

The RT-400-A is a self-propelled cab down rough terrain crane designed for lifting and material handling, with special features of 4-wheel steer and 4-wheel drive. It was designed to be used in application where the easy "stair step" entry and exit of a cab down rough terrain crane is desired. Its 20 US ton lifting capacity can accommodate lifts historically made by older 15 US ton capacity units while not exceeding 75% of the RT-400-A's rated capacity. The RT-400-A incorporates a pilot-controlled hydraulic system that provides the "feel" and precision of direct mechanical to hydraulic level controls while moving the noise and heat of control valves outside the cab operator environment. RT-400-A control levers are mounted on the operator's station arm rests to enable comfortable operation of crane functions in a spacious operator cab environment. The RT-400-A engine is Tier 4 final compliant. The RT-400-A's CAN bus based electrical design provides trouble shooting data, operation history data and easily integrates to advanced functions like telematics, load indicating light external light bars and crane camera systems.

The basic unit consists of a chassis and hydraulic boom assembly. The chassis includes, a frame, 4 hydraulic independently controlled outriggers, engine, a 2 range; 3-speed range (forward and reverse) transmission, front and rear steering/driving axles, fuel tank, hydraulic oil tank, operator control station, 3-mode (front 2 wheel steer, 4 wheel steer, crab steer) Powered steering, power brakes and lighting package. The boom assembly includes a hydraulic boom telescope cylinder and hydraulic powered hoist. A Broderon-designed Rated Capacity Limiter is standard.

RT-400-A:

4-section hydraulically extended boom with capacity of 40,000 pounds (18,143 kg) at 10 feet (3.05 m). Horizontal reach of 65 feet (19.8 m) and maximum height of 90 feet (24.4 m).

GENERAL:

Length:	
Overall	30 feet 10 inches (9.39m)
Chassis	18 feet 2 inches (5.55m)
Width:	8 feet 5 inches (2.57m)
Height:	11 feet 2 inches (3.4m)
Wheelbase:	9 feet 2 inches (2.8m)
Ground Clearance, Chassis	17.5 inches (38cm)
Angle of Approach:	20 degrees
Angle of Departure:	30 degrees
Turning Radius: (4-Wheel Steering)	
Outside Tire Centerline Radius	14 feet 5 inches (4.4m)
Vehicle Clearance Circle Diameter	17 feet 2 inches (5.23m)
Road Speed:	24 MPH (37 km/h)
Gradeability:	70 percent* (34 degrees)
	<i>*Calculated, wheels spin before values are reached in 2-wheel drive.</i>
Grade Limit:	19 percent (11 degrees)
	<i>*Calculated, wheels spin before values are reached in 2-wheel drive.</i>

ENGINE:

Standard:

Cummins QSB4.5L Turbo

Cummins Model QSB4.5 diesel engine, turbocharged, charge air cooled, four cylinder, 4.5 liter (275 CID). U.S. EPA Tier 4 Final. Bore 4.21 inches (10.7 cm), stroke 4.88 inches (12.4 cm). Rated 163 hp (122 kw) at 2,600 rpm. 460 foot pounds (624 Nm) maximum torque at 1,500 rpm. 130 amp alternator. Oil capacity, 11.6 quarts (11 L). Coolant capacity, 33.6 quarts (31.8 L). Electronic controls for three engine speeds during crane operation – 850, 1200 or 1800 rpm, as well as incremental rpm steps, at 100 rpm per step between set points. Protection system shuts down engine when coolant is too hot or oil pressure is too low. Charge air cooler, grid heater and engine block heater which plugs into 120 volt AC extension cord are included. Tier 4 Final engines require ultra low sulfur diesel (ULSD) 15 parts per million (ppm). Tier 4 Final engines also require diesel exhaust fluid (DEF). A 5-gallon DEF container is located adjacent to the fuel tank.

Fuel Tank:

70 gallon (265 L) capacity.

TRANSMISSION:

Standard:

Dana 13.5 HR Powershift transmission with 2 ranges and 3 speeds in FORWARD and REVERSE. Provides full powershifts between the 3 FORWARD and REVERSE gears at maximum engine speed. Provides a low range and a high range that can be selected when the machine is at a STOP. All shifting is done with an electric push button operator interface in the operator compartment. The transmission includes a front axle disconnect for 2-wheel drive when commanded by the operator through the electric push button interface in the operator compartment. The machine must be placed in park before changing from 2-wheel drive or 4-wheel drive. The control system will not allow a change in drive state without being in PARK. A Torque convertor with a stall torque ratio of 2.73:1 attaches directly to engine flywheel to drive transmission. Equipped with oil cooler and filter.

Forward gear ratios and speeds:

GEAR	RATIO	SPEED
1st	8.93	2.1 mph (3.4 km/h)
2nd	4.63	4 mph (6.4 km/h)
3rd	1.70	10.5 mph (16.9 km/h)
4th	3.75	4.9 mph (7.9 km/h)
5th	1.94	9.2 mph (14.8 km/h)
6th	0.71	23.6 mph (38 km/h)

Reverse gear ratios and speeds:

GEAR	RATIO	SPEED
1st	8.93	2.7 mph (4.3 km/h)
2nd	4.63	6.3 mph (10.1 km/h)
3rd	1.70	15 mph (25.4 km/h)
4th	3.75	4.9 mph (7.9 km/h)
5th	1.94	9.2 mph (14.8 km/h)
6th	0.71	23.6 mph (38 km/h)

FRONT AXLE:

Standard:

Dana 213 Series planetary drive-steer axle with 19.33 to 1 ratio. Front axle is rigid mounted and has 30% limited-slip differential.

REAR AXLE:

Standard:

Dana 213 Series planetary drive-steer axle with 19.33 to 1 ratio. Rear axle is rigid mounted and has 30% limited-slip differential.

BRAKES:

Standard:

Four-wheel hydraulic, internal wet-disc brakes. System includes two .5 gallon (1.9L) accumulators, unloading valve, and brake malfunction light. Parking brake is internal wet-disc, spring applied, hydraulically released, integral to rear axle.

STEERING:**Standard:**

Hydraulic steering unit with a 4 inch (10.1cm) cylinder attached to each axle. Allows limited steering when engine is not running. Push button operator interface to select front-wheel, 4-wheel, or crab steer modes. Sensors and control module sense when steering is aligned in new mode. Electronic sensors sense when wheels are centered upon selection of new mode. Steering wheel and electronically controlled selector valve control 3-mode steering.

TIRES:**Standard:**

17.5 x 25, 20-ply rating, mud lug.

Tire Options:**Spare Wheel and Tire:**

Standard Size: Extra wheel with 17.5 x 25, 20-ply rating tire mounted, ready for service. Net Weight: 530 pounds (240kg)

CHASSIS:**Standard:****Steps:**

Grip-strut steps forward of driver's side front tire and ergonomically located grab bars enable easy entry and exit without stepping on front.

Outriggers:

Four independently controlled outriggers of swing-down design. Independent controls for each outrigger. Hydraulic cylinders are equipped with direct connected holding valves. Foot pad dimensions: 16 inches (41 cm) by 16 inches (41 cm).

Sheave Block Storage:

Recessed storage location integral to fuel tank for stowing sheave block with hook on top for easy lifting and lowering into storage box.

Tie Downs:

Four holes (two front, two rear) that provide tie down locations for truck transport.

Rear View Mirrors:

Right and left side 6" (15 cm) wide x 16" (41 cm) high mounted to cab provide visibility to rear and sides of crane. Net Weight: 12 pounds (15 kg)

Optional Chassis Accessories:**Auxiliary Front Winch:**

Planetary gear winch, mounted beneath front chassis frame with push button controls located in operator's compartment. Hydraulic powered to provide bare drum line pull of 15,000 lbs (6800 kg) and 40 ft/min (12m/min) line speed. Includes 125 feet (38.1 m) of 9/16 inch (14 mm) diameter 6x36-EIP-IWRC wire rope, minimum breaking strength of 33,600 pounds (150kN). A Pintle hook is recommended for 2-parting line with a sheave block (not included). Net Weight: 580 lbs (265 kg)

Pintle Hook Front:

T-60-AOL Holland pintle hook mounted on front outrigger frame member, rated for 30,000 pounds (13,600 kg) trailer weight. Not available with Auxiliary Front Winch. Net Weight: 15 pounds (6.8 kg)

Pintle Hook Rear:

T-60-AOL Holland pintle hook mounted on rear frame member, rated for 30,000 pounds (13,600 kg) trailer weight. Net Weight: 15 pounds (6.8 kg)

OPERATOR'S COMPARTMENT:**Standard:**

Operator control station with one-position access to all chassis and crane controls functions. Includes adjustable operator's seat and seat belt, and tilting & telescopic steering column. Also includes access point to J1939 CAN Bus System. Operator compartment is equipped with safety glass and sliding door for entry and egress. Door is equipped with a keyed lock to protect the operator's station. Includes dome light, heater/AC with 2-speed fan, 12V-electric windshield wiper on front and top glass, and sliding shade for top glass. There is a zip seal sliding window in the right side of the operator compartment. This may be removed as an **emergency exit**.

Drum Rotation Indicator:

Provides tactile feedback to operator when hoist drum is rotating. Feedback device attached to hoist control handle. Feedback is proportional to hoist speed.

Air Conditioning:

Provided factory integrally-designed AC system using R134a refrigerant with no externally mounted "cooling package" complications. Compact AC unit mounted in operator area, fan-cooled condenser integral to the machine radiator tower, and belt-driven compressor with magnetic clutch, driven by engine.

Pilot-Hydraulic Controls:

Dual-axis joysticks, at each of the operator's hands, provide control of boom motions and hoist. Arming command push button on the control panel enables, or disables the function of the pilot joysticks, in conjunction with the seat switch. Key pad on dash control outrigger functions.

ELECTRICAL SYSTEM - Standard 12 Volt DC:**Standard:****Battery:**

12 Volt, Group 31, 950 CCA battery.

Lighting Group:

Consists of two, 12V LED headlamps; LED tail, brake and turn signal lights, and backup lights in rear; LED front turn signals and emergency flasher buttons at operator's station. Emergency flashers are operated by pushing the left and right turn signals buttons simultaneously. 12V horn actuated by button located on hoist control joystick.

Dash Display:

In-dash LCD Screen show engine data including RPMs, coolant temperature, battery voltage, fuel level, engine oil pressure, DEF fluid level percent. Display also show engine hourmeter, engine fault codes and control system faults. Screen indicates hydraulic oil temperature. Also included are lights for engine warning and engine shutdown, in addition to a diagnostics page to aid with trouble shooting and fuse/relay failure identification.

Back-Up Alarm:

Provides pulsating sound from a 102 dB-alarm when ignition is on and transmission is in REVERSE. Conforms to SAE J994B.

Outrigger Alarm System:

102 dB alarm with alternating two-tone sound is actuated by a switch when the OUTRIGGER DOWN controls are operated.

Emergency Stop-Switch:

A two-position push button switch located on the top, left hand side of the dash panel. Designed to stop the engine and shut down the hydraulic system.

Optional Electrical Accessories:**Strobe Lights:**

Two yellow LED Strobe lights mounted on each side of counterweight for high 360-degree visibility around crane. Flashes 60-120 times per minute. Strobe draws only one-half amp. Includes switch in operator compartment. Net Weight: 15 pounds (7 kg)

Boom Work Lights:

Two LED work lights, one on left side of boom to light boom tip and one on the right side of the turret to light ground under boom tip. Includes switch in operator compartment. Net Weight: 10 pounds (4.5 kg)

HYDRAULIC SYSTEM:

Standard:

Two piston pumps, mounted on and driven by the main transmission, delivers a combined flow of 103 GPM (390 L/min) at 3200 PSI (221 bar) and 2600 RPM engine speed. System protected by relief valves, suction-line strainers and a 150 GPM, 10-micron return-line filter. Dual pump configuration provides hydraulic system redundancy. Large 160-gallon (606L) hydraulic tank provides passive hydraulic fluid cooling without oil cooler.

Hydraulic Reservoir:

160 gallon (605 L) capacity, equipped with 10-micron breather filter on top and oil level gauge on side.

BOOM:

Standard:

Four-section, high strength steel construction, equipped with lubricant-filled bearing pads for efficient support and extension. Hydraulic cylinder coupled with double runs of high strength leaf chain, extends and retracts the second, third, and fourth stages proportionally. The telescope cylinder and the boom elevation cylinder are equipped with cylinder-mounted holding valves. Boom angle indicator is provided on the left side of the boom

BOOM ROTATION:

Standard:

Heavy-duty bearing rotation gear with external teeth supports turn table. Rotation is powered by hydraulic motor and worm gear drive. Rotation gearbox may be adjusted as wear occurs, to minimize backlash. Boom is attached by steel turret weldment.

MAIN HOIST ROPE:

Standard:

Main hoist rope is 5/8" diameter, Compact 35 rotation resistant rope, RRL lay, 2160 Grade, minimum breaking strength 56,400 lbs (251 kN), 425' (130 m) long. Weight per foot is 0.88 lbs (1.31 kg perm). Note that rope weight is not included in load calculations.

BOOM ATTACHMENTS:

Standard:

Downhaul Weight & Hook:

Downhaul weight and 14,000-pound (6350 kg) rated swivel hook to use with wedge socket on 5/8-inch (16 mm) load line. Specially designed to work with the anti-two-block system and to clamp the dead end of the rope. Weighs 180 pounds (82 kg).

Anti-Two-Block Device:

Prevents damage to hoist rope and/or machine components from accidentally pulling sheave block or downhaul weight against boom tip. Consists of trip arm at boom tip which is moved upward by sheave block or downhaul weight as hook approaches boom tip. Trip arm actuates electric switch that is connected by cable reel mounted on boom, to solenoid dump valve control system. This system will stop HOIST RAISE, TELESCOPE EXTEND, and BOOM LOWER. No other circuits are affected. These circuits are returned to normal operation by operating the HOIST LOWER or TELESCOPE RETRACT control.

Rated Capacity Limiter:

Operational aid that warns operator of impending overload with audible and visual signals. Has read-outs for load, boom angle, boom length and load radius. In the event of an overload, it will block the following boom functions: HOIST RAISE, TELESCOPE EXTEND, and BOOM LOWER. These circuits are returned to normal by lowering load to a safe resting place with hoist, or by retracting or raising boom to a shorter load radius. There is an override function on the display of the RCL system in the operator compartment.

Four-Part-Line Sheave Block:

Double sheave block for 4-part-line requirements. 12-inch (305 mm) OD sheaves for 5/8-inch (16mm) diameter wire rope. Swivel hook with safety latch. 480-pound (218 kg) weight provides positive overhaul. Includes bar on top to

actuate trip arm of Anti-Two Block Device.

Optional Boom Attachments:

Boom Extension - 20 Ft. (6.1 m), Offset:

Provides 20 feet (6.1m) of additional length for lifting loads with load line. Boom extension may be stowed alongside base boom section when not in use. Tip sheave, attaching brackets, and pins are included. Deduct 500 pounds (220kg) from Capacity Chart when boom extension is in the stowed position. Includes trip arm for Anti-Two Block device. Boom extension will tilt through 3 positions: in-line, 15° offset and 30° offset. Net Weight: 775 pounds (350 kg)

Specifications subject to change without notice.

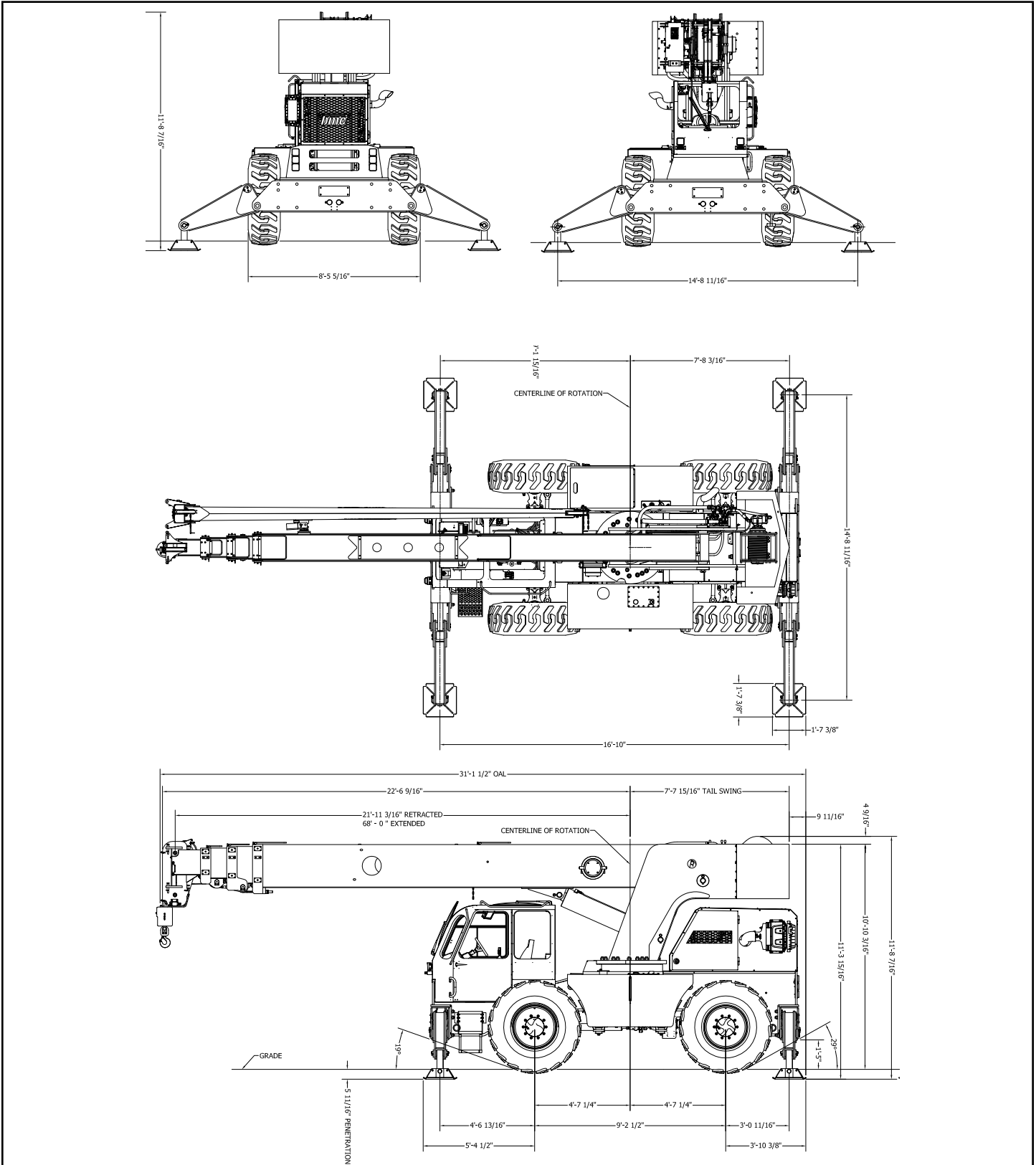
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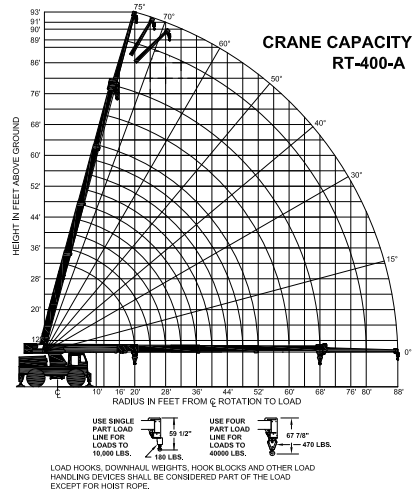
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*Dimensions and values shown
are for reference purposes
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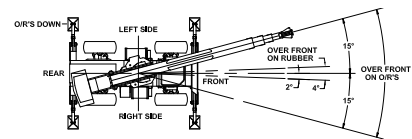




Crane Capacity Chart: Imperial



Load hooks, downhaul weights, hook blocks and other load handling devices except hoist rope shall be considered part of the load.



The load hoist line on this unit must be 5/8" dia. 425 Foot long compact 35x7 class grade 2160 wire rope (or equivalent) with a minimum breaking strength of 35,000 lbs.

Approved tires: 17.5-2520 Pr-100 psi

Torque wheel nuts to 475 ft. Lbs. (These conditions must be maintained to handle rated loads on this crane.)

CAPACITIES APPLY TO OPERATION ON FIRM LEVEL SURFACE								
LOAD RADIUS FEET	MAIN BOOM OR EXTENSION CAPACITIES IN POUNDS							
	360° ROTATION		OVER FRONT					
	ON RUBBER	ON OUTRIGGERS	ON RUBBER	ON OUTRIGGERS				
10	18300	40000	26300	40000				
12	13900	34100	22000	34100				
14	10900	29200	18000	29200				
16	8600	25500	14800	25500				
18	7300	23200	12400	22700				
20	6000	22000	10000	22000				
22	5000	19000	8300	20000				
24	4200	17800	7000	18300				
26	3600	16100	6100	16900				
28	3000	13300	5200	15700				
30	2500	12000	4600	14600				
32	2200	10700	4000	13700				
34	1800	9700	3500	12900				
36	1500	8900	3100	11900				
38	1300	8000	2700	10900				
40	1000	7300	2400	9900				
42	800	6700	2000	9200				
46	----	5600	1600	8100				
50	----	4700	1200	7000				
54	----	4000	800	6100				
58	----	3400	500	5300				
62	----	2900	----	4600				
66	----	2400	----	4000				
68	----	2300	----	3600				
72	----	2500	----	2800				
76	----	2000	----	2800				
80	----	1600	----	2800				
84	----	1300	----	2800				
88	----	1100	----	2000				
BOOM EXTENSION	20-FOOT BOOM EXTENSION CAPACITIES							
	MAIN BOOM ANGLE							
	ANGLE	0°	15°	30°	40°	50°	60°	70°
0°	2300	2400	2700	3100	3700	4800	6200	7000
15°	----	2300	2400	2600	2900	3400	4100	4800
30°	----	----	2300	2400	2500	2700	3100	3400

DO NOT POSITION BOOM AT LOAD RADII WHERE NO LOAD CAPACITIES ARE SHOWN.

EXCEEDING CAPACITY RATINGS OR APPLYING SIDE LOADS TO THE BOOM OR BOOM EXTENSION IS MISUSE, IS HAZARDOUS, AND VOIDS WARRANTY.

CAUTION: BOOM EXTENSION LOADS MUST NOT EXCEED MAIN BOOM CAPACITY. DO NOT PICK AND CARRY WITH LOADS ON BOOM EXTENSION. DO NOT LIFT LOADS ON BOOM EXTENSION WHEN ON RUBBER.

LOAD RADIUS IS THE HORIZONTAL DISTANCE FROM THE CENTER OF ROTATION OF THE UNLOADED CRANE TO THE VERTICAL LOAD LINE WITH THE LOAD APPLIED.

CAPACITIES ON OUTRIGGERS ARE 85% OF TIPPING LOADS. CAPACITIES ON RUBBER ARE 75% OF TIPPING LOADS. CAPACITIES BELOW BOLD LINES ARE LIMITED BY TIPPING. OTHER CAPACITIES ARE LIMITED BY STRUCTURAL OR HYDRAULIC CAPACITY.

PICK AND CARRY WITH THE SHORTEST PRACTICAL BOOM, CENTERED OVER THE FRONT. OPERATE WITH BOOM AS LOW AS POSSIBLE, WITH THE LOAD CLOSE TO THE GROUND. PICK AND CARRY CAPACITIES ARE FOR SMOOTH, LEVEL PAVED SURFACE. SPEED MUST BE LESS THAN 3 MPH.

THE BOOMS ON THIS UNIT ARE ALL STEEL AND HAVE NO LINE VOLTAGE RATING - NO ELECTRICAL INSULATION VALUE.

MAXIMUM HYDRAULIC PRESSURE: 3000 PSI

BOOM EXTENSION DEDUCT: 500 LBS WHEN STOWED ON BASE BOOM

ENSURE ANTI-TWO-BLOCK SWITCH IS FUNCTIONAL AFTER DEPLOYING OR STOWING BOOM EXTENSION.



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