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## SPRING RUBBER USE

Today's set ups have become more detailed and the knowledge gained by professional teams filters down to Saturday night racers at a very rapid pace. Refining your set up becomes more important with each and every race. One way to get the most out of your set up is to use spring rubbers to create the maximum advantage. While the term spring rubber is often heard, quality spring rubbers are actually made from polyurethane. Polyurethane offers uniform hardness and color coding helps to keep things organized.

Quality spring rubbers are available from very soft to very hard and a good selection helps to maximize your set ups. A good selection allows you to make small rate changes giving you the ability to get between the rates supplied by spring manufactures. Spring rubbers can be installed quickly and they allow you to try out a stiffer spring set up without taking time to change the actual spring saving you valuable practice time. Installing a spring rubber only takes a minute which allows you to get the car back on the track. Drivers can give you instant feedback relating to cornering improvements assisting in the decision to change the spring or perhaps install spring rubbers of a different rate.

Spring rubbers will affect your spring depending on the rate of your spring, the installed height, and the actual rate of the rubber used in the manufacture of the spring rubber. Using a spring tester to test your range of springs with a variety of spring rubbers will prove to be good practice. To get the maximum accuracy you will need to know the installed height of the spring. Knowing the installed height will allow you to test the effect of spring rubbers in the actual condition that they are used.

To properly record the effect of spring rubbers you should first check the spring without any rubbers installed. First you should compress the spring to the installed height. From there, compress the spring exactly one more inch and record the rate. It is also beneficial to record the results of a second inch of compression. Be sure to utilize a dial indicator as testing in exactly one inch increments is key.

After recording the rate of your bare spring verifying factory accuracy you then can install the softest rubber in your inventory to visually see the rate changes created by the spring rubber. First, install the rubber on the spring and then compress the spring with the rubber to the

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installed height determined by your actual car. Next, compress the spring and rubber exactly one inch and record the number on your chart directly below the results obtained from your initial test of just a bare spring. Compress the spring an additional one inch and record the number on your chart. The chart below shows the rate change of our test spring.

| Factory Spring Rate      | Installed Height | At 1" Compression | At 2" Compression |
|--------------------------|------------------|-------------------|-------------------|
| 370 LBS Bare Spring      | 8.75"            | 370 LBS           | 371 LBS           |
| 370 LBS with Soft Rubber | 8.75"            | 378 LBS           | 381 LBS           |
| 370 LBS with Hard Rubber | 8.75"            | 420 LBS           | 420 LBS           |

Repeat the testing process on your spring for each of the rubbers in your inventory. Continue the testing process utilizing reasonable spring rates that may end up on your car. While shop testing is time consuming, you will get better results at the track with your investment in shop time. Carry the chart with you to the track to illustrate all the possible combinations.

Installing a rubber in the right front will tighten the car up. Trial and error testing is required but with experience you can use the spring rubber selection to give you another way to find more speed. You can use a spring rubber to increase the corner rate beyond the next manufactured spring. You can see in our example that a soft rubber made an 8-10 lb change where as the hard rubber made a 50 lb change! Chassis gurus often choose to go with the softer spring that is enhanced by a stiff spring rubber, taking the combination beyond the next manufactured rate, thus building in varying rate of adjustability into the car. You can test the effect of different spring rubber rates which will increase your knowledge base. Experience will give you an idea of ride height changes created by the installation or removal of spring rubbers which varies with the rate of the rubber installed.

Pit stop races give you the opportunity to pull a rubber and change spring rate in just seconds. Smart crew chiefs strategically install rubbers so as to create adjustability. Pulling a rubber out of the right rear tends to tighten the car up where as pulling a rubber out of the left rear tends to loosen the car up especially under throttle. Should the car be tight you can pull a rubber out of the right front. Pulling a rubber out of the left front tends to tighten the car. Experience will teach you how much adjustability to build in. Crew chiefs need to decide to go with stiffer rubbers for maximum adjustability on pit stops or soft rubbers which provide a more subtle adjustment.



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You can sometimes use a rubber change in combination with panhard bar adjustments and air pressure adjustments helping to achieve maximum speed. For example, the driver complains about the dreaded push loose condition. To correct the problem your team could drop a pound of air out of the RF and LR which takes bite out of the car and decreases the overall spring rate at the RF and LR. Less air pressure creates a larger contact patch at the RF helping the car to cut and more contact patch at the LR can help to get the car off the turn. Stagger changes need to be considered as well. In addition, you could take a turn out (raise) of the panhard bar to further loosen up the car. These initial changes are sure to free up the car. Now we can pull a rubber out of the RR to which softens the corner creating more exit grip creating a better balance in the set up.

Pulling a rubber out of a given corner changes the ride height a small amount. Removing a rubber from the right rear will lower ride height a small amount adding wedge to the car. You can use these adjustments to your advantage. You can utilize some trial and error testing in your shop to visually see how you can utilize rubbers to achieve a variety of adjustments. Several combinations of adjustments, including wedge changes, are available when using spring rubbers and experienced crew chiefs think out the possibilities at every opportunity.

Remembering that spring rubbers increase spring rates, change ride heights and wedge, provide for pit stop adjustability, and make for quick adjustments will help to increase your corner speed. Understanding your adjustment options will allow you to get the most from your spring rubber inventory. Spending a few minutes in the shop tracking and recording the effects of spring rubbers will give you the information for a great set up throughout the race.

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