

BUMP STOP TECH



During the past several years many racers have become faster by running a “Big Bar Soft Spring” (BBSS) set up. BBSS set up’s offer several advantages. The soft springs let the nose drop improving aerodynamics. Stability improves because there is less body roll and the car is more consistent. Load is transferred to the front tires faster improving grip. Increased rebound in the front shocks and coil binding or bump stops are an essential parts of the BBSS set up. Although the “Cup” guys have proven a car can be fast coil binding, our experience has been most racers can be consistently faster for less money running bump stops. We’re constantly asked which bump stops to run. This tech sheet is provided to help answer some bump stop questions.

To select the correct bump stops a number of decisions must be made. First you must determine the bump stop stack height required to keep the front of the car off the track. This is easily done by doing the following:

1. With the car at loaded racing ride height measure the amount of exposed shock rod on both sides of the car. Write down these measurements as A Left and A Right.
2. Support the front end of the car and remove the springs from the shock absorbers (assuming the car has coil overs).
3. Place a $\frac{3}{4}$ ” metal block under the front cross member.
4. Lower the car onto the $\frac{3}{4}$ ” block. The car is now at the attitude where compression of the bump stops should begin,
5. With the car sitting on the $\frac{3}{4}$ ” block measure the amount of shock absorber rod showing on both sides of the car. Write down these measurements as B Left and B Right.
6. Subtract B from A for both sides of the car. Write down the number as C Left and C Right. The bump stop stack consisting of bump rubbers, washers, spacers and shims should equal the C number for each side of the car.
7. This method of determining the stack height assumes the front tires will compress about $\frac{3}{8}$ ” and the bump stop stack will compress about $\frac{3}{8}$ ”. Since tire construction varies and track configuration and driver style affect bump stop compression you will probably have to “fine tune” the bump stop stack height.
8. The bump stop stack height can be adjusted by using shorter or taller bump rubbers, washers, spacers and plastic shims. When adjusting the stack height we recommend a washer be used on both sides of the bump stop.
9. Different types of bump stops require different hardware. “Christmas tree” shaped bump stops such as Right Foot 6070’s and 6071’s should always be run with a cup. Right Foot “puck type” bump stops do not require a cup. Bump rubbers should always bump against a smooth flat surface on both sides and there should always be some type of separator between bump rubbers. When using washers make sure the washers don’t have any sharp edges or burrs which can catch the bump rubber. It’s also helpful to polish the washers so the bump rubbers slide smoothly against the washers. Washers that are pre-polished are also available.
10. Next decide on the spring rate and/or durometer of the bump stop to be used. Most bump stop manufacturers have spring rate information available for their bump rubbers. If you are running bump stops for the first time it is typically better to start with softer bump rubbers. As a general rule, rough tracks require softer bump rubbers. High bank tracks require harder bump rubbers. If you are using a Gale Force Machine to set your coil overs a reading of 1,800# for the left front and 2,200# for the right front are good starting points.

11. After installing the bump stop stacks reassemble the coil overs.

Once the bump stops are installed testing is required. Prior to testing you should install travel indicators or ground clearance gages on your car. You need to know bump stop travel and how close the car is to the track. Right Foot Performance makes a very useful ground clearance gage available under P/N 6100. Ideally the front crossmember should drop to within 1/8" to 1/4" off the track, but should not touch.

The front springs have to be matched to the bump stops. When testing you must verify the front springs are stiff enough to prevent coil binding. The bump stops can't work if the springs coil bind before or as the bump stops are engaging.

Bump stop set up's will vary from track to track and driver to driver. There is no one set up that works for all drivers. Some drivers prefer to bump only one front corner while some bump three corners of the car. As a general rule it's best to start out bumping both front corners somewhat evenly. Adjust the bump stop stack height so the front crossmember is as close to the ground as possible without touching the track. A selection of 1/16" and 1/8" snap in shims is useful for this process. When adding shims or packers be aware the addition of a shim will also engage the bump stop stack sooner which will increase the combined spring rate of the coil over sooner.

The driver has to pay attention to how weight is transferring around the car. Typically weight will transfer to the LF bump stop first and then as the car rolls will transfer to the RF. If too much weight is transferring to the RF the LF stack can be shortened or the RF stack increased. By adjusting the bump stop stack height you are able to wedge or de-wedge the car. If the tires seem to chatter when the car is on the bump stops that is an indication softer bump stops are needed. If the car suddenly pushes up a lane in the middle of the corner that is often an indication of bump rubbers that are too stiff. If your car is fast on short runs but the tires go away on long runs that may indicate the bump stops are too hard. If the front crossmember is hitting the track you need to add stiffer bump rubbers or add shims to increase the stack height.

Using bump stops on the LR is a good way to improve "bite" coming out of a corner, especially if you are set up to run one track with 25 to 75 lap features. Racers on a traveling circuit running longer features may find it difficult to set up a LR bump stop because it's difficult to compensate for the amount of fuel burned off. When running a LR bump stop set up the bump stop stack so the car has 1/4" to 3/8" coil spring travel before engaging the bump rubbers. Use a stack of soft bump rubbers such as 50 or 55 durometer. If the car picks up an acceleration push decrease the bump stop stack height or back off the point at which the bump rubbers are engaged. If the car needs more bite increase the stack height to engage the bump stop sooner.

REMEMBER – Bump Stops and Big Bar - Soft Spring are part of an overall set up. Other adjustments with the springs, shock valving, roll center, camber, and etc. will have to be made. Testing is required! Plan on using up some tires to get it right. Please feel free to call us at 1 (920) 832-2322 with questions.