



## LOAD CHARTS for Use in CCO Written Examinations

# **MANITEX**

## **TELESCOPIC BOOM CRANE—FIXED CAB (TSS)**

*These charts have been adapted from the original manufacturer's charts for use in NCCCO Written Examinations.*

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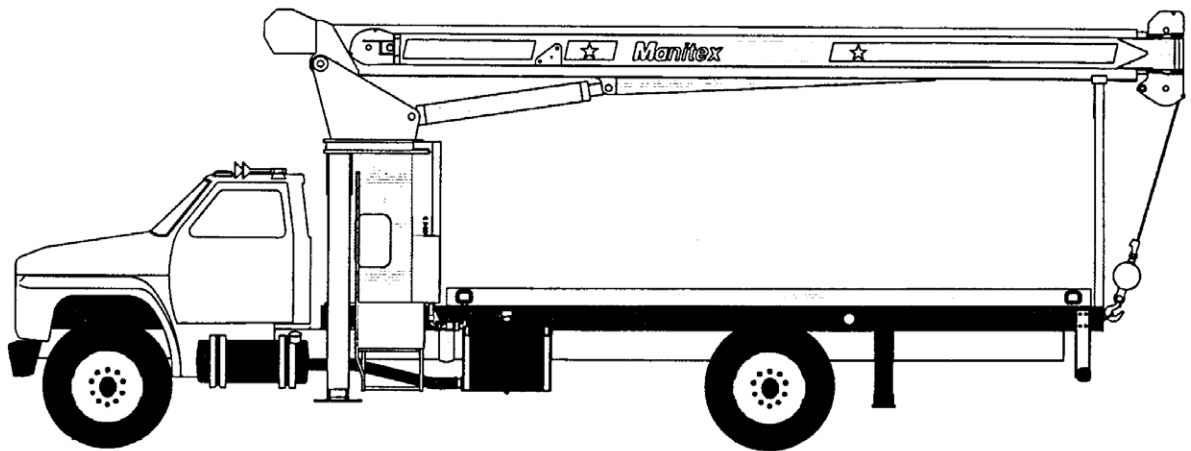
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# Millennium Series™

## General Specifications



Model shown with optional jib.

### STANDARD EQUIPMENT

- 2-Speed planetary hoist.
- 5-Ton (4.5 mt) hook and ball.
- 2 Sheave boom point.
- Anti-two-block shutoff.
- Boom hoist cylinder.
- System pressure gauge.
- 70-Gallon (265-liter) hydraulic reservoir.
- Removable boom rest.
- Finish paint in Manitex colors.
- Engine start/stop.
- Operator/service/parts manuals.
- 3-Section Telescopic boom 26' to 68' (7.93 m to 20.73 m).
- 260 Feet (79.25m) of 9/16" (14.3 mm) EIPS IWRC wire rope.
- 372° Non-continuous rotation.
- Pedestal, turret, rotation bearing and swing system
- Dual operator control stations.
- Hydraulic capacity alert warning system (HYCAS) - audio.
- Audible outrigger/stabilizer motion alarm.
- A-frame link type outriggers.
- A-frame rear stabilizer.
- 3-Section vane type hydraulic pump.
- Signal horn.
- 18-Foot (5.49m) Subframe.

## STANDARD SPECIFICATIONS AND FEATURES

**BOOM** — 26' To 68' (7.93m to 20.73m). Inverted-T cross section. 3-Section telescoping type, extended and retracted proportionally by double-acting hydraulic cylinder and cable-crowd system. Maximum tip height 79' (24.09m).

**BOOM POINT** — Two high-density nylon sheaves mounted on heavy-duty roller bearings. Two removable pin-type rope guards.

**HOIST** — Maximum theoretical line speed 247 fpm (75.29 mpm). Maximum theoretical bottom-layer line pull 12,000 lb (5,443 kg). Two-speed planetary reducer. Spring-applied, pressure-released internal brake.

**WIRE ROPE** — 260' (79.25m) of 9/16" (14.29mm) diameter 6 x 25 EIPS IWRC.

**BOOM ELEVATION** — Double-acting hydraulic cylinder. Working range from 13° below horizontal to 80° above.

**SWING SYSTEM** — Externally mounted, double-reduction planetary driven by hydraulic motor. Maximum theoretical swing speed 1.80 rpm. Wet multi-disc internal brake is spring applied, pressure released. Oversized diameter ball bearing swing circle with external gear. 372° Non-continuous rotation.

**OUTRIGGERS** — 20'10" (6.13m) Extended. A-frame link type. Operated independently for precise leveling. Equipped with double-acting hydraulic cylinders. 16" x 20" (406mm x 508mm) Pivoting pads. 8 1/2" (215.9mm) Maximum rise.

**A-FRAME STABILIZERS** — 8' (2.44m) Retracted; 10' (3.05m) extended. Operated independently for precise leveling. Double-acting hydraulic cylinders. 8" x 11" (203mm x 279mm) fixed pads. 9" (229mm) Maximum rise.

**SUBFRAME** — Torsionally resistant, rigid 4-plate design. Mounted under crane full length of truck frame.

**REAR UNDERRIDE PROTECTION** — Supplied on factory mounted cranes. Fabricated structure mounted under rear of bed.

**BACK-UP ALARM** — Supplied on factory-mounted cranes. Electronic audible motion alarm activated when truck transmission is in reverse gear.

**MOUNTING** — Pedestal and subframe are mounted to chassis by threaded rods and clamp plates. No welding, drilling, or bolting to truck.

**CONTROL SYSTEM** — Dual operator stations are equipped with four single-lever crane controls arranged to ANSI B30.5 standards. Fully proportional control valves and system pressure gauge. Each station also includes outrigger and stabilizer controls, engine start/stop, foot throttle, signal horn, capacity light indication, boom-angle indicator, bubble levels, load chart and range diagram.

**HYDRAULIC SYSTEM** — A 3-section vane pump direct mounted to power take-off on truck transmission provides 35 gpm (133 lpm) to the hoist, 8 gpm (30 lpm) to the swing circuit and 18 gpm (68 lpm) to other crane functions. 70-Gallon (265-liter) baffled reservoir includes 10-micron filter in the re-

turn line. Extensive use of SAE O-ring and face seal O-ring hydraulic fittings.

**HYDRAULIC CYLINDERS** — All are equipped with integral holding valves.

**BOOM REST** — Heavy-duty fabrication. Easily removed to simplify loading and unloading.

**LOAD HOOK** — 5-Ton (4.5-mt) capacity hook with heavy-duty swivel and weight is provided for single-line operation.

**HYDRAULIC CAPACITY ALERT SYSTEM (HYCAS)** — Hydraulically senses boom hoist cylinder pressures and indicates an overload condition with an audible alarm. Optional shutdown prevents continuing overload.

**ANTI-TWO-BLOCK SYSTEM** — Audible warning and shutoff functions prevent hook from contacting boom point.

**ELECTRICAL** — 12-Volt direct current. Environmentally sealed enclosure contains accessory circuit, terminal strips and relays. In-line fuse.

**DESIGN/WELDING** — Design conforms to ANSI B30.5. Welding conforms to AWS D1.1.

**MANUALS** — Operator, service and parts manuals depict correct crane operation, maintenance procedures and parts listing.

**WARRANTY** — 12-Month warranty covers parts and labor resulting from defects in material or workmanship.

## OPTIONS

### ELECTRONIC CAPACITY ALERT SYSTEM

**(ECAS)** — Electronically senses boom hoist cylinder pressures. Color-coded gauge at each operator station and audible alarm indicate approaching overload. Optional shutdown system hydraulically prevents continuing overload.

### FIXED SWING-AROUND JIB — 23' (7.01m)

Fixed length, stows along boom base. Maximum tip height 101' (30.79m).

### TELESCOPIC SWING-AROUND JIB —

Working lengths 23' (7.01m) and 40' (12.19m). Stows along boom base. Telescopic section stows inside jib base. Manually pinned in retracted or extended position. Maximum tip height 118' (35.97m).

**H-STYLE STABILIZERS** — Two vertical double-acting hydraulic cylinders - 18" (457.2mm) stroke with 12" (304.8mm) diameter pivoting pads.

**BED** — Choice of 8' x 14' to 20' lengths (2.44m x 4.27m to 6.10m). Deck of high density hardwood or diamond steel tread plate. Cross sills on 12" (305mm) centers. Bolts to subframe.

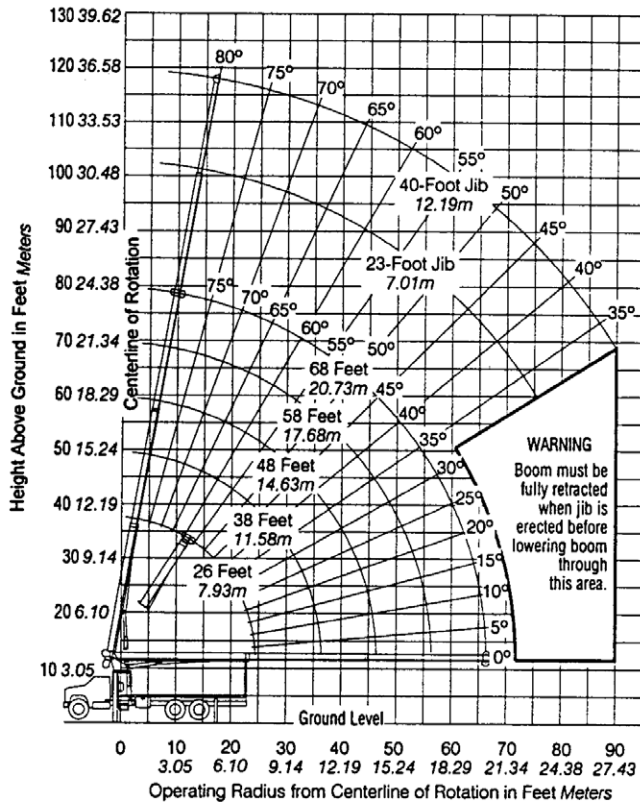
- 9/16" (14.3mm) rotation-resistant wire rope.
- Hook blocks for 2- to 4-part load line.
- Hanger sheave for 3- or 4-part line.
- Aerial baskets, 1- or 2-person.
- Top mounted work platform.
- Radio remote-control operation.
- Front-bumper stabilizer for 360° operation.
- Hydraulic swivel for continuous rotation.
- Capacity overload shutdown system.
- Dunnage/tool boxes.
- Air throttle.
- Various mountings.
- Special paint.
- Roofing application.
- Hydraulic hose reel.
- Oil cooler for duty-cycle applications.

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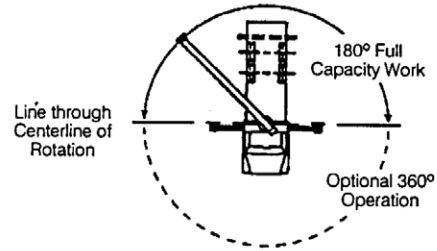
## OPERATOR ASSIST FEATURES

- Anti-Two-Block Warning and Shutoff
  - Capacity-Alert System, Audio Warning
  - Load Chart/Range Diagram
  - Boom-Angle Indicator
  - Audible Outrigger/Stabilizer Motion Alarm
  - Engine Start/Stop
  - Signal Horn
  - Back-Up Alarm
-

# Manitex Range Diagram



## AREA OF OPERATION



## WEIGHTS

Total crane, including hydraulic fluid.....	13,900 lb.....	6,305 kg
23' (7.01m) Fixed length jib.....	545 lb.....	247 kg
40' (12.19m) Telescopic jib.....	820 lb.....	372 kg
15-Ton (13.6-mt) single-sheave block.....	260 lb.....	118 kg
20-Ton (18.1-mt) double-sheave block.....	350 lb.....	159 kg
Hanger sheave for 3- and 4-part line.....	50 lb.....	23 kg
20'4" (6.20m) steel or wood bed.....	1,900 lb.....	862 kg

## DEDUCTIONS

Auxiliary Block.....	50 lb.....	22.68 kg
Overhaul Ball.....	120 lb.....	54.43 kg
Single-Sheave Load Block.....	260 lb.....	117.93 kg
Double-Sheave Load Block.....	350 lb.....	158.76 kg
Hose Reel.....	190 lb.....	86.18 kg

Swing-Around Jib (Stowed) ..... See Load Rating Chart

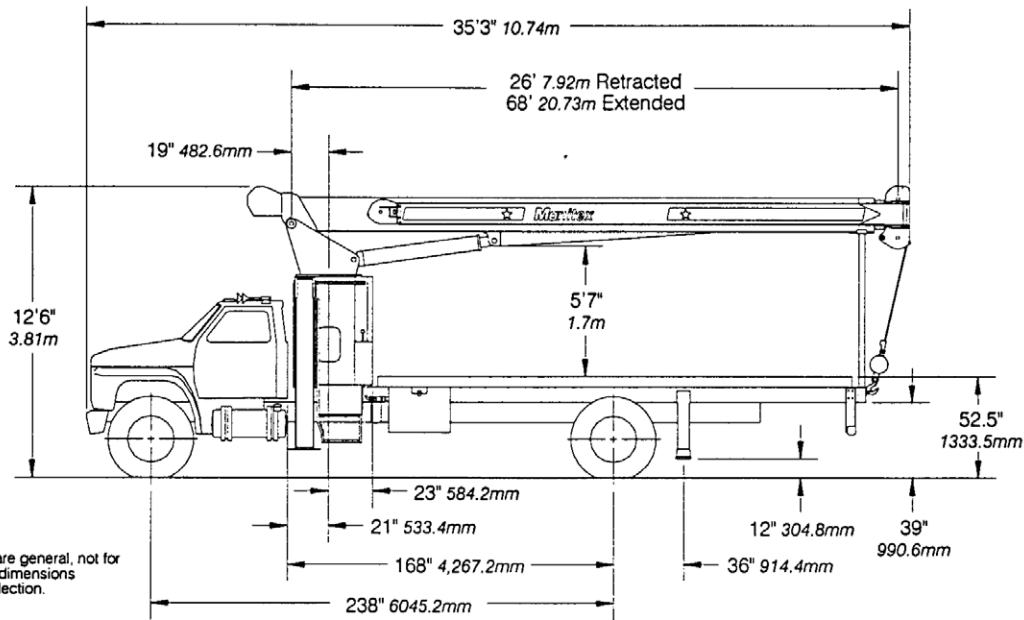
### WARNING

Lifting off the main boom point while the swing-around jib is erected is not intended or approved.

ALLOWABLE LINE PULL				WARNING
1 PART LINE	2 PART LINE	3 PART LINE	4 PART LINE	
				<p>Anti-Two-Block system must be in good operating condition before operating crane. Refer to Owner's Manual.</p> <p>Keep at least three wraps on load line on drum at all times.</p>
8500 lb 3856 kg	17000 lb 7711 kg	25500 lb 11567 kg	34000 lb 15422 kg	
7400 lb 3357 kg	14800 lb 6313 kg	22200 lb 10070 kg	29600 lb 13426 kg	<p>9/16" (14.29 mm) 6x25 IWRC (3.5:1 SF). 29750 lb (13494 kg) Minimum breaking strength.</p> <p>9/16" (14.29 mm) Rot resistant (5.0:1 SF). 37000 lb (16783 kg) Minimum breaking strength.</p>



## OUTLINE DIMENSIONS



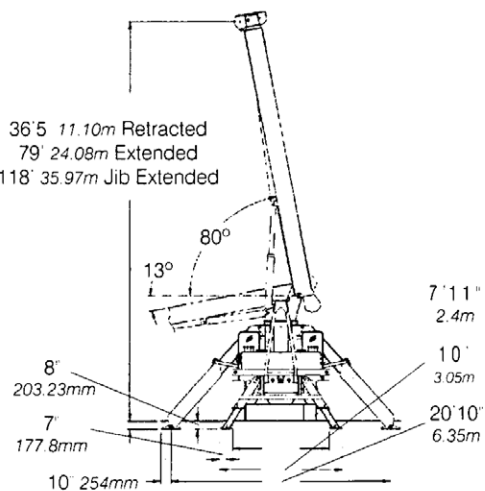
### TRUCK CHASSIS DATA

#### Minimum Requirements

Some configurations and options may increase requirements

Wheelbase.....	238 In.....	6,045mm
Cab to Axle.....	168 In.....	4,267mm
Frame Section Modulus.....	18 In <sup>3</sup> .....	3,295cc
	50,000 psi.....	344,750 kPa
Frame Section Modulus.....	15.9 In <sup>3</sup> .....	260cc
	110,000 psi.....	758,450 kPa
Nominal Frame Width.....	34 In.....	864mm
Front Axle Gross Weight Rating.....	12,000 lb.....	5,443 kg
Rear Axle Gross Weight Rating.....	21,000 lb.....	9,525 kg

36'5" 11.10m Retracted  
79' 24.08m Extended  
118' 35.97m Jib Extended



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Due to continuing improvements, Manitex reserves the right to change product specifications without notice.



LOAD RATINGS IN LBS WITH OUTRIGGERS AND STABILIZERS EXTENDED											JIB LOAD RATINGS WITH OUTRIGGERS AND STABILIZERS EXTENDED					
OPERATING RADIUS	LOADED BOOM ANGLE	BOOM LENGTH									OPERATING RADIUS	BOOM ANGLE	23 FT. JIB FOR ALL BOOM LENGTHS SEE WARNING NOTE*	BOOM ANGLE	40 FT. JIB FOR ALL BOOM LENGTHS SEE WARNING NOTE*	
			26 FT	38 FT	48 FT	58 FT	68 FT	RATED LOAD IN POUNDS	RATED LOAD IN POUNDS							
5	77	34000														
8	70	24000	77	21500												
10	66	20110	74	18460	78	14600					10					
12	61	17360	71	16010	76	12680	79	11810			12					
15	52	14310	66	13320	72	10500	76	9830	78	9200	15					
20	36	10490	57	10350	65	8160	70	7690	74	7280	20	78	3500			
25			47	8310	58	6570	65	6240	70	5910	25	75	3060	78	1940	
30			36	6610	51	5420	59	5200	65	4940	30	72	2700	75	1690	
35			17	4560	42	4470	53	4390	60	4200	35	69	2400	72	1490	
40					32	3580	47	3720	55	3610	40	65	2150	70	1320	
45					16	2380	39	3120	50	3110	45	62	1950	67	1180	
50							29	2500	43	2670	50	58	1770	64	1060	
55							15	1610	36	2240	55	55	1550	61	960	
60									28	1780	60	50	1350	58	870	
65									14	1400	65	46	1160	55	790	
70											70	41	1010	51	730	
75											75	36	830	48	670	
80											80			44	610	
85											85			40	570	
90											90			35	520	
95											95					
100											100					
		480 LBS.	330 LBS.	260 LBS.	220 LBS.	190 LBS.	DEDUCTIONS FOR STOWED JIB									

**WARNING**

1. THE OPERATOR MUST READ AND UNDERSTAND THE OWNER'S MANUAL BEFORE OPERATING THIS CRANE.
2. POSITIONING OR OPERATION OF CRANE BEYOND AREAS SHOWN ON THIS CHART IS NOT INTENDED OR APPROVED EXCEPT WHERE SPECIFIED IN OWNER'S MANUAL.
3. LOADED BOOM ANGLES AT SPECIFIED BOOM LENGTHS GIVE ONLY AN APPROXIMATION OF THE OPERATING RADIUS. THE BOOM ANGLE BEFORE LOADING SHOULD BE GREATER TO ACCOUNT FOR DEFLECTIONS. DO NOT EXCEED THE OPERATING RADIUS FOR RATED LOADS.
4. THE OPERATING RADIUS SHOWN IN THE JIB RATING CHART IS FOR FULLY EXTENDED BOOM ONLY. WHEN BOOM IS NOT FULLY EXTENDED, USE ONLY LOADED BOOM ANGLE TO DETERMINE LOAD RATING OF JIB. DO NOT RELY ON CAPACITY ALERT SYSTEM WHEN LIFTING FROM JIB.
5. BOOM MUST BE FULLY RETRACTED WHEN JIB IS ERECTED, BEFORE LOWERING BOOM THRU THIS AREA.
6. FOR BOOM ANGLES NOT SHOWN ON JIB LOAD RATING CHART, USE RATING OF NEXT LOWER BOOM ANGLE.
7. FOR BOOM LENGTHS NOT SHOWN, USE RATING OF NEXT LONGER BOOM LENGTH. FOR RADII NOT SHOWN, USE RATING OF NEXT LONGER RADIUS.
8. CRANE LOAD RATINGS ON OUTRIGGERS ARE BASED ON FREELY SUSPENDED LOADS WITH THE MACHINE LEVELED AND STANDING ON A FIRM UNIFORM SUPPORTING SURFACE. NO ATTEMPT SHALL BE MADE TO MOVE A LOAD HORIZONTALLY ON THE GROUND IN ANY DIRECTION.
9. PRACTICAL WORKING LOADS DEPEND ON SUPPORTING SURFACE, WIND, AND OTHER FACTORS AFFECTING STABILITY SUCH AS HAZARDOUS SURROUNDINGS, EXPERIENCE OF PERSONNEL, AND PROPER HANDLING, ALL OF WHICH MUST BE TAKEN INTO ACCOUNT BY THE OPERATOR.
10. THE MAXIMUM LOAD WHICH MAY BE TELESCOPED IS LIMITED BY HYDRAULIC PRESSURE, BOOM ANGLE, AND BOOM LUBRICATION. IT IS SAFE TO ATTEMPT TO TELESCOPE ANY LOAD WITHIN THE LIMITS OF THE LOAD RATING CHART.

**INFORMATION**

1. DEDUCTIONS MUST BE MADE FROM RATED LOADS FOR STOWED JIB, OPTIONAL ATTACHMENTS, HOOKS, AND LOAD BLOCKS (SEE DEDUCTION CHART). WEIGHTS OF SLINGS AND ALL OTHER LOAD HANDLING DEVICES SHALL BE CONSIDERED A PART OF THE LOAD.
2. CRANE LOAD RATINGS WITH OUTRIGGERS ARE BASED ON OUTRIGGERS AND STABILIZERS EXTENDED AND SET WITH MACHINE LEVELED.
3. LOAD RATINGS ABOVE THE HEAVY LINE ARE STRUCTURALLY LIMITED CAPACITIES. LOAD RATINGS BELOW THE HEAVY LINE ARE STABILITY LIMITED CAPACITIES AND DO NOT EXCEED 85% OF TIPPING.

**DEFINITIONS**

1. OPERATING RADIUS IS THE HORIZONTAL DISTANCE FROM THE AXIS OF ROTATION TO THE CENTER OF THE VERTICAL HOIST LINE OR TACKLE WITH LOAD APPLIED.
2. LOADED BOOM ANGLE AS SHOWN IN THE COLUMN HEADED BY  $\angle$ , IS THE INCLUDED ANGLE BETWEEN THE HORIZONTAL AND LONGITUDINAL AXES OF THE BOOM BASE AFTER LIFTING RATED LOAD AT RATED RADIUS.