Let us first find the angular acceleration. Two equations for angular displacement and angular velocity are:

$$\phi = \nu_0 t + \epsilon t^2/2$$

$$\nu_f = \nu_0 + \epsilon t$$

where ν_0 is initial angular speed and ϵ is angular acceleration From where we can find that

$$\phi = \nu_0 t + (\nu_f - \nu_0)t/2 = t/2(\nu_0 + \nu_f)$$

And we can find time of acceleration

$$t = \frac{\phi}{1/2(\nu_0 + \nu_f)}$$

then we can find acceleration:

$$\epsilon = \frac{\nu_f - \nu_0}{t} = \frac{\nu_f - \nu_0}{\frac{\phi}{1/2(\nu_0+\nu_f)}}$$

And, finally, the time, needed to reach $\nu_2 = 7.28 \cdot 10^4$ rad/s speed from rest

$$t = \frac{\nu_2}{\epsilon} = \frac{\nu_2 \phi}{(\nu_f - \nu_0)(1/2(\nu_0 + \nu_f))} =$$

$$= \frac{7.28 \cdot 10^4 \cdot 1.53 \cdot 10^4}{(5.05 \cdot 10^4 - 1.38 \cdot 10^4)(1/2 \cdot 1.38 \cdot 10^4 + 1/2 \cdot 5.05 \cdot 10^4)} \approx 0.944\, s$$