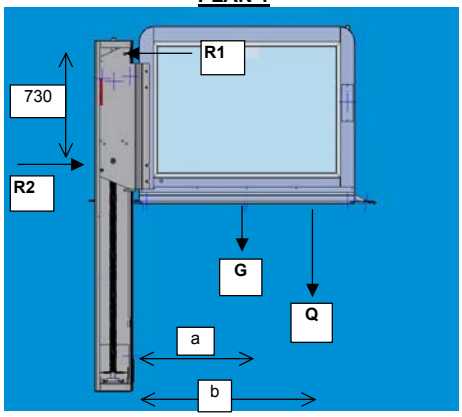
Type B Forces & Loadings

PLAN 1



Calculations guide frame fastener B-Lift

Lift Cage weight **G** =		170 kg
Max load =		300 kg
Loading test =	Max load x 1,2 = **Q** =	360 kg
B-lift 3000	Frame weight **H** about~	500 kg

Forces on guide frame by Lift Cage PLAN 1

Moment equation (c.p. **R2**)

R1 = (**G** x 9,81 x **a**) + (**Q** x 9,81 x **b**) / 0,73 8574 N

Static Force Equation

Direction → **R2 - R1** = 0

therefore **R2 = R1** (Reaction forces)

Guide frame fastner PLAN 2

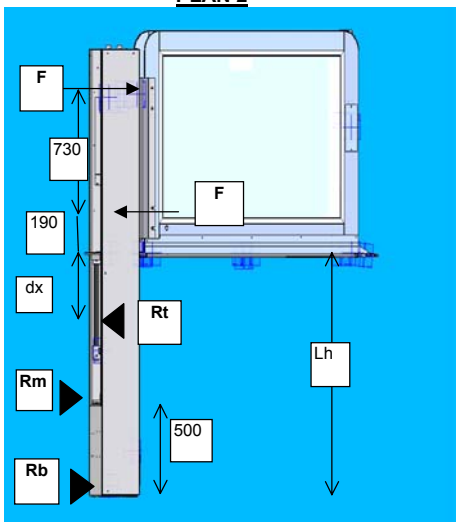
We look at the active force **F** which is the some as **R1** and **R2** but opposite direction.

Moment equation frame / lift (c.p. **Rt**)

Clockwice: **F** (**dx** + 0,19 + 0,73) - **F** (**dx** + 0,19) - **Rb** (**Lh** - **dx**) = 0

Thus **Rb** = **F** x 0,73 / (**Lh** - **dx**)

PLAN 2



Static Force Equation

Direction → **F** - **F** - **Rt** + **Rb** = 0

therefore **Rt** = **Rb**

B-lift, lift height (l	3000	If **dx** min	**Rt** =	2140 N
B-lift, lift height	3000	**dx** max	**Rt** =	2479 N
B-lift, lift height	1000	If **dx** min	**Rt** =	6766 N
B-lift, lift height	1000	**dx** max	**Rt** =	11921 N

B-lift 1000 has the max force = 11921 N

Recommend by Swedish Work Environment Authority
note no 130, increase **Rt** by 40%, = 16,690 N

Mounting bolt M10, structural strength 8.8, breaking stren 29200 N

Breakage safety, 2 bolts = 3.5 times

a =	1 m
b =	1.3 m
c =	0.73 m
dx =	0.075 m min
dx =	0.475 m max possibly

The guide frame shall stay against a wall at plan 1.
Not quite nessary if the guide frame on floor has support against wall but to increase guide frame stability we recommend complete with 2 bolts at top of electric motor box.

Max load on floor

B-lift 3000 **G** + **Q** + **H** = 1030 kg (**G** + **Q** + **H**) / basis 2,50 x 13,00 = 32 kg/dm2

Fastner at the top of motor box.

If the guide frame can´t be fixed against something at bottom, the fixings at top of motor box will increase the force **Rt**.

Moment equation frame / lift (c.p. **Rt**)

Direction → **F**(**dx** + 0,19 + 0,73) - **F**(**dx** + 0,19) - **Rm** (**Lh** - **dx** - 0,5) = 0

Thus **Rm** = **F** x 0,73 / (**Lh** - **dx** - 0,5)

B-lift 800, shall b **dx** = min **Rm** = **Rt** = 27818 N

B-lift 3000 **dx** = max **Rm** = **Rt** = 3091 N

For the small B-lift 800, we check the force on bolts at **Rt**, calculation.

Recommend increase **Rt** by 40%, = 38945 N

Mounting bolt M10, structural strength 8.8, breaking stren 29200 N

Breakage safety, 2 bolts = 1.5 times

RESULT: **Fastner for all B-lifts shall be at least 2 bolts 8.8 M10 at plan 2 and NTD recommend to complete with bolts at motor box for stability.**