


Testa model S


$P = 581 \text{ kW}$


drivaxel  $\sim 600$

$M = 1\,223\,000 \text{ Nmm}$

konstant?


  $I_p = \frac{\pi D^4}{32}$   $W_v = \frac{\pi D^3}{16}$

  $I_p = \frac{\pi}{32} (D^4 - d^4)$   $W_v = \frac{\pi}{16D} (D^4 - d^4)$

  $t \ll D$   
 $I_p = 2\pi \left(\frac{D}{2}\right)^3 \cdot t$   $W_v = 2\pi \left(\frac{D}{2}\right)^2 \cdot t$


$\tau_v$ : vridspänning  $\left[\frac{\text{N}}{\text{mm}^2}\right]$   $\longleftrightarrow$  jämför  $\longleftrightarrow$  skjuvspänning  $\tau$

$M_v$ : vridmoment  $[\text{Nmm}]$   $\longleftrightarrow$   $M_b$

$W_v$ : vridmotstånd  $[\text{mm}^3]$   $\longleftrightarrow$   $W_b = \frac{\pi D^3}{32}$  

$\tau_v = \frac{M_v}{W_v} \Rightarrow W_v = \frac{M_v}{\tau_v}$

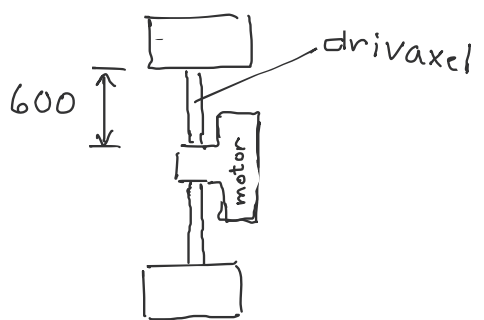
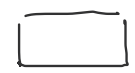
$\frac{\pi D^3}{16} = \frac{M_v}{\tau_v}$

$W_v = \frac{\pi D^3}{16}$  

$D = \sqrt[3]{\frac{6M_v}{\pi \tau_v}}$

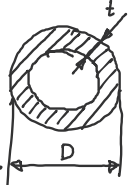
$\tau_v = 0,6 \sigma_s = 150$   
 $\sigma = 250$

$D = \sqrt[3]{\frac{6 \cdot 1\,223\,000}{\pi \cdot 150}} \approx \underline{\underline{25 \text{ mm}}}$



Uppg.  $D, \varphi, b = ?$

	$\sigma_s$	185	275	355	460	690
1	t					
	D					
	$\varphi$					
2	b					
	D					
	$\varphi$					
	b					



förvridning

även  $t = 3, 4, 5, 6, 7, 8$   
 kalkylblad finns

$\varphi = \frac{M_v \cdot L}{G \cdot I_p} = \frac{1\,223\,000 \cdot 600}{80\,769 \cdot 38\,349} \approx \underline{\underline{0,2369 \text{ radianer}}}$

$I_p = \frac{\pi D^4}{32} = \frac{\pi 25^4}{32} \approx 38\,349$

$= 0,2369 \cdot \frac{180}{\pi}$

$\approx \underline{\underline{13,57^\circ}}$

$G$ : skjuvmodul

$G \approx \frac{E}{2,6}$  stål

$\approx \frac{210\,000}{2,6}$

$\approx 80\,769$



[radianer]

$b = \frac{\varphi}{2\pi} \cdot \text{Omkrets}$

$= \frac{\varphi \cdot \pi r}{2\pi} = \frac{\varphi r}{2} = \frac{0,2369 \cdot 25}{2}$

$\approx \underline{\underline{2,96 \text{ mm}}}$