

Ackerman Steering Geometry and Ackerman Steering Angle

For the assignment you need to find the ackerman steering angle. If the road wheel steering angle is greater than this then you have understeer and if it is less you have oversteer.

The ackerman steering geometry is designed so that both inner and outer steered wheels have the correct steered angle so that they both driving round the same turn centre. In line with the rear axle.

The SAE defines ackerman steering as the angle of the steering wheel that is required with zero front and rear slip angles where both front and rear wheels track around the same centre.

Although the SAE definition of under , neutral and over steer talks in terms of steering wheel angle compared with ackerman steering angle I have simplified it by using the measured outer road wheel angle - the conversion to steering wheel angle is just the steering ratio of steering wheel to road wheel angle.

Both inner and outer wheels will have an influence on the steering wheel angle that is finally produced. We assume that the outer wheel is the most influential in cornering as it is the most heavily laden.

The ackerman steering angle is most easily found by driving round a corner at very low speed when no slip angles will be produced. You have plotted the graph for the conversion from steering wheel sensor volts to road wheel angle and so the road wheel angle for ackerman steering can be found. .

You can also calculate the ackerman steering angle (in radians) of the outer front wheel by dividing the wheel base by the radius of turn (which was 21.5 m in the case of the Pembrey test)

You should compare the road wheel angle found by calculation with the road wheel angle measured during a low speed turn.