

# Technical Data

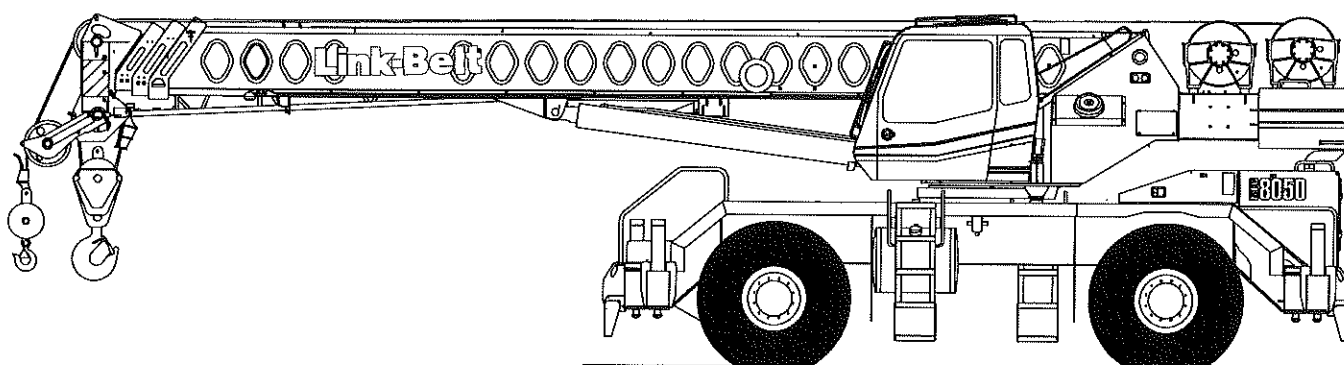
## Specifications & Capacities

# RTC 8050

**Series II**

Telescopic Boom Rough Terrain Crane  
50 ton (50 metric ton)

737M



**CAUTION:** This material is supplied for reference use only. Operator must refer to in-cab Crane Rating Manual and Operator's Manual to determine allowable crane lifting capacities and assembly and operating procedures.



# Table Of Contents

|                                                                      |           |
|----------------------------------------------------------------------|-----------|
| <b>Boom, Attachments, and Upper Structure</b>                        | <b>1</b>  |
| Boom                                                                 | 1         |
| Boom Head                                                            | 1         |
| Boom Elevation                                                       | 1         |
| Auxiliary Lifting Sheave – Optional                                  | 1         |
| Hook Blocks and Balls – Optional                                     | 1         |
| Fly – Optional                                                       | 1         |
| Operator's Cab and Controls                                          | 1         |
| Swing                                                                | 2         |
| Electrical                                                           | 2         |
| Load Hoist System                                                    | 3         |
| Load Hoist Performance                                               | 3         |
| 2M Main and Optional Auxiliary Winches                               | 3         |
| Hydraulic System                                                     | 3         |
| Counterweight                                                        | 3         |
| <b>Carrier</b>                                                       | <b>4</b>  |
| General                                                              | 4         |
| Outriggers                                                           | 4         |
| Steering and Axles                                                   | 4         |
| Suspension                                                           | 4         |
| Tires and Wheels                                                     | 4         |
| Brakes                                                               | 4         |
| Electrical                                                           | 4         |
| Engine                                                               | 4         |
| Transmission                                                         | 4         |
| Carrier Speeds and Gradeability                                      | 5         |
| Fuel Tank                                                            | 5         |
| Hydraulic System                                                     | 5         |
| Pump Drive                                                           | 5         |
| <b>Axle Loads</b>                                                    | <b>6</b>  |
| <b>General Dimensions</b>                                            | <b>7</b>  |
| <b>Working Range Diagram</b>                                         | <b>8</b>  |
| <b>Boom Extend Modes</b>                                             | <b>9</b>  |
| <b>Main Boom Lift Capacity Charts – Standard</b>                     | <b>10</b> |
| Fully Extended Outriggers – 360° Rotation                            | 10        |
| On Tires – Stationary – Boom Centered Over Front Between Tire Tracks | 11        |
| On Tires – Pick & Carry (Creep) – Boom Centered Over Front           | 11        |
| On Tires – Stationary – 360° Rotation                                | 11        |
| <b>Fly Attachment Lift Capacity Charts – Optional</b>                | <b>12</b> |
| Fully Extended Outriggers – 360° Rotation                            | 12        |
| 110 ft Main Boom Length – 2° Fly Offset                              | 12        |
| 110 ft Main Boom Length – 20° Fly Offset                             | 12        |
| 110 ft Main Boom Length – 40° Fly Offset                             | 12        |

|                                                                            |           |
|----------------------------------------------------------------------------|-----------|
| <b>Main Boom Lift Capacity Charts – Optional (Metric)</b> .....            | <b>13</b> |
| Fully Extended Outriggers – 360° Rotation .....                            | 13        |
| On Tires – Stationary – Boom Centered Over Front Between Tire Tracks ..... | 14        |
| On Tires – Pick & Carry (Creep) – Boom Centered Over Front .....           | 14        |
| On Tires – Stationary – 360° Rotation .....                                | 15        |
| <b>Fly Attachment Lift Capacity Charts – Optional (Metric)</b> .....       | <b>15</b> |
| Fully Extended Outriggers – 360° Rotation .....                            | 15        |
| 33.53m Main Boom Length – 2° Fly Offset .....                              | 15        |
| 33.53m Main Boom Length – 20° Fly Offset .....                             | 15        |
| 33.53m Main Boom Length – 40° Fly Offset .....                             | 15        |

# Boom, Attachments, and Upper Structure

## ■ Boom

**Design** – Four section, box type construction of high tensile steel consisting of one base section and three telescoping sections. The vertical side plates have diamond shaped steel impressions for superior strength to weight ratio. The first telescoping section extends independently by means of one double-acting, single stage hydraulic cylinder with integrated holding valves. The second and third telescoping sections extend proportionally by means of one double-acting, single stage cylinder with integrated holding valves and cables.

### Boom

- 35 ft 6 in–110 ft (10.8–33.5m) four section full power boom
- Two mode boom extension: *A-max* mode provides superior capacities by extending the first telescoping section to 60 ft 4 in (18.4m). Standard mode synchronizes all the telescoping sections proportionally to 110 ft (33.5m). Controlled from the operator's cab.
- Mechanical boom angle indicator
- Maximum tip height for *A-max* mode is 70 ft (21.3m) and standard mode is 118 ft 5 in (36.1m).

### Boom Head

- Four 16.5 in (41.9cm) root diameter nylon sheaves to handle up to eight parts of line
- Easily removable wire rope guards
- Rope dead end lugs on each side of the boom head
- Boom head is designed for quick-reeve of the hook block

### Boom Elevation

- One double acting hydraulic cylinder with integral holding valve
- Boom elevation:  $-3^{\circ}$  to  $78^{\circ}$

### Auxiliary Lifting Sheave – Optional

- Single 16.5 in (41.9m) root diameter nylon sheave
- Easily removable wire rope guards
- Does not affect erection of the fly or use of the main head sheaves

### Hook Blocks and Balls – Optional

- 40 ton (36.3mt) 4 sheave quick-reeve hook block with safety latch
- 60 ton (54.4mt) 4 sheave quick-reeve hook block with safety latch
- 8.5 ton (7.7mt) swivel and non-swivel hook balls with safety latch

### Fly – Optional

- 28 ft 6 in (8.7m) one piece lattice fly, stowable, offsettable to  $2^{\circ}$ ,  $20^{\circ}$ , and  $40^{\circ}$ . Maximum tip height is 146 ft (44.5m).
- 28 ft 6 in–51 ft (8.7–15.5m) two piece bi-fold lattice fly, stowable, offsettable to  $2^{\circ}$ ,  $20^{\circ}$ , and  $40^{\circ}$ . Maximum tip height is 168 ft (51.2m).

## ■ Operator's Cab and Controls

**Environmental Cab** – Fully enclosed, one person cab of galvanneal steel structure with acoustical insulation.

Equipped with:

- Tinted and tempered glass windows
- Extra-large fixed front window with windshield wiper and washer
- Swing up roof window with windshield wiper
- Sliding left side door with large fixed window
- Sliding rear and right side windows for ventilation
- Six way adjustable, cushioned seat with seat belt and storage compartment
- Diesel fired warm-water heater with air ducts for front windshield defroster and cab floor
- Defroster fan for the front window
- Bubble level
- Circulating fan
- Adjustable sun visor
- Dome light
- Cup holder
- Fire extinguisher
- Left side viewing mirror
- Two position travel swing lock

**Air Conditioning – Optional** – Integral with cab heating system utilizing the same ventilation outlets

**Engine Dependent Heater – Optional** – Flameless, warm-water system that does not have a separate fuel tank

**Steering Column** – Pedestal type with tilt and telescope functions for operator comfort. Column includes the following controls and indicators:

Left and right levers include:

- Horn button
- Turn signal switch
- Driving light switch
- Transmission direction switch
- Panel mounted switches for:
  - Travel park brake
  - Steer mode selector
  - 4 wheel drive
  - Transmission gear selector
  - Hazard flasher

Panel mounted indicator/warning lights for:

- Transmission display
- Transmission temperature
- Engine oil pressure
- Travel park brake
- Service brake
- Turn signals
- Rear wheel offset
- Emergency steer – optional

**Armrest Controls** – Two dual axis hydraulic joystick controllers or optional single axis hydraulic controllers for:

- Swing
- Boom hoist
- Main rear winch
- Auxiliary front winch – optional
- Drum rotation indication
- Drum rotation indicator activation switch
- Winch high/low speed and disable switch(es)
- Third wrap selector switch – optional
- Telescopic override switches
- Warning horn button
- Swing park brake

**Outrigger Controls** – Hand held control box with umbilical cord gives the operator the freedom to view operation while setting the outriggers.

#### **Foot Controls**

- Boom telescope
- Swing brake
- Engine throttle

**Right Front Console** – Controls and indicators for:

- Engine ignition
- Engine throttle lock
- Function disable
- Front windshield wiper and washer
- Cab floodlights
- Warning horn
- Heating controls
- Console dimmer switch
- Bubble level
- 12 volt power connection
- Air conditioning – optional
- Boom floodlight – optional
- Rotating beacon/Strobe light – optional
- Third wrap indicator – optional

**Cab Instrumentation** – Ergonomically positioned, analog instrumentation for crane operation including:

- Engine coolant temperature with warning indicator
- Hydraulic oil temperature with warning indicator
- Fuel level with warning indicator
- Tachometer

**Rated Capacity Limiter** – Microguard 434 graphic audio–visual warning system integrated into the dash with anti–two block and function limiter. Operating data available includes:

- Crane configuration
- Boom length and angle
- Boom head height
- Allowed load and % of allowed load
- Boom angle
- Radius of load
- Actual load
- Operator settable alarms (include):
  - Maximum and minimum boom angles
  - Maximum tip height
  - Maximum boom length
  - Swing left/right positions
  - Operator defined area (imaginary plane)

**Internal RCL Light Bar – Optional** – Visually informs the operator when crane is approaching maximum load capacity with a series of green, yellow, and red lights.

**External RCL Light Bar – Optional** – Visually informs the ground crew when crane is approaching maximum load capacity with a series of green, yellow, and red lights.

## ■ Swing

**Motor/Planetary** – Bi–directional hydraulic swing motor mounted to a planetary reducer for 360° continuous smooth swing at 2.5 rpm.

**Swing Park Brake** – 360°, electric over hydraulic, (spring applied/hydraulic released) multi–disc brake mounted on the speed reducer. Operated by a switch from the operator's cab.

**Swing Brake** – 360°, foot operated, hydraulic applied disc brake mounted to the speed reducer.

**Swing Lock** – Two–position swing lock (boom over front or rear) operated from the operator's cab.

**360° Positive Swing Lock – Optional** – Meets New York City requirement.

## ■ Electrical

**Swing Alarm** – Audio warning device signals when the upper is swinging.

#### **Lights**

- Two working lights on front of the cab
- One rotating amber beacon on top of the cab – optional
- One amber strobe beacon on top of the cab – optional
- Boom floodlight – optional

## ■ Load Hoist System

### Load Hoist Performance

| Main (Rear) and Auxiliary (Front) Winches – 3/4 in (19mm) Rope |                   |         |                   |       |                 |       |       |      |       |       |
|----------------------------------------------------------------|-------------------|---------|-------------------|-------|-----------------|-------|-------|------|-------|-------|
| Layer                                                          | Maximum Line Pull |         | Normal Line Speed |       | High Line Speed |       | Layer |      | Total |       |
|                                                                | lb                | kg      | ft/min            | m/min | ft/min          | m/min | ft    | m    | ft    | m     |
| 1                                                              | 15,390            | 6 980.8 | 168               | 51.2  | 337             | 102.7 | 114   | 34.7 | 114   | 34.7  |
| 2                                                              | 14,150            | 6 418.3 | 183               | 55.8  | 366             | 111.6 | 124   | 37.8 | 238   | 72.5  |
| 3                                                              | 13,094            | 5 939.3 | 198               | 60.4  | 396             | 120.7 | 134   | 40.8 | 372   | 113.4 |
| 4                                                              | 12,185            | 5 527.0 | 212               | 64.6  | 425             | 129.5 | 144   | 43.9 | 516   | 157.3 |
| 5                                                              | 11,394            | 5 168.2 | 227               | 69.2  | 455             | 138.7 | 154   | 46.9 | 670   | 204.2 |

| Wire Rope Application   |          | Diameter |    | Type                                                   | Maximum Permissible Load |         |
|-------------------------|----------|----------|----|--------------------------------------------------------|--------------------------|---------|
|                         |          | in       | mm |                                                        | lb                       | kg      |
| Main (Rear) Winch       | Standard | 3/4      | 19 | 18x19 rotation resistant – right regular lay (Type RB) | 12,920                   | 5 860.5 |
|                         | Optional | 3/4      | 19 | 36x7 rotation resistant – right regular lay (Type ZB)  | 15,600                   | 7 076.2 |
| Auxiliary (Front) Winch | Standard | 3/4      | 19 | 18x19 rotation resistant – right regular lay (Type RB) | 12,920                   | 5 860.5 |
|                         | Optional | 3/4      | 19 | 36x7 rotation resistant – right regular lay (Type ZB)  | 15,600                   | 7 076.2 |

### 2M Main and Optional Auxiliary Winches

- Bi-directional gear-type (2-speed) hydraulic motors driven through planetary reduction unit for positive control under all load conditions.
- Grooved lagging
- Power up/down mode of operation
- Hoist drum cable follower
- Drum rotation indicator
- Drum diameter: 16 in (40.6cm)
- Rope length:
  - Main: 600 ft (182.9m)
  - Auxiliary: 600 ft (182.9m)
- Maximum rope storage: 834 ft (254.2m)
- Terminator style socket and wedge

**Third wrap indicator – optional** – Visually and audibly warns the operator when the wire rope is on the first/bottom layer and when the wire rope is down to the last three wraps.

### ■ Hydraulic System

**Counterbalance Valves** – All hoist motors, boom extend cylinders, and boom hoist cylinders are equipped with counterbalance valves to provide load lowering and prevents accidental load drop when hydraulic power is suddenly reduced.

### ■ Counterweight

Total of 12,500 lb (5 670kg) of counterweight bolted to the upper structure frame with capacities for the 12,500 lb (5 670kg) configuration.

## Carrier

### ■ General

- 10 ft 10.5 in (3.31m) wide
- 12 ft 7 in (3.83m) wheelbase (centerline of first axle to centerline of second axle).

**Frame** – Box–type, torsion resistant, welded construction made of high tensile steel. Equipped with front and rear towing and tie–down lugs, tow connections, and access ladders.

### ■ Outriggers

**Boxes** – Two double box, front and rear welded to carrier frame.

**Beams and Jacks** – Four single stage beams with Confined Area Lifting Capacities (CALC™) provide selectable outrigger extensions of full, intermediate, and retracted. Hydraulically controlled from the operator's cab with integral check valves.

**Pontoons** – Four lightweight, quick release, 19.25 x 19.25 in (48.90 x 48.90cm), steel pontoons with contact area of 307 in<sup>2</sup> (1 980.6cm<sup>2</sup>) can be stored for road travel in storage racks on the carrier.

**Main Jack Reaction** – 63,500 lb (28 803kg) force and 213 psi (1 469kPa) ground bearing pressure.

### ■ Steering and Axles

**Steering** – Four independent modes consisting of two wheel front, two wheel rear, four wheel, and crab. Each mode is controlled from the steering wheel and is selected by a switch in the operator's cab.

**Drive** – Two modes: 4 x 2 and 4 x 4 for off highway travel

**Axle 1** – Steered, non–driven for 4 x 2 and steered, driven for 4 x 4

**Axle 2** – Steered, driven

### ■ Suspension

**Front** – Rigid mount to the carrier frame

**Rear** – The rear axle is suspended on the oscillation cylinders with motion of the axle controlled by a four bar linkage system. The oscillation cylinders lockout when the upper structure rotates 2.5° past centerline.

- Hydro–gas rear suspension – optional

### ■ Tires and Wheels

**Front and Rear** – Four (single) 23.5 x 25–20 ply rating, earthmover type tires on steel disc wheels

- Spare tires and wheels – optional

### ■ Brakes

**Service** – Full hydraulic, dual circuit, disc type brakes on all wheel ends

**Parking/Emergency** – Spring loaded type, acting on front axle

### ■ Electrical

Three batteries provide 12 volt operation and starting

#### Lights

- Front lighting includes two main headlights, and two parking/directional indicators.
- Side lighting includes two parking/directional indicators per side.
- Rear lighting includes two parking/directional indicators, two parking/brake lights, and two reversing lights.
- Other equipment includes hazard/warning system, cab light, instrument panel light, and signal horn.

### ■ Engine

| Specification                                                                                                                                                                                                            | CAT C6.6                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Numbers of Cylinders                                                                                                                                                                                                     | 6                       |
| Cycle                                                                                                                                                                                                                    | 4                       |
| Bore and Stroke: inch (mm)                                                                                                                                                                                               | 4.13 x 5.00 (105 x 127) |
| Piston Displacement: in <sup>3</sup> (L)                                                                                                                                                                                 | 402.7 (6.6)             |
| Max. Brake Horsepower: hp (kW)                                                                                                                                                                                           | 174 (130) @ 2,200 rpm   |
| Peak Torque: ft lb (Nm)                                                                                                                                                                                                  | 512 (694) @ 1,500 rpm   |
| Alternator: volts – amps                                                                                                                                                                                                 | 12 – 150                |
| Crankcase Capacity: qt (L)                                                                                                                                                                                               | 18.4 (17.4)             |
| <ul style="list-style-type: none"> <li>• Mechanically driven fan and thermostatically controlled radiator</li> <li>• Water/Fuel separator</li> <li>• 110–volt block heater</li> <li>• Glow plugs/block heater</li> </ul> |                         |

### ■ Transmission

**Powershift** – Three speed with high/low range for 6 forward and 6 reverse gears. Front axle disconnect for two or four wheel drive. Front axle disconnect in high range.

## ■ Carrier Speeds and Gradeability

| Dana Spicer |                       | Ratio | Speed |       | Gradeability<br>(@ 70%<br>Converter<br>efficiency) |
|-------------|-----------------------|-------|-------|-------|----------------------------------------------------|
| Gear        |                       |       | mph   | km/h  |                                                    |
| 6th         | Forward<br>2WD<br>Hi  | 0.82  | 22.4  | 36.05 | 3.0                                                |
| 5th         |                       | 2.25  | 8.2   | 13.20 | 11.8                                               |
| 4th         |                       | 4.67  | 3.9   | 6.28  | 27.4                                               |
| 3rd         | Forward<br>4WD<br>Low | 2.40  | 7.6   | 12.23 | 12.7                                               |
| 2nd         |                       | 6.54  | 2.8   | 4.51  | 40.9                                               |
| 1st         |                       | 13.60 | 1.3   | 2.09  | 137.3                                              |
| 2nd         | Reverse<br>2WD        | 4.67  | 3.9   | 6.28  | 27.4                                               |
| 1st         | Reverse<br>4WD        | 13.60 | 1.3   | 2.09  | 137.3                                              |

Based on a gross vehicle weight of 80,000 lb (36 287kg)  
Crane operating angle must not exceed 35° (77% grade).

## ■ Fuel Tank

One 75 gallon (283.9L) capacity tank

## ■ Hydraulic System

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

### Main Pumps

- Three fixed displacement gear pumps for the main and auxiliary winches, swing, boom hoist, and telescope circuits with a manual disconnect to aid during cold weather starts.
- One gear pump for the outriggers, power steering, brakes, and telescope circuits.
- One pressure compensated piston pump is used in the control and service brake circuits.
- Combined pump capacity of 139 gpm (526.2Lpm).

**Hydraulic Reservoir** – 131 gal (495.9L) capacity equipped with sight level gauge. Diffusers built in for deaeration.

**Filtration** – One 10 micron, full flow, line filter in the control circuit. All oil is filtered prior to return to sump tank. Accessible for easy filter replacement.

## ■ Pump Drive

All pumps are mechanically driven by the diesel engine. Main and auxiliary winches, swing, boom hoist, and telescope pumps are mounted to a mechanical pump disconnect on the transmission torque converter to aid in cold weather starting.

## Axle Loads

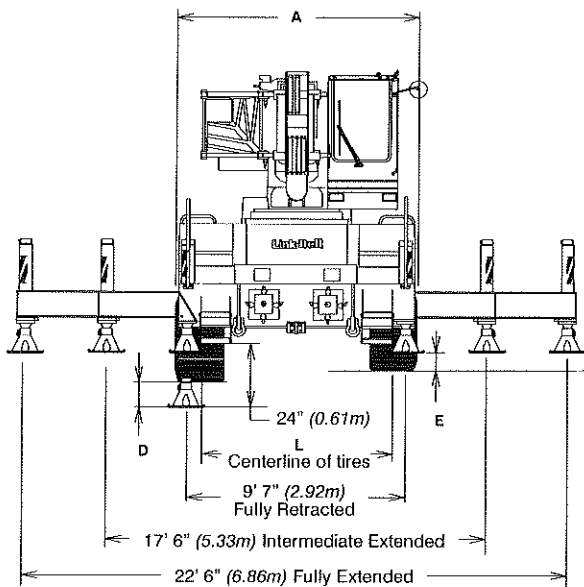
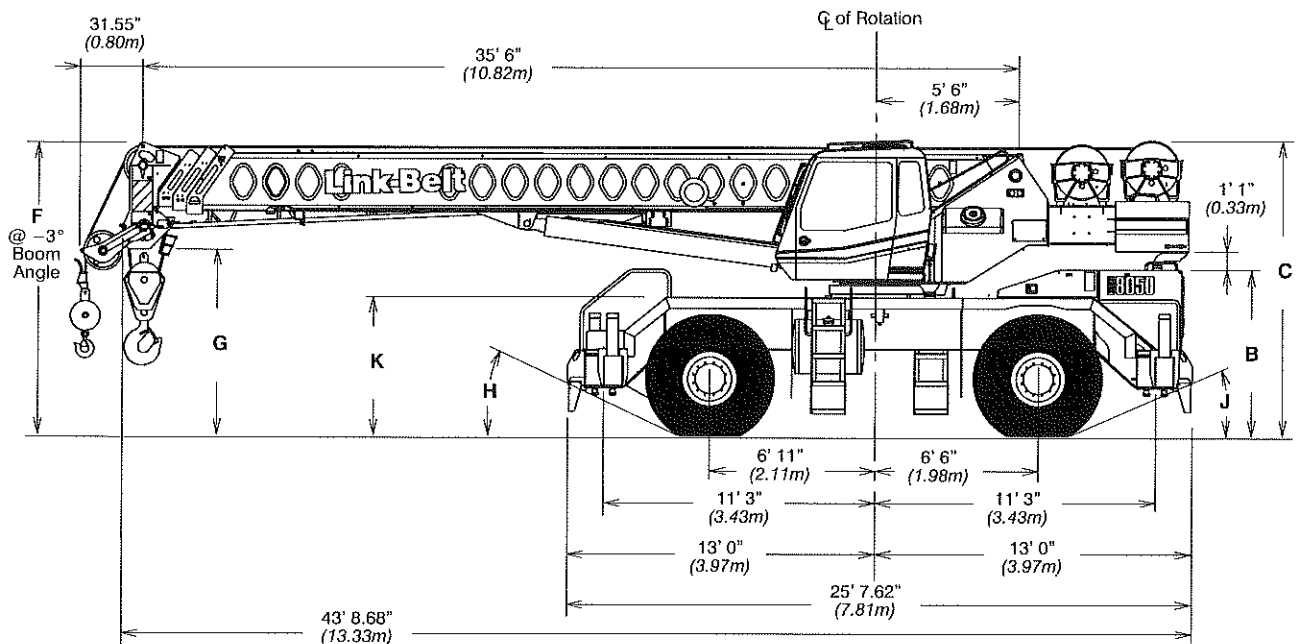
| Base crane with full tank of fuel                             | Gross Vehicle Weight <sup>(1)</sup> |        | Upper Facing Front |        |            |        | Upper Facing Rear |        |            |        |
|---------------------------------------------------------------|-------------------------------------|--------|--------------------|--------|------------|--------|-------------------|--------|------------|--------|
|                                                               |                                     |        | Front Axles        |        | Rear Axles |        | Front Axles       |        | Rear Axles |        |
|                                                               | lb                                  | kg     | lb                 | kg     | lb         | kg     | lb                | kg     | lb         | kg     |
|                                                               | 72,495                              | 32 883 | 33,996             | 15 420 | 38,499     | 17 463 | 32,896            | 14 921 | 39,599     | 17 962 |
| 23.5R25 tires and wheels                                      | 368                                 | 167    | 183                | 83     | 185        | 84     | 183               | 83     | 185        | 84     |
| Pintle hook, front                                            | 13                                  | 6      | 18                 | 8      | –5         | –2     | 18                | 8      | –5         | –2     |
| Pintle hook, rear                                             | 13                                  | 6      | –5                 | –2     | 18         | 8      | –5                | –2     | 18         | 8      |
| Rear steer indicator                                          | 3                                   | 1      | 0                  | 0      | 3          | 1      | 0                 | 0      | 3          | 1      |
| Hydro–gas suspension                                          | 52                                  | 24     | 18                 | 8      | 34         | 15     | 18                | 8      | 34         | 15     |
| Winch roller – rear winch                                     | 93                                  | 42     | –39                | –18    | 132        | 60     | 129               | 59     | –36        | –17    |
| Winch roller – front winch                                    | 93                                  | 42     | –19                | –9     | 112        | 51     | 109               | 49     | –16        | –7     |
| 2M auxiliary winch                                            | 19                                  | 9      | –2                 | –0.9   | 21         | 10     | 21                | 10     | –2         | –0.9   |
| 600 ft (182.9m) of 3/4 in (19mm) wire rope on auxiliary winch | 669                                 | 303    | –88                | –40    | 757        | 343    | 734               | 333    | –65        | –30    |
| Air conditioning in operator's cab                            | 315                                 | 143    | 74                 | 34     | 241        | 109    | 231               | 105    | 84         | 38     |
| 360° swing lock                                               | 76                                  | 34     | 28                 | 13     | 48         | 22     | 45                | 20     | 31         | 14     |
| Emergency steer system                                        | 136                                 | 62     | 15                 | 7      | 121        | 55     | 116               | 53     | 20         | 9      |
| Fly storage brackets to boom base section for fly options     | 99                                  | 45     | 146                | 66     | –47        | –21    | –51               | –23    | 150        | 68     |
| 28.5 ft (8.68m) offset fly – stowed                           | 1,291                               | 585    | 2,237              | 1 015  | –947       | –430   | –990              | –449   | 2,281      | 1 035  |
| 28.5–51 ft (8.68–15.54m) offset fly – stowed                  | 1,861                               | 844    | 3,060              | 1 388  | –1,199     | –544   | –1,263            | –573   | 3,124      | 1 417  |
| Floodlight to boom base section                               | 10                                  | 5      | 23                 | 10     | –13        | –6     | –13               | –6     | 23         | 10     |
| 60 ton (54.4mt) hook block at front/rear bumper               | 1,109                               | 503    | 1,530              | 694    | –421       | –191   | –459              | –208   | 1,568      | 711    |
| 40 ton (36.3mt) hook ball at front/rear bumper                | 720                                 | 327    | 994                | 451    | –274       | –124   | –298              | –135   | 1,108      | 462    |
| 8.5 ton (7.7mt) hook ball at front/rear bumper                | 360                                 | 163    | 497                | 225    | –137       | –62    | –149              | –68    | 509        | 231    |
| Auxiliary lifting sheave                                      | 91                                  | 41     | 257                | 117    | –166       | –75    | –169              | –77    | 260        | 118    |

| Tire              | Maximum Load @ 25 mph (40.2km/h) |
|-------------------|----------------------------------|
| 23.5 x 25 (20–PR) | 38,000 lb (17 600kg)             |
| 23.5R25 2 Star    | 37,500 lb (17 010kg)             |

(1) Adjust gross vehicle weight and axle loading according to component weight.

Note: All weights are ±3%.

## General Dimensions



| Turning Radius – Front Wheel (4x2) Steering | English | Metric |
|---------------------------------------------|---------|--------|
| Wall to wall over carrier                   | 39' 0"  | 11.9m  |
| Wall to wall over boom                      | 47' 7"  | 14.5m  |
| Wall to wall over boom attachment           | 49' 7"  | 15.1m  |
| Curb to curb                                | 37' 3"  | 11.4m  |
| Centerline of tire                          | 36' 0"  | 11.0m  |

| Turning Radius – All Wheel (4x4) Steering | English | Metric |
|-------------------------------------------|---------|--------|
| Wall to wall over carrier                 | 23' 4"  | 7.1m   |
| Wall to wall over boom                    | 34' 0"  | 10.4m  |
| Wall to wall over boom attachment         | 35' 6"  | 10.8m  |
| Curb to curb                              | 21' 4"  | 6.5m   |
| Centerline of lane                        | 20' 0"  | 6.1m   |

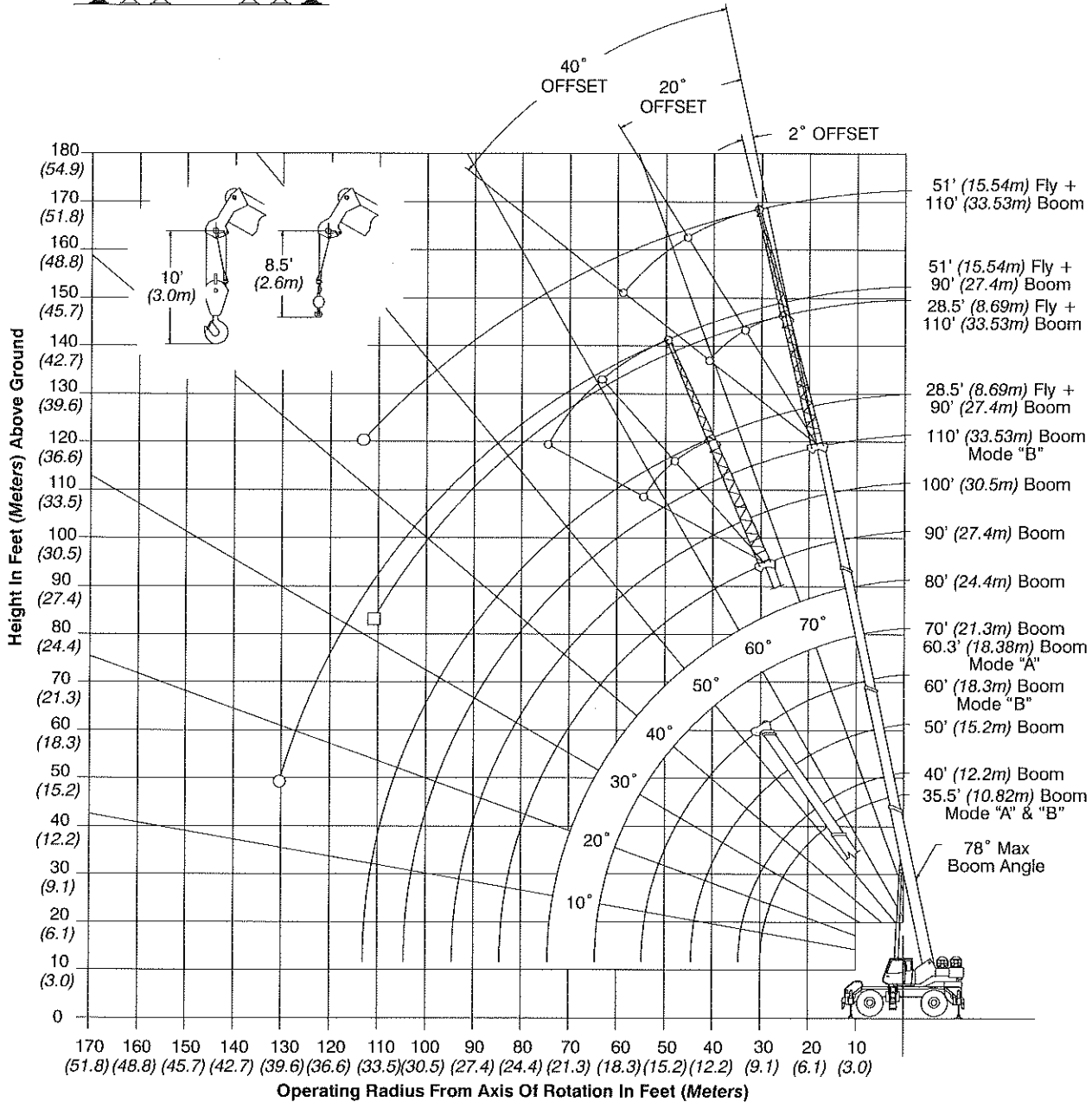
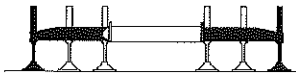
| Tail Swing            | English | Metric |
|-----------------------|---------|--------|
| With counterweight    | 12' 8"  | 3.9m   |
| Without counterweight | N/A     | N/A    |

| General Dimensions | Tire Size      |        |                |        |
|--------------------|----------------|--------|----------------|--------|
|                    | 23.5 x 25 bias |        | 23.5R25 radial |        |
|                    | English        | Metric | English        | Metric |
| A                  | 10' 3.5"       | 3.14m  | 10' 3"         | 3.12m  |
| B                  | 6' 7.75"       | 2.03m  | 6' 9.5"        | 2.06m  |
| C                  | 11' 11.75"     | 3.65m  | 12' 1.5"       | 3.70m  |
| D                  | 7.75"          | 0.20m  | 7"             | 0.18m  |
| E                  | 10"            | 0.25m  | 11.75"         | 0.30m  |
| F                  | 10' 0.25"      | 3.05m  | 10' 2"         | 3.10m  |
| G                  | 7' 6"          | 2.29m  | 7' 7.75"       | 2.33m  |
| H                  | 24"            | --     | 24.8"          | --     |
| J                  | 21"            | --     | 22"            | --     |
| K                  | 6' 6.75"       | 1.69m  | 6' 8.5"        | 1.74m  |
| L                  | 8' 3"          | 2.51m  | 8' 3"          | 2.51m  |

Not To Scale

# Working Range Diagram

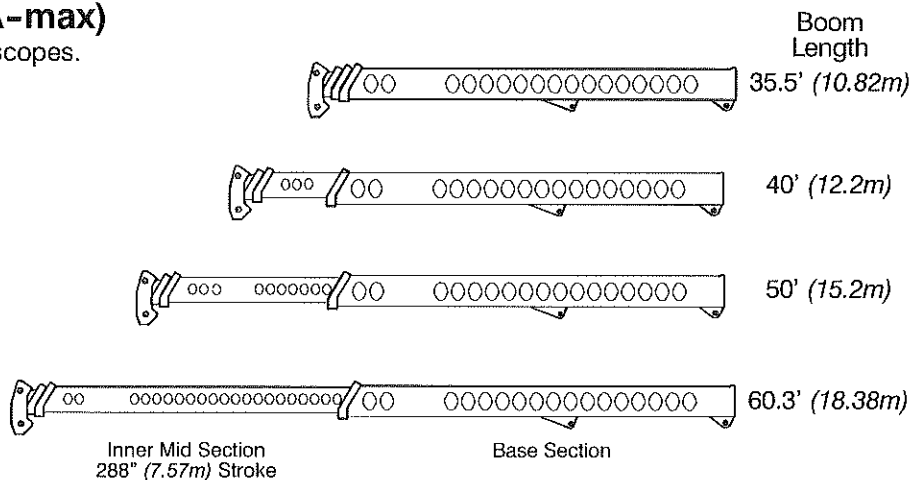
Working Range Diagram  
On Fully Extended Outriggers



## Boom Extend Modes

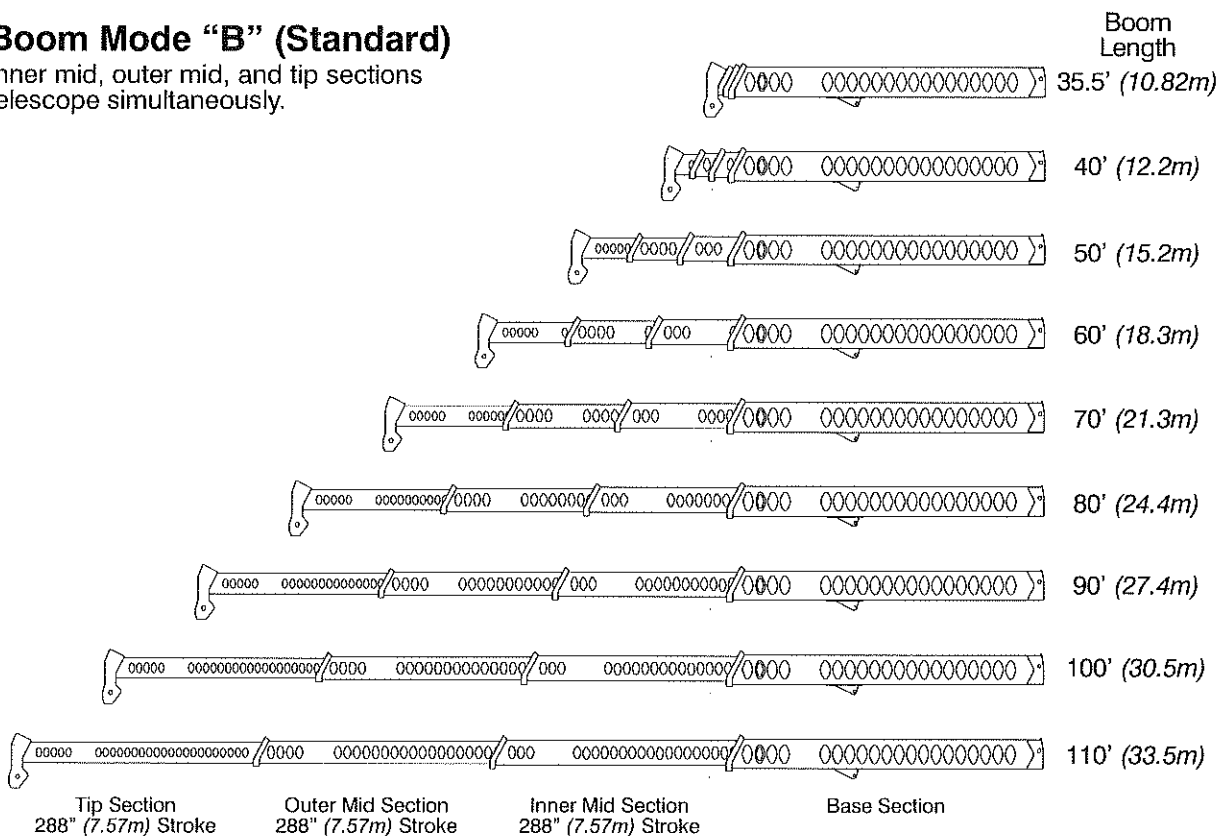
### Boom Mode “A” (A-max)

Only inner mid section telescopes.



### Boom Mode “B” (Standard)

Inner mid, outer mid, and tip sections telescope simultaneously.



## Main Boom Lift Capacity Charts – Standard

| Fully Extended Outriggers – 360° Rotation<br>(All Capacities Are Listed In Pounds) |                  |        |        |          |        |        |        |        |        |                |
|------------------------------------------------------------------------------------|------------------|--------|--------|----------|--------|--------|--------|--------|--------|----------------|
| Radius<br>(ft)                                                                     | Boom Length (ft) |        |        |          |        |        |        |        |        | Radius<br>(ft) |
|                                                                                    | 35.5             | 40     | 50     | 60/60.3  | 70     | 80     | 90     | 100    | 110    |                |
| 10                                                                                 | 100,000          | 78,400 | 72,600 |          |        |        |        |        |        | 10             |
| 12                                                                                 | 73,900           | 73,100 | 65,600 | 50,900** | 37,900 |        |        |        |        | 12             |
| 15                                                                                 | 63,200           | 63,000 | 57,500 | 46,900** | 37,900 | 35,400 |        |        |        | 15             |
| 20                                                                                 | 50,300           | 50,100 | 47,600 | 39,200** | 37,900 | 34,700 | 28,900 |        |        | 20             |
| 25                                                                                 | 39,000           | 38,900 | 38,500 | 37,900   | 37,900 | 34,200 | 28,200 | 24,000 | 19,500 | 25             |
| 30                                                                                 |                  | 31,300 | 31,900 | 32,300   | 32,500 | 30,300 | 24,800 | 22,500 | 19,500 | 30             |
| 35                                                                                 |                  |        | 26,100 | 26,500   | 26,700 | 26,900 | 22,000 | 19,900 | 18,300 | 35             |
| 40                                                                                 |                  |        | 20,800 | 21,200   | 21,400 | 21,500 | 19,700 | 17,800 | 16,400 | 40             |
| 45                                                                                 |                  |        |        | 17,100   | 17,300 | 17,400 | 17,500 | 15,900 | 14,600 | 45             |
| 50                                                                                 |                  |        |        | 13,900   | 14,200 | 14,300 | 14,400 | 14,400 | 13,200 | 50             |
| 55                                                                                 |                  |        |        |          | 11,900 | 12,100 | 12,200 | 12,200 | 12,100 | 55             |
| 60                                                                                 |                  |        |        |          | 10,000 | 10,200 | 10,300 | 10,300 | 10,400 | 60             |
| 65                                                                                 |                  |        |        |          |        | 8,600  | 8,700  | 8,800  | 8,900  | 65             |
| 70                                                                                 |                  |        |        |          |        | 7,300  | 7,500  | 7,500  | 7,600  | 70             |
| 75                                                                                 |                  |        |        |          |        |        | 6,400  | 6,500  | 6,500  | 75             |
| 80                                                                                 |                  |        |        |          |        |        | 5,400  | 5,500  | 5,600  | 80             |
| 85                                                                                 |                  |        |        |          |        |        |        | 4,700  | 4,800  | 85             |
| 90                                                                                 |                  |        |        |          |        |        |        | 4,000  | 4,100  | 90             |
| 95                                                                                 |                  |        |        |          |        |        |        |        | 3,500  | 95             |
| 100                                                                                |                  |        |        |          |        |        |        |        | 2,900  | 100            |

\* Special Conditions Or Wire Rope Required

\*\* 60.3 A – max Mode

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 85% of the tipping loads and on tires do not exceed 75% of the tipping loads.

**On Tires – Stationary – Boom Centered Over Front Between Tire Tracks**  
(All Capacities Are Listed In Pounds)

| Radius<br>(ft) | Boom Length (ft) |        |        |        |        | Radius<br>(ft) |
|----------------|------------------|--------|--------|--------|--------|----------------|
|                | 35.5             | 40     | 50     | 60     | 70     |                |
| 10             | 47,300           | 47,100 |        |        |        | 10             |
| 12             | 41,600           | 41,400 |        |        |        | 12             |
| 15             | 35,100           | 35,000 | 35,800 |        |        | 15             |
| 20             | 27,400           | 27,300 | 28,200 | 28,500 |        | 20             |
| 25             | 21,900           | 21,700 | 22,900 | 23,200 | 23,400 | 25             |
| 30             |                  | 16,100 | 16,700 | 17,100 | 17,200 | 30             |
| 35             |                  |        | 12,600 | 12,900 | 13,100 | 35             |
| 40             |                  |        | 9,700  | 10,100 | 10,300 | 40             |
| 45             |                  |        |        | 7,900  | 8,200  | 45             |
| 50             |                  |        |        | 6,300  | 6,500  | 50             |
| 55             |                  |        |        |        | 5,200  | 55             |
| 60             |                  |        |        |        | 4,200  | 60             |

**On Tires – Pick & Carry (Creep) – Boom Centered Over Front**  
(All Capacities Are Listed In Pounds)

| Radius<br>(ft) | Boom Length (ft) |        |        |        |        | Radius<br>(ft) |
|----------------|------------------|--------|--------|--------|--------|----------------|
|                | 35.5             | 40     | 50     | 60     | 70     |                |
| 10             | 44,100           | 43,900 |        |        |        | 10             |
| 12             | 38,400           | 38,200 |        |        |        | 12             |
| 15             | 31,800           | 32,000 | 32,400 |        |        | 15             |
| 20             | 24,000           | 24,300 | 24,700 | 25,000 |        | 20             |
| 25             | 18,600           | 19,000 | 19,500 | 19,800 | 19,900 | 25             |
| 30             |                  | 15,100 | 15,600 | 15,900 | 16,100 | 30             |
| 35             |                  |        | 12,600 | 12,900 | 13,100 | 35             |
| 40             |                  |        | 9,700  | 10,100 | 10,300 | 40             |
| 45             |                  |        |        | 7,900  | 8,200  | 45             |
| 50             |                  |        |        | 6,300  | 6,500  | 50             |
| 55             |                  |        |        |        | 5,200  | 55             |
| 60             |                  |        |        |        | 4,200  | 60             |

**On Tires – Stationary – 360° Rotation**  
(All Capacities Are Listed In Pounds)

| Radius<br>(ft) | Boom Length (ft) |        |        |        |        | Radius<br>(ft) |
|----------------|------------------|--------|--------|--------|--------|----------------|
|                | 35.5             | 40     | 50     | 60     | 70     |                |
| 10             | 37,200           | 37,400 | 37,700 |        |        | 10             |
| 12             | 31,100           | 31,400 | 31,800 |        |        | 12             |
| 15             | 24,000           | 24,400 | 24,900 |        |        | 15             |
| 20             | 14,500           | 14,800 | 15,400 | 15,700 |        | 20             |
| 25             | 9,400            | 9,800  | 10,300 | 10,700 | 10,900 | 25             |
| 30             |                  | 6,600  | 7,100  | 7,500  | 7,700  | 30             |
| 35             |                  |        | 5,000  | 5,300  | 5,500  | 35             |
| 40             |                  |        | 3,400  | 3,700  | 3,900  | 40             |
| 45             |                  |        |        | 2,500  | 2,700  | 45             |

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 85% of the tipping loads and on tires do not exceed 75% of the tipping loads.

## Fly Attachment Lift Capacity Charts – Optional

| Fully Extended Outriggers – 360° Rotation<br>(All Capacities Are Listed In Pounds) |                 |       |                                           |                 |       |                                           |                 |       |
|------------------------------------------------------------------------------------|-----------------|-------|-------------------------------------------|-----------------|-------|-------------------------------------------|-----------------|-------|
| 110 ft Main Boom Length<br>2° Fly Offset                                           |                 |       | 110 ft Main Boom Length<br>20° Fly Offset |                 |       | 110 ft Main Boom Length<br>40° Fly Offset |                 |       |
| Radius<br>(ft)                                                                     | Fly Length (ft) |       | Radius<br>(ft)                            | Fly Length (ft) |       | Radius<br>(ft)                            | Fly Length (ft) |       |
|                                                                                    | 28.5            | 51    |                                           | 28.5            | 51    |                                           | 28.5            | 51    |
| 35                                                                                 | 9,400           |       | 45                                        | 9,500           |       | 50                                        | 7,500           |       |
| 40                                                                                 | 9,400           |       | 50                                        | 9,100           |       | 55                                        | 7,300           |       |
| 45                                                                                 | 9,400           | 6,200 | 55                                        | 8,400           |       | 60                                        | 7,100           |       |
| 50                                                                                 | 9,400           | 6,200 | 60                                        | 7,800           | 4,800 | 65                                        | 6,900           |       |
| 55                                                                                 | 9,200           | 6,200 | 65                                        | 7,300           | 4,600 | 70                                        | 6,500           |       |
| 60                                                                                 | 8,500           | 6,200 | 70                                        | 6,800           | 4,400 | 75                                        | 6,100           | 3,400 |
| 65                                                                                 | 7,900           | 6,000 | 75                                        | 6,400           | 4,300 | 80                                        | 5,800           | 3,400 |
| 70                                                                                 | 7,300           | 5,700 | 80                                        | 6,000           | 4,100 | 85                                        | 5,500           | 3,300 |
| 75                                                                                 | 6,800           | 5,300 | 85                                        | 5,700           | 4,000 | 90                                        | 5,200           | 3,200 |
| 80                                                                                 | 6,200           | 4,900 | 90                                        | 5,000           | 3,800 | 95                                        | 4,600           | 3,200 |
| 85                                                                                 | 5,300           | 4,600 | 95                                        | 4,300           | 3,700 | 100                                       | 3,900           | 3,100 |
| 90                                                                                 | 4,600           | 4,300 | 100                                       | 3,700           | 3,500 | 105                                       | 3,300           | 3,100 |
| 95                                                                                 | 4,000           | 4,000 | 105                                       | 3,200           | 3,300 | 110                                       | 2,800           | 3,000 |
| 100                                                                                | 3,500           | 3,800 | 110                                       | 2,700           | 3,200 | 115                                       |                 | 2,900 |
| 105                                                                                | 3,000           | 3,500 | 115                                       | 2,300           | 3,000 | 120                                       |                 | 2,800 |
| 110                                                                                | 2,500           | 3,000 | 120                                       |                 | 2,600 | 125                                       |                 | 2,400 |
| 115                                                                                | 2,100           | 2,600 | 125                                       |                 | 2,200 | 130                                       |                 | 2,000 |
| 120                                                                                |                 | 2,200 | 130                                       |                 | 1,900 |                                           |                 |       |

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 85% of the tipping loads and on tires do not exceed 75% of the tipping loads.

## Main Boom Lift Capacity Charts – Optional (Metric)

| Fully Extended Outriggers – 360° Rotation<br>(All Capacities Are Listed In Kilograms) |                 |        |        |            |        |        |        |        |       |               |
|---------------------------------------------------------------------------------------|-----------------|--------|--------|------------|--------|--------|--------|--------|-------|---------------|
| Radius<br>(m)                                                                         | Boom Length (m) |        |        |            |        |        |        |        |       | Radius<br>(m) |
|                                                                                       | 10.82           | 12.2   | 15.2   | 18.3/18.38 | 21.3   | 24.4   | 27.4   | 30.5   | 33.53 |               |
| 2.5                                                                                   | 50 000          |        |        |            |        |        |        |        |       | 2.0           |
| 3.0                                                                                   | 45 350          | 35 550 | 33 250 |            |        |        |        |        |       | 3.0           |
| 3.5                                                                                   | 34 550          | 34 050 | 30 550 |            |        |        |        |        |       | 3.5           |
| 4.0                                                                                   | 31 550          | 31 350 | 28 350 | 23 050**   | 17 150 |        |        |        |       | 4.0           |
| 4.5                                                                                   | 29 000          | 28 900 | 26 350 | 21 450**   | 17 150 |        |        |        |       | 4.5           |
| 5.0                                                                                   | 26 750          | 26 700 | 24 650 | 20 200**   | 17 150 | 16 050 |        |        |       | 5.0           |
| 6.0                                                                                   | 23 100          | 23 050 | 21 850 | 17 950**   | 17 150 | 15 700 | 13 100 |        |       | 6.0           |
| 7.0                                                                                   | 19 650          | 19 600 | 19 450 | 17 150     | 17 150 | 15 700 | 13 100 | 10 850 |       | 7.0           |
| 8.0                                                                                   | 16 650          | 16 850 | 17 100 | 17 150     | 16 600 | 15 050 | 12 400 | 10 850 | 8 800 | 8.0           |
| 9.0                                                                                   | 13 000          | 14 400 | 14 700 | 14 800     | 14 900 | 13 850 | 11 400 | 10 300 | 8 800 | 9.0           |
| 10.0                                                                                  |                 | 11 700 | 12 050 | 12 150     | 12 200 | 12 250 | 10 500 | 9 500  | 8 750 | 10.0          |
| 12.0                                                                                  |                 |        | 8 550  | 8 700      | 8 800  | 8 850  | 8 900  | 8 200  | 7 550 | 12.0          |
| 14.0                                                                                  |                 |        |        | 6 550      | 6 650  | 6 700  | 6 750  | 6 750  | 6 500 | 14.0          |
| 16.0                                                                                  |                 |        |        | 5 050      | 5 200  | 5 250  | 5 300  | 5 350  | 5 350 | 16.0          |
| 18.0                                                                                  |                 |        |        |            | 4 100  | 4 200  | 4 250  | 4 250  | 4 300 | 18.0          |
| 20.0                                                                                  |                 |        |        |            |        | 3 350  | 3 400  | 3 450  | 3 450 | 20.0          |
| 22.0                                                                                  |                 |        |        |            |        | 2 700  | 2 750  | 2 800  | 2 850 | 22.0          |
| 24.0                                                                                  |                 |        |        |            |        |        | 2 250  | 2 300  | 2 350 | 24.0          |
| 26.0                                                                                  |                 |        |        |            |        |        |        | 1 850  | 1 900 | 26.0          |
| 28.0                                                                                  |                 |        |        |            |        |        |        | 1 500  | 1 550 | 28.0          |
| 30.0                                                                                  |                 |        |        |            |        |        |        |        | 1 250 | 30.0          |

\* Special Conditions Or Wire Rope Required

\*\* 18.38 A –max Mode

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 75% of the tipping loads and on tires do not exceed 65% of the tipping loads.

| On Tires – Stationary – Boom Centered Over Front Between Tire Tracks<br>(All Capacities Are Listed In Kilograms) |                 |        |        |        |       |               |
|------------------------------------------------------------------------------------------------------------------|-----------------|--------|--------|--------|-------|---------------|
| Radius<br>(m)                                                                                                    | Boom Length (m) |        |        |        |       | Radius<br>(m) |
|                                                                                                                  | 10.82           | 12.2   | 15.2   | 18.3   | 21.3  |               |
| 3                                                                                                                | 21 700          |        |        |        |       | 3             |
| 3.5                                                                                                              | 19 500          | 19 400 |        |        |       | 3.5           |
| 4                                                                                                                | 17 650          | 17 600 |        |        |       | 4             |
| 4.5                                                                                                              | 16 150          | 16 250 | 16 450 |        |       | 4.5           |
| 5                                                                                                                | 14 800          | 14 950 | 15 150 |        |       | 5             |
| 6                                                                                                                | 12 650          | 12 750 | 12 950 | 13 100 |       | 6             |
| 7                                                                                                                | 10 150          | 10 300 | 10 550 | 10 650 | 9 900 | 7             |
| 8                                                                                                                | 7 900           | 8 100  | 8 350  | 8 450  | 8 500 | 8             |
| 9                                                                                                                | 6 300           | 6 500  | 6 750  | 6 900  | 6 950 | 9             |
| 10                                                                                                               |                 | 5 350  | 5 600  | 5 750  | 5 800 | 10            |
| 12                                                                                                               |                 |        | 3 950  | 4 100  | 4 200 | 12            |
| 14                                                                                                               |                 |        |        | 3 000  | 3 050 | 14            |
| 16                                                                                                               |                 |        |        | 2 200  | 2 300 | 16            |
| 18                                                                                                               |                 |        |        |        | 1 700 | 18            |

| On Tires – Pick & Carry (Creep) – Boom Centered Over Front<br>(All Capacities Are Listed In Kilograms) |                 |        |        |        |       |               |
|--------------------------------------------------------------------------------------------------------|-----------------|--------|--------|--------|-------|---------------|
| Radius<br>(m)                                                                                          | Boom Length (m) |        |        |        |       | Radius<br>(m) |
|                                                                                                        | 10.82           | 12.2   | 15.2   | 18.3   | 21.3  |               |
| 3                                                                                                      | 20 250          |        |        |        |       | 3             |
| 3.5                                                                                                    | 18 000          | 17 950 |        |        |       | 3.5           |
| 4                                                                                                      | 16 200          | 16 300 |        |        |       | 4             |
| 4.5                                                                                                    | 14 600          | 14 750 | 14 900 |        |       | 4.5           |
| 5                                                                                                      | 13 250          | 13 400 | 13 550 |        |       | 5             |
| 6                                                                                                      | 11 050          | 11 200 | 11 400 | 11 500 |       | 6             |
| 7                                                                                                      | 9 350           | 9 500  | 9 700  | 9 850  | 9 900 | 7             |
| 8                                                                                                      | 7 900           | 8 100  | 8 350  | 8 450  | 8 500 | 8             |
| 9                                                                                                      | 6 300           | 6 500  | 6 750  | 6 900  | 6 950 | 9             |
| 10                                                                                                     |                 | 5 350  | 5 600  | 5 750  | 5 800 | 10            |
| 12                                                                                                     |                 |        | 3 950  | 4 100  | 4 200 | 12            |
| 14                                                                                                     |                 |        |        | 3 000  | 3 050 | 14            |
| 16                                                                                                     |                 |        |        | 2 200  | 2 300 | 16            |
| 18                                                                                                     |                 |        |        |        | 1 700 | 18            |

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 75% of the tipping loads and on tires do not exceed 65% of the tipping loads.

| On Tires – Stationary – 360° Rotation<br>(All Capacities Are Listed In Kilograms) |                 |        |        |       |       |               |
|-----------------------------------------------------------------------------------|-----------------|--------|--------|-------|-------|---------------|
| Radius<br>(m)                                                                     | Boom Length (m) |        |        |       |       | Radius<br>(m) |
|                                                                                   | 10.82           | 12.2   | 15.2   | 18.3  | 21.3  |               |
| 3                                                                                 | 17 100          |        |        |       |       | 3             |
| 3.5                                                                               | 14 750          | 14 900 |        |       |       | 3.5           |
| 4                                                                                 | 11 850          | 12 000 |        |       |       | 4             |
| 4.5                                                                               | 9 700           | 9 850  | 10 050 |       |       | 4.5           |
| 5                                                                                 | 8 100           | 8 250  | 8 450  |       |       | 5             |
| 6                                                                                 | 5 850           | 6 000  | 6 200  | 6 350 |       | 6             |
| 7                                                                                 | 4 400           | 4 550  | 4 750  | 4 900 | 4 950 | 7             |
| 8                                                                                 | 3 300           | 3 450  | 3 700  | 3 800 | 3 900 | 8             |
| 9                                                                                 | 2 500           | 2 650  | 2 900  | 3 050 | 3 100 | 9             |
| 10                                                                                |                 | 2 050  | 2 300  | 2 400 | 2 500 | 10            |
| 12                                                                                |                 |        | 1 400  | 1 500 | 1 600 | 12            |
| 14                                                                                |                 |        |        |       | 1 000 | 14            |

## Fly Attachment Lift Capacity Charts – Optional (Metric)

| Fully Extended Outriggers – 360° Rotation<br>(All Capacities Are Listed In Kilograms) |                |       |                                           |                |       |                                           |                |       |
|---------------------------------------------------------------------------------------|----------------|-------|-------------------------------------------|----------------|-------|-------------------------------------------|----------------|-------|
| 33.53m Main Boom Length<br>2° Fly Offset                                              |                |       | 33.53m Main Boom Length<br>20° Fly Offset |                |       | 33.53m Main Boom Length<br>40° Fly Offset |                |       |
| Radius<br>(m)                                                                         | Fly Length (m) |       | Radius<br>(m)                             | Fly Length (m) |       | Radius<br>(m)                             | Fly Length (m) |       |
|                                                                                       | 8.69           | 15.54 |                                           | 8.69           | 15.54 |                                           | 8.69           | 15.54 |
| 12                                                                                    | 4 250          |       | 14                                        | 4 250          |       | 16                                        | 3 350          |       |
| 14                                                                                    | 4 250          | 2 800 | 16                                        | 4 000          |       | 18                                        | 3 250          |       |
| 16                                                                                    | 4 250          | 2 800 | 18                                        | 3 600          | 2 200 | 20                                        | 3 100          |       |
| 18                                                                                    | 3 900          | 2 800 | 20                                        | 3 300          | 2 100 | 22                                        | 2 850          | 1 600 |
| 20                                                                                    | 3 550          | 2 700 | 22                                        | 3 000          | 1 950 | 24                                        | 2 650          | 1 550 |
| 22                                                                                    | 3 050          | 2 500 | 24                                        | 2 750          | 1 850 | 26                                        | 2 400          | 1 500 |
| 24                                                                                    | 2 550          | 2 250 | 26                                        | 2 300          | 1 800 | 28                                        | 2 000          | 1 450 |
| 26                                                                                    | 2 100          | 2 050 | 28                                        | 1 900          | 1 700 | 30                                        | 1 650          | 1 400 |
| 28                                                                                    | 1 750          | 1 900 | 30                                        | 1 550          | 1 650 | 32                                        | 1 350          | 1 400 |
| 30                                                                                    | 1 450          | 1 650 | 32                                        | 1 250          | 1 500 | 34                                        | 1 050          | 1 350 |
| 32                                                                                    | 1 150          | 1 350 | 34                                        | 1 000          | 1 300 | 36                                        |                | 1 200 |
| 34                                                                                    | 950            | 1 150 | 36                                        | 800            | 1 100 | 38                                        |                | 950   |
| 36                                                                                    |                | 950   | 38                                        |                | 900   | 40                                        |                | 750   |

This information is not for crane operation. Operator must refer to the in-cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 75% of the tipping loads and on tires do not exceed 65% of the tipping loads.

**Link-Belt Construction Equipment Company**      Lexington, Kentucky      [www.linkbelt.com](http://www.linkbelt.com)

®Link-Belt is a registered trademark. Copyright 2009. We are constantly improving our products and therefore reserve the right to change designs and specifications.