

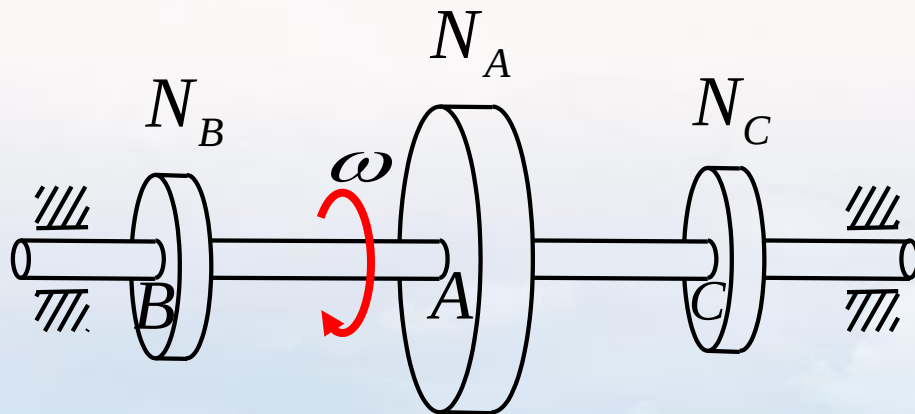
例题一



外力偶矩和扭矩

扭矩和扭矩图

如图所示，在转速 $n=300\text{r/min}$ 的传动轴上共有三个轮子，A为主动轮，输入功率 $N_A=50\text{kW}$ ，B、C为从动轮，输出功率分别为 $N_B=30\text{kW}$ ， $N_C=20\text{kW}$ 。试求轴上各截面扭矩。



$$m = 9549 \frac{N_k}{n}$$

m : 外力偶矩, $\text{N} \cdot \text{m}$

n : 转速, $\text{r} / \text{min}(\text{rpm})$

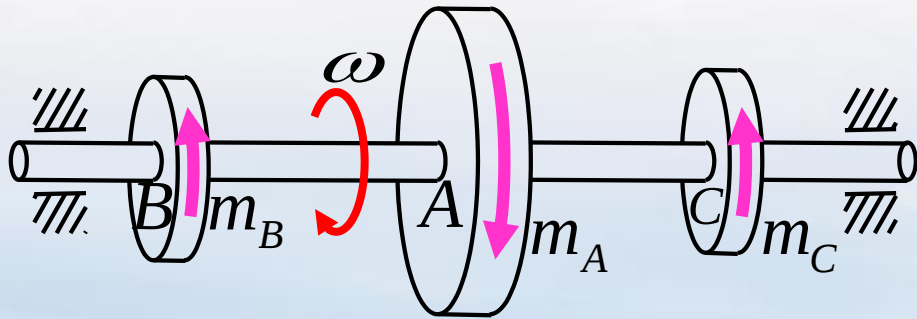
N_k : 功率, kW



外力偶矩和扭矩

解：首先计算各轮子的外力偶矩。

$$\begin{aligned}m_A &= 9549 \frac{50}{300} N \cdot m \\ &= 1591.5 N \cdot m\end{aligned}$$

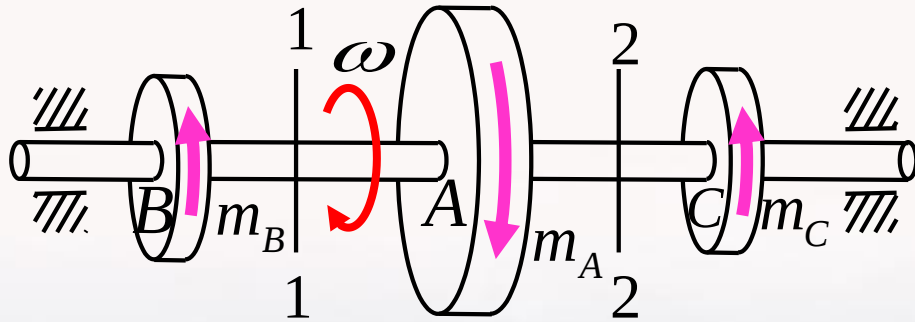


$$\begin{aligned}m_B &= 9549 \frac{30}{300} N \cdot m \\ &= 954.9 N \cdot m\end{aligned}$$

$$\begin{aligned}m_C &= 9549 \frac{20}{300} N \cdot m \\ &= 636.6 N \cdot m\end{aligned}$$

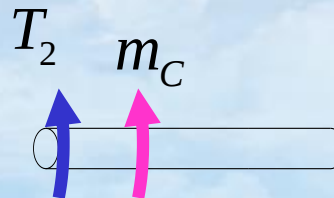
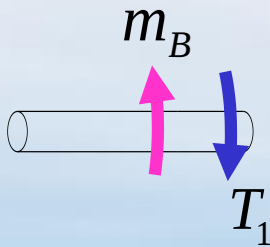


外力偶矩和扭矩

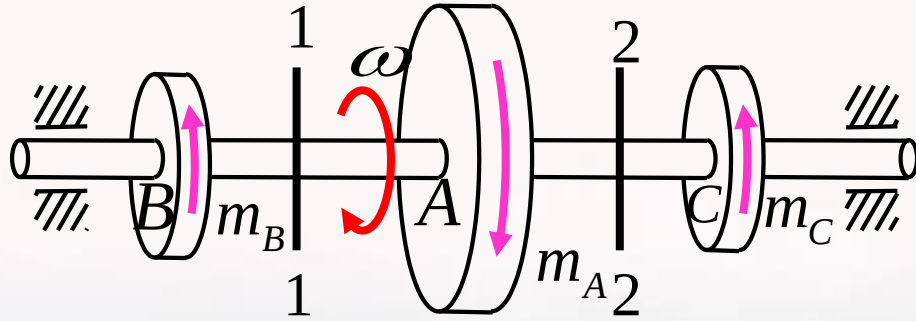


$$T_1 = m_B = 954.9 \text{ N} \cdot \text{m}$$

$$T_2 = -m_C = -636.6 \text{ N} \cdot \text{m}$$



外力偶矩和扭矩



$$T_1 = m_B = 954.9 \text{ N} \cdot \text{m}$$

$$T_2 = -m_C = -636.6 \text{ N} \cdot \text{m}$$

