

KATO

NK-500E

FULLY HYDRAULIC TRUCK CRANE

ACS *Moment Limiter*

Lifting Capacity

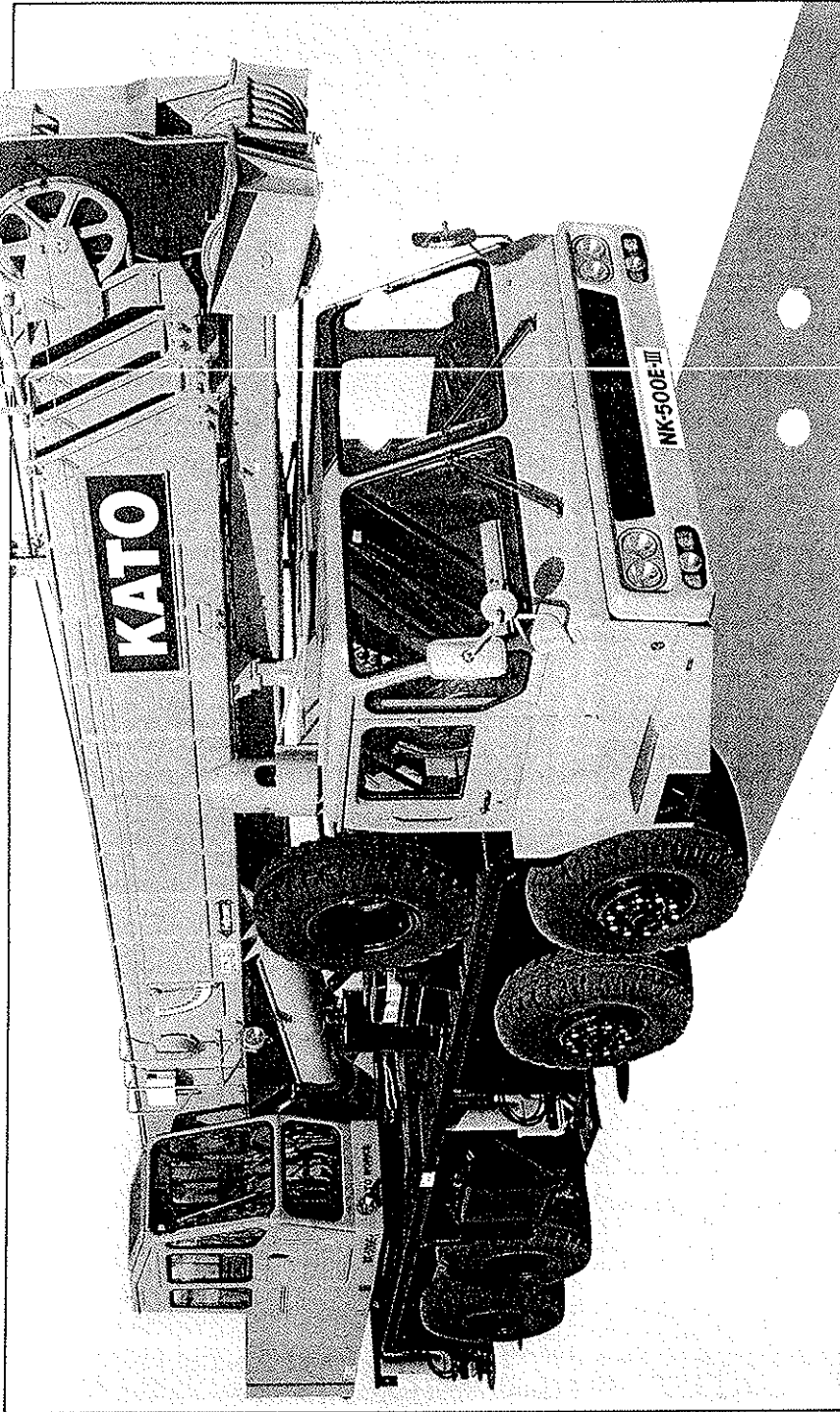
50.5 Ton
Metric



KATO WORKS CO., LTD.

Power That Won't Quit

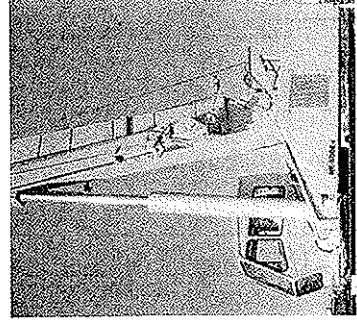
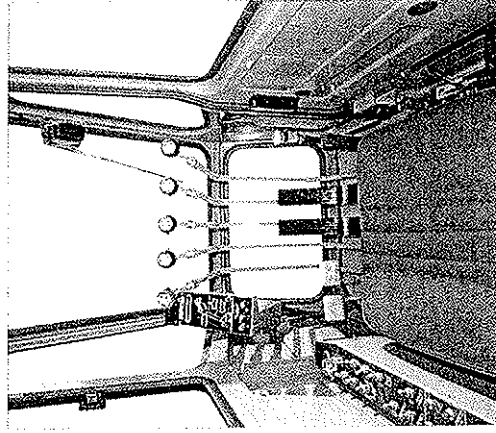
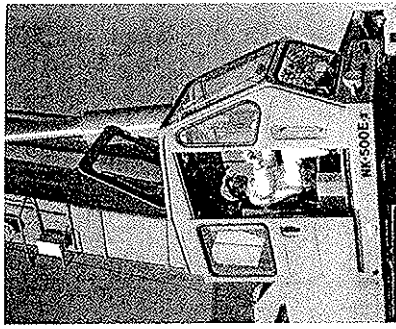
Amazing Power is Proof of the E of KATO Technology



ALL-ROUND COMFORT! SPACIOUS CAB GUARANTEES 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 length 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 that helps banish fatigue even during extended periods of operation.

Priority Given to Safety in Operator's Cab for maximum operator comfort and safety every instrumentation utilizes the very latest electronic technology and has been located in the optimum position for visibility and ease of operation.



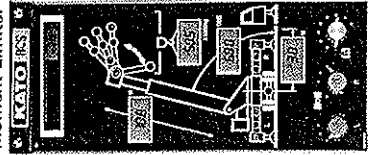
FORWARD-ACTING DERRICK CYLINDER DELIVERS DEEP DERRICKING RANGE

The powerful forward-acting derrick cylinder greatly facilitates operations by giving the NK-500E-III a derricking range of .2 to .8: extending reach, and making job housing procedures simpler.

CONVENIENT SLEWING SYSTEM WITH FREE-LOCK SWITCHING.

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

COMPULOAD Moment Limiter



The CompuLoad Moment Limiter has been simplified for the purpose of maximum safety. The status shown is not an actual working condition.

Microcomputer Control System for Unwavering Safety and Reliability

Technologically Advanced Voice Alarm

Checks and overloads sound of female voice to provide start-up checks and overload warnings. (Voice alarm is available as an option.)



CONSTANT FIVE-POINT DISPLAY OF OPERATING CONDITION

Panel indicators have been replaced by digital displays that show safety level, boom angle, boom length, working radius and critical load at all times, without troublesome button operations. For further safety, the display of safety level is color-coded 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.



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 every operation.

NK-500E-III

Maximum Lifting Capacity	50.5t
Maximum Boom Length	40m
Maximum Lifting Height (boom)	39.8m
(jib)	54.7m
	(1.5m jib offset)



RELIABLE OPERATION GUARANTEED INDEPENDENT WINCHES WITH AUTOMATIC BRAKING

- The NK-500E-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 WINCHES PROVIDE 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 two winches between high and low without any loss of hoisting power.
- Easy to use pedals have been attached to the winch levers for greater convenience in compound operations.



HIGHLY FUNCTIONAL, THREE SAFETY MEASURES

- 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.

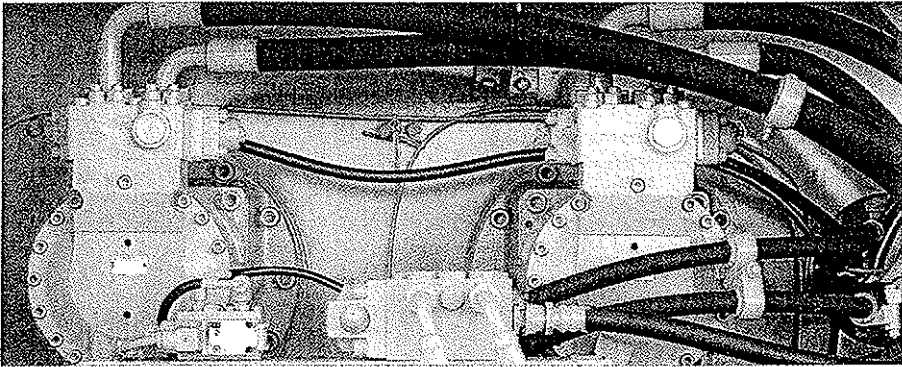
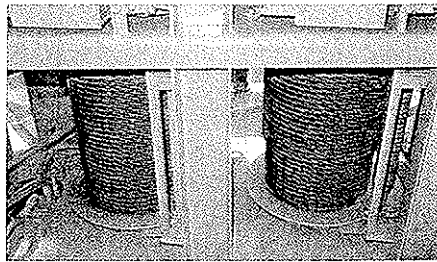
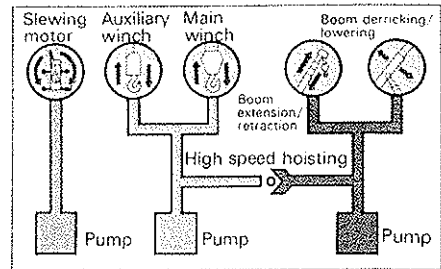
Non-rotating rope stays straight

- 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.



POWERFUL, SMOOTH SIMULTANEOUS OPERATION

- **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.



MICROCOMPUTER CONTROLS PERFORMANCE ACCORDING TO OUTRIGGER STATUS

- **Sturdy, Fully Hydraulic Outriggers** The outriggers are designed for 2-stage extension (7.20m maximum stroke and 4.85m at intermediate stroke) for greater stability during operations on restricted sites. Messy float mounting and dismounting operations have been eliminated by incorporating the floats into a single unit with the vertical cylinders, thus helping to reduce operation time. Ample road clearance permits the simple setting of wooden planks.

OPTIONAL HYDRAULIC FRONT JACK PROVIDES EXCELLENT 360 LIFTING CAPABILITIES

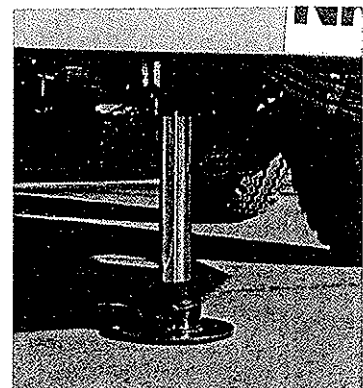
- A hydraulic jack installed under the front extremity of the carrier chassis enables the crane to offer the same lifting performance in all directions. This means that there are fewer limitations caused by the orientation of the crane when it enters a site, so the crane has a greater operational range.

Intermediate Extension of Outriggers for Outstanding Performance



Intermediate stroke 4.85m

Maximum stroke 7.20m



• Hydraulic front jack (option)

Exceptionally Wide Operating Range Amazing On-the-job Operating Performance

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



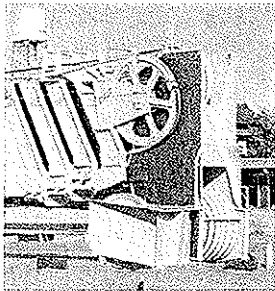
THE CRYSTALLIZATION OF ADVANCED TECHNOLOGY NEWLY DESIGNED STURDY FULL POWER BOOM CUTS DEFLECTION WAY DOWN

- 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 10.8m (fully retracted) to high lifts at 40.0m (fully extended).

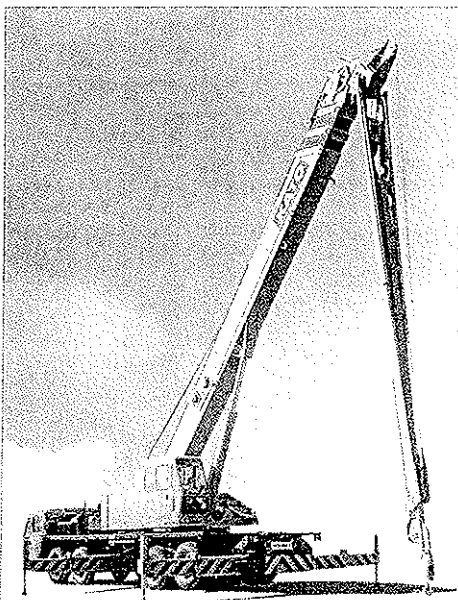
ROPE DURABILITY DRAMATICALLY IMPROVED BY ENLARGED SHEAVES

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



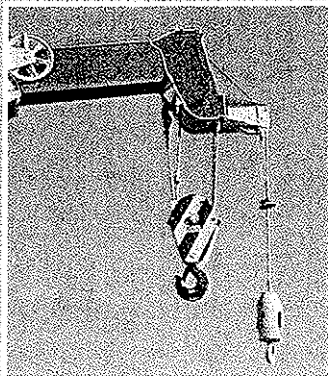
CONVENIENT, FORWARD-EXTENDIBLE JIB EASY TO SET UP EVEN AT SMALL SITES

- 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 than sideways-extending jibs.



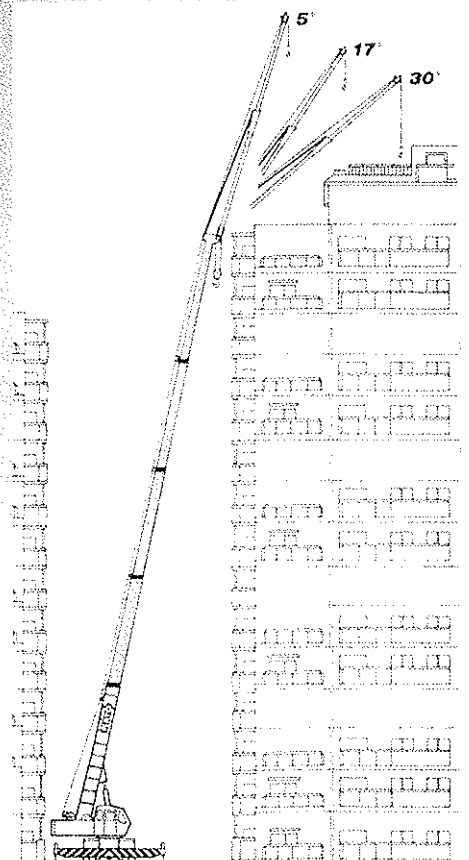
IDEAL FOR HIGH-LIFT AND CLOSE-IN OPERATIONS 3-STAGE JIB OFFSET

- The NK-500E-III features a new three-stage offset jib designed to operate at 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.



- Convenient rooster sheave for single rope lifting operations

Extra-long boom ideal for close-in, high-lift work!



KATO NK-500E-III

FULLY HYDRAULIC TRUCK CRANE

RATED LIFTING CAPACITY (1)

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

NOTE: 360° full working range is available with optional front jack.

Working radius (m)	With fully extended outrigger-over side and over rear					Without outriggers over side & over rear 10.8m Boom
	10.8m Boom	18.1m Boom	25.4m Boom	32.7m Boom	40.0m Boom	
3.0	50.50	28.00				8.00
3.5	42.20	28.00	18.00			6.40
4.0	37.00	28.00	18.00			5.10
4.5	33.00	28.00	18.00			4.20
5.0	30.20	28.00	18.00	13.00		3.40
5.5	27.50	25.60	18.00	13.00		2.80
6.0	25.00	23.50	18.00	13.00		2.30
6.5	22.70	21.80	18.00	13.00	7.50	1.90
7.0	20.70	20.00	16.80	13.00	7.50	1.60
7.5	18.90	18.50	15.70	13.00	7.50	1.25
8.0	17.40	17.00	14.80	12.30	7.50	1.00
8.5	15.65	15.40	14.00	11.60	7.50	
9.0	14.00	13.85	13.20	11.00	7.50	
9.5		12.50	12.20	10.50	7.50	
10.0		11.40	11.15	10.00	7.30	
11.0		9.50	9.40	9.10	6.80	
12.0		8.00	7.90	8.30	6.30	
13.0		6.80	6.60	7.40	5.90	
14.0		5.80	5.60	6.40	5.50	
16.0		4.25	4.00	4.80	4.70	
18.0			2.80	3.60	4.00	
20.0			1.85	2.70	3.25	
22.0			1.20	2.00	2.50	
24.0			0.60	1.40	1.90	
26.0				0.90	1.40	
28.0				0.50	1.00	
30.0					0.65	
31.0					0.50	
Parts of line	12	7	5	4	3	12
Critical boom angle					35°	

(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 50.5 ton	for 20 ton	for 4 ton
Weight (kg)	500	270	120

2) The tabulated working radii are the actual values including boom deflection under laden condition. The crane must be operated on the basis of the those figures. However, the working radii shown for jib operations are based on the values obtained when the boom is fully extended (40m). Jib operations should be performed on the basis of boom angle only, regardless of boom length.

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 4,000kg. 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, 2,000kg plus the weight of 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.

RATED LIFTING CAPACITY (2)

Boom Angle	With fully extended outriggers — over side and over rear						
	9.2m Jib			Boom Angle	15m Jib		
	Offset 5°	Offset 17°	Offset 30°		Offset 5°	Offset 17°	Offset 30°
81°	3.50	2.70	2.00	81°	2.50	1.60	1.00
80°	3.50	2.70	2.00	79°	2.50	1.60	1.00
79°	3.50	2.66	2.00	78°	2.50	1.55	1.00
78°	3.50	2.54	2.00	77°	2.35	1.48	1.00
77°	3.32	2.42	1.94	76°	2.22	1.42	0.97
76°	3.13	2.32	1.88	75°	2.10	1.36	0.96
75°	2.97	2.22	1.83	74°	1.98	1.31	0.94
74°	2.82	2.13	1.78	72°	1.78	1.22	0.90
72°	2.55	1.95	1.67	70°	1.61	1.14	0.87
70°	2.33	1.81	1.58	68°	1.48	1.07	0.83
68°	2.14	1.69	1.48	66°	1.36	1.00	0.81
66°	1.97	1.58	1.40	64°	1.26	0.95	0.78
64°	1.83	1.48	1.31	62°	1.16	0.90	0.75
62°	1.71	1.40	1.24	60°	1.08	0.86	0.73
60°	1.51	1.32	1.17	58°	1.01	0.82	0.72
59°	1.38	1.28	1.14	57°	0.90	0.79	0.71
58°	1.23	1.18	1.10	56°	0.80	0.74	0.70
56°	1.02	0.95	0.90	54°	0.60	0.55	0.52
54°	0.80	0.72	0.69				
52°	0.60	0.52	0.50				
Parts of line	1			Parts of line	1		
Critical boom angle	51°			Critical boom angle	53°		

(Unit: metric ton)

RATED LIFTING CAPACITY (3)

(Unit: metric ton)

Working radius (m)	With intermediately extended outriggers – 360° full range				
	With fully extended outriggers – over front				
	10.8m Boom	18.1m Boom	25.4m Boom	32.7m Boom	40.0m Boom
3.0	32.00	20.00			
3.5	32.00	20.00	15.00		
4.0	32.00	20.00	15.00		
4.5	27.00	20.00	15.00		
5.0	20.20	20.00	15.00	10.00	
5.5	15.85	15.60	15.00	10.00	
6.0	12.85	12.55	12.35	10.00	
6.5	10.60	10.30	10.00	10.00	6.00
7.0	8.90	8.60	8.40	9.45	6.00
7.5	7.50	7.25	7.10	8.10	6.00
8.0	6.40	6.20	6.00	7.00	6.00
9.0	4.80	4.55	4.30	5.30	6.00
10.0		3.25	3.05	4.10	4.65
11.0		2.25	2.05	3.05	3.70
12.0		1.45	1.25	2.20	2.90
13.0				1.55	2.25
14.0				1.05	1.70
15.0					1.25
Parts of line	12	7	5	4	3
Critical boom angle		40°	59°	63°	67°

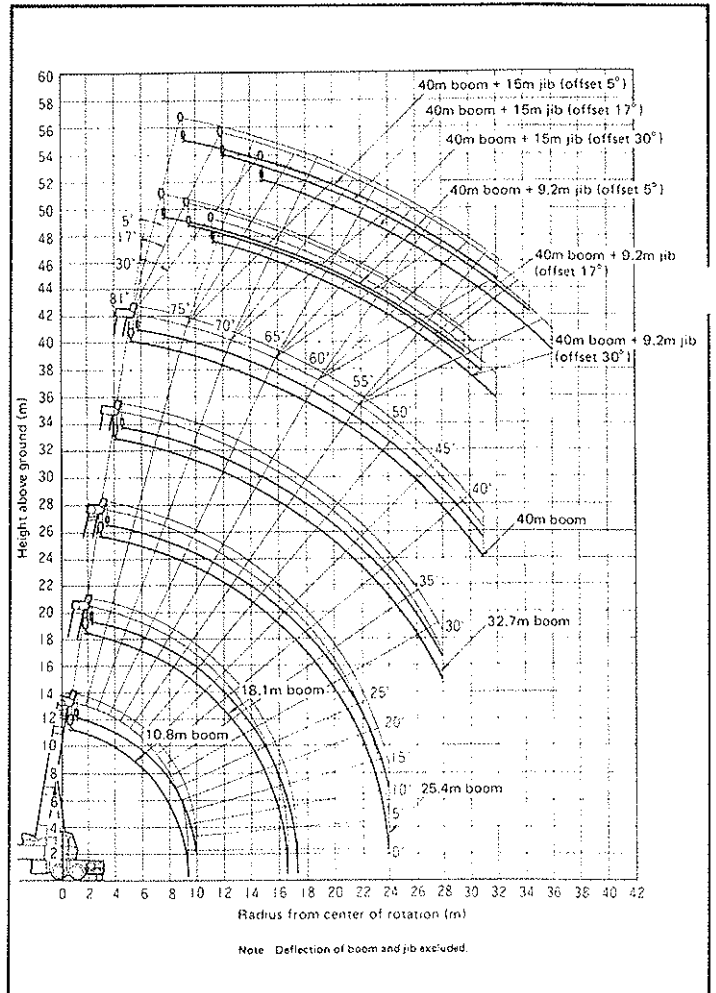
- 8) The minimum number of parts of line is determined so that the weight per part will not exceed 4,000kg. The number of parts of line for the various boom lengths (with a standard hook) is as follows:
- 9) In principal, free fall should only be allowed with the hook only, but when free fall under laden 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 (4)

(Unit: metric ton)

With intermediately extended outriggers – 360° full range							
With fully extended outriggers – over front							
Boom Angle	9.2m Jib			Boom Angle	15m Jib		
	Offset 5°	Offset 17°	Offset 30°		Offset 5°	Offset 17°	Offset 30°
81°	3.50	2.70	2.00	81°	2.50	1.60	1.00
80°	3.50	2.70	2.00	79°	2.50	1.60	1.00
79°	3.50	2.66	2.00	78°	2.50	1.55	1.00
78°	3.43	2.54	2.00	77°	2.20	1.48	1.00
77°	2.88	2.42	1.94	76°	1.87	1.42	
76°	2.44	2.11	1.81	75°	1.58		
75°	2.06	1.75					
74°	1.73						
Parts of line	1			Parts of line	1		
Critical boom angle	73°	74°	75°	Critical boom angle	74°	75°	76°

WORKING RANGES



SUPERSTRUCTURE SPECIFICATIONS

Name and Type: NK-500E-III FULLY HYDRAULIC TRUCK CRANE

• Performance

Crane capacity: 50.5t x 3m 10.8m boom with outriggers, over rear & side
 28t x 5m 18.1m boom with outriggers, over rear & side
 18t x 6.5m 25.4m boom with outriggers, over rear & side
 13t x 7.5m 32.7m boom with outriggers, over rear & side
 7.5t x 9.5m 40m boom with outriggers, over rear & side
 4t Rooster sheave with outriggers, over rear & side
 3.5t x 78° 9.2m jib (offset 5°) with outriggers,
 over rear & side
 2.7t x 80° 9.2m jib (offset 17°) with outriggers,
 over rear & side
 2.0t x 78° 9.2m jib (offset 30°) with outriggers,
 over rear & side
 2.5t x 78° 15.0m jib (offset 5°) with outriggers,
 over rear & side
 1.6t x 79° 15.0m jib (offset 17°) with outriggers,
 over rear & side
 1.0t x 77° 15.0m jib (offset 30°) with outriggers,
 over rear & side
 8t x 3m 10.8m boom without outriggers,
 over rear & side

Boom length: Basic 10.8m
 Maximum 40.0m

Jib length: 9.2m ~ 15.0m (2 section)

Maximum lifting height: 39.8m (40.0m boom)
 54.7m (40.0m boom + 15.0m jib offset 5°)

Hook Line Main 119m/min (3rd layer)
 Speed: Auxiliary 111m/min (2nd layer)
 Hook Hoisting Main 9.9m/min (3rd layer, 12 parts line)
 Speed: Auxiliary 111m/min (2nd layer, 1 part line)
 Boom lifting time: 58 sec (-2° ~ 81°)
 Boom derricking angle: -2° ~ 81°
 Slewing speed: 2.4rpm

• Hydraulic System

Hydraulic pump: 3 section gear type
 Hydraulic Hoisting motor Axial piston type
 Hydraulic Slewing motor Axial piston type
 Control valve: Multiple automatic return type
 Cylinders: High-pressure double-acting type

• Superstructure

Hoisting mechanism: Hydraulic motor-driven; planetary gear speed reduction type (with free fall device and automatic brake system)
 Single winch x 2
 Slewing mechanism: Hydraulic motor driven, spur gear speed reduction type with built-in negative brakes and free/lock switching
 Slewing circle: Ball bearing type
 Boom derricking mechanism: 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: ϕ 18 x 180m Non-rotating type
 Auxiliary: ϕ 18 x 120m Non-rotating type

• Safety Equipment

Microcomputer type ACS fully automatic over load protection device (Moment Limiter), Boom free falling safety device, Overhoist 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 device

• Optional equipment

Cooler, Heater and Fan, Radio for crane cabin, Front jack, Voice Alarm device for ACS

CARRIER SPECIFICATIONS

Maximum traveling speed : 80km/h
 Gradeability (tan θ) : 27% (computed @ G.V.W. = 39,200kg)
 Minimum turning radius
 (center of extreme outer tire) : 11.5m

• General dimensions

Overall length : approx. 13,300mm
 Overall width : approx. 2,750mm
 Overall height : approx. 3,800mm
 Wheel base : 5,250mm
 Treads; Front : 2,240mm
 Rear : 2,055mm
 Center to center of
 extended outriggers : 7,200mm (Fully extended)
 4,850mm
 (Intermediately extended)
 Gross weight : approx. 39,200kg
 Front : approx. 15,200kg
 Rear : approx. 24,000kg

• Carrier

Maker : MITSUBISHI
 Model : K503LK3
 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 : 14,886cc
 Max. output horsepower : 290 PS/2,300 r.p.m.
 213 KW/2,300 r.p.m.
 Max. output torque : 99 kg-m/1,400 r.p.m.
 970 N-m/1,400 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 : 10 forward & 2 reverse speed synchro-mesh 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 brake : 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 - 140 AH x 2
 Fuel tank capacity : 300 lit.
 Driver's cab : All steel welded construction 2 persons, low line type
 Tire size; Front : 12.00-20-18PR
 Rear (dual tire) : 12.00-20-18PR