

## SUSPENSION SUPPORT

### Aims

- ⇒ Guarantee the contact between the tires and the road permanently.
- ⇒ Tune the car's handling

### Conception steps

#### Step 1: Wheel rate calculation

Ride frequency chosen and the wheel rate based on it:

	Front	Rear
Ride frequency (Hz)	1.78	1.67
Wheel rate (N/mm)	36.4	32.2

#### Step 2: Determination of the geometry

Reminder: The motion ratio is defined as:

$$MR = \frac{\text{Wheel travel}}{\text{Spring travel}}$$

Hence, we have:

$$MR^2 = \frac{\text{Spring rate}}{\text{Wheel rate}}$$

The goal of the geometry was to aim **a linear descending motion ratio** with a value of **1.1 in static**. To reach this value, 2D model were used thanks to Geogebra.

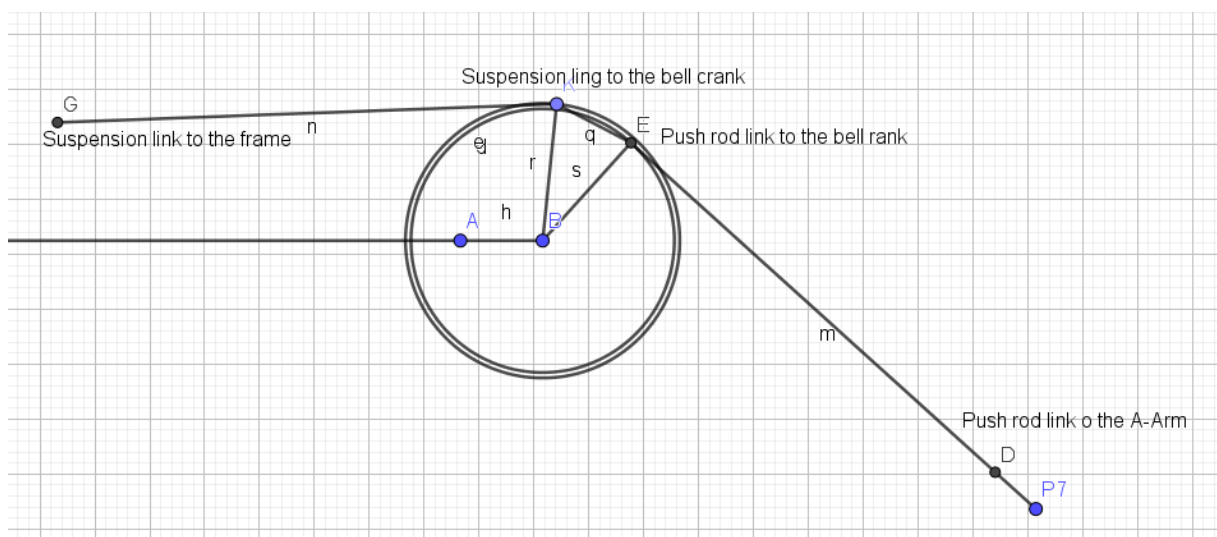


Figure 1: 2D model to determine rear suspension geometry

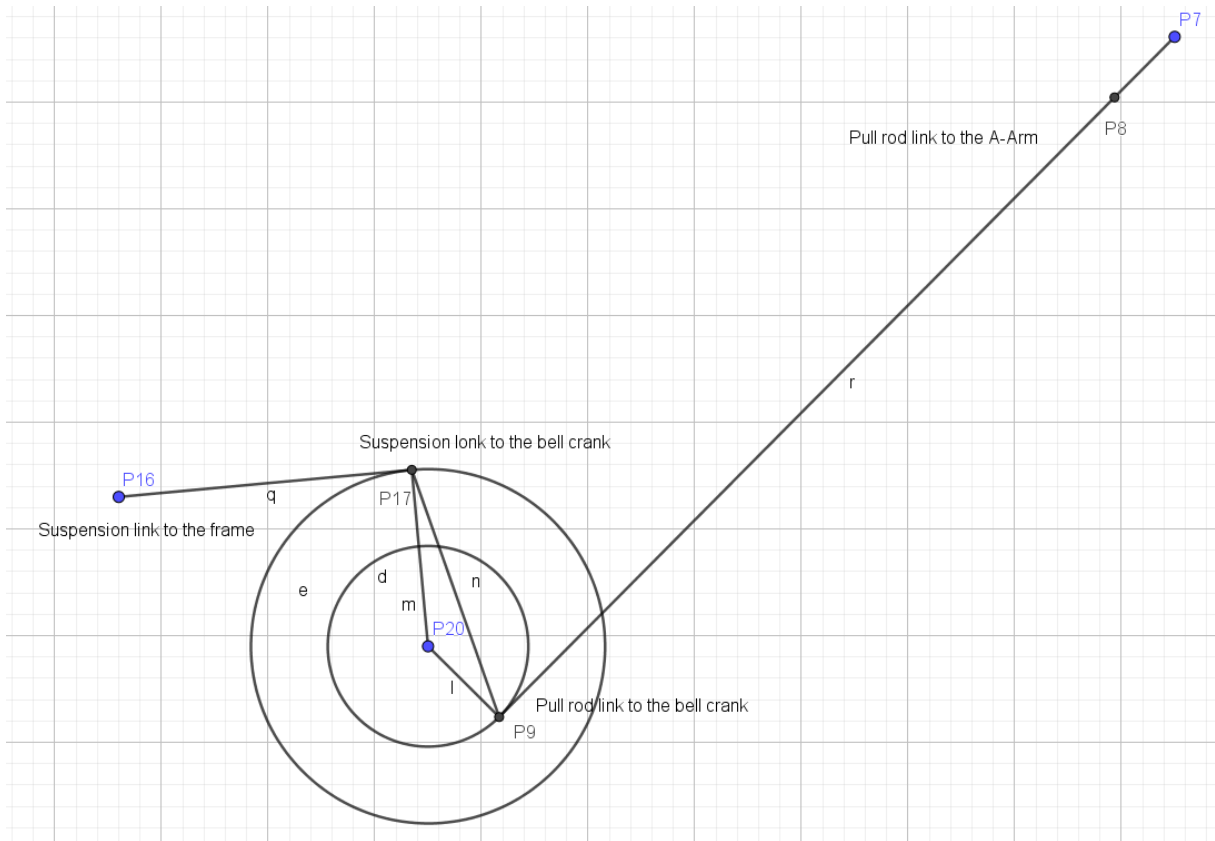


Figure 2: 2D model to determine front suspension geometry

This lead to the following Motion Ratio curves:

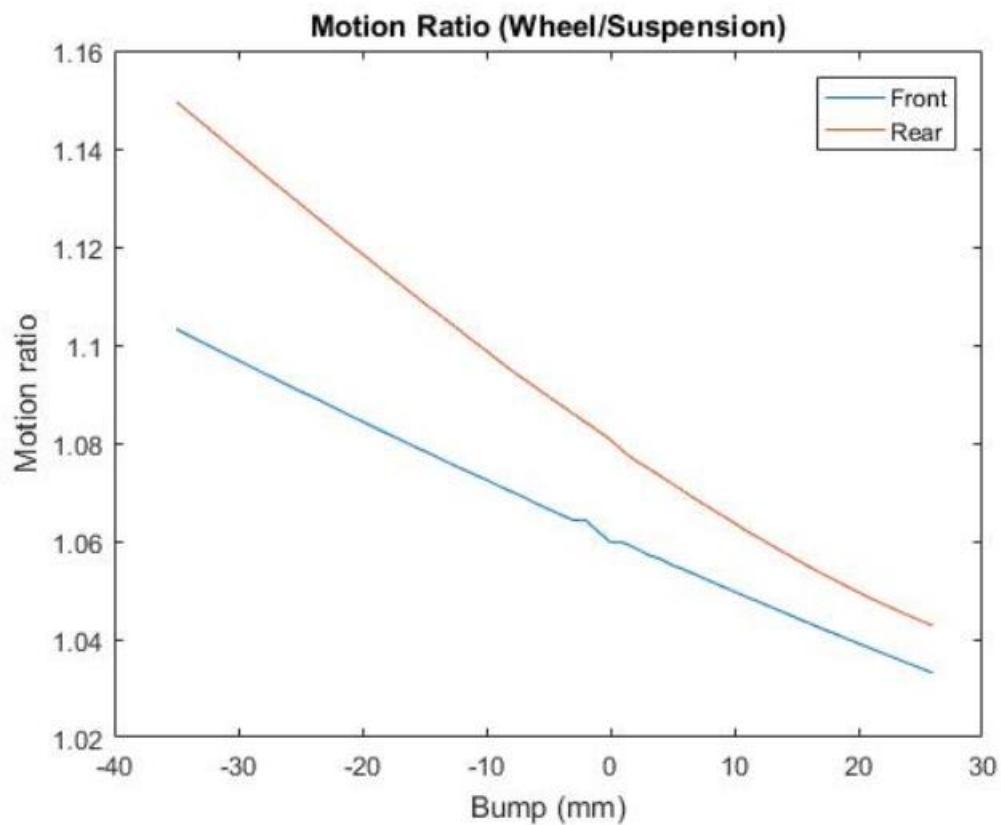


Figure 3: Motion ratios of the car

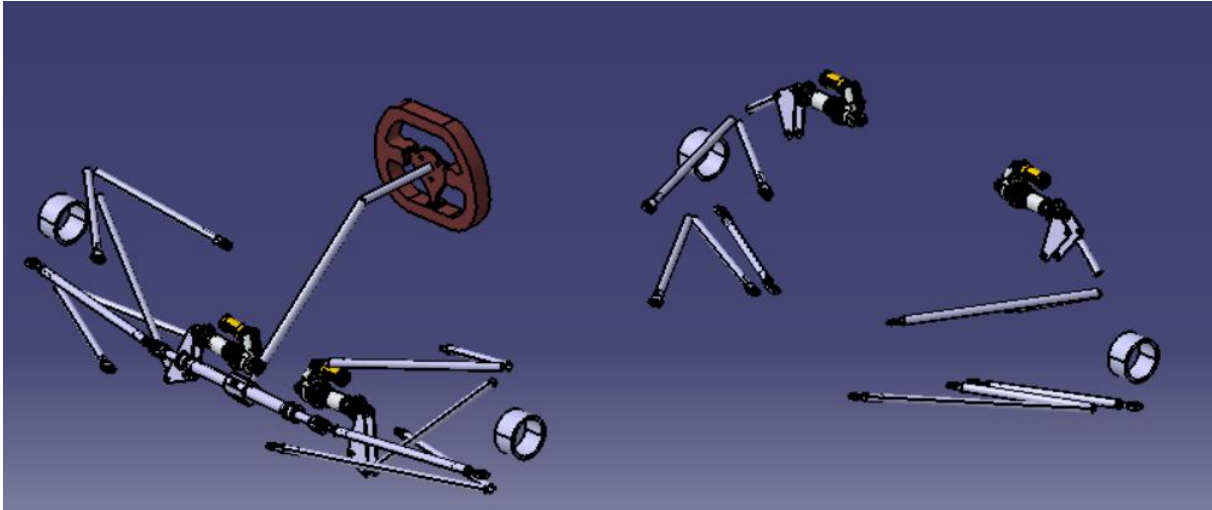


Figure 4: 3D model used to confirm the motion ratio curves