*Required Calculations & Justifications*

1. Rack & Pinion (immediate) torque calculation.

2. Research justifying usage of Gears or Pulley.

3. Distance from Motor-Steering\_shaft, gear/pulley justification.

4. Required (immediate) torque factor calculation with selected BLDC motor

4.1 *Motor-Steering\_shaft, gear/pulley pitch calculation*.

4.2 *Gear/pulley ratio calculation.*

5. Motor-Steering\_shaft, placement justification.

6. BLDC motor Mounting\_bracket (arrangement & location) justification.

6.1 *BLDC motor Mounting\_bracket Model design + CAD + FEA.*

7. Research for gear/pulley belt material.

8. *Requirement* (YES/NO) → *Selection* → *Usage* of tensioner justification.

9. Research justifying selection of gear/pulley belt material.  
  
***IF using gear/pulley THEN***  
10. Gear/pulley type justification.

10.1 ***IF pulley THEN*** *Find Pulley & pulley “groove” dimension justification.*

10.2 ***IF gear THEN*** *Find gear teeth “space\_width” dimension justification.*

Highlights:

*Torque factor*: A multiple of the Rack & Pinion (immediate) torque (1.0) after finding the operational torque of the selected BLDC motor.

*Motor-Steering\_shaft, placement*: Placement, or location of the Motor-Steering\_shaft coupling in the car. Simply, as in **where to**couple the motor\_gear and the steering\_shaft gear.

*Gear/pulley type*: ***IF using gear*** then what type of gear (i.e. spur, helical, bevel) arrangement to use. ***IF using pulley*** then specify the type of pulley, **if needed.**

Note:

Justification can be a quantitative and/or qualitative calculation + analysis.