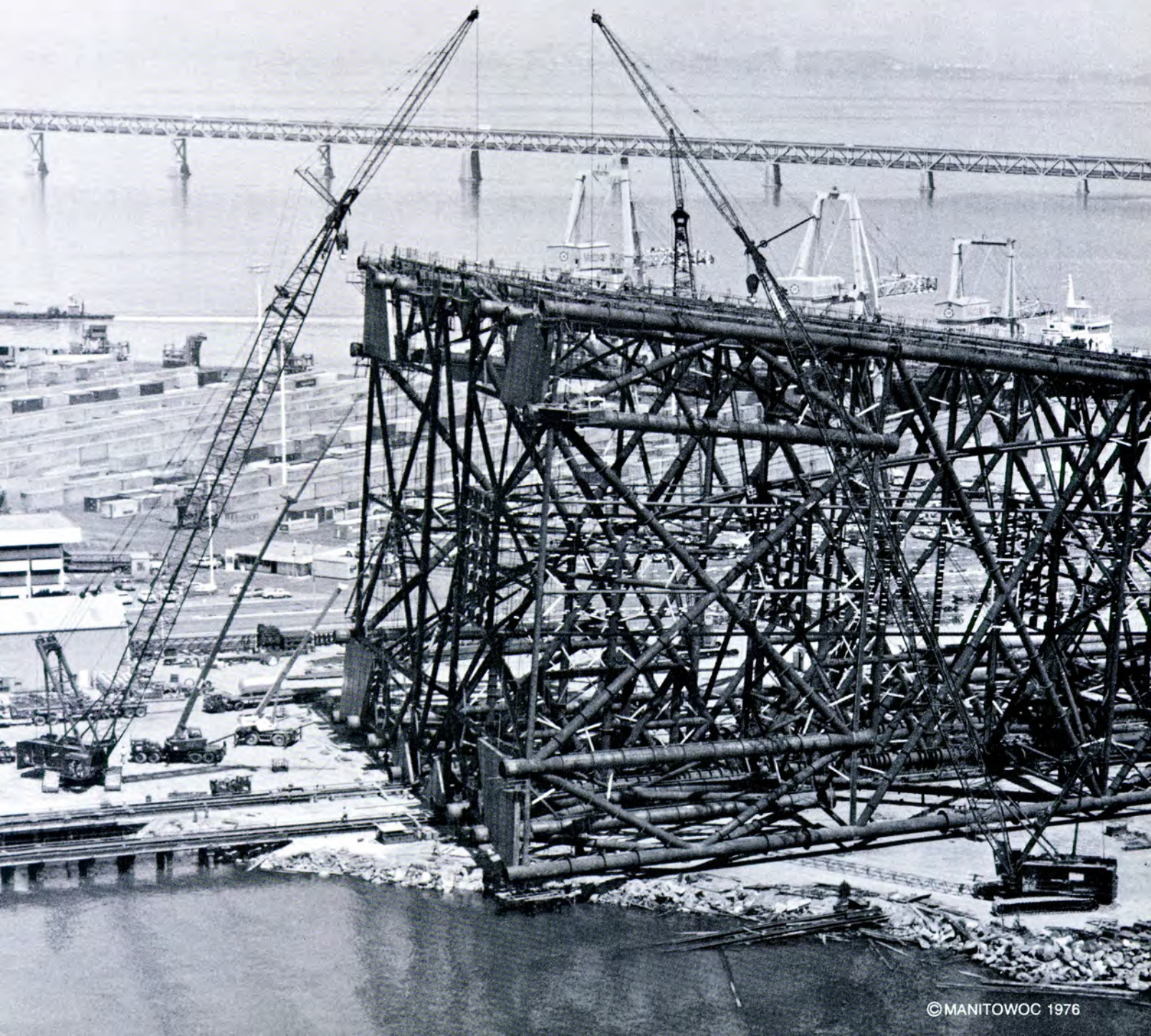
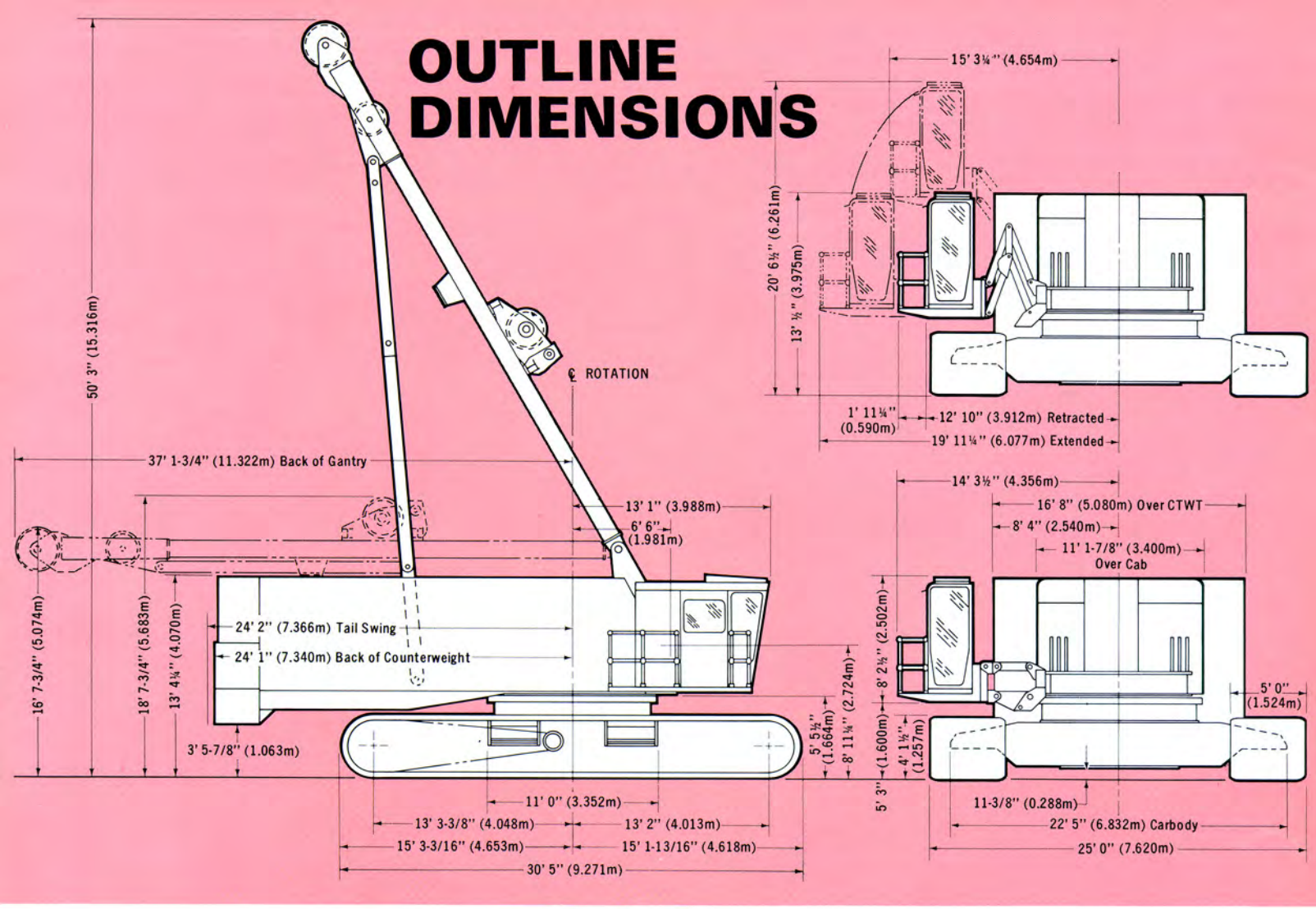
MANITOWOC SPECIFICATIONS

4600 S-4



OUTLINE DIMENSIONS



WEIGHTS

	POUNDS*
LIFTCRANE, complete with 80′ No. 27B Boom, gantry and backhitch, boom hoist rigging, pendants, basic upperworks package, operator's module, counterweights, 30′ 5″ long crawlers with 60″ treads and outside crawler drive	561,500
CRAWLERS, with crawler side frames, 60″ crawler treads and outside crawler chains (each 66,700)	133,400
CARBODY, with king pin, roller path and travel mechanism, without crawlers	85,600
UPPERWORKS, complete with basic machinery, including main drums but not including boom hoist, gantry and backhitch, operator's module, front end attachments or counterweights	138,200
GANTRY AND BACKHITCH	29,500
BOOM HOIST	15,100

	POUNDS*
EQUALIZER AND PENDANT LINKS	1,860

NOTE: Gantry and backhitch, boom hoist and fully reeved equalizer can be removed as a unit. Total weight: 49,300 pounds.

REMOVABLE COUNTERWEIGHT (5-PC)	
Lower	44,000
Middle Left and Middle Right (each 20,500)	41,000
Upper Left and Upper Right (each 17,500)	35,000
Total	120,000
BOOM NO. 27B	
BOOM BUTT: (less wire rope and pendants)	11,670
BOOM TOP: (equipped with lower boom point and sheaves)	11,060
Add for upper boom point and sheave	1,140
Total	12,200
BOOM INSERTS:	
Insert—10′ (with pendants)	2,500
Insert—20′ (with pendants & wire rope guide)	4,225
Insert—40′ (with pendants & wire rope guides)	7,050

** Weights are approximate and may vary between machines as a result of design changes and component variations.*

POWER PLANTS		Cylinder	Bore	Stroke	Cubic Inch Displacement	Net HP @ RPM (at flywheel)
BASIC	Cummins VTA-1710-C700 Diesel	12	5.50″	6.0″	1,710	685 @ 2,000*
OPTIONAL	Caterpillar D-379-B Diesel	8	6.25″	8.0″	1,964	635 @ 1,270*
*Ratings Without Fan.					Fuel Tank Capacity: 840 Gallons.	

LOWER MACHINERY

CARBODY: One-piece, ribbed steel fabrication with integral side wings. Side wings transmit loads directly to crawler side frames, eliminating axles and providing lower center of gravity.

RING GEAR AND ROLLER PATH: Cast alloy steel. Integral ring gear and roller path bolted to carbody. Internal gear teeth, machine cut. Roller path has 134" outside diameter with 5" thick hook roller flange.

KING PIN: Cast steel. Bolted to carbody with high strength bolts. Provides pivot for rotating upperworks. Takes horizontal load only, no uplift. Pressure-lubricated bronze bearing in rotating bed.

TRAVEL SHAFTS: Power transmitted through vertical travel shaft to three-piece horizontal travel shaft by bevel gears enclosed in oil bath. Final reduction gears at end of each travel shaft increases torque to crawler drive sprockets. Reduction gears, steering and travel mechanism enclosed in carbody by protective steel covers.

TRAVEL AND STEERING: Air controlled jaw clutches normally engaged for straight travel. For gradual or sharp turns, clutch may be positioned in neutral or locked position respectively. Interlock keeps one jaw clutch engaged at all times.

TRAVEL LOCKS: Air operated travel locks have dual ratchet and pawl permitting travel in one direction while preventing movement in opposite direction. Can be set to prevent travel in either direction. Travel lock pawls engage external teeth on travel jaw clutch. Each pawl can be released separately by independent air control.

CRAWLER SIDE FRAMES: Steel fabrication with integral supports for attachment to carbody. Twelve, 20" diameter double-flanged cast steel intermediate idler rollers are mounted between side plates on 6" diameter stationary shafts. Each roller supported by dual bronze bearings with center grease pocket. Abrasion resistant slide bars on top of frames support crawler pads.

CRAWLER FRONT IDLER: Double-flanged cast steel roller; large bronze bearing on each end and grease pocket in center. Mounted on 7" diameter stationary shaft supported at both ends in side frame. Tread belt adjusted by hydraulic jack and U-shaped shims which hold shaft in position.

CRAWLER SPROCKET AND TUMBLER: Cast steel. Teeth and tumbler rim flame-hardened. Driving torque transmitted through single-unit integral sprocket and tumbler with bronze bearings on each end and center grease pocket. Mounted on 7" diameter stationary shaft supported at both ends in side frame. Self-cleaning tumbler has alternate sides open. Drive chain adjustment accomplished by moving tumbler with hydraulic jack. U-shaped shims hold tumbler shaft in position.

CRAWLER DRIVE: Drive chains located outside of crawler frame. Drive sprockets self-contained within crawler side frames are joined to horizontal travel shaft by jaw clutch coupling. Allows crawler removal without separating drive chains or tread belts.

CRAWLER PADS: Cast alloy steel. Box section design with central driving lug, internally ribbed for extra strength. Bottom edges tapered upward. Each pad connected by two high carbon, wear resistant steel pins.

UPPER MACHINERY

ROTATING BED: One-piece, ribbed steel fabrication with integral machinery side frames forms a rigid deck for power plant, house rollers, rotating machinery, gantry support and boom hinge.

HOUSE ROLLERS: 6 antifriction bearing mounted; 4 Front, 2 Rear.

HOOK ROLLERS: 6 antifriction bearing mounted on eccentric shafts for adjustment; 2 Front, 4 Rear.

UPPER STRUCTURE: Fabricated steel rear column, roof support and center support structure. Fabricated steel front leg supports with integral box section cross brace. Structure supports gantry, counterweight and boom hoist assembly.

POWER PLANTS: See bottom of page 2.

POWER TRANSMISSION, VICON®: The VICON (**V**ariable **I**ndependent **CON**trol—Patented) system provides stepless variable control power transmission for various machine functions. Engine power divided at transmission case to hoist converter, two swing converters, and hydraulic pumps which power boom hoist and travel functions.

HOIST DRIVE: Controlled torque converter chain drives a sprocket floating independently on antifriction bearing mounted main drive shaft. Pinion bolted to this sprocket engages a reduction gear splined to antifriction bearing mounted countershaft. Another pinion splined to countershaft, engages a gear on rear drum shaft which drives a similar gear on the front drum shaft. Chain and gear drives are enclosed and oil lubricated.

SWING DRIVE: Two controlled torque converters driven at constant input speed from transmission case. Converter outputs connected through gear drive so that one converter powers swing in left direction and other converter powers swing in right direction. Converters provide stepless, variable power to swing in either direction and eliminates need for reversing clutches. Swing output transmitted to main drive shaft by chain drive. Chain and gear drives are enclosed and oil lubricated.

TRAVEL DRIVE: Powered through variable displacement hydraulic pump mounted directly to transmission case.

BOOM HOIST DRIVE: Powered through variable displacement hydraulic pump mounted directly to transmission case.

MAIN DRIVE SHAFT: Alloy steel, mounted on antifriction bearings. Power from swing drive transmitted by chain drive to outboard sprocket on main drive shaft. This sprocket is mounted to an adapter which is splined to main drive shaft and powers swing bevel gear. The chain and gear drives are enclosed and oil lubricated.

SWING MACHINERY: Vertical swing shaft is alloy steel, mounted on antifriction bearings with bevel gear splined to upper end. Receives power from bevel gear on main drive shaft. Pinion on lower end of vertical swing shaft drives double gear reduction to main swing pinion which meshes with ring gear.

UPPER MACHINERY (continued)

TRAVEL MACHINERY: Dual, reversible hydraulic motors drive through gear case, horizontal shaft, bevel gear set and gear reduction to vertical travel shaft. Pressure compensating hydraulic system varies torque and speed output of motors to suit travel requirements.

COUNTERSHAFT: Countershaft gear and drum drive pinion are splined to left end of countershaft and straddle large antifriction bearing. Gears enclosed and run in oil-tight case.

FRONT AND REAR DRUM ASSEMBLIES: Both drums have heat-treated alloy steel drum shafts with antifriction bearing mountings. Integral drum gear hubs and clutch spiders are keyed to drum shafts. Steel drums mounted on antifriction bearings have bolted cast iron combination brake and clutch flanges on left side, brake flange only on right side. Air controlled, internal expanding band-type drum clutches are mounted on left side and have heavy duty molded linings. Dual, air actuated, external contracting band-type brakes are spring set for parking and automatically set in the event of air pressure loss. Rear drum is used for main load line on liftcrane and front drum is used for whipline.

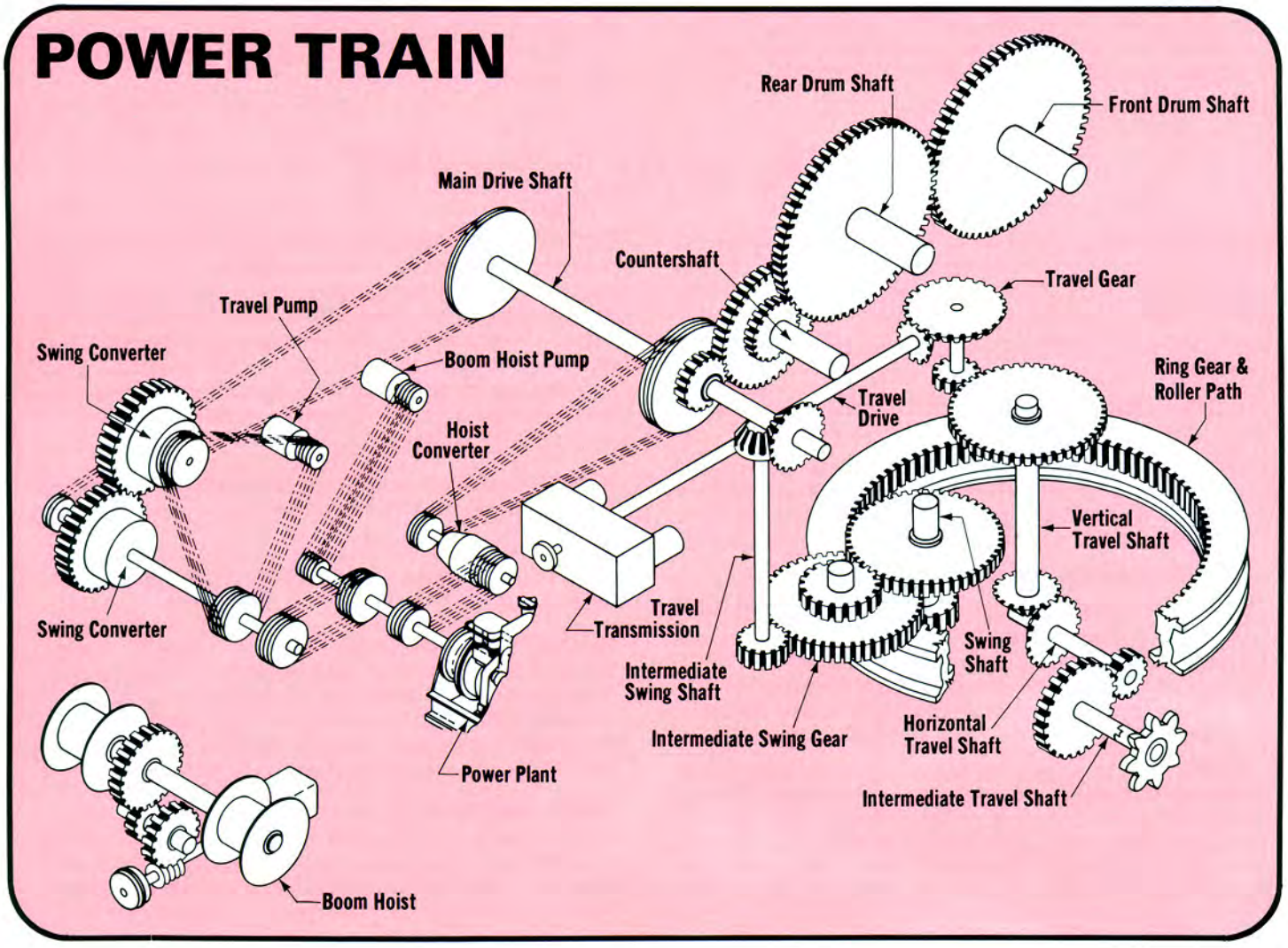
INDEPENDENT BOOM HOIST: Dual drums, alloy steel drum shaft. Driven by alloy steel worm shaft and bronze worm gear through gear and pinion reduction. Gears fully enclosed and run in oil. All rotating shafts antifriction bearing mounted. Boom hoist powered independently by variable displacement hydraulic motor providing full range speed control. Boom hoist brake is external contracting band-type, spring applied, air released, located on worm shaft; automatically releases or sets as boom hoist is engaged or disengaged. Auxiliary brake, external contracting band-type, set from operator's station. Ratchet on boom hoist drum flange with pawl mounted on gear housing. Boom hoist mounted at back of machine on rear column.

GANTRY AND BACKHITCH: Gantry is fabricated plate with parallel box section legs. Mounted to fabricated support, pin-connected to rotating bed and center support structure. Backhitch is two-piece telescoping, link-type construction, with power actuated link pins. Gantry and backhitch are pin-connected. Vertical lower gantry sheaves antifriction bearing mounted; horizontal equalizing sheaves and floating vertical upper gantry sheaves bronze bearing mounted.

GANTRY LIFTING DEVICE: Electrically controlled hydraulic unit used for partially raising gantry prior to erection into working position. Also controls lowering of gantry onto cab roof.

AUTOMATIC BOOM STOP: Push rod contacts electric switch which actuates valve in air line automatically stopping air supply to independent boom hoist hydraulic pump positioner. Set to stop hoisting when boom reaches maximum angle.

TELESCOPIC BOOM STOP: Telescoping tubes, air cushioned. Pinned to boom and A-frame. Starts cushioning at 76½° with positive physical stop at 85° from horizontal.



DRUMS & LAGGINGS

TANDEM DRUM SHAFT							
Application	Drum	Diameter	Drum Width	Type of Lagging	Wire Rope Size	Spooling Capacity	
						Layers	Maximum Capacity Without Ratchet
LIFTCRANE							
Hoist	Rear	28"	43¼"	None	1¼"	9	2,900'
Whip	Front	28"	43¼"	None	1¼"	9	2,900'
Optional	Front	41½"	43¼"	Plain	1¼"	3	1,115'
CLAMSHELL							
Closing	Rear	41"	43¼"	Grooved	1½"	First Layer Only	289'
Holding	Front	41"	43¼"	Grooved	1½"		289'

FRONT END EQUIPMENT

NO. 27B BOOM: 80' boom (40' heavy duty butt section and 40' open throat top section); optional 10', 20' and 40' inserts. All welded construction. Inverted angle chords 100,000 PSI yield steel. Butt, top and inserts 114" wide x 90" deep at pin-connected joints. Each insert matched with two pair of 1⅜" diameter single-length pendants. Lower boom point equipped with eight 32" diameter sheaves, antifriction bearing mounted. Maximum boom length 310'.

BOOM RIGGING: Twelve-part line, reeved between gantry and equalizer. Controls boom angle by dual lines from independent boom hoist drums. Two pair of 1⅜" diameter pendants connect equalizer to boom point. For longer booms, pendants matched to insert lengths.

EQUALIZER: Steel fabrication. Six vertical sheaves, antifriction bearing mounted.

WIRE ROPE GUIDE: Mounted on top side of boom. Two sets of interlocking fleeting sheaves. One set for main hoist line and one set for whipline. Bronze bearing mounted.

WIRE ROPE ROLLER GUIDE: Mounted on top side of boom. Induction hardened. Antifriction bearing mounted.

UPPER BOOM POINT: Optional detachable assemblies. Pin-connected to open throat top. Single 36" OD sheave with rope guard for liftcrane. Double 47" OD sheaves with cheek plates for clamshell. All sheaves antifriction bearing mounted.

4½° OFFSET BOOM TOP: Optional. Permits greater clearance between load and boom. Standard No. 27B boom converted by adapter links at upper boom joint. Basic length 80'; maximum length 310'.

FOR CAPACITY CHARTS AND INFORMATION, CONSULT FACTORY.

NO. 125 JIB: Optional. 44-ton maximum capacity, 40' length, extendible to 80' with 10' and 20' inserts and matching pendants. Jib offset angle adjustable to 3, 10, and 20 degrees. All welded construction. Tubular chord and lacing members; 48¾" wide x 38¼" deep at pin-connected joints. Top section has 32" OD antifriction bearing sheave, cheek plates and anchor joint for two-part line.

CONSULT JIB LIFTING CAPACITY CHARTS FOR SPECIFIC CAPACITY WHEN USED ON VARIOUS BOOM LENGTHS.

GENERAL

FIXED OPERATOR'S MODULE: Standard. Fully enclosed and insulated steel module with large safety glass windows. Independently mounted to right front of machinery house on fixed brackets. Isolated from machinery noise. Cab swings forward of rotating bed for 11' 1⅞" shipping clearance. Air signal horn, air windshield wipers, air circulating fan and 24 volt dome light are standard. Heater and air conditioner optional.

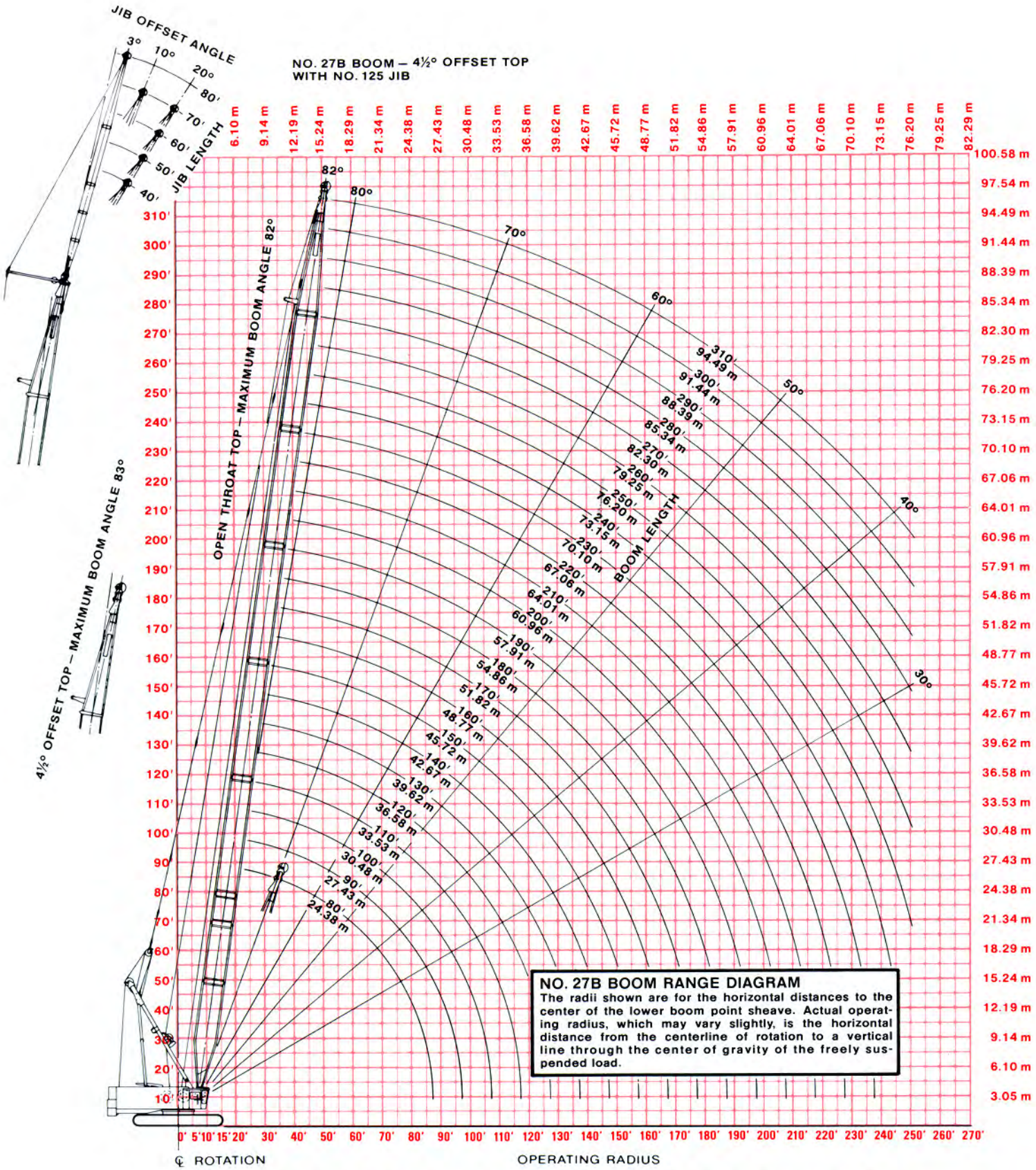
MOVABLE OPERATOR'S MODULE: Optional. Same operator's module as above, but with power actuated bracket arrangement which permits raising, lowering or extending the module as shown on outline dimensions.

CONTROLS: Graduated air controls for main functions. VICON® system on front and rear drums. Drum control levers are combination clutch and converter control; first movement engages drum clutch; further movement increases converter output torque permitting variable speed. Air operated treadle type drum brakes for feel and ease of operation with spring set, air released parking brake. With VICON® system on swing, movement of control lever increases converter output in direction of desired swing permitting variable speed. Air actuated, hydraulic valves operate boom hoist and travel functions. Drum rotation indicators are standard for boom hoist and front and rear drums. Control side consoles provide for good downward visibility.

SWING SPEED: Variable, 2.4 RPM maximum.

TRAVEL SPEED: Variable, 1.0 MPH maximum.

GRADEABILITY: 30%.



NO. 27B BOOM RANGE DIAGRAM

The radii shown are for the horizontal distances to the center of the lower boom point sheave. Actual operating radius, which may vary slightly, is the horizontal distance from the centerline of rotation to a vertical line through the center of gravity of the freely suspended load.

Larger-scale blueprint-type RANGE DIAGRAMS for planning your lifts are available from factory.

Because of a program of continuing improvements, Manitowoc Engineering Co. reserves the right to change this description at any time, without notice.

MANITOWOC ENGINEERING CO.
(A division of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin 54220

Form No. 7621

MO/5M-Litho in U.S.A.