21 = 1HP , $n_g = 3250$

CK = 15
Dişli

Fe = 70
mil

$Z_{em} = Z_1 = 15$ } $Z_1 = 11$
$l_2 = l_1$
$m = ?$

[1]

CK 15

$\sigma_{em} = \frac{0.5 \times 464}{1.25} \times \frac{1 \times 1}{1.4} = 232.57\ N/m^2 \Rightarrow \sigma_{em} = \frac{0.5 \times \sigma_K}{S} \cdot \frac{K_y \cdot K_o}{K_c}$

$P_{em} = 0.3 \times H_B = 0.3 \times 1460 = 511\ N/mm^2$

* Diş Kökü mukavemetine göre modeli :-

$m = \sqrt[3]{\frac{2.5 \cdot m_{d1}}{z_1 \cdot \psi_m \cdot F \cdot \sigma_{em}} \cdot K_f} \Rightarrow m_d = 9550 \times \frac{P_{motor}}{n_g} \Rightarrow 9550 \times \frac{15}{3250} = 44.07\ Nm$
$44.07\ Nmm$

$m = \sqrt[3]{\frac{2 \times 1.35 \times 44.07}{11 \times 20 \times 1.3 \times 232.57}} \times 2.50 = 0.74$

* Diş Yüzey Ezilmesine göre modül :-

$m = \sqrt[3]{\frac{2 \times 5 \times m_{d1} \times E \times \frac{i+1}{i}}{z_1^2 \times \psi_m \times E \times P_{em}^2}}$

$= \sqrt[3]{\frac{2 \times 1.25 \times 44.07 \times 2.1 \times 10^5 \times \frac{4+1}{4}}{(11)^2 \times 20 \times 1.3 \times 511^2}} = 1.52$

$m = 0.74$
$m = 1.52$ $\Rightarrow$ 0.75 Seçilen standart modül.

* Eğilme Göre Diş Dibi Kontrolü :-

$F_G = 2 \times 5 \times \frac{m_{d1}}{del} \rightarrow m \times z_1 \Rightarrow 0.75 \times 11$

$F_G = 2 \times 1.25 \times \frac{44.07}{0.75 \times 11} = 1335.43\ N$ *

$\sigma_{max} = K_f \times \frac{F_G}{(m \times E \times b)} \leq$ Emniyet

b = Diş Genişliği $= \psi_m \cdot m = 20 \times 0.75 = 15\ mm$

$\sigma_{max} = 2.5 \times \frac{1335}{0.75 \times 1.3 \times 15} \leq 232.57\ N/m^2$

$228.205 \leq 232.57\ N/m^2$

Emniyetli

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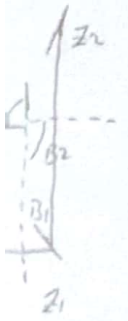
Eğ Ezilmesi Kontrolü :-

$\sigma = K_m \times K_\alpha \times K_\varepsilon \sqrt{\frac{F_C \times i+1}{b \times d_{w1}}} \leq P_{em}$ (21)

$= 1.763 \times 0.877 \sqrt{\frac{1875 \times \frac{4+1}{4}}{15 \times 0.75 \times 11}}$ ($d_{w1} = m \times Z_1$) $= P_{max} = 1532.98\ N/m^2 \not\leq 511\ N/m^2$

Emniyetdegil

Dişliçi	Z_2 Dişli
$= 0.75$	$m = 0.75$
$= 11$	$Z_2 = 55$
$= m \times Z_1 = 8.25\ mm$	$d_{t2} = m \times Z_2 = 41.25\ mm$
$= 8.25\ mm$	$d_{o2} = 41.25\ mm$



$\alpha = \beta_1 + \beta_2$

$\alpha = 90$

$\tan\beta_1 = \frac{d_{t1}}{d_{t2}} = \frac{Z_1}{Z_2} = \frac{11}{55} = 5$

$\beta_1 = \tan^{-1}\left(\frac{11}{55}\right) = 11.30$

$\beta_2 = 90 - 12 = 78°$

$R_{a1} = \frac{d_{t1}}{2 \times \sin\beta_1} = \frac{8.25}{2 \times \sin(12)} = 19.84$

$R_{a2} = \frac{d_{t2}}{2 \sin\beta_2} = \frac{41.25}{2 \times \sin(78)} = 21.08$

$d_{om1} = 8.25 \times 11 = 90.75\ mm$

$d_{b1} = 11 \times 0.75 = 8.25\ mm$

$F_{t1} = \frac{2 \times m d_1}{d_{om1}} = \frac{2 \times 1407}{90.75} = 97.12\ N$

$f_{t1} = f_{t2} = 97.12\ N$

$f_{r1} = f_t \cdot \tan\alpha \cdot \cos\beta_1$

$= 97.12 \times \tan 20 \times \cos 12 = 8277.87\ N$

$f_{r2} = f_{t2} \times \tan\alpha \times \cos\beta_2$

$f_{r2} = 97.12 \times \tan 20 \times \cos 78 = 1759.51\ N$

$f_{n1} = \sqrt{F_{r1}^2 + F_{t1}^2} = \sqrt{8277.87^2 + 75^2} = 8311.77\ N$

$f_{n1} = \sqrt{f_{r2}^2 + f_{t2}^2} = \sqrt{1759.51^2 + 75^2} = 1912.68\ N$

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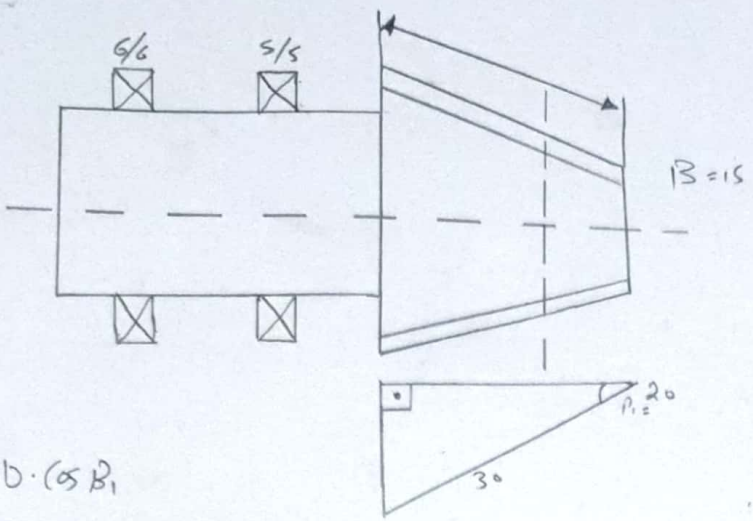
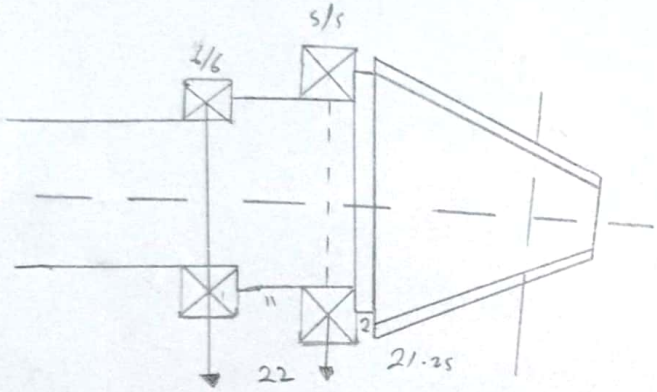
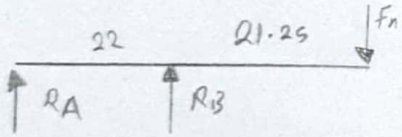


$B_0 = D \cdot \cos B_1$

$B_0 = 15 \cdot \cos 12 = 14.67$ mm





$f_{a1} = f_{t1} \cdot \tan\alpha \cdot \sin B_1$

$f_{a1} = 97.12 \times \tan 20 \times \sin 12 = 7.34$ N

$M = F \cdot L$

$M_b = f_{a1} \cdot \frac{d_{um}}{2} = \frac{7.34 \times 90.75}{2} = 333,05$ N mm

$\sum m_0 = 0$

$\sum m_0 = RB \cdot 22 - f_n \cdot 43 + 333,05 = 0$

$\Rightarrow RB = 398.05$

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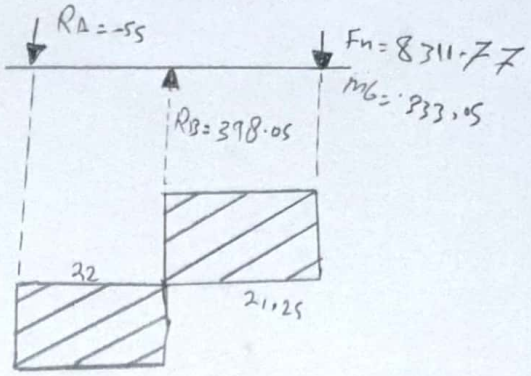
$\Sigma F_y = 0$

$R_A + R_B - F_n = 0$

$R_A = F_n - R_B$

$R_A = -55\,N$



mil Gal = -

$$d = \sqrt[3]{\frac{32 \cdot mes}{\pi \cdot Can}}$$

$$mesA = \sqrt{metotal^2 + MG^2}$$

$mesA = RA \cdot 6 = 55 \times 6 = 330$

$$= \sqrt{330 + 0.75 \times 4407^2} = 3816.61$$

$$meiB = \sqrt{5981 + 0.75 \times 4407^2} = 3817.35$$

$$dA = \sqrt[3]{\frac{32 \cdot 3817.35}{\pi \cdot 22.76}} = 11.95$$

$$dB = \sqrt[3]{\frac{32 \cdot 3816.61}{\pi \cdot 22.76}} = 12$$

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