the Rear/Rear suspension bracket, the green dots can be used without any interference issues.

In order to use the positions marked in red the rear suspension arms will need to be trimmed slightly at the front inside hinge pin boss to prevent interference on the transmission case.



FRONT 25-POSITION INDEXED GEOMETRY SYSTEM

FRONT SUSPENSION GEOMETRY

In the front of the SRX8 Gen.4, there are 3 key adjustments you can make to fine tune your suspension geometry. You can achieve all of these adjustments using the insert system.

- Kick-up
- Roll-Center
- Track Width

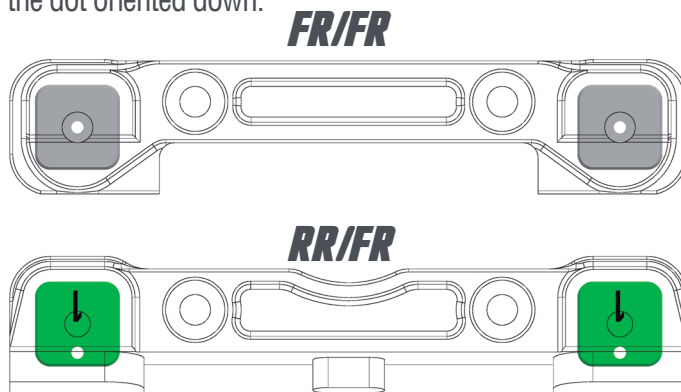
To visualize how to use the system, remember that there are 25 positions and on the rear you are starting at the centered position on the Front/Rear and Rear/Rear suspension brackets. . It is important to note that you can change one or both suspension bracket inserts to achieve different or similar results. It is recommended to only make a change to the inserts in one suspension bracket at a time.

DEFAULT FRONT SUSPENSION SETUP:

Here we will explain the standard front geometry of the SRX8 Gen4 that you will find in the instruction manual as the noted as the standard setup.

IMPORTANT NOTE: In the front of the car, we do not recommend, using any angle horizontally (toe-in/out on the hinge pin, due to clearance issues with the steering geometry, or drive shafts.). In the illustration below, you can see that the Front/Front suspension bracket is fitted using the centered Insert, and the Rear/Front suspension bracket is fitted with a 1 centered insert with the dot oriented down.

- Kick-up: 10°
- Roll-Center: +/-0mm
- Track Width: +/-0mm

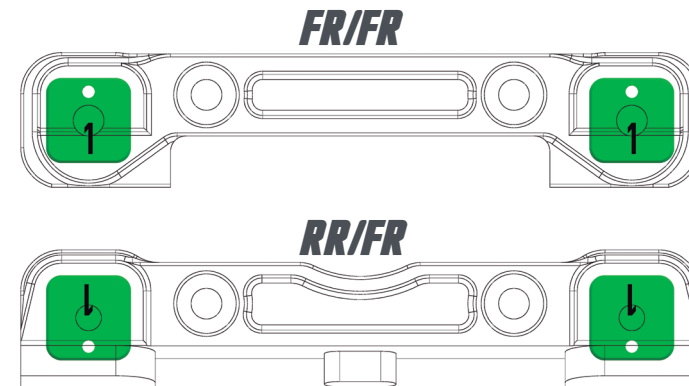


CHANGING FRONT KICK-UP ANGLE:

There are lots of times changing the Kick-up of the front end can improve the handling of the car. It can improve bump handling, on/off power steering and how the car lifts off of jump faces. Let's assume you want more lift off of the jumps, in this case we will increase the front Kick-up by 1 degree.

In the illustration below, we cannot add more angle to the Rear/Front suspension block, so we must add more kick-up to the Front/Front suspension block. In this case we can take a look at the position chart and easily see that if we want move 1 degree up from the centered insert we would have to use a 1 centered insert oriented up.

- Kick-up: 11°
- Roll-Center: +/-0mm
- Track Width: +/-0mm



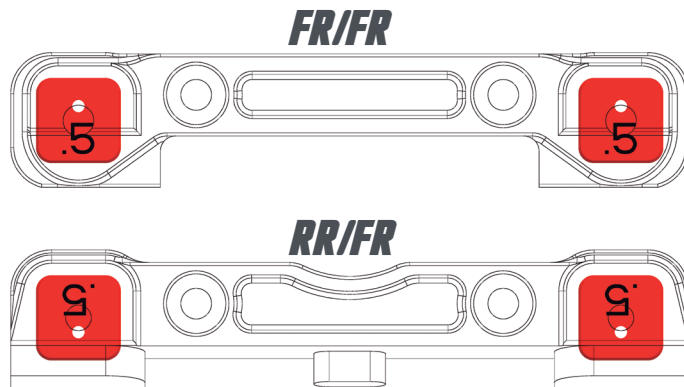
FRONT 25-POSITION INDEXED GEOMETRY SYSTEM

CHANGING FRONT ROLL CENTER:

Sometimes a Roll Center adjustment is all you need to succeed. The track is a bit higher grip and the front end is gripping a little more than you want. It is possible the roll center is a little too low. You can decrease front roll by raising the front roll center.

In the illustration below, we wanted to keep the same Kick-up angle, but raise **ONLY** the roll center 0.5mm. In order to do this we can take a look at the position chart and see that the Front/Front block insert will need to go from centered to 0.5 Centered dot oriented up and the Front/Rear block insert will need to go from 1 centered oriented down to .5 centered oriented down. We are simply moving the pin up 1 insert on both brackets, or 0.5mm.

- Kick-up: 11°
- Roll-Center: +0.5mm Roll Center
- Track Width: +/-0mm

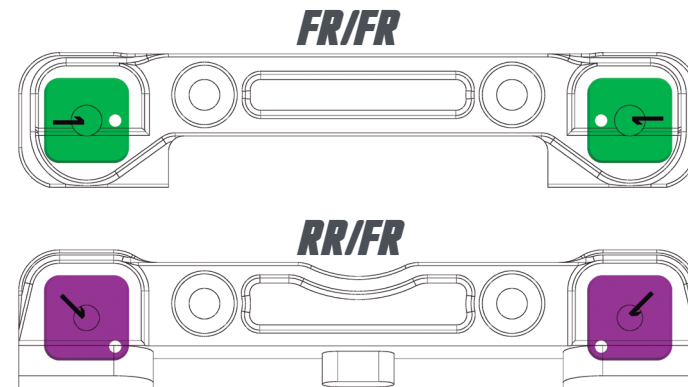


CHANGING THE FRONT TRACK WIDTH:

In some case you might want to narrow the track width. This is primarily due to how much front Toe-In/out you run statically. If you run a lot of static toe-out you might run into issues being illegal in the technical inspection box. You can also use it as a way to tune how much the car will lean at the apex of the corner.

In the illustration below, we wanted to narrow the front of the car a total of 2mm. In order to do this we will need to use the 1 centered offset inserts oriented with the dot inward in the Front/Front suspension block and a 1 diagonal oriented with the dot down and in. (The 1 inserts offset will narrow the car 1mm per side= 2mm) Using the position chart we were able to easily identify which inserts and what orientation the dot would need to be to narrow the car.

- Kick-up: 11°
- Roll-Center: +0mm Roll Center
- Track Width: -2mm Track Width



FRONT 25-POSITION INDEXED GEOMETRY SYSTEM

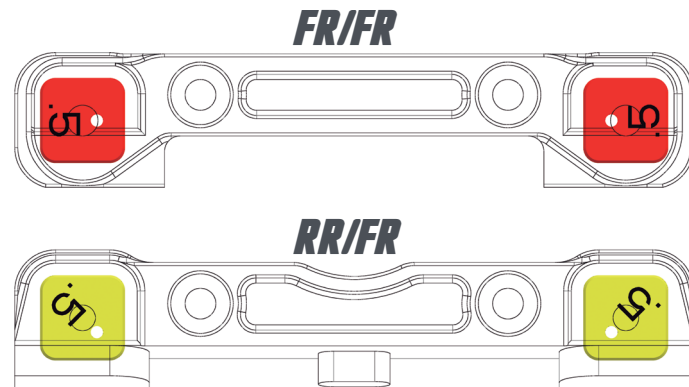
FRONT COMBINATION CHANGES:

It is possible also on the front to do a combination change all in one go. We will assume you want to reduce the Kick-up .5 degree, narrow the Track Width by 1mm total(.5mm per side), and raise the Roll Center .5mm.

It is still very important to use the position chart to identify what inserts you need, to solve this easily and effectively. The chart will be even more useful when you are working out a complex setup.

In the illustration below, you can see we had to use a specific combination of inserts to achieve this goal. To do this we needed to first need to focus on the Rear/Front suspension bracket. We need to narrow the Track Width 1mm, and then reduce the Kick-up angle .5 degree. To do this we will use a .5 diagonal oriented down and inward. This insert will reduce the Kick-up 0.5 degree and narrow the vehicle 0.5mm per side.. Now that we have the rear bracket handled, we will move onto the Front/Front. In this case all we need is to reduce the track width. So, we have to use a .5 centered oriented inward to achieve the 0.5 narrower per side (-1mm total).

- Kick-up: 9.5°
- Roll-Center: +0 mm Roll Center
- Track Width: -1mm Track Width



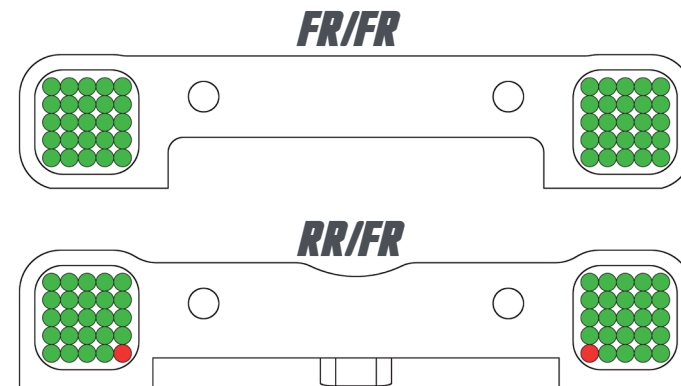
FRONT INSERT POSITIONS WITH CLEARANCE ISSUES:

If you take a look at the Position chart you can see its 5 rows of 5 inserts.

In this Illustration below each insert and its orientation is represented by a dot. The dots that are green are useable positions; the dots that are red have suspension arm clearance issues.

On the Front/Front suspension bracket the green dots represent positions that can be used.

On the Rear/Front suspension bracket the red dots represent positions that can be used, but there are interference issues. In order to use the positions marked in red, the front suspension arms will need to be trimmed slightly at the back inside hinge pin boss to prevent interference on the chassis.



CONCLUSION:

Congratulations you have made it to the end of the Serpent Geo-Matrix™ user's guide. Now that you have a clear understanding of the Geo-Matrix, you can fully tune your SRX8 Gen4 race car. No matter what race conditions you may face, low bite, no bite, high bite, rough or smooth, you can tune for it all. As a final thought, memorize the position chart to help determine all the possible outcomes no matter large or small, it will help we promise.

Now, it's time to hit the track and collect the trophies!

Sincerely,
 • Serpent Racing Development