TATA

TFC-280-45

Crawler Crane Clamshell & Dragline

- Max. Lifting Capacity : 75 tonnes • Boom Length : 15.24 - 45.72 meters
- Dragline Bucket Capacity : 1.91 - 2.68 cum • Clamshell Bucket Capacity: 1.91 - 2.29 cum

ENGINE

- Make ……..……..: Cummins
- Model ……..: NT 743 C
- Type …… : Water-Cooled, 4 Cycle, 6 Cylinder, inline DI chamber type, diesel engine.
- Rated Power…… : 210 HP @ 1800 rpm (net at flywheel)

Transmission

- Direct Power Take off
- P.T.O. Make ……: Ghatge Patil
- P.T.O. Model ……: SP 214P

MAIN AND AUXILIARY HOIST MECHANISM

Completely independent operation. Drums mounted on antifriction bearings. The tandem drum arrangement permits extra rope capacity and minimum number of wraps for longer cable life. Smooth, precise power lowering of main load due to planetary load lowering mechanism.

- Clutches ……..: Pneumatic, internal expanding friction band type
- Brakes ……: Pneumatic, external contracting friction band type
- For additional safety, pneumatically operated Pawl & Ratchet are provided.

BOOM HOIST MECHANISM

The boom hoist drum is driven through reduction gear by engaging clutch. Smooth, precise boom lowering is made possible by power lowering with the help of planetary type unidirectional cam clutches.

- Clutches ……: Pneumatic, external contracting friction band type
- Brakes ……: Pneumatic brake of self energizing type. Spring set, external contracting friction band type brake automatically holds boom.
- Double anchoring of intermediate suspension cable reduces natural sag due to long boom.

- Boom hoist line speed ……(raising) : 16.6 mpm
  … (lowering): 33.2 mpm

SWING MECHANISM

Swing motion is through two Eleclutch units on jackshaft Jaw clutches for swing and propel are interlocked. Smoother, faster swings with minimum wear are made possible through Tata Live Roller Circle. Swing gear is of external type.

- Swing lock .....: Pneumatic, positive wedge type on swing gear.
- Swing brake .....: Pneumatic, locks upper structure in any angle during erection work. Provided as optional
- Swing Circle.....: Tata Live Roller circle consists of a complete ring of 24 equally spaced, free running roller bearings to permit even distribution of upper weight, thus reducing stress and friction wear to a minimum.
- Swing Speed.....: 3.19 rpm

REVOLVING FRAME

Single all welded fabricated box structure unit made of alloy steels for superior structural strength and high service life. Deck machinery located behind the centre of rotation & acts as a counterweight. This provides maximum stability and helps eliminate power-robbing ballast.

Gantry : Standard folding high gantry, lowerable for transportation. Especially designed for rigidity and strength.

Counterweight : 3-piece casting that can be disassembled while transportation.

- Total weight …… 21,600 kg(8,800 kg + 8,800 kg + 4,000 kg)

Type of Fastening to Lower

- 6 adjustable hook rollers, two front and two double rear.

OPERATOR'S CAB

All weather, well-ventilated, all round visibility, roomy cab.

UNDER CARRIAGE

Travel Mechanism: Propel motion through two Eleclutch units on jackshaft. Power transmitted through gear train to horizontal propel shaft and finally to crawler through drive sprocket and chain. Hunting type crawler drive sprockets on involute splined crawler drive shaft increases the sprockets and pin life. The idler and drive sprockets mounted on bearing blocks slide on crawler frame. Independent spring loaded double acting propel brakes on horizontal shaft are set and released through pneumatic controls at operator's station.

Track frame: All welded robust rolled steel, stress relieved box-section construction. Crawler frames slide on to axles and are fixed with pins. This eliminates cumbersome bolt tightening operation.

Track Shoes: Heat treated cast steel flat shoes.

- Shoe width ……(Standard) ……..914 mm
  (Optional) ……..1067 mm
- Number of shoes (each side) …… 46

Rollers: Rollers ride on deep lugs on heavier section of shoes, eliminating outside pressure points to prevent shoe bending or breakage.

- Number of lower rollers ……11
- Roller dia ……254 mm

Propel Speed ……..1.11 kmph

Gradeability ……..28.4 %

Track Tension Adjuster

Track tension adjustment possible by application of manual hydraulic jack force on track adjusting rod and insertion of proper shims. Crawler drive and idler shafts are mounted with sliding bearings in the crawler frame thereby facilitating the track tensioning.

Steering Mechanism

Sliding jaw clutches, one on each side of horizontal propel shaft control application of propelling power to crawlers. Both jaw clutches can be engaged together or one at a time with the other crawler automatically locked to the lower frame. The propel brakes remain set during engagement of jaw clutches.

CONTROLS

Completely pneumatic control levers. Air control valves for clutch and brake operation. Boom pawl, hoist pawl, swing lock, swing propel transfer are pneumatic. Pneumatic cylinders mounted to engage / disengage engine clutch, boom hoist, auxiliary and main hoist pawls, swing lock & shifting of clutch power from swing to propel motion.

SERVICE REFILL CAPACITY

- Fuel Tank ……..511 ltr
- Cooling System …… 49 ltr
- Engine Oil …… 29 ltr

SAFETY FEATURES

- Triple safe boom lowering Unidirectional cam clutches, self energizing brake band and Pawl & Ratchet
- Positive locking Pawls on all drums
- Spring set pneumatically released travel brakes
- Swing lock, Hoist brake pedal lock.
- Boom angle indicator.
- Hook & boom over hoist alarm
- Boom clutch kick out assembly.
- Telescope type boom backstop.

TATA TFC-280-45 Crane Specifications

BOOM

Angle lattice alloy steel construction, with pin joints, Open throat with four boom point sheaves on anti- friction bearings of bottom diameter 610 mm.

10 part boom hoist reeving standard for all boom lengths.

- Maximum Rated Load .....75,000 kg at 3.67 m operating radius
- Basic Boom Length .....15.24 m (in two sections)
  Boom Upper ..... 9.14 m (30 ft)
  Boom Lower ..... 6.10 m (20 ft)
- Operating weight ..... 70,480 kg (Equipped with 75 tonne capacity Hook and 21.6 tonne counter weight)
- Boom Inserts .....3 m (10 ft) Optional
  6 m (20 ft) Optional

Note : Please refer to chart on last page for boom construction.

Hook Block

- 75 tonne 4 sheaves with swivel hook and 8 part hoist line ..... Standard
- Weight of hook block assembly with 4 sheaves ..... 998 kg
- This hook block assembly can be converted to 3 sheave or 2 sheave or single sheave by using required spacers.

HOIST REEVING AND HOOK BLOCK ASSEMBLY

No. of Sheaves	4	3	2	1	1
No. of parts of line	8	6	4	2	1
Max. load (kg)	75,000	68,040	45,360	22,680	11,340
Hook block weight (kg)	*998	*946	721	669	669

Note : Use 151.5 kg cheek plate

DRUM SHAFT ASSEMBLY

Lifting Crane Drums Pitch dia (mm)	Cable dia. (mm)	Cable capacity 1st wrap(m)	Line Pulls* (kg)	Line Speeds* (mpm)
FRONT 635	26	39.32	15730	49
REAR 635	26	22.25	16787	49

*Line pulls and speeds based on first layer of rope and engine at full load speed

GROUND PRESSURE	STANDARD	OPTIONAL
Shoe width Ground Pressure	914 mm 0.73 kg/m^2	1067 mm 0.64 kg/m^2

Jib

- Angle lattice alloy steel construction available in two lengths ..... 6.10 m (20 ft)
  9.14 m (30 ft)
- Jib hook block weight ..... 300 kg
  Capacity..... 7000 kg

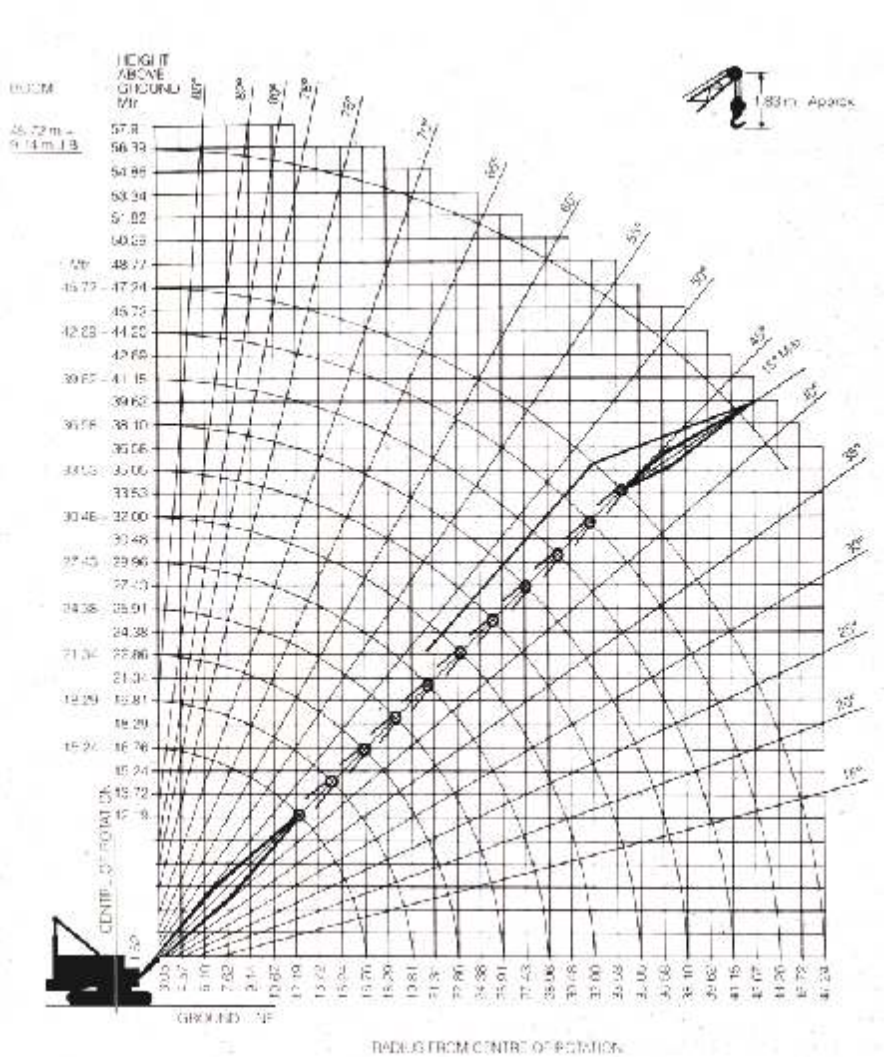
MAXIMUM JIB RATINGS

Offset angle jib to boom under full load	6.10 m jib	9.14 m jib
	kg	kg
5^0	6350	5895
10^0	6125	5670
15^0	5895	5445

Jib ratings at any operating radius are the same as Crane ratings shown in table for main boom when operated at that radius but not to exceed maximum jib ratings shown. Maximum jib operating radius not to exceed maximum jib ratings shown. Maximum jib operating radius not to exceed length of main boom on which it is being used.

RATED CRANE LOADS IN KG. (AS PER IS 4573)

Operating radius	15.24m boom	18.29m boom	21.34m boom	24.38m boom	27.43m boom	30.48m boom	33.53m boom	36.58m boom	39.62m boom	42.67m boom	45.72m boom
3.67	75000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4.57	52165	51960	.....	.....	.....	.....	.....	.....	.....	.....	.....
6.10	32660	32455	32320	32115	31980	.....	.....	.....	.....	.....	.....
7.62	24040	23835	23700	23495	23360	23155	23020	.....	.....	.....	.....
9.14	19005	18800	18665	18460	18325	18120	17985	17800	.....	.....	.....
10.67	15600	15400	15260	15060	14920	14720	14580	14380	14240	14040	.....
12.19	13155	12950	12815	12610	12475	12270	12130	11930	11790	11590	11450
13.72	11340	11135	11000	10795	10660	10455	10320	10115	9980	9775	9640
15.24	9885	9685	9545	9345	9205	9005	8865	8660	8525	8320	8185
16.76	.....	8595	8460	8255	8120	7915	7780	7575	7440	7235	7095
18.29	.....	7685	7550	7345	7210	7005	6870	6665	6530	6325	6190
19.81	.....	.....	6735	6530	6395	6190	6055	5850	5715	5510	5375
21.34	.....	.....	6055	5850	5715	5510	5375	5170	5035	4830	4695
24.38	.....	.....	.....	4850	4715	4510	4375	4170	4035	3830	3695
27.43	.....	.....	.....	.....	3900	3695	3560	3355	3220	3015	2880
30.48	.....	.....	.....	.....	.....	3060	2925	2720	2585	2480	2245
33.53	.....	.....	.....	.....	.....	.....	.....	2220	2085	1880	1745
36.58	.....	.....	.....	.....	.....	.....	.....	.....	.....	1425	1290



NOTE

(a) Ratings are as per IS 4573 i.e., 75% of tippling load for forward stability and 70% for backward stability.

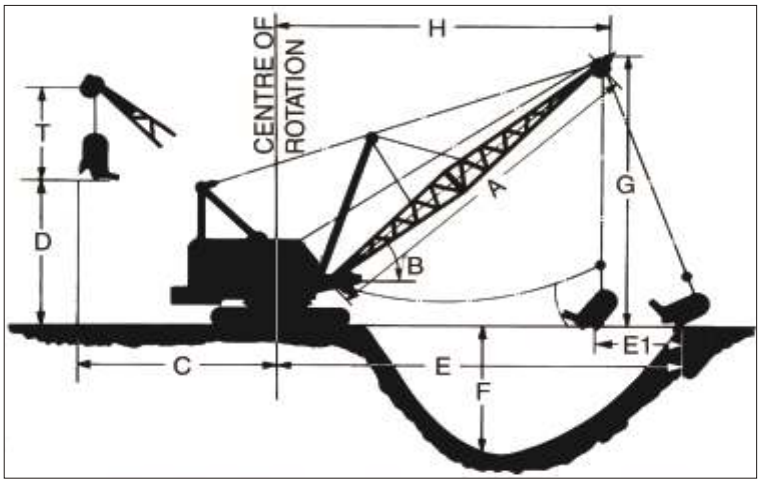
(b) Capacities include the weight of the hook block, slings, etc.

(c) Capacities are for machine standing on firm, level, uniform supporting surface and depend upon the mounting, ground, boom length, radius of operation and which must be taken into account by the user.

(d) Deduct 680 kg for 6.10m jib and 910 kg for 9.14m jib.

CAUTION

Machine must not be used for lifting operations with the gantry in lowered position.



TATA TFC-280-45 Dragline Specifications

GENERAL DATA

- Boom: Angle lattice alloy steel construction. Basic lengths, pin connected in two sections ….. 15.24 m with one boom point sheave on anti-friction bearings, bottom diameter 762 mm. 10 part boom hoist reeving standard for boom lengths.
- Fairlead: 4 sheave, hinge type, on bronze bearings.
- Gantry: High gantry, hinge folding type, standard.
- Working weight: (w/o bucket) ……. 70218 kg
Counterweight included in working weight Std. 21600 kg
- Bucket capacity: 1.91 - 2.29 cum

RATED DRAGLINE LOADS IN KG

Operating radius (m)	15.24m boom	18.29m boom	21.34m boom	*24.38m boom	*27.43m boom	*30.48m boom	*33.53m boom
12.19	7710	.....	.....	.....	.....	.....	.....
13.72	7710	.....	.....	.....	.....	.....	.....
15.24	7710	7710	.....	.....	.....	.....	.....
16.76	.....	7710	7710	.....	.....	.....	.....
18.29	.....	.....	7550	7345	.....	.....	.....
19.81	.....	.....	6735	6530	.....	.....	.....
21.34	.....	.....	.....	5850	5715	.....	.....
24.38	.....	.....	.....	.....	4715	4510	4375
27.43	.....	.....	.....	.....	.....	3695	3560
30.48	.....	.....	.....	.....	.....	.....	2925

*Boom lengths of 24.38 m and over require the use of auxiliary gantry.
Above ratings are combined weights of bucket and material.
Maximum boom length recommended for dragline

- Operations ……33.53 m
- Limit on dragline rating …….. 7710 kg
- Maximum allowable size of dragline bucket …… 2.68 cum

*To select bucket size, use the following formula :

Refer to above charts to obtain dragline capacity in kg.
Dragline capacity = (cum capacity of bucket) x (weight of material per cum)+ (weight of specific dragline bucket)

Approximate weight of 1.91 cum dragline bucket
Non-Perforated : 3500 kg.

1.91 cum is the maximum allowable heavy digging-type bucket. Larger size may be approved on type of material, type of bucket within limitations of rating chart.

DRUM SHAFT ASSEMBLY

Dragline drums pitch dia.	# Cable dia. Mm	Line* Pulls	Line* speed
Front 562 mm	26 or 28	15780 kg	49 m/ min
Rear 638 mm	26 or 28	16787 kg	49 m/ min

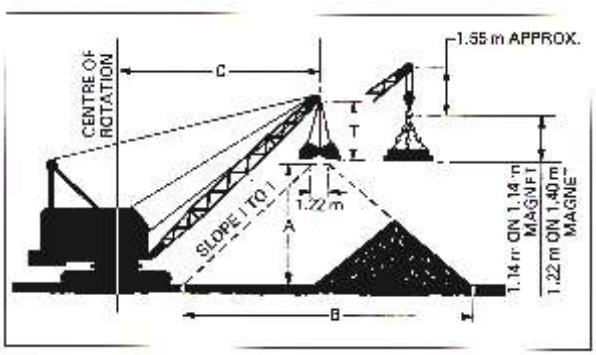
*Line pulls and speeds based on first layer of rope and engine at full load speed.
For 28 mm dia 6 X 19F (12/6-6f/1), RHO, IWRC, Ungalvanised, Grade B wire rope.
For 26 mm dia 3/36 RHO, IWRC, HIFLEX, Ungalvanised, Grade-C (200 kg/mm^2) wire rope,
OR
- 7/37 RHO, IWRC, HIFLEX, Ungalvanised, Grade C (200 kg/mm^2) wire rope.
Min. breaking strength 55 tonnes

GROUND PRESSURE	
Shoe width	914 mm
Ground Pressure	0.73 kg/sq cm

A	Boom length	15.24m		18.29m		21.34m		24.38m		27.43m		30.48m		27.43m	
B	Boom angle	30°	35°	30°	35°	30°	35°	30°	35°	30°	35°	30°	35°	30°	35°
C	Centre of rotation to centre of pump	16.61	15.90	19.25	18.42	21.89	20.93	24.54	23.42	27.18	25.91	29.82	28.40	32.49	30.91
D	Dumping height(max.)	05.36	06.48	06.88	08.23	08.41	09.98	09.93	11.73	11.46	13.59	12.98	15.21	14.50	16.97
E	Digging reach(approx.)	20.40	20.35	24.00	23.95	27.61	27.41	31.01	30.96	34.59	34.52	38.15	37.92	41.63	41.46
E1	Casting distance(approx.)	05.54	06.40	06.48	07.32	07.42	08.23	08.23	09.30	09.14	10.36	10.06	11.28	10.87	12.29
F	Depth cut(approx.)	08.74	09.04	10.26	10.87	11.79	12.70	13.31	14.53	14.83	16.05	16.36	17.58	17.88	19.71
G	Clearance height of boom point sheave	10.01	11.13	11.53	13.58	13.06	14.63	14.58	16.38	16.10	18.21	17.63	19.86	19.15	21.62
H	Clearance radius of boom point sheave	14.94	14.20	17.58	16.71	20.22	19.23	22.86	21.72	25.51	24.21	28.14	26.69	30.81	29.21

Note: Dimensions E and E1 may vary considerably depending on digging and skill of the operator. Dimension F(depth oc cut) depends on the character of digging

TATA TFC-280-45 Clamshell Specifications



GENERAL DATA

- **Boom:** Angle lattice alloy steel construction. Basic lengths, pin connected in two sections ….. 15.24 m with one boom point sheave on anti-friction bearings, bottom diameter 610 mm. 10 part boom hoist reeving standard for boom lengths over 21.34 m.
- **Gantry:** High gantry, folding type, standard.
- **Working weight:** (w/o bucket)..... 70218 kg
  Counterweight included in working weight Std. 21600 kg
- **Bucket capacity:** .....1.91 - 2.29 cum

RATED CLAMSHELL LOADS IN KG

Operating radius(m)	15.24m boom	18.29m boom	21.24m boom	*24.38m boom	*27.43m boom	*30.48m boom	*33.53m boom
09.14	7710	.....	.....	.....	.....	.....	.....
10.67	7710	7710	.....	.....	.....	.....	.....
12.19	7710	7710	7710	.....	.....	.....	.....
13.72	7710	7710	7710	7710	.....	.....	.....
15.24	.....	7710	7710	7710	.....	.....	.....
16.76	.....	7710	7575	7390	7255	7075	.....
18.29	.....	.....	6755	6575	6440	6260	6120
19.81	.....	.....	6030	5850	5715	5535	5395
21.34	.....	.....	.....	5215	5080	4895	4760
24.48	.....	.....	.....	.....	4215	3990	3900
27.43	.....	.....	.....	.....	.....	3265	3130
30.48	.....	.....	.....	.....	.....	.....	2585

*To select bucket size best suited for your application use the following formula :
Refer to chart above to obtain clamshell rating in kg.
Clamshell capacity = (cum capacity of bucket) x (weight of material per cum) + (weight of specific clamshell bucket)
Approximate weight of 1.91 cum clamshell bucket : 4000 kg.

Clamshell ratings shown also apply to magnet, grapple and all other material handling buckets except dragline which is rated separately. For clamshell and magnet operations, the weight of bucket or magnet is considered a part of load and the total weight of bucket plus contents or magnet plus load must not exceed the corresponding ratings shown.

Maximum boom length recommended for clamshell operations …….. 33.53 m
Limit on clamshell rating …….. 7710 m
Maximum allowable size of clamshell bucket …….. 2.29 cum

Caution : Machines must not be used for lifting operations with the gantry in lowered position. Machines with basic boom length may be transported or crawled with the gantry in lowered position.

DRUM SHAFT ASSEMBLY

Clamshell drums pitch dia.	Cable dia.	Line* Pulls	Line* speed
Front 635 mm	26 mm	15780 kg	49 m/ min
Rear 635 mm	26 mm	16787 kg	49 m/ min

*Line pulls and speeds based on first layer of rope and engine at full load speed.

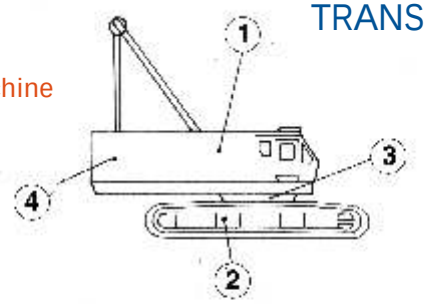
GROUND PRESSURE	
Shoe width	914 mm
Ground Pressure	0.73 kg/sq cm

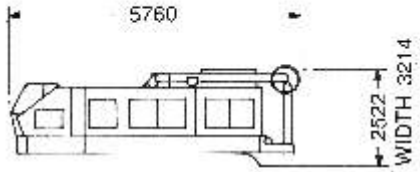
CLAMSHELL WORKING RANGES(M)

Boom(length)	15.24m	18.29m	21.34m	24.38m	27.43m	30.48m	33.53m
height & width of stock pile	A 7.62 m B 16.46	A 10.06 m B 21.34	A 12.50 m B 26.21	A 14.94 m B 31.09	A 17.37 m B 35.97	A 19.81 m B 40.84	A 22.25 m B 45.72
Operating radius C	12.50	14.63	16.76	18.90	21.03	23.17	25.30
Bucket heightT	Varies between 3.66m and 5.18m depending on make and capacity of bucket						

TRANSPORTATION DATA

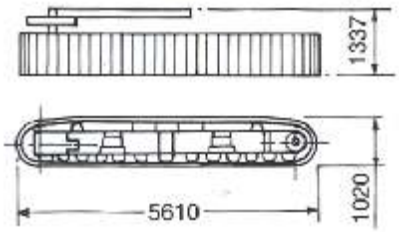
Basic Machine

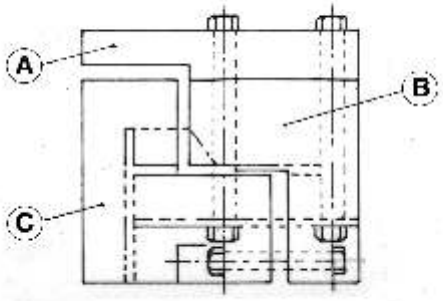




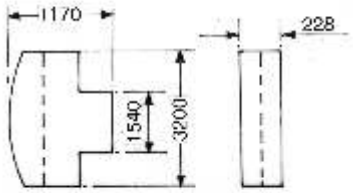
(1) - 2 **Superstructure (with gantry) - 21,600 Kg**

(2) **Side frames – 8,900 Kg x 2**

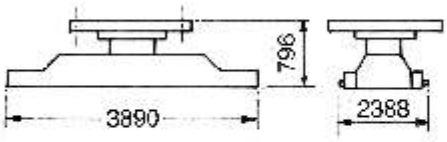


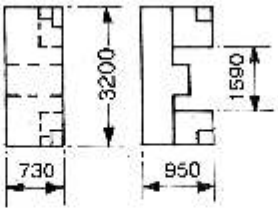


(4) **Counterweight**

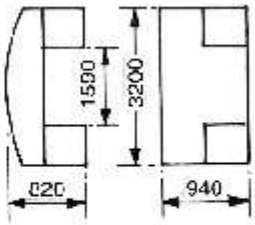


Counterweight (A) – 4,000 Kg



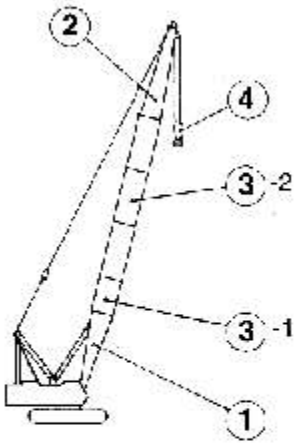


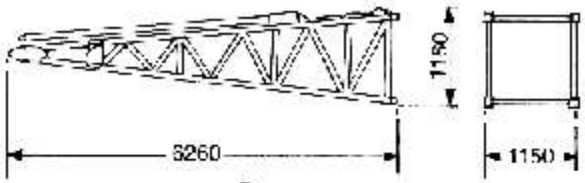
Counterweight (B) – 8,800 Kg



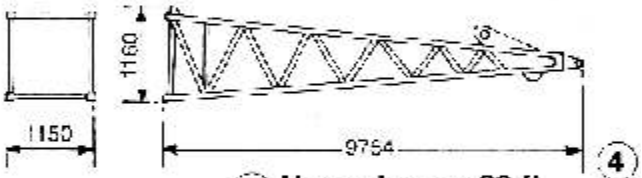
Counterweight (C) – 8,800 Kg

Crane Attachment

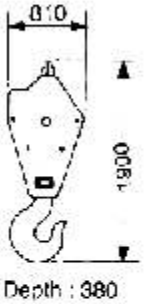




(1) **Lower boom - 20 ft**
2,300 Kg

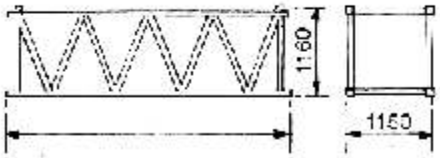


(2) **Upper boom - 30 ft**
2,280 kg

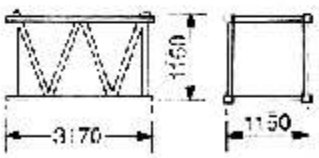


Depth : 380

75 - tonne hook block
998 kg



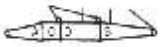
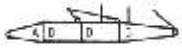
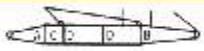
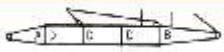
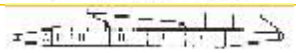
(3) -2 **20 ft boom insert**
734 kg



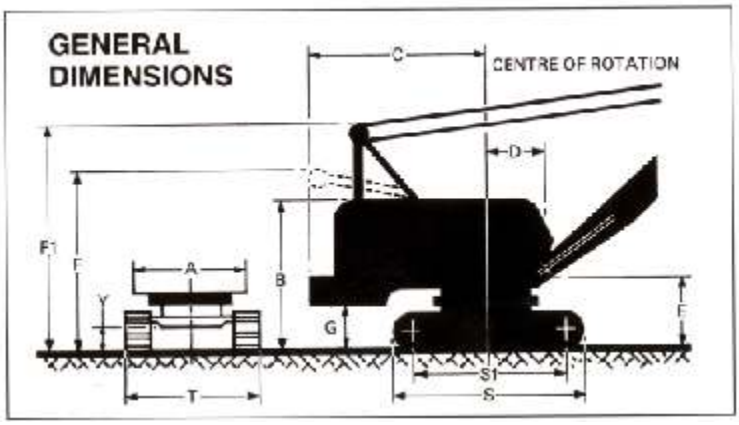
(3) **1 10 ft boom insert**
411 kg

NOTE: ALL DIMENSIONS IN MM

MAIN BOOM CONSTRUCTION

Boom Length	Boom Construction - Crane	Boom Construction Clamshell & Dragline
50'		← same
60'		← same
70'		← same
80'		← same
90'		← same
100'		← same
110'		← same
120'		
130'		
140'		
150'		

A = lower boom(20'), B = upper boom(30'), C = boom insert(10'), D = boom insert(20')



A	–	Width of cab	3200 mm
B	–	Height of cab top	3610 mm
C	–	Radius of rear end (Counterweight)	4660 mm
D	–	Centre of rotation to boom foot pin	1280 mm
E	–	Height from ground to boom foot pin	1930 mm
F	–	Clearance height over high gantry – Folded	3960 mm
F1	–	Clearance height over gantry (working position)	5960 mm
G	–	Counterweight ground clearance	15940 mm
S	–	Overall length of crawlers	5610 mm
S1	–	Centre distance between sprockets	4630 mm
T	–	Overall width of crawlers with 914 mm std. shoes	4470 mm
Y	–	Ground clearance of carbody (lowest point)	254 mm

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