080502_berechnung_vortestat

newline
J_{2}({d%omega_{2}} over {dt})=J_{1red}({d%omega_{1}^{'}} over {dt})
newline newline
Bestimmnung %omega_{2max}:
newline
v=95km/h=26,39m/s
newline
d_{Kettenrad}=2r_{Kettenrad}=2000mm~es folgt~r_{kettenrad}=1m
newline
v=%omega*r~~%omega_{2max}={26,39m/s} over {1m} = 26,39`1/s
newline newline Bestimmung von T_{R} newline

T_{R}=J_{2}%omega_{2max} over {t_{R}}=15000kgm² {26,39 1/s} over {3,9s}= 15000kgm² 6,766`1/s²= 101496Nm
newline newline Bestimmung von %omega_{10} newline

i_{Getriebe}= {%omega_{1}} over {%omega'_{1}}~~es folgt~i_{Getriebe}* %omega'_{1}= %omega_{1}
newline
aus ~{1} over {2}* J_{1}*i²%omega'_{1}²= {1} over {2}* J_{1red}*%omega_{1}² ~~~folgt~ J_{1red}=4J_{1}
newline
mit J_{2}%omega_{2max} over {t_{R}}=-J_{1red}{%DELTA%omega'_{1}} over {t_{R}}
newline

{J_{2}} over {-4J_{1}}* %omega_{2max}= {15000 kgm²} over {-4*8000kgm²} *26,39 1/s = %DELTA%omega'_{1} = -12,37 1/s
newline
%omega'_{10}= %omega_{2max}-%DELTA%omega'_{1}=38,76 1/s

newline
%omega_{10}= i_{Getriebe}* %omega'_{10}=77,52 1/s

newline newline Bestimmung von d_{w} newline

d_{w}=nroot{3}{{16*S* T_{R}} over {%pi* %tau_{T}}}

newline
d_{w}=nroot{3}{{16*13*101496kgm²/s²} over {%pi* 260000000N/m²}}= 0,296m
newline wähle ~~ d_{w}=300mm gemaess DIN 748
newline
newline
Bestimmgung von S_{E}
newline
Es gilt:
newline

$$aus \quad \frac{1}{2} * J_1 * i^2 \omega'^2_1 = \frac{1}{2} * J_{1red} * \omega_1^2 \qquad folgt \quad J_{1red} = 4J_1$$

$$mit \; J_2 \frac{\omega_{2max}}{t_R} = -J_{1red} \frac{\Delta\omega'_1}{t_R}$$