



COMEDIL



Tower Crane

GTS 511/A-S12

Technical Specifications
Preparation of the Job Site
Crane Movement and Transportation

The specifications inside form integral part of the new operation manual under updating now, which is to replace that for GTS 511 S12 (Version 98 E 01) enclosed inside (valid, anyhow, for any information other than those contained herein).

The new operation manual (Version 99 E 01) shall follow, of course, as soon as ready.



U.S. Customary units

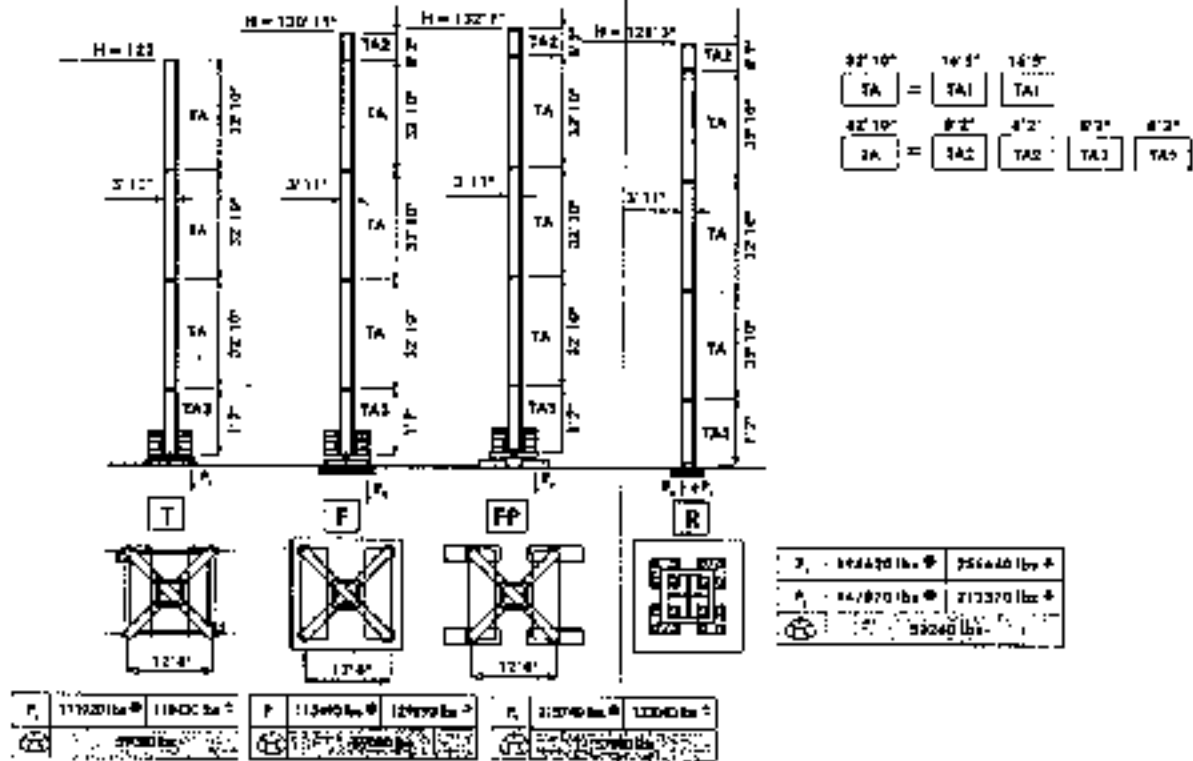


Fig. 3.2.2

<ul style="list-style-type: none"> ● Altiss. massima sotto carico ● In servizio ● Fuori servizio ● A vista, senza carichi, braccio max., altezza max. ● Altesse allerhöchste ● In service ● Out of service ● Sin cargo, sin vista, con fleche y altura máxima ● Höchste Hakenhöhe ● In Betrieb ● Außer Betrieb ● Ohne Last und Balken, mit Maximalausleger und Maximalhöhe 	<ul style="list-style-type: none"> ● Max. H. mod. sous charge ● En service ● Hors service ● A vide, sans chat, avec fleche et hauteur maximum ● Max. Under hook height ● In service ● Out of service ● Without load, without bal. net, max. jib and max. height
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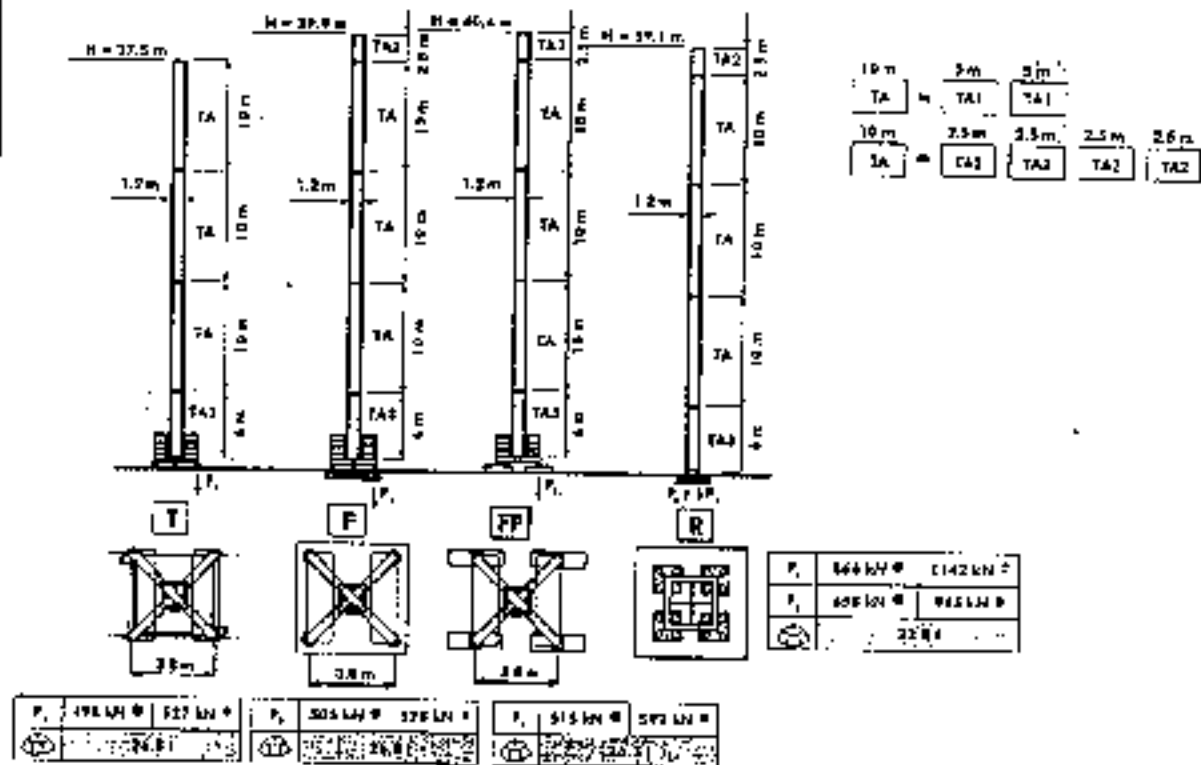


Fig. 3.2.2

H	Altezza massima in fuor servizio	c	Altezza ruota, senza crocchio
h	In servizio	f	In servizio
e	Fuori servizio	GR	Max. service
⊕	A vuoto, senza carichi, braccio max., altezza max.		A vide, sans lat., avec Riche et hauteur maximum
⊕	Maxima altura bajo grana	⊕	Max. unter hook height
⊕	In servicio		In service
⊕	Fuori de servizio		Out of service
⊕	Sen carga, sin lastre, con Radio y altura maxima		Without load, without ballast, max. jib and max. height
H	Röhre, Räderhöhe	b	
h	In Betrieb		
⊕	Außer Betrieb		
⊕	Ohne Last und Ballast, mit Maximalausleger und Maximalhöhe		

TECHNICAL SPECIFICATIONS

The chapter describes the technical specifications of GTS 511/A S12 tower crane.

3.1 CRANE CLASSIFICATION

Standards for structural calculations of the crane:

C.N.R. 10021/85; C.N.R. 10011/85; C.N.R. UNI 10012
DIN 15018; DIN 15019; DIN 15020.

Machine grade:

according to C.N.R. 10021/85 standards, the crane is
A4 (U4 - Q2) grade.

Standards for the electrical components: CEI - EN 60204 - 1.

3.2 RANGES AND TOWER CONFIGURATIONS

The typical dimensions of the crane are shown in figure 3.2.1 together with the different approved ranges and the configuration of the single jibs.

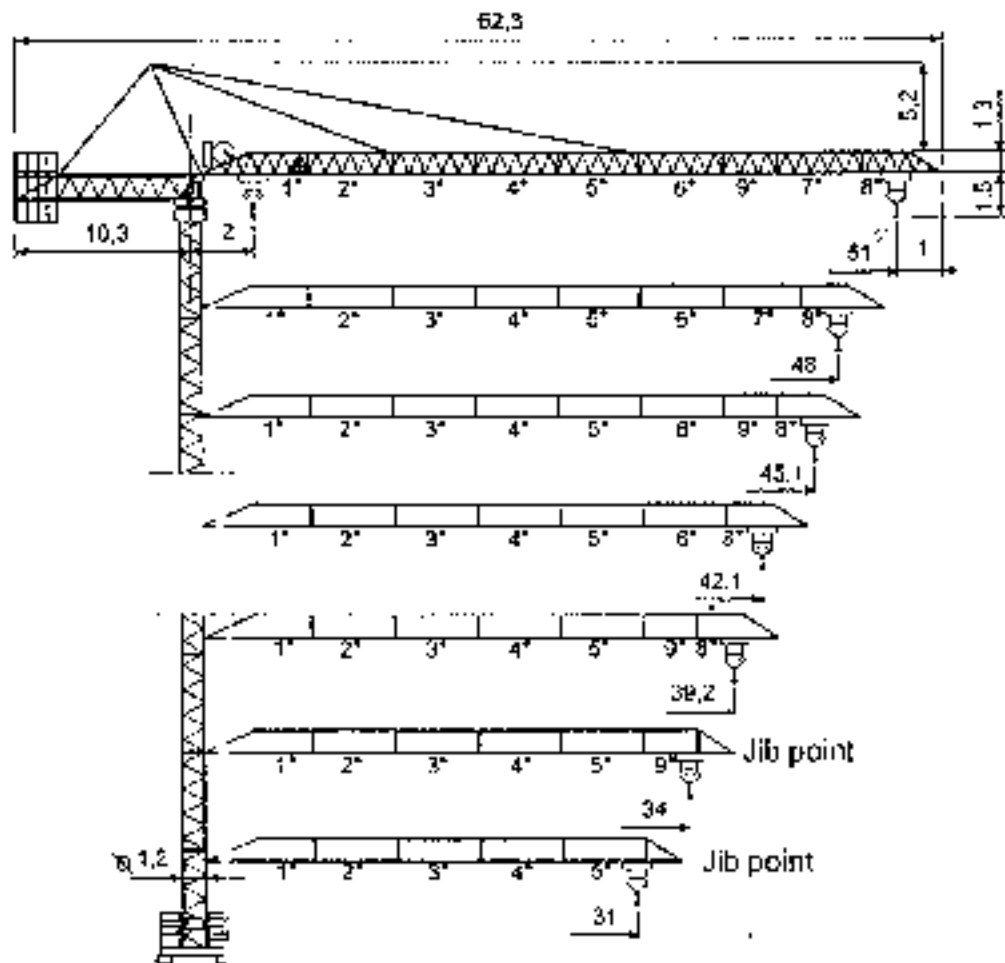
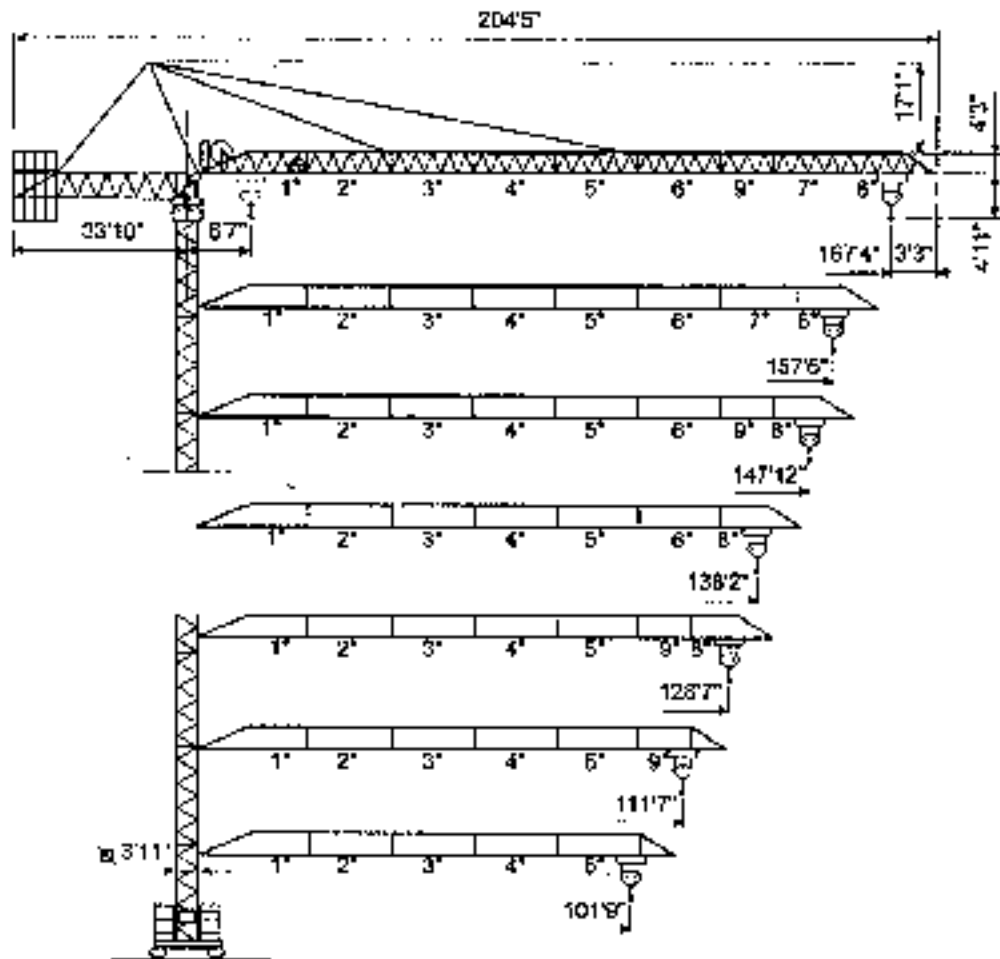


Fig. 3.2.1

The dimensions are expressed in metres



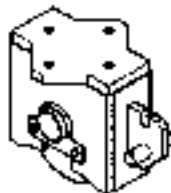
U.S. Customary units



The maximum heights for the crane in the four different configurations available are shown in figure 3.2.2.

T: travelling crane on undercarriage

F: static crane with undercarriage on base plates



FP: static crane with undercarriage on concrete foundation

R1: static crane without undercarriage



3.3 RANGES AND CAPACITIES

GTS 511/A 10-30

Capacity	Span	Unit	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
3000 kg	20.8 m	kg	3000	3000	3000	3000	3000	2864	2414	2117	1877	1680	1527	1408	1308	1228	1158	1095	1038	985	935	888	843
3000 kg	23.5 m	kg	3000	3000	3000	3000	3000	2800	2327	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	24.8 m	kg	3000	3000	3000	3000	3000	2800	2326	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	26 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	26.3 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	26.9 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	27.1 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743

GTS 511/A 10-50

Capacity	Span	Unit	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
3000 kg	20.3 m	kg	3000	3000	3000	3000	3000	2879	2380	2033	1858	1685	1554	1440	1361	1274	1194	1120	1050	990	935	885	835
3000 kg	10.2 m	kg	3000	3000	3000	3000	3000	2879	2380	2033	1858	1685	1554	1440	1361	1274	1194	1120	1050	990	935	885	835
3000 kg	21.5 m	kg	3000	3000	3000	3000	3000	2800	2326	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	21.8 m	kg	3000	3000	3000	3000	3000	2800	2326	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	24.7 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	12.4 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	25 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	12.8 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	20.3 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	15.2 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	26.8 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	11.5 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	27.3 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743
3000 kg	17.7 m	kg	3000	3000	3000	3000	3000	2800	2350	2010	1760	1560	1400	1290	1200	1120	1050	990	935	885	835	788	743

3.3.1 RANGES AND CAPACITIES
U.S. Customary units

Capacity	Height	Span	32'11"	42'11"	47'11"	57'11"	67'11"	77'11"	87'11"	97'11"	107'11"	117'11"	127'11"	137'11"	147'11"	157'11"	167'11"
60'0 lb	67'7"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	77'1"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	87'5"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	97'9"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	107'3"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	117'7"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	127'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	137'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	147'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	157'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
60'0 lb	167'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610

Capacity	Height	Span	32'11"	42'11"	47'11"	57'11"	67'11"	77'11"	87'11"	97'11"	107'11"	117'11"	127'11"	137'11"	147'11"	157'11"	167'11"
60'0 lb	67'7"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	77'1"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220
60'0 lb	87'5"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	97'9"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220
60'0 lb	107'3"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	117'7"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220
60'0 lb	127'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	137'11"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220
60'0 lb	147'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	157'11"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220
60'0 lb	167'11"	8x	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610	6610
120'0 lb	177'11"	8x	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220	13220





3.4 GENERAL INFORMATION ON DRIVE ASSEMBLIES



HOISTING	Speed (m/min)	Capacity (t)	Power (kW)	Hoisting rope working length
	6	3		
	26	3	14.7	200 m max
	52	1.5		> 200 m consult Comedil
	3	6		
	13	6	14.7	200 m max
	26	3		> 200 m consult Comedil
	10	3		
	42	3	24.3	246 m max
	85	1.5		> 246 m consult Comedil
	5	6		
	21	6	24.3	246 m max
	42.5	3		> 246 m consult Comedil

	Type	Speed	Power	
Standard trolley	DAD 2.2	0-23-46 m/min	1.1-2.2 kW	440 V - 50 Hz
Optional trolley	DSR 3.50	0-10-30-60 m/min	50-40 Nm	440 V - 50 Hz / 480 V - 60 Hz
Slewing	SSR 1:150	0-0.8 gr/min	50 Nm	440 V - 50 Hz / 480 V - 60 Hz
Travelling	TAD 2 P 1.3	0-24 m/min	2 x 3 kW	440 V - 50 Hz / 480 V - 60 Hz



U.S. Customary units

HOISTING	Speed (ft/min)	Capacity (lbs)	Power (HP)	Hoisting Rope Working Length
20 AG 30 HB	20	6614		
	85	6614	20	656' max.
	171	3307		> 656' consult Comedil
	10	13230		
	42	13230	20	656' max.
	85	6614		> 656' consult Comedil
25 AG 30 HB	20	6614		
	85	6614	25	807' max.
	171	3307		> 807' consult Comedil
	17	13230		
	68	13230	25	807' max.
	140	6614		> 807' consult Comedil

33 AG 30 HB (OPTIONAL)	33	6614		
	138	6614	33	807' max.
	279	3307		> 807' consult Comedil
	17	13230		
	68	13230	33	807' max.
	140	6614		> 807' consult Comedil

	Type	Speed	Power	
Standard Trolley	DAD 2.2	0-76-150 r/min	1-3 HP	440 V - 50 Hz
Optional Trolley	DSR 3.50	0-10-99-186 r/min	37/303 lbs	440 V - 50 Hz / 460 V - 60 Hz
Slawing	SSR 1.1.50	0-0.8 r.p.m.	37 lbs	440 V - 50 Hz / 460 V - 60 Hz
Travelling	TAD 2.P.1.3	0-79 r/min	3 x 3 HP	440 V - 50 Hz / 460 V - 60 Hz

3.5 TOTAL ABSORBED POWER

Total absorbed power *	Winches	Three-phase current
23 kVA	20 AG 30 HB	400 V - 50 Hz
27 kVA	25 AG 30 HB	400 V - 50 Hz / 480 V - 60 Hz
33 kVA	33 AG 30 HB	400 V - 60 Hz / 480 V - 60 Hz

* Total absorbed power refers to stationary crane (not travelling crane)

3.6 WIRE ROPES

Rope	Diameter	Breaking strength	
		[kN]	[kg]
Hoisting	12	103	23150
Trolley	7	34.3 / 40.7	7710 / 9150

3.7 LOAD HANDLING DEVICES

Hook UNI-ISO 4779 Chain UNI 9423

3.8 WORK ENVIRONMENT



- *Working temperature:* **0 °C ➔ 40 °C** (upon the customer's request, cranes withstanding temperatures up to -20 °C can be supplied)
- *Maximum relative humidity:* **90%**
- *Maximum wind speed:*

<u>during assembly</u>	14	m/s (~50 km/h)
<u>in service</u>	20	m/s (~72 km/h)
<u>out of service</u>	42	m/s (~150 km/h)



U.S. Customary units

- *Working temperature:* **32 °F ➔ 104 °F** (upon the customer's request, cranes withstanding temperatures up to -4 °F can be supplied)
- *Maximum relative humidity:* **90%**
- *Maximum wind speed:*

<u>during assembly</u>	46	ft/s (~31 mph)
<u>in service</u>	66	ft/s (~45 mph)
<u>out of service</u>	138	ft/s (~93 mph)
- *Maximum front surface:*
the maximum admitted surface exposed to the wind in correspondence of the full load allowed at a certain jib length during hoisting is obtained by the ratio.

$$A = \frac{D \cdot 0.03 \cdot P}{q \cdot 1.2} \quad \text{where}$$

A = Front surface exposed to the wind [m²]
P = Weight of the load hanging from the hook [daN]
q = Pressure factor = $\frac{v^2}{16}$ [daN/m²]
v = Wind speed [m/s]

Important

The crane cannot be used in an explosive work environment or a work environment subject to fire risks. Also it cannot be operated in a work environment where flameproof devices are required.

36 PIN LIST

ELEMENT	PINS		
	Type	Dimensione (mm)	Qty
Undercarriage	C	Ø 70 × 450	4
FP Supports	C	Ø 20 × 165	8
TA 3 Tower	C	Ø 18 × 90	4
	T	Ø 55 × 175	4
TA 1 - 2 Tower	C	Ø 18 × 90	4
	T	Ø 55 × 175	4
TB 1 - 2 Tower	C	Ø 18 × 90	4
	T	Ø 55 × 175	4
Tower head	C	Ø 45 × 97	2
	T	Ø 65 × 165	1
Counterjib Tie-bars	T	Ø 40 × 80	4
	T	Ø 40 × 120	2
Jib Tie-bars	T	Ø 50 × 75	8
	T	Ø 50 × 120	2
Platforms	T	Ø 20 × 105	2
	T	Ø 20 × 120	2
Cab Support	T	Ø 25 × 110	4
Hoist Winch Support	T	Ø 25 × 55	4
Trolley Winch Support	C	Ø 25 × 125	1

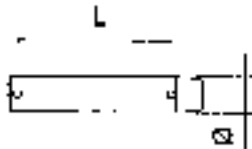
ELEMENT	PINS			
	Type	Dimensione (mm)	Qty	
1°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
2°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
3°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
4°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
5°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
6°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
7°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
8°	L.L.S.	T	Ø 40 × 85	2
	U.L.S.	T	Ø 50 × 120	1
9°	L.L.S.	T	Ø 40 × 80	2
	U.L.S.	T	Ø 50 × 90	1
Jib point	T	Ø 30 × 170	1	

U.L.S. = upper longitudinal spar

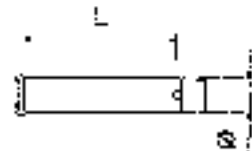
L.L.S. = lower longitudinal spar

Pin identification name: "TYPE" diameter (\varnothing) x length(L)

Example: "C" 80 x 350



Pin type "C"



Pin type "T"

3.10 CONFIGURATION OF THE TOWERS

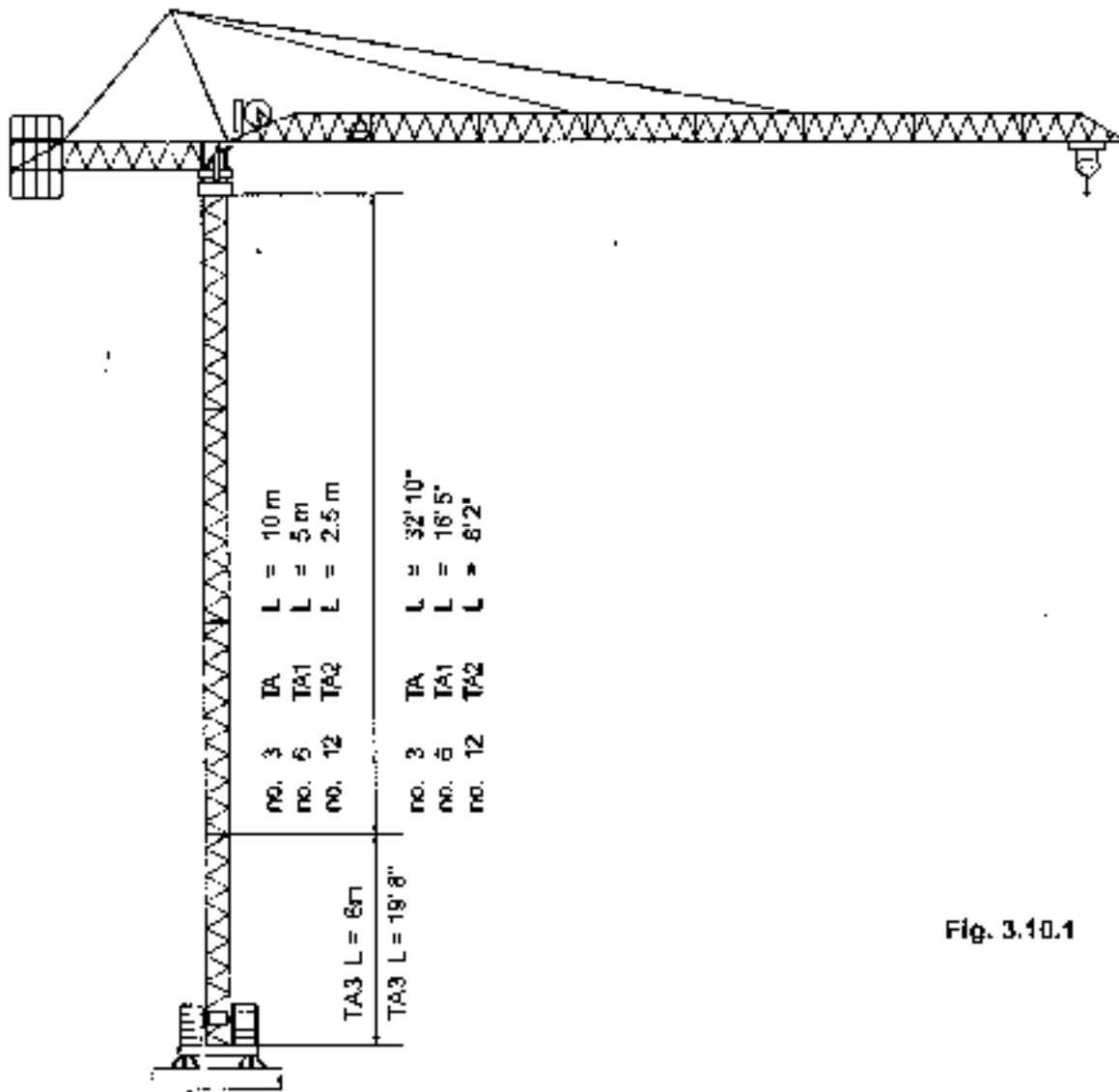
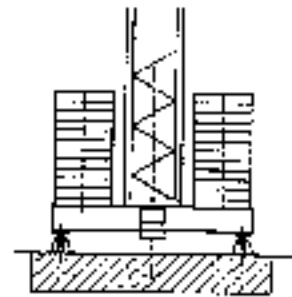


Fig. 3.10.1

The following are some examples of the composition of different tower elements according to the heights measured under the hook in the various configurations.

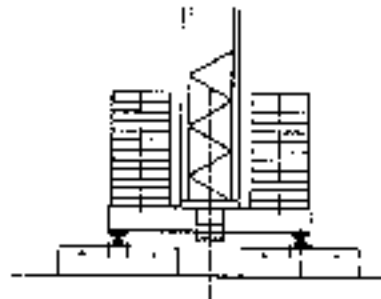
**STATIC CRANE WITH UNDERCARRIAGE
BEARING "R"**

HOOK HEIGHT		Tower Sections: Type and Quantity		
(m)	(feet)	TA3	TA	TA2
19,9	65' 4"	1	1	1
22,4	73' 5"	1	1	2
24,6	81' 0"	1	1	3
27,4	89' 11"	1	1	4
29,8	98' 1"	1	1	5
32,4	106' 4"	1	1	6
34,9	114' 6"	1	1	7
37,4	122' 0"	1	1	8
39,9	130' 11"	1	1	9

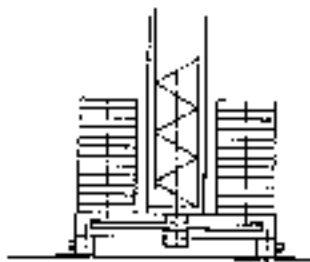


**STATIC CRANE WITH UNDERCARRIAGE
BEARING "R"**

HOOK HEIGHT		Tower Sections: Type and Quantity		
(m)	(feet)	TA3	TA	TA2
20,4	66' 11"	1	1	1
22,0	75' 2"	1	1	2
25,4	83' 4"	1	1	3
27,9	91' 6"	1	1	4
30,4	99' 9"	1	1	5
32,8	106' 4"	1	1	6
35,4	116' 2"	1	1	7
37,8	124' 4"	1	1	8
40,4	132' 7"	1	1	9

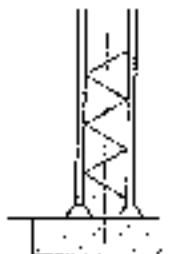


TRAVELLING CRANE ON UNDERCARRIAGE BEARING "T"



HOOK HEIGHT		Tower Sections: Type and Quantity		
(m)	(feet)	TA3	TA	TA2
20,5	67' 3"	1	1	1
22,5	73' 10"	1	1	2
25,5	82' 3"	1	1	3
27,5	90' 3"	1	1	4
30	98' 5"	1	1	5
32,5	109' 5"	1	1	6
35	114' 10"	1	1	7
37,5	123'	1	1	8

**STATIC CRANE WITHOUT UNDERCARRIAGE
BEARING "R"**



HOOK HEIGHT		Tower Sections: Type and Quantity		
(m)	(feet)	TA3	TA	TA2
19,1	62' 8"	1	1	1
21,8	70' 10"	1	1	2
24,3	79' 1"	1	1	3
26,6	87' 3"	1	1	4
28,1	95' 6"	1	1	5
31,6	103' 9"	1	1	6
34,1	111' 1"	1	1	7
36,6	120' 1"	1	1	8
39,1	129' 3"	1	1	9

3.11 MAIN CRANE COMPONENTS

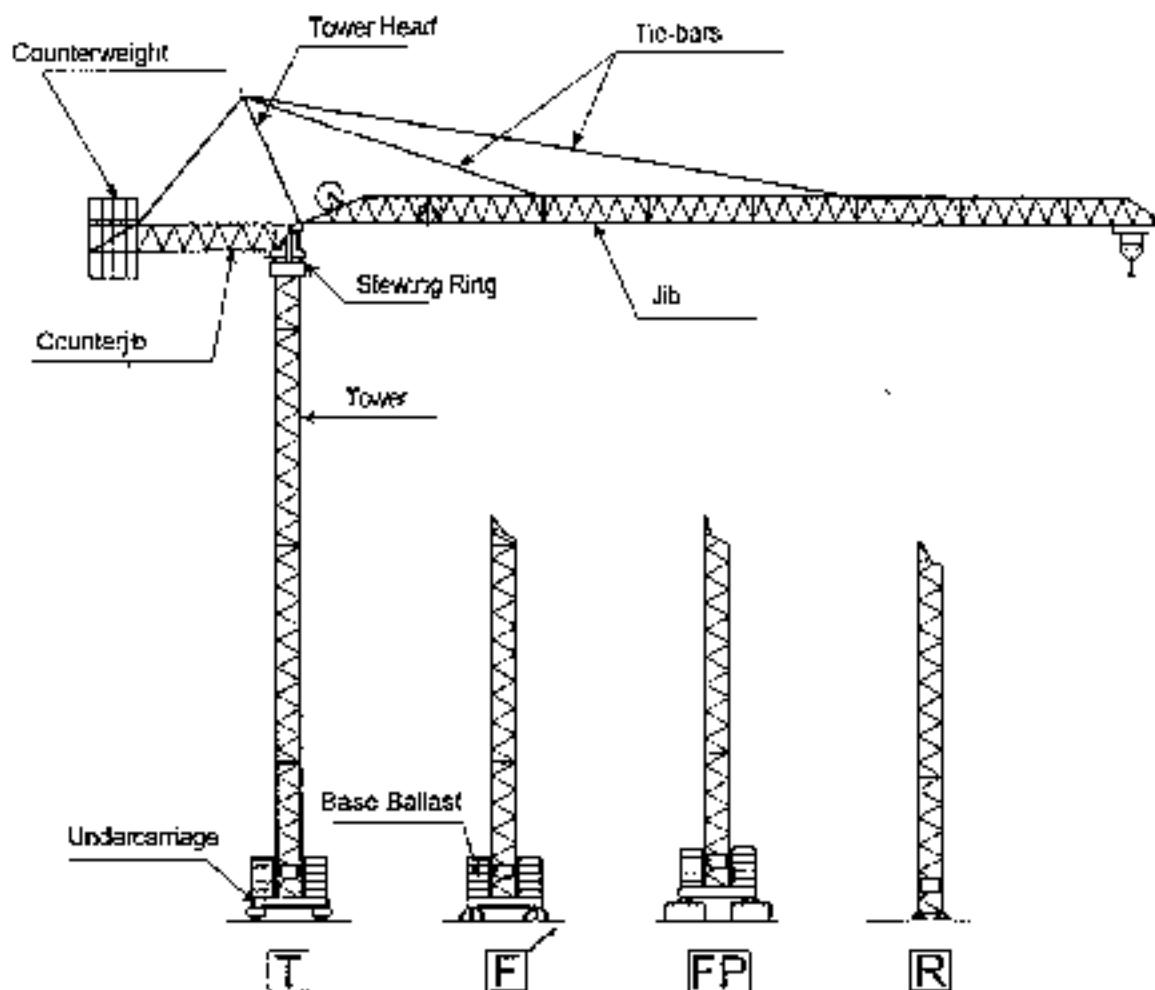


Fig. 3.11.1

Undercarriage

The undercarriage is available in three versions: "F", "FP" and "R". The tower carries stresses directly onto the beams.

It has a 3.8 m × 3.8 m (12' 6" × 12' 6") bearing surface.

Base ballast

It consists of self-supporting blocks made of reinforced concrete that uniformly distribute their weight on the base supports through the structure of the undercarriage.

Tower

In all crane configurations, the bottom section is "TA3" type (6 m / 19' 8" long).
The remaining tower sections are "TA2" type (2.5 m / 8' 2" long), "TA1" type (5 m / 16' 5" long) or "TA" type (10 m / 32' 10" long).

Counterjib

Made up of hollow bars, it is equipped with a catwalk protected by safety rails to the operator's base.
The counterweight is placed on it.

Slewing unit

It consists of two elements: the upper and lower slewing ring support with the slewing ring placed in the middle. It is placed on the top of the tower.
The jib, counterjib and tower head are hinged to it.
The slewing unit is also equipped with side rails allowing to reach the control cab, the counterjib and the jib, as well as to service the slewing drive unit.

Tower head

Triangle-shaped, it is made of hollow bars. The jib tie-bars holding the jib and counterjib are pin-connected on the top of it.

Jib

It consists of 8 triangle-sectioned elements (standard crane with 51 m / 167' 4"-jib) made of square-hollow bar spars and round-hollow bar diagonals.
It is equipped with a catwalk up to the end of the first section. It is also equipped with safety cable for attaching people's safety belts when servicing the trolley winch.
It can be assembled in the 51 m, 48 m, 45 m, 42 m, 39 m, 34 m and 31 m (167' 4", 157' 6", 147' 8", 137' 10", 127' 12", 111' 7" and 101' 9") versions (fig. 3.2.1).

Counterweight

It consists of five blocks with total weight 14.500 kg (31970 lbs) (standard crane with 51m / 167' 4" jib). They are self-supporting type, made of reinforced concrete and placed in the proper compartment located on the rear of the counterjib.

Tie-bars

They're made of round and flat bars, which are pin-connected each other and hinged to the tower head.
They hold jib and counterjib.

3.12 DRIVE ASSEMBLIES

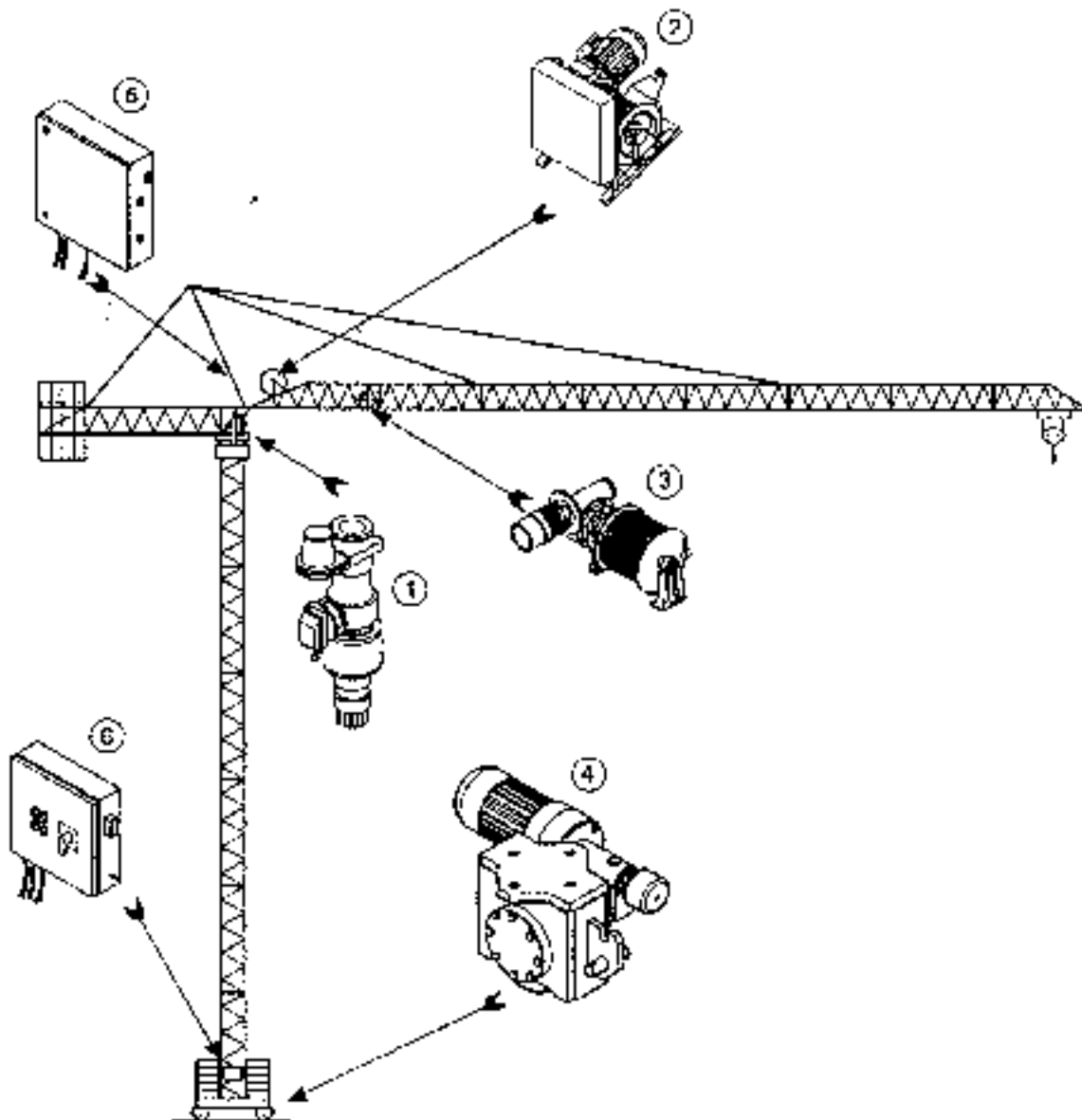


Fig. 3.12.1

- 1) SLEWING REDUCTION GEAR
- 2) HOIST WINCH
- 3) TROLLEY TRAVERSING WINCH
- 4) TRAVELLING UNIT
- 5) MAIN ELECTRICAL BOX
- 6) SHUNT BOX (CDI)

3.12.1 Slewing SSR 1 1 50

The slewing motor allows 3 speeds varying from 0 and 0.9 r.p.m.

A 50 Nm (37 lbs) eddy current motor brake allows jerk-free accelerations and decelerations to ensure a smooth load movement.

The unit incorporates a limit switch to prevent slewing through more than 1.5 complete turns in the same direction.

At the end of this stroke, reverse the manoeuvre to prevent twisting of and damage to the power cables which run up the mast right through the slewing unit.



Motor

Feeding:
Type:
Power:
R.p.m.:
Cooling:

Three-phase 400 V 50 Hz
I,emy LSA 112 M1 FCOL RQ/2
50 Nm (37 lbs)
1300 approx.
Forced ventilation by electric fan

Reduction gear

Epicycloidal in line with the motor :
Max. output torque:
Reduction:
Lubrication:
Pinion:

TRASMITAL 735 T3 (735 TS ⇒ 460 V - 60 Hz)
1000 daNm (7380 ftlbs)
1/152 (1/163 ⇒ 460 V - 60 Hz)
oil/grease
No. 14 teeth, module 8

Slewing ring

Type:
Teeth no :
Module:
Fixing bolts:

E 2 120.401
148
8
No. 40 × 2 COMEDIL special bolts M18

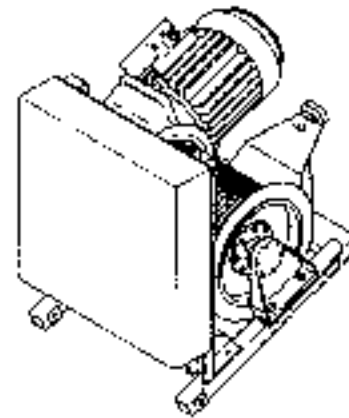
Service brake

Type:
Feeding:
Resistant torque:

Passive shoe brake FCO 112 I emy
20 Vdc
2 daNm (10 ftlbs)

3.12.2 Hoist winch (20 AG 30 HB - 25 AG 30 HB)

The hoist winch is driven by a three-phase electric motor and allows three different speeds varying according to the motor type installed (see paragraph 3.4).



Motor

Type:	<i>Patay PV 54 D / 120 L</i>
Feeding:	<i>Three-phase current 400 V 50 Hz</i>
Power:	<i>14.7 kW to 18.3 kW (20 to 25 HP)</i>
R.p.m.:	<i>350 / 1400 / 2800</i>
Cooling:	<i>Forced ventilation by electric fan (only for 18.3 kW / 25 HP)</i>

Reduction gear

Type:	<i>COMEDIL "RA"</i>
Max. output torque:	<i>900 daNm (6640 ftlbs)</i>
Reduction:	<i>1/37</i>
Lubrication:	<i>Oil bath</i>

Drum for winch 20 AG 30 HB

Winding diameter:	<i>0.4 m (1' 4")</i>
Edge external diameter:	<i>0.52 m (1' 8")</i>
Width:	<i>0.46 m (1' 6")</i>
Rope housing:	<i>Left helical</i>
Rope working length:	<i>200 m (656') su quattro strati</i>

Drum for winch 25 AG 30 HB

Winding diameter:	<i>0.5 m (1' 8")</i>
Edge external diameter:	<i>0.62 m (2')</i>
Width:	<i>0.46 m (1' 6")</i>
Rope housing:	<i>Left helical</i>
Rope working length:	<i>246 m (807') su quattro strati</i>

Rope for winch 20 AG 30 HB and 25 AG 30 HB

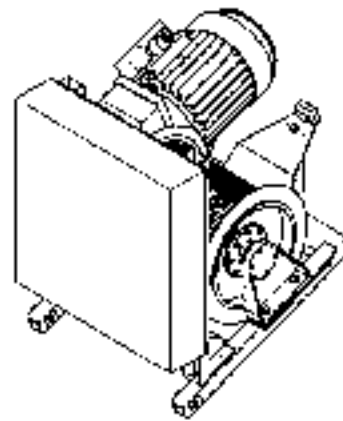
Diameter:	<i>12 mm</i>
Type:	<i>133 twisting-resistant wires</i>
Breaking strength:	<i>16300 daN (23150 lbs)</i>
Spiral:	<i>Right</i>

Service brake 20 AG 30 HB and 25 AG 30 HB

Type:	<i>Passive disc brake FCPL 54 Leroy</i>
Feeding:	<i>40 Vdc</i>
Resistant torque:	<i>15 to 25 daNm (110 ftlbs to 180 ftlbs)</i>

3.12.2.1 *Hoist Winch (OPTIONAL)* (33 AG 30 HB)

The hoisting winch is driven by a three-phase electric motor and allows three different speeds varying according to the motor type installed (see paragraph 3.4).



Motor

Type:	<i>DASHL 6 BESOZZI</i>
Feeding:	<i>Three-phase current 400 V 50 Hz</i>
Power:	<i>24.3 kW (33 HP)</i>
R.p.m.:	<i>350 / 1400 / 2800</i>
Cooling:	<i>Forced ventilation by electric fan</i>

Reduction gear

Type:	<i>COMEDIL "RA"</i>
Max. output torque:	<i>900 daNm (6640 lbs)</i>
Reduction:	<i>1/27.5</i>
Lubrication:	<i>Oil bath</i>

Drum

Winding diameter:	<i>0.5 m (1' 8")</i>
Edge external diameter:	<i>0.62 m (2')</i>
Width:	<i>0.46 m (1' 6")</i>
Rope housing:	<i>Left helical</i>
Rope working length:	<i>246 m (807') on four layers</i>

Rope

Diameter:	<i>12 mm</i>
Type:	<i>133 twisting-resistant wires</i>
Breaking strength:	<i>10300 daN (23150 lbs)</i>
Spiral:	<i>Right</i>
Length:	<i>246 m (807') on four layers</i>

Service brake

Type:	<i>Passive double-disc brake MS 200 DD</i>
Feeding:	<i>40 Vdc</i>
Resistant torque:	<i>50 daNm (370 lbs)</i>

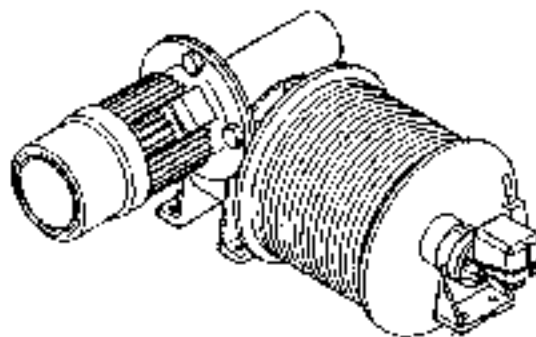
3.12.3 Trolley traversing type AD 22

The trolley winch powers 1.1/22 kW (1.3 HP).

Driven by a A.C. two polarity motor, it allows two speeds: 23 and 46 r.p.m. (75' 6" e 150' 11").

The reduction gear is worm type in oil bath.

On one side the drum is splined to the reduction gear; on the other side it is held by strong supports.



Motor

Feeding:

Type:

Power:

R.p.m.:

Cooling:

Three-phase current 400 V - 50 Hz

Leroy LS 100 LS DP / BESOZZI MCFA 100

2.2 kW (3 HP)

1400 / 2800

Self-ventilated

Reduction gear

Type:

Max. output torque:

Reduction:

Lubrication:

STM RMI 130

300 daNm (2210 ftlbs)

1/70

"Long-Life" oil bath

Drum

Winding diameter:

Edge external diameter:

Width:

Rope housing:

Rope working length:

0.407 m (1' 4")

0.43 m (1' 5")

0.323 m (1' 1")

Left helical

51 m (167' 4")

Rope

Diameter:

Spire:

Length:

7 mm

Dostra

1 x 60 m (196' 10") + 1 x 110 m (360' 11")

(51-m / 167' 4" jib)

For CRANE version 10-30

Type:

Breaking strength:

114 wires • Metal core

3430 daN (7710 lbs)

For CRANE version 10-60

Type:

Breaking strength:

DSC.9.153

4070 daN (9150 lbs)

Service brake

Type:

Feeding:

Resistant torque:

Passive disc brake FCI Leroy/Besozzi 100 S1

40 Vdc / 24 Vdc

2 daNm (10 ftlbs)

3.12.3.1 *Trolley Traversing Winch DSR 3 50 (OPTIONAL - 50 Hz)*

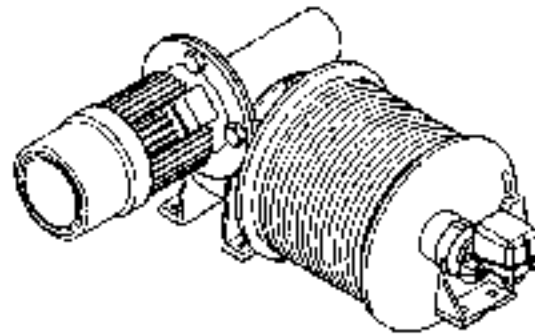
The trolley winch power is 50/40 Nm (37/30 ftlbs).

The two-speed motor is always equipped with an addy current drag brake.

This allows jerk-free acceleration/deceleration and ensures smooth load movement when passing from one speed to another. The speeds achieved are 10/30/60 m/min (32' 10" - 98' 5" - 196' 10").

The reduction gear is worm type in oil bath

On one side the drum is spined to the reduction gear; on the other side it is held by strong supports



Motor

Feeding:	Three-phase current 400 V - 50 Hz
Type:	BESOZZI ANMR 6
Power:	50/40 Nm (37/30 ftlbs)
R.p.m.:	1400 / 2800
Coating:	Self-ventilated

Reduction gear

Type:	STM RM1 130
Max output torque:	300 daNm (2210 ftlbs)
Reduction:	1/56
Lubrication:	"Long-Life" oil bath

Drum

Winding diameter:	0.407 m (1' 4")
Edge external diameter:	0.43 m (1' 5")
Width:	0.323 m (1' 1")
Rope housing:	Left helical
Rope working length:	51 m (167' 4")

Rope

Diameter:	7 mm
Spiral:	Destra
Length:	1 x 60 m + 1 x 110 m (196' 10" + 360' 11") (51 / 167' 4" m jib)

For CRANE version 10-30

Type:	114 wires + Metal core
Breaking strength:	3430 daN (7710 lbs)

For CRANE version 10-60

Type:	DSC.9.153
Breaking strength:	4070 daN (9150 lbs)

Service brake

Type:	Passive disc brake Be c. ti 100 S1
Feeding:	24 Vdc
Resistant torque:	2 daNm (15 ftlbs)

**3.12.32 Trolley Traversing Winch DSR 3 50
(OPTIONAL - 60 Hz)**

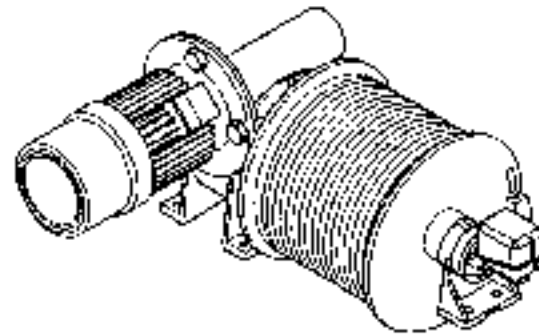
The trolley winch power is 50/40 Nm (37/30 ftlbs).

The two-speed motor is always equipped with an addy current drag brake

This allows jerk-free acceleration/deceleration and ensures smooth load movement when passing from one speed to another. The speeds achieved are 10/30/60 m/min (32' 10" / 98' 5" / 198' 10").

The reduction gear is worm type in oil bath.

On one side the drum is splined to the reduction gear, on the other side it is held by strong supports.


Motor

Feeding:	Three-phase current 400 V - 50 Hz
Type:	BESOZZI ANMR 6
Power:	50/40 Nm (37/30 ftlbs)
R.p.m.:	1700 / 3200
Cooling:	Self-ventilated

Reduction gear

Type:	STM RMI 130
Max. output torque:	300 daNm (2210 ftlbs)
Reduction:	1/70
Lubrication:	"Long-Life" oil bath

Drum

Winding diameter:	0.407 m (1' 4")
Edge external diameter:	0.43 m (1' 5")
Width:	0.323 m (1' 1")
Rope housing:	Left helical
Rope working length:	51 m (167' 4")

Rope

Diameter:	7 mm
Spiral:	Destra
Length:	1 x 60 m + 1 x 110 m (196' 10" + 360' 11") (51 / 167' 4" m jib)

For CRANE version 10-30

Type:	114 wires + Metal core
Breaking strength:	3430 daN (7710 lbs)

For CRANE version 10-60

Type:	DSC.9.153
Breaking strength:	4070 daN (9150 lbs)

Service brake

Type:	Passive disc brake Besozzi 100 S1
Feeding:	24 Vdc
Resistant torque:	2 daNm (10 ftlbs)

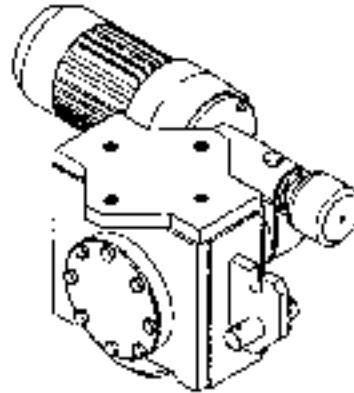
3.12.4 Travelling TAD 2 P 1 3

Travelling is controlled by two 3 kW (4 HP)-power units.

These are driven by a.c. motors which allow a speed of 24 m/min (78' 9" /min).

A hydraulic coupling is placed between the motor and the reduction gear thus allowing motion to start gradually.

Each bogie is equipped with one wheel



Motor

Feeding:

Three-phase current

Type:

Leroy LSA 100

Power:

3 kW (4 HP) x 2

R.p.m.:

1400 (1700 ⇒ 460 V - 60 Hz)

Cooling:

Self-ventilated

Reduction gear

Type:

Combined - Brevini EM 1045/RM185

Max. output torque:

250 daNm (1840 lbs)

Reduction:

1/51.7 (1/72.5 ⇒ 460 V - 60 Hz)

Lubrication:

Oil bath

Wheel

Type:

with side guide edges

Diameter:

0.3 m (12")

Service brake

Type:

Passive disc brake FMFR 125

Feeding:

40 Vdc

Resistant torque:

2.5 daNm (20 lbs)

4 PREPARATION OF THE JOB SITE

4.1 INTRODUCTION

The responsibility for the preparation of the crane job site rests entirely with the crane user. Any clearing, leveling, building up or reinforcing of the ground where the crane will be positioned and operated shall be carried out by him, as well as the verification of feasibility of the different crane installations proposed by the manufacturer.

4.2 CHECKING THE GROUND CONSISTENCY

The primary requirements to be met at the job site before the arrival of the crane are: concrete foundations, ground beneath the ballast placed under the undercarriage or rail tracks, depending on the crane configuration chosen.

The installation of such elements depends particularly on the type of ground and foundation on which these assemblies are to be placed, as well as on the crane own characteristics.

The Buyer therefore must carry out a careful inspection and analysis of the ground consistency on which the crane shall stand.



Attention: When close to diggings, slopes, banks, etc., keep such a safety margin as to grant a load distribution angle of 45°.

The safety distance depends also on the ground characteristics (water-quantity, friction, etc.).

Should ground conditions be critical, provide against sinkings with a containment concrete wall (fig. 4.2.1).

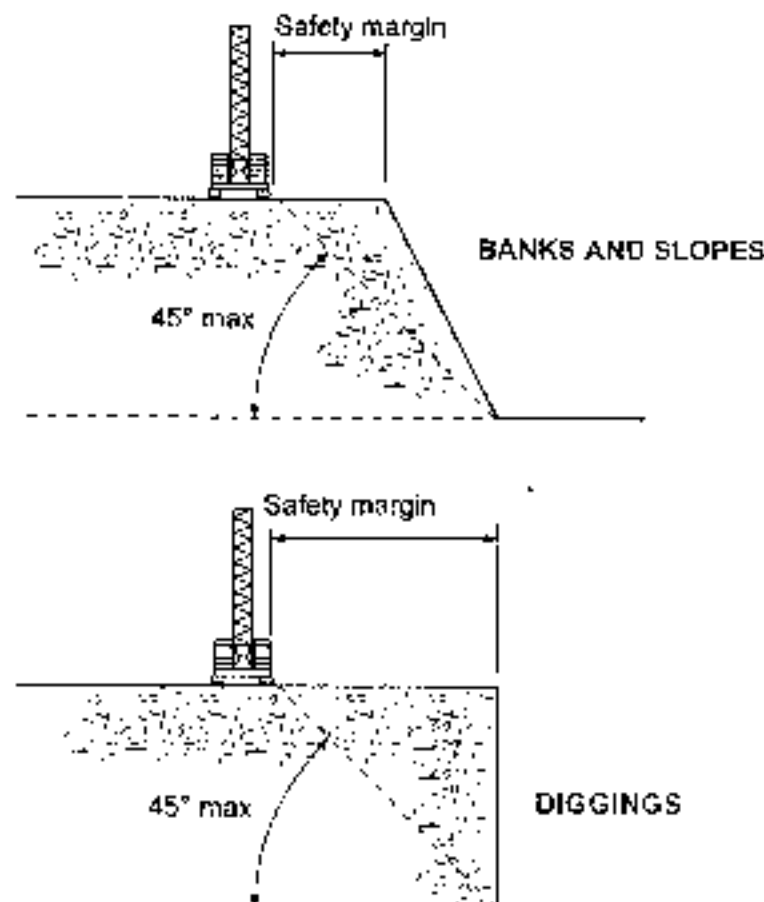


Fig. 4.2.1

4.3 CHECKING THE CRANE INSTALLATION AREA

When choosing the location for the crane at the job site, the Client shall be particularly careful to ensure that the crane is not obstructed during its operational movements. Likewise he shall verify that, when the crane is out of service, its free slewing doesn't allow it to come in contact with existing buildings, buildings under construction, stored materials, scaffolding, adjacent cranes, machines, installations, cables, trees, etc. (fig. 4.3.1).

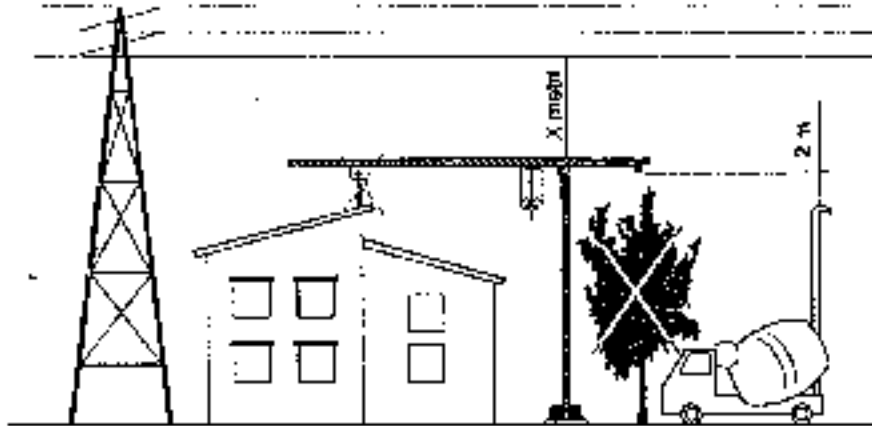


Fig. 4.3.1

If the crane is working near electrical lines, precautionary measures shall be taken to prevent any crane part or the load from entering into the danger zone area shown in fig. 4.3.2.

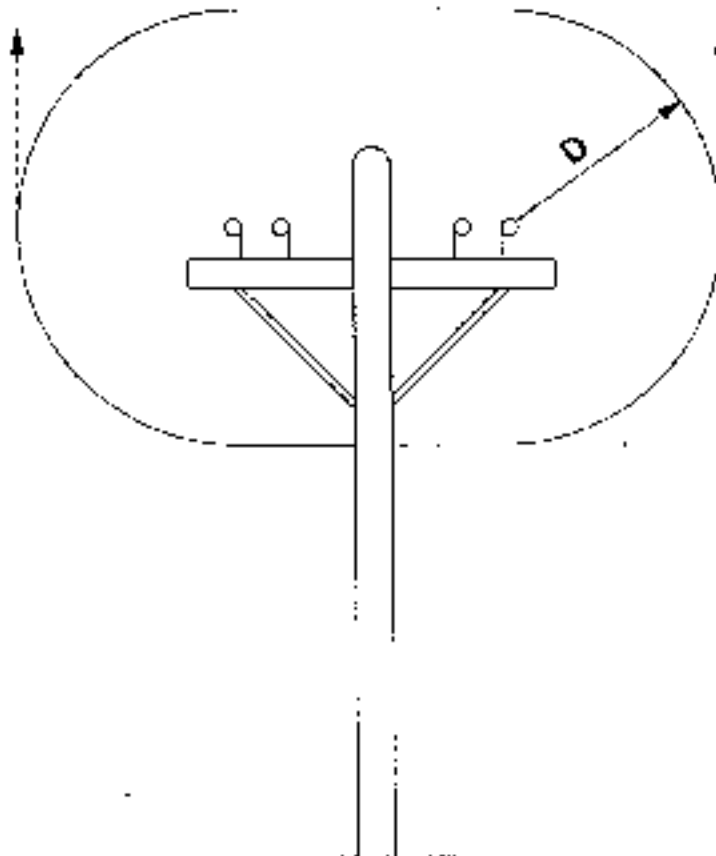


Fig. 4.3.2

4.4 INTERFERING CRANES

When two or more cranes working at close range in the same job site can interfere each other, the following precautions must be taken:

- A) jibs must be offset to avoid collision of any structural parts considering the maximum oscillation amplitude and a reasonable safety distance;
- B) the minimum distance between the two cranes must be great enough to prevent the cables and loads of the higher crane from interfering with the lower crane;

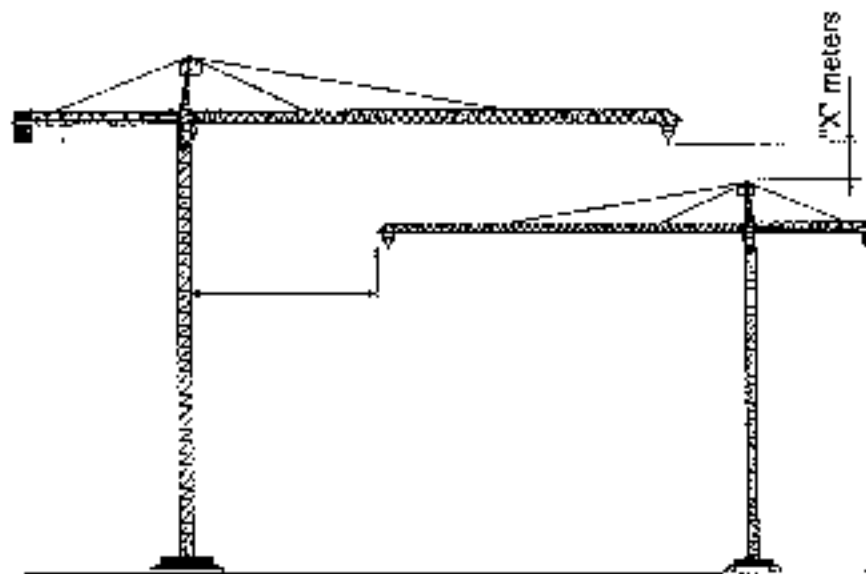


Fig. 4.4.1

"X" distance depends on the dimensions of the loads

- C) electrical or radar anti-collision devices can be installed to limit the crane working range. Always consult the **Manufacturer** for the installation of this safety device

Remember that cranes must be always offset in height to avoid any interference when out of service.

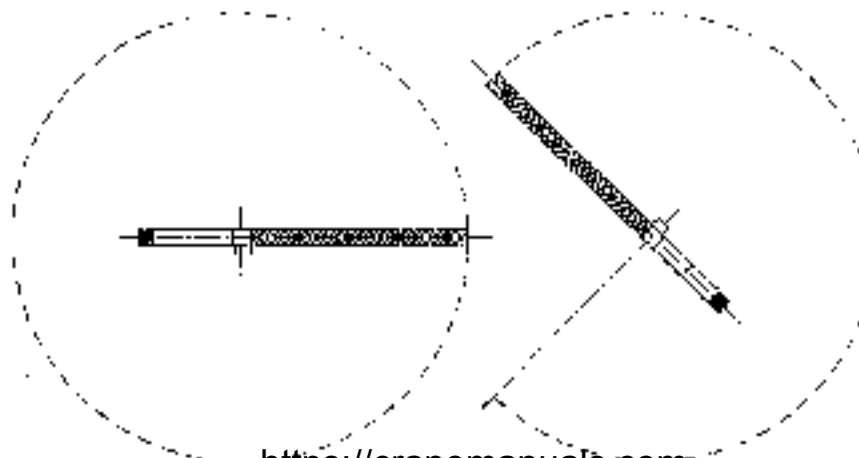


Fig. 4.4.2

REQUIRED CLEARANCE FROM HIGH VOLTAGE POWER LINES					
Normal Voltage [KV]				Minimum Clearance D	
Operations near High Voltage Power Lines				[m]	[ft]
to 50				3	10
over 50	to	200	4.5	15	
over 200	to	350	6	20	
over 350	to	500	7.5	25	
over 500	to	750	10.5	35	
over 750	to	1000	14	45	

Table 4.3.1

Caution shall be exercised when working near overhead lines because they can move horizontally or vertically due to wind, moving the danger zone shown in figure 4.3.2 to new positions.

A qualified signperson shall be assigned to observe the clearance when the crane moves to within a jib's length of the Table 4.3.1 limits. Actually the crane operator is not in the best position to judge distance between the power line and the crane or its protuberances.

When a crane is installed in proximity to power lines, durable signs shall be installed at the operator's station and on the base of the crane, warning that electrocution or serious bodily injury may occur.

Anyhow, before the commencement of operations near electrical lines, the person responsible for the job shall notify the owners of the lines or their authorized representatives, providing them with all pertinent information and requesting their cooperation to determine the proper safety distance according to the line power.

4.5 LOADS ON THE GROUND

The tables show the loads on the ground for the different crane configurations according to the hook height.

The above loading specifications include static and dynamic safety factors as provided for by the standards set forth at para. 3.1.



The data shown herein are applicable only to the specific crane configuration indicated. Do not interpolate or extrapolate the data.



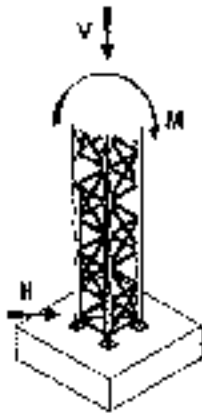
Any deviations from the prescribed and recommended data and specifications could result in a defective foundation and damage to and even collapse of the tower crane.

The contractor is responsible for damage caused by an incorrectly prepared foundation or by neglecting the site conditions.

TWISTING MOMENT

GTS 511/A s12 98 E 01			
Jib Configurations		Twisting Moment (M)	
(T)	(M)	(Nm)	(lbs)
All		120	88,500

Note: Twisting moment concerns in-service crane (for out-of-service crane, twisting moment is always 0). It considers the dynamic safety factor as provided for by the standards set forth at para. 3.1.



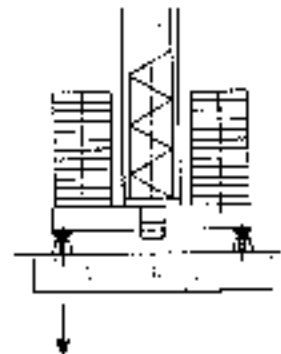
- V = Axial Load
- M = Twisting Moment
- H = Horizontal Thrust (diagonal to the tower)

STATIC CRANE WITHOUT UNDERCARRIAGE - CONFIGURATION "R"

Hook Height (m)	In Service			Out of Service		
	V (t)	M (t·m)	H (t)	V (t)	M (t·m)	H (t)
21,6	36,42	2,51	88,40	34,65	4,20	42,35
24,1	37,30	1,34	92,60	35,45	4,58	56,47
26,6	38,20	1,21	96,80	36,26	4,96	71,52
29,1	39,00	1,51	100,0	37,07	5,34	87,53
31,6	39,80	1,80	103,2	37,89	5,72	104,4
34,1	40,60	1,68	106,2	38,69	6,10	122,4
36,6	41,40	1,96	109,2	39,49	6,48	141,2
39,1	42,20	1,65	117,3	40,30	6,86	161,0

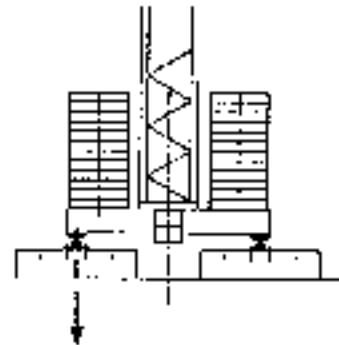
STATIC UNDERCARRIAGE - CONFIGURATION "F"

Hook Height (m)	In Service	Out of Service
	Max. Load on each Support (t)	Max. Load on each Support (t)
19,9	37,10	25,80
22,4	37,90	26,60
24,9	38,70	31,50
27,4	41,00	35,90
29,9	41,80	39,10
32,4	42,90	42,50
34,9	46,65	46,60
37,4	49,05	53,60
39,9	51,50	59,90

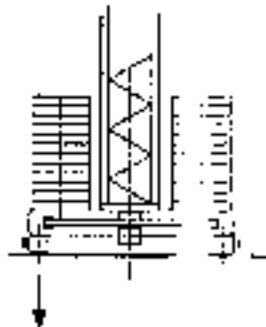


STATIONARY UNDERCARRIAGE CONFIGURATION "EP"

Hook Height [m]	In Service	Out of Service
	Max. Load on each Support [t]	Max. Load on each Support [t]
20,4	38,12	27,26
22,9	38,93	29,09
25,4	39,80	30,91
27,9	42,04	37,28
30,4	42,86	40,53
32,9	43,88	43,67
35,4	46,33	48,85
37,9	48,75	53,50
40,4	62,64	60,38

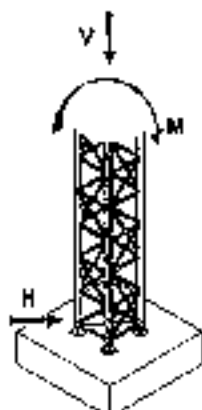


TRAVELLING UNDERCARRIAGE CONFIGURATION "T"



Hook Height [m]	In Service	Out of Service
	Max. Load on each Support [t]	Max. Load on each Support [t]
20,5	38,03	25,97
22,5	38,95	28,79
25,0	39,82	31,67
27,5	42,29	35,99
30,0	43,33	39,23
32,5	44,42	42,85
35,0	48,27	48,74
37,5	53,81	53,76

Sistema unità di misura americana



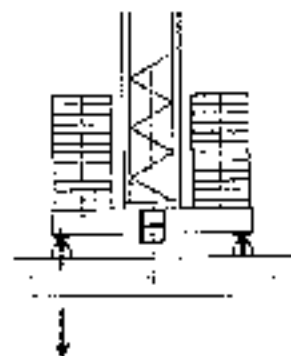
- V = Axial Load
- M = Twisting Moment
- H = Horizontal Thrust (diagonal to the tower)

STATIC CRANE WITHOUT UNDERCARRIAGE - CONFIGURATION "R"

Hook Height (feet)	In Service			Out of Service		
	Max. Load (lbs)	Max. Load (lbs)	Max. Moment (lbs feet)	Max. Load (lbs)	Max. Load (lbs)	Max. Moment (lbs feet)
70' 10"	82230	2850	671420	78150	10100	406550
75' 1"	82230	2850	671420	78150	10100	406550
81' 3"	85980	3330	723490	81720	11770	433260
85' 6"	85980	3330	723490	81720	11770	433260
91' 8"	89650	3700	782780	85300	13450	465200
95' 6"	89650	3700	782780	85300	13450	465200
103' 10"	93700	4080	848640	88850	15120	494610
111' 9"	93700	4080	848640	88850	15120	494610
120' 1"	93700	4080	848640	88850	15120	494610
128' 3"	93700	4080	848640	88850	15120	494610

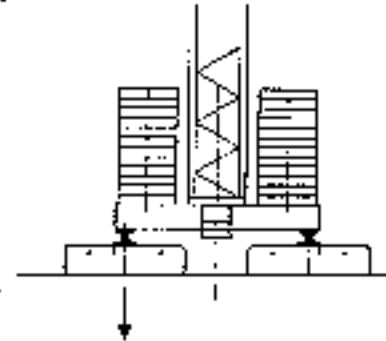
STATIC UNDERCARRIAGE - CONFIGURATION "F"

Hook Height (feet)	In Service	Out of Service
	Max. Load on each Support (lbs)	Max. Load on each Support (lbs)
65' 4"	61790	56690
73' 6"	63530	63050
81' 8"	65320	69443
89' 11"	90390	78920
98' 1"	92370	86200
108' 4"	94580	93700
114' 6"	102840	107140
122' 8"	108140	116170
130' 11"	113540	129850



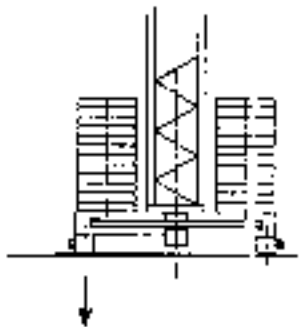
STATIC UNDERCARRIAGE CONFIGURATION "FP"

Hook Height [feet]	In Service	Out of Service
	Max. Load on each Support [lbs]	Max. Load on each Support [lbs]
66' 11"	84040	60100
75' 2"	85830	66120
83' 4"	87740	72550
91' 6"	92680	82140
99' 9"	94750	88560
107' 11"	96910	96940
115' 2"	102140	107690
124' 4"	107470	119830
132' 7"	115830	133110



TRAVELLING UNDERCARRIAGE CONFIGURATION "T"

Hook Height [feet]	In Service	Out of Service
	Max. Load on each Support [lbs]	Max. Load on each Support [lbs]
66' 11"	83840	57250
73' 10"	85870	63470
82' 11"	88010	69820
90' 5"	93230	79340
98' 9"	95530	85490
106' 8"	97930	94030
114' 10"	105420	107450
123'	112020	118520



4.6 BALLASTS

Preparation of the ballast

The ballast blocks must be prepared with maximum precision. They shall be installed once they have cured and exact weight established.

The weight of the counterweight blocks type "4", "5", "6" and "7" shall be within a tolerance of $\pm 2\%$.

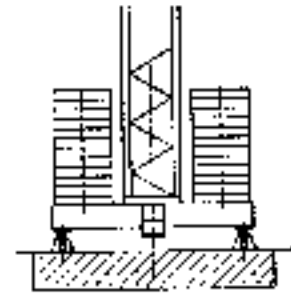
The manufacturing material shall have the following features:

- concrete grade 300;
- FeB 44K-type steel reinforcement.

4.6.1 Base Ballast

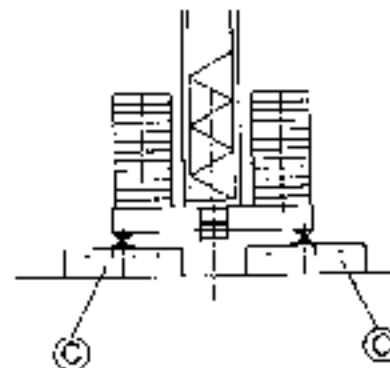
STATIC UNDERCARRIAGE CONFIGURATION "FP"

Hook Height [m]	Ballast Weight [t]	"A" Docks [No.]
10,9	35	14
22,4	40	16
24,9	40	16
27,4	45	18
28,9	45	18
32,4	45	18
34,9	50	20
37,4	60	24
39,9	65	26



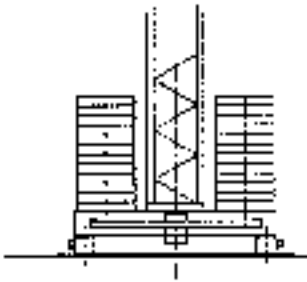
STATIC UNDERCARRIAGE CONFIGURATION "FP"

Hook Height [m]	Ballast Weight * [t]	"A" Docks [No.]
20,4	35	14
22,9	35	14
25,4	35	14
27,9	40	16
30,4	40	16
32,9	40	16
35,4	45	18
37,9	50	20
40,4	60	24



* Add no. 4 ballast blocks type "C" (2.500 kg each) to the base ballast...

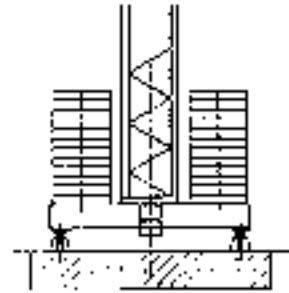
TRAVELLING UNDERCARRIAGE - CONFIGURATION "T"



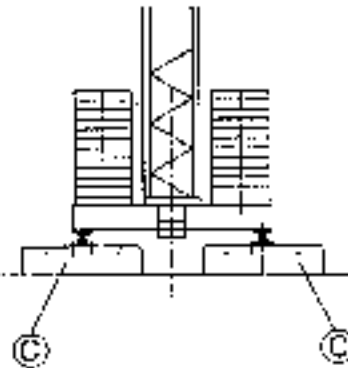
Hook Height [m]	Ballast Weight [t]	"A" Blocks [No.]
20,0	40	16
22,5	40	16
25,0	40	16
27,5	45	18
30,0	45	18
32,5	45	18
35,0	55	22
37,5	60	24


Sistema unità di misura americana
STATIC UNDERCARRIAGE CONFIGURATION "F"

Hook Height [feet]	Ballast Weight [lbs]	"A" Blocks [No.]
65' 4"	88180	16
73' 6"	88180	18
81' 8"	88180	18
89' 11"	99210	18
98' 1"	99210	18
106' 4"	99210	18
114' 8"	127250	22
122' 9"	132280	24
130' 11"	143300	26


STATIC UNDERCARRIAGE CONFIGURATION "EP"

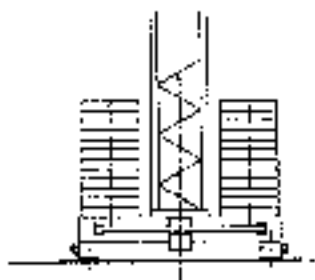
Hook Height [feet]	Ballast Weight * [lbs]	"A" Blocks [No.]
105' 11"	77160	14
75' 2"	77160	14
83' 4"	77160	14
91' 6"	88160	16
99' 9"	88160	16
107' 11"	88160	15
116' 2"	99210	16
124' 4"	110230	20
132' 7"	132250	24



* Add no. 4 ballast blocks type "C" (unitary weight 2500 kg / 5510 lbs) to the base ballast.

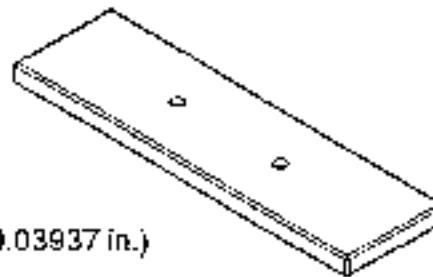
TRAVELLING UNDERCARRIAGE CONFIGURATION "T"

Hook Height [feet]	Ballast Weight [lbs]	"A" Blocks [No.]
65' 7"	66180	18
73' 10"	88180	16
82'	88180	16
90' 3"	99210	16
98' 5"	99210	18
106' 6"	99210	18
114' 10"	127250	22
122'	132280	24

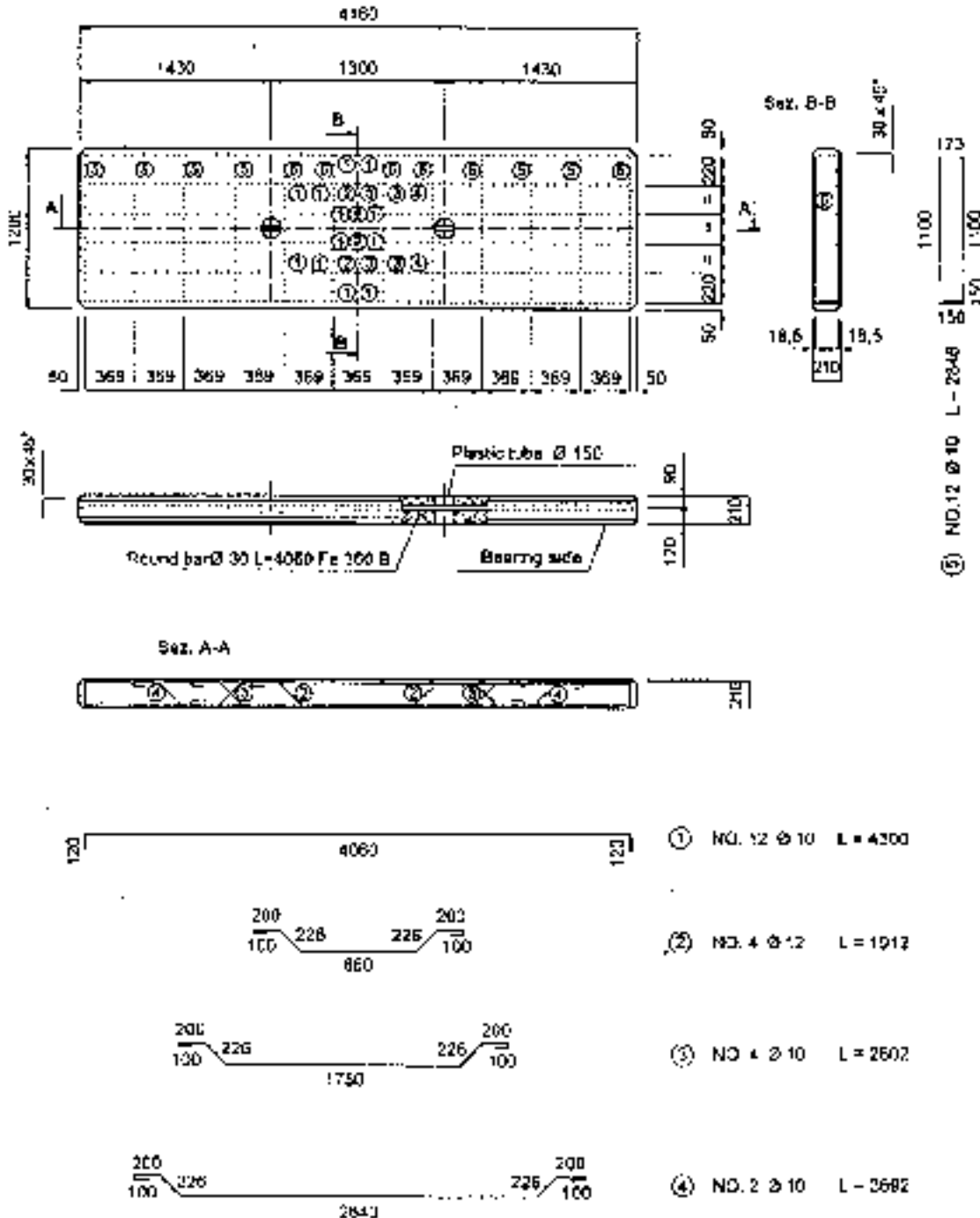


4.6.1.1 Base Ballast Type "A" (2500 kg / 5510 lbs)

Concrete specific weight:
2400 kg/m³ (150 lbs/feet³)



Dimensions are expressed in millimeters (1 mm = 0.03937 in.)



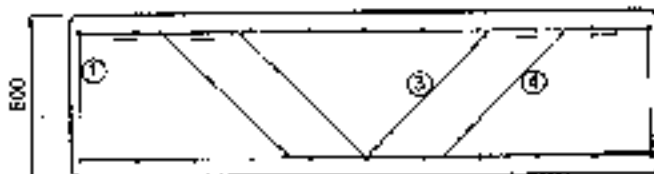
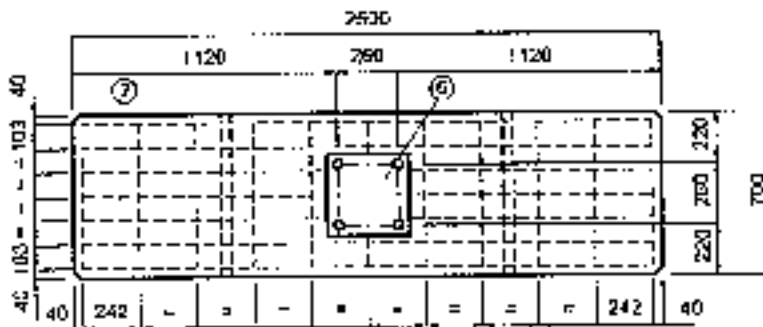
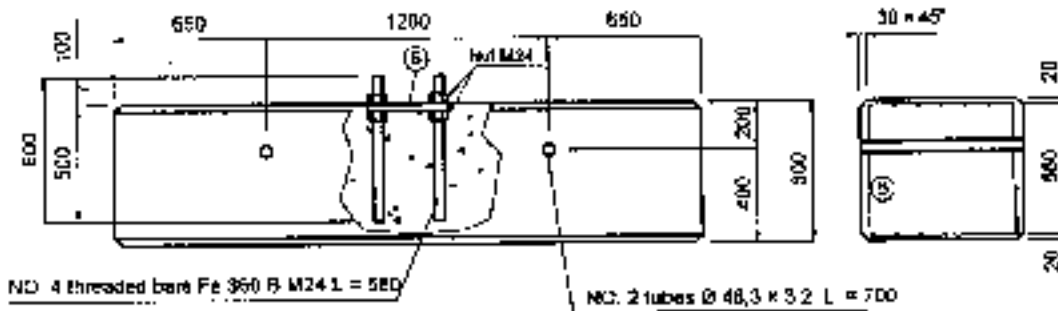
Bend iron bars "2", "3" and "4" 45° degrees

Fig. 4.6.1

4.6.1.2 **Base Ballast Type "C" (2500 kg / 5510 lbs)**
(placed under the undercarriage)

Take care that the tie-down bolts are perpendicular.

Concrete specific weight:
 2400 kg/m³ (150 lbs/feet³)

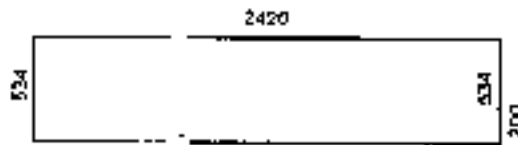


Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

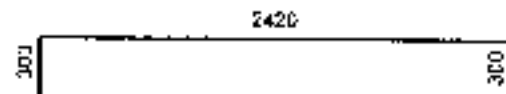
Fig. 4.6.2

Reinforcing rods for base ballast type "C"

① NO. 4 Ø 18 L = 6308



② NO. 8 Ø 18 L = 3020



③ NO. 3 Ø 12 L = 2160

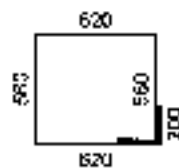


④ NO. 3 Ø 12 L = 2770

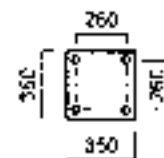


Bend brackets "4" and "5" 45 degrees

⑤ NO. 11 Ø 12 L = 2760



⑥ NO. 1 plate 8 mm thickness



4.6.2 Counterweight

Position on the counterjib the right number and type of ballast blocks shown in figure 4.6.3, which vary according to the jib length.

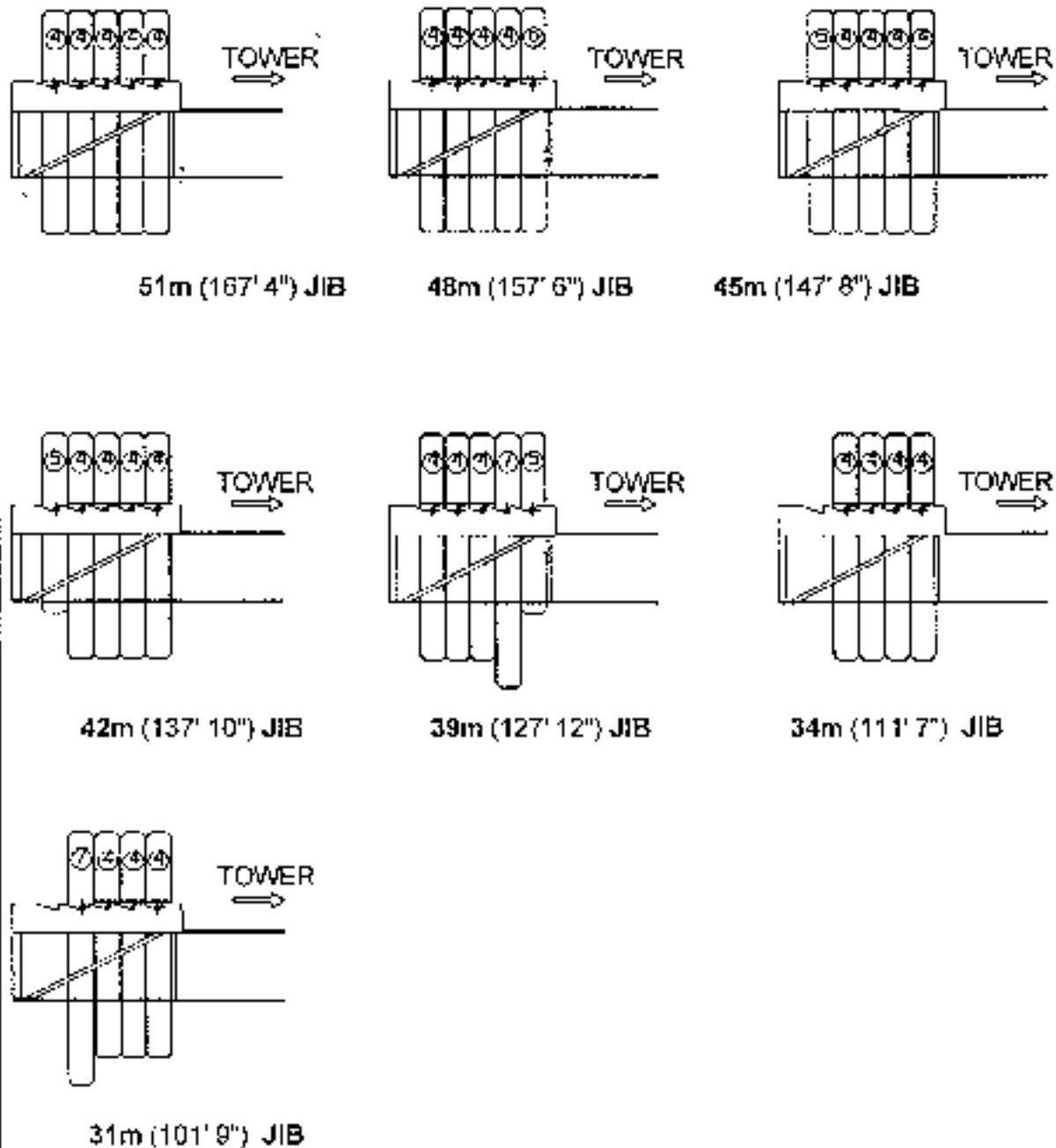
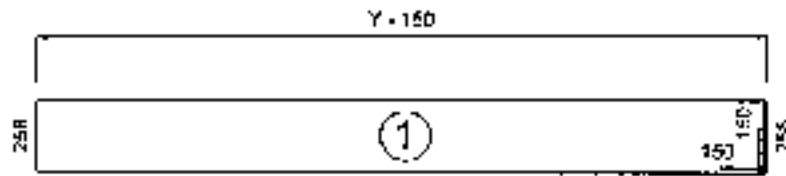


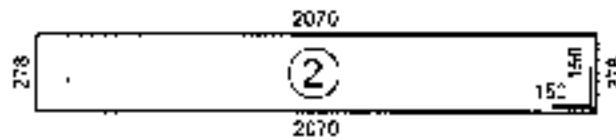
Fig. 4.6.3

Iron bars for counterweight type "4"

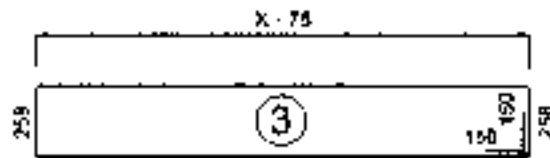
Dimensions are expressed in millimeters (1 mm = 0.03937 in)



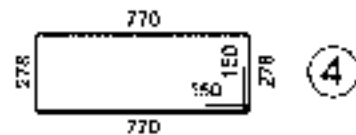
① NO. 6 Ø 10 L = 475



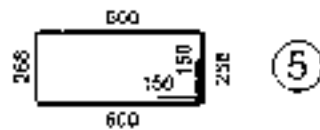
② NO. 4 Ø 8 L = 496



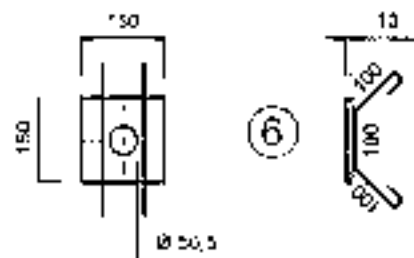
③ NO. 4 Ø 10 L = 441



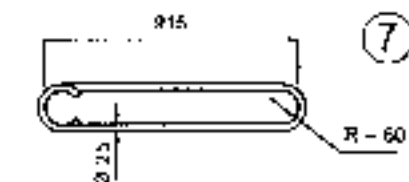
④ NO. 5 Ø 8 L = 296



⑤ NO. 6 Ø 10 L = 206



⑥ NU. 2



Fe 350 B

⑦ NO. 1 Ø 25 L = 2270
Hot bending

4.6.2.2 Counterweight Type "6" (2330 kg / 5140 lbs)

R.C. Total Specific Weight		[mm]		[inch]	
kg/m ³	lbs/feet ³	[mm]	[inch]	[mm]	[inch]
2300	144	1850	72.8	2775	109.2
2400	150	1720	67.7	2645	104.1
2500	156	1600	63	2525	99.4

Weight tolerance ±2%

Material:

Rck 300 grade concrete

FeB44k steel round bars

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

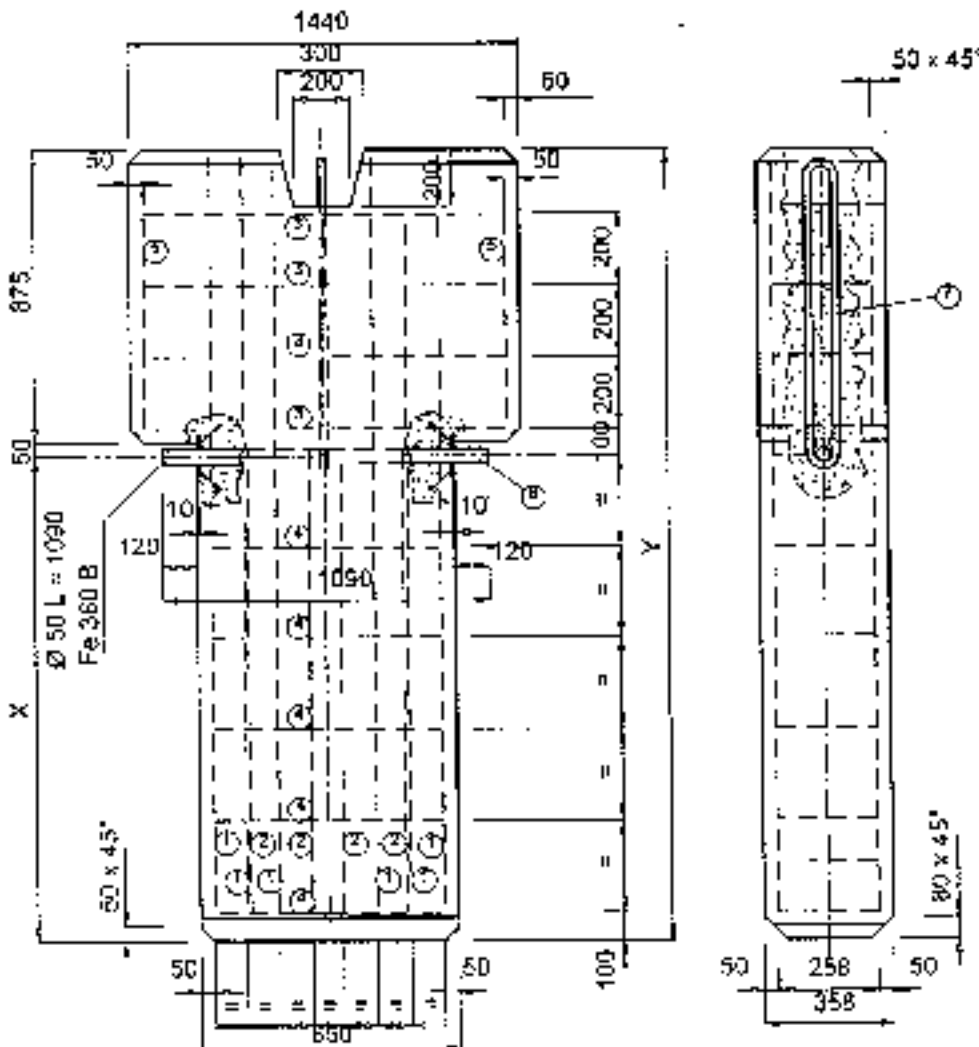
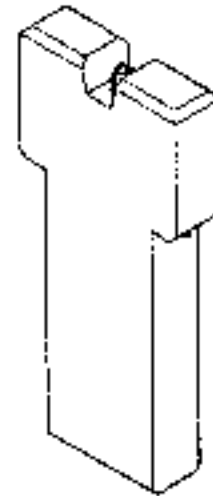
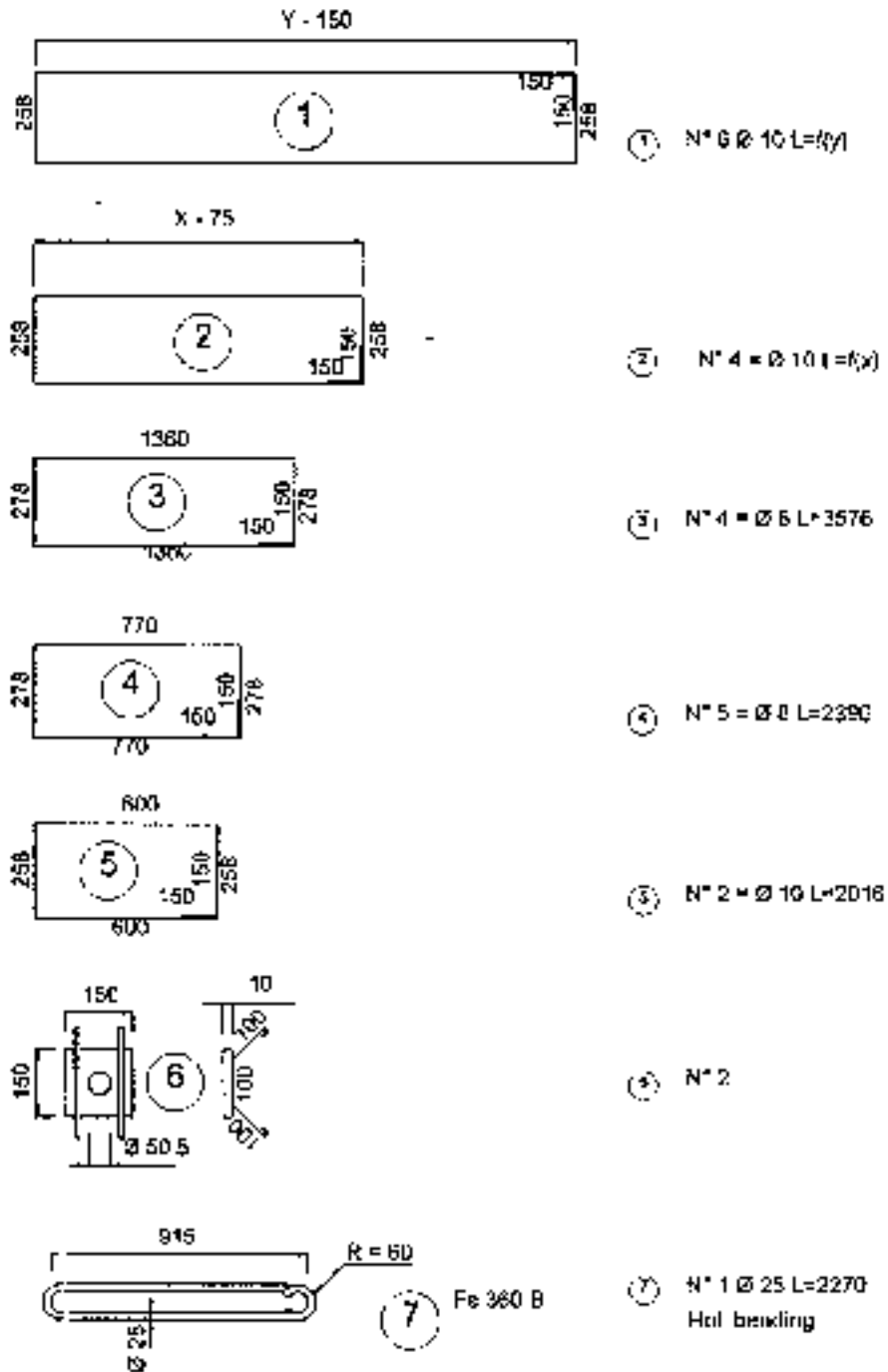


Fig. 4.6.6

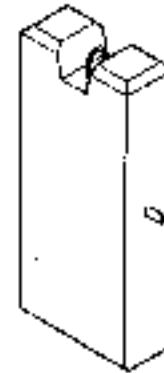
Iron bars for counterweight type "6"

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)



4.6.2.3 Counterweight Type "5" (1300 kg / 2870 lbs)

R.O. Total		Specific Weight		[mm] - [inch]	
kg/m ³	lbs/feet ³	[mm]	[inch]	[mm]	[inch]
2300	144	1216	47.8	1916	75.4
2400	150	1139	44.8	1839	72.4
2500	156	1068	42	1768	69.6



Weight tolerance ±2%

Material:
Rck 300 grade concrete
FeB44k steel round bars

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

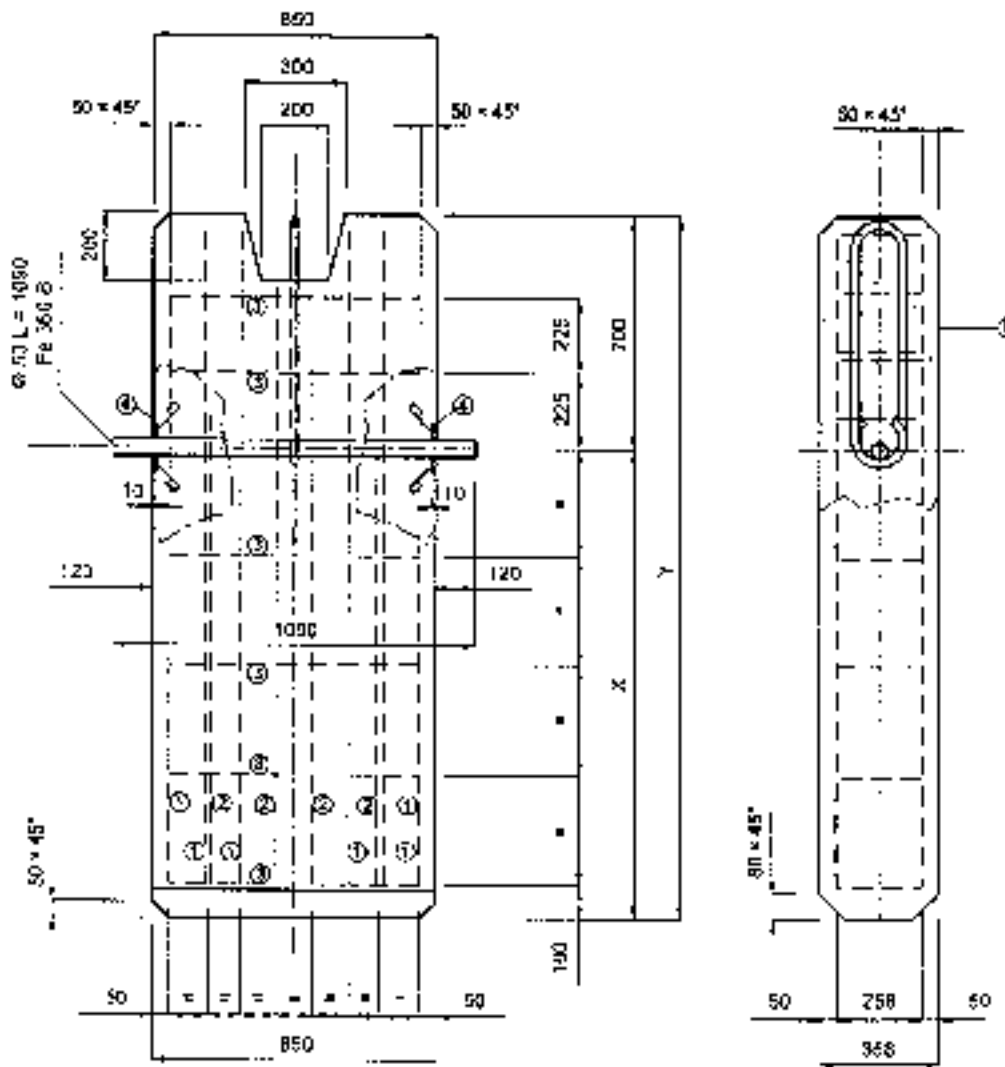
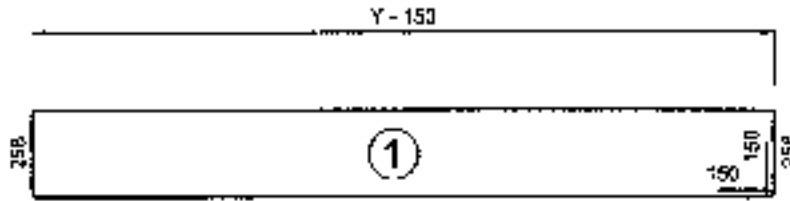


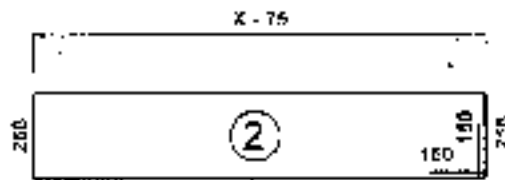
Fig. 4.6.6

Iron bars for counterweight type "5"

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)



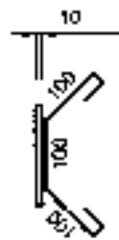
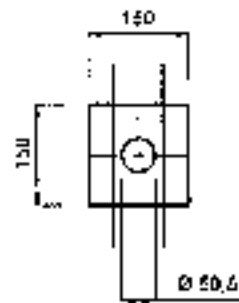
① NO. 8 Ø 10 L = (Y)



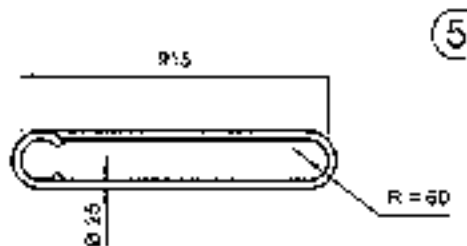
② NO. 4 Ø 10 L = (X)



③ NO. 8 Ø 8 L = 2356



④ NO. 2

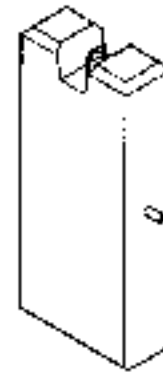


Fe 350 B

⑤ NO. 1 Ø 25 L = 2270
Hot bending

4.6.2.4 Counterweight Type "7" (1900 kg / 4190 lbs)

R.C. Total		X		Y	
kg/m	lbs/feet	(mm)	(inch)	(mm)	(inch)
2350	144	1875	73.8	2800	110.2
2400	150	1765	69.5	2690	105.9
2500	156	1650	65.3	2585	101.7



Weight tolerance $\pm 2\%$

Material:

Rck 300 grade concrete
FeB44k steel round bars

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

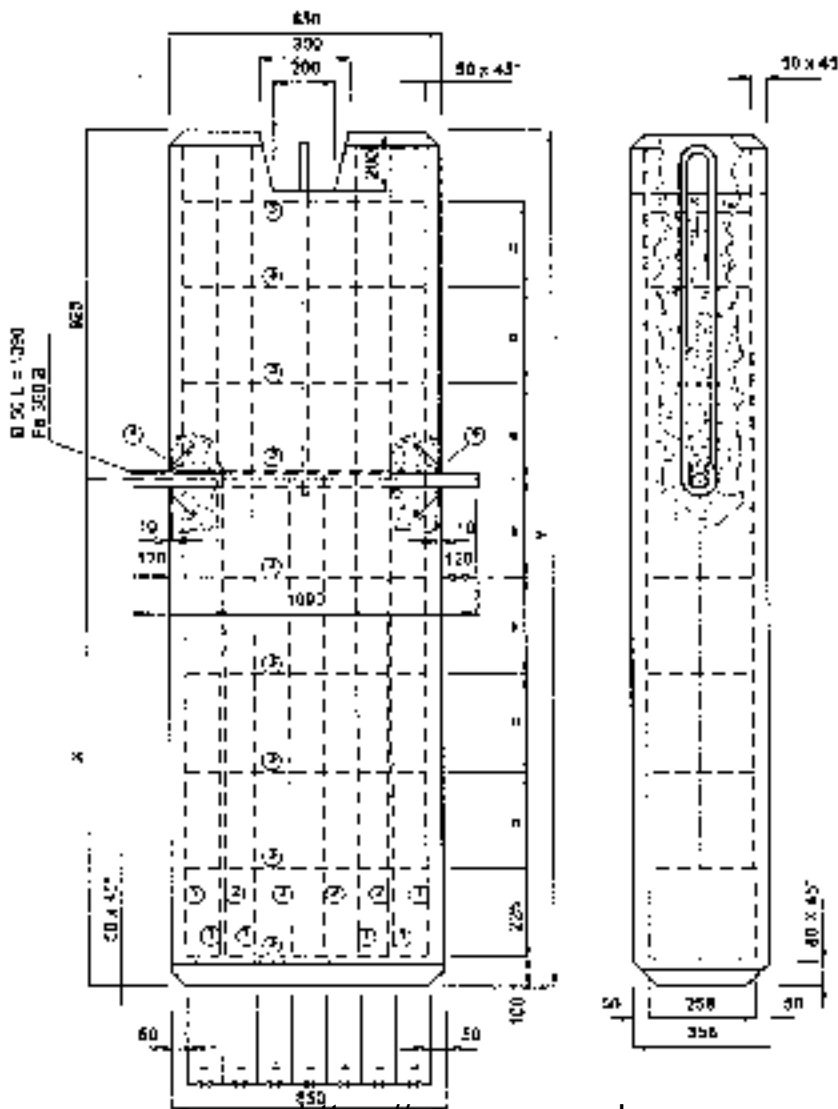
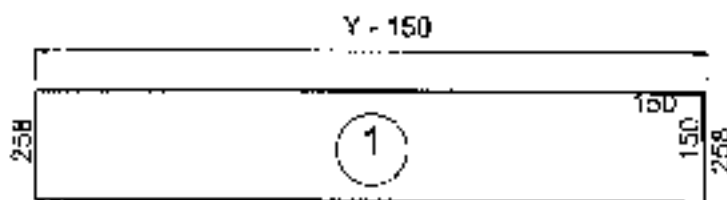


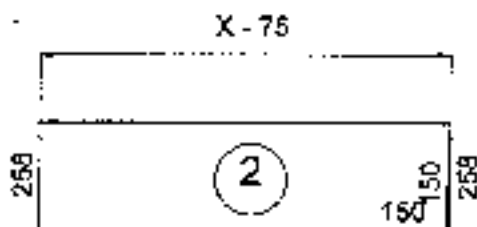
Fig. 4.6.7

Ferri per armatura zavorra tipo "7"

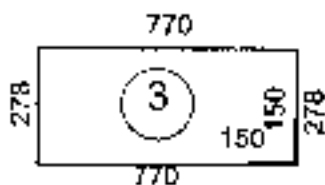
Dimensions are expressed in millimeters (1 mm = 0.03937 in.)



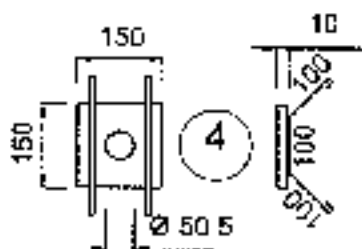
① N° 8 Ø 10 L=(y)



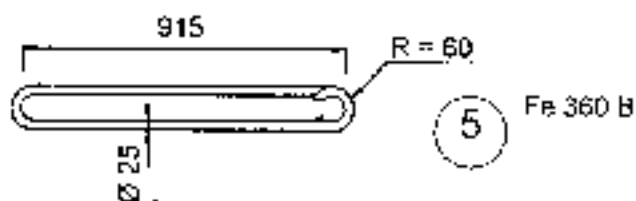
② N° 4 = Ø 10 L=f(x)



③ N° 9 = Ø 8 L=2395



④ N° 2



⑤ N° 1 Ø 25 L=2270
Hot bending

4.7 BASE SUPPORT CONFIGURATIONS

Comedi® just provides some general requirements concerning the dimensions of the supports. The actual dimensions shall be calculated by the customer according to the loads transmitted by the crane to the supports and the bearing capacity of the ground.

4.7.1 Configuration "R"



4.7.1.1 Preparing the concrete foundation

The dimensions of the concrete foundation must be calculated by the designer engineer responsible for the concrete works, who shall refer to the load values indicated in section 4.5 and to the ground resistance values measured.

The procedure to calculate the concrete foundation dimensions:

Positively $e = \frac{M + (H \times h)}{V + P} \leq \frac{L}{3}$ in cui:

- M = Overturning moment
- H = Horizontal thrust
- h = Concrete foundation height
- V = Axial load
- P = Concrete foundation weight

- $P = L^2 \times h \times \rho$
- L = Concrete foundation side
- $\rho = 24 \text{ kN/m}^3 \text{ (150 lbs/ft}^3\text{)}$
- f = Friction factor (ground/concrete)

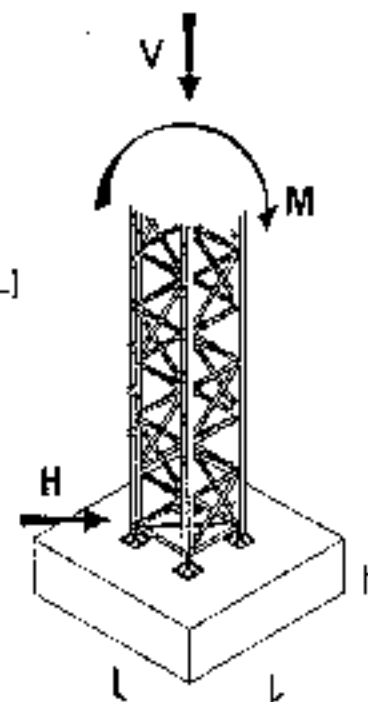
Two situations can ensue from this relation:

$$1) \quad e > \frac{L}{6} \quad \sigma = \frac{2}{3} \times \frac{V + P}{L \times [(L/2) - e]}$$

$$2) \quad e \leq \frac{L}{6} \quad \sigma = \frac{V + P}{L^2} \times [1 + (6 \times e)/L]$$

Simultaneously check the following conditions:

- a) $\sigma \leq \sigma_{\text{allowed by the ground}}$
- b) $H < \frac{f}{1,3} \times (V + P)$ where $f = 0.5 - 0.8$



Note: Concrete foundation height "h" shall be $\geq 1,35 \text{ m (4' 5")}$

"σ" possible pressures (kg/cm² - lbs/in².) for superficial foundations (DIN 1054)

a) Recent deposits:

Slip - Muds - Fine sand aggregate - Peat 0 (0)

b) Loose/Unstable ground:

for foundations deep	Fine and middle sand				Coarse sand - Gravel			
	For the smallest dimension of foundation measuring [m]							
	0.4	1.0	5.0	10.0	0.4	1.0	5.0	10.0
to 0.5 m	1.2	1.5	2.0	2.5	1.5	2.5	3.0	4.0
over 0.5 to 1.0 m	1.5	2.5	3.0	4.0	2.0	3.0	4.0	5.0
over 1.0 to 2.0 m	2.0	3.0	4.0	5.0	2.5	3.5	5.0	6.0



U.S. Customary units

b) Loose/Unstable ground:

for foundations deep	Fine and middle sand				Coarse sand - Gravel			
	For the smallest dimension of foundation measuring [ft]							
	1'4"	3'3"	16'5"	32'10"	1'4"	3'3"	16'5"	32'10"
to 1'6"	17.1	21.3	28.4	35.6	21.3	35.6	42.7	56.9
over 1'6" to 3'3"	21.3	35.6	42.7	56.9	28.4	42.7	56.9	71.1
over 3'3" to 6'7"	28.4	42.7	56.9	71.1	35.6	49.8	71.1	85.3

c) Solid/Stable ground:

Slip-Plastic clay 0.4 (5.7)
 Solid-Plastic clay 1.0 (14.2)
 Half-solid clay 1.5 (21.3)
 Solid clay 3.0 (42.7)

d) Unfissured rock (1/5 of ultimate compressive stress; from 10 (142) to 30 (427)

e) Tufa - Solid pozzuolana 3 - 5 (42.7 - 71.1)

1 kg/cm² ≅ 100 kN/m² (14.22 lbs/in².)

4.7.1.2 *Placing the base plates*

After excavating the foundation pit and assembling the reinforcement mesh cage of the bed, position the base plates (fig. 4.7.1) or the jig frame in the centre of the upper surface of the reinforcement mesh cage itself (fig. 4.7.2).

Shim and level the base plates thus allowing their lower surface to match the upper surface of the concrete slab.

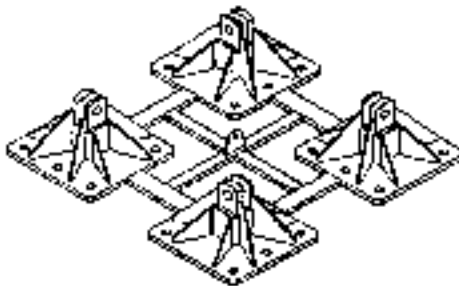


Fig. 4.7.1

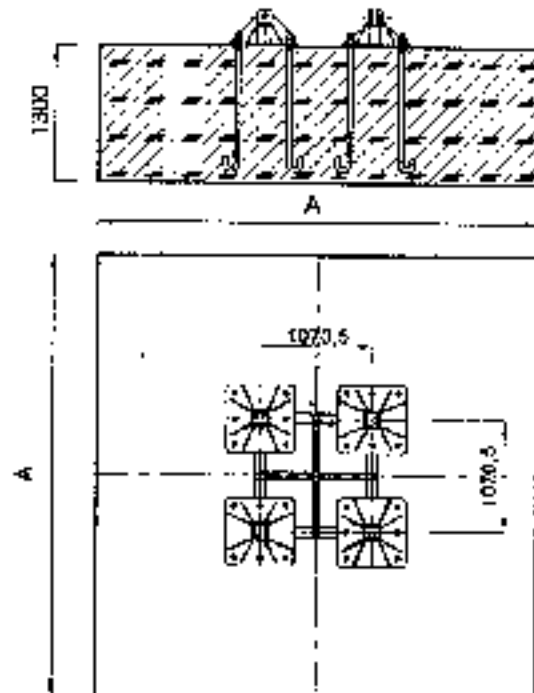


Fig. 4.7.2

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

4.7.1.3 *Placing the tie-down bolts*

The quantity of tie-down bolts to be used depends on the height of the crane.

Crane height less than or equal to 34 m (111' 7"):
four tie-down bolts for each plate

Crane height exceeding 34 m (111' 7"):
six tie-down bolts for each plate.

Screw down flat nut M42 (1) on the tie-down bolt 5 mm (2") far from the bottom of the thread.

Put the tie-down bolt into the hole of the plate.

Position washer (3) and screw ball nut M42 (2).

Now the tie-down bolts stay at right angle about the surface of the base plate (fig. 4.7.3).

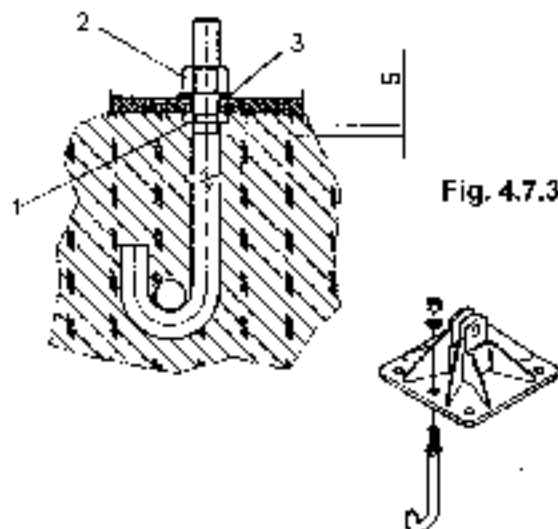


Fig. 4.7.3

Connect the tie-down bolts with $\varnothing 30$ steel iron bars (fig. 4.7.4).

Weld or connect the tie-down bolts to the reinforcement mesh cage.

Remove the shims used for leveling.

Tighten the nuts (torque wrench setting 145 daNm / 1070 ftlbs).

Secure the nuts with lock-nuts.

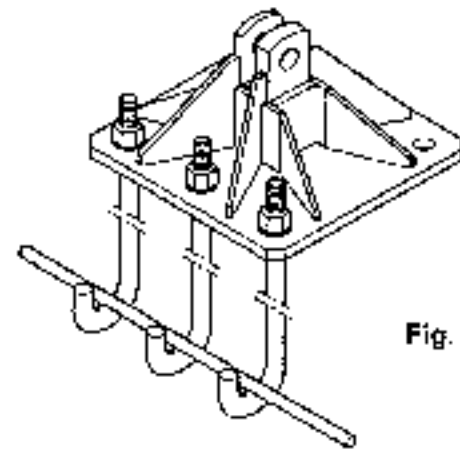


Fig. 4.7.4

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

To adjust the level, rotate nuts (1) and (2) (fig. 4.7.5)

Take care the threaded part of the tie-down bolt below flat nut M42 (1) does not exceed 10 mm (4").

Pour the concrete.

Inspect the concrete three days after pouring and, if necessary, use high-resistance concrete for the final leveling of the base plates (fig. 4.7.6).

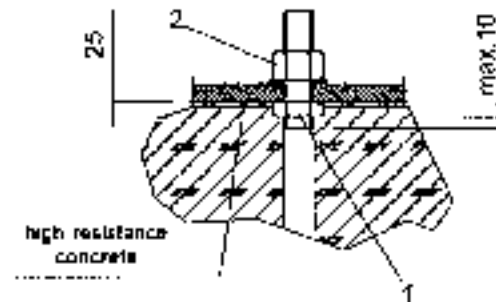


Fig. 4.7.5

4.7.1.4 Final leveling

To correct any leveling error, remove tall nuts M42 (2) of fig. 4.7.3 and place shims where necessary.

Screw tall nuts M42 down to the plate without tightening them firmly.

Fill the empty spaces between the concrete slab and the base plates with high-resistance concrete

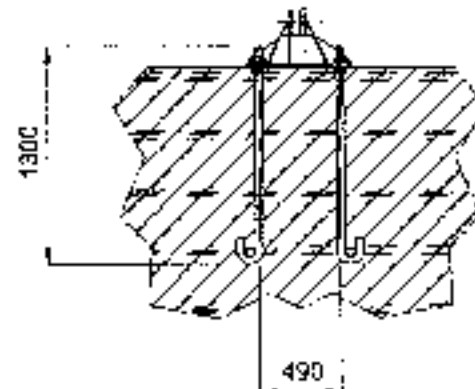


Fig. 4.7.6

4.7.2 Configuration "F"



The following bearings are available for the crane so configured (static with undercarriage):

4.7.2.1 Four reinforced concrete slabs

Below see an example where "L" side is calculated according to the ratio:

$$L = \sqrt{\frac{R}{\sigma_t}}$$

where "R" is the greatest of the values shown in section 4.5 and σ_t is the bearing capacity of the ground.

The dimensions of the reinforcement mesh cage depend on side "L".

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

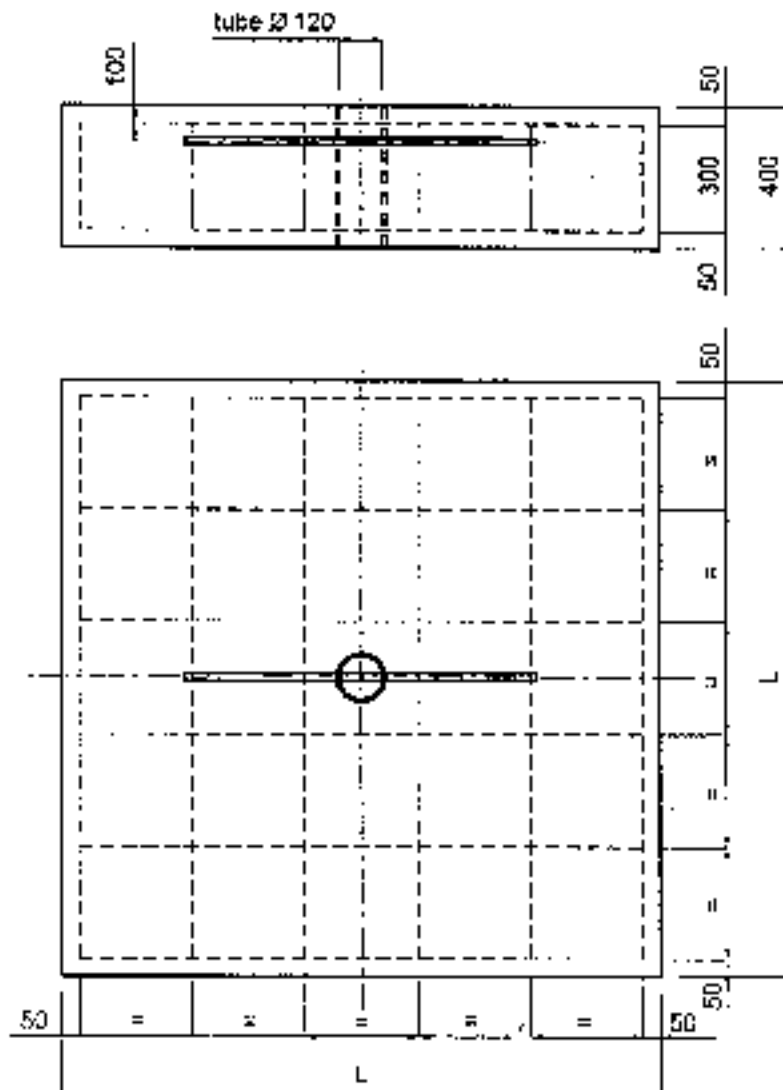


Fig. 4.7.7

The base plates shall be positioned as shown in figure 4.7.8.

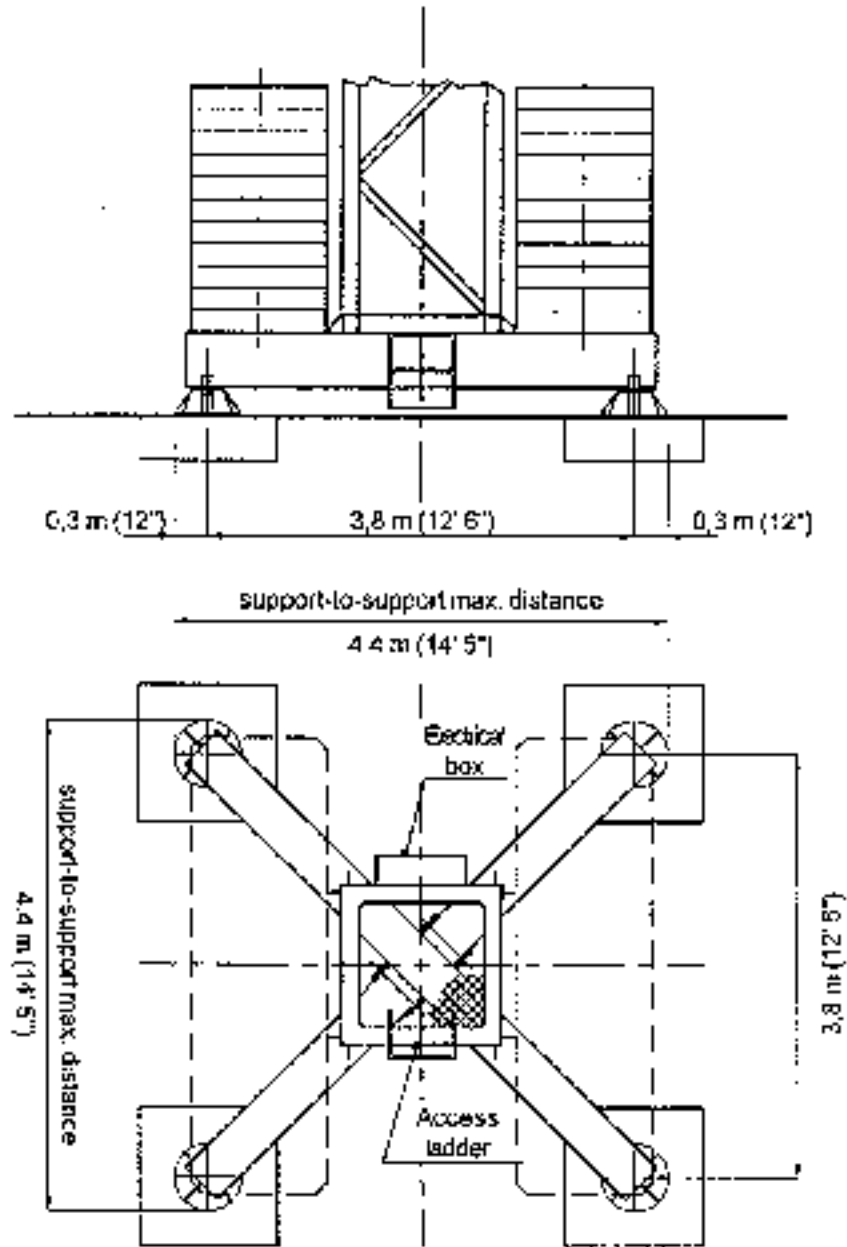


Fig. 4.7.8

4.7.2.2 *Two reinforced concrete kerbs*

The base plates shall be positioned as shown in figure 4.7.9.

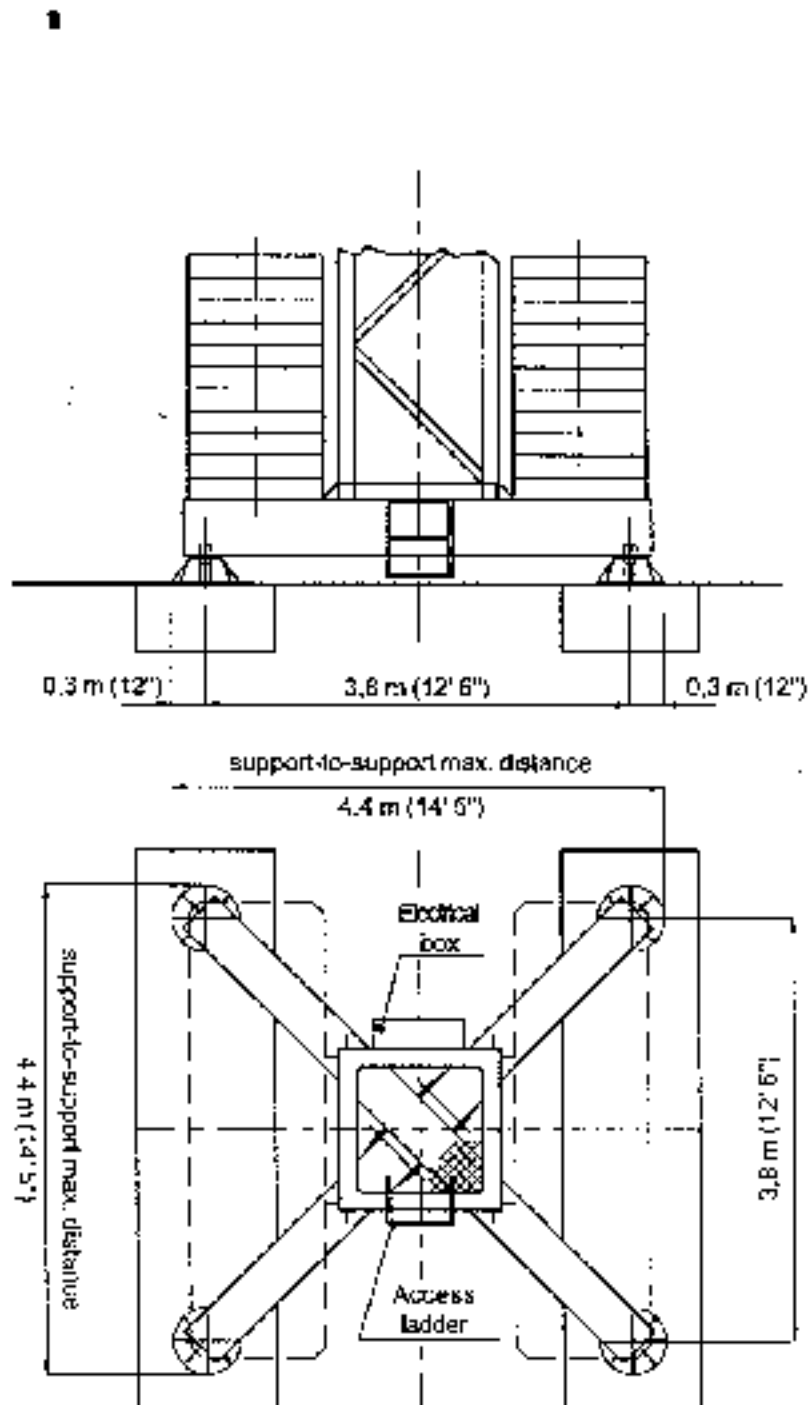


Fig. 4.7.9

4.7.2.3 A reinforced concrete bed

The base plates shall be positioned as shown in figure 4.7.10.

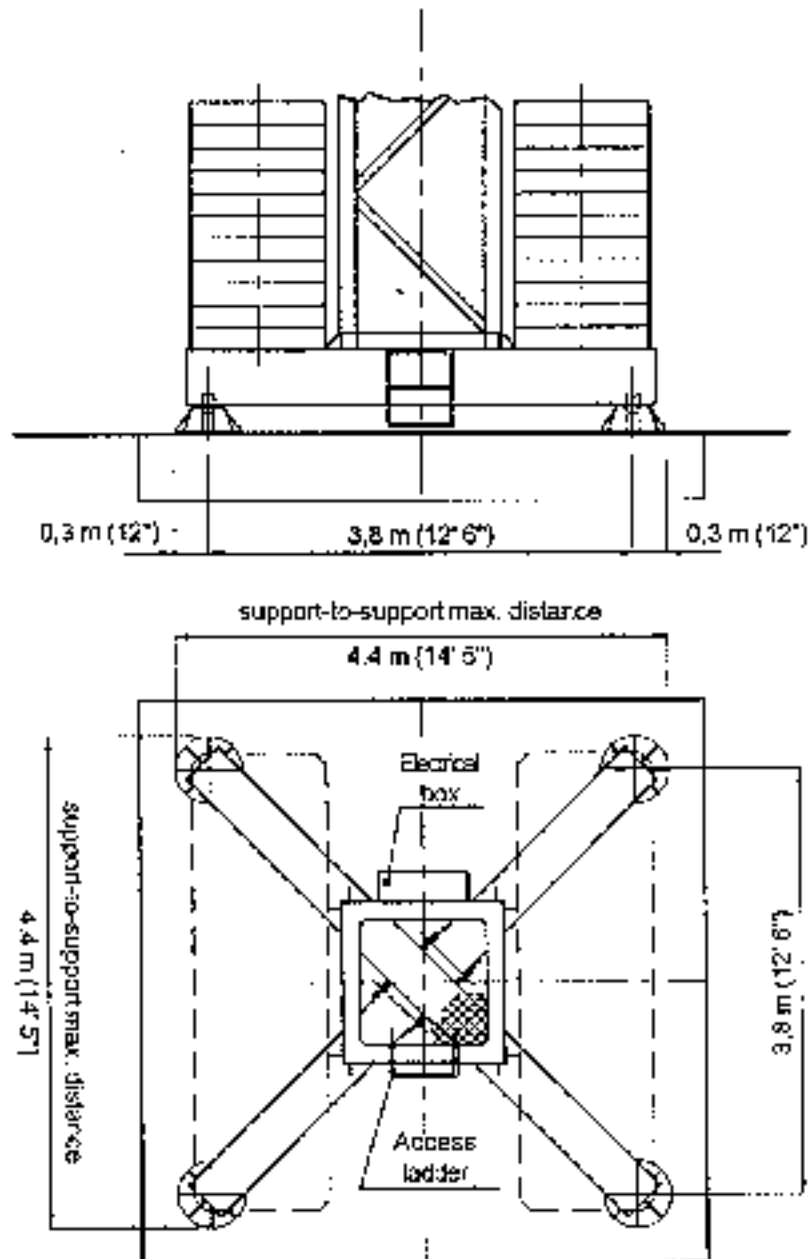


Fig. 4.7.10

4.7.3 Configuration "FP"



The crane so configured rests on "C" ballast blocks (para. 4.6.1)

The base plates shall be positioned as shown in figure 4.7.11 or turned 90°.

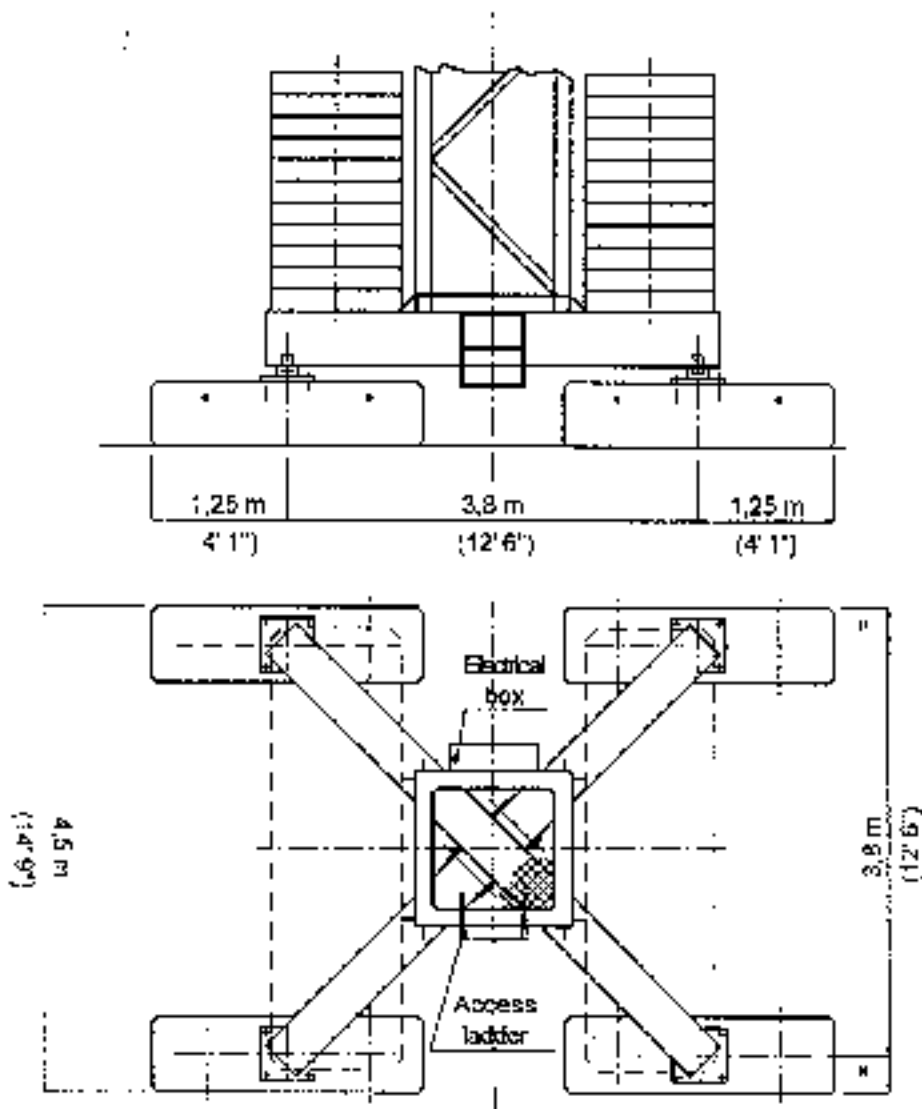


Fig. 4.7.11

4.7.4 Configuration "T"

For travelling cranes the user shall install travel tracks according to CNR 10021/85 standards. The main provisions are given below:

- A) the travel tracks shall be perfectly leveled both longitudinally and transversally;
- B) the gauge shall be constant and the rail tracks perfectly straight and with the same shape along the entire path;
- C) the rail tracks shall be placed on a solid base;

Dimensions are expressed in millimeters (1 mm = 0.03937 in.)

RAIL SHAPE TOLERANCES [mm]		
Straightness on the horizontal plane of a rail		$L = 2000$ $r \leq \pm 1$
Straightness on the vertical plane of a rail		$v/L \leq 0,002$
Parallelism of the rails		$P-1 \leq 3$
Difference in level		$h_i \leq 0,002$
Eccentricity of the rail about the bottom		$E \leq 0,5$ per $S \geq 12$ mm $E \leq 6$ mm per $S \geq 12$ mm
Inclination of the rail about the horizontal plane		$\beta \leq \pm 0,003$ rad.

Table 4.7.1

Dimensions are approximate. In fact the rails shall be chosen according to the travelling equipment used and to the crane's own configuration.

The rail shall be type 46 UNI 3141 or 50 UNI 3141 and have a nominal head of 66 mm or 70 mm (2.6" or 2.7").

The weight per metre shall be between 46 kg and 50 kg (100 and 110 lbs).

Slightly used rails are preferable as they provide a better bearing surface (fig. 4.7.12).

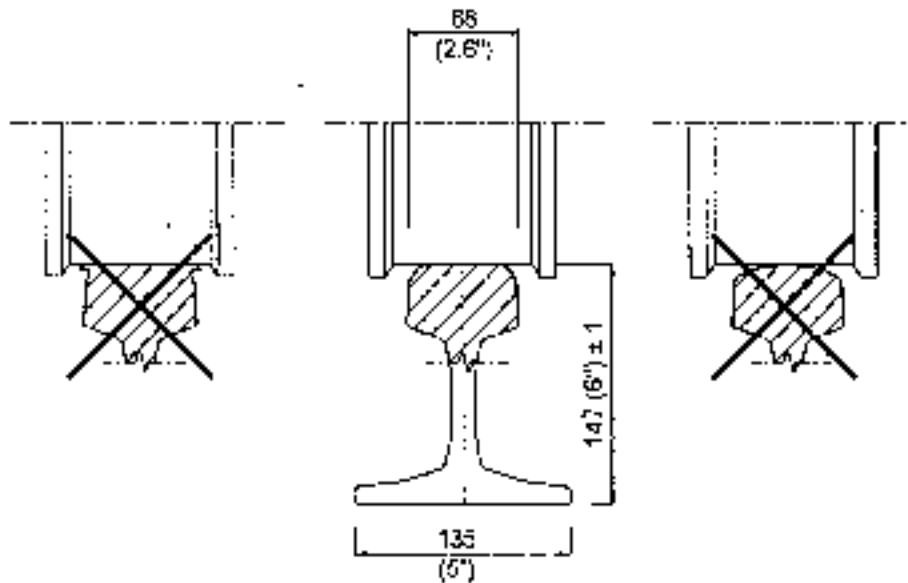


Fig. 4.7.12

Position the bogies as shown in figure 4.7.13.

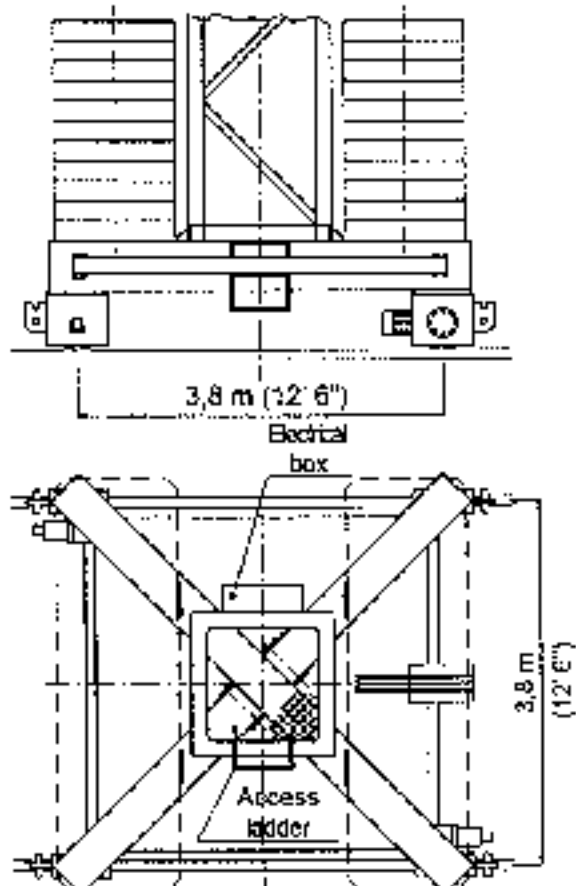


Fig. 4.7.13

4.8 ELECTRIC POWER SUPPLY

The user must provide the necessary electrical supply and crane wiring/connections.

For the dimensions of the mains, table 4.8.1 provides the maximum wire lengths and cross-sectional diameters of the conductors according to the electrical load applied.

Results depicted in the table use the following requisites as the basis for making the calculations: symmetrical and balanced three-phase system with 400 V voltage, 50 Hz frequency, 0.8 (cos ϕ) power factor and power cable withstanding a continuous working temperature of 60°C.

For exposed cables or cables routed through underground conduits, it is suggested to use NIVVK fire retardant type cable. For other type of installation (e.g., with cable reel) it is advisable to choose the most suitable type basing on the sectional area, length, weight and bending radius, if any.

The electrical power source must meet the requirements for the particular crane and likewise comply with the established standards.

CEI EN 60204 standards are applicable to the electrical equipments of the crane; therefore, voltage requirements must be within a $\pm 10\%$ maximum tolerance, and the maximum marginal frequency variance for a short period of time is $\pm 2\%$ (cf. CEI EN 60204 § 4.3.1).

The user must ensure that the power source voltage and frequency requirements meet the specifications and standards necessary to operate the crane.

Remember that the frequency requirement is particularly important should generating sets be used for feeding the crane.

Comedil's Engineering department is at customers' disposal for assistance, clarifications or for providing service for any special need that could arise at the job site.

Adequate overload protection for the mains must be provided depending on the electrical requirements of the crane.

Fuses used for the line protection must be "aM" type. If thermal or differential cutoff circuit breakers are used to protect the line input, the electrical protection curve of these protection devices must be like that of the starting squirrel-cage motors (D curve).

The mains wire ends must be connected to RST terminals in the line shunt box (QFI.)

The ground connection terminal, marked PE, for the ground bonding circuit is also located in the line shunt box near the RST terminals.

The connection of PE terminal to the ground bonding circuit must be completed before the crane is connected to the main power supply.

Max. recommended length from power source to line run max												
[kVA]	12.5	25	37.5	50	62.5	75	87.5	100	112.5	125	137.5	156.25
Conductor cross-section size [mm ²]	Line length [m]											
6	95											
10	182	81										
16	264	127	85	63								
25	410	205	137	103	82	80						
35	560	298	198	148	119	80	55	74	66			
50	711	356	237	178	142	110	102	89	79	71	65	
70	1006	503	335	252	201	188	144	126	112	101	91	80
95	1388	684	458	342	274	228	195	171	152	137	124	109
120	1887	933	556	417	333	276	238	208	185	167	152	133
150	2576	1288	666	494	393	328	282	247	219	199	180	157
180	3319	1599	773	580	464	388	331	290	260	232	211	185
240	4963	2481	1188	741	583	494	423	370	329	299	269	236
300	6333	3167	1511	933	697	538	470	417	370	333	303	266
400	8103	4051	1958	1028	821	664	586	513	458	410	373	327

Table 4.8.1

Calculation for electric lines with 380 Vac 50 Hz PF 0.8 with maximum conductor temperature 60°C.

Sistema unità di misura americana

Lunghezza massima consigliata dal punto di rilascio della allungata quadrifila												
[kVA]	12.5	25	37.5	50	62.5	75	87.5	100	112.5	125	137.5	156.25
Sezione conduttore [inch ²]	Line length [feet]											
0.008	312											
0.015	501	288										
0.025	693	417	279	267								
0.039	1345	672	449	338	269	273						
0.054	1915	971	650	485	390	325	279	243	217			
0.077	2333	1188	773	584	466	390	335	292	259	233	213	
0.108	3301	1650	1099	827	659	551	472	412	367	331	299	262
0.147	4458	2244	1488	1122	889	748	640	551	488	445	407	358
0.155	5459	2733	1824	1355	1092	912	781	692	607	548	499	436
0.232	6480	3242	2158	1621	1268	1079	925	810	718	650	593	512
0.287	7609	3803	2538	1803	1522	1286	1086	951	846	761	692	607
0.372	9721	4859	3242	2431	1946	1621	1388	1214	1079	971	886	774
0.465	10935	5469	3643	2733	2188	1824	1552	1388	1214	1082	994	889
0.620	13462	6729	4488	3366	2669	2244	1923	1663	1436	1242	1122	1073

4.9 GROUNDING

If the conductor is copper type, refer to table 4.9.1 to calculate its diameter. Where a conductor other than copper is used, its minimum cross-sectional area must be 16 mm² and its electrical resistance, based upon length unit, must not exceed the value allowed for a copper conductor.

The user is responsible for the installation of the protective bonding system and must ensure that the minimum requirements established by the standards are complied with.

The continuous technological development leads to the solution of many job site problems making, in turn, new materials available to customers, such as new ground plates.

Because of ongoing changes to designs and to avoid issuing any obsolete technical information, materials and methods for the installation of protective circuits have been excluded from this manual. Contact Comedil's Engineering Department for any inquiries.

Phase conductor cross-sectional area as per Table 4.8.1 S [mm ²]	External protective conductor minimum cross-sectional area S _p [mm ²]
S < 16 or S = 16	S _p = S
S > 16 or S < 35 or S = 35	S _p = 16
S > 35	S _p = S/2

Table 4.9.1



Sistema unità di misura americano

Phase conductor cross-sectional area as per Table 4.8.1 S [in ²]	External protective conductor minimum cross-sectional area S _p [in ²]
S < 16 or S = 0.025	S _p = S
S > 16 or S < 35 or S = 0.054	S _p = 0.025
S > 0.054	S _p = S/2

4.9.1 Electric system

The electric equipment of the crane shall always be connected to the bonding circuit.
The connecting terminal, marked PE, is placed inside the line shunt box (CDL) (fig. 4.9.1).

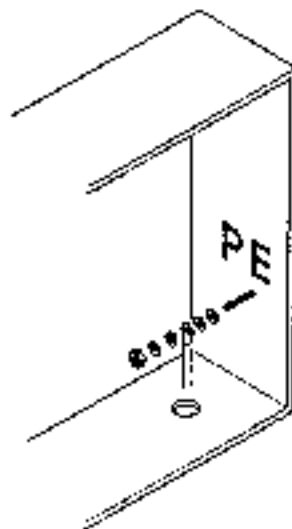


Fig. 4.9.1

4.9.2 Structure

For sizes, installation, test and maintenance of the protective grounding system against atmospheric discharges, the laws and standards of the country where the crane is installed are to be complied with.

The connection screws for the wire terminals are welded on the undercarriage (fig. 4.9.2) or on the base plates (fig. 4.9.3)

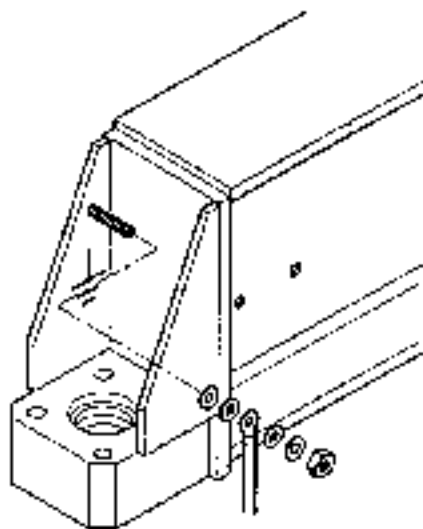


Fig. 4.9.2

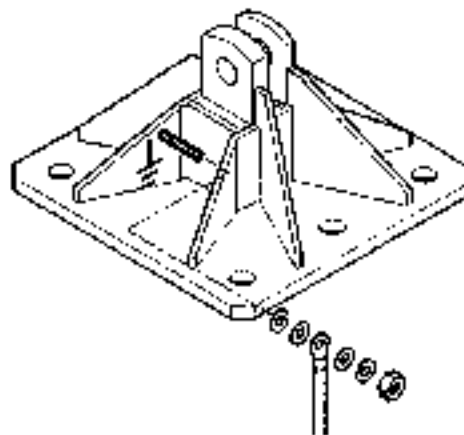


Fig. 4.9.3

4.10 CALIBRATING WEIGHTS

The Customer is responsible for the preparation of the weights for the operational testing and for the calibration of the safety devices

Weights shall be prepared as indicated at page 7-2-1

4.11 TIE-IN ASSEMBLY

To reach heights exceeding the maximum free-standing height (para. 3.2), the crane shall be suitably anchored.

GTS 511/A S12 can achieve a maximum under hook height of 134.9 m (442' 7").

Be sure that weather conditions keep fine during the day and locate and fix each tie-collar before the day is over.

The first tie-collar shall be placed at maximum 30 m (98' 5") off the ground; the top tie-collar at a maximum distance of 25 m (82') from the hook.

For intermediate positions, the maximum distance between the tie-collars shall not exceed 18 m (59' 1").

Place the special antitorsional diagonals supplied in the tie-collars position.

On Customer's request, Comedil shall supply frames, crossbeams and value of the stresses on the tie-collars.

An example tie-in assembly of the crane is shown in fig. 4.11.1.

Other solutions are also available to meet the Customer's need. If requested, contact Comedil Engineering Department.

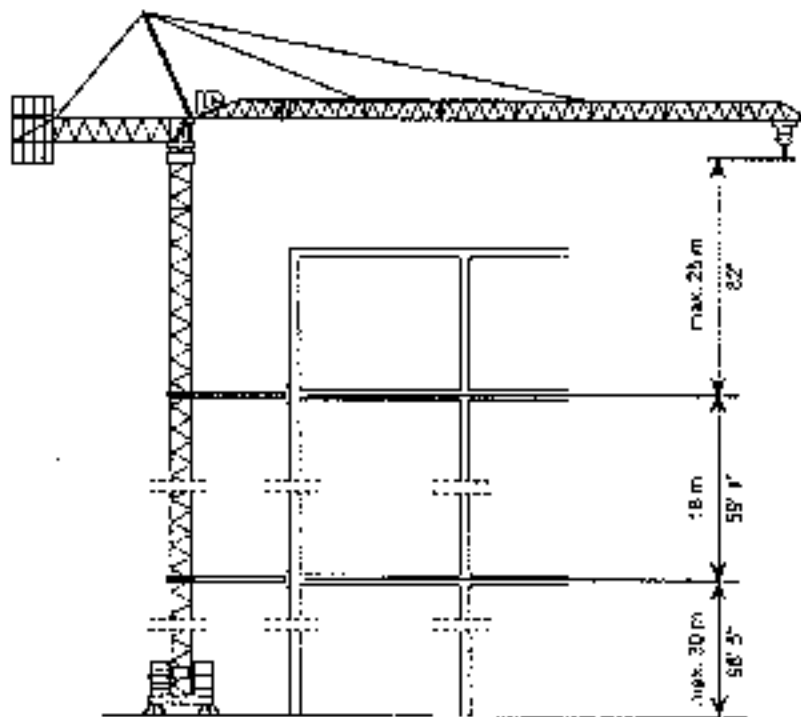
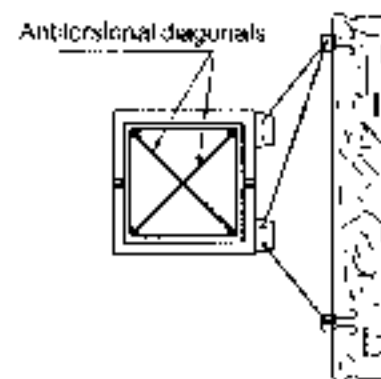


Fig. 4.11.1



5

CRANE MOVEMENT AND TRANSPORTATION

The crane components have been designed to be broken into modules to simplify packing and handling for different means of transportation (lorries, railway carriages, containers, etc.).

As the cranes are made of steel structural elements, special measures, other than the ones described below, are not necessary for movement, transportation and stowage.

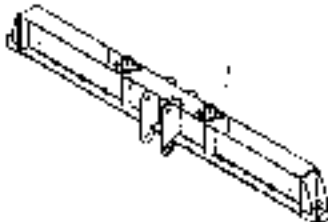
- 1) Light modules must be placed on top of heavy ones.
- 2) All elements must be well secured to the means of transportation.
- 3) To prevent damages to the painted surfaces, place padded or wooden separating materials between the elements.
- 4) Make sure the crane components are not in direct contact with the ground during the unloading phases to prevent impurities (sand, earth, etc.) from entering the mounting holes.
- 5) Do not use unsuitable means of transportation to move the crane parts, such as bulldozers or lift trucks.

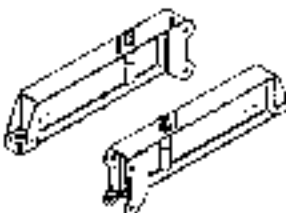
5.1 DIMENSIONS AND WEIGHTS

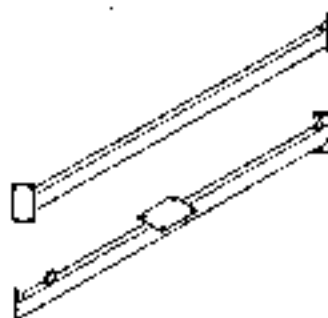
A detailed description of the weights and dimensions of the crane components is given in the following pages.

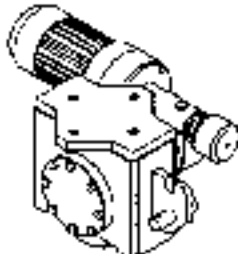
NOTE: THE TABLES IN THE FOLLOWING PAGES SHOW THE UNITARY WEIGHT OF THE CRANE COMPONENT.

COMPONENT DIMENSIONS AND WEIGHT TOWER CRANE "CITY" GTS 511/A S12


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	UNDERCARRIAGE LONG BEAM	5,7 m (18'8")	1	1700 kg (3750 lbs)
		WIDTH		
		0,63 m (2'1")		
HEIGHT				
		1,03 m (3'5")		

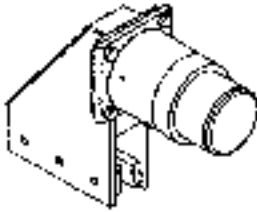
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	UNDERCARRIAGE SHORT BEAM	2,75 m (9')	2	787 kg (1740 lbs)
		WIDTH		
		0,35 m (1'2")		
HEIGHT				
		1,03 m (3'5")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	UNDERCARRIAGE JOINING SLEEPERS	3,36 m (11')	4	133 kg (290 lbs)
		WIDTH		
		0,22 m (9")		
HEIGHT				
		0,35 m (1'2")		

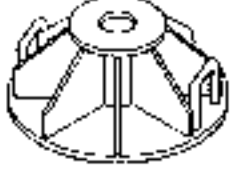
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	TRAVELLING DRIVE BOX	1 m (3'3")	2	294 kg (650 lbs)
		WIDTH		
		0,7 m (2'4")		
HEIGHT				
		0,37 m (1'3")		

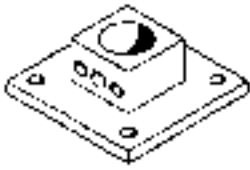
<https://cranemanuals.com>

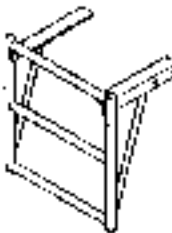
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	TRAVELLING DRIVE BOX	0,63 m (2'1")	2	187 kg (410 lbs)
		WIDTH		
		0,41 m (1'4")		
HEIGHT				
		0,37 m (1'3")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	BUFFER	0,8 m (2'7")	4	42 kg (90 lbs)
		WIDTH		
		0,22 m (9")		
HEIGHT				
		0,47 m (1'7")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	BASE PLATE "R" STATIC CRANE WITHOUT UNDERCARRIAGE	1,72 m (5'8")	1	631 kg (1390 lbs)
		WIDTH		
		1,72 m (5'8")		
HEIGHT				
		0,36 m (1'2")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	BASE PLATE "F" STATIC CRANE WITH UNDERCARRIAGE	Ø 0,6 m (1'12")	4	92 kg (200 lbs)
		WIDTH		
		Ø 0,6 m (1'12")		
HEIGHT				
		0,26 m (10")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	BASE PLATE "FP" STATIC CRANE WITH UNDERCARRIAGE ON BALLASTS	0,33 m (1'1")	4	51 kg (110 lbs)
		WIDTH		
		0,33 m (1'1")		
HEIGHT				
		0,125 m (5")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	LADDER FOR UNDERCARRIAGE	0,6 m (2'1")	1	13 kg (30 lbs)
		WIDTH		
		0,65 m (1'4")		
HEIGHT				
		0,36 m (1'3")		

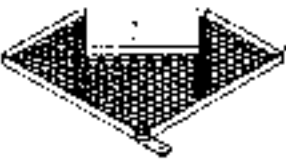
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	BASE TOWER SECTION "TA3"	1,2 m (2'7")	1	1727 kg (3810 lbs)
		WIDTH		
		1,2 m (9')		
HEIGHT				
		6 m (17')		

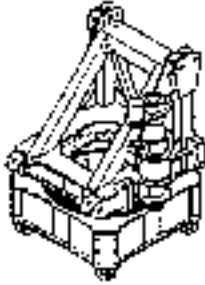
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	TOWER SECTION "TA"	1,2 m (3'11")	1	2776 kg (6120 lbs)
		WIDTH		
		1,2 m (3'11")		
HEIGHT				
		10 m (32'10")		

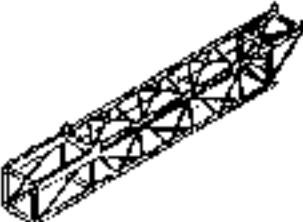
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	TOWER SECTION "TA1"	1,2 m (3'11")	1	1467 kg (3230 lbs)
		WIDTH		
		1,2 m (3'11")		
HEIGHT				
		5 m (16'5")		

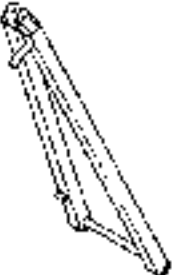
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	ELEMENTO "TA2"	1,2 m (3'11")	1	838 kg (1850 lbs)
		WIDTH		
		1,2 m (3'11")		
HEIGHT				
		2,5 m (8'2")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	INTERMEDIATE LADDER	2,4 m (7'10")	1	18 kg (40 lbs)
		WIDTH		
		0,4 m (1'4")		
HEIGHT				

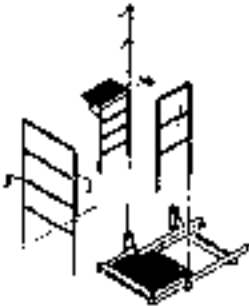
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	REST PLATFORM	0,95 m (3'1")	1	26 kg (60 lbs)
		WIDTH		
		0,95 m (3'1")		
HEIGHT				
0,1 m (4")				

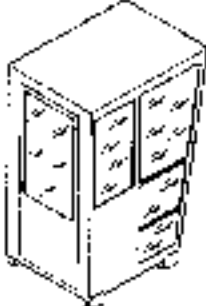
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	SLEWING UNIT	1,4 m (4'7")	1	2680 kg (5910 lbs)
		WIDTH		
		1,4 m (4'7")		
HEIGHT				
1,8 m (5'11")				

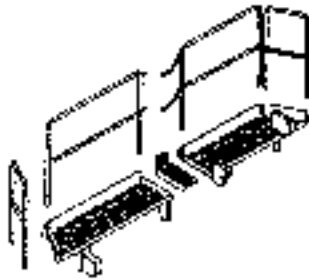
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	COMPLETE COUNTERJIB	9,75 m (31'12")	1	2011 kg (4430 lbs)
		WIDTH		
		1,15 m (3'9")		
HEIGHT				
1,2 m (3'11")				

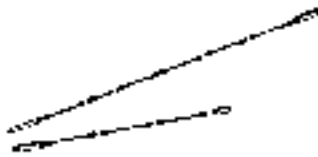
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	TOWER HEAD	7 m (22'12")	1	451 kg (990 lbs)
		WIDTH		
		1,1 m (3'7")		
HEIGHT				
0,14 m (6")				

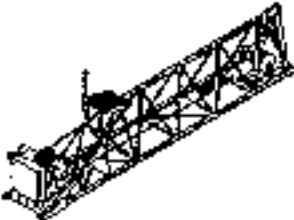
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	COUNTERJIB TIE-BARS	1,6 m (5'3")	5	205 kg (450 lbs)	
		WIDTH			0,25 m (10")
		HEIGHT			

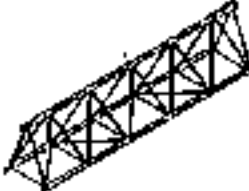
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	CAB SUPPORT PLATFORM (COMPLETE OF LADDER AND PROTECTIONS)	2 m (6'7")	1	230 kg (510 lbs)	
		WIDTH			1,3 m (4'3")
		HEIGHT			0,4 m (1'4")

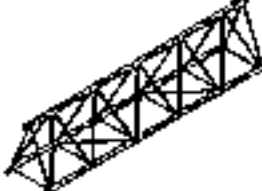
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	PANORAMIC CAB	1 m (3'3")	1	400 kg (880 lbs)	
		WIDTH			0,8 m (2'11")
		HEIGHT			2 m (6'7")

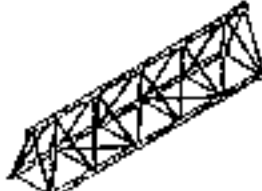
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	JIB-COUNTERJIB PLATFORM (COMPLETE OF SAFETY RAILS)	1,87 m (6'2")	1	168 kg (370 lbs)	
		WIDTH			1,2 m (3'11")
		HEIGHT			0,8 m (1'12")

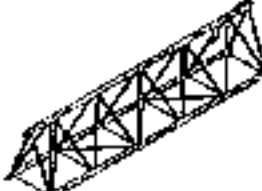
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	JIB TIE-BARS WITH SUPPORT	6,2 m (20'4")	13	1051 kg (2320 lbs)	
		WIDTH			
		HEIGHT			0,24 m

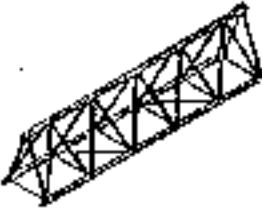
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	1 ST JIB SECTION				7,58 m (24'10")
		WIDTH			1,14 m (3'9")
		HEIGHT			1,45 m (4'9")


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	2 ND JIB SECTION				6,08 m (19'11")
		WIDTH			1,11 m (3'8")
		HEIGHT			1,45 m (4'9")

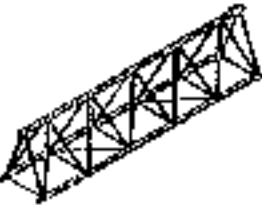
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	3 RD JIB SECTION				6,08 m (19'11")
		WIDTH			1,11 m (3'8")
		HEIGHT			1,45 m (4'9")

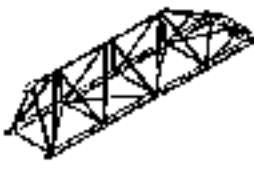
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	4 TH JIB SECTION				6,08 m (19'11")
		WIDTH			1,11 m (3'8")
		HEIGHT			1,45 m (4'9")

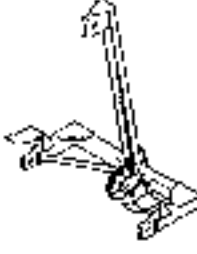
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	5 TH JIB SECTION				6,08 m (19'11")
		WIDTH			1,11 m (3'8")
		HEIGHT			1,45 m (4'9")

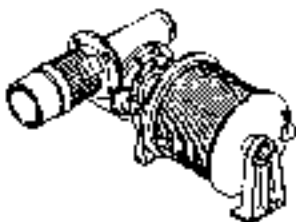
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	6 TH JIB SECTION	6,08 m (19'11")	1	435 kg (960 lbs)
		WIDTH		
		1,11 m (3'8")		
		HEIGHT		
		1,45 m (4'9")		

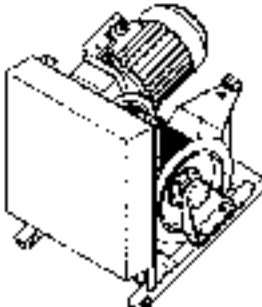
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	9 TH JIB SECTION	3,15 m (10'4")	1	219 kg (480 lbs)
		WIDTH		
		1,11 m (3'8")		
		HEIGHT		
		1,45 m (4'9")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	7 TH JIB SECTION	6,08 m (19'11")	1	344 kg (760 lbs)
		WIDTH		
		1,11 m (3'8")		
		HEIGHT		
		1,45 m (4'9")		


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	8 TH JIB SECTION	5,56 m (18'3")	1	306 kg (670 lbs)
		WIDTH		
		1,11 m (3'8")		
		HEIGHT		
		1,45 m (4'9")		

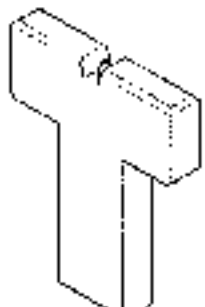
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT
	JIB POINT	1,15 m (3'9")	1	91 kg (200 lbs)
		WIDTH		
		0,5 m (1'8")		
		HEIGHT		
		1,4 m		
https://cranemanuals.com/				

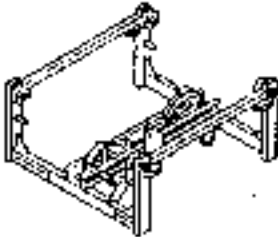


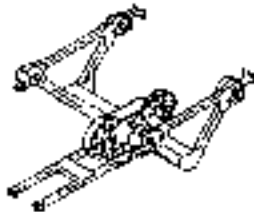
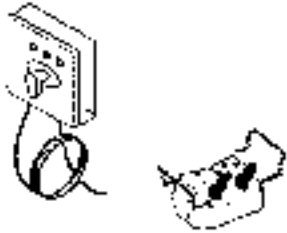
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	TROLLEY TRAVERSING WINCH	0,85 m (2'9")			
		WIDTH			0,85 m (2'9")
		HEIGHT			0,6 m (1'12")
		1			182 kg (400 lbs)

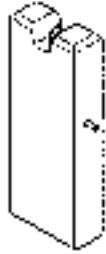
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	HOIST WINCH	1,45 m (4'9")			
		WIDTH			1,1 m (3'7")
		HEIGHT			0,9 m (2'11")
1	650 kg (1430 lbs)				


	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	(3) SINGLE HOIST BLOCK (2-PART LINE)	0,78 m (2'7")			
		WIDTH			0,12 m (5")
		HEIGHT			0,58 m (1'11")
1	120 kg (260 lbs)				

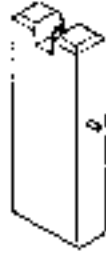
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	(6) DOUBLE HOIST BLOCK (2-4 PART LINE)	1,2 m (3'11")			
		WIDTH			0,12 m (5")
		HEIGHT			0,76 m (2'6")
1	60 kg (500 lbs)				

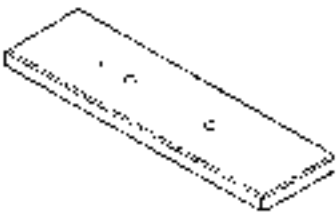
	DESCRIPTION	LENGTH	QUANTITY	WEIGHT	
	COUNTERWEIGHT "4"	2,15 m (7'1")			
		WIDTH			0,36 m (1'2")
		HEIGHT			2,5 + 2,9 m (8'2" - 9'6")
		1			2900 kg (6390 lbs)

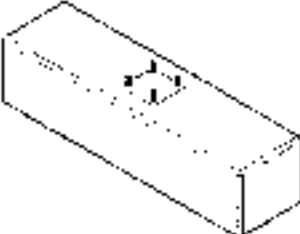
	DESCRIPTION (3 t) SINGLE TROLLEY (2-PART LINE)	LENGTH 1,3 m (4'3") WIDTH 1,8 m (5'11") HEIGHT 0,9 m (2'11")	QUANTITY 1	WEIGHT 165 kg (360 lbs)
	DESCRIPTION (5 t) SINGLE TROLLEY (2-4 PART LINE)	LENGTH 2,4 m (7'10") WIDTH 1,25 m (4'1") HEIGHT 0,65 m (2'2")	QUANTITY 1	WEIGHT 400 kg (880 lbs)
	DESCRIPTION JIB-FOOT TROLLEY (5 t)	LENGTH 1,15 m (3'9") WIDTH 1,25 m (4'1") HEIGHT 0,65 m (2'2")	QUANTITY 1	WEIGHT 197 kg (430 lbs)
	DESCRIPTION JIB-POINT TROLLEY (5 t)	LENGTH 1,78 m (5'10") WIDTH 1,25 m (4'1") HEIGHT 0,65 m (2'2")	QUANTITY 1	WEIGHT 203 kg (450 lbs)
	DESCRIPTION ELECTRICAL BOX WITH REMOTE CONTROL UNIT AND CABLES	LENGTH 1 m (3'3") WIDTH 0,8 m (2'7") HEIGHT 0,6 m (1'12")	QUANTITY 1	WEIGHT

DESCRIPTION	LENGTH	QUANTITY	WEIGHT
 COUNTERWEIGHT "5"	0,85 m (2'9")	1	1300 kg (2870 lbs)
	WIDTH		
	0,36 m (1'2")		
	HEIGHT		
	1,77 + 1,9 m (5'10"+6'3")		

DESCRIPTION	LENGTH	QUANTITY	WEIGHT
 COUNTERWEIGHT "6"	1,44 m (4'9")	1	2330 kg (5140 lbs)
	WIDTH		
	0,36 m (1'2")		
	HEIGHT		
	2,5 + 2,6 m (8'2"+9'2")		

DESCRIPTION	LENGTH	QUANTITY	WEIGHT
 COUNTERWEIGHT "7"	0,85 m (2'9")	1	1900 kg (4190 lbs)
	WIDTH		
	0,36 m (1'2")		
	HEIGHT		
	2,56 - 2,8 m (8'5"+9'2")		

DESCRIPTION	LENGTH	QUANTITY	WEIGHT
 BASE BALLAST BLOCK "A"	4,16 m (13'8")	1	2500 kg (5510 lbs)
	WIDTH		
	1,2 m (3'11")		
	HEIGHT		
	0,21 m (8")		

DESCRIPTION	LENGTH	QUANTITY	WEIGHT
 BASE BALLAST BLOCK "C"	2,5 m (8'2")	4	2500 kg (5510 lbs)
	WIDTH		
	0,7 m (2'4")		
	HEIGHT		
	0,6 m (1'12")		

