Equations:

N = Diametral Pitch \* Diameter

Gear Ratio =

Variables:

(Number of Stage 1 Planet Teeth = diametral pitch \* stage 1 planet diameter)

(Number of Stage 2 Planet Teeth = diametral pitch \* stage 2 planet diameter)

(Number of Stage 1 Sun Teeth = diametral pitch \* stage 1 sun diameter)

(Number of Stage 2 Ring Teeth = diametral pitch \* stage 2 ring diameter)

(Diametral Pitch)

(Stage 1 planet diameter)

(Stage 2 planet diameter)

(Stage 1 sun diameter)

(Stage 2 ring diameter)

(planetary gear extrusion diameter)

(sun gear extrusion diameter)

(bearing diameter)

(desired gear ratio)

Constraints:

Radius Sun Gear + Radius Stage 1 Planet Gear + Radius Stage 2 Planet Gear <= Ring Gear <= Bearing ID

Diameter of Stage 1 Sun Gear Extrusion < Diameter Stage 1 Sun Gear

Gear Ratio =

Gear Ratio +/- 4%

Optimization Statement:

Minimize:

Subject to:

Where:

