

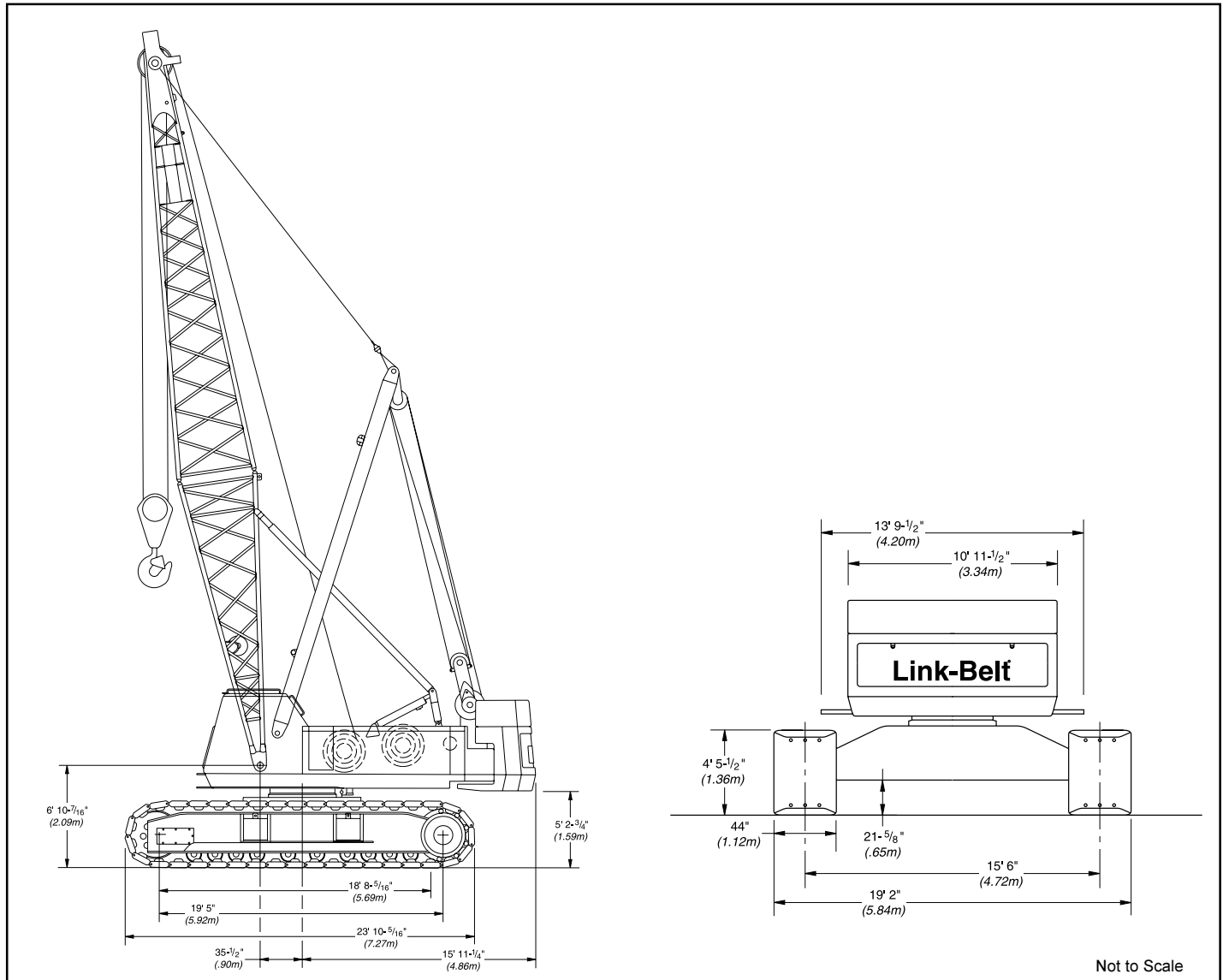
# Specifications

Lattice Boom Crawler Crane

## LS-238H

150-Ton (136 metric ton)

### HYLAB Series



Not to Scale

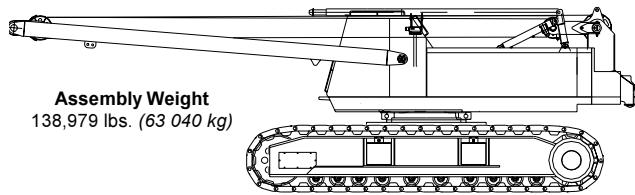
General dimensions	feet	meters
Basic boom length	50	15.24
Overall width of machine with 44" (1.12 m) track shoes	19.17	5.84
Overall width of cab w/catwalks both sides	13.79	4.20
Overall width of cab less catwalks	10.95	3.34

General dimensions	feet	meters
Tailswing of counterweight "A"	14.95	4.50
Tailswing of counterweight "AB"	15.94	4.85
Tailswing of counterweight "ABC"	15.94	4.85
Overall height for transport w/boom base	13.31	4.05
Overall height for transport w/live mast only	13.31	4.05
Maximum tailswing of live mast	19.71	6.01

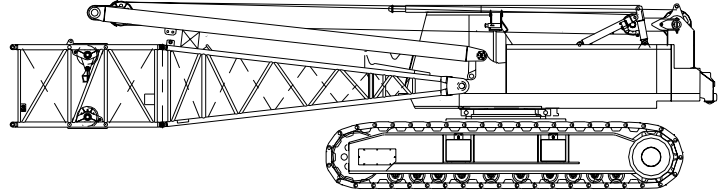
# Machine Working Weights - approximate

Based on standard machine including Isuzu 6SD1TQB diesel engine, turntable bearing, independent hydraulic powered drums, boomhoist limiting device, independent hydraulic swing and travel, counterweight "ABC", swing brake, drum rotation indicators, and 15' 6" (4.72 m) gauge by 23' 10" (7.26 m) long crawler lower with 44" (1.12 m) wide track shoes, sealed track rollers, catwalks, hydraulic boomfoot pin removal, plus the following:	<b>Ctwt. "A"</b>		<b>Ctwt. "AB"</b>		<b>Ctwt. "ABC"</b>		<b>Ctwt. "ABC" + Track Ctwt.</b>	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
Lifting Crane - includes 50' (15.24 m) basic tubular boom, 26' (7.92 m) live mast, 950' (289.6 m) of 7/8" (22 mm) diameter wire rope, 465' (141.7 m) of 7/8" (22 mm) diameter boomhoist rope, 150-ton (136 mt) hookblock, and basic pendants.	170,034	77 126	189,364	85 894	216,034	97 991	236,034	107 063

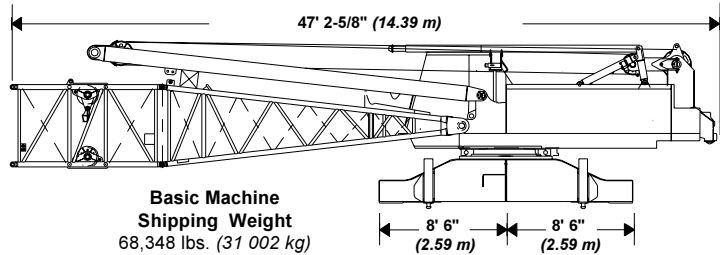
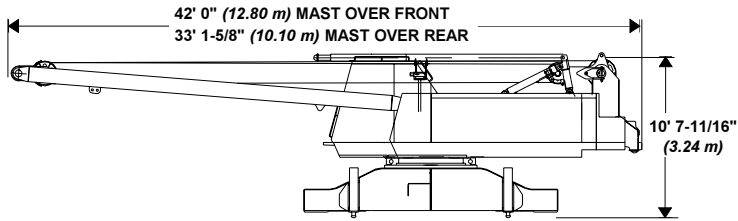
# Transport Weights and Dimensions - ± 3%



**Assembly Weight**  
138,979 lbs. (63 040 kg)

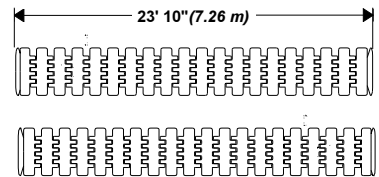
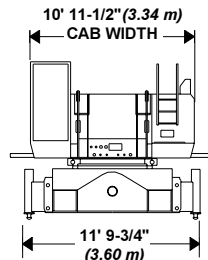


**Assembly Weight**  
144,884 lbs. (65 718 kg)

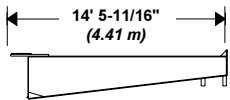


**Basic Machine Shipping Weight**  
68,348 lbs. (31 002 kg)

**Basic Machine Shipping Weight**  
59,759 lbs. (27 107 kg) Upper & Carbody  
+ 2,684 lbs. (1 217 kg) Carbody Jacks  
62,443 (28 324 kg) Total

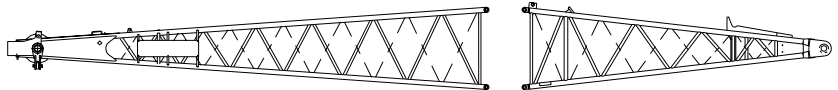


**Tread Members**  
38,100 lbs. (17 281 kg) each  
44" (1.12 m) Track shoes



**Counterweight Assist Frame**  
3,400 lbs. (1 542 kg)  
(not included in basic machine weight)

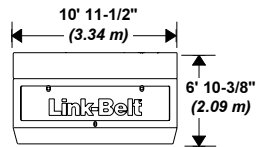
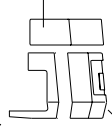
70" x 62" (1.77 x 1.57 m) tubular cross-section tubular boom



**30' (9.14 m) Peak Section**  
4,430 lbs. (2 009 kg)

**20' (6.10 m) Base Section w/power pins**  
3,625 lbs. (1 644 kg) - w/o third drum winch  
5,625 lbs. (2 552 kg) - w/third drum winch assembly

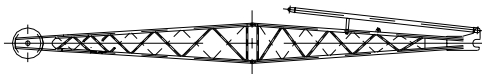
**"C" Upper Counterweight**  
26,670 lbs. (12 098 kg)



**"ABC" Counterweight**  
69,000 lbs. (31 298 kg)

**"B" Upper Counterweight**  
19,330 lbs. (8 768 kg)

**"A" Upper Counterweight**  
23,000 lbs. (10 433 kg)



**30' (9.14 m) Jib Assembly**  
36" (.91 m) wide x 30" (.76 m) deep cross-section 1,700 lbs. (770 kg)



**Track Counterweights (2)**  
10,000 lbs. (4 536 kg) each  
(not included in basic machine weight)



**Third Drum Winch**  
2,000 lbs. (907 kg) each  
(not included in basic machine weight)

Optional Boom Sections	
10' (3.05 m) boom extension	1,100 lbs. (499 kg)
10' (3.05 m) with sheaves boom extension	2,280 lbs. (1 034 kg)
20' (6.10 m) boom extension	1,164 lbs. (645 kg)
30' (9.14 m) boom extension	1,669 lbs. (888 kg)
40' (12.19 m) boom extension	2,156 lbs. (1 131 kg)
50' (15.24 m) boom extension	2,638 lbs. (1 197 kg)
Misc. Items	
Axle wedge packs (4)	336 lbs. (152 kg)

# Crawler Mounting

## ■ Lower frame

All welded high strength steel (100,000 psi yield), box construction; precision machined surfaces for turntable bearing and axle plates.

## ■ Turntable bearing

Outer race bolted to upper frame; inner race with internal swing gears bolted to lower.

## ■ Crawler side frames

All welded, precision machined and removable. Positioned on cross axles by dowels and held in place with adjustable wedge packs.

## ■ Track drive sprockets

Cast steel, heat treated, self-cleaning. Powered by hydraulic motors through double reduction gear drive.

## ■ Track carrier slide rails

Slide rails on top of each side frame.

## ■ Track rollers

Heat treated, mounted on oil filled "lifetime sealed" anti-friction bearings; 10 per side crawler side frame.

## ■ Tracks

Heat treated, self-cleaning, multiple hinged track shoes joined by one piece full floating pins; 42 shoes per side frame - 44" (1.12 m) wide.

**Track tension adjustment** - Idler wheel adjusted by means of hydraulic cylinder and hand pump. Idler wheel shaft held in position with shims after adjustment is made.

## ■ Take up idlers

Cast steel, heat treated, self-cleaning, mounted on aluminum/bronze bushings. Lubricated through idler shaft.

## ■ Independent hydraulic travel/steering

Power transmitted by axial piston hydraulic motors through double reduction unit to track drive sprocket.

**Steering** - Axial piston motor with reduction gear is located at inner drive end of each crawler side frame. Each track is driven simultaneously or individually for straight-line, gradual turn, or pivot turn. The tracks can be counterrotated for spin turns.

**Brakes** - Spring applied, hydraulically released multiple disc brakes are applied automatically when the control lever is in the neutral position.

Travel speed - 0.61 mph (0.97 km/hr).

Gradeability - 30%

## ■ Jacking system

*Optional*; four ground controlled, power hydraulic jacks, pinned to the lower carbody frame, used to raise the machine to facilitate removal or installation of the crawler side frames.

## Ground contact area and ground bearing pressure

Based on standard machine equipped with "ABC" counterweight and 50' (15.24 m) tubular boom.

Track shoes		Ground contact area		Ground bearing pressure	
inches	meters	sq. in.	cm <sup>2</sup>	psi	kg/cm <sup>2</sup>
44	1.12	20,500	132 258	11.51	0.74

# Revolving Upperstructure

## ■ Frame

All welded and precision machined.

## ■ Turntable bearing

With integral swing (ring) gear. Inner race with internal swing gear is bolted to lower frame.

## ■ Engine

Full pressure lubrication, oil filter, air cleaner, hour meter and throttle, electric control shutdown.

## ■ Fuel tank

77 gallon (291 liter) capacity; equipped with fuel sight level gauge, flame arrester, and self-closing cap with locking eye for padlock.

Engine Specifications	Isuzu 6SD1TQB
Number of cylinders	6
Bore and stroke: inch - (mm)	4.72 x 5.71 (115 x 135)
Piston displacement - cu. in. - (cm <sup>3</sup> )	600 (8 413)
High idle speed - rpm	2,325
Engine rpm at full load speed	2,100
Net engine hp at full load speed	207
Peak torque - foot pounds - joules	513 (696)
Peak torque - rpm	1,400
Electrical system	24-volt
Batteries	2 - 12 volt

# LS-238H Load Hoisting Performance

Available line speed and line pull

Line pulls are not based on wire rope strength. See wire rope chart below for maximum permissible single part of line working loads.

## Line Speeds and Pulls

Rope layer	Front Drum - 7/8" (22 mm) wire rope						Rear Drum - 7/8" (22 mm) wire rope					
	Maximum line pull		No load line speed		Full load line speed		Maximum line pull		No load line speed		Full load line speed	
	lbs.	kg	ft./min	m/min	ft./min	m/min	lbs.	kg	ft./min	m/min	ft./min	m/min
1	35,913	16 290	227	69	113	35	22,154	10 049	368	112	184	56
2	33,081	15 006	246	75	123	38	20,407	9 257	399	122	200	61
3	30,649	13 902	266	81	133	41	18,906	8 576	431	131	216	66
4	28,562	12 956	285	87	143	43	17,619	7 992	462	141	231	71
5	26,730	12 125	305	93	152	46	16,489	7 479	494	151	247	75
6	25,129	11 399	324	99	162	49	15,502	7 031	525	160	263	80
7	23,700	10 750	344	105	172	52	14,620	6 632	557	170	279	85

Rope layer	Boomhoist Drum - 7/8" (22 mm) wire rope						Third Drum - 3/4" (19 mm) wire rope					
	Maximum line pull		No load line speed		Full load line speed		Maximum line pull		No load line speed		Full load line speed	
	lbs.	kg	ft./min	m/min	ft./min	m/min	lbs.	kg	ft./min	m/min	ft./min	m/min
1	40,842	18 526	112	34	100	30	18,961	8 601	248	76	185	56
2	36,760	16 674	124	38	111	34	17,607	7 986	268	82	199	61
3	33,417	15 158	136	42	122	37	16,433	7 454	287	88	214	65
4	30,633	13 895	149	45	133	41	15,406	6 988	306	93	228	70
5	28,276	12 826	161	49	144	44	14,500	6 577	325	99	242	74
6	26,257	11 910	174	53	155	47	--	--	--	--	--	--
7	24,506	11 116	186	57	166	51	--	--	--	--	--	--

## Wire Rope Drum Capacities

Rope layer	Boomhoist Drum Capacity - 7/8" (22 mm) wire rope					
	Pitch Diameter		Layer		Total	
	in.	mm	ft.	m	ft.	m
1	15.88	403	51.8	15.8	51.8	15.8
2	17.63	448	57.1	17.4	108.9	33.2
3	19.38	492	62.3	19.0	171.2	52.2
4	21.13	537	67.2	20.5	238.5	72.7
5	22.88	581	72.5	22.1	310.9	94.8
6	24.63	625	77.4	23.6	388.4	118.4
7	26.38	670	82.7	25.2	471.3	143.7

Rope layer	Front Drum Capacity - 7/8" (22 mm) wire rope					
	Pitch Diameter		Layer		Total	
	in.	mm	ft.	m	ft.	m
1	17.6	448	111	33.8	111	33.8
2	19.4	492	122	37.1	233	70.9
3	21.1	537	133	40.5	365	111.4
4	22.9	581	144	43.8	509	155.3
5	24.6	626	155	47.2	664	202.4
6	26.4	670	166	50.5	830	253.0
7	28.1	715	177	53.9	1,007	306.9

Rope layer	Rear Drum Capacity - 7/8" (22 mm) wire rope					
	Pitch Diameter		Layer		Total	
	in.	mm	ft.	m	ft.	m
1	17.6	448	111	33.8	111	33.8
2	19.4	492	122	37.1	233	70.9
3	21.1	537	133	40.5	365	111.4
4	22.9	581	144	43.8	509	155.3
5	24.6	626	155	47.2	664	202.4
6	26.4	670	166	50.5	830	253.0
7	28.1	715	177	53.9	1,007	306.9

Rope layer	Third Drum Capacity - 3/4" (19 mm) wire rope					
	Pitch Diameter		Layer		Total	
	in.	mm	ft.	m	ft.	m
1	19.5	495	148	45.1	148	45.1
2	21.0	533	160	48.8	308	93.9
3	22.5	572	171	52.1	479	146.0
4	24.0	610	182	55.5	661	201.5
5	25.5	648	194	59.1	855	260.6

## Wire Rope: size, type and working strength

Wire rope application	Size: diameter		Type	Max. permissible load	
	inches	mm		lbs.	kg
Boomhoist	7/8	22	AC	25,000	11 340
Main load hoist	7/8	22	DB	22,700	10 297
Jib load hoist	7/8	22	RB	17,520	7 938
Boom pendants (dual)	1-3/8	35	N	64,000	29 030
Jib staylines	7/8	22	N	22,700	10 297
Third Drum	3/4	19	RB	12,920	5 861

### Wire Rope: types available

- Type "DB" - 6 x 26 (6 x 19 class) Warrington Sale, extra improved plow steel, preformed, right lay, regular lay.
- Type "AC" - 9 x 40 strand, post formed, swaged - constructex, crush resistant
- Type "RB" - 18 x 19 non-rotating, extra, extra improved plow steel, preformed, right lay, regular lay, swaged.

## Hydraulic System

### ■ Hydraulic pumps

Two variable displacement piston pumps operating at 4,000 psi (281.24 kg/cm<sup>2</sup>) power travel, main drum, auxiliary drum, third drum, and boomhoist functions. One fixed displacement gear pump operating at 3,000 psi (211 kg/cm<sup>2</sup>) power swing, counterweight lowering, and machine jack functions. One fixed displacement gear pump operating at 1,210 psi (85 kg/cm<sup>2</sup>) powers pilot control system, clutches, brakes, and pump controls.

### ■ Pump control ("fine inching") mode

Special fine metering pump setting selectable from the operator's cab allows very slow movements for precision work. Main hoist, auxiliary hoist, boomhoist, third drum, and travel are all supplied with this standard feature.

### ■ Hydraulic reservoir

42 gal. (159 L), equipped with sight level gauge.

### ■ Relief valves

Each function is equipped with relief valves to protect the circuit from overload or shock.

### ■ Hydraulic filtration

Ten micron, full flow line filter furnished in control circuit. All oil is filtered prior to return to sump tank.

### ■ Hydraulic motors

Main hoist drum, auxiliary hoist drum, boomhoist, swing, and travel are powered by axial piston motors.

### ■ Counterbalance valves

**Upper** - Hoist motors are equipped with counterbalance valves to provide positive load lowering and prevent accidental load drop when hydraulic power is suddenly reduced.

**Lower** - Travel motors are equipped with counterbalance valves to provide positive travel lock and prevent overspeeding of travel motors.

## Principal Operating Functions

### ■ Control system

Remote controlled hydraulic servo for main drum, auxiliary drum, travel, boomhoist, and third drum. Mechanical linkage controls swing. Function speed is proportional to lever movement. Levers are adjustable for operator comfort.

### ■ Load hoisting and lowering

Main and auxiliary hoist drums are driven by individual axial piston motors and reduction gearing. Load hoisting or lowering is provided by actuating a hydraulic motor. The control lever provides two speeds for hoisting and lowering. Hoisting or lowering speeds are proportional to lever movement.

**Freefall** - The incorporation of power hydraulic controlled, two-shoe clutches allow freefall operation of the main and auxiliary hoist drums for special crane cycle application. Mode selection switch on control panel allows operator to select the most productive operation mode.

### ■ Load hoist drums

Main (front) and auxiliary (rear) hoist drums are 16-3/4" (.43 m) root diameter grooved for 7/8" (22 mm) wire rope. Mounted on anti-friction bearings.

**Third operating drum** - *Optional*; 18-3/4" (.49 m) grooved drum lagging, mounted in boom base section. 3/4" (19 mm) wire rope.

### ■ Drum clutches

Speed-o-Matic® power hydraulic two-shoe clutches; internal expanding, lined shoes. Clutch spiders are splined to shafts; clutch drums are integral with hoist drums.

**Load hoist clutches** - Front and rear main drums - clutch drums 20" (.51 m) diameter, 5" (.13 m) width.

### ■ Drum brakes

External contracting band type; operated by foot pedal equipped with a locking latch. Operator may select automatic brake mode\* (spring applied, hydraulically released), which will apply brakes when the hoist control lever is in the neutral position.

\*When in the automatic brake mode, the LS-238H meets all OSHA requirements for personnel handling.

### ■ Drum rotation indicators

Standard for front and rear drums. Audible-type indicators.

### ■ Drum locking pawl

Standard for front and rear drums; electrically actuated and prevents drum rotation in a lowering direction.

### ■ Anti two-block system

Standard - A switch mounted on the boom peak activates a buzzer to warn the operator of a two-block condition and simultaneously disengages hoist function while applying the hoist brakes.

### ■ Swing system

Independent, hydraulic swing is driven by two gear motors through a gear reduction system; free swing when lever is in neutral position.

**Swing brake** - Spring applied, hydraulically released; controlled by button on swing control lever.

**Swing lock** - Mechanically controlled, three-position locking mechanism.

**Swing speed** - Variable from 0 to 2.2 rpm.

### ■ Boomhoist/lowering system

Independent, hydraulic boomhoist is driven by an axial piston motor through a gear reduction system. Boom hoisting or lowering is performed by actuating or reversing the motor. Boomhoist speed is infinitely variable. Boomhoist speed from 0° to 70° boom angle is 90 seconds.

### ■ Boomhoist drum

Single grooved lagging 10.68" (.27 m) root diameter.

### ■ Boomhoist drum locking pawl

Electrically operated.

### ■ Boomhoist brake

Spring applied, hydraulically released, multiple disc type brake. Brake is automatically applied when control lever is in neutral position.

**Boomhoist limiting device** - Restricts hoisting boom beyond recommended minimum radius.

#### ■ Electrical system

24 volt negative ground system with two 12-volt batteries. Standard lighting system includes: two 70 watt headlights mounted on machine front and one interior cab light.

#### ■ Operator's cab

Full vision, modular compartment with safety glass panels. The completely independent cab is insulated against noise and vibration. Sliding operator's door, swing up roof window. Standard equipment includes: heater, defroster, windshield wiper, dry chemical fire extinguisher, sun visor, bubble-type level, fuel gauge, tachometer, hydraulic temperature gauge, engine oil pressure gauge, coolant temperature gauge, and service monitor system.

#### ■ Machinery cab

Hinged doors (one on right side, two on left side) for machinery access. Equipped with rooftop access ladder, electric warning horn and skid resistant finish on roof.

#### ■ Catwalks

Standard on right and left sides. Catwalks remove for reduced travel width.

#### ■ Bail

Pinned to revolving frame. Five sheaves are provided for 16 part boomhoist wire rope reeving. Sheaves mounted on "sealed" anti-friction bearings.

#### ■ Counterweights

"A" upper ctwt. - 23,000 lbs. (10 433 kg)

"AB" upper ctwt. - 42,330 lbs. (19 201 kg)

"ABC" upper ctwt. - 69,000 lbs. (31 298 kg)

Track ctwt. (2) - 10,000 lbs. (4 536 kg) each

## Boom and Jib

#### ■ Tubular boom

Two-piece basic boom 50' (15.24 m) long with open throat top section. Boom 70" (1.78 m) wide, 62" (1.57 m) deep at connections. Alloy steel round tubular cords 4" (101.6 mm) outside diameter. Maximum boom length is 240' (73.15 m).

#### ■ Base section

20' (6.10 m) long; boomfoot lugs on 55" (1.40 m) centers.

#### ■ Boom extensions

Available in 10', 20', 30', 40' and 50' (3.05, 6.10, 9.14, 12.19 and 15.24 m) lengths with appropriate length pendants.

*Optional* - Special 10' (3.05 m) boom extension with necessary sheaves for handling crawler side frames and counterweight. Can be used as an extension in normal boom makeup. Includes appropriate pendants.

#### ■ Boom connections

In-line pin connections.

#### ■ Boom top section

Open throat; 30' (9.14 m) long.

#### ■ Boompoint machinery

Six 20-1/2" (.52 m) root diameter sheaves mounted on "sealed" anti-friction bearings.

#### ■ Hydraulic boomfoot pin removal

Standard; Speed-o-Matic controlled; located between mounting lugs on boom base section.

#### ■ Boom live mast

26' (7.92 m) long; supports boomhoist bridle and boom pendants. Required for all boom lengths. May be used as short boom for assembling and disassembly of side frames and boom, but is not intended for general crane service. Refer to operator's manual for boom live mast lifting capacities.

#### ■ Jib

Tubular; two-piece basic jib 30' (9.14 m) long; 36" (.91 m) wide, 30" (.75 m) deep at centerline of connections. Alloy steel tubular chords 2-1/2" (63 mm) outside diameter.

**Base section** - 15' 0" (4.57 m) long.

**Jib extensions** - Available in 10' (3.05 m), 20' (6.10 m), and 30' (9.14 m) lengths with appropriate length pendants.

**Jib connections** - In-line, tapered pins.

**Tip section** - 15' (4.57 m) long; equipped with single peak sheave 21" (.53 m) root diameter, heat treated and mounted on anti-friction bearings. Anchor provided at peak of jib tip section for two-part load hoist wire rope (whipline) connection.

**Maximum jib length permitted** - 70' (21.34 m). All jib lengths may be mounted at 0°, 15°, or 30° offset to boom.

#### ■ Jib mast

12' 7.62" (3.85 m) long, mounted on jib base section. Deflector sheave mounted within mast to guide whipline; mounted on anti-friction bearings.

**Jib staylines** - Front and back staylines. Back staylines vary in length depending on degree of jib offset from boom centerline; back staylines attached at bottom end of boom top section.

**Jib stops** - Telescoping type; pinned from jib mast to boom top section and from jib mast to jib base section.

## Auxiliary Equipment

#### ■ Boom angle indicator

Pendulum type; mounted on boom base section. Electronic type readout on load indicator.

#### ■ Hook blocks

Blocks, or weighted ball with swivel hook, *optional* - refer to price list.

#### ■ Rated capacity limiter

Standard; electronic load indicator for load hoist line.

#### ■ Swing alarm

Standard; audio/visual warning device signals when upper is swinging.