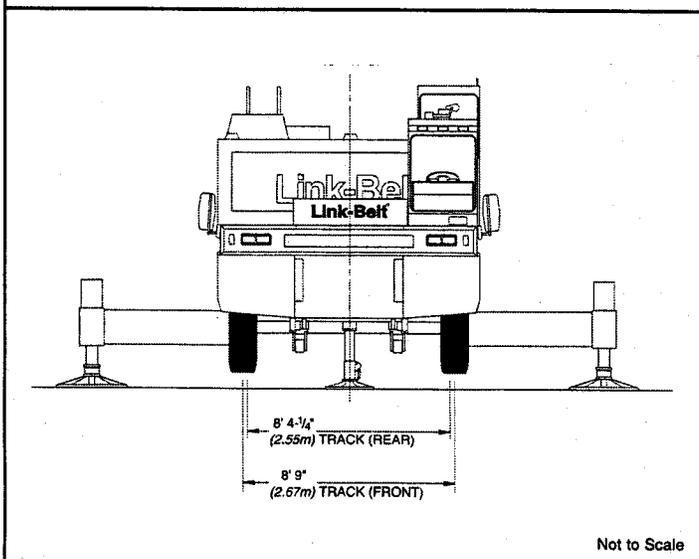
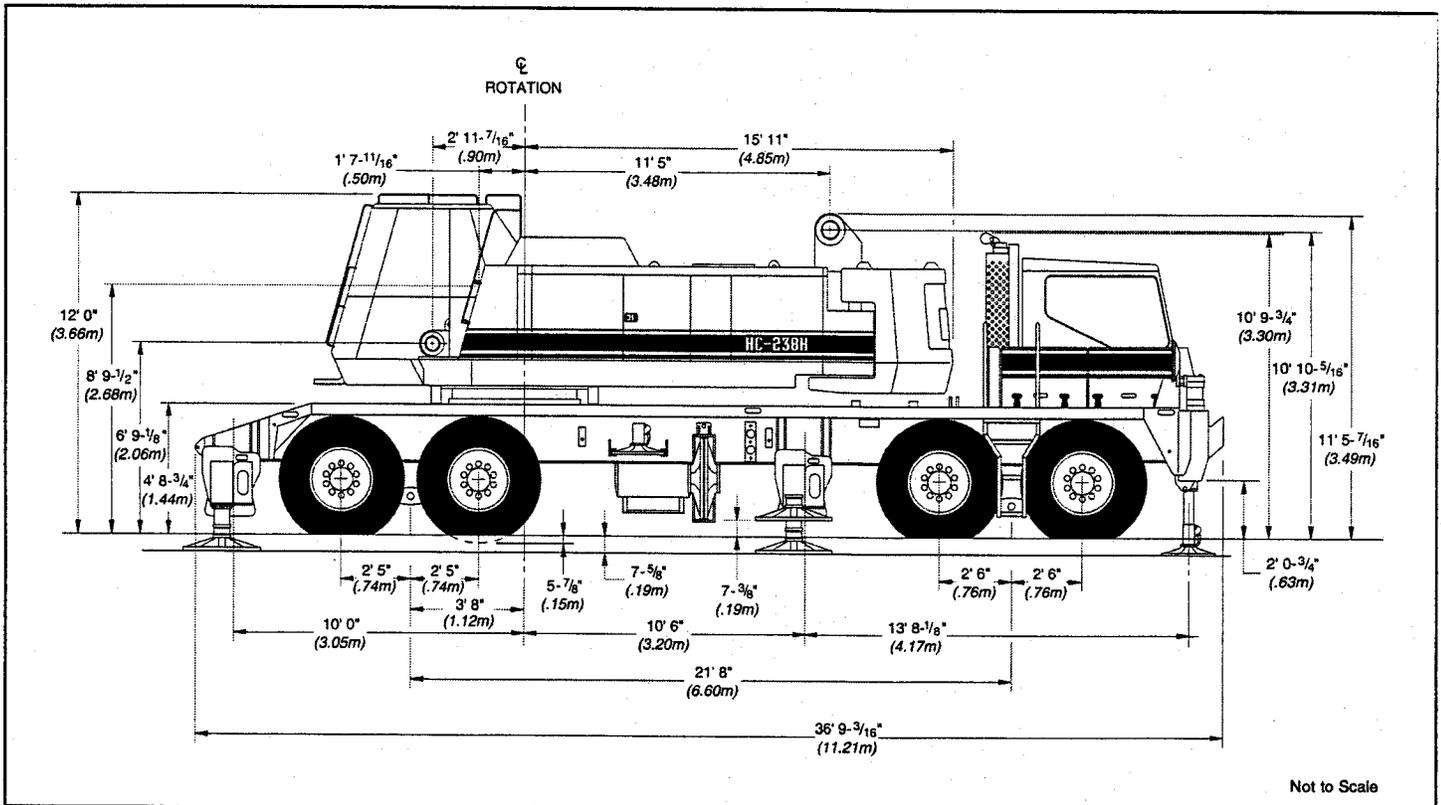


Specifications

Hydraulic Lattice Boom Truck Crane

HC-238H 150-ton (136 metric ton)



General dimensions	feet	meters
Overall width, outriggers extended (over floats)	23' 10"	7.26
Overall width, outriggers extended (c/ of jacks)	21' 0"	6.40
Overall width, outriggers retracted	11' 0"	3.35
Vehicle clearance circle over outside of front bumper	104' 2"	31.73
Vehicle clearance circle over outside of front bumper counterweight	105' 2"	32.05
Minimum ground clearance (at bottom of front bogie beams)	11"	0.28
Counterweight tailswing (at corners)	15' 11"	4.85
Overall cab width (upper)	11' 0"	3.35
Radius of boom hinge pin	35-7/16"	0.90
Height of boom hinge pin	6' 9"	1.98
Ground clearance under counterweight	5' 2"	1.58

Axle Loads

Standard HC-238H revolving upperstructure equipped with Isuzu diesel engine, power load lowering clutches and rear load hoist drums, no counterweight, mounted on 260" (6.60 m) wheelbase, 8 x 4 drive carrier, 11' 0" (3.35 m) wide, equipped with Detroit Diesel 60 Series engine, front center hydraulic jack and full fuel.	Basic Machine Gross Weight ^①		Upper facing front				Upper facing rear				
	**	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
	A	34,340	15 577	-510	-231	34,850	15 808	12,130	5 502	22,210	10 074
B	43,900	19 913	21,905	9 936	21,995	9 977	21,905	9 936	21,995	9 977	
C	78,240	35 490	21,395	9 705	56,845	25 785	34,035	15 438	44,205	20 051	
Adjust axle loadings accordingly for the following components:	Component Weights		Front axle		Rear axle		Front axle		Rear axle		
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	
Upperstructure											
Add for boomhoist rope and live mast: folded to rear of upper	5,590	2 535	-2,455	-1 114	8,045	3 649	4,345	1 971	1,245	565	
-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	
folded forward of boomfoot	5,590	2 536	3,470	1 574	2,120	962	-1,575	-714	7,165	3 250	
Rear drum wire rope - 610' (185.9 m) of 7/8" (22 mm) Type "RB"											
Rear drum wire rope - 805' (245.4 m) of 7/8" (22 mm) Type "RB"											
Front drum wire rope - 950' (289.6 m) of 7/8" (22 mm) Type "N"	1,350	612	50	23	1,300	590	410	186	940	426	
Counterweight "A"	23,000	10 433	-10,580	-4 809	33,580	15 232	18,365	8 330	4,635	2 102	
-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	
Counterweight "AB"	42,330	19 201	-20,635	9 360	62,965	28 561	34 960	15 858	7,370	3 343	
-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	-or-	
Counterweight "ABC"	69,000	31 298	-33,262	-15 088	102,262	46 386	56,613	25 680	12,387	5 619	
Carrier											
Bumper counterweight "A"	13,500	6 124	17,810	8 079	-4,310	-1 955	17,810	8 079	-4,310	-1 955	
Front outrigger beams and jacks	7,600	3 447	4,970	2 254	2,630	1 193	4,970	2 254	2,630	1 193	
Rear outrigger beams and jacks	7,600	3 447	-2,220	-1 007	9,820	4 454	-2,220	-1 007	9,820	4 454	
Main outrigger floats	660	299	335	152	325	147	335	152	325	147	
Bumper outrigger float	80	36	41	19	39	17	41	19	39	17	
Michelin tires	1,200	544	400	181	800	363	400	181	800	363	
Hydraulic pin pullers	430	195	80	36	350	159	80	36	350	159	
Attachment											
20' (6.10 m) tubular boom base section with hydraulic boomfoot pins - horizontal	3,380	1 533	-	-	-	-	-1,465	-665	4,845	2 198	

** A - Upper, B - Carrier, C - Total

① Pusher axle would add 2,200 lbs. (998 kg) total weight.

Mounting

■ Type

260" (6.60 m) wheelbase, 8 x 4 drive.
11' 0" (3.35 m) wide.

Frame - Main members heat treated alloy steel, triple-box construction. Machined mounting surface for turntable bearing.

Turntable bearing - Inner race, with integral internal tooth swing (ring) gear, bolted machined surface on carrier deck.

■ Outriggers

Full width, double box, front and rear pin connected to carrier frame. Hydraulically operated beams and jack cylinders individually controlled from each side of carrier. Check valve at each jack cylinder.

Optional - Hydraulic outrigger box pin puller.

Front center hydraulic jack with float - Standard - Single hydraulic jack, with float, mounted at front of the carrier. Jack/float assembly required for handling 360° swing rated capacities.

Floats - Four low profile, snap-on, alloy steel; 34" (.86 m) diameter base. Front center jack is snap-on aluminum; 24" (.61 m) diameter base.

■ Axles

Front - Tubular; bogie beam mounted tandem axles, single wheels. 105" (2.67 m) track.

Rear - Planetary type, bogie mounted tandem axles, dual wheels. 100" (2.54 m) track.

Suspension - Hendrickson rubber bushed front and bronze bushed rear equalizer beams with rubber bushed torque rods. Equipped with a shock absorber at each front wheel.

Wheels and rims - Front; disc-type. Dual rear, integral with planetary hubs.

Pusher axle - *Optional* - 22,000 lb. (9 979 kg) rated tubular trailer axle with dual 275/70R 22.5 tubeless radial tires on disc wheels and lift type air suspension system. Axle centerline at 91" (2.31 m) ahead of drive axle tandem centerline.

Tag axle - *Optional* - consult factory.

■ Tires

Single tires front; dual tires rear
14.00 x 24 CHM load range L (20 ply rating) bias ply transport type tread.

Optional - Michelin 14.00R24 XGC (3 star rating) radial tires front and rear.

■ Brakes - Air brake system

Service - Dual circuit with modulated emergency brakes. Bendix dual circuit 8 wheel air brakes with service chambers on 4 front wheels and spring applied, air released emergency, parking, service chambers on 4 rear wheels. Air dryer standard.

Size -

Rear wheels: 20-1/4" x 7" (.51 x .18 m)

Front wheels: 16-1/2" x 6" (.42 x .15 m)

Steering - Sheppard full integral hydraulic power. Steering mounted high on side of frame to minimize exposure to hazards. High speed, high power system to maximize maneuverability both on the job site and on the road.

■ Engines

Diesel; 12 volt alternator, starter, air compressor, dry type air cleaner, pressure lubrication and hydraulic pump.

Detroit Diesel 60 Series engine, 6 cylinder (12.7 liter). See page 4 for details.

Clutch - Valeo 17" (.43 m) single plate dry disc, diaphragm spring.

■ Transmissions -

Main - Eaton RTO 14908LL; ten speeds forward, three reverse.

Auxiliary - Spicer P-1241-C; 4-speed, midship mounting.

■ Automatic - *Optional*

Main - Eaton RTO 14109B ATE CEEMAT (Converter Enhanced Electronically Managed Automatic Transmission), 9 speeds forward, shifted fully automatically, 1 reverse. Ratios and speeds are similar to the manual transmission. Consult factory for more details.

Auxiliary - Spicer P-1241-D; 4-speed midship mounting. Same as the auxiliary transmission for the manual version except with a 1.59:1 1st gear ratio.

■ Bumper counterweight

"A" counterweight - 13,500 lbs. (6 124 kg).

■ Carrier cab

One-man, fully enclosed. Air suspension mounted bucket seat with seat belt. Noise absorbing insulation with vinyl covering, sound reduction headliner, rubber floor mat. Tilt-out instrument panel (for easy service) includes speedometer, odometer, tachometer, voltmeter, hourmeter, and gauges for fuel level, engine temperature, engine oil pressure, air pressure, and transmission temperature (auto. trans. only). Control switches are included for cruise control, engine fan clutch, heater/defroster, and lights. Also included are low air pressure warning buzzer/light, transmission overheat warning buzzer/light (auto. trans only) and parking brake applied light. The tilt/telescoping steering column includes key locking ignition/starter, and 2-speed windshield wiper/washer. Sliding right and rear windows. Roll down door window. Front and roof fresh air vents.

■ Electrical system

12-volt system with 12-volt starting; including dual sealed beam headlights, directional signals with 4-way flashing system, stop and tail lights, clearance lights, side turn indicators, horn, instrument panel lighting, dome light, headlight dimmer switch, four 12-volt, group 31 batteries, and Delco 12-volt, 130 amp alternator.

■ Fuel tank

One 85 gallon (322 liter) capacity aluminum tank; side mounted on carrier frame.

■ Standard equipment

West coast type rear view mirrors with adjustable convex mirror, lug wrench, 2-way reading bubble levels. High pressure lube fittings at all bearing points. Hand grab rails, carrier deck access ladder on both sides and rear, back-up alarm, skid-resistant finish on carrier deck, air and electric connections on rear of carrier, and towing shackles front and rear.

GENERAL INFORMATION ONLY

Engine Specifications	Detroit Diesel 60 Series - Model S60 12.7 L
Number of cylinders	6
Bore	5.12" (130 mm)
Stroke	6.30" (160 mm)
Piston displacement	778 cu. in. (12 751 cm ³)
Max. brake h.p. @ rpm	430 (321 kw) @ 2,100
Governed load speed rpm	2,100
Peak torque @ rpm	1450 ft. lbs. (1 966 joules) @ 1,200
Electrical system	12-volt charging/12-volt starting
Batteries	Four 12-volt
Alternator	Delco 12-volt, 130 amps
Air compressor	Bendix TU-FLO 1400, 31 cfm (.88 m ³ /min)

Carrier Speeds

Main - Eaton RTO 14908LL			Auxiliary - Spicer P-1241-C							
			4th (.81)		3rd (1.00)		2nd (1.24)		1st (2.37)	
Gear	Ratio	mph	km/h	mph	km/h	mph	km/h	mph	km/h	
High	8th	.74	58.4*	94.0*	47.4	76.3	38.2	61.5	20.0	32.2
	7th	1.00	43.2	69.5	35.1	56.5	28.3	45.5	14.8	23.8
	6th	1.36	31.8	51.2	25.8	41.5	20.8	33.5	10.9	17.5
	5th	1.83	23.6	38.0	19.2	30.9	15.5	24.9	8.1	13.0
Low	4th	2.53	17.1	27.5	13.9	22.4	11.2	18.0	5.9	9.5
	3rd	3.40	12.7	20.4	10.3	16.6	8.3	13.4	4.4	7.1
	2nd	4.63	9.3	15.0	7.6	12.2	6.1	9.8	3.2	5.1
	1st	6.24	6.9	11.1	5.6	9.0	4.5	7.2	2.4	3.9
	L	9.42	4.6	7.4	3.7	6.0	3.0	4.8	1.6	2.6
Deep Reduction	LL	14.56	3.0	4.8	2.4	3.9	1.9	3.1	1.0	1.6
Hi Rev.	Rev.	2.89	15.0	24.1	12.1	19.5	9.8	15.8	5.1	8.2
Lo Rev.	Rev.	9.85	4.4	7.1	3.6	5.8	2.9	4.7	1.5	2.4
Deep Reduction	Rev.	15.22	2.8	4.5	2.3	3.7	1.9	3.1	1.0	1.6
Deep Reduction @ 600 rpm	LL	14.56	.85	1.4	.7	1.2	.55	.9	.3	.5
Deep Reduction @ 600 rpm	Rev.	15.22	.8	1.3	.65	1.1	.5	.8	.3	.5

* Radial tires and pick and carry axles and rims required for top speeds above 50 mph (80.45 km/hr).

Turning Ability

Turning circle diameter	Curb clearance circle diameter	Vehicle clearance circle diameter	
		Over outside of front bumper	Over outside of front bumper counterweight "A"
Centerline of outer front tire	Outside of outer front tire	Over outside of front bumper	Over outside of front bumper counterweight "A"
98' 6" (30.02 m)	99' 10" (30.43 m)	104' 2" (31.75 m)	105' 2" (32.05 m)

HC-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					
	Maximum line pull		No load line speed		Full load line speed	
	lbs.	kg	ft./min	m/min	ft./min	m/min
1	40,842	18 526	112	34	100	30
2	36,760	16 674	124	38	111	34
3	33,417	15 158	136	42	122	37
4	30,633	13 895	149	45	133	41
5	28,276	12 826	161	49	144	44
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

Wire Rope: size, type and working strength

Wire rope application	Size: diameter		Type	Max. permissible load	
	inches	mm		lbs.	kg
Main hoist	7/8	22	N	22,700	10 297
Auxiliary hoist	7/8	22	RB	17,520	7 947
Boom hoist	7/8	22	RB	17,520	7 947
Boom pendants	1-3/8	35	N	n/a	n/a
Jib pendants	3/4	19	N	n/a	n/a

Wire Rope: types available

- Type "N" - 6 x 25 (6 x 19 class) filler wire, extra improved plow steel, preformed, independent wire rope center, right lay, regular lay.
- Type "RB" - 18 x 19 rotation resistant, extra, extra improved plow steel, preformed, right lay, regular lay, swaged.

Upperstructure

■ Frame

All-welded, precision machined unit.

■ Fuel Tank

76 gallon (290 L) capacity.

■ Power transmission

All functions hydraulically powered allowing positive, precise control, with independent or simultaneous operation of all crane functions.

Engine Specifications

Isuzu A-6SD1TQB with oil filter, oil cooler, air cleaner, fuel filter, water separator, hour meter, tachometer and electrical shutdown.

Number of cylinders		6
Bore and stroke	-inch -(mm)	4.72 X 5.71 (120 X 145)
Piston displacement	-(in ³) -(cm ³)	600 (9 839)
Engine rpm at full load speed		2100
Hi-idle rpm		2325
Net engine horsepower at full load speed, (HP)		207 (155 kw)
Peak torque	- foot pounds - (joule)	513 696
Peak torque - rpm		1400
Electrical system		24 volt
Batteries		2 - 12 volt
Alternator		24-volt, 40 amps

Hydraulic System

■ Hydraulic pumps

Two variable displacement piston pumps operating at 4,000 psi (281 kg/cm²) powers main drum, auxiliary drum, and boomhoist functions. Two fixed displacement gear pumps operating at 3,000 psi (211 kg/cm²) powers swing functions. One fixed displacement gear pump operating at 1,200 psi (84 kg/cm²) powers pilot control system, clutches, brakes, pump controls and counterweight lifting cylinders.

■ Hydraulic reservoir

42 gallons (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 and swing are powered by axial piston motors.

■ Counterbalance valves

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

Principal Operating Functions

■ Control system

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

■ Load hoisting & lowering

Main and auxiliary hoist drums are driven by individual axial piston motors and reduction gearing. Load hoisting or lowering is provided by actuating or reversing a hydraulic motor. Smooth, precise power load lowering is attained with automatic hydraulic brake. The control lever provides two speeds for hoisting and lowering. Hoisting or lowering speeds are proportional to lever movement.

■ Load hoist drums

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

■ Drum clutches

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

Load Hoist clutches - Front and rear main drums - clutch drums 26" (.66 m) diameter, 5.12" (130 mm) face width. Swept area is 418 square inches (2 697 cm²).

■ 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.

■ 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 low-ering 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.

■ Rated capacity limiter

Standard; PAT DS-350 rated capacity limiter, programmed with multiple charts, provides the operator with: main boom length, main boom angle, jib angle, jib length, operating mode, load radius, boom tip height, anti-two block indicator, pre-warning light, audible alarm, overload light, and load on hook.

■ Swing system

Independent, hydraulic swing is driven by two axial piston motors through a gear reduction system.

Swing Brake - Spring loaded, hydraulically released, controlled by button on swing control lever.

Swing lock - Mechanically controlled, 360° locking mechanism.

Swing speed - 0 to 2.2 r.p.m.

■ 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 drum

Single grooved lagging 15" (0.38 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. 24-volt, 40 amp alternator. 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 roof-top access ladder, electric warning horn and skid resistant finish on roof.

■ Catwalks

Standard - Folding catwalk along operator's side.

■ Bail

Pinned to revolving frame. Five sheaves are provided for 12-part boomhoist wire rope reeving; sheaves mounted on anti-friction bearings, sealed for lifetime lubrication.

■ Counterweight

Counterweight "A" - 23,000 lbs (10 433 kg)

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

Counterweight "C" - 27,000 lbs. (12 247 kg)

Boom and Jib

■ Tubular boom

Two-piece boom 50' (15.24 m) long with open throat top section. Boom 70" (1.77 m) wide, 62" (1.57 m) deep at connections. Alloy steel round tubular cords 4" (0.10 m) outside diameter.

■ Base section

20' (6.10 m) long; boomfeet 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 used to self-assemble machine. Can be used as an extension in normal boom makeup. Includes appropriate pendants and deflector roller.

■ Boom connections

In-line pin connections.

■ Boom top section

Open throat; 30' (9.14 m) long.

■ Boompoint machinery

Six 20-1/2" (0.52 m) root diameter sheaves mounted on lifetime sealed anti-friction bearings for lifting crane applications.

■ 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 disassembling counterweight, outriggers and boom, but is not intended for general crane service. Refer to operator's manual for boom live mast lifting capacities.

Note: The mast may be self-stored either over the back of the machinery house or forward of the boomfoot during transportation. Resulting weight transfer will significantly affect axle loadings (see axle load chart on page 2).

Live Mast Weight Transfer System

Optional - Hydraulic cylinder operated system positions the live mast over the rear of the upper to transfer weight from one axle group to the other.

■ Tubular jib

Two-piece basic jib 30' (9.14 m) long; 36" (0.91 m) wide. 30" (0.76 m) deep at connections. Alloy steel tubular chords 2-1/4" (57 mm) outside diameter.

■ Base section

15' (4.57 m) long; mounted to boom headshaft hubs.

■ Jib extensions

Available in 10', 20' and 30' (3.05, 6.10 and 9.14 m) lengths; maximum jib length permitted - 70' (21.34 m).

■ Jib connections

In-line pin connections.

■ Jib tip section

15' (4.57 m) long; single peak sheave 21" (0.53 m) root diameter mounted on anti-friction bearings.

■ Jib mast

13' 6" (4.11 m) high, mounted on jib base section. One deflector sheave, mounted on anti-friction bearings, mounted within mast to guide jib load hoist line. Jib frontstay line and jib backstay line pin at top of jib mast.