

# 684H-TM

## preliminary product guide

### features

- All new design
- 20 USt (18.1 t) rating
- 84 ft (25.6 m) compact six-section boom
- Full, mid-, and retracted span outriggers
- NEW Mentor LMI system
- Internal anti-two block
- Your choice of 3-axle chassis

### contents

Features	2
Mounting Configurations	3
Specifications	4
Capacities	5
Dimensions Specifications	7
Accessories	8



\*Product may be shown with optional equipment.

# features

## Why Buy a National Crane 684H-TM Tractor Mount:

2



\*Product may be shown with optional equipment.

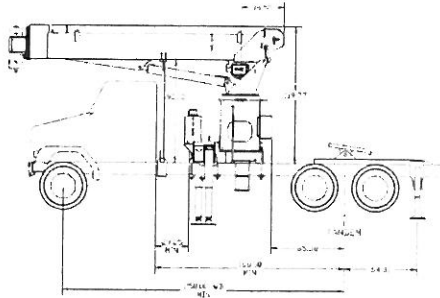
- 20 USt (18.1 t) maximum capacity
- 94 ft (28.6 m) maximum vertical hydraulic reach\*
- Load Moment Indicator system (LMI)
- Proportional boom extension
- High performance planetary winch
- Heavy-duty triple pump hydraulics
- \* Maximum vertical reach is ground-level to boom tip height at maximum extension and angle with outriggers/stabilizers fully extended.

- **20 USt (18.1 t) Rating** – The new 684H-TM provides a 20 USt (18.1 t) capacity.
- **84 ft (25.6 m) Six-section Boom** – The longest in its size range. The longer, compact boom allows the operator to perform more lifts without the use of a jib, reducing setup time and improving efficiency.
- **Overload Protection** – All National Crane boom trucks are equipped with overload protection:
  - Mentor Load Moment Indicator (LMI) is standard on all series 600H machines with (WADS) "work area definition system."
  - LMI display console is weatherproof.
  - All crane load lifting values are displayed simultaneously.
- **Easy Glide Boom Wear Pads** – Reduce the conditions that cause boom chatter and vibration. The net result is smoother crane operation.
- **"HO"-style Outriggers** – One set of "HO"-style outriggers with 20 ft (6.09 m) span, with 8 ft (2.43 m) mid span setting with manual locks and reduced capacity chart, and fully retracted outrigger spread with reduced capacity chart.  
Main outriggers are equipped with removable ball and socket aluminum foot pads.
- **Rotation** – The 684H-TM is standard with 375° non-continuous rotation.
- **Adjustable Swing Speed** – Standard on the 684H-TM. A control knob located on the swing motor brake release valve can be easily adjusted to the crane operator's swing speed preference.
- **Speedy-reeve Boom Tip and Sheave Blocks** – These standard features simplify rigging changes by decreasing the time needed to change line reeving.
- **Burst-of-Speed Winch** – Provides faster winch payout and pickup of unloaded cable.
- **Gear Pump** – Three-section direct mount gear pump.
- **Shutoff valve on suction line for ease of maintenance.**
- **Pre-painted Components** – Painting crane components before assembly reduces the possibility of rust, improves serviceability and enhances the appearance of the machine.
- **Improved Serviceability** –
  - Bearings on the boom extend and retract cables can be greased through access holes in the boom side plates.
  - Number of boom parts has been reduced, decreasing service time when rebuilding the machine.
  - Internal anti-two-block wire routing eliminates damage potential.
- **Electronic versions of manuals available through Manitowoc Crane CARE.**
- **New State-of-the-art Control Valve** – Provides smoother operation. The new design eliminates parts, reducing repair costs and improving the machine's serviceability.
- **National Crane is the Market Leader** – National Crane is number one in the production of commercial truck-mounted boom trucks and has many programs and people directly and indirectly involved to provide our customers reliable products.
  - National Crane has the boom truck industry's leading test program. Every structural part of the crane is cycle tested up to 60,000 cycles at full capacity. In addition to cycle testing, each model is subjected to state-of-the-art strain gauge testing that measures metal deformation as small as one one-millionth of an inch. The net result is that any weak areas are caught in test, not on job sites where costly downtime occurs.
  - Lift and telescoping cylinders are manufactured by National Crane, so that the seals, packing glands, and end plates are traced for accurate shipment of replacement parts.
  - Parts are available for all National Crane machines for the life of the crane.
  - National Crane has a formalized quality program and is ISO 9001 approved.
- **National Crane's Quality Management System is ISO 9001:2000 Approved.**

684H-TM

# mounting configuration

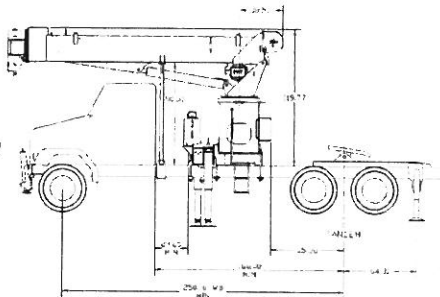
The configurations are based on the Series 684H-TM with an 85% stability factor. The complete unit must be installed in accordance with factory requirements and a test performed to determine actual stability and counterweight requirements since individual truck chassis vary.



## Configuration 1 with Torsion Box – 180' Full Capacity Work Area

Working area .....	180
Gross Axle Weight Rating Front .....	20,000 lb (9072 kg)
Gross Axle Weight Rating Rear .....	34,000 lb (15,442 kg)
Gross Vehicle Weight Rating .....	54,000 lb (24,494 kg)
Wheelbase .....	250 in (635 cm)
Cab to Axle/trunnion (CA/CT) .....	168 in (427 cm)
Frame Section Modulus (SM) under crane:	
110,000 PSI (758 MPa) .....	30.0 in <sup>3</sup> (491.6 cm <sup>3</sup> )
Frame Section Modulus (SM) over rear stabilizers:	
110,000 PSI (758 MPa) .....	30.0 in <sup>3</sup> (491.6 cm <sup>3</sup> )
Stability Weight, Front .....	10,000 lb (4536 kg) minimum*
Stability Weight, Rear .....	9,500 lb (4309 kg) minimum*

This configuration is the least expensive method for the Model 684H-TM. This mount, with the crane mounted behind the cab, requires the least weight of all mounts for stability; thus, you can haul larger payloads on your truck. It requires standard subbase and rear (ASH) stabilizers.



## Configuration 2 with Torsion Box – 360' Full Capacity Work Area

Working area .....	360
Gross Axle Weight Rating Front .....	20,000 lb (9072 kg)
Gross Axle Weight Rating Rear .....	34,000 lb (15,422 kg)
Gross Vehicle Weight Rating .....	54,000 lb (24,493 kg)
Wheelbase .....	250 in (635 cm)
Cab to Axle/trunnion (CA/CT) .....	168 in (427 cm)
Frame Section Modulus (SM) under crane:	
110,000 PSI (758 MPa) .....	30 in <sup>3</sup> (491.6 cm <sup>3</sup> )
Frame Section Modulus (SM) over rear stabilizers:	
110,000 PSI (758 MPa) .....	30 in <sup>3</sup> (491.6 cm <sup>3</sup> )
Stability Weight, Front .....	10,000 lb (4536 kg) minimum*
Stability Weight, Rear .....	9,500 lb (4309 kg) minimum*

Requires front SFO stabilizer to give machine full capacity 360° around the truck. Truck must meet the minimum requirements above. Front stabilizer gives the machine a solid base, helping the operator control loads precisely. Extended front frame rails required for SFO installation.

### Notes:

- Gross Vehicle Weight rating (GVWR) is dependent on all components of the vehicle (axles, tires, springs, frame, etc.) meeting manufacturers' recommendations: always specify GVWR when purchasing trucks
- Diesel engines require a variable speed governor and energize-to-run fuel solenoid for smooth crane operation; electronic fuel injection requires EET engine remote throttle
- All mounting data is based on a National Series 684H-TM with an 85 percent stability factor

- The complete unit must be installed in accordance with factory requirements, and a test performed to determine actual stability and counterweight requirements per SAE J765; contact the factory for details
- Transmission neutral safety interlock switch is required with optional remote control

\*Estimated axle scale rates prior to installation of crane, stabilizers and subbase for 85% stability.

684H-TM

# specifications

## Boom and Jib Combination Data

4 **Model 684H TM** – Equipped with a 19-84 ft (7.32-24.38 m) six-section boom. Max tip height is 94 ft (28.6 m).

*Note: Maximum tip is measured with outriggers/stabilizers fully extended.*

## 600H-TM Winch Data

### 600H-TM Winch Data

- All winch pulls and speeds in this chart are shown on the fourth layer
- Winch line pulls would increase on the first and second layers
- Winch line pulls may be limited by the winch capacity or the ANSI 5 to 1 cable safety factor, shown below this chart
- Hook blocks are rated at maximum capacity for the block. **Do not exceed rated cable pull with any block.**

600H-TM Winch Data			1 Part Line	2 Part Line	3 Part Line	4 Part Line	5 Part Line	6 Part Line
<ul style="list-style-type: none"> <li>• All winch pulls and speeds in this chart are shown on the fourth layer</li> <li>• Winch line pulls would increase on the first and second layers</li> <li>• Winch line pulls may be limited by the winch capacity or the ANSI 5 to 1 cable safety factor, shown below this chart</li> <li>• Hook blocks are rated at maximum capacity for the block. <b>Do not exceed rated cable pull with any block.</b></li> </ul>								
			Max. Pull	Max. Pull	Max. Pull	Max. Pull	Max. Pull	Max. Pull
Winch	Cable Supplied	Average Breaking Strength	7,700 lb (3 492.66 kg)	15,400 lb (6 985.32 kg)	23,100 lb (10 477.98 kg)	30,800 lb (13 970.65 kg)	38,500 lb (17 454.96 kg)	40,000 lb (18 143.69 kg)
Standard Planetary Winch	9/16 in Diameter Rotation Resistant	38,500 lb (17,463 kg)						

Layer	Winch Pull		Winch Speed		BOS Winch Speed		Rope Capacity	
	lb	(kg)	fpm	(mpm)	fpm	(mpm)	ft	(m)
1	10,380	(4708)	157	(48)	222	(68)	64	19
2	9,360	(4246)	175	(53)	246	(75)	136	41
3	8,520	(3865)	192	(59)	271	(83)	215	65
4	7,820	(3547)	209	(64)	294	(90)	301	91
5	7,230	(3279)	257	(69)	318	(97)	394	120

NOTE: All ratings based on 34 GPM at 3300 psi (128.7 LPM at 22.75 MPa)  
Burst of Speed maximum pull = 3000 lb (1361 kg)

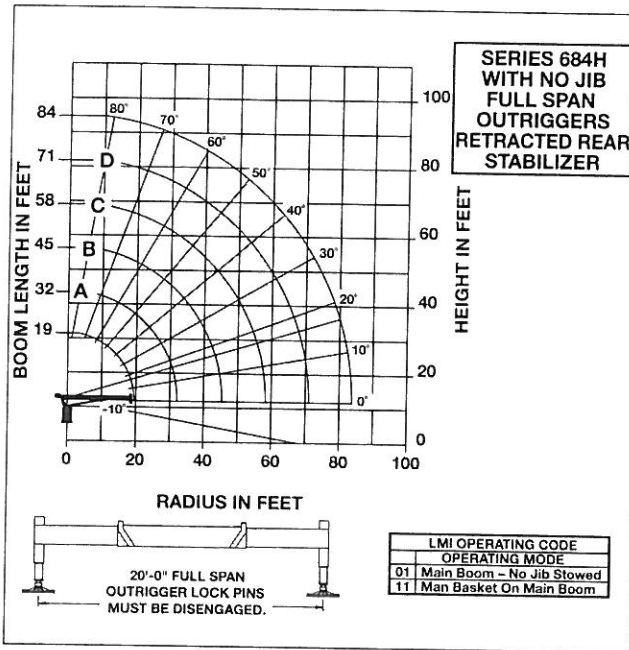
Winch	Bare Drum Pull	Allowable Cable Pull
With standard rotation resistant rope	10,200 lb (4627 kg)	7,700 lb (3493 kg)

Block Type	Rating	Weight
Downhaul Weight	3.85 USt (3.49 t)	150 lb (68 kg)
1 Sheave Block	11.55 USt (10.48 t)	200 lb (91 kg)
2 Sheave Block	19.25 USt (17.46 t)	355 lb (161 kg)

684H-TM

# capacities

## Load Rating Chart: Model 684H-TM (25.6 m) Boom/Fullspan Outrigger 20 ft (6.1 m) & Stabilizer



### CAUTION:

- Do not operate crane booms, jib extensions, any accessories or loads within 10 ft (3m) of live power lines or other conductors of electricity.
- Boom capacities shown are maximum for each section.
- Do not exceed capacities at reduced radii.
- Load ratings shown on the appropriate charts are maximum allowable loads with the crane mounted on a factory-approved truck and all outriggers at full span range and set on a firm level surface so that the crane is level and all tires are suspended.
- Always level the crane with the level indicator located on the crane.
- The operator must reduce load to allow for factors such as wind, ground conditions, operating speeds and their effects on freely suspended loads.
- Overloading this crane may cause structural collapse or instability.
- Weights on any accessories attached to the boom or loadline must be deducted from the load chart capacities.
- Do not deadhead lineblock against boom tip when extending boom or winching up.
- Keep at least three wraps of loadline on drum at all times.
- Use only specified cable with this machine.

### SERIES 684H-TM (25.6 M) BOOM/FULLSPAN OUTRIGGER & STABILIZER

### LOADLINE EQUIPMENT DEDUCT.

Downhaul weight .....	150 lb (68 kg)
One sheave block .....	200 lb (90.7 kg)
Two sheave block.....	355 lb (161 kg)

## Load Rating Chart: Series 684H (25.6 m) Boom/Fullspan Outrigger 20 ft (6.1 m) & Stabilizer

LOADED RADIUS (ft)	LOADED BOOM ANGLE (deg)	19 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	A 32 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	B 45 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	C 58 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	D 71 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	84 FT BOOM (lb)
6	71.7	40,000										
8	61.2	30,300	74	20,900	79.4	20,300						
10	53.5	25,500	70.5	20,650	76.8	17,600						
12	44.8	21,900	66.4	19,150	74.1	15,750	78.1	12,200				
14	34.9	18,550	62.2	17,400	71.4	14,450	76.1	11,250	79	8,700		
16	20.9	14,800	57.9	15,900	68.7	13,550	74.1	10,500	77.4	8,200	79.5	4,200
20			48.4	12,950	63	12,250	69.9	9,100	74.5	7,300	76.9	4,200
25			33.8	9,950	55.3	9,900	64.5	7,900	70.3	6,400	73.6	4,200
30					46.7	8,150	59.3	6,850	66	5,700	70.3	4,200
35					37.4	6,750	53.2	5,900	61.4	5,150	66.7	3,850
40					23.7	5,150	46.5	4,950	56.6	4,500	62.9	3,350
45							38.7	4,550	51.5	3,850	58.9	2,950
50							29	3,900	45.9	3,250	54.7	2,550
55									39.6	2,700	50.2	2,150
60									32.1	2,350	45.5	1,900
65									22.1	2,000	40.2	1,600
70											34.2	1,350
75											27	1,200
80											16.6	850
0		8,300	0	3,900	0	2,100	0	1,050	0	500	0	150

\*SHADED AREAS ARE STRUCTURALLY LIMITED CAPACITIES

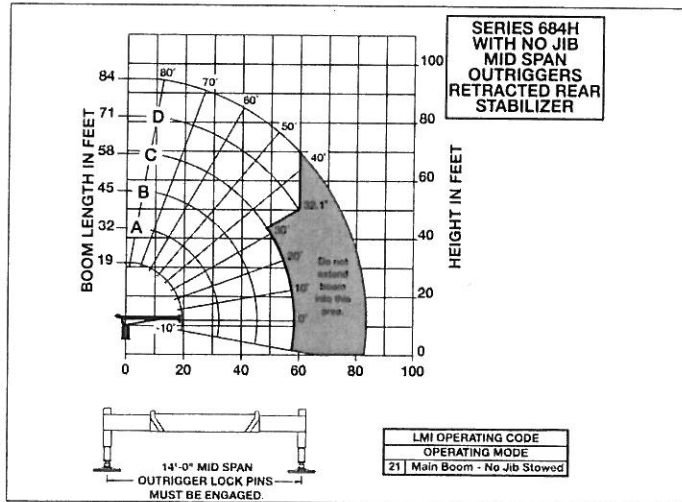
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684H-TM

# capacities

## Load Rating Chart: Series 684H-TM (27.4 m) Boom/Midspan Outrigger 13.3 ft (4.1 m) & Stabilizer

6



### CAUTION:

- Do not operate crane booms, jib extensions, any accessories or loads within 10 ft (3m) of live power lines or other conductors of electricity.
- Boom capacities shown are maximum for each section.
- Do not exceed capacities at reduced radii.
- Load ratings shown on the appropriate charts are maximum allowable loads with the crane mounted on a factory-approved truck and all outriggers at either full span or at mid span range and set on a firm level surface so that the crane is level and all tires are suspended.
- Always level the crane with the level indicator located on the crane.
- The operator must reduce load to allow for factors such as wind, ground conditions, operating speeds and their effects on freely suspended loads.
- Overloading this crane may cause structural collapse or instability.
- Weights on any accessories attached to the boom or loadline must be deducted from the load chart capacities.
- Do not deadhead lineblock against boom tip when extending boom or winching up
- Keep at least three wraps of loadline on drum at all times.
- Use only specified cable with this machine.

### SERIES 684H-TM (27.4 M) BOOM/MIDSPAN OUTRIGGER & STABILIZER

### LOADLINE EQUIPMENT DEDUCT

Downhaul weight.....150 lb (68 kg)  
One sheave block .....200 lb (90.7 kg)  
Two sheave block.....355 lb (161 kg)

## Load Rating Chart: Series 684H-TM (27.4 m) Boom/ Midspan Outrigger 13.3 ft (4.1 m) & Stabilizer

LOADED RADIUS (ft)	LOADED BOOM ANGLE (deg)	19 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	32 FT BOOM (lb)	A LOADED BOOM ANGLE (deg)	B LOADED BOOM ANGLE (deg)	45 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	C LOADED BOOM ANGLE (deg)	58 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	D LOADED BOOM ANGLE (deg)	71 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	84 FT BOOM (lb)
6	71.7	40,000													
8	61.2	30,300	74	20,900	79.4	20,300									
10	53.5	25,500	70.5	20,650	76.8	17,600									
12	44.8	21,800	66.4	19,150	74.1	15,750	78.1	12,200							
14	34.9	18,550	62.2	17,400	71.4	14,450	76.1	11,250	79	8,700					
16	20.9	14,800	57.9	15,900	68.7	13,550	74.1	10,500	77.4	8,200	79.5	4,200			
20			48.4	10,150	63	10,250	69.9	9,100	74.5	7,300	76.9	4,200			
25			33.8	6,800	55.3	6,900	64.5	7,900	70.3	6,400	73.6	4,200			
30					46.7	4,800	59.3	4,900	66.0	5,700	70.3	4,200			
35					37.4	3,600	53.2	3,700	61.4	3,800	66.7	3,950			
40					23.7	2,850	46.5	2,850	56.6	2,950	62.9	3,450			
45							38.7	2,200	51.5	2,300	58.9	2,350			
50							29	1,700	45.9	1,800	54.7	1,800			
55							13.5	1,300	39.6	1,350	50.2	1,400			
60									32.1	950	45.5	1,000			
	0	8,500	0	2,800	0	2,100	0	1,000							

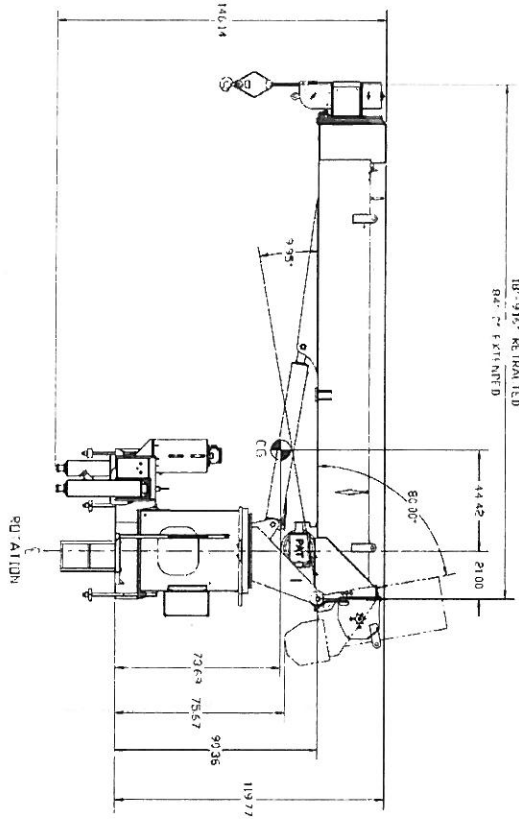
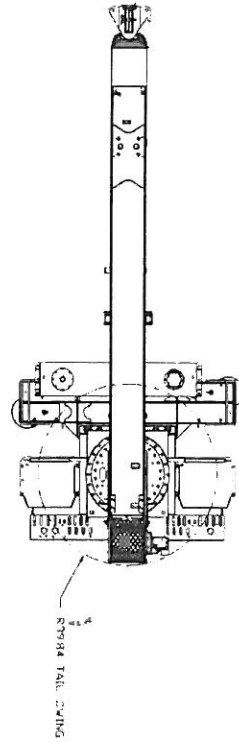
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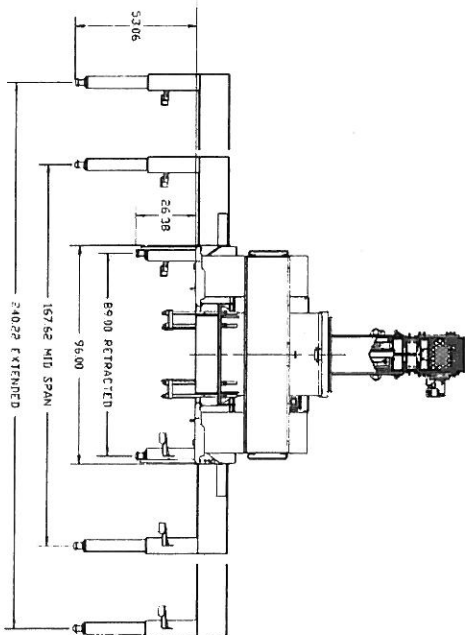
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# dimensions specifications

7



TOP OF TRUCK FRAME RAIL



G CENTER OF GRAVITY FROM CENTERLINE		
Series	DRY WEIGHT*	W/OIL WEIGHT*
684H-TM	12 030 lb [5 457 kg]	12 835 lb [5 822 kg]

\* ABOVE WEIGHTS DO NOT INCLUDE RESERVOIR, RSOD, JIB, PTO, PUMP, BED  
 \*\* WEIGHT INCLUDES BOOM, WINCH, ROPE, TURRET, LIFT CYLINDER, FRAME, CONTROLS, OUTRIGGERS, PLATFORMS, TORQUE BOX, BOOM REST, BUMPER, DOWNHAUL WEIGHT

UNITS IN INCHES UNLESS SPECIFIED

684H-TM