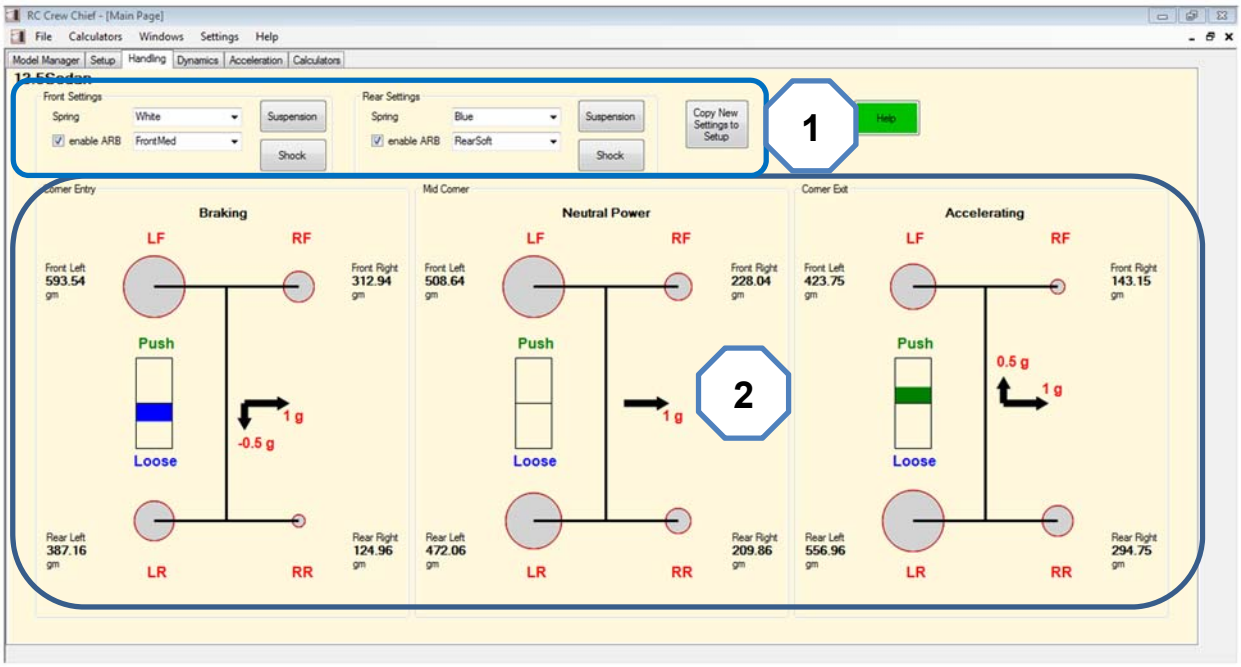
Weight Transfer Tab

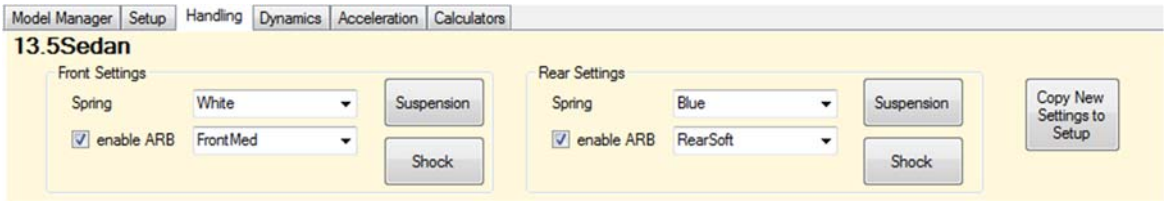
The **Weight Transfer** tab provides three graphics illustrating the loads on each wheel for three corner phases, entry, middle and exit. The magnitude of the load on each wheel under the combined lateral and longitudinal (acceleration/braking) is represented by the size of the lollipop at the end of each axle. The accelerations imposed on the car in each stage are illustrated by the black arrows.



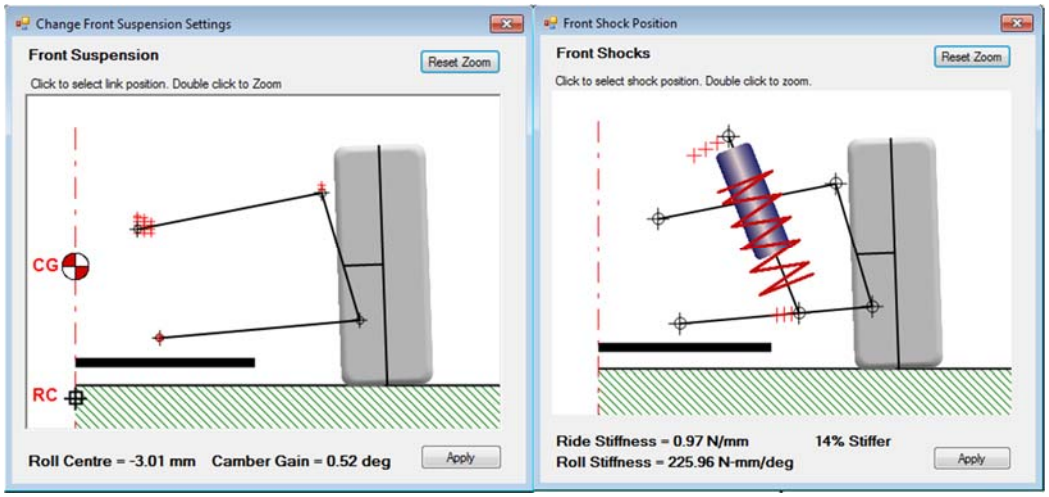
There are two main areas on the **Weight Transfer** Tab to discuss.

Area 1

The front/rear chassis suspension, shock angles, springs and ARB's can all be adjusted. The effect of the change is then graphically displayed in Area 2. When the tab is first entered the selection boxes, suspension links and shock angles are all to the current **"Saved"** setup in the setup tab. If you have made changes in the Setup tab and not saved them before entering the Handling Tab the setup displayed will default back to the saved values.



Clicking on the Suspension or Shock button will pop up a window allowing changes to link positions or shock angles to be made.



Values for Static Roll Centre position and camber gain are provide in the Suspension window. The Shock window provides values for ride and roll stiffness as well as a relative percentage change in stiffness.

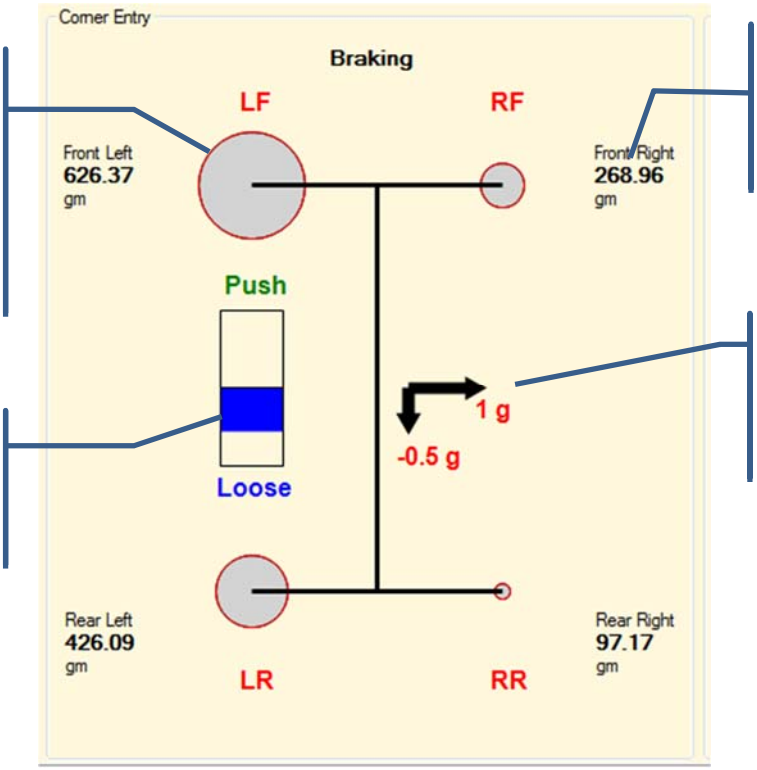
Area 2

The three graphics represent the car negotiating a right hand turn at the following points:

- Corner Entry - Turning and braking
- Mid Corner – Turning Neutral power
- Corner Exit– Turning and accelerating

Let's take a closer look at the **Corner Entry** graphic. This particular graphic is the format you will see upon initial entry into the Handling tab. The values displayed are for the saved setup.

Size of the Lollipop on each wheel represents the magnitude of the wheel load



Calculated wheel load for each wheel.

Bar graph indicates the handling tendency

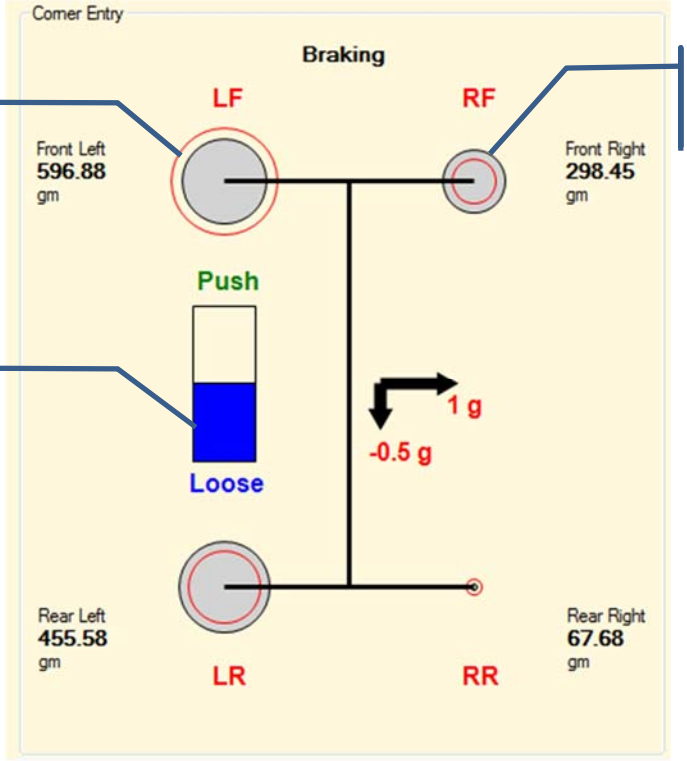
Lateral and Longitudinal acceleration values

When you change one of the Setup values the graphic will update and two circles will be displayed at each wheel. The un-filled red circle represents the original values and the grey filled circle the effect of the new values. If the grey circle is larger than the red circle then the load on that tire has increased.

The wheel loads and bar graph will also update to show the effect of the new setup values.

Red circle is original setup

Handling bar graph updates



Filled grey circle is new setup

Before moving forward to the next section it is important to have a good understanding of lateral weight transfer in a corner. The amount of load that is transferred from the inside to outside wheels during cornering (called Lateral Load Transfer, LLT) is a function of the lateral acceleration, car weight, width of the car and the height of the centre of gravity above the ground. Notice there is no mention of spring, ARB's or roll centres. In short there is nothing you can change with suspension setup that will affect how much load is transferred (well actually there is and we will discuss this in the next section). So you want to reduce the LLT you can reduce the car weight, lower the CG or increase the car width.

So what effect do suspension changes have? Suspension setup affects how the TLLT is proportioned between the front and rear of the car. By moving more weight forward or aft you change the handling characteristics or balance of the car. Watch the graphics as you change the settings and you will see how the weight transfer changes. That's what suspension settings do.

The push/loose graphic uses a term called wedge that is used extensively to predict handling. Wedge is defined as the percentage of the wheel load on the inside tire to the total load on that axle. This calculation is performed for both the front and rear of the car. The end of the car with the lower percentage will tend to

have the least lateral grip. The bar graph uses this relationship to display the predicted handling tendency.

Another point that needs to be discussed, tires. Tires are the most important factor in the handling equation. Without the right tires setup changes are a waste of time. So before you start making setup changes make sure you have the right tires. Talk to other racers in your club and find out what the best tires are and buy them.

So you might ask why tires not modelled in RC Crew Chief. The simple answer is there is no data available on RC tires that would allow this effect to be realistically simulated. The volumes of test data required to create an accurate model to simulate tire performance is staggering. Something that top tier, full scale race teams have access, to but unlikely ever to be available for RC cars. If you would like a better understanding of tire behavior a textbook on tire or race car dynamics would be a good place to start.

When using the handling page keep in mind that there are other factors that affect handling, damping, castor/camber, aerodynamics, steering Ackerman, front/rear toe angles and so on. The simulation provides guidance on what to expect on track. It is not intended to be the only tool in your bag of tricks to achieve the best setup possible.