

## BEARINGS AND TYRES

Adding a sidecar to any motorcycle is going to highlight any existing weaknesses in the suspension, steering head bearings, swing arm bushes, etc. Before fitting a sidecar check the motorcycle carefully. Any slight play will cause low speed wobbles and will wear to a dangerous condition very quickly once the additional stress of a sidecar is added.

Tyres do not need to be anything special but ideally they should be flattish on the top to get as much contact area as possible. Ribbed tyres really mess up a heavy fast combo and should never be used, if the front tyre has long lines in the tread going inline with the bike change it before the sidecar is fitted.

Think about the suspension as well. If it is adjustable, adjust it to the hardest settings. If it still feels soft even as a solo bike, consider getting aftermarket springs which are stiffer than the originals. Sometimes the non adjustable front forks can be pre-loaded by adding a spacer above the spring inside the forks.

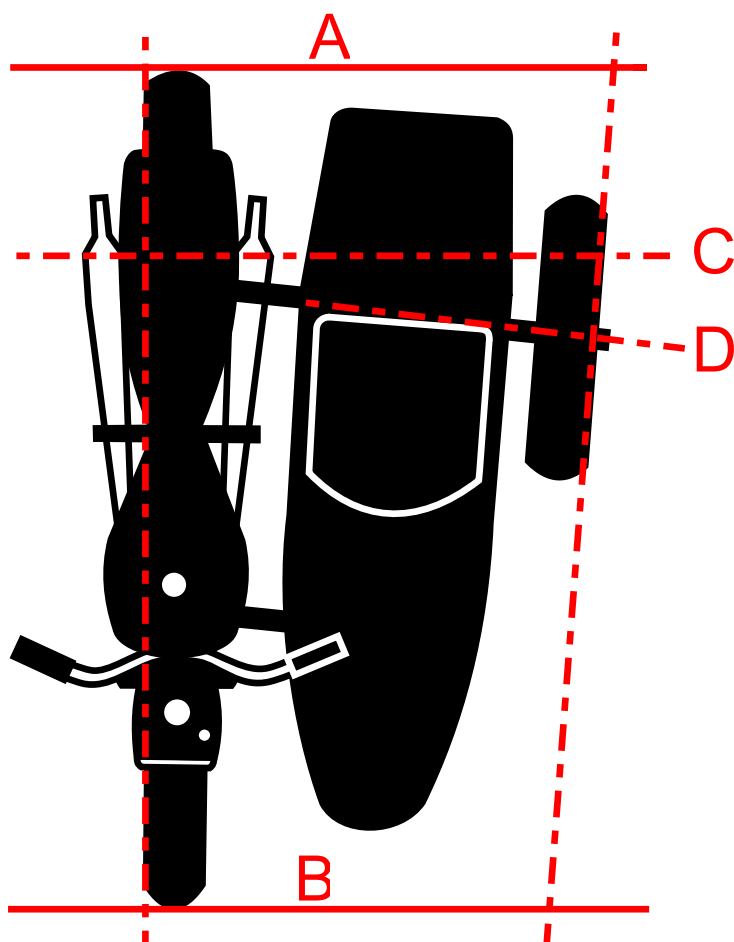
## CLAMP LOCATION

Our frame clamps are designed to fit steel frame tubes. The clamps should be as far apart as possible to spread the load as evenly as possible across the motorcycle frame.

## AXLE LEAD AND TOE IN

Sit on your motorcycle to see how much the suspension drops with your weight. Use ratchet straps to slightly compress the suspension so the motorcycle remains at this level when you get off. Support the motorcycle securely so it is on its wheels and upright.

The first measurement to look at is how much the sidecar axle is in front of the rear wheel axle of the motorcycle as shown at **C** and **D** on this picture. This needs to be between 20 and 30 cm (8" and 12"), less axle lead (i.e. 20 cm) will produce a sidecar outfit which turns quickly but is less stable at speed and will also require slightly more toe in. More axle lead (i.e. 30 mm) will produce a sidecar outfit that is slightly heavier to turn but it will be more stable at speed and it will also require less toe in.



Arrange the sidecar chassis on supports next to the motorcycle so it is level and the axle lead is correct. Loosely attach the two lower mounts. The front lower mount should be as low as possible and as far forward as possible, This can usually be attached to the main horizontal frame tube just before it turns to go up towards the headstock. The rear lower mount should be as far back as possible. This one can sometimes need an additional subframe to take the mounting point as far back on the motorcycle as possible.

Use four bricks and two straight lengths of steel. Place the two straight edges on the bricks either side of the bike and sidecar. On the bike side measure accurately and adjust the straight edge so it is 25 mm (1") away from the wheels rims. You should be able to measure this at four points. Rear of rear wheel, front of rear wheel, rear of front heel and front of front wheel.

Then do the same on the sidecar wheel but as there's one wheel you will have to rely on two measurements. Finally measure the distance at right angles to the bike just behind the rear wheel (marked **A**) and just in front of the front wheel

(marked **B**). This is the amount the vehicle toes in over the whole length. There are no hard and fast rules for this but a good starting point is 16 to 25 mm (5/8" to 1"). So the distance between your two straight edges should be 15 to 25 mm greater at the back than it is at the front. (This assumes the wheel rim is the same width front and back even if the tyres are not the same size). If you had near 30 cm (12") axle lead set the toe in close to 16mm (5/8") and if you had near 20 cm (8") axle lead set the toe in close to 25 mm (1").

## LEAN OUT

Once the toe in is set and the lower mounts reasonably tight the lean out can be set. Loosely attach the two upper mounts. The front upper mount should be as high as possible. This is usually clamped round the frame near the head stock. The rear upper mount should be high up and as far back as possible. It is usually possible to clamp very close to the rear shock absorber top mount.

The motorcycle must lean very slightly away from the sidecar. This must be measured with the steering straight ahead but the measurements are usually carried out on the rear wheel. Tie a washer to some cotton and hold the free end of the cotton near the top of the wheel so the weighted end hangs down on the outside of the wheel. Note where the cotton touches at the top and measure the gap between the cotton and the similar spot at the bottom of the wheel. Over the height of the wheel the lean out should be 4 to 8 mm (5.32" to 5/16"). If the sidecar will be used most of the time with a heavy load this lean out should be increased to 8 to 11 mm 5/16" to 7/16") (**E**).

Once the toe in and lean out are set tighten everything and remove the supports from the motorcycle and release the ratchet straps used to compress the suspension.

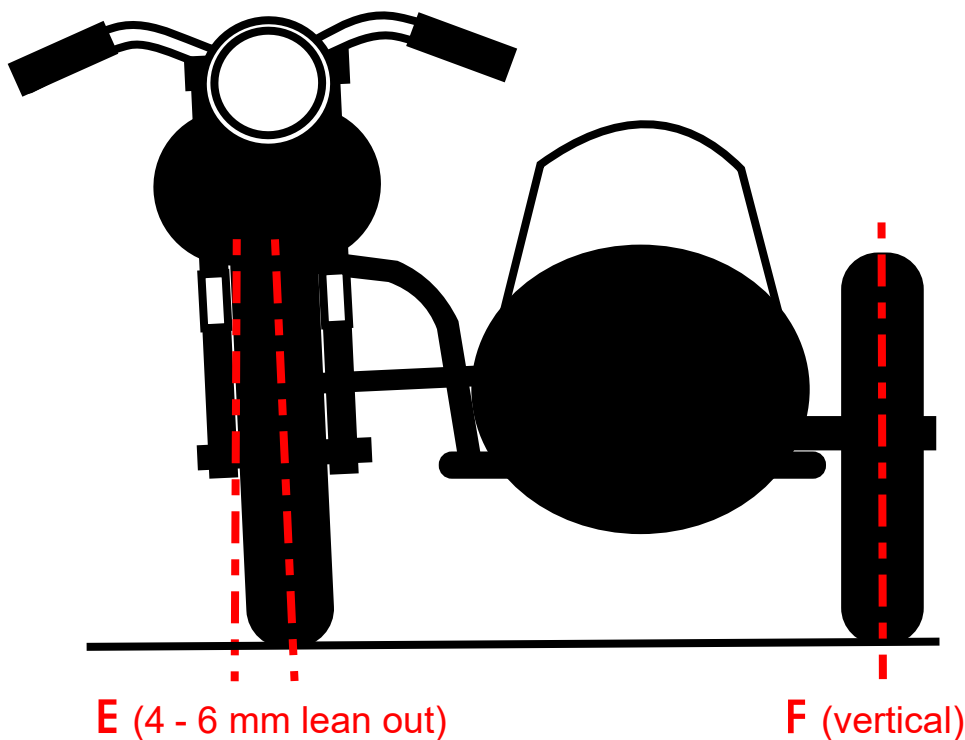
## CAMBER

This is less important than axle lead, toe in or lean out but still worth considering.

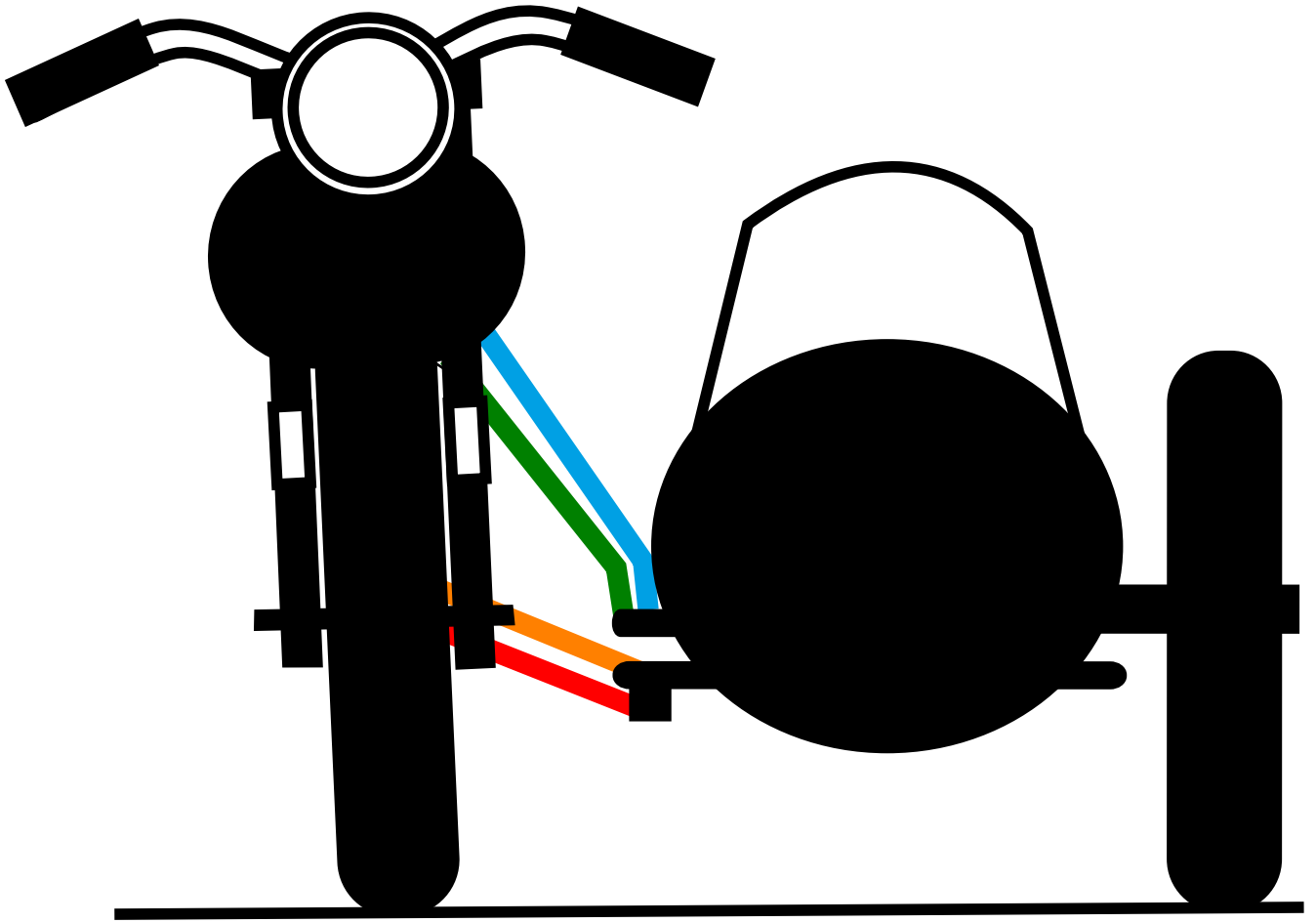
As the bike turns right the suspension on the sidecar will compress and the suspension on the bike will lengthen causing some body roll. This will mean in hard right turns the top of the sidecar wheel will move away from the sidecar as the suspension compresses.

At rest the sidecar wheel should be set to either upright or slightly leaning in towards the sidecar (**F**). It should not be set leaning away at the top as this will increase when cornering right.

When set slightly leaning in at the top, the outfit will be more stable in corners and the forces will go through the wheel and bearings in a straighter line putting less stress on the spokes and bearings.





# 474 GHY & GP Manx



 Front bottom

 Rear bottom

 Front top with SV53

 Rear top with SV53

Axle lead: 9 1/8" (232 mm)

Toe in: 3/4" (19 mm)

Lean out: 1/4" (6 mm), with rider 1/2" (12.5 mm)

Track: 42 1/2" (1130 mm)