

MANITOWOC ENGINEERING CO.

Division of The Manitowoc Company, Inc. Manitowoc, Wisconsin 54220



WIRE ROPE SPECIFICATIONS

4100W

BOOM NO. 27 OR NO. 27A-27

FULL WIDTH TANDEM DRUMS

19" (.5M) DIAMETER, 37-1/4" (.9M) WIDTH

PROCEDURE FOR DETERMINING PARTS OF LINE,
MAXIMUM HOIST DISTANCE AND WIRE ROPE LENGTH
USING FRONT AND/OR REAR DRUMS

4100W SERIES 1

RINGER SERIES 3

TABLE 1: HOIST REEVING FOR MAIN LOAD BLOCK

PARTS OF LINE	1	2	3	4	5	6	7	8	9
MAXIMUM LOAD-LBS.	32,500	65,000	97,500	130,000	162,500	195,000	227,500	260,000	292,500
MAXIMUM LOAD-KG	14,740	29,480	44,220	58,960	73,700	88,450	103,190	117,930	132,670
PARTS OF LINE	10	11	12	13	14	15	16	17	18
MAXIMUM LOAD-LBS.	325,000	357,500	390,000	422,500	455,000	487,500	520,000	552,500	600,000
MAXIMUM LOAD-KG	147,410	162,150	176,900	191,640	206,380	221,120	235,860	250,610	272,150
HOIST LINE:	1-1/8" (28.6MM) - 6 X 31 WARRINGTON-SEALE, EXTRA IMPROVED PLOW STEEL, REGULAR LAY, IWRC. MINIMUM BREAKING STRENGTH 130,000 LBS. (58,960KG). APPROX. WEIGHT = 2.34 LBS. PER FT. (3.50 KG/M).								
WHIP LINE: (STANDARD)	1-1/8" (28.6MM) - 6 X 31 WARRINGTON-SEALE, IMPROVED PLOW STEEL, REGULAR LAY, IWRC. MINIMUM BREAKING STRENGTH 113,000 LBS. (51,250KG). MAXIMUM LOAD = 28,300 LBS. (12,830KG) PER LINE. APPROX. WEIGHT = 2.34 LBS. PER FT. (3.50 KG/M).								
WHIP LINE: (OPTIONAL - JIB NO. 122A WITH 25' STRUT)	1-1/8" (28.6MM) - 6 X 31 WARRINGTON-SEALE, EXTRA IMPROVED PLOW STEEL, REGULAR LAY, IWRC. MINIMUM BREAKING STRENGTH 130,000 LBS. (58,960KG). MAXIMUM LOAD = 32,500 LBS. (14,740KG) PER LINE. APPROX. WEIGHT = 2.34 LBS. PER FT. (3.50 KG/M).								

TABLE 2: MAXIMUM SPOOLING CAPACITIES

FRONT DRUM (HOIST LINE) - 1-1/8" (28.6MM) WIRE ROPE - 7 LAYERS - 1,494' (455.4M)
REAR DRUM (HOIST LINE) - 1-1/8" (28.6MM) WIRE ROPE - 7 LAYERS - 1,494' (455.4M)
CAUTION: SIMULTANEOUS SPOOLING OF HOIST LINE ON FULL WIDTH FRONT AND REAR DRUMS IS PERMITTED ONLY IF TOTAL LINE PULL OF THE TWO LINES DOES NOT EXCEED 32,500 LBS. (14,740KG).
REAR DRUM (WHIP LINE) - 1-1/8" (28.6MM) WIRE ROPE - 3 LAYERS - 725' (221.0M) (WITH 27-5/8" (.7M) DIA. LAGGING)
REAR DRUM (WHIP LINE) - 1-1/8" (28.6MM) WIRE ROPE - 7 LAYERS - 1,494' (455.4M) JIB NO. 122A WITH 25' STRUT)
11' (3.4M) AND 15' (4.6M) ARE DEDUCTED FROM MAXIMUM SPOOLING CAPACITIES FOR 2 DEAD WRAPS PER DRUM AND LAGGING RESPECTIVELY.

TABLE 3: WIRE ROPE CONSTANT

AMOUNT OF WIRE ROPE REQUIRED TO REEVE SHEAVES IN SHEAVE CARRIER AND LOAD BLOCK									
PARTS OF LINE	1	2	3	4	5	6	7	8	9
WIRE ROPE CONSTANT-FT.	35	40	45	50	55	60	60	65	70
WIRE ROPE CONSTANT-M	11	12	14	15	17	18	18	20	21
PARTS OF LINE	10	11	12	13	14	15	16	17	18
WIRE ROPE CONSTANT-FT.	75	75	80	85	85	90	95	95	100
WIRE ROPE CONSTANT-M	23	23	24	26	26	27	29	29	30
NOTE: ABOVE LENGTHS INCLUDE INITIAL WRAPS ON FRONT DRUM AND WIRE ROPE REQUIRED FROM FRONT DRUM TO SHEAVES ON FRONT ROLLER CARRIER.									

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MAXIMUM HOIST DISTANCE AND WIRE ROPE LENGTH
USING FRONT AND/OR REAR DRUMS****4100W SERIES 1****RINGER SERIES 3**

- A. PARTS OF LINE REQUIRED TO HOIST A GIVEN LOAD ARE SHOWN IN TABLE 1. WEIGHT OF JIB, ALL LOAD BLOCKS, HOOKS, WEIGHT BALL, SLINGS, HOIST LINES, ETC., BENEATH BOOM AND JIB POINT SHEAVES, IS CONSIDERED PART OF THE LOAD.
- B. (1) FROM JOB LAYOUT, DETERMINE MAXIMUM DISTANCE LOAD IS TO BE LIFTED.
- (2) MULTIPLY HOIST DISTANCE (FROM STEP B-1) X PARTS OF LINE. CHECK THIS TOTAL AMOUNT OF ROPE WITH DRUM SPOOLING CAPACITY (TABLE 2) TO DETERMINE IF SPOOLING CAPACITY IS ADEQUATE. WHEN USING FRONT DRUM AND ADDITIONAL SPOOLING CAPACITY IS REQUIRED, ROPE CAN BE REEVED FROM FRONT DRUM THROUGH LOAD BLOCK AND DEAD END ATTACHED TO REAR DRUM. THIS WILL PROVIDE THE SPOOLING CAPACITY OF THE REAR DRUM IN ADDITION TO THAT OF THE FRONT DRUM. AN EVEN NUMBER OF PARTS OF LINE IS REQUIRED FOR THIS METHOD. WHIP LINE CANNOT BE USED WHEN BOTH DRUMS ARE USED FOR MAIN HOIST.
- C. (1) DETERMINE WIRE ROPE LENGTH
- a) USING FRONT DRUM ONLY
- TO DETERMINE TOTAL LENGTH OF WIRE ROPE REQUIRED FOR MAIN HOIST, MULTIPLY PARTS OF LINE X TOTAL DISTANCE FROM CENTERLINE OF SHEAVES IN BOOM TOP TO CENTERLINE OF SHEAVES IN BLOCK WITH BLOCK AT LOWEST ELEVATION. ADD BOOM LENGTH PLUS WIRE ROPE CONSTANT FROM TABLE 3 CORRESPONDING TO PARTS OF LINE USED.
- b) USING FRONT AND REAR DRUM
- TO DETERMINE TOTAL LENGTH OF WIRE ROPE REQUIRED FOR MAIN HOIST, MULTIPLY PARTS OF LINE X TOTAL DISTANCE FROM CENTERLINE OF SHEAVES IN BOOM TOP TO CENTERLINE OF SHEAVES IN BLOCK WITH BLOCK AT LOWEST ELEVATION. ADD TWICE THE BOOM LENGTH PLUS 50' (15.2M) PLUS WIRE ROPE CONSTANT FROM TABLE 3 CORRESPONDING TO PARTS OF LINE USED.
- (2) TO DETERMINE TOTAL LENGTH OF WIRE ROPE REQUIRED FOR WHIP LINE USING REAR DRUM, MULTIPLY PARTS OF LINE X TOTAL DISTANCE FROM CENTERLINE OF SHEAVES IN JIB TOP TO CENTERLINE OF SHEAVES IN BLOCK WITH BLOCK AT LOWEST ELEVATION. ADD BOOM LENGTH, JIB LENGTH PLUS 50' (15.2M).
- (3) OTHER CONSIDERATIONS SUCH AS LENGTH OF ROPE AVAILABLE AND WIRE ROPE REQUIRED TO DROP HOOK TO GRADE MAY INFLUENCE TOTAL LENGTH OF WIRE ROPE SELECTED.

REFER TO WIRE ROPE SPECIFICATION CHART NO. 6144-B WHEN SPOOLING ON FRONT AND REAR DRUMS AND MACHINE IS EQUIPPED WITH A SPLIT REAR DRUM (21" (.5M) DIAMETER X 17-3/8" (.4M) WIDTH).

REFER TO LOAD LINE HOISTING RANGE CHART NO. 6144-A FOR MAXIMUM HOISTING RANGES WITH BOOM NO. 27 AND NO. 6144-C FOR MAXIMUM HOISTING RANGES WITH BOOM NO. 27A-27.

REFER TO DRUM AND LAGGING CHART NO. 6105.