

II

KSIĄŻKA REWIZJI DŹWIGNICY

Wórcza: Monitor S.p.A.
 w Milano Włochy
 budowy 1996 Nr fabryczny 363532
 rodzaj dźwignicy Dźwignia osobowa "Monitor" Nr rejestr. 3104000225
 waga 1250 kg 16 osób
 lokalizacja Wydział Matematyki - Przemysłowy WSP ul. AK 13/15
 Wyższa Szkoła Pedagogiczna ul. Waryńskiego 418
 42-200 Częstochowa 10

Załączniki :

z odbioru technicznego dźwignicy
 z dokumentacją techniczną.

Inspektorat Dozoru Technicznego
 w Częstochowie
 Sędziwa Specjalista

inż. Marek Krygier

Książka niniejsza jest zesnurowana i zawiera 42 karty, w tym 2 karty oznaczone I-II oraz 20 podwójnych kart oznaczonych 1 i 1a - 20 i 20a, z których co druga jest perforowana i przeznaczona na kopie do akt IDT

Częstochowa dnia 21.01.1987r

Inspektorat Dozoru Technicznego
 w Częstochowie
 GŁÓWNY INSPEKTOR
 KODOWY ALFABETU
 mgr inż. Włodzisław Maciejko

(pieczęć i podpis)

YTET
 TDO-OWE
 KLERZA

KA

MPa

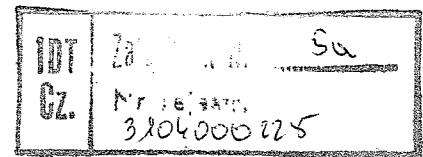
TECHNICAL DOCUMENTATION FOR THE ELECTRIC LIFT
 NO. : 25/96 MADE BY MONITOR POLSKA

The technical documentation includes:

- 1. one sketch DRAWING filled with general figures and TECHNICAL DATA as per appendix following
- 2. one TECHNICAL DESCRIPTION with equipment general figures
- 3. basic ELECTRIC DIAGRAMS
- 4. all necessities CERTIFICATES

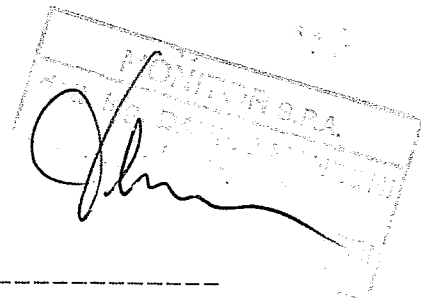
Drawing No. 963532

Owner : W.S.P. CZESTOCHOWA
 Installed in :
 Lift type : Passenger lift
 Capacity : 1250 kg.
 Passengers : 16 nr.
 Travel : 13,90 m.
 Stops : 5 nr.



Speed : max. up/down[m/sec.] = 0,50
 slow-down.....[m/sec.] = -
 levelling.....[m/sec.] = 0,16

No. of entrance in the car: 1
 Car door : sliding door
 Car inside area.....[m²] : 2,87
 Suspension : Direct drive 1:1



DESCRIPTION

Suspended machinery located to: On the top
 Machine room entrance is direct, no obstruction, and safe.

Motor type TRIPHASIPHASE ASYNCHRONOUS

made by.....: MOTOR-LIFT ; power.....[kW] 7,10
 tension...[V] : 380 ; frequenc....[Hz] : 50
 1380 r.p.m. ; intermittent working [%] : 40

CIRCUIT	CURRENT	TENSION	SECTION	NOM TENS	SPECIFIC.
[Hz-cr-cc]	[V]	[mm^2]	U0/U	SYMBOL	
main motor	50	AC 380	10,00	450/750	H07VK
control	50	AC 110	1,00	450/750	H05VU
car light	50	AC 220	1,00	450/750	A07VVH-F
signals	50	Dc 24	1,00	450/750	H05VU
alarm	CC	CC 12	1,00	450/750	A07VVH-F
door motor	50	Ca 380	1,00	450/750	H07VU

EARTH WIRING: copper wires, section 10,00 / 2,50 mmq
 to be connectenected to the job site net earthing

All electric materials and their installation should comply with
 general mounting rules. Insulation should be of antiager type.

Control :FULL COLLECTIVE

Protection on the control circuit:

trasformer with secondary coil to earth

Protection on the hoisting motor: thermistors and thermal contact

Protection from landing calls: timer

LIFT WELL

=====

Shaft built with fire resistant material : Reinforced concrete

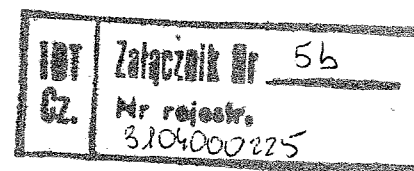
safety glass type :

Dimensions[mm]: X X

Landing doors made of : MONITOR

safety glass type :

Dimensions[mm]: X X



Reinforced panel steel car.

safety glass type :

Dimensions[mm]: X X

The inside car finishing material should be of fire proof and/or of
 fire retardant type.

Car door made of: Monitor

Safety glass type :

Dimensions[mm]: X X

Contacts positive safety 2 pieces contact

Safety equipment for automatic doors :
electromechanic locks type with safety contacts.
pressure lower than 12 Kg.

The forces and the kinetic energy of the door must be lower than the
the correspondent max. value accepted by the the normes
to whom they refer.

SAFETY GEAR and its characteristics:

instantaneous , intervention by mean of speed governor
interruption of electric circuit and stopping of the machine.

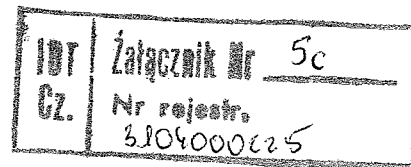
Car stops at up position : buffers under counterweight
Car stops at low position : buffers on fixed blocks

Buffers under the car.....: Type : spring buffer
travel [mm]: 75,00
Buffers under the counterweight.: Type : spring buffer
travel [mm]: 70,00

VERIFICATION OF BUFFER CALCULATION

		under car	under c/w
1) SPRING BUFFERS			
Static load [car + load]-[CW weight] daN	$C = 2440,00$	1815,00	
Number of buffers	$N = 4,00$	2,00	
Length [mm]	$L = 187,00$	196,00	
Average outside diameter [mm]	$D = 90,00$	92,00	
Coil diameter [mm]	$d = 17,00$	19,00	
Coil centres [mm]	$p = 34,00$	35,40	
Number of active coils	$n = 5,00$	5,00	
Maximum speed [m/s]	$v = 0,50$	0,50	
Acceleration of gravity [m/s ²]	$g = 9,81$	9,81	
Buffer travel $L-d(1+1.1n)$ [mm]	$f = 75,00$	70,00	
Verification of buffer travel [mm]	$= 33,75$	33,75	
Modulus of elasticity [daN/mm ²]	$G = 8040$	8040	
Total compression load $(fGd^4)/([daN]$	$F = 1727,13$	2354,75	
Static load on each spring buffer [daN]	$Q = 610,00$	907,50	
Verification of static load $(2.5 \leq F/Q \leq 4)$	$F/Q = 2,83$	2,59	

VERIFICATION OF ROPES ON THE TENSION



Ropes No. 7 ; diameter d [mm] 11,00 ; strands No. 8
Formation SEALE 152 FILI
Maximum wire diameter (except central wire) [mm] dm = 0,41
External diameter.....[mm] = 0,71
Rope section.....[mm²] = 42,60
Unitary breaking load.....[daN/mm²] = 157,00

S.11.96

Breaking load on one rope conventional.....	[daN]	=	5350,00
Car weight.....	[daN]	=	1190,00
Capacity.....	[Kg]	=	1250,00
Rope weight.....	[kg]	=	40,96
Total load on ropes.....	[daN]	=	2480,96
Load on each rope.....	[daN]	=	354,42
Tension.....	[daN/mm ²]	=	8,32
Safety factor.....		=	18,87
Minimum pulley diameter.....	[mm] D	=	440,00
Rope to pulley ratio.....	D/d	=	40,00

Safety factor on rope attachment > 80% of resistance ropes

TRACTION VERIFICATION

The following formula shall be satisfied:

$$T_1/T_2 * C_1 * C_2 \leq e^{f \cdot \alpha}$$

where

T_1/T_2 = ratio between the greater and smaller static force in the portions of rope situated on either side of the traction sheave in the following cases:

- car stationary at the lowest landing with a load equivalent to 125 % of the rated load;
- car stationary at the highest landing level, unloaded.

C_1 = coefficient taking account of acceleration, deceleration and specific condition of the installation.

$$C_1 = \frac{g_n + a}{g_n - a} \quad \begin{array}{l} g_n = \text{standard acceleration of free fall} \\ a = \text{braking deceleration of the car} \end{array}$$

C_2 = coefficient taking account of the variation profile of the groove due to wear;

$$C_2 = 1,2 \text{ for vee grooves}$$

e = base of natural logarithms

f = friction factor of the ropes in the grooves = 0,29

α = angle of wrap of the ropes on the traction sheave (gradi) = 150

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Cz.	Nr rejestr. 3104000215

$$C_1 * C_2 * T_1/T_2 \dots : 2,13 \leq e^{f \cdot \alpha} \dots : 2,14$$

SPECIFIC PRESSURE OF THE ROPES IN THE GROOVES

The specific pressure is calculated according to the following formulae:

$$p = \frac{4,5 * T}{n * d * D * \sin(\gamma/2)} \text{ [N/mm}^2\text{]} = 9,38$$

$$\sigma < (12,5 + 4 \cdot v) / (1 + v) \dots \dots \dots [\text{N/mm}^2] = 9,67$$

VERIFICATION OF CAR GUIDE RAILS

Profile and dimensions :	RF 90 (90 x 75 x 16 mm)
Distance between fixings	[cm] l = 180,00
Breaking load	[daN/cm ²] Kr = 4900,00
Distance between car shoes	[cm] dp = 358,00
Car weight	[daN] Pca = 1060,00
Door operator weight	[daN] Pop = 130,00
Capacity	[Kg] Q = 1250,00

In the guide	Perpen. guide
rail section	rail section

Distance between car rope suspension and centres of gravity:

of load on half car floor	[cm] =	0,00	78,00
of car	[cm] =	5,40	39,00
of car door	[cm] =	87,10	88,00
Loads on guide rails			
(min. 80 e 40 daN)..	[daN] =	80,00	177,93
Modulus of resistance...	[cm ³] Wx&Wy	20,80	11,40
Bending moments.....	[daN/cm ²] =	3600,00	8006,98
Tension.....	[daN/cm ²] =	173,08	702,37
Safety factor.....	c1 =	28,31	c2 = 6,98
Inertia moments.....	[cm ⁴] Jx =	101,20	Jy = 51,50
Deflection.....	[cm] f1x =	0,05	f1y = 0,20
Bracket deflection.....	[cm] f2x =	0,05	f2y = 0,05
Total deflection.....	[cm] ftx =	0,10	fty = 0,25

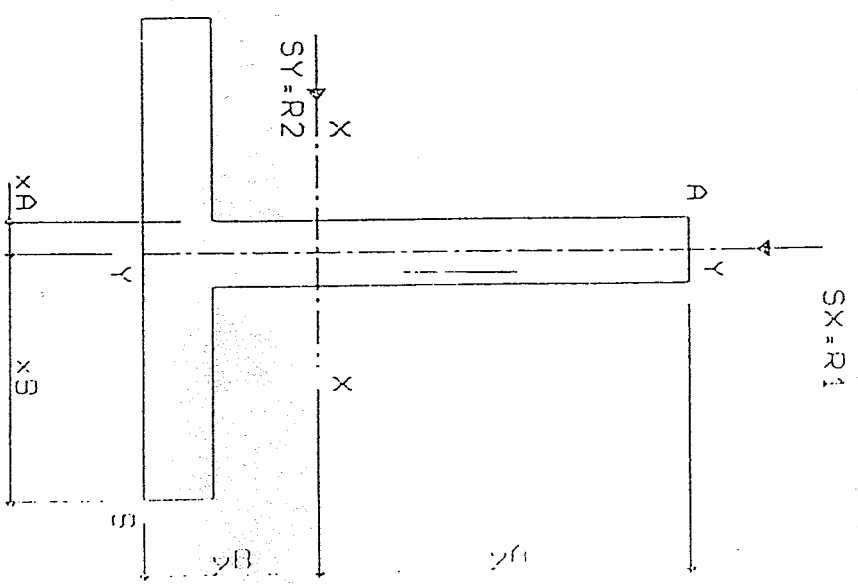
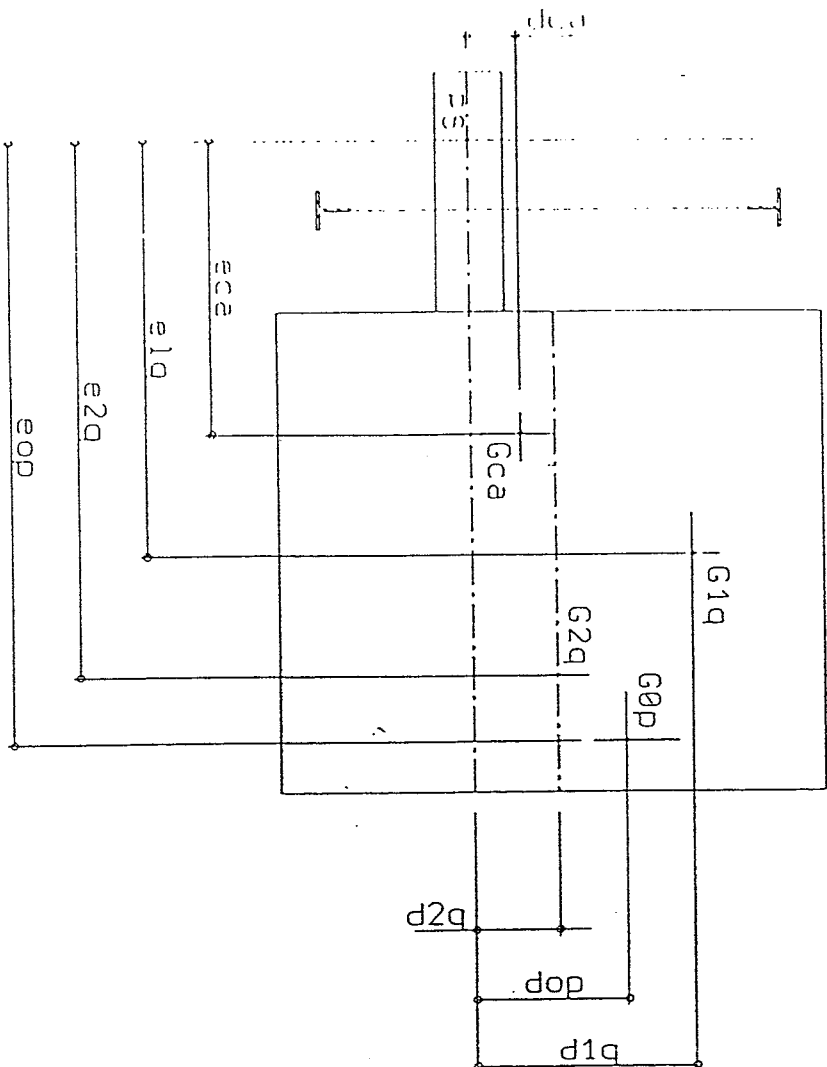
VERIFICATION OF CAR GUIDE RAILS ON PRESSION

IDT	Załącznik Nr 5e
Cz.	Nr rejestr. 3104000215

Minimum inertia moments.....	[cm ²] Jmin =	51,50
Cross section area of a guide.....	[cm ²] A =	17,00
Radius of gyration	[cm ²] i(g) =	1,74
Coefficient of slenderness.....	lambda...1/i(g) =	103,42
Buckling factor.....	omega =	1,98
buckling stress in the guides <= 140 N/mm ²		
Gear type :	instantaneous safety gear (roller type)	

$$\sigma(k) = 15 \cdot (P + Q) \cdot \omega / A \dots \dots \dots = 42,63$$

2



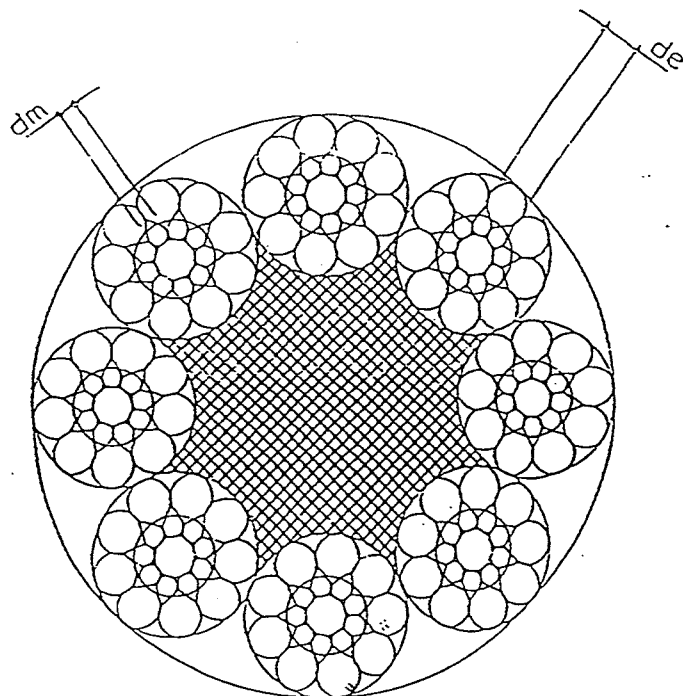
LIFT NUMBER: CRD. 25/96. DRAW. 963532
 OWNER: W.S.P. CZESTOCHOVA
 INSTALLED IN: _____

IDENTIFICATION
 Nr. rejestracji
 3.10.000225

ANNEX N. 1

Wire rope 8 x 19 scale

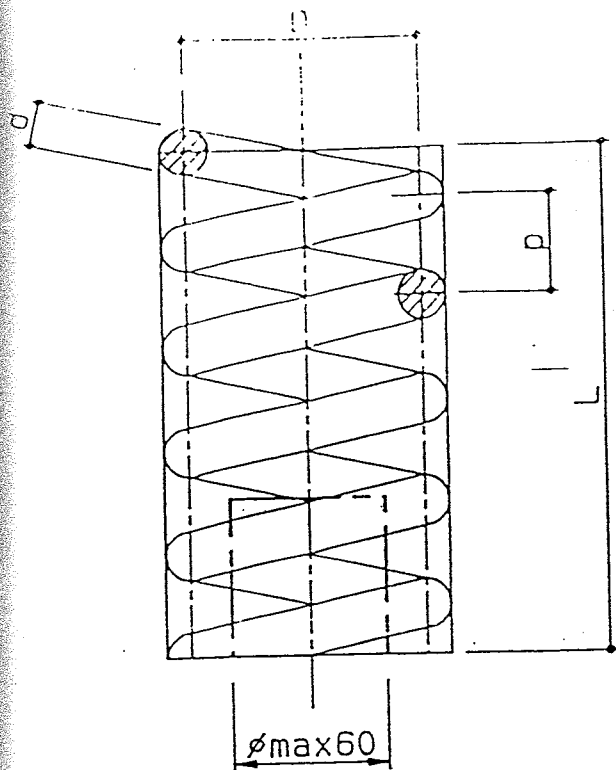
construction of the strand : 9 x 9 x 1



with fibre core (FC)

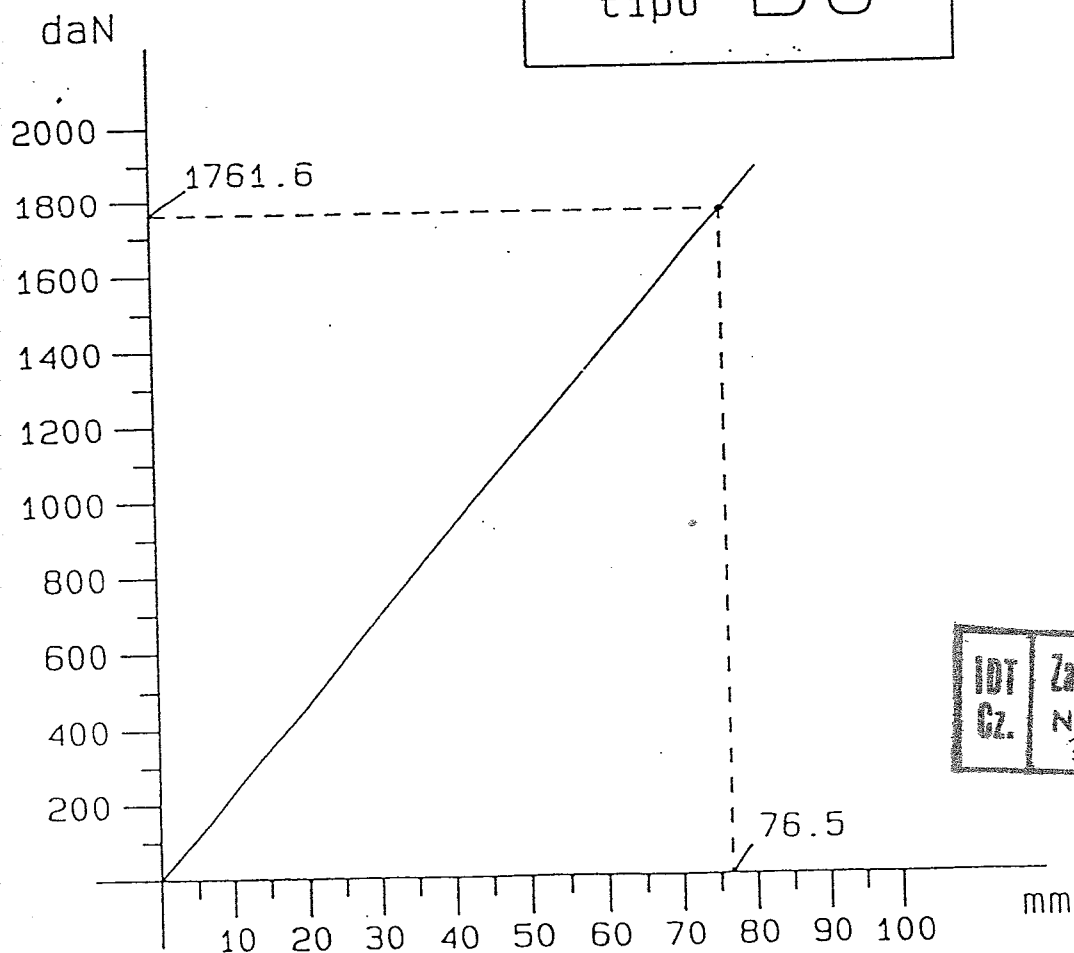
OBJ	Załącznik Nr 5
Gz.	Nr rejestr. 3104000225

ANNEX N. 2
ORD. 25/96 DRAW. 963532



$D = 90$ mm
 $d = 17$ mm
 $p = 34$ mm
 $L = 187$ mm

type Bo
 tipo



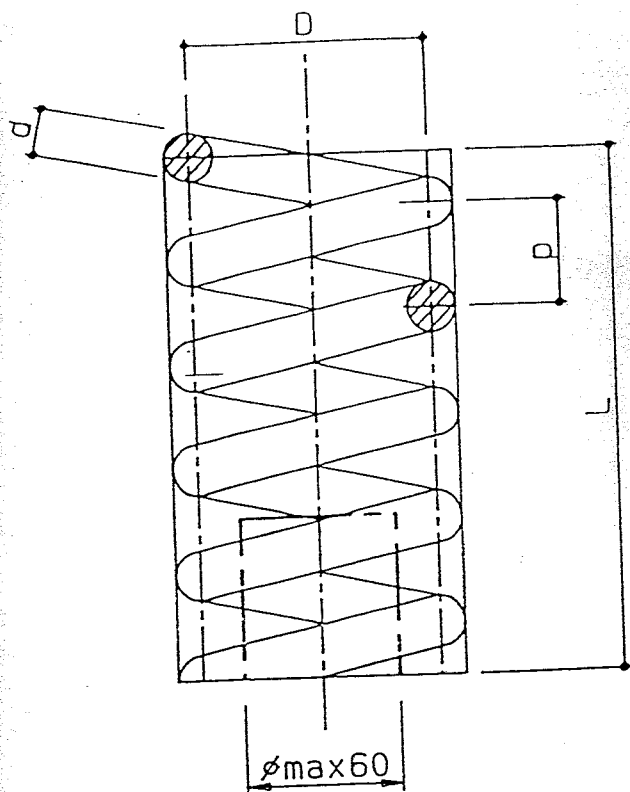
IDT Złącznik Nr 5h
 Cz. Nr rejestr. 3104000025

Monitor

Buffers
 Ammortizzatori

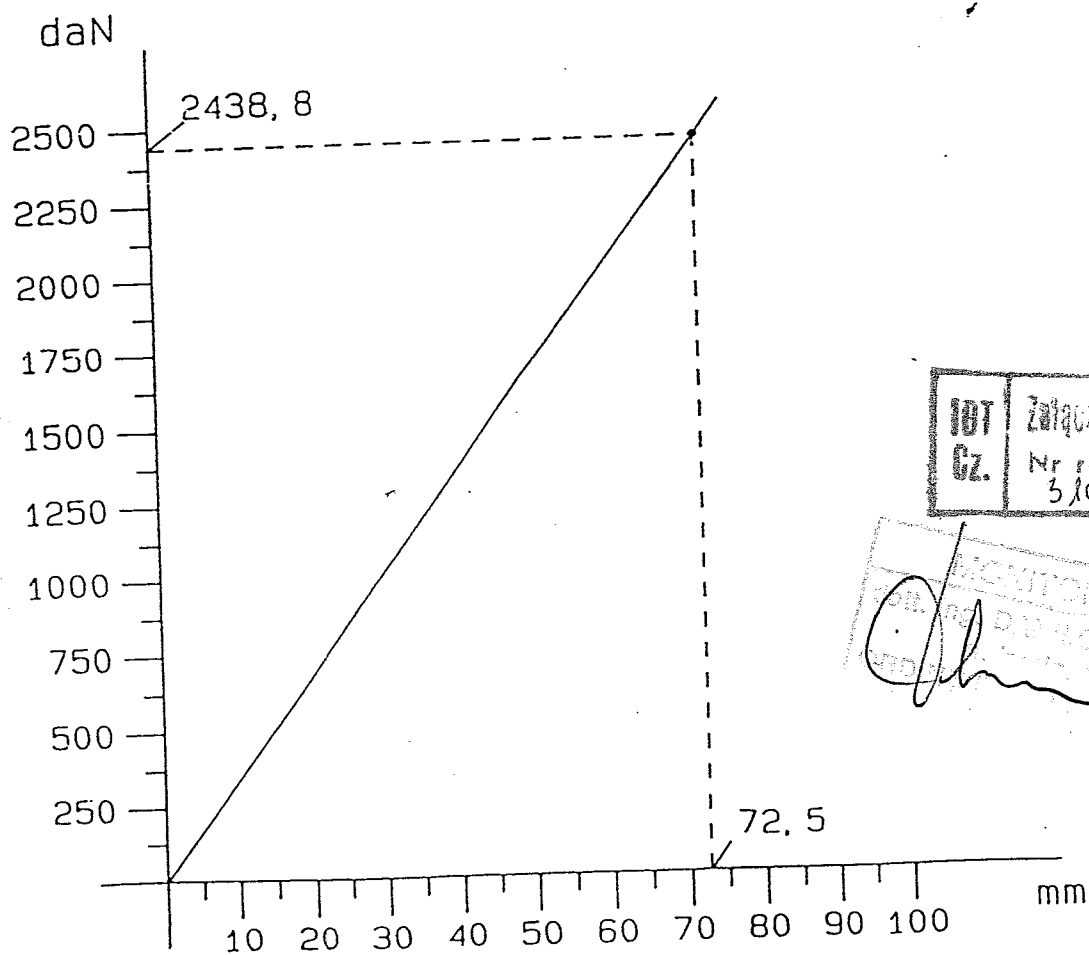
ORD.: 25/96. DRAW.: 963532

Bo



$D = 92 \text{ mm}$
 $d = 19 \text{ mm}$
 $p = 35,4 \text{ mm}$
 $L = 196 \text{ mm}$

type Co
 tipo Co



IBT Złącznik Nr 5i
 Cz. Nr rejestr. 3104000226

MONITOR S.p.A.
 S.p.A. 00100 ROMA
 VIA DELL'INDUSTRIA, 10
 00198 ROMA (RM)

Monitor

Buffers
 Ammortizzatori
 RIF. 25/96 DRAW. 963532

Co

CO. 96 35 32

1. Sprawdzenie cierności lin zgodnie z normą EN.81.1

Dane:	Udźwig	1250 daN
	Prędkość	0,5 m/s
	Kąt opasania	= 150°
	Kąt rowka klinowego	= 36°
	Ciężar kabiny z ramą	1015 daN
	Ciężar lin	41 daN
	Ciężar kabli płaskich	30 daN
	Ciężar przeciwwagi	1640 daN

Powinna być spełniona następująca nierówność:

$$(T_1/T_2) * C_1 * C_2 e^{f\alpha}$$

gdzie:

$$C_1 = 1,10$$
$$C_2 = 1,2$$
$$f = \mu \sin(\gamma/2) = 0,09 / \sin(0,628/2) = 0,2914$$
$$\alpha = 2,617 \text{ rad}$$
$$e^{f\alpha} = 2,144$$

zatem

$$T_1/T_2 e^{f\alpha} / (C_1 * C_2) = 1,624$$

Pierwszy przypadek:

$$T_1 = 1015 + 41(1,25 * 1250) = 2618,5 \text{ daN (kabina w dole z obciążeniem 125% udźwigu)}$$

$$T_2 = 1640 \text{ daN (przeciwwaga w górze)}$$

$$T_1/T_2 = 1,60$$

Drugi przypadek:

$$T_1 = 1640 + 41 = 1681 \text{ daN (przeciwwaga w dole)}$$

$$T_2 = 1015 + 30 = 1045 \text{ daN (pusta kabina w górze)}$$

$$T_1/T_2 = 1,61$$

Sprawdzone zachowanie warunków cierności lin.

10T	Załącznik Nr 6
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2 Sprawdzenie nacisku liny nośnej w rowku koła ciernego.

Powinno być:

$$[T / (n \cdot d \cdot D)] \cdot 4,5 / (\sin \gamma / 2) \cdot (12,5 + 4 V_c) / (1 + V_c)$$

gdzie:

$$n = 7$$

$$d = 11 \text{ mm}$$

$$D = 500 \text{ mm}$$

$$\gamma = 36^\circ = 0,628 \text{ rad}$$

$$V_c = 0,5 \text{ m/s}$$

$$T = 10150 + 410 + 12500 = 23060 \text{ N}$$

przystanku i z obciążeniem równym udźwigowi

$$[23060 / (7 \cdot 11 \cdot 500)] \cdot 4,5 / 0,3089 \leq (12,5 + 4 \cdot 0,5) / (1 + 0,5)$$

$$8,72 < 9,67$$

liczba lin

średnica lin

średnica koła

kąt rowka klinowego

prędkość lin na kole

napięcie lin z kabiną na najniższym

Nierówność jest zachowana.

3 Sprawdzenie współczynnika bezpieczeństwa zerwania lin.

Powinno być: T/n (minimalne obciążenie powodujące zerwanie lin)/12

$$23060/7 \leq 53500 / 12 \text{ daN}$$

$$3292 < 4458 \text{ daN}$$

Nierówność jest zachowana.

DT	zobowiązanie nr 6a
Gz.	Nr rejestr. 3104000225