

The Zoomlion logo consists of a green parallelogram with the word "ZOOMLION" in white, bold, uppercase letters.

ZOOMLION ZRT600V532-1 ROUGH TERRAIN CRANE

TECHNICAL SPECIFICATIONS

GQ07511227000000EN

Zoomlion Heavy Industry Science & Technology Co.,Ltd.

TECHNICAL SPECIFICATIONS

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1. PRODUCT CHARACTERISTICS

ZRT600V532-1 rough terrain crane is of 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.

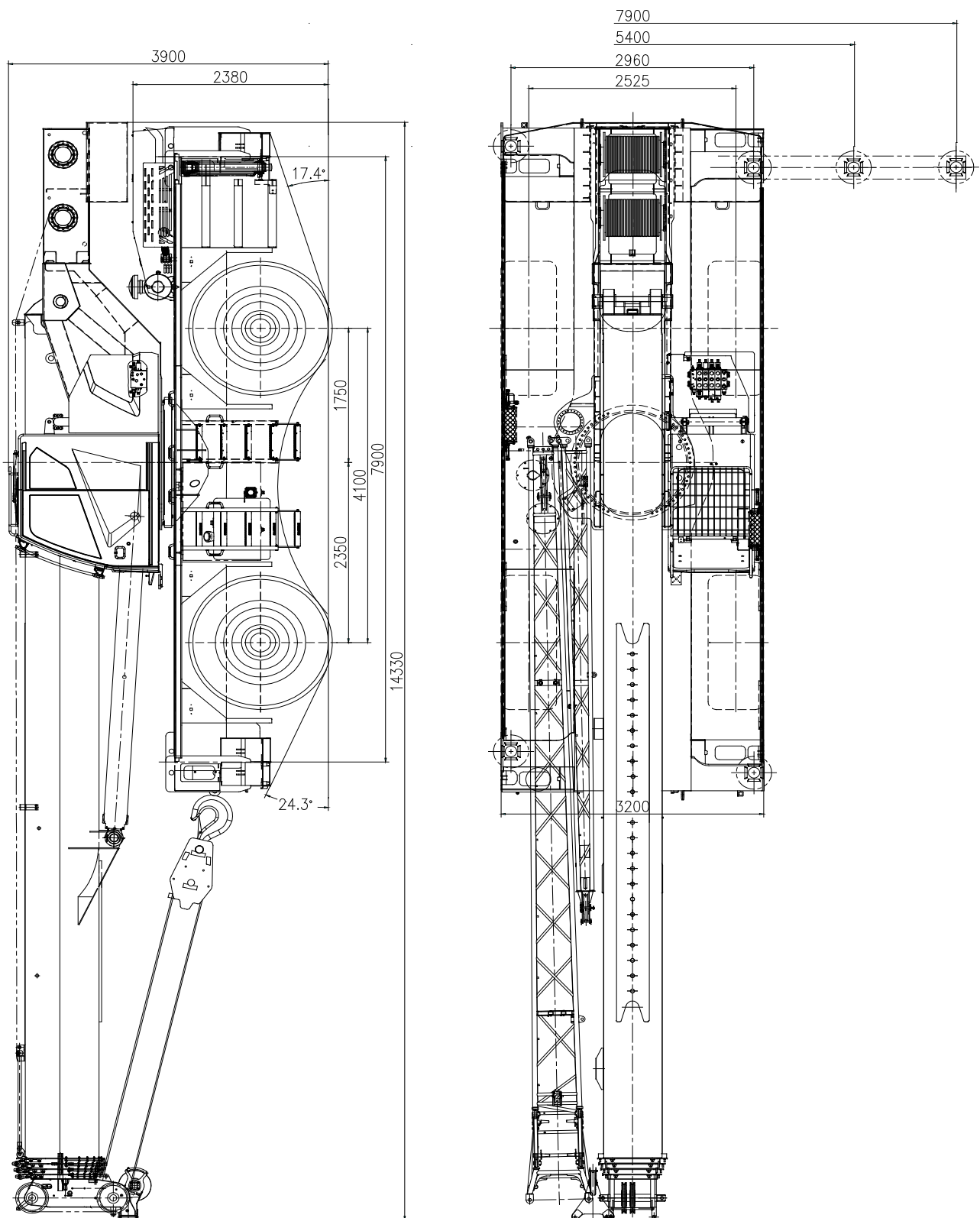
ZRT600V532-1 rough terrain crane consists of the superstructure and special purpose chassis, including the power system, drive system, suspension system, steering system, brake system, hoist mechanism, derricking mechanism, swing mechanism, boom system, slewing platform, chassis frame, outrigger, hydraulic 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 steer
- Max. rated lifting capacity: 60 ton (66.14 tn) at 3 m (9.84 ft) working radius
- Max. lifting height: 61.6m (202.1 ft)
- Max. driving speed: 35km/h (21.75 mph)
- Overall dimensions: 14330 mm×3200 mm×3900mm (47.0ft×10.5ft×12.8ft)
- Deadweight: 41 T (45.2 tn)
- Ability to pick-and carry loads
- Rough terrain travel performance

Unit: mm

**Figure 1 Overall View – ZRT600V532-1 Rough Terrain Crane**

2. TECHNICAL DATA

MAIN TECHNICAL DATA

Type	Ser. No.	Item	Unit	Value
Working performance	1	Max. rated lifting capacity × working radius	lb.ft kg.m	132277.4×9.8 60000×3
	2	Max. load moment of boom	lbf.ft kN.m	1723682.7 2337
	3	Max. load moment of boom (fully extended)	lbf.ft kN.m	855616 1160
	4	Max. lifting height of boom (fully extended)	ft m	149.6 45.6
	5	Max. lifting height of jib	ft m	202.1 61.6
Dimensions	6	Overall dimensions (L × W × H)	ft mm	47.0×10.5×12.8 14330×3200×3900
	7	Outrigger spread (Height × Width)	ft mm	25.9×25.9 7900×7900
	8	Boom length (fully retracted – fully extended)	ft mm	38.4~149.3 11700~45500
	9	Jib length (fully retracted – fully extended)	ft mm	31.2~52.5 9500~16000
	10	Boom angle	°	-2-80
	11	Swing range		360° unlimited swing (Full range)
Working speeds	12	Max. hoist rope speed (Main winch)	ft/min m/min	475.7 145
	13	Min. boom telescoping out time	s	78
	14	Min. boom telescoping in time	s	92
	15	Min. boom derricking up time	s	47
	16	Min. boom derricking down time	s	95
	17	Swing speed	r/min	0-2.5
Hydraulic system	18	Maximum working pressure	psi MPa	4061.1 28
	19	Rate working flow	gal./min L/min	74.0 280

Type	Ser. No.	Item	Unit	Value
	20	Hydraulic oil tank capacity	gal. L	211.3 800
Gross vehicle mass	21	Gross weight	lbs kg	90389.5 41000
	22	Front weight	lbs kg	46738.0 21200
	23	Rear weight	lbs kg	43651.5 19800
Driving	24	Max. driving speed (forward/backward)	mph km/h	21.7 35
	25	Wheelbase	ft mm	13.5 4100
	26	Treads (Front / Rear)	ft mm	8.3 2525
	27	Max. gradeability	%	60

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/2200rpm (Dongfeng Cummins)/194KW/2400rpm (Cummins US)
	6	Engine rated torque	N.m/r/min	990N.m/1500rpm
	7	Fuel tank capacity		300 L(79.3 gal)
Drive system	8	Transmission drive mode		4×2, 4×4
	9	Model or brand of transmission		DANA
	10	Transmission gear stage		6 forward and 3 reverse speeds
Travel system	11	Suspension		Rigid (front) / Flexible (rear)
	12	Model or brand of axles		HANDE

	13	Steering mode		2-wheel steering (front wheel) 2-wheel steering (rear wheel) 4-wheel steering Crab steering
	14	Tire size		26.5-25-32PR
	15	Tire number		4
Hydraulic system	16	Model or brand of main valve		ZOOMLION
	17	Gear pump		Liyuan/Hi-Tech/Hengli
	18	Balance valve / hydraulic lock		NEM (Italy)/ZOOMLION
	19	Swing motor		HIGH-TECH/Liyuan (China)
Electrical system	20	Rated capacity indicator		ZOOMLION/HIRSCHMANN
	21	Controller		ZOOMLION/HIRSCHMANN
Emission	22			TIII

3. SPECIFICATIONS, SUPERSTRUCTURE

3.1 Boom and telescoping mechanism

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

The boom head is equipped with 6 sheaves, which is convenient for changing line parts without removing the wedges. The rooster sheave is optional.

The telescopic boom sections are telescoped in / out via two telescopic cylinder and two sets of boom extension / retraction ropes. The telescopic cylinder is equipped with a plunge-jointed balance valve.

Min. boom length (with telescopic sections completely retracted): 11700mm (38.4ft)

Max. boom length (with telescopic sections completely extended): 45500mm (149.3ft)

Min. telescoping out time: about 78s

3.2 Jib

It consists of two jib sections. The jib section II is secured into the jib section I, and the whole jib is side stowed with the boom via moveable pins during driving.

A sheave is assembled at the jib head.

Jib angle: 0°, 15° and 30°

Jib length: 9.5m – 16 m (31.2ft - 52.5 ft)

3.3 Derricking mechanism

Rear-mounted single derricking cylinder with derricking balance valve.

Derrick angle: -2°- 80°

Derrick speed: -2°- 80°/47s

3.4 Hoist mechanism

3.4.1 Main and auxiliary winches

Main and auxiliary winches are equipped with the same spare parts, including Variable-displacement hydraulic motor with axial plunger and planetary reducer. The hydraulic motor drives the winch with a planetary reducer. When the winch turns (rotates), the wire rope reels off or spools on to the winch

3.4.2 Wire rope

Twist resistant wire ropes are used; high strength wire ropes are optional.

Max. hoist rope strength:	52kN (11689.6 lbf)
Max. hoist rope speed:	145 m/min (475.7 ft/min) (At the 4th layer)
Rope diameter:	Φ17mm (Φ0.056 ft)
Main winch rope length:	230m (754.6 ft)
Auxiliary winch rope length:	140 m (459.3 ft)

3.4.3 Hook block

Rotatable main hook: 60 t (66.1 tn), with 6 sheaves and hook latch, secured at the chassis frame in front of slewing platform.

Rotatable auxiliary hook: 5 ton (5.5 tn), with hook latch, used for the rooster sheave and jib, secured at auxiliary hook holder on the chassis frame.

3.5 Slewing mechanism

It consists of hydraulic motor, planetary gear reducer, pinion gear and 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, with a swing function that you can control and a pneumatic swing lockout device.

Slewing speed:	0 - 2.5 r/min
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3.6 Slewing platform

The slewing platform adopts a wall structure.

3.7 Hydraulic system

3.7.1 Oil pumps

A variable pump and two gear pumps are installed at the transmission.

The variable pump supplies oil to the telescoping mechanism, derricking mechanism, hoisting mechanism of the main and auxiliary winches, and supplies pilot oil as well.

One gear pump supplies oil to the outriggers, braking system, oil radiator of the torque converter

in the undercarriage and superstructure AC; the other gear pump supplies oil to the slewing and steering system.

3.7.2 Control valve

It applies a quadruple valve back compensation multi-way directional valve.

3.7.3 Pipelines

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.

3.7.4 Hydraulic oil tank

Capacity: about 800L (211.3 gal)

A return oil filter is installed in the tank. It can eliminate bubbles inside the tank and is of a filtration accuracy of 12 μ m.

3.7.5 Filter

A high pressure filter with the filtering accuracy of 10 μ is mounted in oil-ways of outriggers, braking system, slewing system and steering system.

A low pressure filter with the filtering accuracy of 5 μ is mounted in oil-ways of pilot oil circuits.

3.8 Crane controls

The superstructure movements are controlled by two hydraulically controlled joysticks on both sides of operator's seat (comply with ISO standard requirements).

The left joystick controls the swing and auxiliary winch movements

The right joystick controls the derricking and main winch movements.

The hoist mechanism can carry out the derricking or telescoping movement simultaneously.

3.9 Cab

There is only one cab for ZRT600V532-1 rough terrain crane. It can be used as operator's cab as well as driver's cab. The cab is side-mounted and adopts left hand drive.

The controls of 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 $\pm$ 5 mm, i.e. (71.3 $\pm$ 0.2) in

Width: 1050 $\pm$ 5 mm, i.e.(41.3 $\pm$ 0.2) in

Height: 1710 $\pm$ 5 mm, i.e.(67.3 $\pm$ 0.2) in

3.10 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;
- Offset or line parts;
- Boom status indication;
- Outrigger status (completely extended, intermediately extended or completely retracted or “On Tires” indication).

The following information is displayed by bar graph:

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

3.11 Outriggers

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 3.11.3 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 crane operation.

Outrigger spread (Height): 7900 mm (25.9 ft)

Outrigger spread (Width): 7900 mm (25.9 ft) (fully extended)

5400 mm (17.7 ft) (half extended)

2960 mm (9.7 ft) (fully retracted)

4. SPECIFICATIONS, SPECIAL PURPOSE CHASSIS FOR ROUGH TERRAIN CRANE

4.1 Type

Rear mounted engine

Drive mode: 4 x 2 and 4 x 4

4.2 Chassis frame

Integral box-type construction welded by high-strength steel

4.3 Engine

4.3.1 Model

CUMMINS QSB6.7

4.3.2 Type

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

4.3.3 Performance

Max. output power: Dongfeng Cummins: 194 KW / 2200 RPM;

Cummins US: 194 KW / 2400 RPM

Max. output torque: 990 Nm / 1500 RPM

4.4 Drive system

Electrically controlled automatic hydraulic transmission, with transfer case.

6 forwards and 3 reverse speeds, electro-hydraulic power shift, and automatic locking mechanism.

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

4.5 Axles

4.5.1 Front axle

Steering and driving axle, rigidly mounted to chassis frame, with planetary reducer and brake.

4.5.2 Rear axle

Full-floating steering and driving axle, with planetary reducer and brake.

4.6 Steering system

Full hydraulic power steering gear

The cylinder for steering and driving axle is controlled by 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

4.7 Suspension system

Front axle: rigidly mounted to chassis frame

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

4.8 Brake system

4.8.1 Service brake

Hydraulically controlled disc brake on 4 wheels

4.8.2 Parking brake

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

4.9 Electrical system

24 Volt DC

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

4.10 Fuel tank

Capacity: 300 L (79.3 gal)

4.11 Tire

Size: 26.5-25-32PR

5. SAFETY DEVICES

- Rated capacity indicator (RCI)
- Rotating beacon and horn
- Anti-Two Block devices
- 3rd wrap indicator
- Balance valve
- Hydraulic lock
- Hydraulic safety valve
- Swing brake
- Swing lockout device
- Boom angle indicator
- Outrigger beam retaining pin
- Emergency stop button

6. LOAD RATING

6.1 LIFTS WITH OUTRIGGER BEAMS FULLY EXTENDED

6.1.1 BOOM RATED LOADS

Table 6-1 Rated capacity chart with boom only on outriggers fully extended

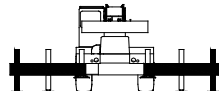
		360° slewing (Unit: Kg)					
Boom						Outriggers fully extended	
Working radius (m)	TELESCOPIC CYLINDER I FULLY EXTENDED, outriggers fully extended, 5t counterweight						
	11.7	16	20.3	26.6	32.9	39.2	45.5
3.0	60000	46000	35000				
3.5	58000	46000	35000				
4.0	56000	46000	35000				
4.5	53000	44000	33000	25000			
5.0	47000	42000	32000	25000			
5.5	42000	40000	32000	24000			
6.0	37500	36500	31000	24000	20500		
6.5	35000	34300	29000	23000	20500		
7.0	31000	31000	28000	22500	20000		
7.5	29000	29000	27000	21000	19000	14500	
8.0	27000	27000	25500	20500	18500	13500	
9.0	21000	20500	20000	17500	17000	13000	10000
10.0		16500	16000	16500	15500	11500	9600
11.0		13400	13200	13600	14000	11000	9300
12.0		11000	11000	12100	11800	10000	9100
14.0			7800	8800	9400	9000	8200
16.0			5600	6700	7300	7400	7400
18.0				5200	5800	6100	6200
20.0				4000	4600	4900	5200
22.0					3600	4000	4300
24.0					2800	3200	3500
26.0					2150	2600	2800
28.0						2100	2300
30.0						1600	1900
32.0						1200	1500
34.0							1100
36.0							
I (m)	0	4.3	8.6	8.6	8.6	8.6	8.6
II (m)	0	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	8	6	4	4	3
Hook	60t						

Table 6-2 Rated capacity chart with boom only on outriggers fully extended

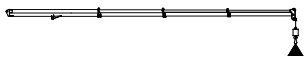
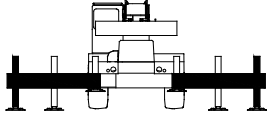
		360° (UNIT: lb)					
MAIN BOOM					OUTRIGGERS FULLY EXTENDED		
LOAD RADIUS (ft)	TELESCOPIC CYLINDER I FULLY EXTENDED, outriggers fully extended, 5.5tn counterweight						
	38	52	66	87	107	128	149
10	131850	101410	77160				
12	126470	101410	77160				
15	114930	96360	72430	55110			
20	81610	79530	67490	52480	45190		
25	58460	62870	58730	46030	41620	31430	
30	46290	43920	42820	38260	37000	28180	21910
35		31810	31150	32100	31960	24610	20720
40		24250	23570	25970	25500	21830	19870
45			18190	20430	21380	20150	18350
50			14180	16530	17850	17650	16980
55				13500	13410	15210	15300
60				11080	10790	13060	13350
65				9060	9790	11050	11670
70					8370	9470	10130
75					6350	8060	8720
80					5300	6800	7420
85					4490	5790	6240
90						4940	5380
95						4100	4640
100						3310	3970
105						2640	3300
110							2630
115							
I	0	14	28	28	28	28	28
II	0	0	0	21	41	62	83
Reeving	12	10	8	6	4	4	3
Hook	66.1 tn						

Table 6-3 Rated capacity chart with boom only on outriggers fully extended

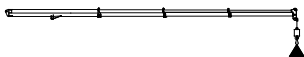
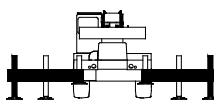
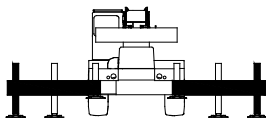
		360° slewing (Unit: Kg)				
Boom					Outriggers fully extended	
Working radius (m)	TELESCOPIC CYLINDER I INTERMEDIATELY EXTENDED, outriggers fully extended, 5t counterweight					
	11.7	16	22.3	28.6	34.9	41.2
3.0	60000	46000				
3.5	58000	46000				
4.0	56000	46000	25000			
4.5	53000	44000	25000			
5.0	47000	42000	25000	21000		
5.5	42000	40000	25000	21000		
6.0	37500	36500	24000	21000	14500	
6.5	35000	34300	24000	21000	14500	
7.0	31000	31000	23500	20000	13800	
7.5	29000	29000	23500	20000	13300	
8.0	27000	27000	24000	19000	12800	10000
9.0	21000	20500	20200	17500	14500	9800
10.0		16500	16600	16300	12000	9200
11.0		13400	13800	14400	10300	8500
12.0		11000	11500	12200	9600	7900
14.0			8600	9200	8400	6900
16.0			6600	7200	7500	7600
18.0			5100	5700	6000	6100
20.0				4600	4900	5200
22.0				3700	4100	4300
24.0					3400	3600
26.0					2800	3100
28.0					2300	2600
30.0						2200
32.0						1800
34.0						1500
I (m)	0	4.3	4.3	4.3	4.3	4.3
II (m)	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	8	6	4	3
Hook	60t					

Table 6-4 Rated capacity chart with boom only on outriggers fully extended

		360° slewing (Unit: Kg)			
Boom				Outriggers fully extended	
Working radius (m)	TELESCOPIC CYLINDER I FULLY RETRACTED, outriggers fully extended, 5t counterweight				
	11.7	18	24.3	30.6	36.9
3.0	60000				
3.5	58000				
4.0	56000	25000			
4.5	53000	25000	21500		
5.0	47000	25000	21500		
5.5	42000	24000	20000	14500	
6.0	37500	23000	19000	14500	
6.5	35000	23000	18000	13000	
7.0	31000	22800	18000	13000	10500
7.5	29000	22000	17000	12000	10500
8.0	27000	21600	16500	12000	10500
9.0	21000	21000	15500	11000	10000
10.0		17200	14600	10000	8800
11.0		14300	13600	9200	8200
12.0		12100	13000	8500	7500
14.0		9100	9300	7500	8200
16.0			7800	6700	6500
18.0			6200	6000	5100
20.0				5300	4600
22.0				4500	4100
24.0				3700	3700
26.0					3400
28.0					2900
30.0					2400
32.0					
34.0					
I (m)	0	0	0	0	0
II (m)	0	6.3	12.6	18.9	25.2
Reeving	12	6	5	4	3
Hook	60t				

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) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator's Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.
- k) 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.
- l) When an anti-twist wire rope is used, unless otherwise specified, the permissible load of the wire rope should be a fifth of the tensile strength.
- 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*.

6.1.2 RATED LOADS ON BOOM AND JIB

Table 6-5 Rated capacity chart with boom + 9.5 m jib on outriggers fully extended

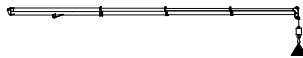
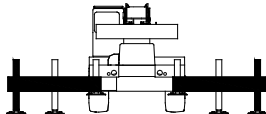
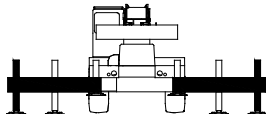
 Boom + 9.5m jib		360° slewing (Unit: Kg)		 Outriggers fully extended
Boom angle (°)	Outriggers fully extended, 5t counterweight			
	0°	15°	30°	
80	5000	3300	2500	
78	4600	3300	2500	
76	4300	3200	2500	
74	4000	3100	2500	
72	3600	2900	2400	
70	3300	2700	2300	
68	3100	2600	2200	
66	2900	2500	2100	
64	2700	2400	2000	
62	2400	2200	1900	
60	2100	2000	1800	
58	1900	1700	1600	
56	1600	1500	1400	
54	1400	1300	1200	
52	1200	1100	1000	
50	1000	900	900	
Reeving	1			
Hook	5t			

Table 6-6 Rated capacity chart with boom + 16 m jib on outriggers fully extended

		360° slewing (Unit: Kg)		
Boom + 16m jib		Outriggers fully extended		
Boom angle (°)	Outriggers fully extended, 5t counterweight			
	0°	15°	30°	
80	2800	1600	1200	
78	2500	1500	1150	
76	2300	1450	1100	
74	2100	1400	1050	
72	1900	1300	1000	
70	1800	1250	1000	
68	1700	1200	1000	
66	1600	1150	1000	
64	1500	1100	950	
62	1400	1050	900	
60	1700	1000	900	
58	1300	1000	900	
56	1200	950	850	
54	1100	900	800	
52	950	800	750	
50	850	750	700	
Reeving	1			
Hook	5t			

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) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator's Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.
- k) 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.
- l) When an anti-twist wire rope is used, unless otherwise specified, the permissible load of the wire rope should be a fifth of the tensile strength.
- 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*.

6.2 LIFTS WITH OUTRIGGER BEAMS AT MID-POSITION

6.2.1 BOOM RATED LOADS

Table 6-7 Rate capacity chart with boom on outriggers at middle position

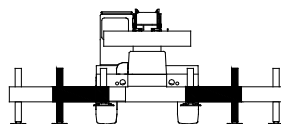
		360° slewing (Unit: Kg)					
Boom		Outriggers at middle position					
Working radius (m)	TELESCOPIC CYLINDER I FULLY EXTENDED, outriggers at middle position, 5t counterweight						
	11.7	16	20.3	26.6	32.9	39.2	45.5
3.0	60000	46000	35000				
3.5	54000	44000	35000				
4.0	47000	42000	35000				
4.5	41000	38000	33000	25000			
5.0	32000	31500	29500	25000			
5.5	27000	25800	25000	23500			
6.0	22500	21400	21000	21500	20500		
6.5	19500	18500	18000	19000	19500		
7.0	18000	17300	17000	18200	18500		
7.5	15500	15000	14700	16500	16500	14000	
8.0	13600	13200	12900	13800	14500	14000	
9.0	10700	10300	10200	11000	11500	12000	9600
10.0		8400	8100	9100	9800	10000	9400
11.0		6800	6600	7500	8200	8600	8600
12.0		5600	5300	6300	6900	7400	7600
14.0			3500	4500	5000	5500	5700
16.0			2300	3200	3700	4200	4400
18.0				2300	2700	3100	3500
20.0				1500	1900	2300	2700
22.0					1400	1800	2100
24.0					900	1300	1500
26.0						800	1100
I	0	4.3	8.6	8.6	8.6	8.6	8.6
II	0	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	8	6	4	4	3
Hook	60t						

Table 6-8 Rate capacity chart with boom on outriggers at middle position

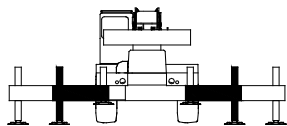
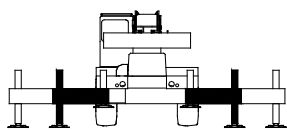
		360° slewing (Unit: Kg)				
Boom		Outriggers at middle position				
Working radius (m)	TELESCOPIC CYLINDER I INTERMEDIATELY EXTENDED, outriggers at middle position, 5t counterweight					
	11.7	16	22.3	28.6	34.9	41.2
3.0	60000	46000				
3.5	54000	44000				
4.0	47000	42000	25000			
4.5	41000	38000	25000			
5.0	32000	31500	25000	21000		
5.5	27000	25800	24500	21000		
6.0	22500	21400	23200	21000	14500	
6.5	19500	18500	19000	20000	14500	
7.0	18000	17300	18400	18800	14500	
7.5	15500	15000	16000	17000	14000	
8.0	13600	13200	14500	15000	13500	10000
9.0	10700	10300	11500	12000	12200	9800
10.0		8400	9400	9800	10200	9200
11.0		6800	7800	8300	9000	8500
12.0		5600	6600	7100	7500	7600
14.0			4700	5300	5700	6000
16.0			3500	4000	4400	4600
18.0			2500	3000	3400	3600
20.0				2300	2600	2900
22.0				1600	2000	2200
24.0					1500	1700
26.0					1100	1300
28.0					750	1000
30.0						700
I	0	4.3	4.3	4.3	4.3	4.3
II	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	8	6	4	3
Hook	60t					

Table 6-9 Rate capacity chart with boom on outriggers at middle position

		360° slewing (Unit: Kg)			
Boom		Outriggers at middle position			
Working radius (m)	TELESCOPIC CYLINDER I FULLY RETRACTED, outriggers at middle position, 5t counterweight				
	11.7	18	24.3	30.6	36.9
3.0	60000				
3.5	54000				
4.0	47000	25000			
4.5	41000	25000	21500		
5.0	32000	25000	21500	14500	
5.5	27000	24000	20000	14500	
6.0	22500	23500	19000	14500	
6.5	19500	21500	18500	13000	
7.0	18000	18500	18000	12600	10500
7.5	15500	17000	17500	12000	10500
8.0	13600	14600	15200	11600	10500
9.0	10700	12000	12500	10700	9800
10.0		10000	10600	10000	8800
11.0		8400	9000	9300	8000
12.0		7100	7700	8100	7400
14.0		5200	5800	6100	6300
16.0			4500	4700	4900
18.0			3500	3700	3900
20.0				3000	3300
22.0				2400	2600
24.0				1900	2100
26.0					1700
28.0					1300
30.0					1000
I (m)	0	0	0	0	0
II (m)	0	6.3	12.6	18.9	25.2
Reeving	12	6	5	4	3
Hook	60t				

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*.

6.3 LIFTS WITH OUTRIGGER BEAMS FULLY RETRACTED**6.3.1 BOOM RATED LOADS**

Table 6-10 Rate capacity chart with boom on outriggers fully retracted

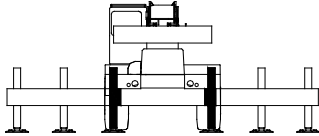
 Boom		360° slewing (Unit: Kg)				 Outriggers fully retracted	
Working radius (m)	TELESCOPIC CYLINDER I FULLY EXTENDED, outriggers fully retracted, 5t counterweight						
	11.7	16	20.3	26.6	32.9	39.2	45.5
3.0	32000	28000					
3.5	24000	23000	21500				
4.0	19500	19000	18000	18000			
4.5	15500	15300	15000	15000			
5.0	12500	12200	12000	12500			
5.5	10500	10800	10000	11000	11500		
6.0	9400	9000	8500	9200	9800		
6.5	7800	7600	7100	8200	8700		
7.0	7000	6600	6100	7100	7700	8000	
7.5	6000	5400	5200	6200	7000	7000	
8.0	5300	4900	4700	5500	6000	6400	6500
9.0		3700	3500	4300	4800	5200	5400
10.0		2800	2500	3300	3800	4200	4400
11.0		2000	1800	2600	3100	3400	3600
12.0		1300	1200	2000	2500	2800	3000
14.0				1100	1500	1800	2100
16.0					900	1200	1300
18.0						700	800
I (m)	0	4.3	8.6	8.6	8.6	8.6	8.6
II (m)	0	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	8	6	4	4	3
Hook	60t						

Table 6-11 Rate capacity chart with boom on outriggers fully retracted

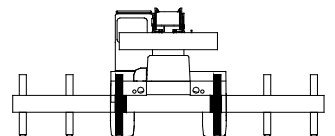
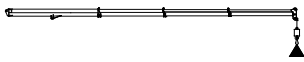
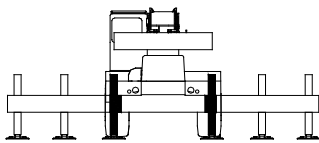
 Boom		360° slewing (Unit: Kg)			 Outriggers fully retracted	
Working radius (m)	TELESCOPIC CYLINDER I INTERMEDIATELY EXTENDED, outriggers fully retracted					
	5t counterweight					
	11.7	16	22.3	28.6	34.9	41.2
3.0	32000	29000				
3.5	24000	23000	23000			
4.0	19500	18600	18900			
4.5	15500	15000	15800	15500		
5.0	12500	12300	13500	13500		
5.5	10500	10000	11400	12000	12000	
6.0	9400	8700	9800	10200	10500	
6.5	7800	7500	8500	9100	9400	
7.0	7000	6400	7400	8000	8400	8000
7.5	6000	5400	6200	7000	7300	7500
8.0	5300	4800	5800	6300	6700	7000
9.0		3600	4500	5000	5400	5600
10.0		2700	3600	3900	4400	4700
11.0		2000	2900	3400	3700	3900
12.0		1400	2300	2700	3100	3300
14.0			1400	1800	2100	2400
16.0				1100	1400	1700
18.0					850	1100
I (m)	0	4.3	4.3	4.3	4.3	4.3
II (m)	0	0	6.3	12.6	18.9	25.2
Reeving	12	10	6	5	4	3
Hook	60t					

Table 6-12 Rate capacity chart with boom on outriggers fully retracted

 Boom		360° slewing (Unit: Kg)		 Outriggers fully retracted	
Working radius (m)	TELESCOPIC CYLINDER I FULLY RETRACTED, outriggers fully retracted, 5t counterweight				
	11.7	18	24.3	30.6	36.9
3.0	32000	25000			
3.5	24000	24000	23000		
4.0	19500	20000	20000		
4.5	15500	16500	16500		
5.0	12500	13500	14000	14000	
5.5	10500	11500	12200	12500	
6.0	9400	10000	10500	11000	
6.5	7800	8700	9500	9800	10000
7.0	7000	7800	8300	8700	8900
7.5	6000	7000	7500	7800	8000
8.0	5300	6100	6700	7000	7200
9.0		4900	5500	5700	5900
10.0		4000	4500	4800	5000
11.0		3300	3700	4000	4200
12.0		2600	3100	3400	3600
14.0		1800	2200	2500	2700
16.0			1500	1800	2000
18.0			1000	1200	1400
20.0				800	900
I (m)	0	0	0	0	0
II (m)	0	6.3	12.6	18.9	25.2
Reeving	12	6	5	4	3
Hook	60t				

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*.

6.4 LIFTS ON TIRES**6.4.1 BOOM RATED LOADS**

Table 6-13 Rated capacity chart for lift on tires

Boom length (m)	11.6		15.9		20.1		26.4	
Working radius (m)	360°	Travel with load over front	360°	Travel with load over front	360°	Travel with load over front	360°	Travel with load over front
3.0	13500	14,000	13800	13500				
3.5	11200	12500	11600	12000				
4.0	10000	11000	10500	10800	10600	10500		
4.5	8500	10000	8800	9800	9000	10000	9200	10200
5.0	7500	9000	8000	8600	8500	8800	8600	9000
5.5	6200	8000	7000	7500	7800	8000	7800	8000
6	5500	7000	6000	6500	6200	6500	6400	6700
7	4200	6000	5000	5500	5200	5600	5300	5700
8	3000	5000	4000	4800	4500	5000	4500	5100
9	2300	4,000	3000	4000	3200	4200	3500	4300
10			2300	3000	2500	3200	2500	3200
11			1800	2600	2000	2800	2200	2800
12			1500	2300	1500	2300	1600	2400
14						1200		1200
16								
I (m)	0		0		0		0	
II (m)	0		6.3		12.6		18.9	
Reeving	12		10		8		6	
Hook	60t							

Note: 360° in the above chart is for the crane to stand still.

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) 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.
- f) 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.
- g) 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.
- h) Use of jib is not permitted for pick-and-carry operations.
- i) 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.
- j) The load should be restrained from swinging.
- k) 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).
- l) Consult appropriate section of the *Operator's Manual* for more exact description of hoist line reeving.
- m) 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.
- n) Properly maintained wire rope is essential for safe crane operation. Consult the *Operator's Manual* and *Maintenance Manual* for proper maintenance and inspection requirements.
- o) 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.
- p) 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 of 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.
- q) Load ratings are dependent upon the crane being maintained according to the *Operator's Manual* and *Maintenance Manual*.

6.5 Lift Height Chart

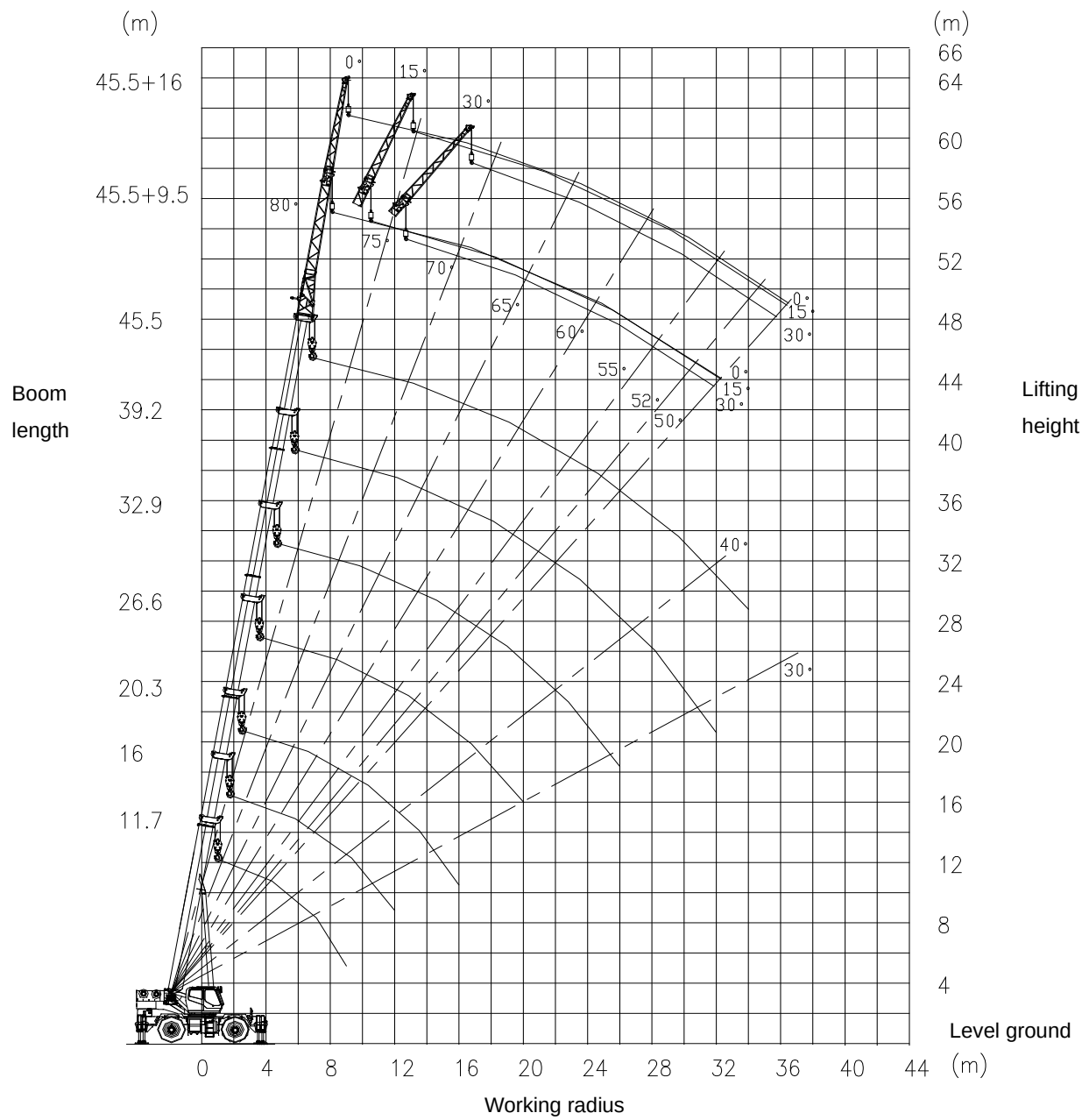


Figure 2 Lift Height with 16 m jib on Outriggers Fully Extended