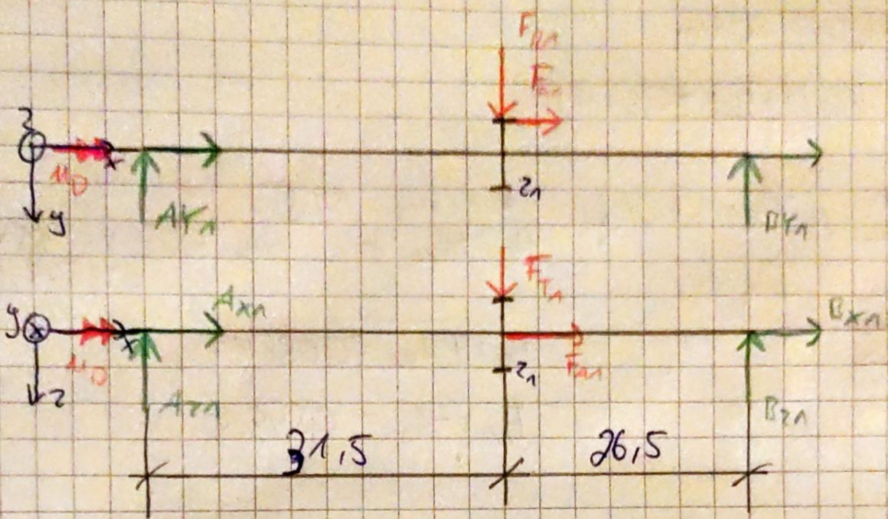
Antriebswelle



$\curvearrowleft A_{y1}$: $-F_{R1} \cdot 31{,}5\,mm + B_{y1} \cdot 58\,mm - F_{a1} \cdot 33{,}705\,mm = 0$

$$B_{y1} = \frac{F_{R1} \cdot 31{,}5\,mm + F_{a1} \cdot 33{,}705\,mm}{58\,mm} = 0{,}62\,kN$$

$\uparrow$: $A_{y1} + B_{y1} - F_{R1} = 0$

$$A_{y1} = F_{R1} - B_{y1} = 0{,}57\,kN - 0{,}62\,kN = -0{,}05\,kN$$

$\curvearrowleft A_{z1}$: $-F_{T1} \cdot 31{,}5\,mm + B_{z1} \cdot 58\,mm = 0$

$$B_{z1} = \frac{F_{T1} \cdot 31{,}5\,mm}{58} = 0{,}8\,kN$$

$\uparrow$ $A_{z1} + B_{z1} - F_{T1} = 0$

$$\rightarrow A_{z1} = F_{T1} - B_{z1} = 1{,}48\,kN - 0{,}8\,kN = 0{,}68\,kN$$

$$A_{R1} = \sqrt{A_{y1}^2 + A_{z1}^2} = \sqrt{(-0{,}05\,kN)^2 + (0{,}68\,kN)^2} = 0{,}68\,kN$$

$$B_{R1} = \sqrt{B_{y1}^2 + B_{z1}^2} = \sqrt{(0{,}62\,kN)^2 + (0{,}8\,kN)^2} = 1{,}01\,kN$$

=> A ist Festlager, da kleinere radiale Belastung

$A_x = -F_{A1} = -0{,}54\,kN$

$B_{x1} = 0$

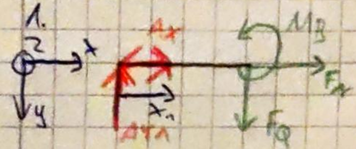
Schnittgrößenverläufe

$M_t(x) = 50\,Nm$

$N(x) = +F_{A1} = +0{,}54\,kN$

$M_{By}(x)$: positiver Schnittufer $x_{1\,max} = 31{,}5$

1.

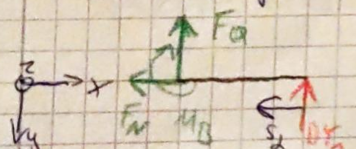


$M_B = +A_{y1} \cdot x$ $max = 0{,}05\,kN \cdot 31{,}5\,mm = -1{,}575\,Nm$, $min = 0$

$F_Q = +A_{y1} = 0{,}05\,kN$

$F_N = -A_x = 0{,}54\,kN$

2. negativer Schnittufer $x_{2\,max} = 26{,}5\,mm$



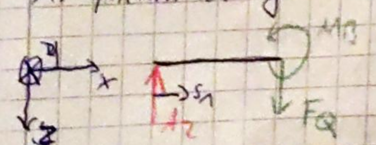
$F_N = 0$

$F_Q = -B_{y1} = 0{,}62\,kN$

$M_{By} = B_{y1} \cdot s_1 \Rightarrow min = 0$, $max = -0{,}62\,kN \cdot 26{,}5\,mm = -16{,}43\,Nm$

M_{Bz}

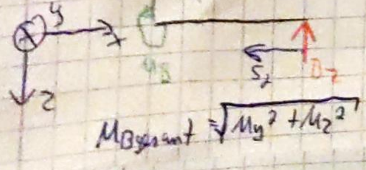
1. positiver Schnittufer $s_{1\,max} = 31{,}5$



$F_Q = +A_{z1} = 0{,}68\,kN$

$M_B = A_{z1} \cdot s_1 \Rightarrow min = 0$, $max = 21{,}42\,Nm$

2. negativer Schnittufer $s_{2\,max} = 26{,}5$



$F_Q = -B_z = -0{,}8\,kN$

$M_B = B_z \cdot s_2 \Rightarrow min = 0$, $max = 21{,}2\,kN$

$M_{B\,gesamt} = \sqrt{M_y^2 + M_z^2} = 27\,Nm$