

**KATO**

# **KR-250**

Rough Terrain Crane

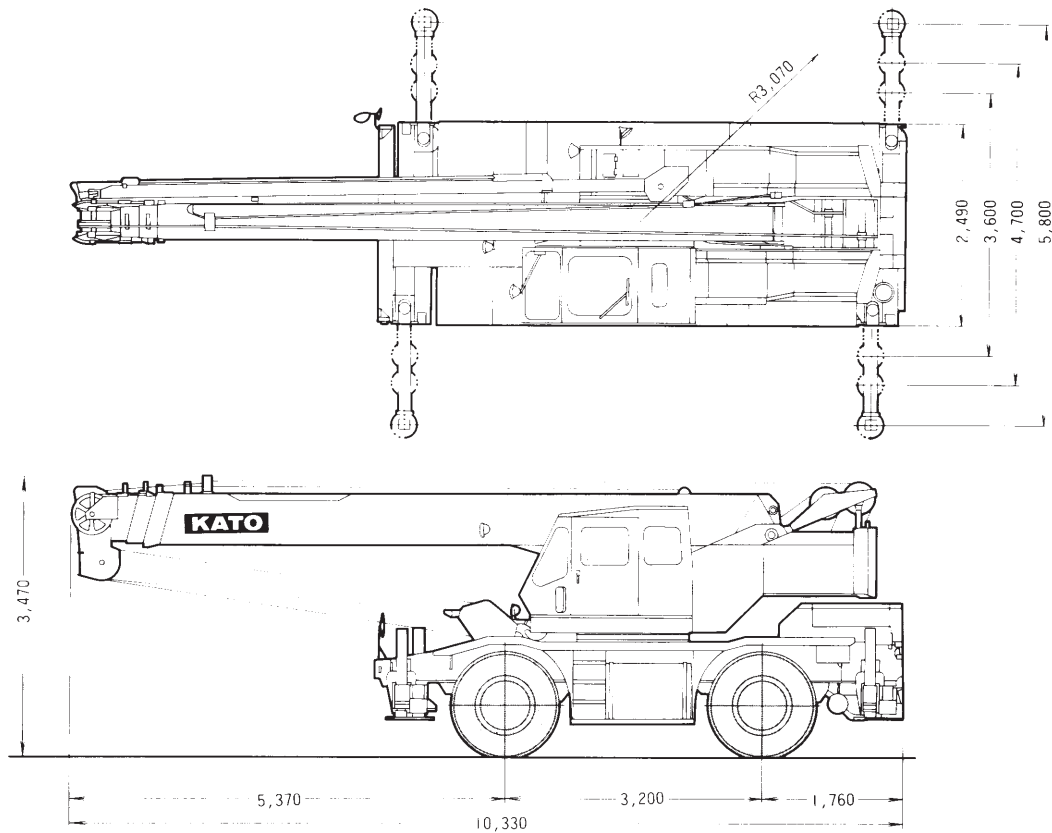
**ROUGHTERR**

**SPECIFICATION**



**KATO WORKS CO.,LTD.**

# DIMENSIONS



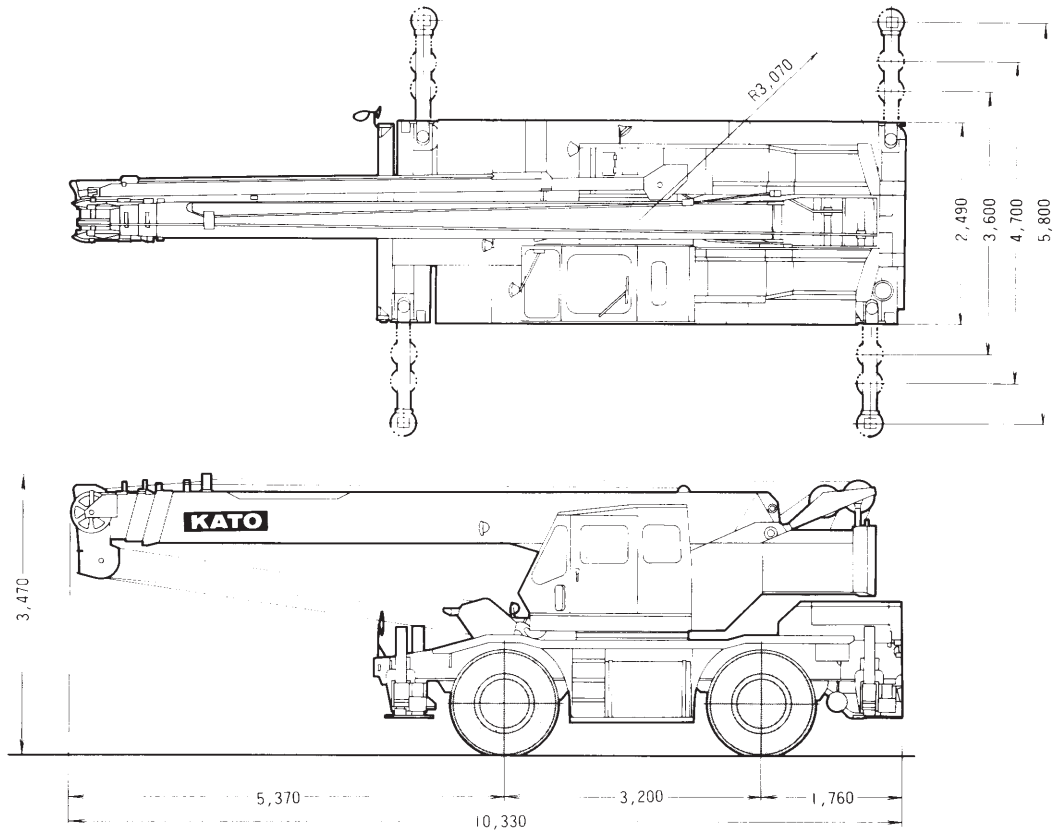
(Unit: mm)

## CRANE SPECIFICATIONS

Name	KATO ROUGHTER (ROUGH TERRAIN CRANE)
Model	KATO KR-250
<b>● Performance</b>	
Maximum rated lifting capacity	25 metric tons × 3.0 m
Boom length	8.4 m ~ 26.7 m (4 sections)
Fly jib length	7 m
Boom derricking angle	0° ~ 80°
Boom derricking time	34 sec. (0° ~ 80°)
Boom extending time	85 sec. (8.4 m ~ 26.7 m)
Hoisting line speed	
Main winch	High 110 m/min. (at 3rd layer) Low 53 m/min. (at 3rd layer)
Auxiliary winch	High 102 m/min. (at 2nd layer) Low 49 m/min. (at 2nd layer)
Hoisting hook speed	
Main winch	High 13.75 m/min. (at 3rd layer) Low 6.62 m/min. (at 3rd layer)
(parts of line: 8)	
Auxiliary winch	High 102 m/min. (at 2nd layer) Low 49 m/min. (at 2nd layer)
(parts of line: 1)	
Slewing speed	3.5 r.p.m.
Wire rope for hoisting	
Main winch:	
Type	4 × F (a + 39)
Diameter	16 mm
Length	160 m
Auxiliary winch:	
Type	4 × F (a + 39)
Diameter	16 mm
Length	105 m (75 m for the right side cab)

Hydraulic system	
Oil pump	4 pumps, gear and axial plunger type
Hoisting motor	Axial plunger type
Slewing motor	Axial plunger type
Cylinder	Double acting type
Control valve	4 way double acting with integral check and relief valves
Oil reservoir capacity	400 lit.
Winch system	
Main winch	Driven by axial plunger type hoisting motor through built-in gear reduction.
Auxiliary winch	Controlled independently by respective operating lever. Equipped with automatic brake with free fall device
<b>● Safety devices</b>	
	ACS (Automatic Crane Stopper) (Digital display of seven factors: Safety level, boom angle, working radius, boom length, critical load, actual load, maximum hook lift) Boom falling prevention device Overhoist prevention device Drum lock device Automatic winch brake Irregular winding prevention device Hydraulic safety valve Outrigger lock device Slewing lock device
<b>● Optional equipment</b>	
	Voice alarm device for ACS moment limiter Heater Cooler Defroster Oil cooler

# DIMENSIONS



(Unit: mm)

## CRANE SPECIFICATIONS

Name	KATO ROUGHTER (ROUGH TERRAIN CRANE)
Model	KATO KR-250
<b>● Performance</b>	
Maximum rated lifting capacity	25 metric tons × 3.0 m
Boom length	8.4 m ~ 26.7 m (4 sections)
Fly jib length	7 m
Boom derricking angle	0° ~ 80°
Boom derricking time	34 sec. (0° ~ 80°)
Boom extending time	85 sec. (8.4 m ~ 26.7 m)
Hoisting line speed	
Main winch	High 110 m/min. (at 3rd layer) Low 53 m/min. (at 3rd layer)
Auxiliary winch	High 102 m/min. (at 2nd layer) Low 49 m/min. (at 2nd layer)
Hoisting hook speed	
Main winch	High 13.75 m/min. (at 3rd layer)
(parts of line: 8)	Low 6.62 m/min. (at 3rd layer)
Auxiliary winch	High 102 m/min. (at 2nd layer)
(parts of line: 1)	Low 49 m/min. (at 2nd layer)
Slewing speed	3.5 r.p.m.
Wire rope for hoisting	
Main winch:	
Type	4 × F (a + 39)
Diameter	16 mm
Length	160 m
Auxiliary winch:	
Type	4 × F (a + 39)
Diameter	16 mm
Length	105 m (75 m for the right side cab)

Hydraulic system	
Oil pump	4 pumps, gear and axial plunger type
Hoisting motor	Axial plunger type
Slewing motor	Axial plunger type
Cylinder	Double acting type
Control valve	4 way double acting with integral check and relief valves
Oil reservoir capacity	400 lit.
Winch system	
Main winch	Driven by axial plunger type hoisting motor through built-in gear reduction.
Auxiliary winch	Controlled independently by respective operating lever. Equipped with automatic brake with free fall device

<b>● Safety devices</b>	ACS (Automatic Crane Stopper) (Digital display of seven factors: Safety level, boom angle, working radius, boom length, critical load, actual load, maximum hook lift) Boom falling prevention device Overhoist prevention device Drum lock device Automatic winch brake Irregular winding prevention device Hydraulic safety valve Outrigger lock device Slewing lock device
-------------------------	--

<b>● Optional equipment</b>	Voice alarm device for ACS moment limiter Heater Cooler Defroster Oil cooler
-----------------------------	--



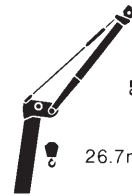
• 8.4m ~ 26.7m Boom



26.7m Boom + 7m jib  
(Offset 5°)



26.7m Boom + 7m jib  
(Offset 17°)



26.7m Boom + 7m jib  
(Offset 30°)

## RATED LIFTING CAPACITY

(Based on \* BS 1757:1981  
\* DIN 15019-2  
\* 75% of tipping loads)

Working radius (m)	With fully extended outriggers				With intermittently extended outriggers (4.7m)			
	360° full range				over side			
	8.4 m Boom	14.5 m Boom	20.6 m Boom	26.7 m Boom	8.4 m Boom	14.5 m Boom	20.6 m Boom	26.7 m Boom
2.5	25.00	16.00			25.00	16.00		
3.0	25.00	16.00			25.00	16.00		
3.5	20.00	16.00	9.00		20.00	16.00	9.00	
4.0	18.50	15.50	9.00		18.50	15.50	9.00	
4.5	16.50	14.20	9.00	6.80	16.50	14.20	9.00	6.80
5.0	15.00	13.10	9.00	6.80	15.00	13.10	9.00	6.80
5.5	13.70	12.10	9.00	6.80	12.30	12.10	9.00	6.80
6.0	12.50	11.20	9.00	6.80	10.40	10.00	9.00	6.80
6.5	11.50	10.40	8.50	6.80	8.70	8.50	8.50	6.80
7.0		9.70	8.00	6.80		7.40	8.00	6.80
8.0		8.15	7.10	6.10		5.70	6.25	5.90
9.0		6.45	6.40	5.50		4.55	5.05	5.30
10.0		5.25	5.80	5.00		3.70	4.15	4.40
12.0		3.65	4.15	4.20		2.45	2.95	3.20
14.0			3.05	3.30			2.10	2.35
16.0			2.30	2.55			1.50	1.70
18.0			1.75	1.95			1.05	1.25
20.0				1.50				0.90
22.0				1.20				0.65
24.0				0.90				0.45
25.0				0.80				
Critical boom angle	-	-	-	-	-	-	-	-

(Unit: Metric ton)

## JIB RATED LIFTING CAPACITY

■ 26.7m Boom + 7m Jib

Boom angle (°)	With fully extended outriggers					
	360° full range					
	offset 5°		offset 17°		offset 30°	
Working radius (m)	Load	Working radius (m)	Load	Working radius (m)	Load	
80.0	6.2	3.00	7.5	2.40	8.8	2.00
75.0	9.4	3.00	10.5	2.40	11.7	2.00
73.0	10.6	3.00	11.5	2.40	12.8	2.00
70.5	12.0	3.00	13.0	2.40	14.0	2.00
65.0	14.9	2.40	15.8	2.00	16.8	1.75
60.0	17.4	2.00	18.2	1.75	19.2	1.60
55.0	19.8	1.75	20.5	1.55	21.3	1.50
53.0	20.7	1.55	21.4	1.50	22.1	1.35
50.0	21.9	1.35	22.7	1.30	23.2	1.20
45.0	23.8	1.05	24.5	1.05	25.0	0.95
40.0	25.6	0.80	26.2	0.80	26.6	0.75
35.0	27.2	0.65	27.7	0.62	27.9	0.60
30.0	28.6	0.50	29.0	0.50	29.0	0.45
25.0	29.8	0.41	30.0	0.40		
23.6	30.0	0.40				
Critical boom angle	-	-	-	-	-	-

(Unit: Metric ton)

## RATED LIFTING CAPACITY

Working radius (m)	With intermittently extended outriggers (3.6 m)				With retracted outriggers (blocked on vertical cyls.)			
	over side				over side			
	8.4 m Boom	14.5 m Boom	20.6 m Boom	26.7 m Boom	8.4 m Boom	14.5 m Boom	20.6 m Boom	26.7 m Boom
2.5	25.00	16.00			10.50	9.50		
3.0	20.00	16.00			10.50	9.50	6.50	
3.5	18.80	16.00	9.00		8.20	7.60	6.50	
4.0	14.50	13.60	9.00		6.50	6.10	6.50	4.00
4.5	11.50	11.10	9.00	6.80	5.35	4.90	5.50	4.00
5.0	9.50	9.10	9.00	6.80	4.45	4.10	4.60	4.00
5.5	8.00	7.65	8.10	6.80	3.75	3.40	3.90	4.00
6.0	6.90	6.50	7.00	6.80	3.20	2.85	3.30	3.50
6.5	6.00	5.60	6.15	6.30	2.70	2.40	2.85	3.05
7.0		4.85	5.40	5.60		2.05	2.50	2.65
8.0		3.75	4.25	4.50		1.40	1.85	2.10
9.0		2.90	3.40	3.60		0.90	1.40	1.65
10.0		2.25	2.75	3.00		0.55	1.05	1.30
11.0		1.75	2.25	2.45			0.75	1.00
12.0		1.35	1.80	2.05				0.75
13.0			1.50	1.70				
14.0			1.20	1.40				
15.0			0.95	1.15				
16.0			0.75	0.95				
17.0			0.55	0.75				
18.0				0.60				
19.0				0.45				
Critical boom angle	-	-	-	35°	-	33°	50°	58°

(Unit: Metric ton)

## JIB RATED LIFTING CAPACITY

■ 26.7m Boom + 7m Jib

Boom angle (°)	With intermittently extended outriggers (3.6 m)					
	over side					
	offset 5°		offset 17°		offset 30°	
Working radius (m)	Load	Working radius (m)	Load	Working radius (m)	Load	
80.0	6.2	3.00	7.5	2.40	8.8	2.00
75.0	9.4	3.00	10.0	2.40	11.7	2.00
70.5	12.0	3.00	13.0	2.40	14.0	2.00
66.5	14.1	2.55	15.0	2.10	16.1	1.95
63.5	15.5	2.10	16.5	1.90	17.6	1.70
60.0	17.2	1.65	18.2	1.55	19.2	1.40
55.0	19.6	1.15	20.5	1.10	21.2	1.05
50.0	21.7	0.85	22.6	0.80	23.1	0.75
45.0	23.6	0.60	24.5	0.55	24.9	0.55
40.0	25.4	0.40	25.9	0.40	26.4	0.40
Critical boom angle	30°		30°		30°	

(Unit: Metric ton)

## JIB RATED LIFTING CAPACITY

### ■ 26.7m Boom + 7m Jib

Boom angle (°)	With intermittently extended outriggers (3.6 m)					
	over side					
	offset 5°		offset 17°		offset 30°	
	Working radius (m)	Load	Working radius (m)	Load	Working radius (m)	Load
80.0	6.2	3.00	7.5	2.40	8.8	2.00
75.0	9.4	3.00	10.5	2.40	11.7	2.00
73.5	10.4	3.00	11.3	2.40	12.5	2.00
72.0	11.1	2.65	12.2	2.40	13.3	2.00
71.0	11.6	2.45	12.7	2.20	13.8	2.00
68.0	13.0	1.95	14.2	1.75	15.3	1.55
65.0	14.6	1.50	15.6	1.40	16.7	1.25
60.0	16.8	1.00	18.0	0.90	18.9	0.85
55.0	19.3	0.60	20.2	0.55	21.1	0.50
53.0	20.0	0.50	21.0	0.45	21.9	0.40
Critical boom angle	48°		48°		48°	

(Unit: Metric ton)

## ■ STATIONARY ON RUBBER RATED LIFTING CAPACITY



Working radius (m)	8.4m Boom		14.5m Boom		20.6m Boom		26.7m Boom	
	Over front	360° full range	Over front	360° full range	Over front	360° full range	Over front	360° full range
3.0	12.20	8.20	8.70	7.20				
3.5	10.70	7.20	8.70	7.00				
4.0	10.00	5.90	8.70	5.60	6.20	4.50		
4.5	8.80	4.80	8.00	4.50	6.20	4.50		
5.0	7.75	3.90	7.20	3.70	6.20	4.10	4.00	2.70
5.5	6.90	3.30	6.40	3.10	5.70	3.50	4.00	2.70
6.0	6.10	2.80	5.65	2.60	5.30	3.00	4.00	2.70
6.5	5.20	2.40	4.90	2.15	4.85	2.60	4.00	2.70
7.0			4.30	1.80	4.50	2.25	3.80	2.40
8.0			3.30	1.25	3.75	1.70	3.35	1.80
9.0			2.55	0.80	3.00	1.25	2.95	1.35
10.0			2.05	0.45	2.45	0.90	2.50	1.05
11.0			1.60		2.00	0.60	2.15	0.75
12.0			1.25		1.60		1.85	
13.0					1.30		1.55	
14.0					1.10		1.30	
15.0					0.85		1.10	
16.0					0.65		0.90	
17.0					0.50		0.75	
18.0							0.55	
Critical boom angle	-	-	-	33°	-	50°	35°	60°

(Unit: Metric ton)

## ■ PICK & CARRY (Traveling speed max. 2km/h)

### RATED LIFTING CAPACITY



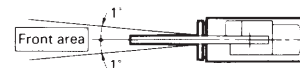
Working radius (m)	8.4m Boom		14.5m Boom		20.6m Boom		26.7m Boom	
	Over front	360° full range	Over front	360° full range	Over front	360° full range	Over front	360° full range
3.0	8.50	6.00	6.60	5.00				
3.5	8.25	5.00	6.60	4.80		3.20		
4.0	8.00	4.30	6.60	4.10	5.00	3.20		
4.5	6.80	3.60	6.00	3.40	5.00	3.20		
5.0	5.80	3.00	5.30	2.80	5.00	3.20	2.80	1.85
5.5	5.00	2.50	4.75	2.30	4.70	2.70	2.80	1.85
6.0	4.50	2.05	4.30	1.90	4.30	2.30	2.80	1.85
6.5	4.00	1.70	3.80	1.60	3.90	2.00	2.80	1.85
7.0			3.40	1.30	3.60	1.70	2.70	1.70
8.0			2.65	0.85	3.00	1.25	2.35	1.35
9.0			2.10		2.45	0.90	2.15	1.05
10.0			1.65		2.00	0.65	2.00	0.75
11.0			1.30		1.65		1.70	
12.0			1.00		1.35		1.45	
13.0					1.10		1.20	
14.0					0.90		1.05	
15.0					0.70		0.90	
16.0					0.55		0.75	
Critical boom angle	-	-	-	45°	25°	53°	45°	62°

(Unit: Metric ton)

### — ON RUBBER —

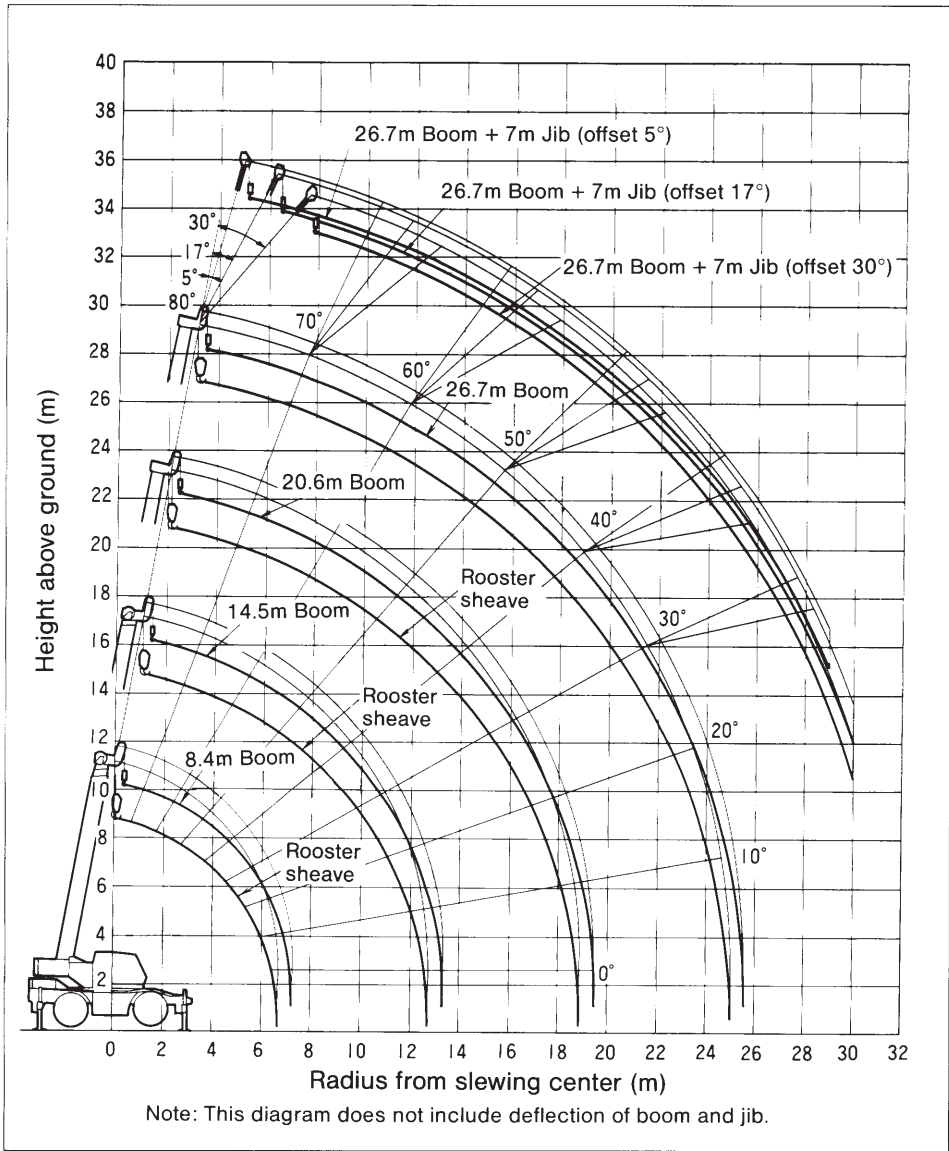
1.) The rated lifting capacities are the load guaranteed when the ground surface is good, specified tire pressure is maintained and spring lock cylinders are fully retracted.  
Specified tire pressure: 8.0 kg/cm<sup>2</sup> (14.00—24—24 PR)

2.) Rated lifting capacities in front area (2° arc) are different from those for full working area (360° arc).  
Great care should be taken when transferring from over front to over side since there is a danger of overloading.



- For on rubber lifting, jib operation and free fall operation are not permitted.
- Apply the parking brake while crane is operating stationary on rubber.
- Push the Hi-Lo switch before Pick & Carry operation to insure low range speed.
- In Pick & Carry operation, move less than 2 km/h and keep the lifting load close to the ground. Especially avoid abrupt steering, accelerating and braking so as to swing the lifting load.
- Do not operate crane functions while carrying the load.
- Critical boom angles for each boom length are shown on bottom-most line of lifting capacity table.  
If the boom angle is lowered to less than the critical boom angle, the machine will tip over without load. Therefore, never lower the boom below these angles.
- The rated lifting capacities for rooster sheave are equivalent to the rated lifting capacities for the main boom to a maximum of 3000 kg.  
At all times the weight of all lifting equipment in use (including main hook block suspended from boom head) forms part of load and must be subtracted from the rated lifting capacity.
- Besides these cautions as shown above, conform to items 1, 2, 4 and 6 of cautions for "ON OUTRIGGERS".

# WORKING RANGE



**NOTE:**  
**— ON OUTRIGGERS —**

1.) The rated lifting capacities are the maximum load guaranteed on a firm level ground and include the weight of hook block and other lifting equipment. The capacities enclosed with bold lines are based on the structural strength of machine and the others are based on the stability of machine.

Hook	for 25 ton	for 3 ton
Weight (kg)	<b>250</b>	<b>60</b>

- 2.) The working radii as given in the table are the actual values including the deflection of the boom. Therefore, operate the machine based on the working radius. However, the working radii shown for jib operations are based on the values obtained when the boom is fully extended (26.7 m). Jib operations should be performed on the basis of boom angle only, regardless of boom length when the boom is not fully extended.
- 3.) Critical boom angles for each boom length are shown on bottom-most line of lifting capacity table. If the boom angle is lowered to less than the critical boom angle, the machine will tip over without load. Therefore, never lower the boom below these angles.
- 4.) If the boom length exceeds the specified value, the rated lifting capacities for the boom length above and below the present boom length should be referred to, and the crane should be operated within the smaller lifting capacity.
- 5.) When using the main boom with the jib installed, 500 kg plus the weight of hook block and other lifting equipment, etc., should be subtracted from the rated lifting capacities. When performing the above operation, do not use the rooster sheave.

6.) The standard number of parts of line is shown in the table below. When the standard number of parts of line is not used, the minimum number of parts of line is determined so that weight per part will not exceed 3,125 kg.

Boom length	8.4m~14.5m	14.5m~26.7m	Jib, Rooster sheave
Parts of line	8	4	1

- 7.) The rated lifting capacities for the rooster sheave are equivalent to the rated lifting capacities for the main boom to a maximum of 3000 kg. At all times the weight of all lifting equipment in use (including main hook block suspended from boom head) forms part of load and must be subtracted from the rated lifting capacity.
- 8.) Outrigger extended width center to center is 5.8m at maximum stroke and 4.7m and 3.6m at intermittent stroke.
- 9.) Lifting capacities over side vary with outrigger width extended. Operation must be carried out according to the lifting capacity table based on the corresponding outrigger width. Lifting capacities over front/rear are equal to those with outriggers fully extended.
- 10.) Free fall is adopted in principle to lower the hook only. If it is necessary to lower a load by free fall, its weight should be less than 20% of the rated lifting capacity and abrupt braking should not be allowed.





# KR-250

## ROUGHTERR

### CARRIER SPECIFICATIONS

Drive system	4 × 4
Maximum traveling speed	57 km/h
Gradeability (tan $\theta$ )	60 % (computed @G.V.W. = 25,200 kg)
Minimum turning radius	4.9 m (4-wheel steer)
(center of extreme outer tire)	8.5 m (2-wheel steer)

#### ● General dimensions

Overall length	approx. 10,330 mm
Overall width	approx. 2,490 mm
Overall height	approx. 3,470 mm
Wheel base	3,200 mm
Treads; Front	2,060 mm
Rear	2,060 mm
Center to center of extended outriggers	5,800 mm (Fully extended)
Gross vehicle weight	approx. 22,960 kg
Front	approx. 11,440 kg
Rear	approx. 11,520 kg

#### ● Engine

Maker	Mitsubishi
Model	6D14T (Turbo-charger)
Type	4 cycle, water cooled, diesel
No. of cylinder	6
Piston displacement	6,557 cc
Max. output horsepower	185 PS/2,800 r.p.m. 136 KW/2,800 r.p.m.
Max. output torque	57 kg-m/1,600 r.p.m. 558.6 N-m/1,600 r.p.m.

NOTE: The output is in accordance with JIS D1004, 1956. Rated power output is guaranteed within 5% at standard ambient condition.

Torque converter	Engine mounted 3 elements 1 stage (with lock up clutch)
Transmission	Remote mounted full powershift with rear axle disconnect 6 forward & 6 reverse speed
Axle: Front	Planetary drive/steer type
Rear	Planetary drive/steer type, with no-spin differential
Suspension: Front & Rear	Semi-elliptic leaf spring equipped with hydraulic shock absorbers and hydraulic locking device
Steering	Full hydraulic power steering. Three steering modes available 1. Front wheel steer 2. 4-wheel coordinated steer 3. 4-wheel crab steer

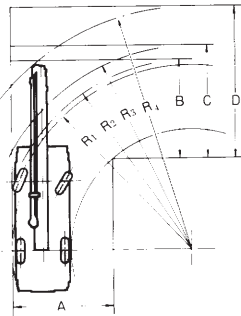
#### ● Brakes

Service brake	Air-over hydraulic disk brake on 4 wheels (2 circuits)
Parking brake	Spring applied, electrically air released cab-controlled parking brake mounted on front axle, internal expanding type
Electric system	24 V
Battery	12V - 120AH × 2
Fuel tank capacity	250 lit.
Driver's cab	All steel welded construction, 1 person (2 seats: optional)
Tire size: Front	14.00-24-24 PR (OR)
Rear	14.00-24-24 PR (OR)

NOTE: Spare tire is not mounted on the machine.

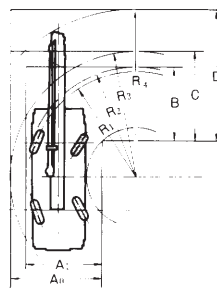
#### ■ Minimum Road Width for Right-Angle Turn

##### ● Right turn in 2-wheel steering mode



$R_1 = 8.5$ m	(Minimum turning radius)
$R_2 = 8.7$ m	(Turning radius of extremely outer tire)
$R_3 = 9.25$ m	(Chassis turning radius)
$R_4 = 11.25$ m	(Boom end turning radius)
$A = 4.55$ m	(Width of entrance)
$B = 4.55$ m	(Width of wheel exit)
$C = 5.1$ m	(Width of chassis exit)
$D = 7.1$ m	(Width of exit at end of boom)

##### ● Right turn in 4-wheel steering mode



$R_1 = 4.9$ m	(Minimum turning radius)
$R_2 = 5.1$ m	(Turning radius of extremely outer tire)
$R_3 = 5.85$ m	(Chassis turning radius)
$R_4 = 8.1$ m	(Boom end turning radius)
$A_0 = 4.2$ m	(Width of entrance)
$A_1 = 3.45$ m	(Width of wheel entrance)
$B = 3.45$ m	(Width of wheel exit)
$C = 4.2$ m	(Width of chassis exit)
$D = 6.4$ m	(Width of exit at end of boom)

Note: The above values are based on calculations.

NOTE: Illustrations may include optional equipment. KATO products and specifications are subject to improvements and changes without notice.



## KATO WORKS CO., LTD.

9-37, Higashi-ohi 1-chome, Shinagawa-ku, Tokyo, 140 Japan

Phone : Head Office Tokyo (03) 458-1111

Export Dept. Tokyo (03) 458-1115

Telex : 222-4519 (CRKATO J)

Fax : Tokyo (03) 458-1152

Cable : CRANEKATO TOKYO