ZOOMLION

ZOOMLION ZRT1100D553 ROUGH TERRAIN CRANE

TECHNICAL SPECIFICATIONS

GQ07514027002000EN

Zoomlion Heavy Industry Science & Technology Co.,Ltd.

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TECHNICAL SPECIFICATIONS

1. PRODUCT CHARACTERISTICS

ZRT1100D553 rough terrain crane is characterized in its wide tread, high stability, short wheelbase and small turning radius, which is adapted to tight work space.

It provides 360° swing function, “on tires” lifts and pick-and-carry operations.

It can be widely used in construction building sites, oil fields, warehouses, freight yards and logistics bases etc., to carry out lifting work, short distance transportation and pick-and-carry operations in narrow working areas.

ZRT1100D553 rough terrain crane consists of a superstructure and a special purpose chassis, including power system, drive system, suspension system, steering system, brake system, hoist mechanism, derricking mechanism, swing mechanism, boom system, slewing table, chassis frame, outrigger, hydraulic system, electric system and cab, etc.

Distinguishing characteristics:

- Four steering modes:

  2-wheel steering (front wheel), 2-wheel steering (rear wheel), 4-wheel steering and Crab steering.

- Max. rated lifting capacity: 110 ton at 2.5 m working radius
- Max. lifting height: 66.8m
- Max. driving speed: 35 km/h
- Overall dimensions: 15000 mm×3400 mm×3910mm
- Deadweight: 60 ton
- Capable of pick-and-carry operations.
- Capable of driving on rough terrains.

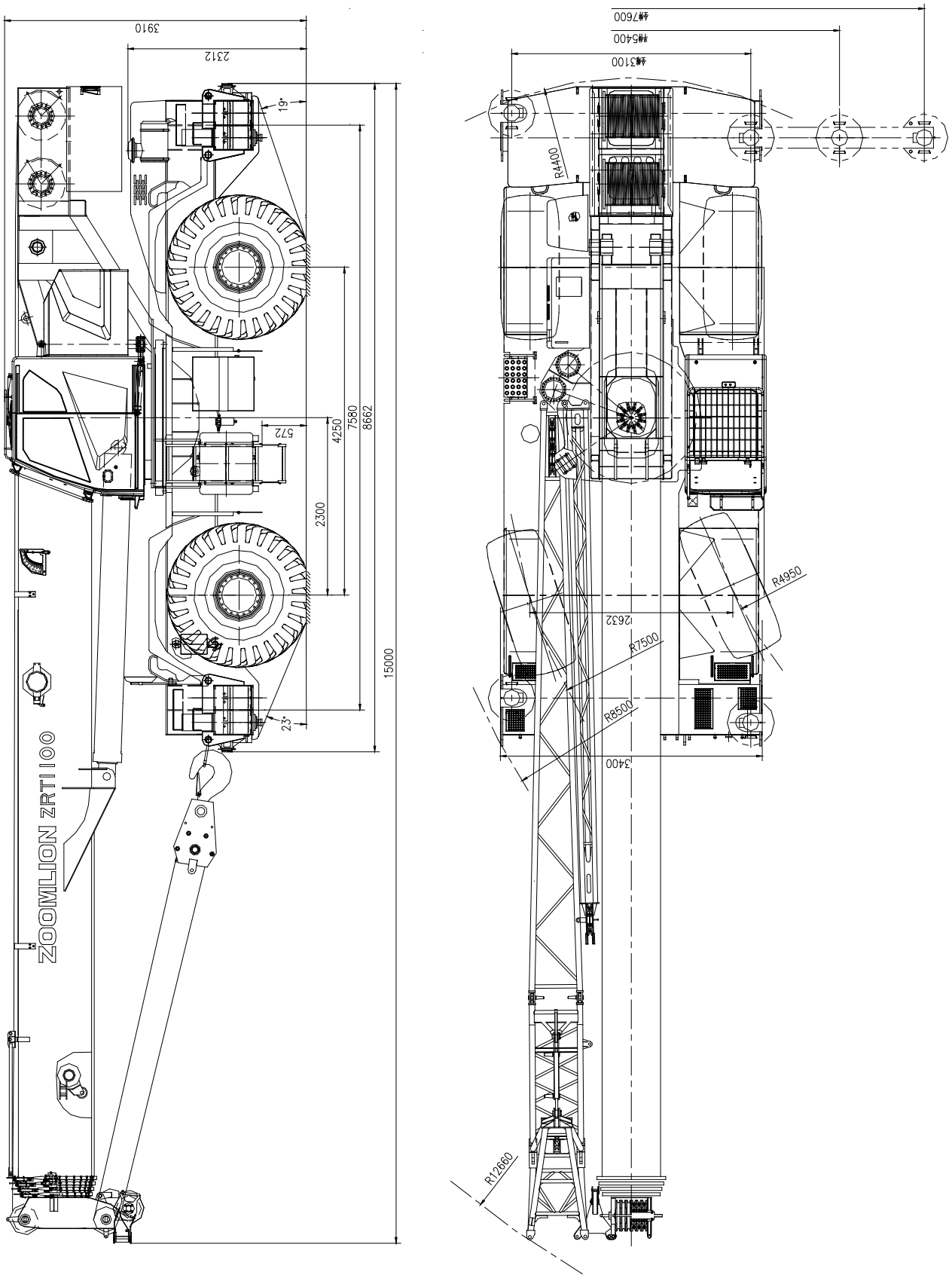


Figure 1 Overall View – ZRT1100D553 Rough Terrain Crane

2. TECHNICAL DATA

MAIN TECHNICAL DATA

Type	Ser. No.	Item	Unit	Value
Working performance	1	Max. rated lifting capacity × working radius	kg.m	110000×2.5
	2	Max. load moment of main boom	kN.m	3381
	3	Max. load moment of main boom (fully extended)	kN.m	1693
	4	Max. lifting height of main boom (fully extended)	m	49.2 (from the lower end of hook to ground, i.e. from 2.5 m below the boom top point to the ground)
	5	Max. lifting height of jib	m	66.8 (from the lower end of hook to ground, i.e. from 2.5 m below the boom top point to the ground)
Dimensions	6	Overall dimensions (L × W × H)	mm	15000×3400×3910
	7	Outrigger spread (Height × Width)	mm	7580×7600
	8	Main boom length	mm	12600 - 49000
	9	Jib length	mm	10400 - 17500
	10	Boom angle	°	-1 - 80
	11	Swing range		360° unlimited swing (Full range)
Working speeds	12	Max. hoist rope speed (Main winch)	m/min	130
	13	Min. boom telescoping out time	s	135
	14	Min. boom telescoping in time	s	135
	15	Min. boom derricking up time	s	60
	16	Min. boom derricking down time	s	≤90
	17	Swing speed	r/min	0-1.6
Hydraulic system	18	Maximum working pressure	MPa	31
	19	Rate working flow	L/min	280
	20	Hydraulic oil tank capacity	L	1100
Gross vehicle	21	Gross weight	kg	60000

Type	Ser. No.	Item	Unit	Value
mass	22	Front weight	kg	29000
	23	Rear weight	kg	31000
Driving	24	Highest driving speed (forward/backward)	km/h	35/35
	25	Wheelbase	mm	4250
	26	Treads (Front / Rear)	mm	2632
	27	Max. gradeability	%	75 (96.7% at stall)

3. MAIN PARTS TABLE

MAIN PARTS TABLE

Type	Ser. No.	Item		Main configuration
Power system	1	Engine make & model		Cummins QSB6.7
	2	Fuel type		Diesel
	3	Intake system		Turbo-charged, air to air, inter-cooling
	4	Cooling system		Water-cooling
	5	Engine rated power	KW/r/min	194KW/2500rpm
	6	Engine rated torque	N.m/r/min	1152N.m/1500rpm
	7	Fuel tank capacity		300 L
Drive system	8	Transmission drive mode		4×2, 4×4
	9	Model or brand of transmission		DANA(America)
	10	Transmission gear stage		6 forward and 6 reverse speeds
Travel system	11	Suspension		Rigid (front) / Flexible (rear)
	12	Model or brand of axles		Kessler （Germany）
	13	Steering mode		2-wheel steer (front wheel) 2-wheel steer (rear wheel) 4-wheel steer Crab steer
	14	Tire size		29.5-25-34PR
	15	Tire number		4
Hydraulic system	16	Model or brand of main valve		ZOOMLION
	17	Gear pump		HIGH-TECH/Jinan Hydraulic
	18	Balance valve / hydraulic lock		BUCHER/ZOOMLION
	19	Swing motor		HIGH-TECH(China)
Electrical system	20	Rated capacity indicator		HIRSCHMANN (Germany)
	21	Controller		IFM(Germany)
Emission	22			Euro V

4. SPECIFICATIONS, SUPERSTRUCTURE

4.1 Main boom and telescoping mechanism

The box-shaped main boom consists of 5 U-type boom sections made of high-strength steel.

The main boom head is equipped with 6 sheaves, which is convenient for changing reeving factors without removing the wedges. The rooster sheave and a dismountable pulley block are included in the standard configuration.

Min. main boom length (with telescopic sections completely retracted): 12600 mm

Max. main boom length (with telescopic sections completely extended): 49000 mm

Min. telescoping out time: about 135 s

4.2 Jib

It consists of two jib sections of lattice structure. The jib section II is secured into the jib section I, and can be extended outward from one side of the section I. The whole jib is side stowed with the main boom via moveable pins during driving.

A sheave is assembled at the jib head.

Offset: 0°, 15° and 30°

Jib length: 10.4m – 17.5 m

4.3 Derricking mechanism

Front-mounted single derricking cylinder with a two-way balance valve.

Derrick angle: -1°- 80°

Derrick speed: -1°- 80°/ 60 s

4.4 Hoist mechanism

4.4.1 Main and auxiliary winches

The main and auxiliary winches are equipped with the same spare parts. An axial variable-displacement hydraulic motor drives the drum to rotate through a planetary reducer, so as to lift and lower a load.

4.4.2 Wire rope

Twist-resistant wire rope is used.

Max. hoist rope strength: 6500 kg

Max. hoist rope speed: 130 m/min (At the 4th layer)

Rope diameter: Φ20 mm

Main winch rope length: 260 m

Auxiliary winch rope length: 140 m

4.4.3 Hook block

Rotatable main hook: 85 t, with 6 sheaves and hook latch, secured at the chassis frame in front of the slewing table.

Rotatable auxiliary hook: 6.5 ton, with hook latch, used with the rooster sheave and jib, secured at the auxiliary hook holder on the chassis frame.

Rotatable hook: 110 t (optional), with 7 sheaves and a hook latch, secured at the chassis frame in front of the slewing table.

4.5 Swing mechanism

It consists of a hydraulic motor, two planetary gear reducers, a pinion gear and a swing bearing, etc. Via the planetary gear reducer, the hydraulic motor drives the pinion gear to rotate and makes the swing bearing outer ring rotate around its inner toothed ring fixed on chassis frame, providing superstructure with 360° unlimited swing.

Hydraulically controlled usually-closed brake, capable of free swing function, and installed with a pneumatic swing lockout device.

Swing speed: 0 – 1.6 r/min.

4.6 Slewing table

The slewing table adopts a wall-plate structure.

4.7 Hydraulic system

4.7.1 Oil pump

The dual variable plunger pumps mounted on the PTO supply oil to the telescoping, derricking and hoist mechanisms.

A gear pump installed at the PTO supplies oil to the slewing and steering mechanisms.

Another gear pump mounted on the engine supplies oil to the outriggers, braking system, oil radiator of the torque converter and air conditioner.

4.7.2 Control valve

It applies an electrically-controlled multi-way directional valve, and provides pilot oil to the hydraulic control system to control the slewing lock mechanism and derricking mechanism.

4.7.3 Pipeline

An air-cooled hydraulic oil cooler driven by an electric motor is located in return line.
The system pressure can display on the instrument console since there is a pressure test port on the hydraulic circuit.

4.7.4 Hydraulic oil tank

Capacity: about 1100 L

4.7.5 Filter

High pressure filters with the filtering accuracy of 10 μ are mounted on oil lines of the steering, slewing, outrigger, pilot, A/C and braking systems.

Two return oil filters with the filtering accuracy of 12 μ are mounted in the hydraulic oil tank.

4.8 Crane controls

The superstructure movements are controlled by two electrically controlled joysticks on both sides of operator's seat as well as the foot pedal at the left side of the operator's seat (complying with ISO standard requirements).

The left joystick controls the swing mechanism and the auxiliary winch.

The right joystick controls the derricking mechanism and the main winch.

The foot pedal controls telescoping of the boom.

A Lifting movement can be compounded with a derricking or telescoping movement.

4.9 Cab

There is only one cab for ZRT1100D533 rough terrain crane. It can be used as the operator's cab as well as the driver's cab. The cab is side-mounted and adopts left-hand drive. A single seat is installed inside the cab.

A hydraulic steering gear (manufacturer: EATON Ji'ning) and an air conditioner for both heating and cooling (manufacturer: Yuxin He'nan) are installed in the crane.

Emission complies with the requirements of Europe environment protection standards.

There are two control boxes on the both sides of operator's seat. The left / right control box can be pulled up. The controls of the superstructure are arranged according to the requirements of ASME B30.5-2007 standard and comply with ISO (International Organization for Standardization) standard.

Cab dimensions:

Length:	1810 ± 5 mm
Width:	1050 ± 5 mm
Height:	1710 ± 5 mm

4.10 Rated capacity indicator (RCI)

If the actual load approaches the rated one, the buzzer sends out visual and audible warning.

If the actual load reaches the rated one, all dangerous movements are switched off automatically.

The rated capacity indicator also can limit the working range (including working radius, boom angle, lifting height and swing range etc.).

The following information can be displayed on the screen:

– Boom angle or moment ratio;

– Boom length or default hook weight;

– Actual working radius or swing angle;

– Actual lifting capacity;

– Max. permissible lifting capacity;

– Jib installation angle or reeving factor;

– Boom status indication;

– Outrigger status (completely extended, half extended or completely retracted or “On Tires” indication).

The following information is displayed in bar graph:

– Percentage of actual lifting capacity to the rated one or working pressure of the hydraulic system.

4.11 Outriggers

4 H-type outriggers, hydraulically controlled, can be operated in the cab simultaneously or independently.

Each vertical jack cylinder is equipped with a two-way hydraulic lock to ensure that outriggers are secured reliably during working or driving.

Outrigger boxes are directly welded onto the chassis frame.

The outriggers can be completely extended, intermediately extended or completely retracted for different crane operations.

Outrigger spread (Height): 7580 mm

Outrigger spread (Width): 7600 mm (fully extended)

5400 mm (half extended)

3100 mm (fully retracted)

5. SPECIFICATIONS, SPECIAL PURPOSE CHASSIS FOR ROUGH TERRAIN CRANE

5.1 Type

Rear mounted engine, left-hand drive

Drive mode: 4 x 2 and 4 x 4

5.2 Chassis frame

Integral box-type construction welded by high-strength steel

5.3 Engine

5.3.1 Model

CUMMINS B6.7

5.3.2 Type

Four-stroke cycles, 6-cylinder diesel, direct injection, water-cooled, turbocharged diesel engine.

5.3.3 Performance

Max. output power:	194 KW / 2500 RPM
Max. output torque:	1152 Nm / 1500 RPM

5.4 Drive system

Electrically controlled automatic hydraulic transmission, front/rear axle driving modes, the front axle driving can be disengaged.

6 forwards and 6 reverse speeds, electro-hydraulic power shift, and installed with an automatic locking mechanism.

The working hydraulic oil pump and steering oil pump directly take off power from the transmission.

5.5 Axle

5.5.1 Front axle

A rigidly connected steering and driving axle, installed with a planetary reducer and a brake.

5.5.2 Rear axle

A full-floating steering and driving axle, installed with a planetary reducer and a brake.

5.6 Steering system

Fully-hydraulic power steering gear

The cylinder of steering and driving axle is controlled by the steering wheel to realize crane steering.

4 steering modes:

2-wheel steering – front wheel steering

2-wheel steering – rear wheel steering

4-wheel steering – all-wheel steering

4-wheel steering – crab steering

5.7 Suspension system

Front axle: rigidly mounted to the chassis frame

Rear axle: oscillation axle, connecting to chassis frame via a hydraulic suspension cylinder

5.8 Brake system

5.8.1 Service brake

Hydraulically controlled disc brake on 4 wheels

5.8.2 Parking brake

Hydraulically released parking brake, under the action of the spring mounted on the input shaft of front axle.

5.9 Electrical system

24 Volt DC

2 batteries with 12 V rated voltage and 120 Ah rated current

5.10 Fuel tank

Capacity: 300 L

5.11 Tire

Size: 29.5-25-34PR

6. SAFETY DEVICES

- Rated capacity indicator (RCI)
- Rotating beacon and horn
- Hoisting limit switch
- Lower limit switch
- Balance valve
- Hydraulic lock
- Hydraulic safety valve
- Swing brake
- Swing lockout device
- Boom angle indicator
- Outrigger beam retaining pin
- Emergency stop button

7. LOAD RATING

7.1 LIFTS WITH OUTRIGGER BEAMS FULLY EXTENDED

7.1.1 MAIN BOOM RATED LOADS

Table 7-1 Rated Load on Outriggers Fully Extended

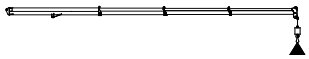
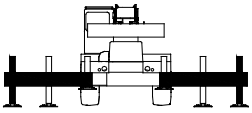
 MAIN BOOM			360° (UNIT: KG)			 OUTRIGGERS FULLY EXTENDED			
LOAD RADIUS (M)	**Outriggers and telescoping cylinder I fully extended, over sides and rear, 12.5 t counterweight**								
	12.6	17.3	21.9	26.4	30.9	35.4	39.9	44.4	49
2.5	110000**								
3	100000**	66000							
3.5	85000*	66000	47000						
4	78000	66000	47000	38000					
4.5	72000	63000	47000	38000					
5	68000	58000	46000	38000	34000				
5.5	62500	53500	43500	38000	34000				
6	57500	49500	41000	37000	33000	30000			
7	48000	43000	38000	35200	30000	27500	21000		
8	38500	36500	34000	32000	27000	25500	21000		
9	29000	27000	28500	28500	25000	24000	20000	17500	
10		22500	22800	24600	22500	22500	19000	17000	13000
11		19500	18600	20200	18600	21200	18000	15800	13000
12		16000	15500	17800	16400	19000	16500	14600	12800
14			10800	12800	12500	13500	13800	13000	11800
16			8500	9800	9800	10000	11000	11000	10500
18				7500	7800	8600	9000	9600	9600
20				5800	6400	7000	7300	7800	8000
22					4800	5800	6200	6200	6700
24					4000	4700	4900	5200	5500
26						3700	4000	4400	4800
28						3000	3300	3700	3800
30							2600	3000	3200
32							2100	2500	2700
34								2100	2300
36								1700	1850
38									1500
40									1200
42									1000
I (m)	0	4.7	9.3	9.3	9.3	9.3	9.3	9.3	9.3
II (m)	0	0	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	12	8	8	6	6	4	4	4
Hook	85t								

Table 7-2 Rated Load on Outriggers Fully Extended

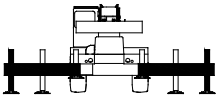
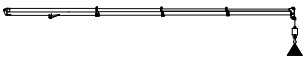
 MAIN BOOM	360° (UNIT: KG)	 OUTRIGGERS FULLY EXTENDED					
LOAD RADIUS (M)	**Outriggers fully extended and telescoping cylinder I intermediately extended, over sides and rear, 12.5 t counterweight**						
12.6	17.3	21.8	26.3	30.8	35.3	39.8	44.4
2.5	110000**							
3	100000**	66000						
3.5	85000*	66000	38000					
4	78000	66000	38000	34000				
4.5	72000	63000	38000	34000				
5	68000	58000	38000	34000	30000			
5.5	62500	53500	37000	34000	30000			
6	57500	49500	36000	32000	30000	24000		
7	48000	43000	34000	31000	29000	23000		
8	38500	36500	32000	30500	27000	22000	18000	
9	29000	27000	28000	29000	26000	20000	18000	13500
10		22500	24500	25500	24500	18400	16400	13500
11		19500	20500	21500	22500	16800	15000	13000
12		16000	17500	18200	18800	15500	14000	12600
14			12400	12800	13500	13400	12100	10800
16			9500	10400	11000	11800	10600	9500
18				8400	8500	8800	9500	8500
20				6500	7000	7400	7500	7700
22					5800	6000	6000	7000
24					4800	5000	5000	5800
26						4200	4000	4800
28						3200	3200	4000
30							2800	3200
32							2500	2600
34								2400
36								1800
38								1200
40								
42								
I (m)	0	4.7	4.7	4.7	4.7	4.7	4.7	4.7
II (m)	0	0	4.5	9	13.5	18	22.5	27.1
Reevin	12	12	8	8	6	6	4	4
Hook	85t							

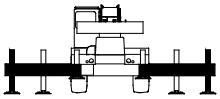
Table 7-3 Rated Load on Outriggers Fully Extended



MAIN BOOM

360°

(UNIT: KG)



OUTRIGGERS FULLY EXTENDED

LOAD RADIUS (M)	Outriggers fully extended and telescoping cylinder I fully retracted, over sides and rear, 12.5 t counterweight						
	12.6	17.1	21.6	26.1	30.6	35.1	39.7
2.5	110000**						
3	100000**	38000					
3.5	85000*	38000	34000				
4	78000	38000	34000	30000			
4.5	72000	38000	34000	30000			
5	68000	38000	34000	30000	25000		
5.5	62500	37000	34000	29000	25000		
6	57500	36000	32000	28000	24000	19000	
7	48000	34000	31000	26000	22500	19000	
8	38500	32000	29000	24500	21000	18000	15000
9	29000	30000	27000	23000	18800	17000	15000
10		26000	25500	22000	17000	15400	13800
11		22000	22000	20500	15800	14100	12800
12		18400	18800	20000	14500	13000	11800
14			14200	15000	12800	11200	10200
16			11000	11500	11200	9800	9000
18				9500	10000	8800	8000
20				8000	8300	8000	7200
22					7000	7300	6600
24					5800	6200	6100
26						5000	5700
28						4200	4500
30							4000
32							3500
34							
36							
38							
40							
42							
I (m)	0	0	0	0	0	0	0
II (m)	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	10	8	8	6	6	4
Hook	85t						

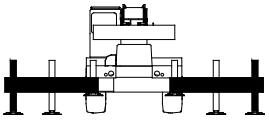
7.1.2 JIB RATED LOADS

Table 7-4 Rated loads for main boom + 10.4m jib

MAIN BOOM + 10.4 m JIB

360°

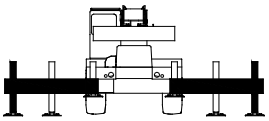
(UNIT: Kg)



OUTRIGGERS FULLY EXTENDED

BOOM ANGLE (º)	Outriggers fully extended, over sides and rear, 12.5 t counterweight		
	0°	15°	30°
80	6500	4600	4300
78	6300	4400	4200
76	6000	4300	3800
74	5600	4100	3600
72	5200	4000	3500
70	5000	3900	3400
68	4600	3800	3300
66	4500	3500	3300
64	4000	3200	3000
62	3200	2800	2600
60	2700	2500	2400
58	2400	2200	2100
56	2200	2000	1800
54	1900	1600	1500
52	1600	1400	1300
50	1400	1200	1100
48	1200	1100	1000
46	1100	1000	900
44	1000	900	
42	900		
40			
Reeving	1		
Hook	6.5t		

Table 7-5 Rated Load on Outriggers Fully Extended

 MAIN BOOM + 17.5 M JIB	360° (UNIT: KG)	 OUTRIGGERS FULLY EXTENDED

BOOM ANGLE (º)	Outriggers fully extended, over sides and rear, 12.5 t counterweight		
	0º	15º	30º
80	4000	2200	1800
78	3700	2000	1600
76	3300	1900	1500
74	3000	1800	1500
72	2900	1800	1500
70	2800	1800	1400
68	2700	1700	1400
66	2700	1700	1350
64	2600	1700	1350
62	2400	1600	1300
60	2200	1600	1300
58	1800	1600	1300
56	1500	1400	1300
54	1400	1300	1200
52	1200	1100	1100
50	1100	1000	1000
48	1000	900	900
46			
44			
42			
40			
Reeving	1		
Hook	6.5t		

Notes:

a) The operating modes marked with * in Table are ones which need using a removable pulley block and selecting a reeving factor of 13 when the crane is working over sides or rear working area. For ones marked with **, a reeving factor of 14 should be selected, and a 110 t hook should be used with an additional special device.

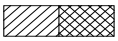
b) Crane load ratings are based on the crane being leveled and standing on a firm and uniform supporting surface.

c) Crane load ratings on outriggers are based on all outrigger beams being positioned according to the applicable lift chart and the tires raised free of the supporting surface.

d) CRANE LOAD RATINGS MUST NOT BE EXCEEDED. DO NOT ATTEMPT TO TIP THE CRANE TO DETERMINE ALLOWABLE LOADS.

e) Lift the load vertically. Do not pull the load at an angle.

f) When either radius or boom length, or both, are between listed values, the smaller of the two listed load ratings shall be used.

g) Do not operate at longer radii than those listed on the applicable lift chart (cross hatched are as  hown on range diagrams) as tipping can occur without a load on the hook.

h) The boom angles shown on the lift charts give an approximation of the operating radius for a specified boom length. The boom angle, before loading, should be greater to account for boom deflection.

i) Rated loads include the weight of hook block, slings, and auxiliary lifting devices. Their weights shall be subtracted from the listed rated load to obtain the net load that can be lifted.

j) Consult appropriate section of the *Operator's Manual* for more exact description of hoist line reeving.

k) The use of more parts of line than required by the load may result in having insufficient rope to allow the hook block to reach the ground. Choose the correct line parts to get a rope in the proper length. Refer to Table 1.1.

l) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator's Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.

m) When the rotation-resistant wire rope is used, the allowable rope loading shall be the breaking strength divided by five (5), unless otherwise specified by the wire rope manufacturer.

n) The user shall operate at reduced ratings to allow for adverse job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping off loads, hazardous conditions, experience of personnel, two-machine lifts, traveling with loads, electric wires, etc, (side pull on boom or jib is hazardous). If the wind speed

is higher than the maximum permissible value (45 ft/s (13.8 m/s), grade 6) or it is fulminous during crane operation, stop the work, fully retract the boom and correctly stow the boom.

o) Load ratings are dependent upon the crane being maintained according to the *Operator's Manual* and *Maintenance Manual*.

7.2 LIFTS WITH OUTRIGGER BEAMS AT MID-POSITION

7.2.1 MAIN BOOM RATED LOADS

Table 7-6 Rated Load on Outriggers Pinned at Mid-Position

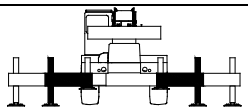
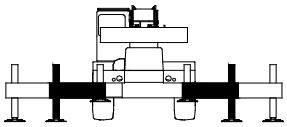
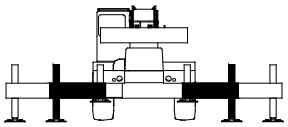
 MAIN BOOM			360° (UNIT: KG)			 OUTRIGGERS PINNED AT MID-POSITION			
LOAD RADIUS (M)	**Outriggers intermediately extended and telescoping cylinder I fully extended, over sides and rear, 12.5 t counterweight**								
	12.6	17.3	21.9	26.4	30.9	35.4	39.9	44.4	49
2.5	110000**								
3	100000**	66000							
3.5	85000*	66000	47000						
4	78000	66000	47000	38000					
4.5	72000	63000	47000	38000					
5	58000	55000	46000	38000	34000				
5.5	46000	46500	42000	38000	34000				
6	37000	37000	38500	37000	33000	30000			
7	26000	27000	28000	28500	30000	27500	21000		
8	20000	21000	20500	21500	22000	24000	21000		
9	16000	16000	16200	17000	17400	18000	20000	17500	
10		13000	13000	13800	14200	15000	15500	17000	13000
11		10000	10400	11000	11600	12400	13000	14000	13000
12		8400	8600	9200	9800	10000	10500	11000	11800
14			6000	6400	6800	7400	7800	8400	8600
16			4000	4500	4800	5400	5800	6500	6800
18				3500	3800	4200	4500	4800	5000
20				2600	3000	3200	3400	3600	4000
22					2200	2400	2800	3000	3200
24					1600	1800	2100	2400	2600
26						1400	1600	1800	2000
28						1000	1300	1500	1600
30							1000	1100	1300
32								1000	1100
34									
36									
38									
40									
42									
I	0	4.7	9.3	9.3	9.3	9.3	9.3	9.3	9.3
II	0	0	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	12	8	8	6	6	4	4	4
Hook	85t								

Table 7-7 Rated Load on Outriggers Pinned at Mid-Position

 MAIN BOOM	360° (UNIT: KG)	 OUTRIGGERS PINNED AT MID-POSITION

LOAD RADIUS (M)	Outriggers and telescoping cylinder I intermediately extended, over sides and rear, 12.5 t counterweight							
	12.6	17.3	21.8	26.3	30.8	35.3	39.8	44.4
2.5	110000**							
3	100000**	66000						
3.5	85000*	66000	38000					
4	78000	66000	38000	34000				
4.5	72000	63000	38000	34000				
5	58000	55000	38000	34000	30000			
5.5	46000	46500	37000	34000	30000			
6	37000	37000	33500	32000	30000	24000		
7	26000	27000	27500	30000	29000	23000		
8	20000	21000	22000	23000	24000	22000	18000	
9	16000	16000	16500	17200	18000	20000	18000	13500
10		13000	13800	14500	15000	15500	16400	13500
11		10000	11000	12000	12500	13000	15000	13000
12		8400	9500	10000	10800	11000	11600	12600
14			7000	7600	8000	8400	8800	10800
16			5200	5600	6000	6400	6600	6800
18				4500	4800	5200	5400	5500
20				3200	3600	4000	4200	4200
22					2800	3000	3400	3500
24					2200	2400	2600	2800
26						2000	2100	2200
28						1500	1700	1800
30							1400	1500
32							1000	1200
34								1000
36								
38								
40								
42								
I	0	4.7	4.7	4.7	4.7	4.7	4.7	4.7
II	0	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	12	8	8	6	6	4	4
Hook	85t							

Table 7-8 Rated Load on Outriggers Pinned at Mid-Position

 MAIN BOOM	360° (UNIT: KG)	 OUTRIGGERS PINNED AT MID-POSITION

LOAD RADIUS (M)	Outriggers intermediately extended and telescoping cylinder I fully retracted, over sides and rear, 12.5 t counterweight						
	12.6	17.1	21.6	26.1	30.6	35.1	39.7
2.5	110000**						
3	100000**	38000					
3.5	85000*	38000	34000				
4	78000	38000	34000	30000			
4.5	72000	38000	34000	30000			
5	58000	38000	34000	30000	25000		
5.5	46000	37000	34000	29000	25000		
6	37000	36000	32000	28000	24000	19000	
7	26000	28000	30000	26000	22500	19000	
8	20000	23000	24000	24500	21000	18000	15000
9	16000	17500	18000	20000	18800	17000	15000
10		14000	15000	16400	17000	15400	13800
11		12000	13000	14000	15500	14100	12800
12		9500	10000	11000	12000	13000	11800
14			8000	8800	8800	9500	10200
16			6500	7000	7200	7400	8000
18				5600	5600	5800	6000
20				4500	4500	4800	5000
22					3700	4000	4200
24					3000	3200	3400
26						2800	2800
28						2200	2400
30							2000
32							1500
34							
36							
38							
40							
42							
I	0	0	0	0	0	0	0
II	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	10	8	8	6	6	4
Hook	85t						

Notes:

a) The operating modes marked with * in Table are ones which need using a removable pulley block and selecting a reeving factor of 13 when the crane is working over sides or rear working area. For ones marked with **, a reeving factor of 14 should be selected, and a 110 t hook should be used with an additional special device.

b) Crane load ratings are based on the crane being leveled and standing on a firm and uniform supporting surface.

c) Crane load ratings on outriggers are based on all outrigger beams being positioned according to the applicable lift chart and the tires raised free of the supporting surface.

d) CRANE LOAD RATINGS MUST NOT BE EXCEEDED. DO NOT ATTEMPT TO TIP THE CRANE TO DETERMINE ALLOWABLE LOADS.

e) Lift the load vertically. Do not pull the load at an angle.

f) When either radius or boom length, or both, are between listed values, the smaller of the two listed load ratings shall be used.

g) Do not operate at longer radii than those listed on the applicable lift chart (cross hatched areas  shown on range diagrams) as tipping can occur without a load on the hook.

h) The boom angles shown on the lift charts give an approximation of the operating radius for a specified boom length. The boom angle, before loading, should be greater to account for boom deflection.

i) Rated loads include the weight of hook block, slings, and auxiliary lifting devices. Their weights shall be subtracted from the listed rated load to obtain the net load that can be lifted.

j) Consult appropriate section of the *Operator ' s Manual* for more exact description of hoist line reeving.

k) The use of more parts of line than required by the load may result in having insufficient rope to allow the hook block to reach the ground. Choose the correct line parts to get a rope in the proper length. Refer to Table 1.1.

l) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator ' s Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.

m) When the rotation-resistant wire rope is used, the allowable rope loading shall be the breaking strength divided by five (5), unless otherwise specified by the wire rope manufacturer.

n) The user shall operate at reduced ratings to allow for adverse job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping off loads, hazardous conditions, experience of personnel, two-machine lifts, traveling with loads, electric wires, etc, (side pull on boom or jib is hazardous). If the wind speed

is higher than the maximum permissible value (45 ft/s (13.8 m/s), grade 6) or it is fulminous during crane operation, stop the work, fully retract the boom and correctly stow the boom.

o) Load ratings are dependent upon the crane being maintained according to the *Operator's Manual* and *Maintenance Manual*.

7.3 LIFTS WITH OUTRIGGER BEAMS FULLY RETRACTED

7.3.1 MAIN BOOM RATED LOADS

Table 7-9 Rated Load on Outriggers Fully Retracted

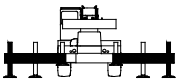
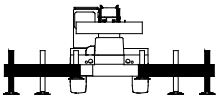
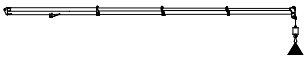
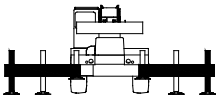
 MAIN BOOM			360° (UNIT: KG)			 OUTRIGGERS FULLY RETRACTED			
LOAD RADIUS (M)	Outriggers fully retracted and telescoping cylinder I fully extended, over sides and rear, 12.5 t counterweight								
	12.6	17.3	21.9	26.4	30.9	35.4	39.9	44.4	49
3	58000	55000							
3.5	45000	42000	42000						
4	36000	34000	32000	32000					
4.5	27000	27000	26000	26000					
5	23000	23500	22000	22500	24000				
5.5	18000	19000	18500	18800	19000				
6	16000	16800	16200	16500	17000	18000			
7	12000	12500	11800	12000	12000	13000	14000		
8	9500	9200	8800	9000	8200	9000	10000		
9	7500	7000	6800	7200	7500	8000	8500	10000	
10		5600	5200	5500	6000	6500	6800	7500	8000
11		4200	4200	4500	5000	5200	5500	6000	6200
12		3000	3000	3200	3500	4000	4500	5000	5200
14			1800	2200	2500	3000	3200	3500	3600
16			1000	1200	1500	1800	2100	2300	2500
18				1000	1100	1200	1500	1700	1800
20						1000	1200	1300	1400
22							1000	1000	1100
24									900
26									
28									
30									
32									
34									
36									
38									
40									
42									
I (m)	0	4.7	9.3	9.3	9.3	9.3	9.3	9.3	9.3
II (m)	0	0	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	10	8	8	6	6	4	4	4
Hook	85t								

Table 7-10 Rated Load on Outriggers Fully Retracted

 MAIN BOOM	360° (UNIT: KG)	 OUTRIGGERS FULLY RETRACTED

LOAD RADIUS (M)	Outriggers fully retracted and telescoping cylinder I intermediately extended, over sides and rear, 12.5 t counterweight							
	12.6	17.3	21.8	26.3	30.8	35.3	39.8	44.4
3	58000	55000						
3.5	45000	42000	38000					
4	36000	34000	34000	34000				
4.5	27000	27000	28000	28000				
5	23000	23500	24000	24000	25000			
5.5	18000	19000	18800	19000	20000			
6	16000	16800	17000	17000	17500	18000		
7	12000	12500	13000	13500	14000	14400		
8	9500	9200	9500	10000	10800	11500	12000	
9	7500	7000	7500	8000	8500	9000	9200	10000
10		5600	6200	6500	7200	7800	8000	8400
11		4200	5000	5500	6000	6500	6800	7000
12		3000	3600	4000	4800	5200	5600	6000
14			2400	2800	3200	3600	4000	4300
16			1800	2000	2400	2800	3000	3000
18				1600	1800	2000	2200	2400
20				1000	1200	1500	1600	1700
22					1000	1100	1200	1300
24							1000	1000
26								
28								
30								
32								
34								
36								
38								
40								
42								
I (m)	0	4.7	4.7	4.7	4.7	4.7	4.7	4.7
II (m)	0	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	10	8	8	6	6	4	4
Hook	85t							

Table 7-11 Rated Load on Outriggers Fully Retracted

 MAIN BOOM	360° (UNIT: KG)	 OUTRIGGERS FULLY RETRACTED

LOAD RADIUS (M)	Outriggers and telescoping cylinder I fully retracted, over sides and rear, 12.5 t counterweight						
	12.6	17.1	21.6	26.1	30.6	35.1	39.7
3	58000	38000					
3.5	45000	38000	34000				
4	36000	34000	34000	30000			
4.5	27000	28000	29000	30000			
5	23000	22000	23000	24000	25000		
5.5	18000	20000	21000	21500	23000		
6	16000	16000	17000	17800	18000	19000	
7	12000	12500	13000	13500	14000	14500	
8	9500	10000	10800	11000	11800	12000	12500
9	7500	8400	9000	9500	9800	10000	10000
10		7000	7800	8000	8000	8400	8800
11		5800	6200	6800	7000	7200	7500
12		4500	4800	5400	5800	6000	6400
14			3200	3800	4000	4200	4600
16			2600	3000	3200	3200	3200
18				2200	2400	2600	2600
20				1600	1800	2100	2200
22					1400	1500	1600
24					1100	1100	1200
26						1000	1100
28							900
30							
32							
34							
36							
38							
40							
42							
I (m)	0	0	0	0	0	0	0
II (m)	0	4.5	9	13.5	18	22.5	27.1
Reeving	12	10	8	8	6	6	4
Hook	85t						

Notes:

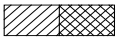
a) Crane load ratings are based on the crane being leveled and standing on a firm and uniform supporting surface.

b) Crane load ratings on outriggers are based on all outrigger beams being positioned according to the applicable lift chart and the tires raised free of the supporting surface.

c) CRANE LOAD RATINGS MUST NOT BE EXCEEDED. DO NOT ATTEMPT TO TIP THE CRANE TO DETERMINE ALLOWABLE LOADS.

d) Lift the load vertically. Do not pull the load at an angle.

e) When either radius or boom length, or both, are between listed values, the smaller of the two listed load ratings shall be used.

f) Do not operate at longer radii than those listed on the applicable lift chart (cross hatched areas  shown on range diagrams) as tipping can occur without a load on the hook.

g) The boom angles shown on the lift charts give an approximation of the operating radius for a specified boom length. The boom angle, before loading, should be greater to account for boom deflection.

h) Rated loads include the weight of hook block, slings, and auxiliary lifting devices. Their weights shall be subtracted from the listed rated load to obtain the net load that can be lifted.

i) Consult appropriate section of the *Operator's Manual* for more exact description of hoist line reeving.

j) The use of more parts of line than required by the load may result in having insufficient rope to allow the hook block to reach the ground. Choose the correct line parts to get a rope in the proper length. Refer to Table 1.1.

k) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator's Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.

l) When the rotation-resistant wire rope is used, the allowable rope loading shall be the breaking strength divided by five (5), unless otherwise specified by the wire rope manufacturer.

m) The user shall operate at reduced ratings to allow for adverse job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping off loads, hazardous conditions, experience of personnel, two-machine lifts, traveling with loads, electric wires, etc, (side pull on boom or jib is hazardous). If the wind speed is higher than the maximum permissible value (45 ft/s (13.8 m/s), grade 6) or it is fulminous during crane operation, stop the work, fully retract the boom and correctly stow the boom.

n) Load ratings are dependent upon the crane being maintained according to the *Operator's Manual* and *Maintenance Manual*.

7.4 LIFTS ON TIRES

7.4.1 MAIN BOOM RATED LOADS

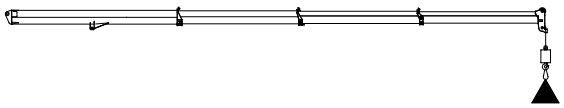
Table 7-12 Rated Load on Tires

RATED LOAD ON TIRES

(UNIT: KG)

LOAD RADIUS	Cylinder I fully retracted, on tires, 360-degree working area, with 12.5t counterweight			
(M)	12.6	17.1	21.6	26.1
3	21000	20000		
3.5	18000	17500		
4	16000	15200	16500	14200
4.5	13800	13000	14000	12000
5	11000	11000	11500	10200
5.5	9800	9500	9800	9200
6	8500	8000	8800	8300
7	6200	6200	7000	7200
8	4500	4800	5400	6000
9	3200	3400	4000	4500
10		2800	3200	3600
11		2200	2500	3000
12		1800	2000	2600
14			1700	2000
16			1300	1600
18				1200
20				1000
I (m)	0	0	0	0
II (m)	0	4.5	9	13.5
Reeving	12	10	8	8
Hook	85t			

Table 7-13 Rated Load on Tires

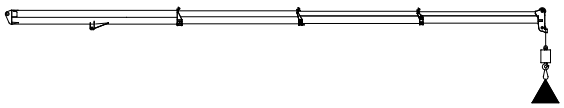


RATED LOAD ON TIRES

(UNIT: KG)

LOAD RADIUS (M)	Cylinder I fully retracted, on tires, over front working area, with 12.5t counterweight			
	12.6	17.1	21.6	26.1
3	30000	28000		
3.5	27000	26000		
4	24000	23500	23000	22000
4.5	21000	21000	21000	20000
5	20000	19500	19000	18000
5.5	17000	17800	16500	16000
6	15000	16000	15000	14500
7	11500	13500	12500	12500
8	8800	10500	10000	9800
9	6200	8800	8500	8400
10		7200	7400	7200
11		5800	6000	6200
12		4500	4800	5000
14			3600	3800
16			2800	3000
18				2200
20				1600
22				
I (m)	0	0	0	0
II (m)	0	4.5	9	13.5
Reeving	12	10	8	8
Hook	85t			

Table 7-14 Rated Load on Tires



RATED LOAD ON TIRES

(UNIT: KG)

LOAD RADIUS (M)	Cylinder I fully retracted, lift and carry, over front working area, with 12.5t counterweight			
	12.6	17.1	21.6	26.1
3	19500	19000		
3.5	17000	16800		
4	15500	15200	15000	14500
4.5	13500	13500	13500	13000
5	12000	12000	12200	11500
5.5	10800	10500	11000	10000
6	9800	9600	9800	8800
7	8000	8500	8400	7500
8	6600	7200	7200	6500
9	4500	5000	6500	5500
10		4400	5400	4600
11		3600	4300	3600
12		2800	3200	2800
14			2200	2200
16			1600	1700
18				1400
20				1000
22				
I (m)	0	0	0	0
II (m)	0	4.5	9	13.5
Reeving	12	10	9	8
Hook	85t			

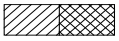
Notes:

a) Crane load ratings are based on the crane being leveled and standing on a firm and uniform supporting surface.

b) CRANE LOAD RATINGS MUST NOT BE EXCEEDED. DO NOT ATTEMPT TO TIP THE CRANE TO DETERMINE ALLOWABLE LOADS.

c) Lift the load vertically. Do not pull the load at an angle.

d) When either radius or boom length, or both, are between listed values, the smaller of the two listed load ratings shall be used.

e) Do not operate at longer radii than those listed on the applicable lift chart (cross hatched areas  shown on range diagrams) as tipping can occur without a load on the hook.

f) The boom angles shown on the lift charts give an approximation of the operating radius for a specified boom length. The boom angle, before loading, should be greater to account for boom deflection.

g) Rated loads include the weight of hook block, slings, and auxiliary lifting devices. Their weights shall be subtracted from the listed rated load to obtain the net load that can be lifted.

h) Crane load ratings on tires depend on appropriate inflation pressure and tire condition. Caution must be exercised when increasing air pressures in tires. Consult the *Operator ' s Manual* for precautions.

i) Use of jib is not permitted for pick-and-carry operations.

j) For pick-and-carry operations, the boom must be centered over the front of the crane with the swing brake lock engaged. Use minimum boom point height and keep the load close to the ground surface. Travel must be on smooth level surface.

k) The load should be restrained from swinging.

l) Creep speed is crane movement of less than 200 ft (61 m) in 30-minutes period and not exceeding 1 mph (1.6 km/h).

m) Consult appropriate section of the *Operator ' s Manual* for more exact description of hoist line reeving.

n) The use of more parts of line than required by the load may result in having insufficient rope to allow the hook block to reach the ground. Choose the correct line parts to get a rope in the proper length. Refer to Table 1.1.

o) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator ' s Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.

p) When the rotation-resistant wire rope is used, the allowable rope loading shall be the breaking strength divided by five (5), unless otherwise specified by the wire rope manufacturer.

q) The user shall operate at reduced ratings to allow for adverse job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping off loads, hazardous conditions, experience of personnel, two-machine lifts, traveling with loads, electric wires, etc, (side pull on boom or jib is hazardous). If the wind speed is higher than the maximum permissible value (45 ft/s (13.8 m/s), grade 6) or it is fulminous during crane operation, stop the work, fully retract the boom and correctly stow the boom.

r) Load ratings are dependent upon the crane being maintained according to the *Operator's Manual* and *Maintenance Manual*.

7.5 Lift Height on Outriggers

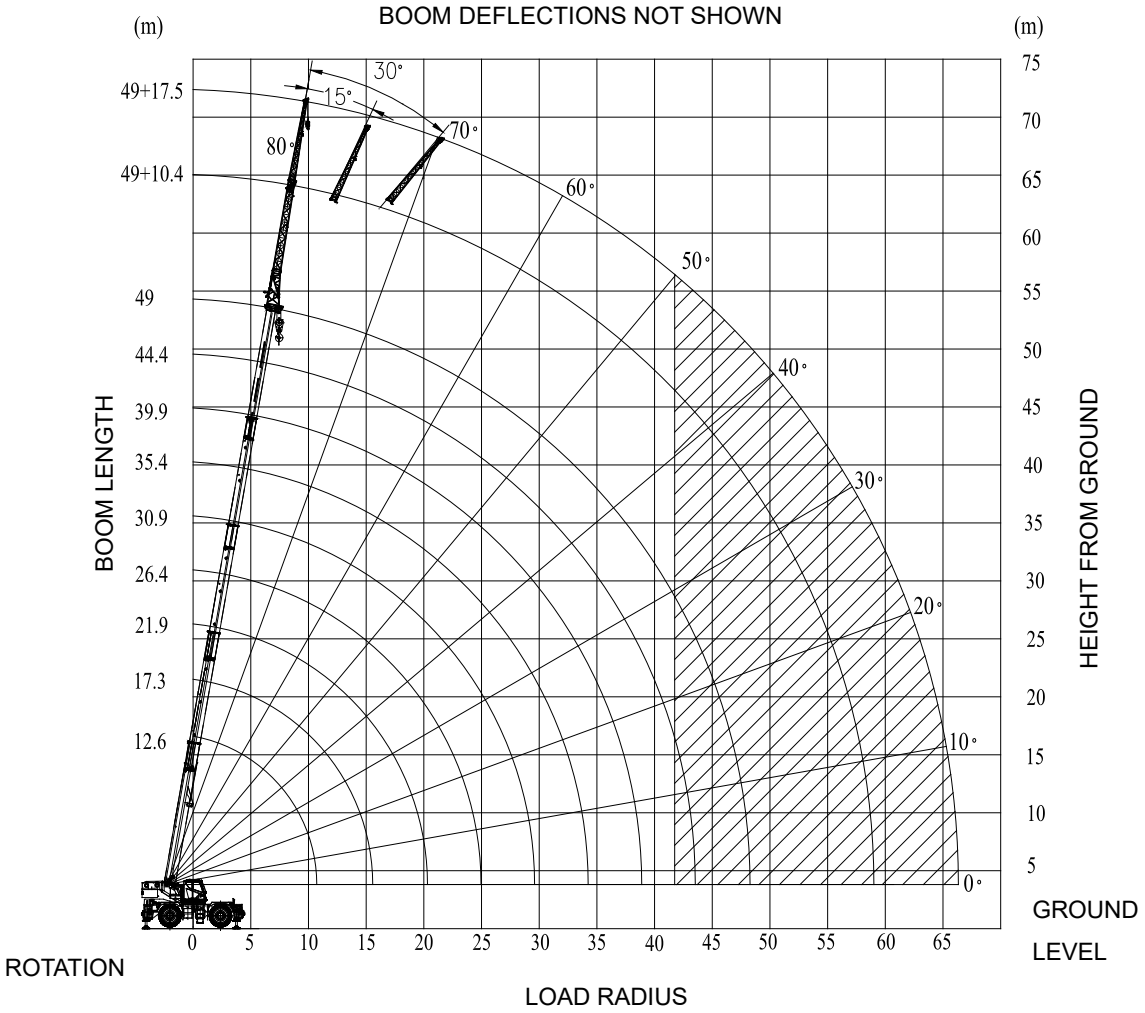


Figure 7-1 Lift Height on Outriggers Fully Extended (Unit: Metric Meter)