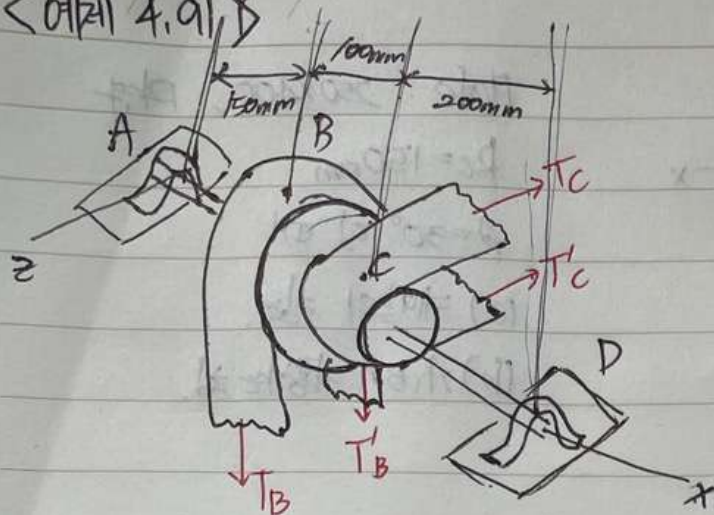


<예제 4.91>

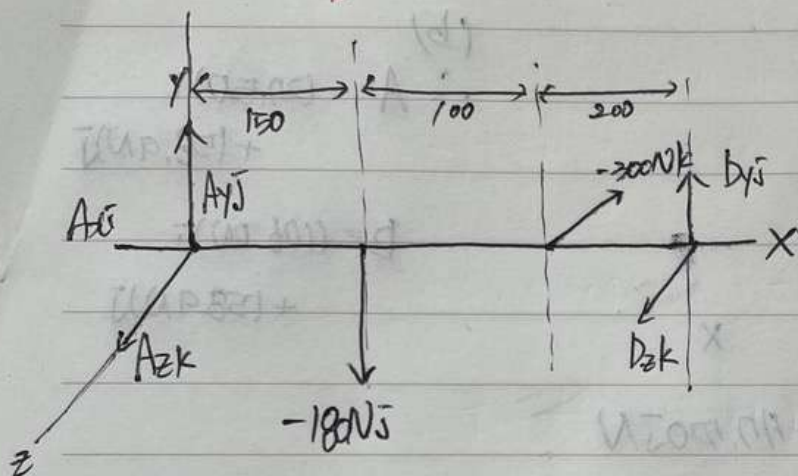


$$r_B = 250\text{mm}, r_C = 125\text{mm}$$

힘 B의 강도: 90N

힘 C의 강도: 150N

A, D에서의 반응 구하시오.



5개의 미지수, 6개의 평형 방정식

$$\sum M_A = 0: (150\hat{i}) \times (-180\hat{j}) + (250\hat{i}) \times (-300\hat{k}) + (450\hat{i}) \times (D_y\hat{j} + D_z\hat{k}) = 0$$

$$-27 \times 10^3 \hat{k} + 75 \times 10^3 \hat{j} + 450 D_y \hat{k} - 450 D_z \hat{j} = 0$$

$$\hat{j}: 75 \times 10^3 - 450 D_z = 0 \rightarrow D_z = 166.7 \text{ N}$$

$$\hat{k}: -27 \times 10^3 + 450 D_y = 0 \rightarrow D_y = 60.0 \text{ N}$$

$$\sum F_x = 0: A_x = 0$$

$$\sum F_y = 0: A_y + D_y - 180 \text{ N} = 0 \rightarrow A_y = 180 - 60 = 120.0 \text{ N}$$

$$\sum F_z = 0: A_z + D_z - 300 \text{ N} = 0 \rightarrow A_z = 300 - 166.7 = 133.3 \text{ N}$$

$$\therefore A = (120.0 \text{ N})\hat{j} + (133.3 \text{ N})\hat{k}$$

$$D = (60.0 \text{ N})\hat{j} + (166.7 \text{ N})\hat{k}$$