



LOAD LINE SPECIFICATIONS

4600 SERIES-4
RINGER® - SERIES-3

BOOM NO. 65

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

**FRONT DRUM: 40" (1.0m) WIDTH, 28" (.7m) DIAMETER, 63" (1.6m) DIAMETER FLANGE
REAR DRUM: 43" (1.0m) WIDTH, 28" (.7m) DIAMETER, 50½" (1.3m) DIAMETER FLANGE**

TABLE 1: HOIST REEVING FOR MAIN LOAD BLOCK

MAXIMUM LOAD FOR VARIOUS WIRE ROPE SIZES											
Parts of Line		1	2	3	4	5	6	7	8	9	10
1¼" (31.8mm)	lbs.	44,000	88,000	132,000	176,000	220,000	264,000	308,000	352,000	396,000	440,000
Wire Rope	kg	19,950	39,910	59,870	79,830	99,790	119,740	139,700	159,660	179,620	199,580
1½" (34.9mm)	lbs.	45,000	90,000	135,000	180,000	225,000	270,000	315,000	360,000	405,000	450,000
Wire Rope	kg	20,410	40,820	61,230	81,640	102,050	122,470	142,880	163,290	183,700	204,110
1½" (38.1mm)	lbs.	50,000	100,000	150,000	200,000	250,000	300,000	350,000	400,000	450,000	500,000
Wire Rope	kg	22,670	45,350	68,030	90,710	113,390	136,070	158,750	181,430	204,110	226,790
1¾" (41.3mm)	lbs.	60,000	120,000	180,000	240,000	300,000	360,000	420,000	480,000	540,000	600,000
Wire Rope	kg	27,210	54,430	81,640	108,860	136,070	163,290	190,500	217,720	244,940	272,150
Parts of Line		11	12	13	14	15	16	17	18	19	20
1¼" (31.8mm)	lbs.	484,000	528,000	572,000	616,000	660,000	704,000	748,000	792,000	836,000	880,000
Wire Rope	kg	219,530	239,490	259,450	279,410	299,370	319,320	339,280	359,240	379,200	399,160
1¾" (34.9mm)	lbs.	495,000	540,000	585,000	630,000	675,000	720,000	765,000	810,000	855,000	900,000
Wire Rope	kg	224,520	244,940	265,350	285,760	306,170	326,580	346,990	367,410	387,820	408,230
1½" (38.1mm)	lbs.	550,000	600,000	650,000	700,000	750,000	800,000	850,000	900,000	950,000	1,000,000
Wire Rope	kg	249,470	272,150	294,830	317,510	340,190	362,870	385,550	408,230	430,910	453,590
1¾" (41.3mm)	lbs.	660,000	720,000	780,000	840,000	900,000	960,000	1,020,000	1,080,000	1,140,000	1,200,000
Wire Rope	kg	299,370	326,580	353,800	381,010	408,230	435,440	462,660	489,880	517,090	544,310
Parts of Line		21	22	23	24	25	26				
1¼" (31.8mm)	lbs.	924,000	968,000	1,012,000	1,056,000	1,100,000	1,144,000				
Wire Rope	kg	419,110	439,070	459,030	478,990	498,950	518,910				
1¾" (34.9mm)	lbs.	945,000	990,000	1,035,000	1,080,000	1,125,000	1,170,000				
Wire Rope	kg	428,640	449,050	469,460	489,880	510,290	530,700				
1½" (38.1mm)	lbs.	1,050,000	1,100,000	1,150,000	1,200,000	1,250,000	1,300,000				
Wire Rope	kg	476,270	498,950	521,630	544,310	566,990	589,670				
1¾" (41.3mm)	lbs.	1,250,000	1,300,000	1,350,000	1,400,000	1,450,000	1,500,000				
Wire Rope	kg	566,990	589,670	612,350	635,030	657,700	680,380				

LOAD AND WHIP LINES:

- 1-1/4" (31.8mm) — 6 x 31 Warrington-Seale, Extra Extra Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 175,800 lbs. (79,740 kg). Approx. Weight Per Ft. in lbs. 2.98 (4.43 kg/m).
- 1-3/8" (34.9mm) — 6 x 43 Filler Wire Seale, Extra Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 192,000 lbs. (87,080 kg). Approx. Weight Per Ft. in lbs. 3.5 (5.21 kg/m).
- 1-1/2" (38.1mm) — 6 x 41 Seale Filler Wire, Extra Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 228,000 lbs. (103,410 kg). Approx. Weight Per Ft. in lbs. 4.16 (6.19 kg/m).
- 1-5/8" (41.3mm) — 6 x 41 Seale Filler Wire, Extra Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 264,000 lbs. (119,740 kg). Approx. Weight Per Ft. in lbs. 4.88 (7.26 kg/m).

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TABLE 2: MAXIMUM SPOOLING CAPACITIES

Front drum (load line)	1½" (31.8mm) wire rope — 12 layers — 3,905' (1,190.2m) with ratchet
	1¾" (34.9mm) wire rope — 11 layers — 3,297' (1,004.9m) with ratchet
	1½" (38.1mm) wire rope — 10 layers — 2,744' (836.4m) with ratchet
	1¾" (41.3mm) wire rope — 7 layers — 1,578' (481.0m) with ratchet
Rear drum (load line)	1½" (31.8mm) wire rope — 9 layers — 2,886' (879.7m) without ratchet — 2,786' (849.2m) with ratchet
	1¾" (34.9mm) wire rope — 8 layers — 2,340' (713.2m) without ratchet — 2,258' (688.2m) with ratchet
	1½" (38.1mm) wire rope — 5 layers — 1,216' (370.6m) without ratchet — 1,173' (357.5m) with ratchet
	1¾" (41.3mm) wire rope — 3 layers — 598' (182.3m) without ratchet — 576' (175.6m) with ratchet
When equipped with drum brake assembly No. 160277	
	1½" (38.1mm) wire rope — 8 layers — 2,205' (672.1m) without ratchet — 2,128' (648.6m) with ratchet
	1¾" (41.3mm) wire rope — 7 layers — 1,708' (520.6m) without ratchet — 1,648' (502.3m) with ratchet
CAUTION: Proper nesting of wire rope is required to achieve maximum spooling capacities. 7 layers of 1½" (41.3mm) wire rope or 10 layers of 1½" (38.1mm) wire rope is allowed on front drum provided the spooled wire rope outside diameter does not exceed 48½" (1.2m) and 55" (1.4m) respectively. 7 layers (2 layers with 41½" (1.1m) lagging) of 1¾" (41.3mm) wire rope or 8 layers (3 layers with 41½" (1.1m) lagging) of 1½" (38.1mm) wire rope is allowed on rear drum provided rear drum is equipped with drum brake assembly No. 160277 and spooled wire rope outside diameter does not exceed 48½" (1.2m) and 50 in. (1.3m) respectively. Simultaneous spooling of load line on front and rear drums is permitted only if total line pull of the two lines does not exceed the wire rope one part allowable in Table 1.	
Rear drum (whip line — jib)	1½" (31.8mm) wire rope — 9 layers — 2,886' (879.7m) without ratchet — 2,786' (849.2m) with ratchet
Rear drum (whip line — 10' (3.0m) upper boom point or upper jib point)	1½" (31.8mm) wire rope — 3 layers — 1,092' (332.8m) lagging without ratchet — 1,053' (321.0m) lagging with ratchet
	1¾" (34.9mm) wire rope — 3 layers — 1,010' (307.8m) lagging without ratchet — 974' (296.9m) lagging with ratchet
	1½" (38.1mm) wire rope — 5 layers — 1,216' (370.6m) lagging without ratchet — 1,173' (357.5m) lagging with ratchet
	1¾" (41.3mm) wire rope — 3 layers — 598' (182.3m) lagging without ratchet — 576' (175.6m) lagging with ratchet
When equipped with drum brake assembly No. 160277	
	1½" (38.1mm) wire rope — 3 layers — 934' (284.7m) lagging without ratchet — 901' (274.6m) lagging with ratchet
	1¾" (41.3mm) wire rope — 2 layers — 536' (163.4m) lagging without ratchet — 517' (157.6m) lagging with ratchet
*1½" (31.8mm) and 1¾" (34.9mm) wire rope spooling capacities are based on rear drum with 41½" (1.1m) dia. lagging. 1½" (38.1mm) and 1¾" (41.3mm) wire rope cannot be used on 41½" (1.1m) diameter lagging unless rear drum is equipped with drum brake assembly No. 160277. 16' (4.9m) and 23' (7.0m) 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	10
Wire Rope Constant — Feet	70	80	85	90	95	100	105	110	120	125
Wire Rope Constant — Meter	21	24	26	27	29	30	32	34	37	38
Parts of Line	11	12	13	14	15	16	17	18	19	20
Wire Rope Constant — Feet	130	135	140	145	150	160	165	170	175	180
Wire Rope Constant — Meter	40	41	43	44	46	49	50	52	53	55
Parts of Line	21	22	23	24	25	26				
Wire Rope Constant — Feet	185	190	200	205	210	215				
Wire Rope Constant — Meter	56	58	61	63	64	66				
Note: Above lengths include initial wraps on front drum and wire rope required from front drum to sheaves on front roller carrier.										

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) × 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 × 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 × 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 80 ft. (24.4m) 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 × 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 and wire rope constant from Table 3 corresponding to parts of line used.

(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 load line hoisting range chart No. 7307-B and No. 7307-C for maximum hoisting ranges with Boom No. 65.

Refer to drum and lagging chart No. 6108.