CITY CRANE

KATO KR-22H

KATO KR-22H CITY CRANE CRANE

Major Specifications

Crane Module

Name		22 ton hoisting rough terrain crane	
Model		Kato KR-22H	
• Crane Performance			
Maximum total rated load		6.70m boom	22,000kg x 3.0m (7 cables)
		11.00m boom	12,000kg x 6.0m (4 cables)
		15.20m boom	12,000kg x 5.5m (4 cables)
		21.60m boom	8,000kg x 6.5m (3 cables)
		28.00m boom	6,000kg x 7.0m (2 cables)
		5.00m jib	3,100kg x 11.0m (1 cable)
		Rooster sheave	3,400 kg (1 cable)
Boom length		6.7m – 28.0m	
Jib length		5.0m	
Maximum lift above ground level		28.7m (boom)	
		34.1m (jib)	
Lifting rope speed	Main hoist	118m/min (4th tier)	
	Secondary hoist	102m/min (2nd tier)	
Hook speed	Main	(Rope cable no.– 7) 16.8m/min (4th tier)	
	Secondary	(Rope cable no.– 1) 102.0m/min (2nd tier)	
Boom hoisting range		–10° – 81°	
Boom raising time		0° – 81°/33sec	
Boom extension time		6.7m – 28.0m/73 sec	
Swivelling speed		2.6rpm	
Rear end swing radius		2.420m (slide sheave)	
		2.140m (counterweight)	
• Crane module equipment and construction			
Boom format		Box 6-level hydraulic telescopic	
Jib format		Box 1-level boom compartment storage type	
Boom telescope		Combination use of hydraulic cylinder and wire ropes 2 & 3-level isometric, and 4, 5 & 6-level isometric telescopic	
Boom hoisting unit		Hydraulic cylinder direct pressing type	
Lifting rope unit		2 single winches, oil motor drive– spur gear reduction system Automatic brake (stepping brake, free lowering and power lowering devices)	
Swivelling unit		Oil motor drive – planetary gear reduction system (built-in negative brake) Free lock switch type	
Swivelling circle		Ball bearing type	
Outrigger unit	Format	All hydraulic H-model (float and vertical cylinder combination)	
	Reach width	5,800mm (maximum reach)	
		4.600mm (intermediate reach)	
		3,400mm (intermediate reach)	
		2,040mm (minimum reach)	
Rope	Main hoist	SeS (48) + 6 x WS (31) f 16mm x 100m	
	Secondary hoist	IWRC 6 x Fi (29) f 16mm x 75m	

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• Hydraulics		
Oil pumps		Double variable plungermodel, gear + plungermodel
Oil motor	Lifting	Axial plunger
	Swivelling	Axial plunger
Control bub		Multiple auto recovery (hydraulic compensated flow control valve)
Cylinder		Double acting
Oil reserve		400 l
• Safety Devices		
		ACS (overload protection and voice alarm), work scope restriction unit, outrigger reach width auto detector, boom natural lowering prevention unit, overlift prevention unit, drum hold safety unit, auto brake, irregular winding prevention unit, hydraulic safety valve, outrigger lock, angle indicator, swivelling warning light, hydraulic fluid overheat alarm, hydraulic fluid filter blockage alarm
• Standard Equipment		
		Hydraulic dehumidifying air conditioner, AM/FM clock radio, drum rotation indicator, intermittent ceiling wiper (with washer)
• Optional Equipment		
		Winch monitoringcamera, TV receiver

Carrier Module

• DrivingPerformance		
Maximum speed		49km/h
Hill-climbing performance		0.6 (tan ?)
Minimum turning radius		7.5m (2-wheel steering)
		4.7m (4-wheel steering)
• Measurements & Weights		
Total length		8,460mm
Total width		2,395mm
Total height		3,400mm
Wheel base		3,300mm
Wheel tread	Front wheels	1,970mm
	Rear wheels	1,970mm
Passengers		1
Total carriage weight		23,705kg
	Forward axle weight	11,840kg
	Rear axle weight	11,865kg
• Engine		
Name		Mitsubishi 6D16-T (with turbo)
Model		6 cylinder, water cooled 4 cycles. Direct fuel-injected diesel engine
Total exhaust		7,545cc
Maximum output		220ps/2,800rpm
Maximum torque		65kg·m/1,600rpm

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• Base driving equipment and construction		
Driving formats		Switches between2-wheel drive (4 x 2) and 4-wheel drive (4 x 4)
Torque convertor		3 elements. 1-level (with auto lock-up clutch)
Transmission model		Auto and manual transmission
Number of speeds		Four speeds when moving forward. Two speeds when moving backwards (Hi/low switch)
Axle model		Full floating type (both front and rear axles)
Main brake		2 system pneumatic-hydraulic combination. 4-wheel disc brake
Parking brake		Mechanical & propeller shaft brake internal expanding type
Auxiliary brake		Torque convertor lock-up interlocking exhaust brake Auxiliary braking unit for work
Suspension	Front axle	Coil spring 4-ring (with hydraulic lock cylinder)
	Rear axle	Coil spring 4-ring (with hydraulic lock cylinder)
Steering unit	Format	All hydraulic power steering With reverse steering correction mechanism
	Mode	Forward 2wheel steering, 4wheel steering, crab steering, rear 2-wheel steering, independent front and rear wheel steering
Tyre size	Front wheels	385/95 R25 170E ROAD
	Rear wheels	385/95 R25 170E ROAD
Fuel tank		300 l
• Safety Devices		
		Camera for reversing powered/electric remote controlled side mirrors, emergency steering unit, back wheel steering auto-lock device, over shift prevention unit, brake fluid leakage alarm, suspension lock unit, auxiliary brakes for work, over-run alarm, radiator liquid level alarm, air filter blockage alarm

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES
This document should be read in conjunction with the AML

Outrigger Maximum Reach (5.8 m) (Total Perimeter)					
Boom Length / Working Radius	6.7 m	11.0 m	15.2 m	21.6 m	28.0 m
3.0 m	22.00	12.00	12.00	8.00	
3.5 m	20.00	12.00	12.00	8.00	
4.0 m	17.00	12.00	12.00	8.00	6.00
4.5 m	15.00	12.00	12.00	8.00	6.00
5.0 m		12.00	12.00	8.00	6.00
5.5 m		12.00	12.00	8.00	6.00
6.0 m		12.00	11.50	8.00	6.00
6.5 m		11.30	10.60	8.00	6.00
7.0 m		9.70	9.40	7.85	6.00
8.0 m		7.35	7.20	7.10	5.90
9.0 m		5.70	5.60	6.35	5.35
10.0 m			4.50	5.25	4.80
11.0 m			3.60	4.35	4.30
12.0 m			2.90	3.65	3.85
13.0 m			2.30	3.05	3.40
14.0 m				2.60	2.90
15.0 m				2.20	2.50
16.0 m				1.80	2.10
17.0 m				1.50	1.80
18.0 m				1.20	1.55
19.0 m				1.00	1.30
20.0 m				0.85 (19.6 m)	1.10
21.0 m					0.95
22.0 m					0.80
23.0 m					0.65
24.0 m					0.50
25.0 m					0.35
Hazardous Angle	-	-	-	-	-

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES
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Outrigger Intermediate Reach (4.6 m) (Laterally)					
Boom Length / Working Radius	6.7 m	11.0 m	15.2 m	21.6 m	28.0 m
3.0 m	22.00	12.00	12.00	8.00	
3.5 m	20.00	12.00	12.00	8.00	
4.0 m	17.00	12.00	12.00	8.00	6.00
4.5 m	15.00	12.00	12.00	8.00	6.00
5.0 m		12.00	12.00	8.00	6.00
5.5 m		10.00	10.00	8.00	6.00
6.0 m		8.50	8.40	8.00	6.00
6.5 m		7.20	7.10	7.90	6.00
7.0 m		6.20	6.10	6.85	6.00
8.0 m		4.65	4.55	5.30	5.65
9.0 m		3.60	3.50	4.20	4.50
10.0 m			2.70	3.40	3.70
11.0 m			2.05	2.75	3.05
12.0 m			1.50	2.25	2.55
13.0 m			1.05	1.85	2.10
14.0 m				1.45	1.75
15.0 m				1.10	1.45
16.0 m				0.85	1.15
17.0 m				0.60	0.90
18.0 m				0.40	0.70
19.0 m					0.50
20.0 m					0.35
Hazardous Angle	-	-	-	18°	38°

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Outrigger Intermediate Reach (3.4 m) (Laterally)					
Boom Length / Working Radius	6.7 m	11.0 m	15.2 m	21.6 m	28.0 m
3.0 m	22.00	12.00	12.00	8.00	
3.5 m	15.20	12.00	12.00	8.00	
4.0 m	11.40	11.00	10.00	8.00	6.00
4.5 m	8.95	8.60	8.40	8.00	6.00
5.0 m		6.95	6.85	7.00	6.00
5.5 m		5.75	5.65	6.20	6.00
6.0 m		4.80	4.70	5.40	5.30
6.5 m		4.05	3.95	4.65	4.70
7.0 m		3.45	3.35	4.00	4.15
8.0 m		2.50	2.40	3.05	3.30
9.0 m		1.80	1.70	2.35	2.65
10.0 m			1.10	1.85	2.10
11.0 m			0.60	1.40	1.65
12.0 m				1.00	1.30
13.0 m				0.65	0.95
14.0 m				0.50 (13.5 m)	0.70
15.0 m					0.45
Hazardous Angle	-	-	30°	42°	53°

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES
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Outrigger Minimum Reach (2.04 m) (Laterally)					
Boom Length / Working Radius	6.7 m	11.0 m	15.2 m	21.6 m	28.0 m
3.0 m	7.80	7.50	7.00	7.00	
3.5 m	6.10	5.80	5.40	5.60	
4.0 m	4.80	4.50	4.30	4.55	3.80
4.5 m	3.80	3.50	3.40	3.80	3.80
5.0 m		2.80	2.70	3.20	3.25
5.5 m		2.20	2.10	2.65	2.75
6.0 m		1.70	1.60	2.25	2.35
6.5 m		1.30	1.20	1.85	2.00
7.0 m		0.90	0.80	1.55	1.70
8.0 m				1.00	1.20
Hazardous Angle	-	30°	55°	62°	69°

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TOTAL RATED LOAD IN TONNES
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Outrigger Maximum Reach (5.8 m)		
Boom Angle (°)	**Working Radius (m)**	**Load (ton)**
81.0	4.0	3.10
73.0	8.5	3.10
68.8	11.0	3.10
65.0	13.0	2.65
60.0	15.5	2.20
57.0	17.0	2.00
56.0	17.4	1.85
50.0	20.1	1.25
45.0	22.1	0.90
40.0	23.9	0.65
35.0	25.6	0.45
30.0	27.1	0.30
Hazardous Angle	25°	

Outrigger Intermediate Reach (4.6 m)		
Boom Angle (°)	**Working Radius (m)**	**Load (ton)**
81.0	4.0	3.10
73.0	8.5	3.10
68.8	11.0	3.10
65.0	13.0	2.30
60.0	15.4	1.55
57.0	16.8	1.20
56.0	17.2	1.10
50.0	19.9	0.60
45.0	22.0	0.30
Hazardous Angle	42°	

Outrigger Intermediate Reach (3.4 m)		
Boom Angle (°)	**Working Radius (m)**	**Load (ton)**
81.0	4.0	3.10
73.0	8.5	3.10
68.8	10.8	1.90
65.0	12.7	1.25
60.0	15.0	0.65
57.0	16.5	0.35
56.0	16.9	0.30
Hazardous Angle	54 °	

KATO KR-22H CITY CRANE HYDRAULIC CRANE

CAUTIONS – WHEN USING THE OUTRIGGER

1. The total rated load tables display the maximum load under warranty in a state where the machine is set level on level and firm ground and includes the weight of the hook and other hoisting accessories.

   The sections boxed in bold (▭) are set out according to the machinery's strength. Other areas are set out according to the machine's degree of stability.

HOOK TYPE	22,000 kg	3,400 kg
WEIGHT	160 kg	60 kg

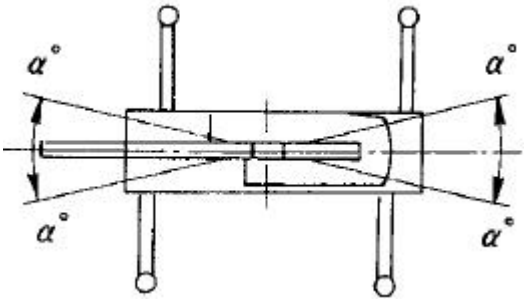
2. Since the working radius is based on the actual values including the flex of the boom, please ensure work is carried out with the working radius as the standard.

3. Total rated loads below the bold lines do not exceed 75% of tipping load.

4. The jib working radius displays values when work is carried out with a jib attached to a 28.0 m boom. Please use just the boom angle as the standard when doing jib work with booms of other lengths.

5. Lateral lifting performance differs according to the outrigger's reach. Consequently, please carry out work for the respective reach conditions according to the total rated load tables. For forward and backward lifting performance, please carry out work according to the total rated load table for the outrigger maximum reach.

Forward range



Backward range

Outrigger reach status	Intermediate reach (4.6m)	Intermediate reach (3.4m)	Minimum reach
Area a°	35	20	3

6. Please do not carry out jib work at the outrigger minimum reach.

7. The total rated load for the rooster sheave is equivalent to the value after subtracting the 22 tonne hook weight (160 kg) from the total rated boom load and the limit shall be 3,400 kg.

8. When the boom length exceeds the stipulated length, please carry out work at the total rated load for either the stipulated length, or at a length for a boom which is one step longer, whichever is the smaller total rated load.

9. When carrying out boom work with a jib or with a rooster sheave attached, in addition to the weight of accessory hoists, please subtract 440 kg from the total rated load when a jib is attached or 90 kg when a rooster sheave is attached.

10. The hazardous angle for booms in each work situation is as per the tables. Please exercise sufficient caution since the crane can topple over even without any load if the boom is lower than the hazardous angle.

11. The number of standard hook cables is as per the table below. However, when using a number of cables other than for the standard hook, please use a limit of 3,300 kg for each wire rope.

Boom length	6.7m	11.0 – 15.2m	21.6m	28.0m	Jib/rooster sheave
No. of lifting cables	7	4	3	2	1

12. The total rated load tables do not include the impact of wind. Please halt work when the instantaneous wind speeds exceeds 10m/sec.

13. When carrying out work that exceeds the total rated load and when the crane has not been used correctly, it will topple over or get damaged. In these instances, the crane's warranty is invalidated.

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES
This document should be read in conjunction with the AML

Not using the Outrigger Fixed Hoisting						
Working Radius (m)	**6.7 m Boom**		**11.0 m Boom**		**15.2 m Boom**	
	Forward	**Total Perimeter**	**Forward**	**Total Perimeter**	**Forward**	**Total Perimeter**
3.0		6.00		5.50		5.20
3.5	8.50	4.50	8.50	4.10	8.00	3.80
4.0	8.50	3.30	8.50	3.20	8.00	3.00
4.5	7.50	2.55	7.20	2.55	6.50	2.40
5.0			6.10	2.00	5.40	1.90
5.5			5.10	1.55	4.55	1.50
6.0			4.25	1.20	3.85	1.15
6.5			3.55	0.90	3.30	0.85
7.0			3.00	0.65	2.80	
8.0			2.15		2.05	
9.0			1.55		1.50	
10.0					1.00	
11.0					0.60	
Hazardous Angle	-	-	-	30°	30°	56°

Not using the Outrigger Driving while suspending a load (under 2 km/hr)						
Working Radius (m)	**6.7 m Boom**		**11.0 m Boom**		**15.2 m Boom**	
	Forward	**Total Perimeter**	**Forward**	**Total Perimeter**	**Forward**	**Total Perimeter**
3.0		4.80		4.40		4.00
3.5	6.80	3.60	6.40	3.30	5.90	3.00
4.0	6.80	2.65	6.40	2.55	5.90	2.40
4.5	6.00	2.05	5.50	2.05	5.00	1.90
5.0			4.75	1.50	4.30	1.40
5.5			4.10	1.05	3.65	1.00
6.0			3.40	0.65	3.10	0.60
6.5			2.85		2.65	
7.0			2.40		2.25	
8.0			1.65		1.60	
9.0			1.00		1.00	
10.0					0.50	
Hazardous Angle	-	-	-	42°	35°	60°

KATO KR-22H CITY CRANE HYDRAULIC CRANE

CAUTIONS – WHEN NOT USING THE OUTRIGGER

1. The total rated load tables display the maximum load under warranty for this crane when tyre air pressure is at the specified pressure on firm and level ground and the suspension lock cylinders have been contracted to a minimum. The values include the weight of the hook and other hoisting accessories.

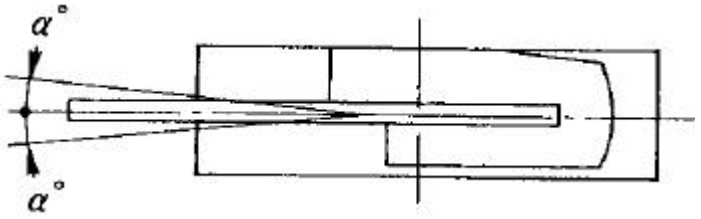
   The sections boxed in bold (▭) are set out according to the machinery's strength. Other areas are set out according to the machine's degree of stability. (The stipulated tyre air pressure is 9.0 kg/cm²).

2. Since the working radius is based on the actual values including the flex of the boom, please ensure work is carried out with the working radius as the standard.

3. Total rated loads below the bold lines do not exceed 75% of tipping load.

4. The total rated loads differ according to forward performance or entire perimeter performance. Please exercise due caution when swivelling from the forward area to a lateral area since there is a risk of overload.

Forward area



Crane work	Fixed hoisting	Driving while suspending a load
Area a°	1	1

5. The total rated load for the rooster sheave is equivalent to the value after subtracting the 22 tonne hook weight (160 kg) from the total rated boom load and the limit shall be 3,400 kg.

6. Please do not carry out boom work, jib work or free lowering work when the boom length exceeds 15.2m.

7. Please carry out fixed crane work with the parking brake active.

8. When driving while suspending a load, turn the high/low switch to "ON" (low range) and have the shift lever at speed 1.

9. While driving while suspending a load, keep the load close to the ground so that it does not sway and proceed at under 2 km/hr. In particular, exercise caution with cornering, sudden acceleration and sudden braking.

10. Do not carry out crane work when driving while suspending a load.

11. The hazardous angle for booms in each work situation is as per the tables. Please exercise due caution since the crane can topple over even without any load if the boom is lower than the hazardous angle.

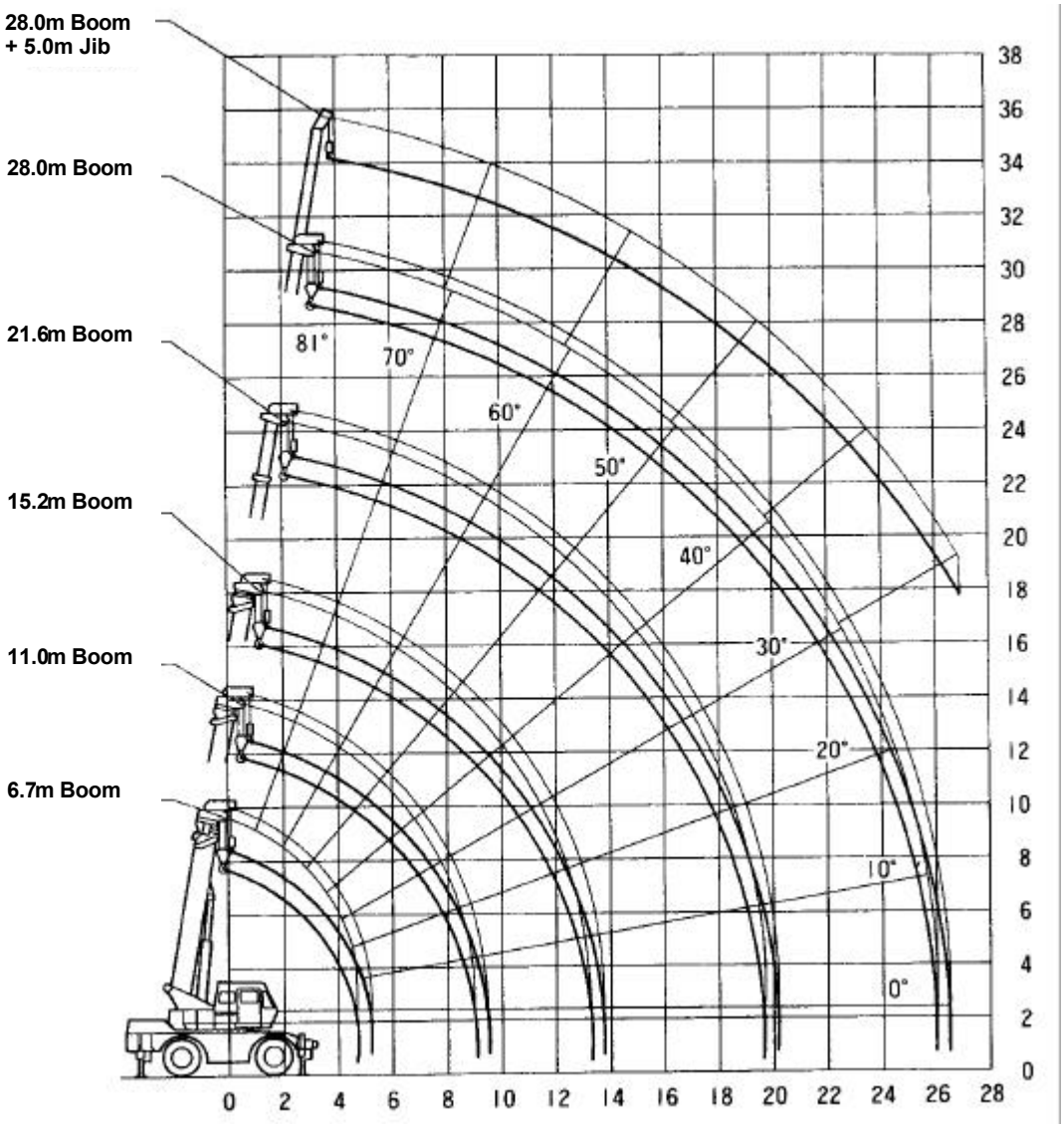
12. The number of standard hook cables is as per the table below. However, when using a number of cables other than for the standard hook, please use a limit of 3,300 kg for each wire rope.

Boom length	6.7m	11.0 – 15.2m	Rooster sheave
No. of lifting cables	7	4	1

13. When carrying out work that exceeds the total rated load and when the crane has not been used correctly, it will topple over or get damaged. In these instances, the crane's warranty is invalidated.

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES

WORKING RANGE DIAGRAM

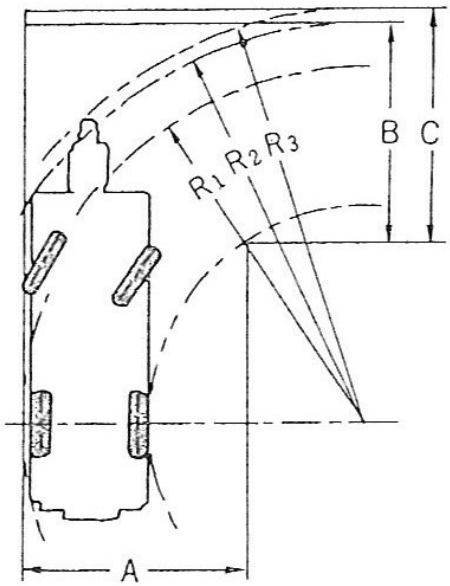


Notes: 1. This figure does not include boom or jib flexing.
2. This figure shows the outrigger maximum reach (full perimeter)

KATO KR-22H CITY CRANE CRANE
TOTAL RATED LOAD IN TONNES

Width of Theoretical Minimum Intersecting Aisle

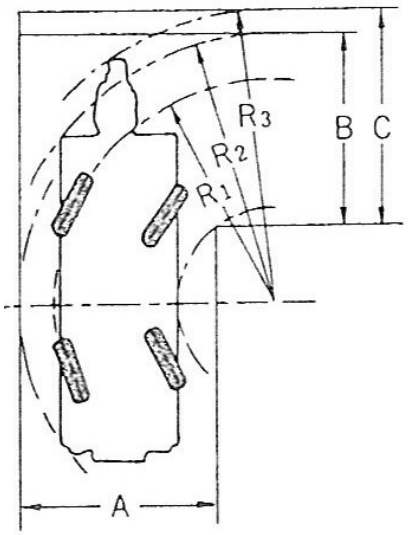
- **Turning right with 2-wheel steering**



- **R_1 = 7.50m (Minimum turning radius)**
- **R_2 = 8.43m (Vehicle body turning radius)**
- **R_3 = 8.73m (Boom tip turning radius)**

- **A = 4.64m (entry aisle width)**
- **B = 4.64m (vehicle body exit aisle width)**
- **C = 4.95m (boom tip exit aisle width)**

- **Turning right with 4-wheel steering**



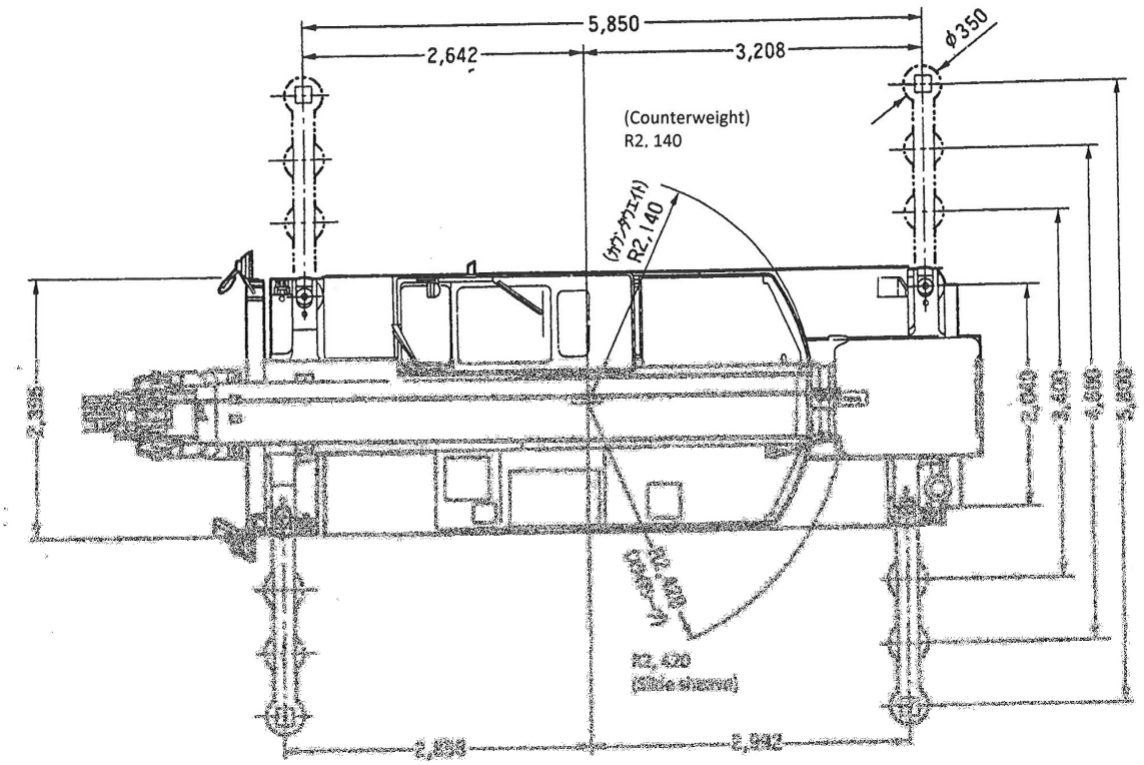
- **R_1 = 4.70m (Minimum turning radius)**
- **R_2 = 5.67m (Vehicle body turning radius)**
- **R_3 = 6.18m (Boom tip turning radius)**

- **A = 4.05m (vehicle body entry aisle width)**
- **B = 4.05m (vehicle body exit aisle width)**
- **C = 4.56m (boom tip exit aisle width)**

NB: The above numbers are calculated values.

- Fully equipped (compulsory automobile inspection registration weight), the KR-22H meets the B criteria of the basic access criteria. Please store the hook in the set location when driving.

Scale: 1/100 units (mm)



Scale: 1/100 units (mm)