



**NIPPON  
GROVE**

TRAPEZOIDAL BOOM SERIES

**TMS1600  
&  
TMS2000**



 **NIPPON GROVE CO., LTD**

# TMS 1600 & TMS 2000

The most advanced 16 & 20 metric ton capacity, extremely mobil, hydraulic crane ... equipped with the popular GROVE TRAPEZOIDAL\* telescoping boom designed for heavy rigging ... and carefull long boom work.



- The convenient arrangement of controls and instruments means less fatigue for the operator during sustained work.
- The hydraulic hoist has a dual braking system with an automatic input shaft brake that permits fine, precise control of either main or auxiliary cable during hoisting and lowering. Free fall is also available.
- Extremely smooth turntable swing is due to the planetary gear drive "Glideswing" mechanism and ball bearing swing circle ... for precise smooth load placement.
- The 3-section gear type hydraulic oil pumps delivers power for simultaneous operation of three separate crane functions without curtailing their individual operating speeds.
- The 3-section boom has constantly synchronized proportionate extension and retraction of telescoping sections for well balanced distribution of stresses in the boom structure ... for safer lifts with any boom length.
- The "Swingaround" offset boom extension is easily installed or removed with the aid of a simple screw device.
- As with other NIPPON GROVE products, particular attention was given to equip the TMS 1600 & 2000 with numerous safety devices. Careful workmanship, close quality control and final testing of each crane when completed ... ensures that every crane will work efficiently and safely.

## THE GROVE TRAI



### TRAPEZOIDAL\* BOOM

The exclusive GROVE TRAPEZOIDAL\* telescoping boom has an optimum strength to weight ratio ... ideally suited for hydraulic crane operation. The lightweight large cross-section provides greater lifting capacity and boom rigidity. Result: it places the hook load where it is supposed to go ... with confident ease.



The TRAPEZOIDAL\* shape of each boom section handles bigger loads higher up, farther out with ...

- Greater vertical and lateral rigidity.
- Wide bottom plate which minimizes deflection and torsion of boom compared to conventional rectangular shaped booms.
- Best placement of low friction pads for efficient telescopic boom action.
- Larger boom cross sections with no increase in boom weight.
- Lower center of gravity.

\* THE GROVE TRAPEZOIDAL BOOM IS A PATENTED GROVE FEATURE.

# PEZOIDAL\* BOOM

Presents the Superior Strength and Capacity

## OPERATOR'S CAB – Good vision and easy operation

- The tilt-back control lever stand and tilting back-rest assures easy operation during high or low boom angle operating conditions.
- The interior of the all steel cab is designed to improve the operator's safety and comfort lacking in other cranes.
- Important instruments, such as load indicator and boom-angle indicator are easy to watch.
- Large tilt-back skylight and easily opened side and rear windows provide good ventilation.

## TWO WINCH DRUMS – Precisely controllable

- The highly efficient hydraulically powered winch assembly has large side-by-side drums, with individually engaged power clutches. The main load and auxiliary hoist line speeds respond smoothly and instantly to the operator's touch for throttle controlled power-up and power-down. An automatic spring loaded brake will not release until the hydraulic motor has developed ample torque to hold or raise the rated lifting capacity with required safety.

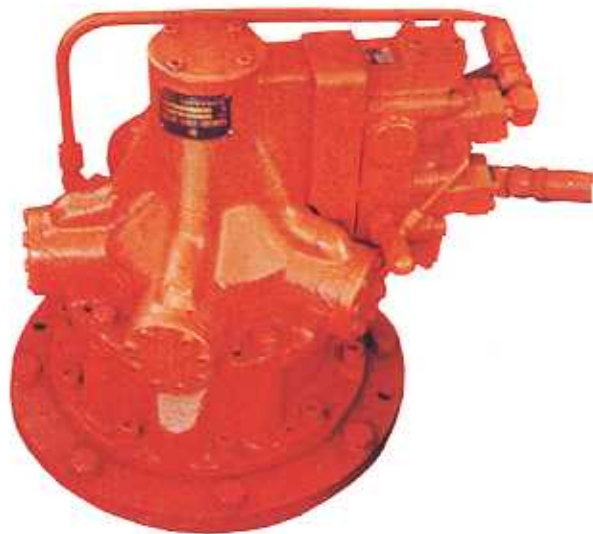
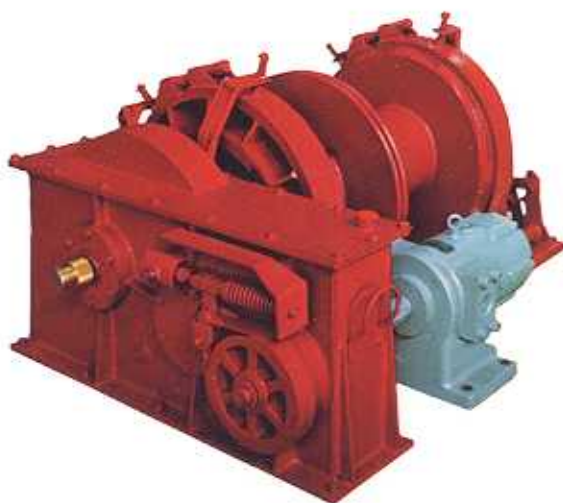
- Shifting to high speed is accomplished by simply moving the hoist control lever into a secondary hoist or lowering position. The versatile control valve thereupon combines and controls the flow of hydraulic oil from two pumps instead of merely one.

Therefore, extra high line speed is possible with no reduction in line pull.

- Triple safety drum holding devices are designed into the winch assembly. It consists of the automatic brake on the power input shaft, extra large contracting band type hydraulic actuated brakes, and pawl/ratchet drum payout stoppers ... which provides the operator with easy and safe operation.

## SEMI-FREE SWING MECHANISM

- The planetary gear reduction with a cushioning valve in the hydraulic swing circuit ... eliminated starting and stopping shocks. Swing control is smooth and precise.
- A completely enclosed, oil bath disc brake provides the operator with smooth stop and secure lockout of the swinging turntable. No adjustment required.
- The radial piston type hydraulic motor has exceptional starting torque, together with the heavy duty ball bearing swing circle, you can swing heavy loads or position a long extended boom with ordinary ease.

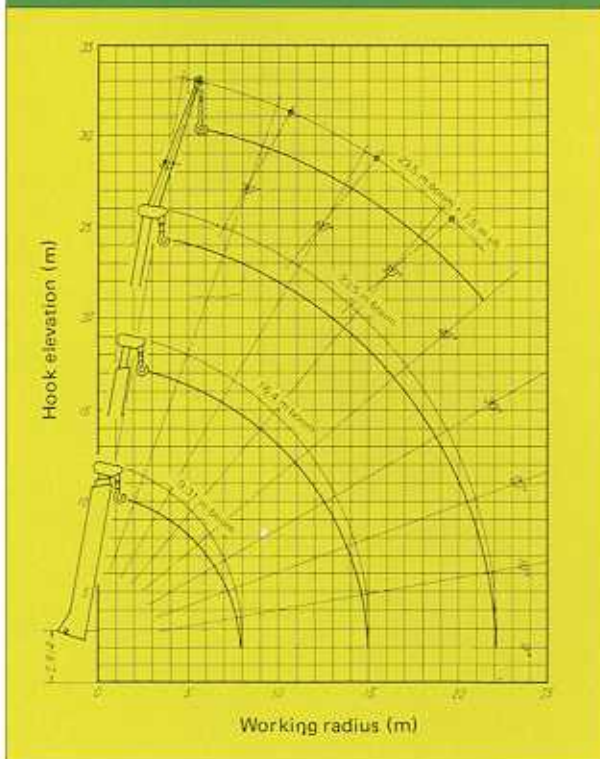


## TMS 1600 SPECIFICATIONS (Class 3-3.45)

Crane capacity	16ton at radius 3m with 9.3 m boom 10ton at radius 5m with 16.4m boom 6 ton at radius 7m with 23.5m boom 2.2ton at boom angle 68° with 23.5m boom + 7.5m jib	Boom elevation	Single, double-acting hydraulic cylinder with integral holding valve.
Boom length	9.3m ~ 23.5m	Hoist	Hydraulic plunger motor driven, spur gear reduction, single shaft two drums type, with internal expanding clutch, band brake, and automatic input shaft brake.
Jib* length	7.5m (fixed offset -10°)	Swing	Hydraulic radial piston type motor driven, planetary-gear reduction, with disc brake.
Boom elevation angle	-3° ~ +80°	Swing circle	Ball bearing
Boom elevation time	60 sec.	Outrigger	H type independently controlled.
Boom extending time	14.2m/63 sec.	Hydraulic pump	3 section gear type.
Hoisting speed	Main: 87m/min. Aux.: 87m/min. Max. line pull 4.2ton	Safety device	Anti-two block device, boom angle indicator, holding valves, winch drum locking device, rated load indicator*, load meter*, load moment limiter*, etc.
Swing speed	3.0rpm (360° continuous rotation)	Carrier	HINO ZT300 or NISSAN KW30M
Outrigger spread	4.9m	G.V.W.	Approx. 19 ton
Boom type	3 section, trapezoidal, full power.		
Jib* type	Lattice construction swingaround.		

\*denotes option.

### TMS 1600 Range Diagram



### TMS 1600 Rated Lifting Capacity (Unit M/T)

Radius (m)	9.3m Boom Side & rear	16.4m Boom Side & rear	23.5m Boom Side & rear	Boom angle	23.5m+ 7.5m Jib Side & rear
3	16.0	10.0		80	2.2
4	12.5	10.0		75	2.2
5	10.0	10.0	6.0	70	2.2
6	7.7	7.7	6.0	68	2.2
7	6.1	6.1	6.0	60	1.3
7.5	5.5	5.5	5.5	55	0.9
8		4.9	4.9	50	0.6
9		4.1	4.1	47	0.45
10		3.45	3.45		
11		2.95	2.95		
12		2.5	2.5		
13		2.15	2.15		
14		1.85	1.85		
16			1.35		
18			0.9		
20			0.63		
22			0.45		

(note)

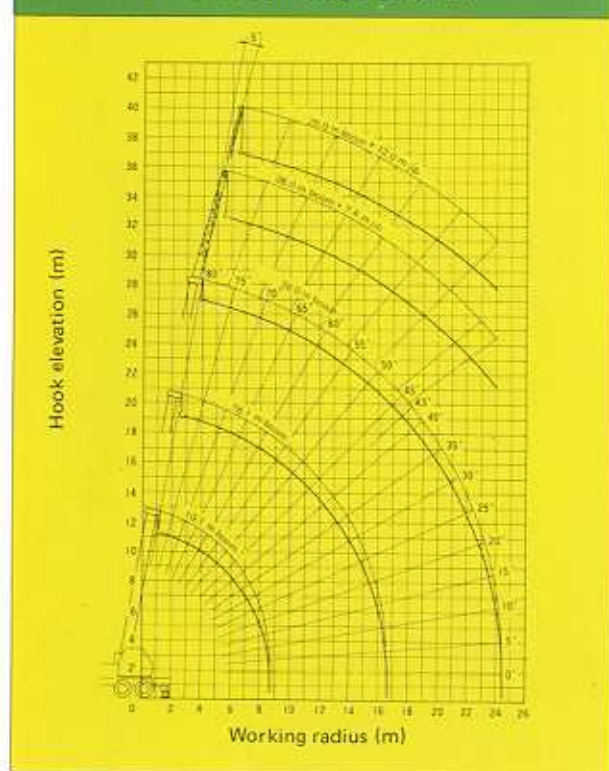
- Figures shown above are the rated lifting capacities with the machine leveled and standing on a firm supporting ground with outrigger extended to their max. positions.
- Figures shown in   column are based on the machinery strength.
- Deduct 600 kg from main boom ratings when the main hook is operated with the auxiliary jib being attached to the boom.
- Capacities do not exceed 78% of tipping loads as determined by test in accordance with Japanese regulation. Special load chart, calculated to other country standards, furnished upon request.

## TMS 2000 SPECIFICATIONS (Class 3-3.9)

Crane capacity	20ton at radius 3.0m with 10.1 m boom 12ton at radius 4.5m with 18.1 m boom 7.5ton at radius 6.5m with 26m boom 3.5 ton at boom angle 73° with 26 m +7.4m jib 2.0 ton at boom angle 75° with 26 m +12m jib	Boom elevation	Single, double-acting hydraulic cylinder with integral holding valve.
		Hoist	Hydraulic plunger motor driven, spur gear reduction, single shaft two drums type, with internal expanding clutch, band brake, and automatic input shaft brake.
Boom length	10.1m ~ 26m	Swing	Hydraulic radial piston type motor driven, planetary-gear reduction, with disc brake.
Jib* length	7.4m ~ 12m 2 section (fixed offset -5°)	Swing circle	Ball bearing
Boom elevation angle	-3° ~ +80°	Outrigger	H type independently controlled.
Boom elevation time	60 sec.	Hydraulic pump	3 section gear type.
Boom extending time	15.9m/70 sec.	Safety device	Anti-two block device, boom angle indicator, holding valves, winch drum locking device, rated load indicator*, load meter*, load moment limiter*, etc.
Hoisting speed	Main: 87m/min. Aux.: 87m/min. Max. line pull 4.2ton	Carrier	HINO ZT300 or NISSAN KW30M
Swing speed	3.0rpm (360° continuous rotation)	G.V.W.	Approx. 21.5 ton
Outrigger spread	5.2m		
Boom type	3 section, trapezoidal, full power.		
Jib* type	2 section, swingaround, 7.4m lattice base section and 4.6m rectangular extension.		

\*denotes option.

### TMS 2000 Range Diagram



### TMS 2000 Rated Lifting Capacity (Unit M/T)

Radius (m)	10.1m Boom side & rear	18.1m Boom side & rear	26.0m Boom side & rear	Boom angle	26.0m+7.4m jib side & rear	26.0m+12m jib side & rear
3.0	20.00	12.00		80	3.50	2.00
3.5	17.00	12.00		75	3.50	2.00
4.0	14.65	12.00		73	3.50	1.88
4.5	12.85	12.00		70	2.86	1.63
5.0	11.30	11.30	7.50	65	1.95	1.27
5.5	9.80	9.80	7.50	60	1.37	0.98
6.0	8.70	8.70	7.50	55	0.95	0.70
6.5	7.70	7.70	7.50	50	0.63	0.50
7.0	6.85	6.85	6.85	45	0.43	
7.5	6.20	6.20	6.20	43	0.38	
8.0	5.60	5.60	5.60			
8.5	5.05	5.05	5.05			
9.0		4.60	4.60			
10.0		3.90	3.90			
11.0		3.30	3.30			
12.0		2.80	2.80			
13.0		2.40	2.40			
14.0		2.10	2.10			
16.0			1.55			
18.0			1.20			
20.0			0.90			
22.0			0.70			
24.0			0.55			

(note)

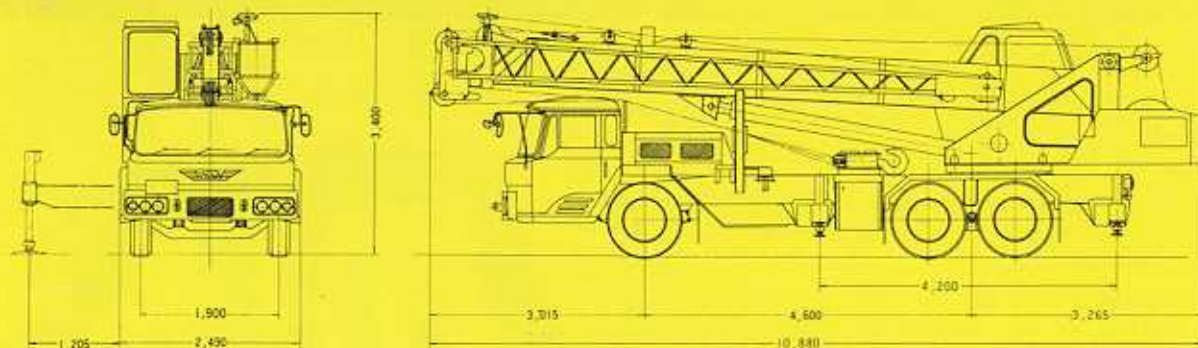
- Figures shown above are the rated lifting capacities with the machine leveled and standing on a firm supporting ground with outrigger extended to their max. positions.
- Figures shown in   column are based on the machinery strength.
- Deduct 1100 kg from main boom ratings when the main hook is operated with 12 m jib being attached to the boom, deduct 900 kg from main boom ratings when the main hook is operated with 7.4 m jib being attached to the boom.
- Capacities do not exceed 78% of tipping loads as determined by test in accordance with Japanese regulation. Special load chart, calculated to other country standards, furnished upon request.

Specification are subject to be changed without notice.

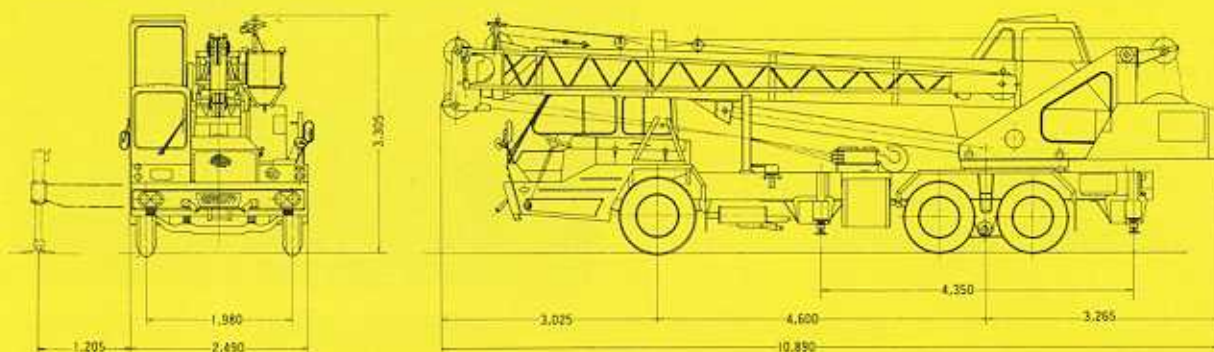
## DIMENSIONS OF TMS 1600

(mm)

CARRIER—MODEL HINO ZT 300



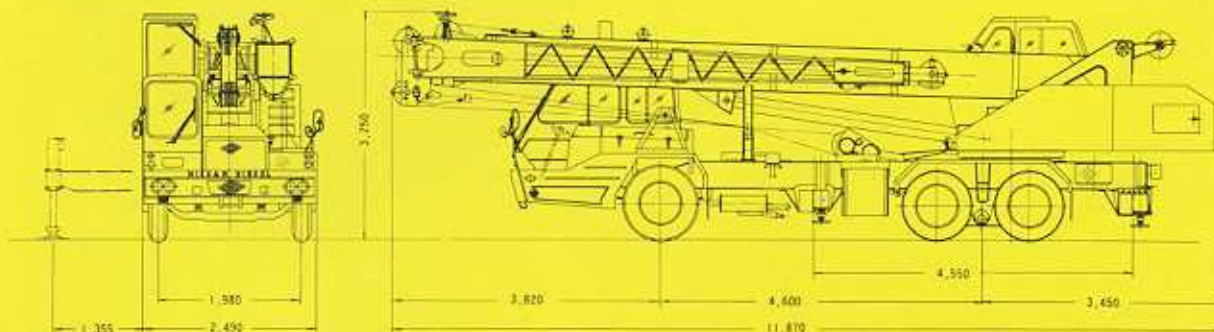
CARRIER—MODEL NISSAN KW 30M



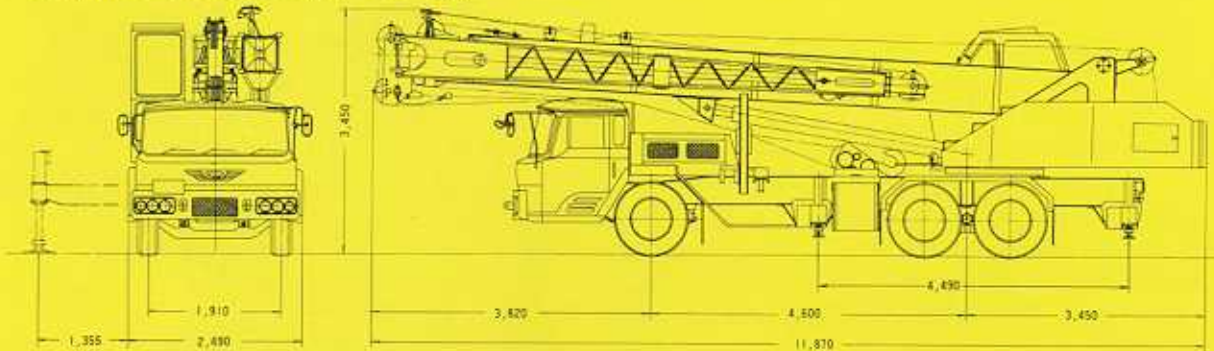
## DIMENSIONS OF TMS 2000

(mm)

CARRIER—MODEL NISSAN KW 30M



CARRIER—MODEL HINO ZT 300



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