Vibration measures of Electronic Power Assisted Steering System

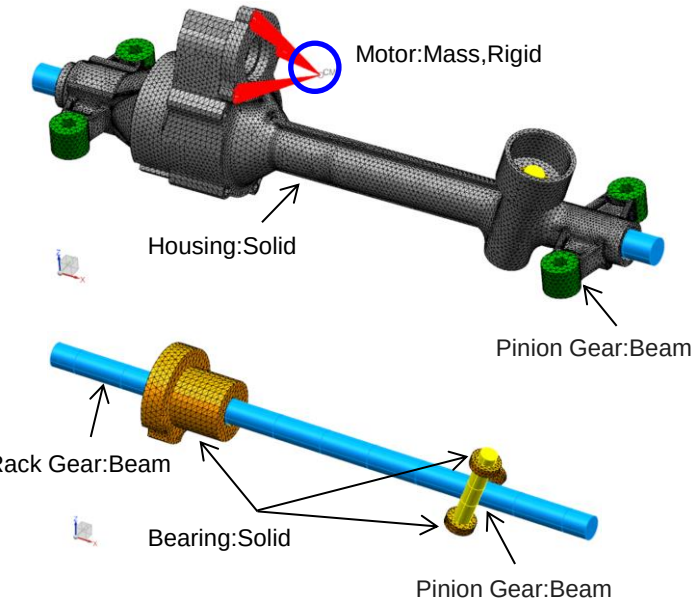
- Overview -

Implement vibration countermeasures for electric power steering (EPS) to mitigate the noise issue caused by electrification. Control multiple resonance frequencies of the housing, addressing vehicle sensitivity at 300 Hz and 600 Hz, by utilizing Non-parametric Shape Optimization. Strength and weight reduction are also taken into account by performing static analysis.

*Non-parametric Shape Optimization:Determines the shape by adjusting the nodes of the FEM model

- Non-parametric Shape Optimization -

● Analysis Model



Inside model

● Requirements

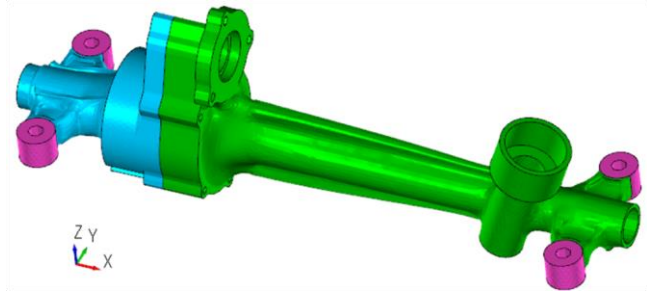
Total Mass Minimization

Natural Frequency : 4modes

Static Analysis : 3Cases
Max principal stress: 120MPa less than

Shape Restriction

● Result Model



Total Mass: 7% down
Natural Frequency : Clear
Max principal stress : Clear

It automatically generate a shape that fulfills multiple requirements while achieving weight reduction.
The result can be used as a reference for design.