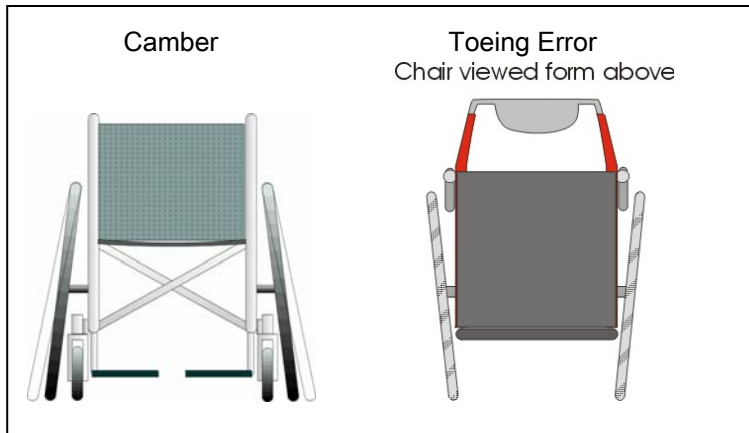


Tracking Adjustment

Wheel camber is the name given to a situation where the wheels viewed from the front are not parallel. Camber has a number of benefits as well as drawbacks. Toeing error is the name given to a situation where the wheels viewed from above are not parallel; toeing error has no benefits, only drawbacks. Toeing error is the same as camber except rotated through 90 degrees.



Benefits of Camber

- Decreased tendency to turn down hill
- Hand protection through doors
- Increased stability turning at speed
- More natural shoulder action

Drawbacks of Camber

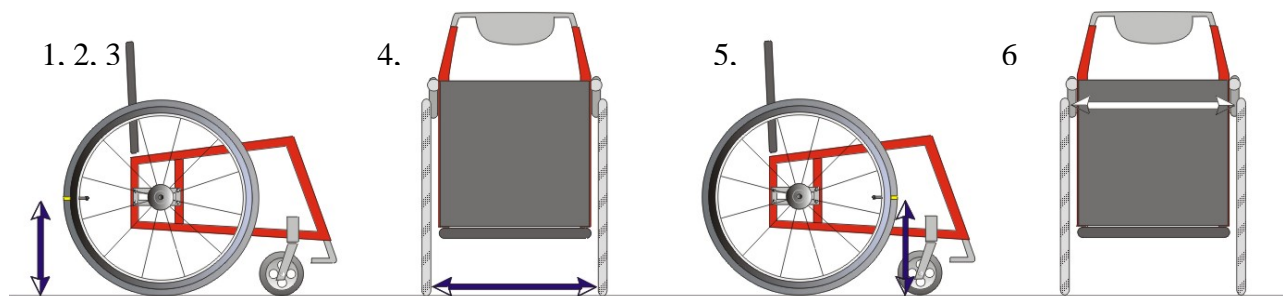
- Chair wider
- Toeing error in wheelie position
- Slight increase in tire and bearing wear

In theory, without camber a wheelchair would never need to be checked for toeing error regardless of the adjustments made. But since we discovered the benefits of camber; pretty well all high-end chairs have a number of different camber settings available. With the availability of camber comes the need to compensate for toeing error that may be induced by a change in wheel height or seat angle. Since there is a mechanism for correcting it, the same mechanism, if left out of adjustment can create it.

One degree of toeing error increases energy expenditure by 50% and 2 degrees = 150%. Toeing error should be checked and minimized on all chairs. Even if you don't get the wrenches out to fix this problem simply alerting the client to it can save him loads of shoulder wear and tear if he takes time to have it fixed.

Measuring

1. Make sure the chair is on a flat smooth surface.
2. Measure the vertical height of the axle from the ground.
3. Draw a mark on the tires at the same height. Or move the wheel until the valve is there.
4. Measure the horizontal distance between the insides of the tires at the height of the mark.
5. Rotate both wheels through 180 degrees so the mark is at the correct height from the ground again.
6. Measure the horizontal distance between the insides of the tires at the height of the mark.
7. Compare your results from step 4 and 6; they should be identical. If not go on to the adjusting section.



Adjusting toeing on a chair with a camber bar.

1. Rotate the wheels so the marks are axle height from the floor at the back.
2. Loosen the bolts holding the camber bar.
3. Rotate the bar until the wheels are parallel. (If the camber bar has a built in spirit level; simply rotate the bar until the bubble is in the middle.)
4. Check the width at the back. E.g. if you measured 24" and 25" for step 4 and step 6 (above) respectively you had a 1" toeing error.
5. The error can be eliminated by rotating the bar until the distance is 24.5"
6. Check to make sure the wheel locks still work.

Adjusting toeing on a chair with a camber plate.

This is way more involved than adjusting a camber bar equipped chair. Allow yourself at least half an hour for the job. You will need two sets of washers adding up to 1/8" thick each. The aforementioned measurements suggest the chair is toed out. You will therefore need to move the camber plate out at the back by placing washers between the spacer and the plate. Work only on one side at a time so you have a reference to help you remember where everything goes.

1. Lay the chair on it's side.
2. Remove the upper wheel.
3. Loosen the two nuts securing the camber plate at the front.
4. Remove the two nuts at the back of the camber plate and pull the bolts out. Take care not to displace any washers already in place.
5. Add the appropriate number of washers between the camber plate and spacer.
6. Reassemble, taking care to snug up all four nuts equally before tightening them.
7. Make sure you have no parts left over; use the untouched side as your reference.
8. Now do the same thing to the other side.
9. Measure the toeing. (If it is still off - go to step 1. and feel free to curse)
10. Adjust the wheel locks.

