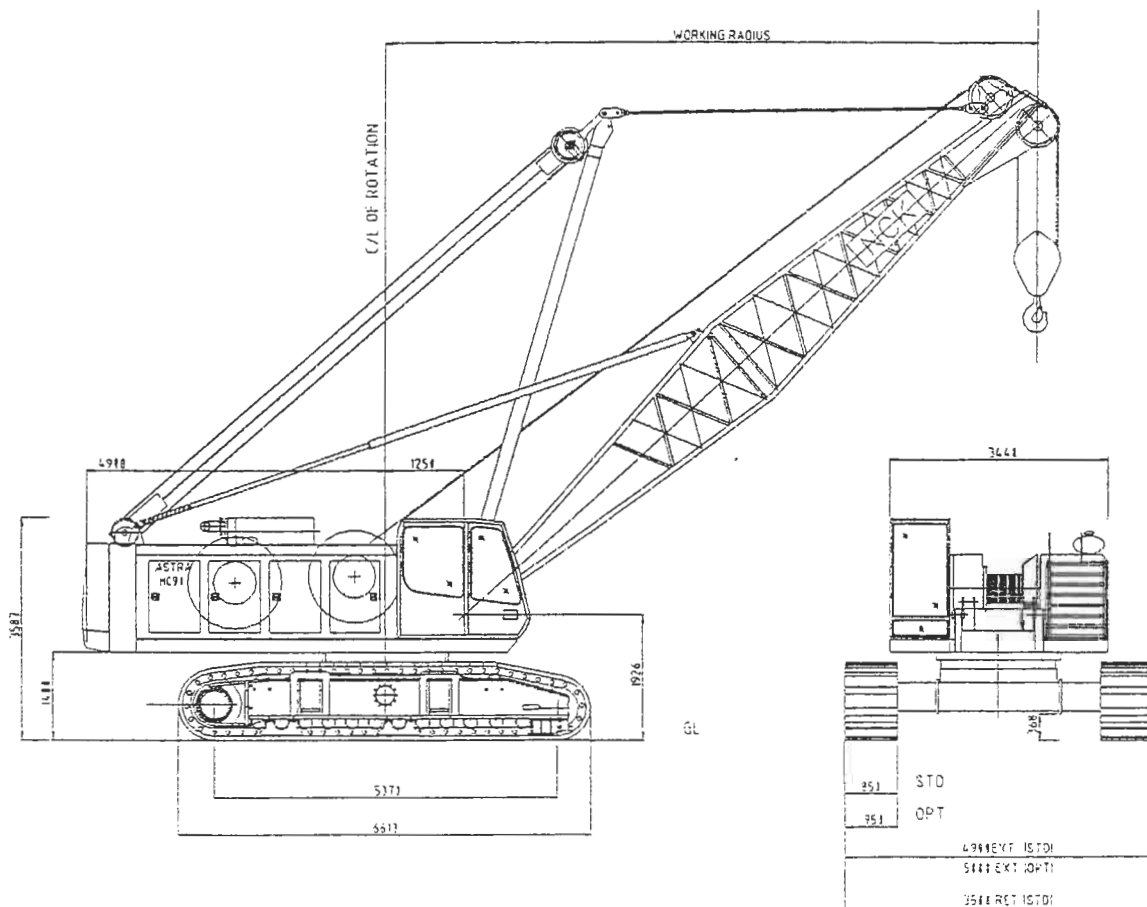


NCK Astra HC-90

HYDRAULIC CRAWLER MOUNTED
Lifting capacity 90 Ton (Metric)

- ▶ Lifterane
- ▶ Dragline
- ▶ Grabcrane
- ▶ Foundation Crane



NCK PROVEN RELIABLE TECHNOLOGY

The ASTRA 90 model is an extension of the well proven NOVA range and can be used as a multi-purpose crawler crane for:- **CONSTRUCTION - FOUNDATION - PORT HANDLING.**

- The machine has a maximum lifting capacity of 90000 kg.
- Tandem drum shaft arrangement with hoist line speeds up to 108 metres per minute.
- Rated lifterane line pull is 12300 kg and the machine has the option available for line pulls up to 27500 kg for the foundation industry.
- The power unit is world proven Caterpillar, rated 240 kW (325 HP) at 2000 rpm.
- The machine is totally hydraulically driven and precisely controlled via low voltage control valves.
- The crawler unit is retractable to 3.5m wide, enabling the complete machine to be easily transported.

NCK Astra HC-90

Crawler Units

Tracks: Independently driven by a bent axis piston motor through a triple reduction gearbox, incorporating a multi-disc brake. This mechanism provides for independent control to travel, steer or contra-rotation for maximum manoeuvrability. Hydraulic system also provides braking to prevent downhill movement.

Crawler Frames: Box section all welded construction, precision machined to accept drive gearbox and lower roller system. Drive sprocket, idler wheel and lower rollers are lifetime lubricated. Tension adjustment on track belt is provided hydraulically.

To ensure transportation within European Road Regulations crawler frames are provided with hydraulic cylinder to facilitate easy retractability.

Track Shoes: Heavy duty high tensile heat treated with abrasion resistant plate.

Carbody: High strength steel fabrication incorporating box section axle extensions to accept crawler frames. Forged steel top ring machined to accept bolt-on slew ring.

Power Unit

Caterpillar Model 3306B-DITA water cooled 4-stroke, 6-cylinder direct injected turbo-charged industrial diesel engine.

Radiator and oil cooler, remote mounted, fan driven by hydraulic motor.

Turntable

Welded steel structure consisting of two fabricated beams as main longitudinal members connected by transverse beams and platework for strength and rigidity.

The structure is precision machined for hoist units, swing unit and lattice boom. The superstructure revolves on a totally enclosed anti-friction slewing ring.

Main and Auxiliary Hoist Units

Main and auxiliary hoist units are driven independently by slow speed, high torque radial piston motors. Rotational direction and speed is controlled through a single lever proportional valve for precise control of hoisting/lowering.

Drums: Main and auxiliary hoist drums are fabricated from rolled steel with cast steel flanges. Rope grooves are machined for controlled rope spooling.

Both drums are mounted on high strength alloy steel shafts which revolve on anti-friction bearings.

Clutches: Drum units are connected to the drive units through large diameter internal expanding friction bands, with replaceable linings. Clutches are spring set and power released.

Brakes: External contracting friction band type, spring applied and power released. Crane (fully powered operation) brakes are automatically released when hoist/lower direction is selected and fully applied with control lever in neutral. Cyclic operation (gravity lower) brake effort is precisely controlled by servo action foot pedals and together with synchronised clutch disconnect, provide excellent control for gravity lowering.

Swing Unit

NCK high specification swing system.

Completely independent of all other motions, swing pinion is driven by reversible high torque radial piston motor incorporating multi-disc brake. Spring applied and power released, hydraulic system provides for controlled braking.

Boom Hoist Unit

Hoist/lower unit is driven by a bent axis piston motor through a double reduction gearbox incorporating a multi-disc brake which is spring applied and power released. The brake is automatically released when main boom is hoisted or lowered and fully applied with control lever in neutral.

Hydraulic system provides for precise control of boom position. A mechanical pawl lock is provided on the boom hoist drum.

NCK Astra HC-90

Operators Cab	Modern ergonomically designed separate module, fully equipped with all necessary equipment for ease of control and operator comfort including all-round visibility, air conditioning unit and in-cab radio. Cab is also flexibly mounted and conforms to all European environmental regulations.
Machinery House	Steel constructed and noise insulated, covering the engine and all operating equipment. Easy access is available for all servicing.
Hydraulic System	<p>Four hydraulic pumps driven via Splitter reduction gearbox.</p> <p>Two variable displacement piston pumps (open circuit) for operation of travel, hoist drums and boom hoist. Simultaneous control or individually.</p> <p>Single variable displacement piston pump (closed circuit) for independent control of swing motion.</p> <p>Single gear pump for control of pilot circuit or ancillary equipment.</p> <p>Main/auxiliary motors: Dual displacement radial piston type complete with counterbalance.</p> <p>Boom hoist motor: Bent axis piston motor complete with counterbalance valve.</p> <p>Swing motor: High torque radial piston motor.</p> <p>Travel motor: Bent axis piston motor.</p> <p>Hydraulic valves: Relief valves protect all motion and control circuits from overload. Main hoist winch and boom hoist circuits incorporate counterbalance valves to ensure safe controlled lowering.</p> <p>Traction circuit also includes counterbalance valves to ensure safe travelling on inclines.</p>
Front End Attachment	<p>Tubular chord boom: Lattice construction, high tensile steel tubular chord.</p> <p>Base boom:- two piece, total length 12 metres.</p> <p>Lower section:- 6 metres</p> <p>Outer section:- 6 metres</p> <p>Boom point:- offset boom head, 5 sheaves mounted on anti-friction bearings.</p> <p>Boom inserts:- 3m, 6m and 9m long. Pin joint connected to increase main boom length.</p>
Fly Jib	<p>Lattice construction, high tensile steel main chord members.</p> <p>Basic jib:- two piece construction, total length 9 metres.</p> <p>Jib inserts:- 4.5 metres long, pin joint connected (maximum length 18 metres).</p> <p>Jib point:- single sheave mounted on anti-friction bearings.</p>
Main Boom Suspension	<p>Pendant suspension from suspension mast which is pin connected to lower superstructure.</p> <p>Mast is hoisted and lowered on a multi-reeved rope system, located between the mast head and a fabricated frame at rear of turntable.</p> <p>All sheaves are mounted on anti-friction bearings and suspension mast can be removed without unreeving the rope system.</p>

Safety Equipment

Boom overhoist: Maximum boom angle is restricted to 80° by automatic cut-out, which neutralises the hoist valve and applies the brake.

Telescopic tubular backstops are also provided between main boom and superstructure.

Operators cab: Safety glass is fitted in all windows.

Counterbalance valve: To ensure machine fails safe in the event of an hydraulic failure, a brake valve is incorporated into the travel, boom hoist, main and auxiliary hoist circuits. This valve is automatically activated.

Rope position indicator: NCK-designed rope positioning device for accurate placement of loads.

Drum lock: Boom hoist drum is fitted with a safety pawl lock.

Brake system: To ensure maximum safety, all brakes are fail safe type, spring applied and power released.

Safe load indicator: An electronic audible and visible automatic safe load indicator is available for main boom and fly jib operations.

Indicator records the operating radius, suspended load (actual) and the safe working load. Management system can be incorporated with computer downloading facility.

The load sensing unit is incorporated into the boom hoist system, making it suitable for cyclic duty and foundation applications, in addition to normal liftcrane loadings.

Noise

Noise emissions to comply with future European standards.

NCK Astra HC-90

BASIC SPECIFICATION

MAXIMUM RATED LOAD		90000 kg @ 4m Radius
Boom	Basic Boom Length	12 m
	Max Boom Length	60 m
	Fly Jib	9 - 13.5 - 18 m
	Maximum boom C/W Fly	48 m plus 18 m
Swing Speed (Variable)		0 - 2.7 RPM
Travel Speed (Two Speed Variable)		0 - 1.28 KPH
Gradeability		50% Low Speed
Power Unit	Model	Caterpillar 3306B-DITA
	Rated Power	240kw (325 BHP) @ 2000 RPM
Operating Weight	Liftcrane Equipped with 12M Boom 90 Tonne Hook Block & Counterweight (18000 kg)	84750 kg

WINCH DRUM DATA

DIMENSIONS

Machine Function	Winch Drum Position	Rope Dia (mm)	PCD 1st Layer (mm)	Drum Length (mm)	No. of Layers	Capacity BS:1757 (M)
Liftcrane	Front	26	560	580	4	160
	Rear	26	560	580	4	160
*(Optional) Foundation	Front	28	460	580	4	150
	Rear	28	460	580	4	150
Dragline	Front (Drag)	28	460	580	1	28
	Rear (Hoist)	26	560	580	1	35
Grabcrane	Front (Closing)	26	560	580	2	78
	Rear (Holding)	26	Taper	580	1	0
Boom Hoist	(Twin Drum)	18	440	180	4	113

OPERATING SPEED (METRES/MIN) AND LINE PULL (kg)

Machine Function	Drum	Speed Range	Rated Line Pull (kg)	Line Speed at Rated Pull (m/min)	Max Line Pull (kg)
Liftcrane	Main Drum Front	Low	12300	0 - 54	18000
		High	8000	0 - 108	9000
	Aux Drum Rear	Low	12300	0 - 54	18000
		High	8000	0 - 108	9000
Dragline	Drag (Front)	Low	11000	0 - 42	22500
	Hoist (Rear)		11000	0 - 54	18000
Grab Crane	Closing (Front)	Low	11000	0 - 54	18000
	Holding (Rear)		11000	0 - 54	18000
Foundation	Front	Low	18000	0 - 42	22500
	Rear	Low	18000	0 - 42	22500
Foundation Optional	Front	Low	18000	0 - 37	27500*
	Rear	Low	18000	0 - 37	27500*

GRABCRANE -

if required for dockside application (Consult with Manufacturer). Winch Motors can be set for optimum Pull/Speed Ratio.

FOUNDATION -

Winch Drums to enable high line pull/speed for foundation application comply with BS EN791 and BS EN896 requirements.

LIFTCRANE -

Maximum line pull of 18000 kg can be obtained but is restricted to 12300 kg to comply with BS 1757:1986 rope factor of safety 4.5:1.

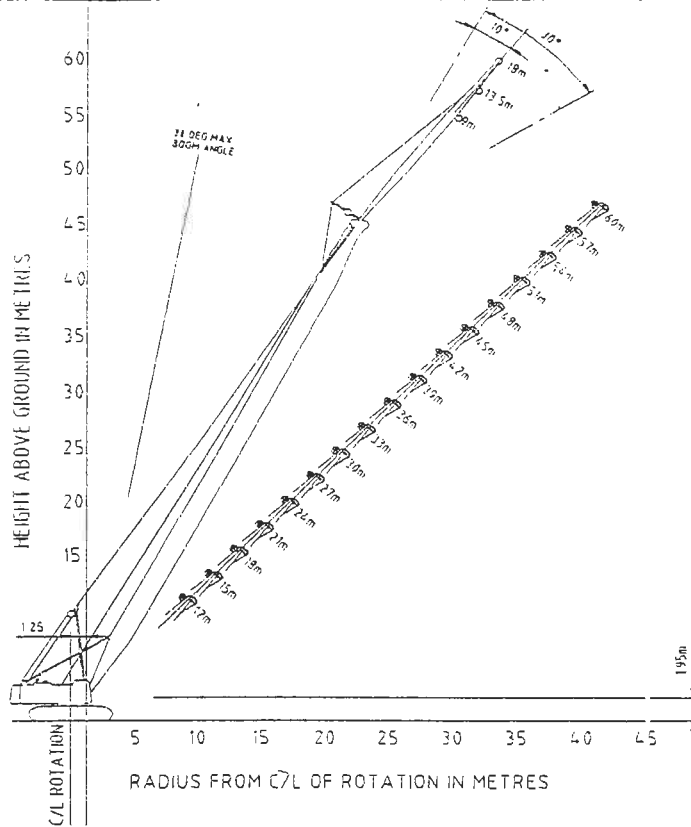
Offset Head Boom Radius Diagram

Users are referred to British Standards Code of Practice (CP 3010 : 1972) "Safe Use of Cranes", which gives guidance for the safe application and operation of mobile cranes.

The Gross Working Loads listed in the

duty tables are to be used under the following conditions:

Operating this equipment in excess of the rated loads shown in the following capacity charts or contrary to our Instruction Manual will result in unsafe conditions, damage to the machine and invalidate the warranty.



IS.O. 4305 : 1981 BS 1757 : 1986, D.I.N. 15019 pt.2, Crane Ratings Capacities in accordance with the requirements of Clause 11, Stability of BS 1757:1986 with wind forces to Table 2(a) and 3(a) of BS 2573, Part 1: 1977 and also meet the Determination of Stability of International Standard ISO 4305, and Stability of Mobile Cranes DIN 15019 part 2.

Loads must be freely suspended and the machine standing on firm ground, level to less than 1 in 100.

Loads shown are gross and the weights of all hook blocks, slings, etc, must be deducted to determine nett working loads.

75% Crane Ratings

Rated loads do not exceed 75% of the tipping loads but in certain instances, are further governed by structural limitations.

Ratings are based on freely suspended loads and make no allowance for such factors as wind effects, ground conditions, out of level, operating speeds or any other conditions that could be detrimental to the safe operation of this equipment.

Loads shown are gross and the weights of all hook blocks, slings, etc, must be deducted to determine nett working loads.

Main Boom Loads

Main boom loads with offset head - maximum capacity 90000 kg, maximum length 60.0 m.

When a fly jib is fitted, the effective weight of all hook blocks, slings, etc, must be deducted when calculating nett working loads. The main boom loads must be further reduced by the following to allow for the weight of the fly jib:

- 9 m Fly Jib - reduce by 1200 kg
- 13.5 m Fly Jib - reduce by 1500 kg
- 18 m Fly Jib - reduce by 2000 kg

Maximum length of main boom when fly jib is fitted - 51 m with 9 m or 13.5 m fly and 48 m with 18 m fly

Fly Jib Loads

Maximum fly jib gross loads: (see Duty Chart)

- 9 m Fly Jib - 10000 kg
- 13.5 m Fly Jib - 9000 kg
- 18 m Fly Jib - 6000 kg

Effective weight of all suspended hook blocks, slings and tackle must be deducted when calculating nett working loads.

Fly Jib Offset

With the standard pendant ropes supplied for each fly jib, the offset of the fly jib head from the centre line of the main boom is 10° or 30°, regardless of the fly jib length. This offset angle must be maintained at all times.

Liftcrane Hoist Rope Loads

26 mm rope

No. of Parts of Rope	Max. Lifting Capacity (kg)
1	12300
2	24400
3	36200
4	47900
5	59200
6	70400
7	81400
8	90000

The above capacities are derived from rope factors of safety to BS 1757 : 1986, also in accordance with P.C.S.A. Standard No.1 and maximum pulls from hoist drums.

NCK Astra HC-90

LIFTING CAPACITIES - OFFSET HEAD BOOM MAIN BOOM (with maximum counterweight)

Metric

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
12.0	3.75	80	90000	90000
	4	79	90000	90000
	5	74	76500	76500
	6	89	56200	52800
	7	63	44100	41550
	8	58	36200	34100
	9	52	30600	28800
	10	45	26350	24850
	12	28	20450	19300
15.0	4.25	80	80000	80000
	5	77	76400	76400
	6	73	56100	52750
	7	69	44000	41500
	8	65	36000	34050
	9	60	30550	28750
	10	56	26300	24700
	12	46	20400	19200
18.0	4.8	80	72200	72200
	6	76	56000	52700
	7	73	43500	41450
	8	69	35500	34000
	9	66	30500	28700
	10	62	26250	24600
	12	55	20350	19100
	14	46	16850	15900
21.0	5.3	80	63800	63800
	6	78	55500	52650
	7	75	43000	41400
	8	72	35000	33900
	9	69	30400	28650
	10	66	26200	24500
	12	60	20300	19000
	14	54	16750	15800
	16	46	14150	13400
24.0	5.9	80	56900	55190
	7	77	42500	41350
	8	75	34500	33800
	9	72	30300	28600
	10	70	26150	24400
	12	64	20250	18900
	14	59	16700	15700
	16	53	14100	13300
	18	47	12000	11450
	20	40	10400	9900
22	31	9100	8700	

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
27.0	6.4	80	49300	48550
	7	79	42000	41300
	8	76	34000	33700
	9	74	30200	28550
	10	72	26100	24300
	12	67	20200	18800
	14	63	16650	15600
	16	58	14050	13200
	18	53	11950	11400
	20	47	10300	9850
30.0	6.9	80	43700	43180
	7	79	41000	41250
	8	78	33500	33500
	9	76	30100	28500
	10	74	26000	24200
	12	70	20100	18700
	14	66	16600	15500
	16	61	14000	13100
	18	57	11900	11350
	20	52	10200	9800
33.0	7.4	80	37600	37600
	8	79	33000	33000
	9	77	30000	28400
	10	75	25900	24100
	12	72	20000	18600
	14	68	16550	15400
	16	64	13900	13000
	18	60	11800	11300
	20	56	10100	9750
	22	52	8800	8550
30.0	24	47	7750	7500
	26	42	6900	6700
	28	37	6100	5950
	30	30	5500	5350

NCK Astra HC-90

LIFTING CAPACITIES - OFFSET HEAD BOOM MAIN BOOM (with maximum counterweight)

Metric

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
36.0	8	80	32000	32000
	9	78	29800	28300
	10	77	25800	24000
	12	73	19900	18500
	14	70	16500	15300
	16	66	13800	12900
	18	63	11700	11250
	20	59	10000	9700
	22	55	8700	8500
	24	51	7700	7450
	26	47	6800	6600
	28	43	6000	5900
	30	38	5400	5300
32	32	4800	4800	
39.0	8.5	80	29700	29700
	9	79	29500	28200
	10	78	25700	23500
	12	75	19800	18400
	14	72	16450	15200
	16	68	13700	12800
	18	65	11600	11100
	20	62	9900	9600
	22	58	8600	8400
	24	55	7600	7350
	26	51	6700	6500
	28	47	5900	5800
	30	43	5300	5200
32	39	4700	4700	
34	33	4300	4200	
42.0	9	80	26200	26200
	10	79	25600	23000
	12	76	19700	18300
	14	73	16400	15100
	16	70	13600	12700
	18	67	11500	11000
	20	64	9800	9500
	22	61	8500	8250
	24	58	7450	7250
	26	54	6550	6400
	28	51	5800	5700
	30	47	5200	5100
	32	43	4600	4600
34	39	4100	4150	
36	35	3700	3700	
38	30	3300	3400	

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
45.0	9.5	80	23000	23000
	10	79	22200	22200
	12	77	19600	18200
	14	74	16350	15000
	16	71	13500	12600
	18	69	11400	10900
	20	66	9750	9400
	22	63	8450	8200
	24	60	7400	7200
	26	57	6500	6350
	28	54	5700	5650
	30	51	5100	5050
	32	47	4500	4500
34	44	4000	4100	
36	40	3600	3600	
38	36	3200	3300	
40	31	2900	3000	
48.0	10	80	19700	19700
	12	78	18800	18100
	14	75	16300	14900
	16	73	13400	12500
	18	70	11300	10800
	20	67	9700	9300
	22	65	8400	8100
	24	62	7300	7100
	26	59	6400	6300
	28	57	5600	5500
	30	54	5000	5000
	32	51	4400	4400
	34	47	3900	4000
36	44	3500	3500	
38	41	3100	3200	
40	37	2800	2900	
51.0	10.6	80	17300	17300
	12	78	16800	16800
	14	76	16000	14800
	16	74	13300	12400
	18	71	11200	10700
	20	69	9600	9200
	22	66	8200	8000
	24	64	7200	7000
	26	61	6300	6200
	28	59	5500	5400
	30	56	4900	4800
	32	53	4300	4300
	34	51	3800	3900
36	48	3400	3400	
38	44	3000	3100	
40	41	2700	2800	
42	37	2300	2500	

NCK Astra HC-90

LIFTING CAPACITIES - OFFSET HEAD BOOM

MAIN BOOM (with maximum counterweight)

Metric

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
54.0	11.1	80	15400	15400
	12	79	15100	15100
	14	77	14400	14400
	16	75	13200	12300
	18	72	11100	10600
	20	70	9400	9100
	22	68	8100	7900
	24	66	7000	6900
	26	63	6100	6100
	28	61	5400	5300
	30	58	4700	4700
	32	56	4200	4200
	34	53	3700	3750
	36	50	3300	3300
	38	48	2900	3000
	40	45	2500	2700
42	41	2200	2400	
44	38	1900	2100	
57.0	11.5	80	13600	13600
	12	79	13500	13500
	14	77	12800	12800
	16	75	12200	12200
	18	73	10900	10500
	20	71	9300	9000
	22	69	8000	7800
	24	67	6900	6800
	26	65	6000	5900
	28	62	5200	5200
	30	60	4600	4600
	32	58	4000	4100
	34	55	3500	3600
	36	53	3100	3200
	38	50	2700	2900
	40	48	2400	2500
42	45	2100	2250	
44	42	1800	2000	

Boom Length	Radius	Boom Angle	GROSS WORKING LOAD	
			BS 1757 : 1986	75% Rating
<i>m</i>	<i>m</i>	<i>degrees</i>	<i>kg</i>	<i>kg</i>
60.0	12.1	80	12000	12000
	14	78	11500	11500
	16	76	10900	10900
	18	74	10400	10400
	20	72	9200	8900
	22	70	7800	7700
	24	68	6800	6700
	26	66	5900	5800
	28	64	5100	5100
	30	62	4400	4500
	32	60	3900	4000
	34	57	3400	3500
	36	55	3000	3100
	38	53	2600	2750
	40	50	2200	2400
	42	48	1900	2150
44	45	1700	1900	

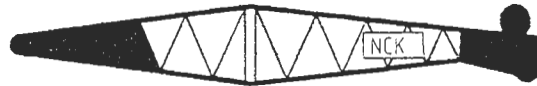
WEIGHTS OF MAJOR COMPONENTS

BASE MACHINE (WITHOUT COUNTERWEIGHT)



59708 Kg

BASIC BOOM (12M)



2435 Kg

UPPER UNIT (WITHOUT COUNTERWEIGHT)



20500 Kg

BOOM INSERTS



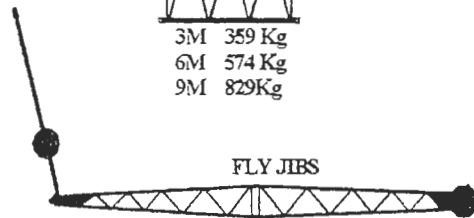
3M 359 Kg
6M 574 Kg
9M 829Kg

CRAWLER UNITS (WT each)



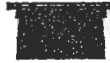
13250 Kg

FLY JIBS



9M 1028 Kg
13.5M 1196 Kg
18M 1364 Kg

CARBODY w/Slew Ring



8360 Kg

COUNTERWEIGHT (3-Sections)



18000 Kg

SUSPENSION MAST 1710 Kg
BOOM HOIST EQUALISER 975 Kg

HOOK BLOCKS
90 TONNE 2000 Kg
60 TONNE 900 Kg
36 TONNE 410 Kg
12 TONNE (SINGLE BALL) 220 Kg

NCK CRANES LTD

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