

What Does A Sway Bar Do?

I get a lot of questions about sway bars and what they will actually do for the Spyder. Here is my feeble attempt at giving a reasonable and, I hope, simple explanation.

To understand what my sway bar will do for you, you have to understand what a sway bar does and how your suspension works. It isn't rocket science but it is a subject, like oil, where there is a lot of misunderstanding. It just isn't something that most people are familiar with.

This is in no way an exhaustive treatment of this subject so bear that in mind.

A sway bar (or Anti-Sway Bar) is simply a SPRING which lurks under most vehicles produced today, quietly doing their job with little or no recognition. The racing enthusiast is quite familiar with sway bars as they are one of the key components to getting around corners quickly and adding control aspects to the vehicle that no other component can.

There are several suspension components that work together to give us a safe, controlled and comfortable ride. Improve any one of them and you will likely see immediate improvement in the area(s) that are affected by that component. It would be foolish for BRP to build the best possible suspension for our Spyders as that would be very expensive and not necessarily appreciated by every customer.

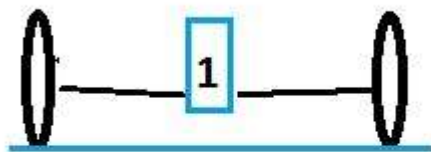
Stock suspension on our Spyders is adequate. Yet there is a great deal of improvement to be had if the owner would like better, more controlled handling.

What we are addressing in this explanation are the effects of centrifugal force (lean angle in a turn) or any side forces (wind, buffeting when passing a large truck, etc.) and how to best counteract these forces, most notably in the case of our Spyders, excessive lean.

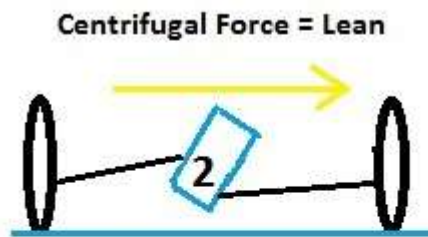
There is much more to our suspension, shocks in particular, than just countering centrifugal force. But for this explanation I am only discussing lean angle aspects.

I'm sure your 2nd grade student could do better with Crayons but please, be kind!

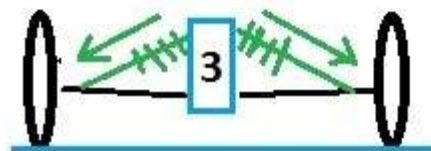
Effect of Shocks & Sway Bar on Centrifugal Force (Lean Angle)



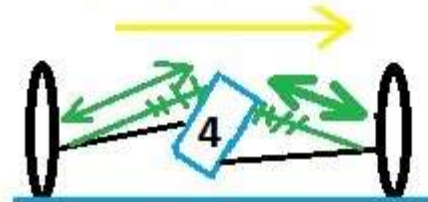
Straight Ahead



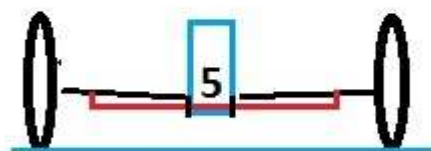
Hard Cornering



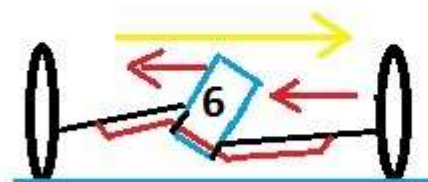
Shocks equal length
Equal down force



Inside Shock Extends = Less Down Force
Outside Shock Compressed = More Down Force



Sway Bar - No Tortion - No Effect



Increased Tortion - Increased Effect in the opposite Direction

1st Picture

This depicts the Spyder going straight ahead without Shocks or Sway Bar. Just 1 A-Arm is shown on each side to keep things simple.

2nd Picture

Suspension and body of the Spyder reacts to Centrifugal force (**Yellow Arrow**) causing the body of the Spyder (**Blue Box**) to lean to the outside of the turn (exactly the opposite of lean angle on 2 wheels where you must lean to the inside of the turn.)

3rd Picture

Shock springs provide equal down force (**Green Arrows**) holding your Spyder up. Stiffer spring setting will raise the Spyder, lower spring setting will lower your Spyder.

4th Picture

Inside Shock - During a turn the **Shock** on the **Inside** of the turn (away from the lean angle) extends. This lengthens the spring and reduces down force to that wheel. Though down force is reduced, this inside shock spring is still contributing to lean angle by pushing down on the suspension and raising the high side of the Spyder body, thus adding to lean angle to some degree. This happens until the inside wheel is lifted off the ground. At this point the inside shock has no effect on lean angle.

Outside Shock - While turning, the **Outside Shock** is compressed reducing spring length which greatly increases down force to that wheel. This increased down force resists lean angle.

The greater the lean angle, the more pronounced both of these shock spring effects are. Here are some basic rules of thumb regarding shock spring effects.

Lower spring Pre-Load setting, lower ride height, increased lean angle in turns, softer, more compliant ride.

Higher spring Pre-Load setting, increased ride height, less lean angle in turns, harsher, less compliant ride.

5th Picture

Remember, the Sway Bar is a Spring attached at 2 points on the frame (**Blue Box**). The ends of the sway bar are attached to the A-Arms. When going straight ahead the Sway Bar has no effect on the suspension what-so-ever. Therefore, a stiffer sway bar cannot effect the harshness or softness of your ride. The sway bar does not hold your Spyder up, so changing the sway bar will not affect ride height.

6th Picture

A sway bar **WILL NOT** eliminate lean. You actually need lean to make everything go smoothly. It is the **AMOUNT** of lean that you want to reduce with the sway bar.

A sway bar is simply a straight spring. As with all springs, it is designed to flex with increasing resistance to increased force applied. You can see in this exaggerated picture that a great deal of stress is being applied to the sway bar due to the lean angle of the Spyder body (**Blue Box**). The sway bar is attached to the frame at 2 points. It does not actually bend as depicted, but it is difficult to show how this torsion spring works with my limited skills in diagramming.

The Sway Bar is always working to stay straight. As the lean increases the Sway Bar applies increasing force to each A-Arm in its attempt to remain straight. Using leverage created by the angle of the A-Arms, the Sway Bar applies force to the Spyder Body (**Blue Box**) in the opposite direction to the lean created by side force.

Once you ride a Spyder with a Custom Performance Sway Bar you won't need to know any of this because you will feel exactly what I'm talking about every time you encounter a situation where your Spyder used to lean too much.

I sincerely hope this helps! Being well informed is the best tool any Spyder owner can have in their tool box.



Baja Ron

What some users have said-

After reading the many positive comments about switching out the factory swaybar with an after market bar, I ordered one from Martin and fitted it to my wife's RTS today. The change in handling is just awesome, to say the least. My wife was extremely satisfied with the vast improvement in stability through the corners and turns. I believe her confidence level has just shot through the roof, and this in itself makes purchasing the swaybar worth it. I cannot speak highly enough of this performance part, and of course the excellent service that I received from Martin when ordering said item.

Below follow quotes on Spyderlovers US forum from happy customers with Ron's sway bars.

Just wanted to say what a great product Baja Ron has with the heavier swaybar for the Spyder RT. It changes the whole dynamics of riding the Spyder. It now RAILS around corners and the twitchy sensation is almost gone. Even riding 2 up it works great and I don't have to have as stiff a preload on the shocks. Should come from the factory this way but I suspect they made it soft to work with the stability control and keep riders from going so fast in corners. (read liability). Thanks Again

"I put my sway bar(BAJARON on a 2013 RT) on yesterday a WOW!!! what a difference it made . Li'LL RED turned into a monster She's like glued to the road! Now I have to be careful or I will in up in jail LOVE the way she handles"

"I Just installed my BajaRon bar yesterday. I have a 2011 RSS with the Fox podium shocks.. I read all these postings about the "bar being the best investment", "It's amazing", "Night & day from the original bar", "Worth every penny & then some" Yaddie Yaddie Yah.... I mean really.... What difference can a bar make?..... Trust me.... EVERY Positive thing you've read or heard about this bar, is ABSOLUTELY 110% true & accurate. You have no idea.... Get the bar.... You'll be Amazed at the difference... (Even if you think you don't need it)."

"I just got back from a real "Thrash" over some real miserable roads... potholed worse than a teen's acne , blind curves, blind hills with curves, and then some more curves with sand thrown in just to get your colon knotted up nicely... I FLEW over this road about 10 mph faster than I ever had before. My personal "Danger; Wil Robinson" alarm was screaming at me the whole way. The bike remained stable, reacted in fluid and predictable ways, and left me grinning like a ninny when I popped out the other side of it."

"Took about a 30 mile ride, some mild twisties, and very satisfied with the sway bar. Feels like a different bike, solid around curves. "

"The BajaRon sway bar kit was the best \$200 I've spent on any bike... It's a new machine now."

"Then out for a test ride....what a difference, the bike will actually stay planted in the center of the lane instead of wandering from line to line. I really like it, for sure a worthwhile modification."

"I just finished the installation of the swaybar and went for a good ride. My wife's Spyder is so much more precise and stable now. I agree in that this should be OEM since it seems to have no downside"

"Drove about 30 miles home with combination 75 mph larger roads, twisties, and a few roundabouts. The bar has exceeded my expectations. I'm very familiar with these roads, and know what the spyder's limits were. Now i'm going faster, with less effort. The bike feels glued to the road. Outstanding product. And for the money, its a no brainer."

"I had the bar installed yesterday. I already have the Elka shocks, but figured the bar would make the handling even better. Boy, was I wrong. Even better is really "a great improvement" in comfort as well as stability on the interstate and especially our great "back roads" here"

"I am amazed on the difference I took it for a 1/2 mile ride and can tell the difference on the first curve now How the heck did Ron know how to remedy the sway problem with such a easy fix are you a magician or a Brain "

Baja Ron