KAR LIFT SOLUTIONS
by OMER®

1.0 VEGA 340/75 : H = 1850 MM (73”) L = 14600 MM (48’)

Being the vehicle described on the following page loaded on the lift, we are evaluating the effect on the base anchorage (on the leg hinge of the base) when are applied, orthogonal to the runways, horizontal forces proportional to the vertical loads even the 30% when the lift is raised at the maximum height, equal to 1850mm (73”)

2.0 Horizontal Forces Determination

As per following drawing, the vertical loads on each runway are:

- First axle :	F_{1v} =	0.50 x 5,779 =	2,980 kg
- Second axle	F_{2v} =	0.50 x 7,534 =	3,767 kg
- Third axle	F_{3v} =	0.50 x 9,140 =	4,570 kg

with :

- p_v = 155 kg/m

and so :

C = 0.30

F_{1o} =	0.30 x F_{1v} =	867 kg
F_{2o} =	0.30 x F_{2v} =	1,130 kg
F_{3o} =	0.30 x F_{3v} =	1,371 kg
F_o =	0.30 x F_v =	46,5 kg

For a Total Force of :

$$F_{to} = F_{1o} + F_{2o} + F_{3o} + 14.6 \times P_o = 4,047 \text{ kg}$$

3.0Regarded Cases

Reversing the loads applied on the runway we obtain the case A (page 4) and the case B (page 5).
The following is developed assuming :

- the vertical force applied on the longitudinal axle of the runway
- the geometrical scheme referred to the axles of the hinges of the lift when raised at the maximum height

4.0 Stress parameters

On pages 6 – 9 are reported the trend of the main moments for the considered case A and B.
For the case A, most stressed, into the limit of the assumed hypothesis we have the following maximum stresses on the inferior joint of a leg :

R_1 =	66 Kg
R_2 =	5,113 Kg
R_3 =	1,692 Kg
M_1 =	2,834 Kg.m
M_2 =	1,200 Kg.m
M_3 =	0 Kg.m

With the meaning explained on the following page.
We want to point out the above mentioned value R_3, M_1, M_2 are 67 % higher than the resulting average value for the four supports, equal to :

$R_{3,m}$ =	0.25 x 4,047 =	1,012 kg
$M_{1,m}$ =	1,012 x 1,675 =	1,695 kg.m
$M_{3,m}$ =	1,012 x 0,712 =	720 kg.m

4.0 Results

Applying the above mentioned values on a base plate as described on page 11, where the weak component force R_1 is balanced by the forces of the other base plates along the pipes, disregarded for more safety the compressive and bending stress of thr component force R_2 of the load applied to the ground, we have :

-shearing stress due to the Forces:

T = 423 kg / anchoring bolt

- shearing stress due to Torque Monent M2 :

$T^1 =$ 883 kg / anchoring bolt

that, as a vectorial resultant , gives a resultant shearing stress Q :

Q = 1,150 kg / anchoring bolt

- pull Z due to the Bending Moment M_1 :

H	=	65.4	cm
h^1	=	3.0	cm
h	=	62.4	cm
B	=	40.0	cm
x	=	13.4	cm
Z	=	2,446	kg /anchoring bolt
δ_c	=	18.2	kg/cm^2

having modulus :

K = 2,703 kg / anchoring bolt

Therefore, between the limits of the above considerations, we should resume the forces applied to the anchoring bolts as described on page 11 on the most stressed support.

Q	=	1,150	kg / anchoring bolt
Z	=	2,446	kg / anchoring bolt
K	=	2,703	kg / anchoring bolt
α	$\cong$	65°	on the normal