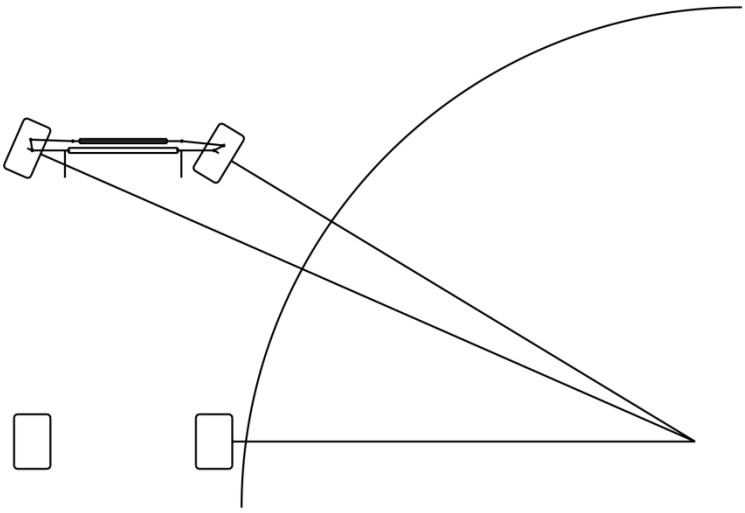
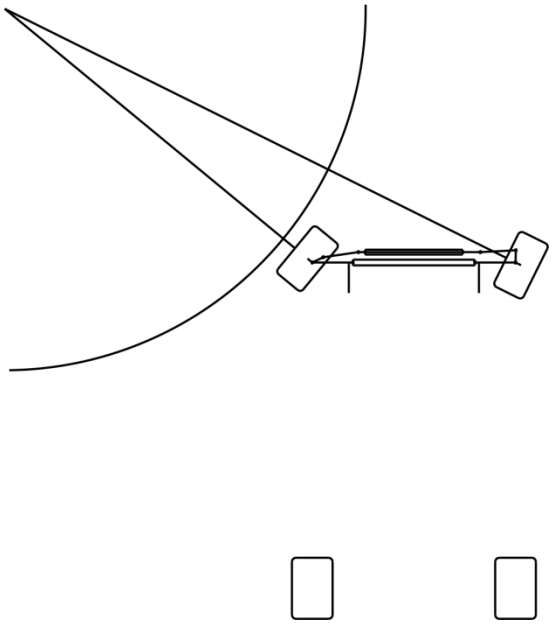
Geometrical side

Ackermann geometry or steering geometry defines inner and outer wheel (leading and trailing in drifting) steering angle difference.

Originally is Ackermann needed to run all the wheels around turn center to reduce scrub. Look the picture below.



In drifting turning the wheels to the same side the instant center is actually on other side of the car, so from geometrical perspective reverse Ackermann is needed.



Practice side

Correct amount of reverse Ackermann in drifting would give minimal scrub and maximum speed, but it makes the car also nerveous and more difficult to drive, especially at high lock.

Parallel steering has the most lock as overcentering would happen at the same time on both wheels and it happens at later than other setups.

Positive Ackermann in drifting makes the car angle corrections more smooth, but generates more scrub from trailing wheel, therefore less speed and maximum lock limitation, because „overcentering“ would happen earlier. In general with positive Ackermann it is easier to drive with some sacrifice to speed and maximum lock.

Most drivers like some amount of Ackermann as the car reacts the way we have use to. Some other drivers, who don't want to sacrifice anything to speed and performance use parallel steering. Reverse Ackermann is used very rarely.

Engineering side

As most of the driftcars are modified production cars, the Ackermann geometry is not linear due to steering rack location. On one car model it could happen, that at 30 degrees of lock it has reverse Ackermann, at 50 degrees parallel steering and at 65 degrees positive Ackermann. On another car model it could change at different rate or be opposite. Sometimes steering rack can be relocated, sometimes not, but there is always packaging issue. Therefore there is no ideal setting even on engineering side, because one driver could use in average 40 degrees of lock, other 55 degrees of lock and the Ackermann is different at those angles.

So finally the „right“ amount of Ackermann depends on car model, driving style and drivers preference. On most of the Wisefab front drift knuckles Ackermann is adjustable to finetune it closer to „right“ amount.

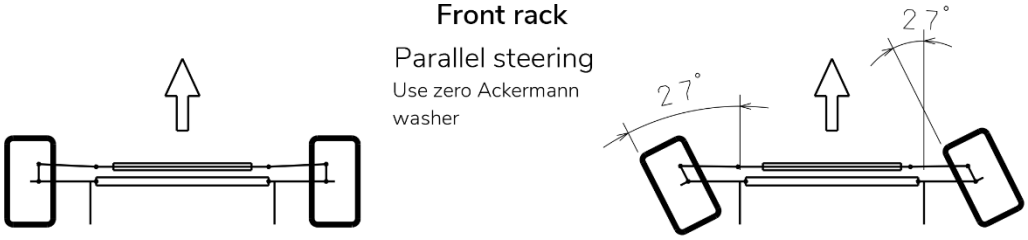
Mechanical side

Below is guide to mechanics about tie rod point adjustment direction and its effect.

Front rack

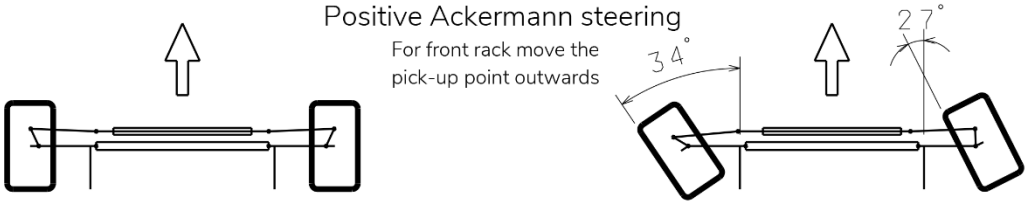
Parallel steering

Use zero Ackermann washer



Positive Ackermann steering

For front rack move the pick-up point outwards



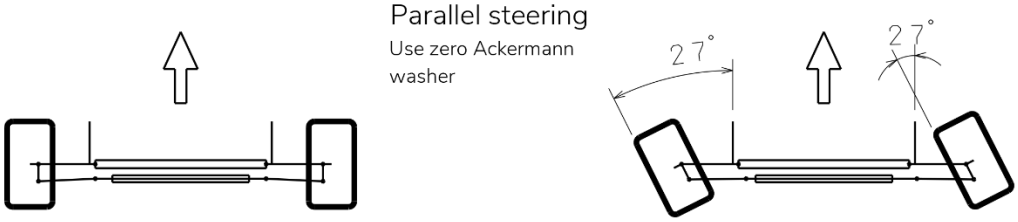
Reverse Ackermann steering

For front rack move the pick-up point inwards

Rear rack

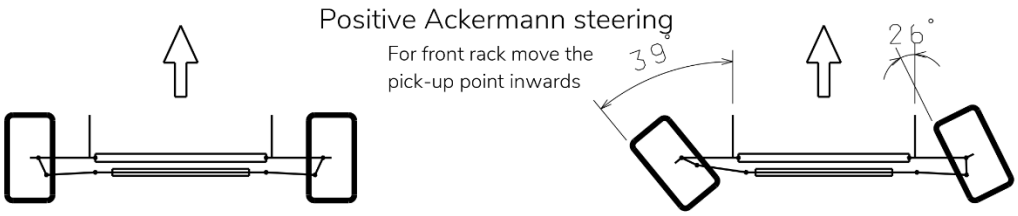
Parallel steering

Use zero Ackermann washer



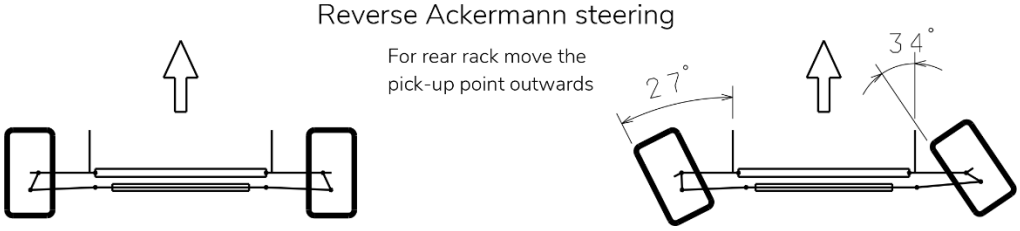
Positive Ackermann steering

For front rack move the pick-up point inwards



Reverse Ackermann steering

For rear rack move the pick-up point outwards



Wisefab has 2 different types of Ackermann washers available. One type for welded knuckles and 2nd type for milled knuckles. Look the picture below.Most of the welded knuckles have 3mm and 6mm offset washers in the kit. Some knuckles that cannot have 6mm offset due to interference problem, have 3mm and 4,5mm washers in the kit.

Each teeth on washer means 1,5mm offset. No teeth, means zero offset and for example 4 tooth means 4 x 1,5 = 6mm offset. This is made for reason that Wisefab tie rod thread pitch is 1,5mm. When changing Ackermann, tie rod length shoud be changed full turns according to number of tooth change to keep the same toe. For example when changing Ackermann washer from 0 to 4 tooth (6mm offset) then toelink need to be adjusted 4 full turns or when changing from 2 tooth to 4 tooth, then 2 turns. Be sure the toelink length is adjusted to correct direction. For a short period of time in 2011 and 2012 Wisefab had Ackermann washers with round cutouts. One cutout was 3mm offset, 2 cutouts 6mm offset. These are not in the picture below.

Currently available Ackermann washers on Wisefab kits