

KATO

NK-400E-III

FULLY HYDRAULIC
TRUCK CRANE

ACS

Moment Limiter

Lifting Capacity **40** Ton
Metric



KATO WORKS CO., LTD.

40 Tons of Lifting Power Goes Where Others Fear to Tread Performance, Safety and Reliability Backed Up by Strong Technology

A new machine with operability and performance that defy comparison. Packed with advanced functions to meet the diversity of user requirements. The **NK-400E-m** is a crystallization of technological excellence with lifting power you can put to work today.



Microcomputer Control System Ensures Safety and Reliability

Technologically Advanced Voice Alarm (Voice Alarm is available as an option)

Compuload synthesizes sound of female voice to provide start-up checks and overload warnings



Automatic Seven-Point Detection

• The advanced ACS Moment Limiter is a fully automatic overload prevention device that incorporates calculation functions based on the latest electronic know-how and an electronic synthesizer that generates the sound of a female voice to provide start-up checks and overload warnings. It provides precise output on up to seven safety factors: safety level (total moment), boom angle, working radius, boom length, critical load, actual load, and maximum hook lift. These factors are displayed on a graphic display panel. This arrangement permits easy readout without eye fatigue and facilitates a constant and accurate appraisal of changes in the safety factors, thereby enhancing the safety of crane operation.

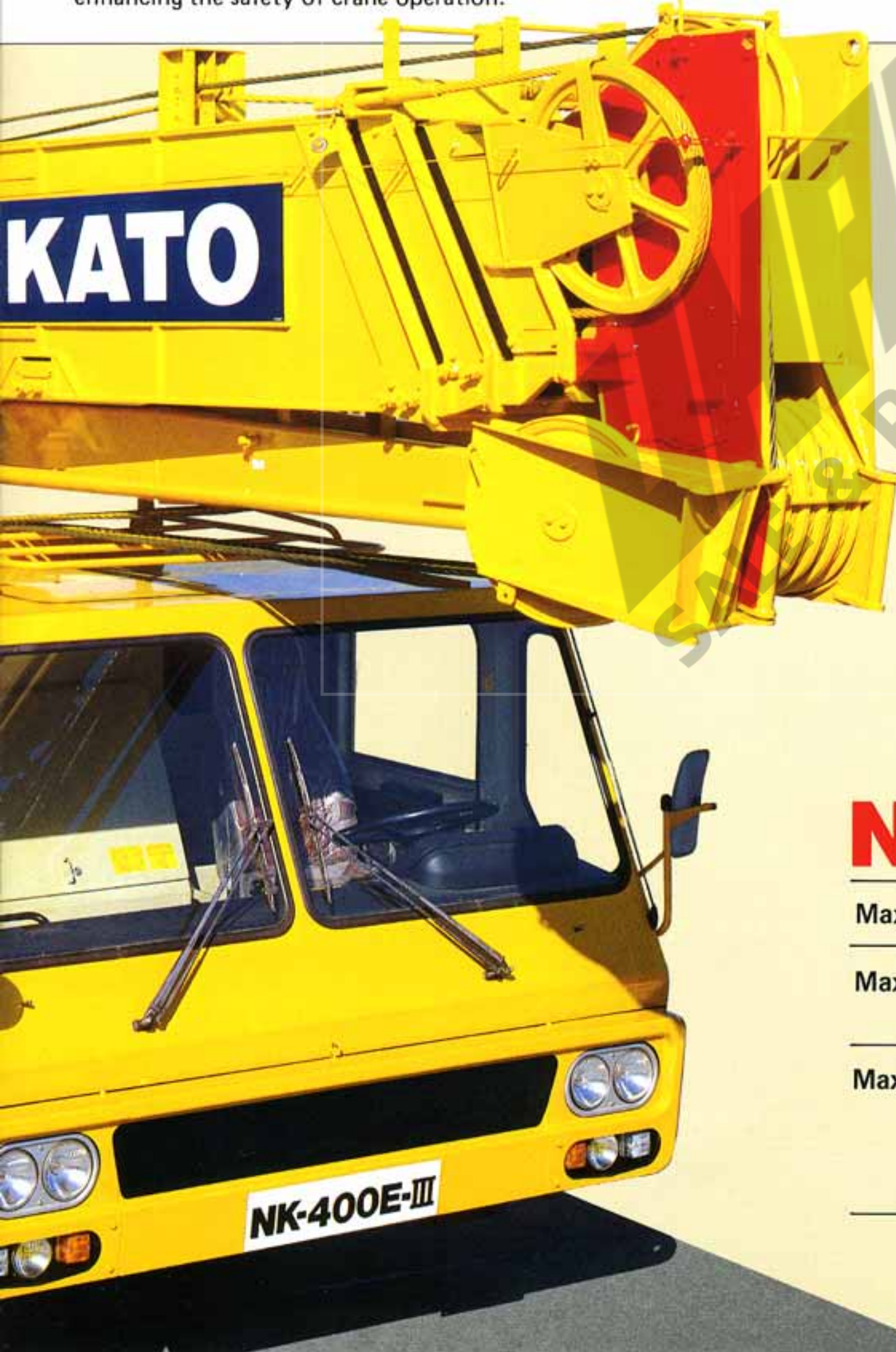
Constant Five-Point Display of Operating Condition

• Five digital displays show safety level, boom angle, boom length, working radius and critical load at all times, without any troublesome button operations. For further safety, the display of safety level is color-zoned to enable the operator to take in the condition of the load at a glance.

Protection Against Breakdowns and Malfunctions

For double protection in the unlikely event of a malfunction in the ACS Moment Limiter or any other problems, a trouble indicator has been provided to generate an emergency signal to warn the operator.

COMPULOAD Moment Limiter



NK-400E-III

Maximum Lifting Capacity **40t**

Maximum Boom Length **35m**

Jib length 9.2m—15.0m (2-section)

Maximum Lifting Height (boom) . . **34.8m**

(jib) **49.7m**

(35m boom + 15m jib offset 5°)

Tough New Boom Reduces Vertical Deflection and Lateral Bending During Lifting Operations

Exceptionally Wide Operating Range

Amazing On-the-job Operating Performance
Outstanding Efficiency on Restricted Sites!
3-stage Jib Offset



- Convenient rooster sheave for single-rope lifting operations

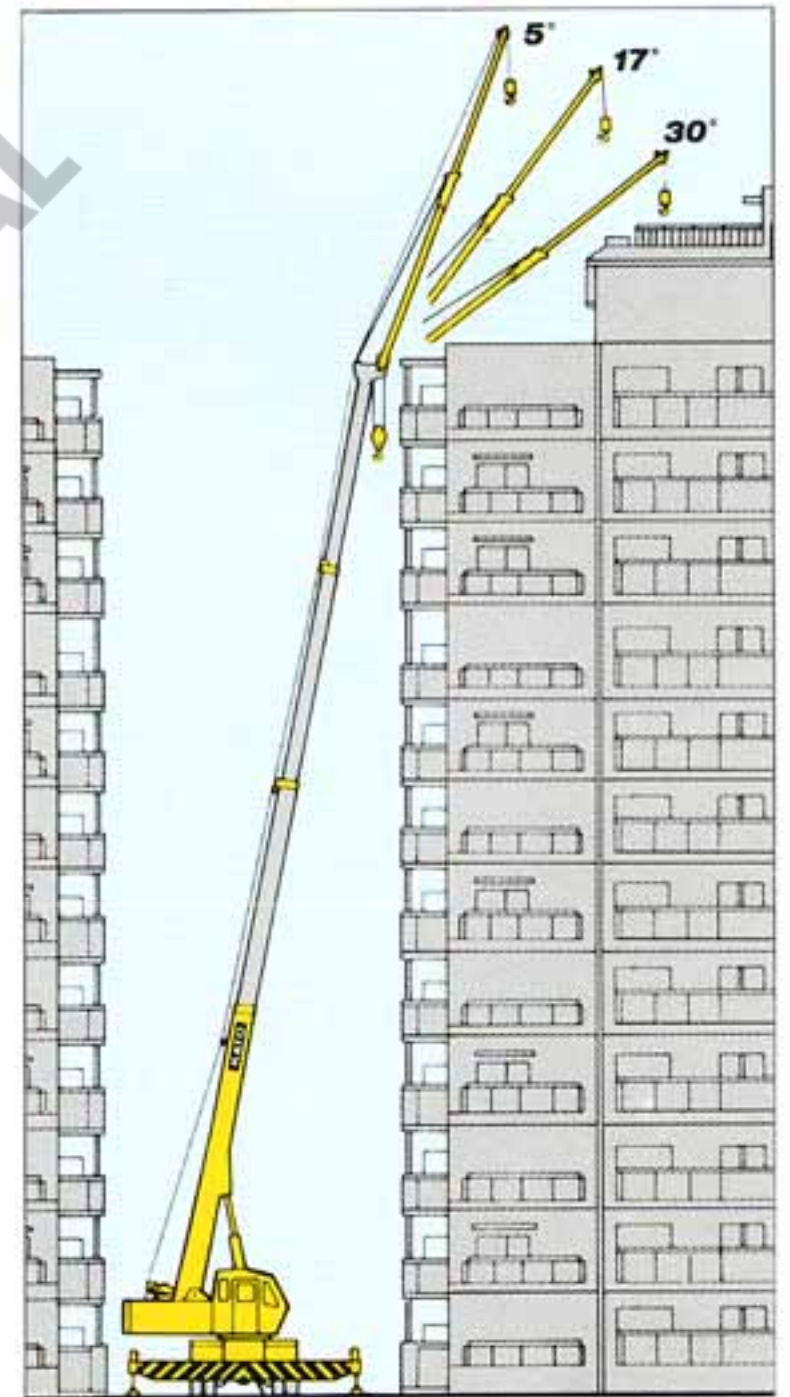


Sturdy Fullpower Boom Cuts Deflection Way Down

- For greater ease of use, operability and safety, the new boom is of a robust construction that reduces vertical deflection and lateral bending during operations.
- The tough new Fullpower boom utilizes a sequential synchronized extension/retraction control system that permits single-lever control and speeds up operations at all boom lengths from low lifts at 11m (fully retracted) to high lifts at 35m (fully extended).

Extra-long Boom Ideal for Close-in, High-lift Work!

- The NK-400E-III features a new three-stage jib designed to operate at three offset angles: 5°, 17° and 30°. This feature is a real boon in the close-in work involved in the construction of high-rise buildings and steel frame erection, lifting heavy objects easily with power that leaves the rest behind.



Amazing On-the-job Operating Performance



Forward-Acting Derrick Cylinder Delivers Incredibly Wide Derricking Range

- The powerful forward-acting derrick cylinder provides -2° to $+81^{\circ}$ elevation for operation in close quarters and easier jib housing.

Rope Durability Dramatically Enhanced by Enlarged Sheaves

- The diameters of the sheaves are 23 times the diameter of the wire rope, minimizing strain on the rope and extending rope life.

Convenient, Forward-Extendible Jib Is Easy to Set Up Even at Small Sites

- The compact jib is housed under the boom when in transport and can be extended forwards when in use. Requires less space and time to set up than side-ways-extending jibs.



Microcomputer Control Raises Efficiency and Augments Safety

Outriggers Capable of Intermediate Extension for Impressive Performance on Narrow Sites



Intermediate stroke **4.6m**

Maximum stroke **6.6m**



Microcomputer Makes Operation Safer by Monitoring the Extended Outriggers

- Outriggers are designed for extension in 2 stages – 6.6m and 4.6m – for performance that matches on-site requirements. And microcomputer control monitors the state of the outriggers to provides a higher level of safety, so the heavy and high lift operations can be undertaken with confidence.

Hydraulic Front Jack Provides Excellent 360° Lifting Capabilities for a Wide Operating Range

- A hydraulic jack installed under the front extremity of the carrier frame enables the crane to offer the same lifting performance in all directions. This means that there are fewer limitations caused by the orientation of the crane when it enters a site, so the crane has a greater operational range.



* Hydraulic front jack (option)

King-Size Cab Larger than Ever More Comfortable, More Functional !



All-Round Comfort and Functional Design of Spacious Cab Guarantee a Pleasant Working Environment

- The spacious cabin is finished in highly relaxing color tones and comes with a sliding door that facilitates ingress and egress and can be left open without getting in the operator's way. A push-up type window is incorporated in the roof for better ventilation. Careful consideration has been given to human engineering for maximum operator comfort; the lengths of the levers can be adjusted and the high-backed seat can be moved forward or backward, raised or lowered to suit any physique. The result is a comfortable, roomy cabin.

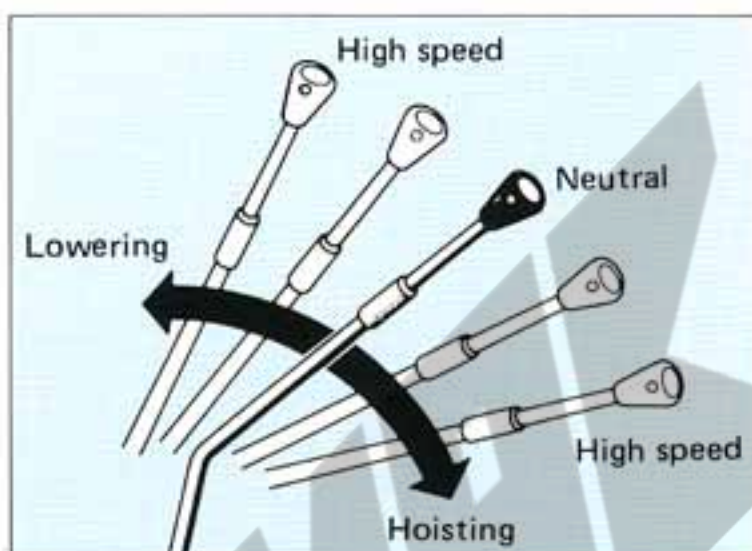
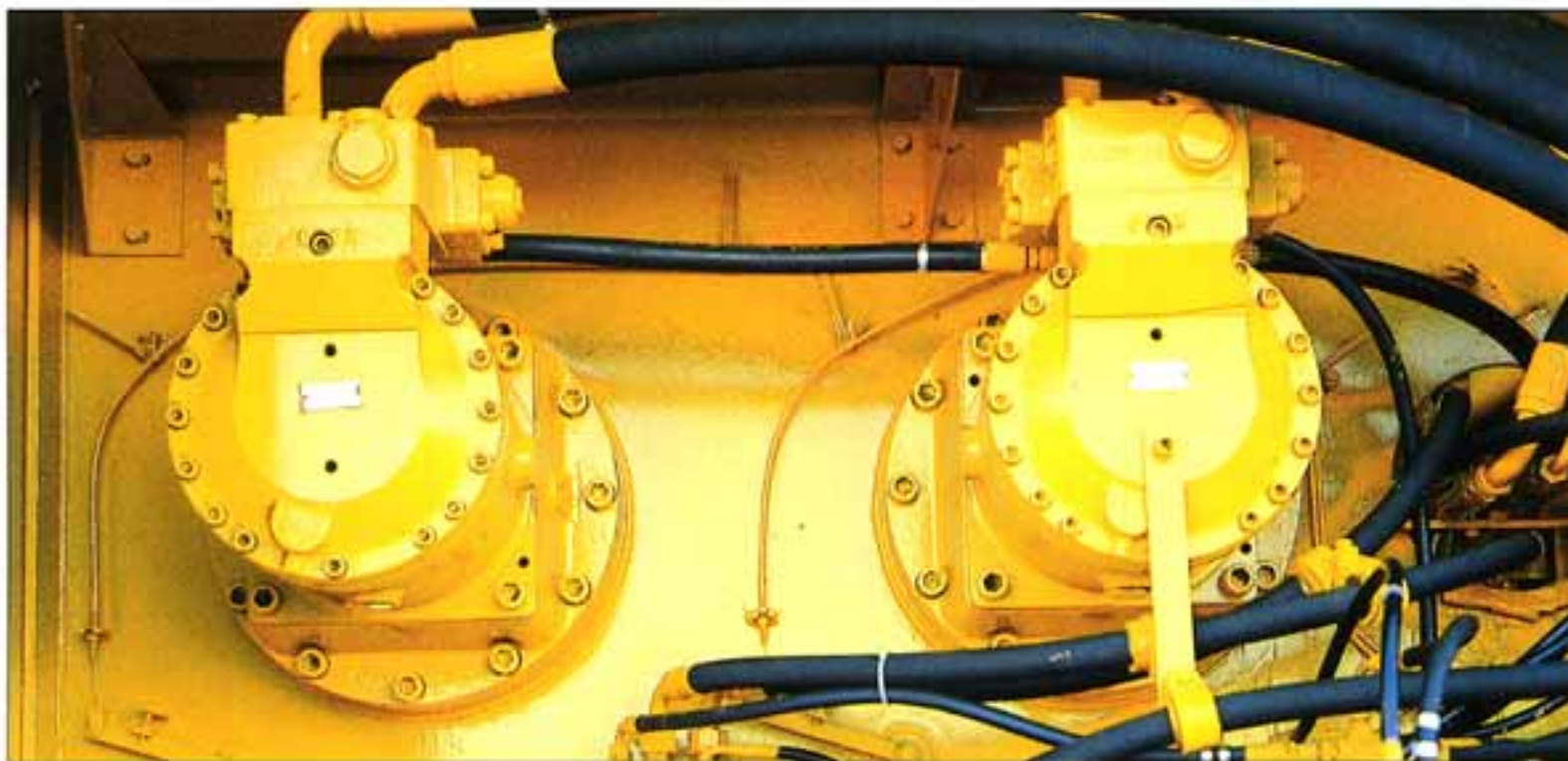
● Priority Given to Safety in Crane Operator's Cab

For maximum operator comfort and safety all instrumentation utilizes the very latest electronic technology has been located in the optimum position for visibility and ease of operation.

- Easy to use foot pedals have been attached to the winch levers for greater convenience in compound operations.



Independent Winches with Automatic Brakes Allow Freedom in Compound Operations Power, Speed, and Operability Are Better Than Ever



Fast, Efficient Operation Guaranteed Independent Winches with Automatic Braking

- The NK-400E-III features 2 independently-driven winches equipped with powerful automatic brakes. This feature is particularly useful in compound operations because the main and auxiliary winches are controlled by separate levers that permit them to perform hoisting and lowering operations independently yet at the same time. The result is faster operations and greater efficiency.
- The automatic brake prevents accidents resulting from incorrect operation, while the elimination of tiring pedal operations for the main and auxiliary winches represents a big reduction in operator workload.

2-Stage Speed Control Winch Provides Easy Control for Compound Operations

- For greater operational versatility, combined dual hydraulic circuits permit 2-stage speed control of the main and auxiliary winches by means of independent levers, enabling the operator to vary the speed of the two winches between high and low without any loss of hoisting power.



Highly Functional, Three-tiered Safety Construction

- The winch mechanism is equipped with three separate safety features: an automatic brake, a counter-balancing valve and a drum lock. These are designed to eliminate the danger arising from operating error and assure safer, more productive operation.

Reliable irregular winding prevention device

- The drum is grooved and equipped with a device to prevent irregularities in rope feeding. This not only keeps the rope winding smoothly but also prolongs rope life.

Non-rotating rope stays straight

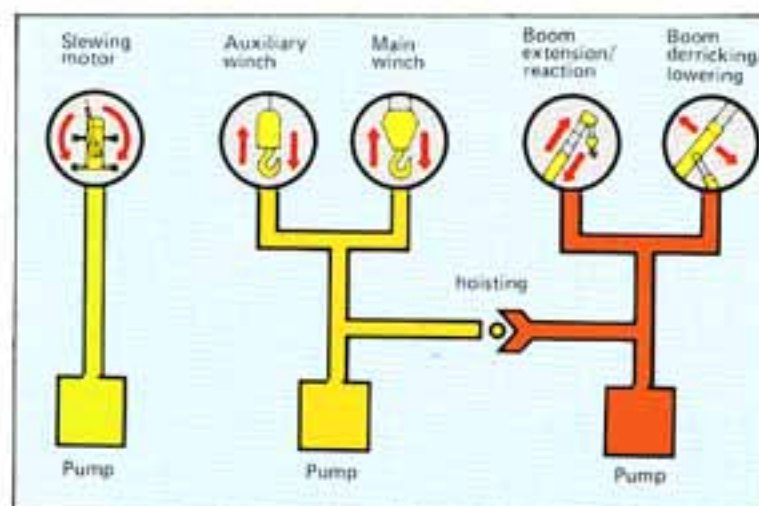
- The use of non-rotating rope prevents tangling during operations and damage to the rope caused by twisting of the hook, resulting in smoother, safer operations.



Smooth and Efficient Simultaneous Hoisting, Slewing and Boom Move- ment

- Simultaneous hoisting, slewing and boom extension/derricking. . .

A special hydraulic system comprising 3 powerful pumps permits 3 operations: (hoisting, lowering), (Boom extension/retraction, Boom derricking/lowering), (Slewing), to be carried out simultaneously and with outstanding speed and efficiency.



Scrupulous Care Taken with Safety Measures that Include a Variety of Safety Devices

- The most careful attention has been given to making the NK-400E-III safe. It has been fitted with all kinds of safety devices, including the ACS Moment Limiter, an overhoisting prevention device, a boom derricking safety device, automatic brakes, an outrigger locking mechanism and hydraulic relief valves. All cylinders mounted in the boom, outriggers and so on are fitted with specially designed safety valves.

Convenient Slewing System With Free-Lock Switching Is Easy to Use

- The slewing system can be locked for delicate slewing operation during high or heavy lifting work, or left free for repetitive operation.



NK-400E-III

FULLY HYDRAULIC TRUCK CRANE



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



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KATO NK-400E-III

FULLY HYDRAULIC TRUCK CRANE

RATED LIFTING CAPACITY (1)

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

Working radius (m)	With fully extended outriggers-over side and over rear					Without outriggers over rear 11.0m Boom
	11.0 Boom	15.0 Boom	19.0 Boom	27.0 Boom	35.0 Boom	
3.0	40.00	28.00	21.00			8.00
3.5	35.00	28.00	21.00			6.40
4.0	31.50	28.00	21.00	15.00		5.10
4.5	28.50	26.60	21.00	15.00		4.20
5.0	26.00	24.40	21.00	15.00		3.40
5.4	23.80	22.50	21.00	15.00		2.90
6.0	21.50	20.50	19.10	15.00	9.00	2.30
6.5	19.80	19.00	17.70	15.00	9.00	1.90
7.0	18.20	17.70	16.50	14.00	9.00	1.60
7.5	16.70	16.50	15.45	13.10	9.00	1.25
8.0	14.90	14.70	14.50	12.30	9.00	1.00
8.5	13.40	13.20	13.00	11.55	9.00	
9.0	12.15	11.95	11.80	10.90	8.60	
10.0		9.95	9.75	9.80	8.00	
11.0		8.35	8.15	8.90	7.40	
12.0		7.00	6.80	7.65	6.80	
13.0		5.85	5.70	6.55	6.25	
14.0			4.80	5.65	5.80	
16.0			3.45	4.25	4.60	
18.0				3.20	3.60	
20.0				2.40	2.85	
22.0				1.80	2.20	
24.0				1.30	1.70	
26.0					1.30	
28.0					1.00	
30.0					0.70	
Standard hook	for 40 tons			for 20 tons		for 40 tons
Hook weight	450kg			270kg		450kg
Parts of line	10	7	6	4	3	10
Critical boom angle					20°	

(Unit: metric ton)

JIB RATED LIFTING CAPACITY (2)

Boom angle (°)	With fully extended outriggers-over side and over rear					
	9.2m Jib			15.0m Jib		
	offset 5°	offset 17°	offset 30°	offset 5°	offset 17°	offset 30°
81	4.00	3.00	2.00	2.70	1.60	1.20
79	4.00	3.00	2.00	2.70	1.60	1.20
77	4.00	3.00	2.00	2.45	1.60	1.20
76	3.86	2.90	2.00	2.30	1.60	1.20
74	3.50	2.67	2.00	2.06	1.51	1.20
72	3.18	2.47	2.00	1.87	1.40	1.16
70	2.91	2.30	1.88	1.70	1.28	1.08
68	2.68	2.15	1.78	1.56	1.20	1.01
66	2.48	2.01	1.70	1.43	1.12	0.99
64	2.32	1.90	1.60	1.33	1.07	0.97
62	2.06	1.78	1.53	1.22	1.03	0.95
60	1.75	1.62	1.46	1.13	1.00	0.93
58	1.45	1.37	1.30	1.06	0.99	0.92
56	1.20	1.16	1.08	0.98	0.90	0.83
54	0.98	0.95	0.87	0.76	0.71	0.67
52	0.78	0.76	0.71	0.58	0.57	0.55
50	0.60	0.60	0.55	0.45	0.45	0.45
48	0.45	0.43	0.40			
Critical boom angle	47°	47°	47°	49°	49°	49°
Standard hook	for 4 tons (120kg weight)					

(Unit: metric ton)

(Notes)

1) The rated lifting capacities indicate the maximum guaranteed load for this model operating on a firm level ground. They include the weight of hook block and other hoisting equipments. The figures in the blue areas are based on the mechanical strength of the crane.

Hook	for 40 ton	for 20 ton	for 4 ton
Weight (kg)	450	270	120

2) The working radii as given in table are the actual values including the deflection of booms and jibs. Therefore operate the crane based on the working radius. However, jib operation should be performed in accordance with the boom angle.

3) The rated lifting capacities for operation without outrigger are based on best condition of the tire air pressure and the ground surface.

4) The rated lifting capacities for the rooster sheave are equivalent to the rated lifting capacities for the boom with an upper limit of 4,000 kg. However, when hoisting equipment, etc., is attached to the boom, the weight of the hoisting equipment (ex. hook block for rooster sheave) plus the weight of the hoisting equipment attached to the boom (ex. hook block for main boom) should be subtracted from the rated lifting capacities.

5) If the boom length exceeds the specified value, refer to the rated lifting capacities for the boom length and the next highest boom length. The crane should be operated within the smaller lifting capacity.

6) When using the boom with the jib installed, 2,000 kg plus the hoisting equipment, etc., should be subtracted from the rated lifting capacities. The rooster sheave should not be used.

7) Critical boom angles for each boom length are shown bottommost line. If the boom angle is lowered to less than critical boom angle, the crane will tip over. Therefore, never lower the boom below these angles.

8) The standard number of parts of line is shown in the rated lifting capacity tables. 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 4000 kg.

9) In principal, free fall should only be allowed with the hook only, but when free fall under laden conditions cannot be avoided, a limit of 20% of the rated lifting capacity should be set and sudden braking must be avoided at all costs.

10) Over front lifting performance is inferior to over side/over rear lifting performance. Great care should be taken when transferring from over side to over front since there is a danger of overloading.

11) When optional front jack is extended, over front performance is the same as over side/over rear performance. Therefore, in case outriggers are fully extended, please refer to the Rated lifting capacity table (1) and (2). In case outriggers are intermediately extended, please refer to the Rated lifting capacity table (3) and (4).

RATED LIFTING CAPACITY (3)

With intermediately extended outriggers-360° full range With fully extended outriggers-over front					
Working radius (m)	11.0m Boom	15.0 Boom	19.0 Boom	27.0 Boom	35.0 Boom
3.0	24.00	20.00	16.00		
3.5	24.00	20.00	16.00		
4.0	24.00	20.00	16.00	12.00	
4.5	24.00	20.00	16.00	12.00	
5.0	22.00	20.00	16.00	12.00	
5.5	17.20	16.80	16.00	12.00	
6.0	13.85	13.50	13.30	12.00	6.00
6.5	11.50	11.20	10.95	12.00	6.00
7.0	9.70	9.45	9.20	10.25	6.00
7.5	8.30	8.00	7.80	8.80	6.00
8.0	7.15	6.85	6.65	7.65	6.00
8.5	6.20	5.90	5.70	6.70	6.00
9.0	5.30	5.10	4.95	5.90	6.00
10.0		3.90	3.70	4.60	5.10
11.0		2.95	2.80	3.65	4.10
12.0		2.20	2.00	2.90	3.35
13.0		1.60	1.40	2.30	2.70
14.0				1.80	2.20
15.0				1.40	1.80
16.0					1.40
17.0					1.10
Standard hook	for 40 tons			for 20 tons	
Hook weight	450kg			270kg	
Parts of line	10	7	6	4	3
Critical boom angle			37°	52°	57°

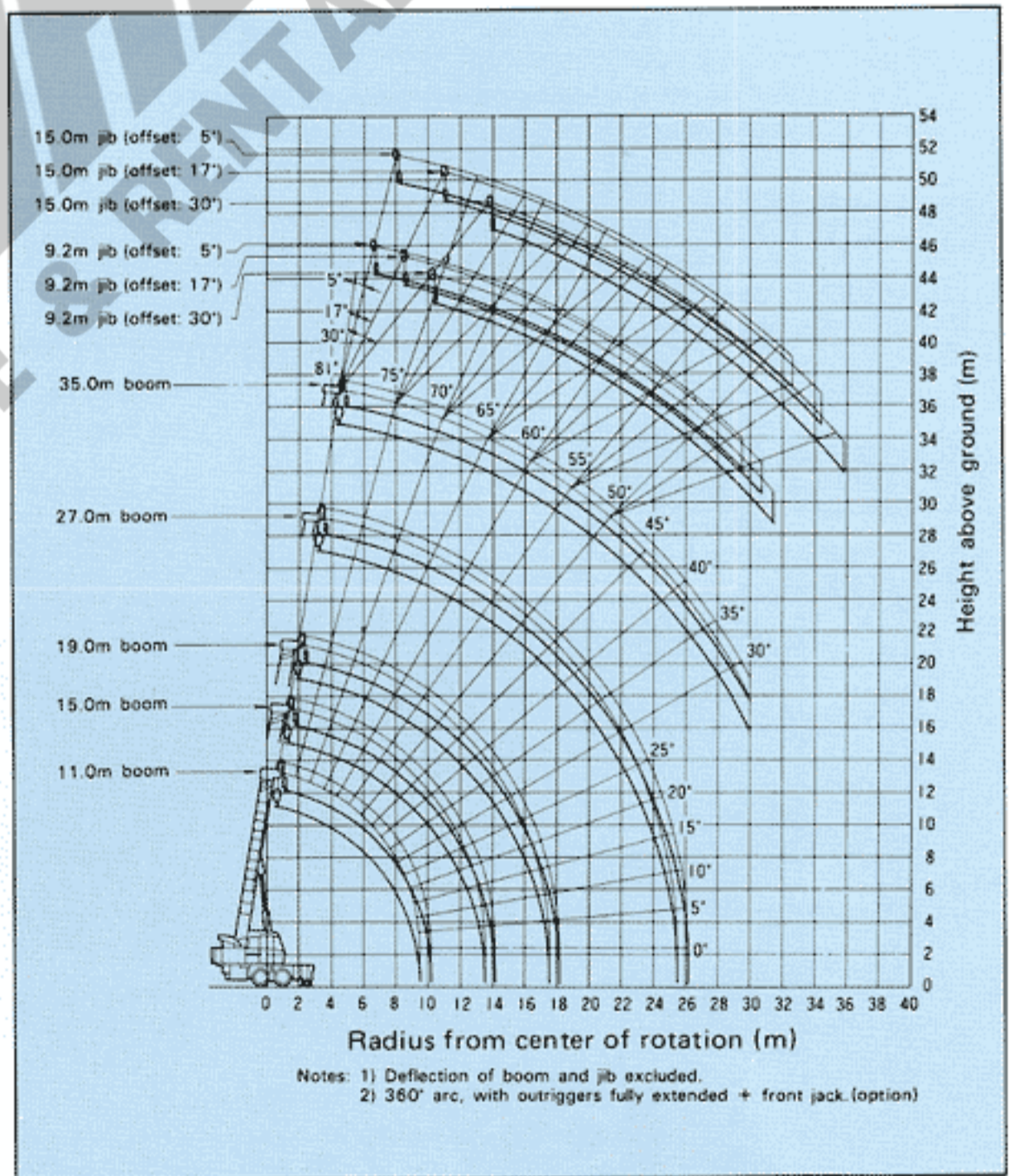
(Unit: metric ton)

JIB RATED LIFTING CAPACITY (4)

With intermediately extended outriggers-360° full range With fully extended outriggers-over front						
Boom angle (°)	9.2m Jib			15.0m Jib		
	Offset 5°	Offset 17°	Offset 30°	Offset 5°	Offset 17°	Offset 30°
81	4.00	3.00	2.00	2.70	1.60	1.20
79	4.00	3.00	2.00	2.70	1.60	1.20
77	3.50	3.00	2.00	2.45	1.60	1.20
76	3.15	2.66	2.00	2.30	1.60	1.20
75	2.82	2.35	2.00	2.18	1.59	1.20
74	2.50	2.08	1.80	1.86	1.51	1.20
73	2.21	1.81	1.56	1.63	1.33	1.07
72	1.95	1.57	1.37	1.42	1.15	0.91
70	1.43	1.15	1.03	1.05	0.85	0.72
68	1.00	0.80	0.75			
Critical boom angle	67°	67°	67°	69°	69°	69°
Standard hook	for 4 tons (120kg weight)					

(Unit: metric ton)

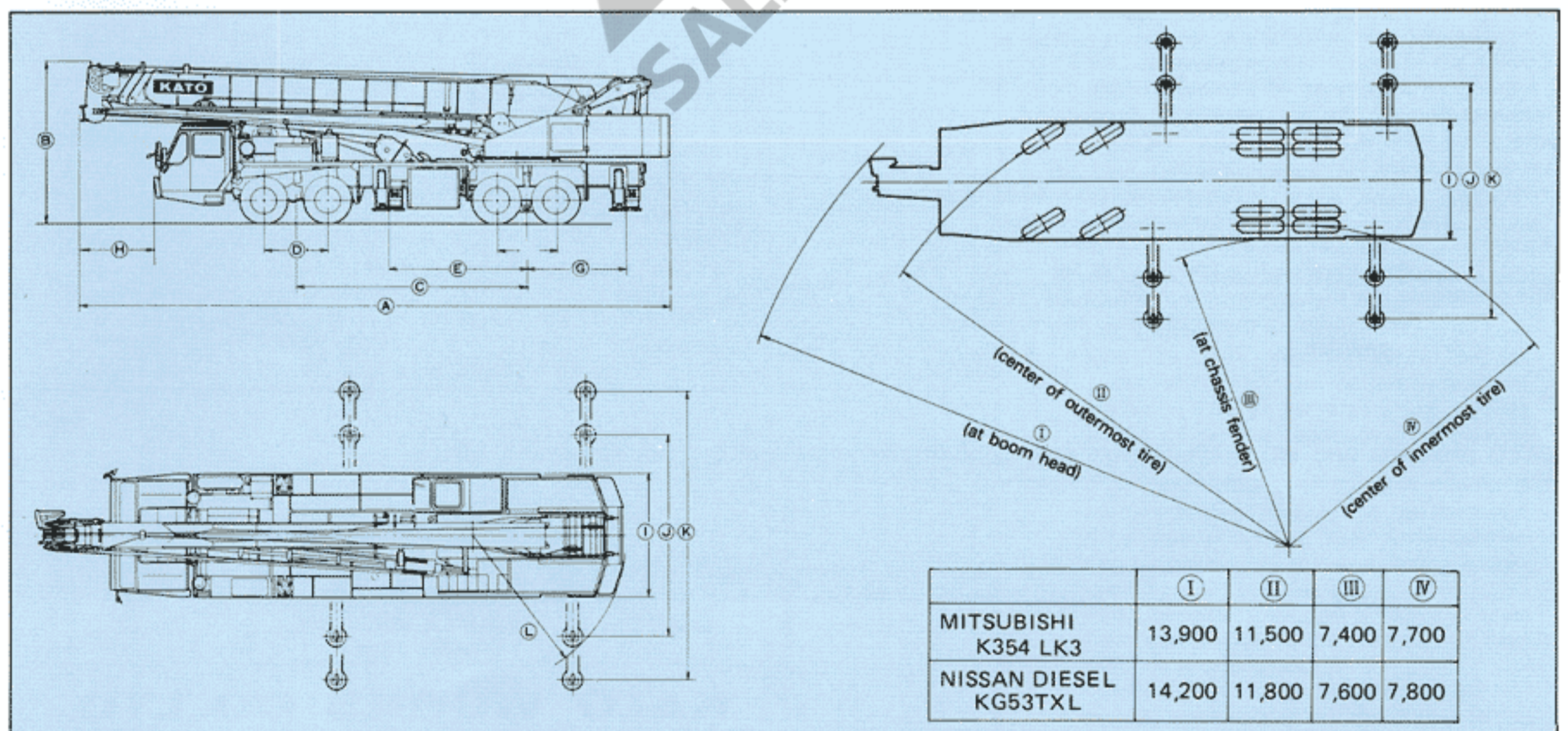
WORKING RANGES



SUPERSTRUCTURE SPECIFICATIONS

Name and Type		KATO NK-400E-III FULLY HYDRAULIC CRANE
Performance		
Crane Capacity		40.0t x 3.0m 11m Boom with outriggers over side and over rear
		28.0t x 4.0m 15m Boom with outriggers over side and over rear
		21.0t x 5.4m 19m Boom with outriggers over side and over rear
		15.0t x 6.5m 27m Boom with outriggers over side and over rear
		9.0t x 8.5m 35m Boom with outriggers over side and over rear
		4.0t Rooster sheave outriggers over side and over rear
		4.0t x 77° 9.2m jib (offset 5') outriggers over side and over rear
		3.0t x 77° 9.2m jib (offset 17') outriggers over side and over rear
		2.0t x 72° 9.2m jib (offset 30') outriggers over side and over rear
		2.7t x 79° 15.0m jib (offset 5') with outriggers over side and over rear
		1.6t x 76° 15.0m jib (offset 17') with outriggers over side and over rear
		1.2t x 74° 15.0m jib (offset 30') with outriggers over side and over rear
	8.0t x 3.0m 11m Boom over side and over rear	
Boom length	Basic	11m
	Max.	35m
Jib length		9.2 ~ 15m
Max. lifting height		34.8m (35m Boom)
		49.7m (35m Boom + 15.0m Jib)
Main hoisting line speed		119m/min (3rd layer)
Auxiliary hoisting line speed		111m/min (2nd layer)
Main hook hoisting speed		11.9m/min (3rd layer, 10-parts of line)
Auxiliary hook hoisting speed		111m/min (2nd layer, 1-part of line)
Boom derricking time		43 sec (-2° ~ 81°)
Boom derricking angle		-2° ~ 81°
Slewing speed		2.3 r.p.m.

Hydraulic System									
Hydraulic pump	High pressure gear type, 3 section								
Hoisting motor	Axial piston type								
Slewing motor	Axial piston type								
Control valve	Multiple automatic return type								
Cylinder	High-pressure doubleacting type								
Superstructure									
Hoisting device	Hydraulic motor-driven planetary gear speed reduction type (with free fall device and automatic brake system) Single winch x 2								
Slewing device	Hydraulic motor-driven cycloid gear speed reduction type with built-in negative brakes and free/lock switching								
Slewing circle	Ball bearing type								
Boom derricking device	Direct-acting cylinder type								
Outrigger system	Hydraulic, vertically supporting with float and vertical cylinder in single unit								
Front jack (option)	Hydraulic, vertically supporting with float and vertical cylinder in single unit								
Hoisting Ropes									
Main	U4 x ses (39) φ 18 x 160m								
Auxiliary	U4 x ses (39) φ 18 x 110m								
Safety Device									
	Microcomputer type ACS fully automatic overload protection device (Moment Limiter), Boom free fall prevention device, Overhoisting prevention device, Drum lock device, Drum hold safety device, Automatic brake, Irregular winding prevention device, Hydraulic circuit safety system, Outrigger lock device, Boom angle indicator, Slewing lock system								
Option									
	<table border="0"> <tr> <td>Cooler</td> <td rowspan="5">} Crane cabin</td> </tr> <tr> <td>Voice alarm</td> </tr> <tr> <td>Radio</td> </tr> <tr> <td>Fan</td> </tr> <tr> <td>Heater</td> </tr> <tr> <td>Front jack</td> <td></td> </tr> </table>	Cooler	} Crane cabin	Voice alarm	Radio	Fan	Heater	Front jack	
Cooler	} Crane cabin								
Voice alarm									
Radio									
Fan									
Heater									
Front jack									



Carrier name and model	A	B	C	D	E	F	G	H	I	J	K	L
MITSUBISHI K354 LK3	13,450	3,750	5,250	1,450	3,150	1,350	2,250	1,780	2,750	4,600	6,600	3,520
NISSAN DIESEL KG53TXL	13,470	3,700	5,215	1,470	3,350	1,400	2,100	2,290	2,820	4,600	6,600	3,520

KATO NK-400E-III

FULLY HYDRAULIC TRUCK CRANE

CARRIER SPECIFICATIONS

MITSUBISHI K354LK3

Maximum traveling speed	75km/h
Gradeability (tan θ)	31.1% (computed, @ G.V.W. = 35800kg)
Minimum turning radius (center of extreme outer tire)	11.5m

General dimensions

Overall length	approx. 13450mm
Overall width	approx. 2750mm
Overall height	approx. 3750mm
Wheel base	5250mm
Treads	Front 2040mm
	Rear 1845mm
Center to center of extended outriggers	6600mm (Fully extended) 4600mm (Intermediately extended)
Gross weight	approx. 35800kg
	Front approx. 12800kg
	Rear approx. 23000kg

Carrier

Maker	MITSUBISHI
Model	K354LK3
Drive system	8 x 4

Engine

Maker	MITSUBISHI
Model	8DC8-2A
Type	4 cycle, water cooled, diesel
Number of cylinder	8 - 90°V
Piston displacement	14886cc
Max. output horsepower	290 ps/2300 r.p.m. 213 kw/2300 r.p.m.
Max. output torque	99 kg-m/1400 r.p.m. 970 N-m/1400 r.p.m.
Clutch	Single dry plate, hydraulic control with air booster
Transmission	10 forward & 2 reverse speed synchromesh and constantmesh gear
Axles	Front Reverse "ELLIOT" type
	Rear Full floating type
Steering	Ball nut type with power booster
Suspension	Front Semi-elliptic leaf springs
	Rear Equalizer beams and torque rods
Brake	Service 2 circuit air brake, 8 wheels internal expanding type
	Parking Spring loaded brake, acting on 4 rear wheels variable air operated
	Auxiliary Exhaust brake
Electric system	24V
Battery	12V - 140AH x 2
Fuel tank capacity	300 lit.
Driver's cab	All steel welded construction 2 persons, low line type
Tire size	Front 11.00 - 20 - 16 PR
	Rear (dual tire) 11.00 - 20 - 16 PR

Note : The output is in accordance with JIS D1004, 1976.
Rated power output guaranteed within 15% at standard
ambient condition.

NISSAN DIESEL KG53TXL

Maximum traveling speed	68km/h
Gradeability (tan θ)	29% (computed, @ G.V.W. = 35700kg)
Minimum turning radius (center of extreme outer tire)	11.8m

General dimensions

Overall length	approx. 13470mm
Overall width	approx. 2820mm
Overall height	approx. 3700mm
Wheel base	5215mm
Treads	Front 2270mm
	Rear 2110mm
Center to center of extend outriggers	6600mm (Fully extended) 4600mm (Intermediately extended)
Gross weight	approx. 35700kg
	Front approx. 13400kg
	Rear approx. 22300kg

Carrier

Maker	NISSAN DIESEL
Model	KG53TXL
Drive system	8 x 4

Engine

Maker	NISSAN DIESEL
Model	RE8
Type	4 cycle, water cooled, diesel
Number of cylinder	8 - V
Piston displacement	15115 cc
Max. output horsepower	315 ps/2300 r.p.m. 231 kw/2300 r.p.m.
Max. output torque	105 kg-m/1400 r.p.m. 1029 N-m/1400 r.p.m.

Note: The output is in accordance with JIS D1004, 1976.
Rated power output guaranteed within 5% at standard
ambient condition.

Clutch	Single dry plate, hydraulic control with air booster
Transmission	5 forward & 1 reverse speed, synchromesh and constantmesh gear
Axles	Front Reverse "ELLIOT" type
	Rear Full floating type
Steering	Ball nut type with power booster
Suspension	Front Semi-elliptic leaf springs
	Rear Equalizer beams and torque rods
Brake	Service 2 circuit air brake, 8 wheels internal expanding type
	Parking Mechanical, internal expanding type acting on drum at transmission case rear
	Auxiliary Exhaust brake
Electric system	24V
Battery	12V - 120AH x 2
Fuel tank capacity	300 lit.
Driver's cab	Steel, two men, semi under floor type, one side cab
Tire size	Front 11.00 - 20 - 16 PR
	Rear (dual tire) 11.00 - 20 - 16 PR

KATO products and specifications are subject to improvements and changes without notice.



KATO WORKS CO., LTD.

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