

Steering Wheel Configuration & Calibration

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[Your steering wheel needs glasses - A note on steering linearity.](#)

Recently there has been a lot of talk about steering linearity on the forums, so I was asked to write up some notes on what it is and why you should care. Every one of our cars has a different limit to how far you can turn its "virtual" wheel. From the meager 336 degrees of the Ford GT to the whopping 970 degrees of the Jetta TDI. At the same time the physical wheel on your desk has its own range of motion. At the very bottom end, some wheels only turn 180 deg. The Microsoft Sidewinder manages 220 deg and the Logitech Momo gets all the way up to 270. Most of the more recent wheels support a full 900 deg of rotation, or more.

As you can see, any wheel but the 900 deg wheels will be unable to turn the cars physical wheel to its lock without some sort of help. To fix this problem we have two separate approaches. At speeds below 30 mph we just change the steering ratio so that your wheel can turn the cars wheels to their full range. This way you can navigate through pit road and turn around on the track after a spin. But at speeds above 30 miles per hour we smoothly switch over to a non linear steering algorithm. This algorithm tries to keep your wheel linear (1:1) with the cars steering wheel through the first 50% of your wheels range. Then as your steering increases we begin to change your steering ratio allowing you to add in more lock while sacrificing some linearity and control over your steering.

Without this non linearity, it would be difficult for you to drive cars like the Jetta and Solstice when using a 270 degree wheel. But not all cars need their full range especially at high speeds. In some cases you may even want to have a linear wheel with less travel instead. So we added in another adjustment, "Limit car's lock to lock range at speed". You can find this setting on the controls tab of the options dialog. This lets you control the tradeoff between linear steering and having more lock to lock range. By default this is set to a minimum of 360 deg or your wheels lock to lock range if it is higher. But you can adjust it up or down in order to get a little more slide catching lock, or a little more sensitivity in your steering as needed.