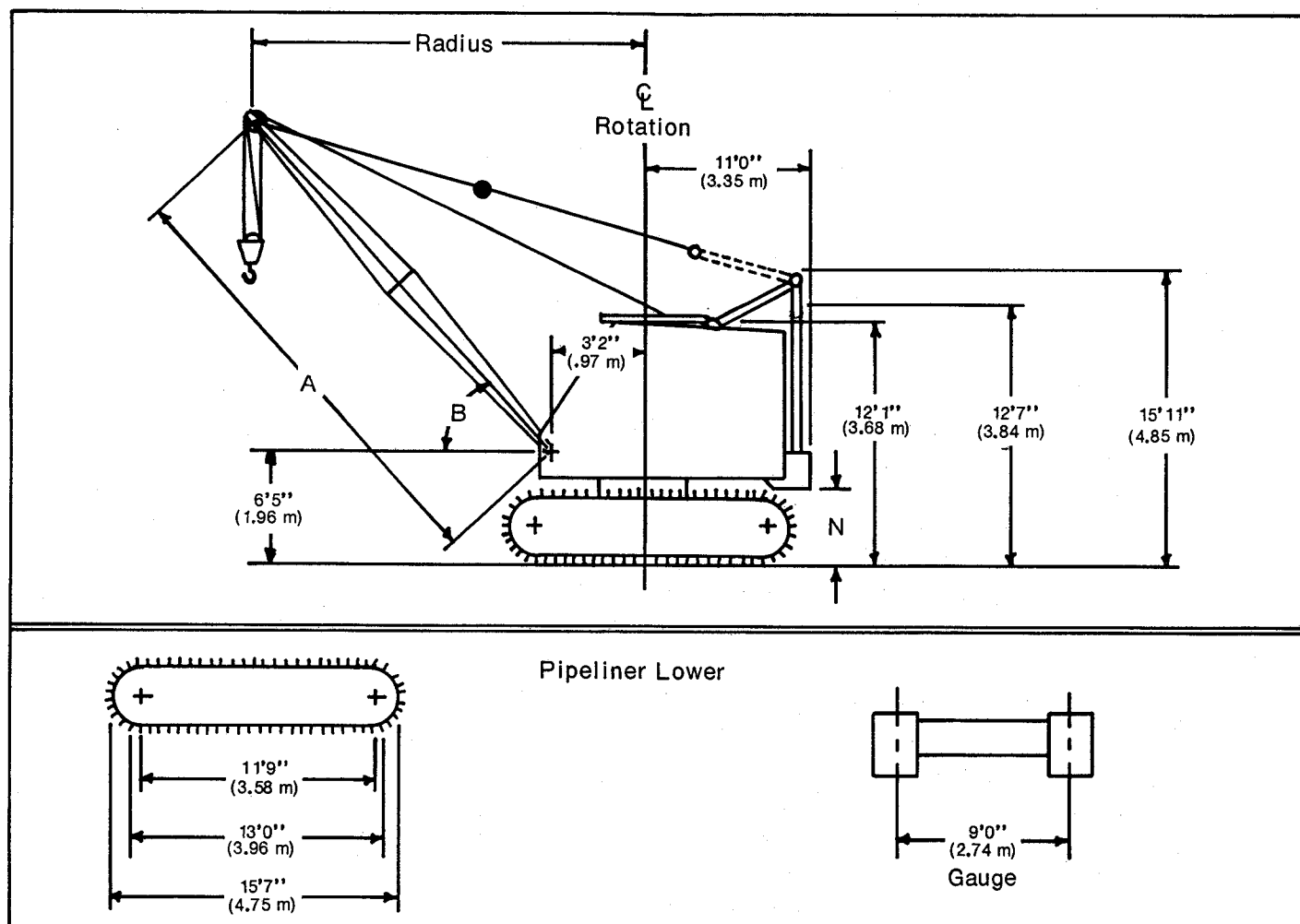


**Link-Belt®****LS-98 Pipeliner**
crawler excavator/crane**GENERAL INFORMATION ONLY****General Dimensions**

		Pipeliner Lower	
		Feet	Meters
Basic boom length	A	40' 0"	12.19
Boom angle	B	—	—
Clearance (ctwt. "A")	N	4' 9"	1.45
Clearance (ctwt. "AB")	N	4' 3"	1.30
Clearance (ctwt. "ABC")	N	4' 0"	1.22
Minimum ground clearance	—	2' 2"	.66
Over-all width with 30" (.76 m) wide grouser shoes	—	11' 6"	3.51
Width of cab	—	8' 0"	2.44



Machine Working Weights — Approximate

Based on std. machine including GM4-71N diesel engine with friction clutch, auxiliary fuel tank, 6 hook rollers, independent boomhoist w/lowering ratchet, auxiliary rear drum brake, independent swing and travel, instant travel, swing brake, low gantry, necessary drum laggings, cwt. "A", 30' (.76 m) wide single grouser shoes.	Pipelinier Lower	
	Pounds	Kilograms
Hoe — including cwt. "A", necessary hoist and inhaul wire ropes, 1¼ cu. yd. (.96 cu. m.) Esco bucket with Esco tooth type side cutters for 47" (1.19 m) cutting width and 20' (6.10 m) boom.	73,540	33,358
Hoe — same as above hoe except including either GM6-71N or Cat. 3306T engine w/friction clutch, cwt. "AB" and complete hydraulic system and bucket cylinder.	79,850	36,220
Dragline — including cwt. "AB", necessary hoist and inhaul wire ropes but no bucket, and 60' (18.29 m) angle boom.	73,015	33,120
Clamshell — including cwt. "AB", necessary holding (hoist) and closing wire ropes but no bucket or tagline winder, and 60' (18.29 m) angle boom.	72,435	32,857
Maximum Lifting Crane — including power load lowering clutches on both front and rear drums, retractable high gantry, cwt. "ABC", 8 hook rollers, necessary load hoist wire rope on rear drum, and 60' (18.29 m) angle boom.	78,385	35,555

GENERAL INFORMATION ONLY

General specifications

Crawler Mounting

Lower Frame — All-welded, stress relieved, precision machined; line bored for horizontal traction shaft. Special cover plates under lower seal and protect lower machinery components. Tow hooks provided on both ends of lower frame.

Roller Path With Integral Ring (Swing) Gear — Double flanged, machined roller path. Swing pinion meshes with internal ring gear.

Horizontal Traction Shaft — Two-piece, joined by involute splined coupling; shaft mounted on bronze bushings in lower frame; powered through bevel gears, enclosed in oil. Travel/steer jaw clutches involute splined to shaft; all shaft components mounted within lower frame. Sprockets on outer ends of shaft, chain drive the track chain sprockets at inside rear of each crawler side frame.

Power Hydraulic Steer/Travel — Jaw clutches splined to traction shaft power hydraulically engaged with jaws on brake drums, releasing spring-applied steer/digging brakes. Brake drums splined to drive sprocket hub. Brakes are not released until jaw clutches are preloaded or fully engaged.

Instant Travel — Standard. Pushbutton control mounted on travel control lever at operator's position in cab. As operator actuates travel control lever, he depresses the pushbutton which actuates an electrical solenoid. Solenoid controlled valve directs Speed-o-Matic® hydraulic oil to release both travel brakes simultaneously as travel jaw clutches are engaged. Permits instant straight-line travel either forward or reverse.

Crawler Side Frames — Fabricated side frames welded integral with lower frame cross axles.

Track Drive Assembly — Heat treated track drive and chain drive sprockets welded integral, mounted on anti-friction bearings at rear end of each crawler side frame; sealed for lifetime lubrication.

Track Idler Roller (Wheel) — Heat treated rollers mounted on shaft on anti-friction bearings at front end of each crawler side frame; sealed for lifetime lubrication.

Track Adjustment — Hydraulically operated with hand grease gun. Contains pre-set relief valve to prevent overtightening track belts. Pre-loaded compensating springs for each track enclosed in oil.

Track Drive Chain Adjustment — Adjustment

at drive end of crawler side frame by means of jack screw and shims.

Crawler Tracks — Tractor/chain type; track belts equipped with single bar grouser shoes; shoes bolted to 8½" (.22 m) pitch continuous chain. Each track belt equipped with two master link pins and locks.

Tracks — Equipped with forty-six 30" (.76 m) wide single bar grouser shoes per side frame. Ground contact area (neglecting grouser bars) — 65 sq. ft. (6.04 m²). Optional — 30" (.76 m) wide two bar grouser shoes. Optional — 23 flat, bolt-on street plates for each side frame (one for every other track shoe); recommended for intermittent service only.

Track Rollers — Heat treated, mounted on anti-friction bearings; sealed for lifetime lubrication. Seven dual type rollers and one single type roller per side frame. (Single type rollers mounted in front of track drive sprocket in each side frame.)

Track Carrier Rollers — Heat treated, mounted on anti-friction bearings; sealed for lifetime lubrication. Two dual type rollers per side frame.

Travel Speed — Two speed standard; low speed, .86 m.p.h. (1.39 km/hr.); high speed, 1.95 m.p.h. (3.14 km/hr.).



Link-Belt® LS-98 Pipeliner lifting crane capacities

PCSA Class 10-79
Refer to notes below.**Boom** — angle, 34" x 34" (0.86 x 0.86 m) with open throat top section and dual 1½" (29 mm) diameter boom pendants.**Mounting** — crawler; 9' 0" (2.74 m) gauge, 15' 7" (4.75 m) overall length.**Counterweights** — refer to engine/counterweight chart below.

Engine	Counterweights					
	"A"		"AB"		"ABC"	
	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms
GM4-71N	6,650	3 016	11,070	5 021	14,220	6 450
Cat. 3306-T	5,750	2 608	10,170	4 613	13,320	6 042

Boom						Counterweight "AB"		Counterweight "ABC"	
Length	Radius		Angle	Boom point height ^①					
	Feet	meters	Degrees	Feet	meters	Pounds	kilograms	Pounds	kilograms
40' (12.19 m)	10	3.05	80.2	45' 10"	13.97	54,770	24 843	60,770	27 564
	12	3.66	77.2	45' 5"	13.85	39,760	18 034	44,160	20 030
	15	4.57	72.8	44' 8"	13.60	27,970	12 686	31,120	14 115
	20	6.10	65.1	42' 8"	13.02	18,460	8 373	20,590	9 339
	25	7.62	56.9	39' 11"	12.17	13,590	6 164	15,200	6 894
	30	9.14	47.9	36' 1"	11.00	10,630	4 821	11,930	5 411
	35	10.67	37.3	30' 8"	9.34	8,640	3 919	9,730	4 413
	40	12.19	23.0	22' 0"	6.71	7,210	3 270	8,140	3 692
50' (15.24 m)	12	3.66	79.8	55' 8"	16.96	39,540	17 935	43,940	19 930
	15	4.57	76.3	55' 0"	16.76	27,740	12 582	30,880	14 006
	20	6.10	70.3	53' 6"	16.31	18,220	8 264	20,340	9 226
	25	7.62	64.1	51' 5"	15.67	13,340	6 050	14,950	6 781
	30	9.14	57.5	48' 7"	14.82	10,380	4 708	11,670	5 293
	35	10.67	50.5	45' 0"	13.71	8,380	3 801	9,470	4 295
	40	12.19	42.6	40' 3"	12.26	6,950	3 152	7,880	3 574
	45	13.72	33.2	33' 10"	10.31	5,870	2 662	6,690	3 034
	50	15.24	20.5	23' 11"	7.30	5,030	2 281	5,760	2 612
60' (18.29 m)	15	4.57	78.6	65' 3"	19.89	27,500	12 473	30,640	13 898
	20	6.10	73.7	64' 0"	19.51	17,970	8 151	20,100	9 117
	25	7.62	68.7	62' 4"	18.99	13,090	5 937	14,690	6 663
	30	9.14	63.4	60' 1"	18.31	10,120	4 590	11,410	5 175
	35	10.67	58.0	57' 3"	17.46	8,120	3 683	9,210	4 177
	40	12.19	52.1	53' 9"	16.39	6,690	3 034	7,620	3 456
	45	13.72	45.8	49' 5"	15.07	5,610	2 544	6,430	2 916
	50	15.24	38.7	43' 11"	13.39	4,770	2 163	5,500	2 494
	55	16.76	30.3	36' 8"	11.17	4,100	1 859	4,750	2 154
	60	18.29	18.7	25' 8"	7.82	3,540	1 605	5,140	1 877

^①Measured vertically from center of boom head sheave to ground.

Notes — lifting crane

- The capacities included in this chart are the maximum allowable, and are based on machine standing level on firm supporting surface under ideal job conditions.
- Capacities are based on 75% of tipping loads.
- Capacities are based on freely suspended loads and make no allowance for such factors as the effect of wind, sudden stopping of loads, supporting surface conditions, and operating speeds. Operator must reduce load ratings to take such conditions into account. Deduction
- Least stable position is over the side.
- For lifting maximum rated capacity, 5-parts of ¾" (19 mm) type "N" wire rope are required.
- Retractable high gantry must be fixed in raised position for boom lengths over 55' (16.76 m).
- Main boom length must not exceed 60' (18.29 m).
- For maximum lifts the front and rear track sprockets must be blocked between shoe and ground.
- These capacities apply only to the machine as originally manufactured and normally equipped by FMC Corporation, Cable Crane and Excavator Division.

GENERAL INFORMATION ONLY

**LS-98 Pipeliner dragline/clamshell/magnet capacities**

Refer to notes below.

Boom — angle, 34" x 34" (0.86 x 0.86 m) with open throat top section and dual 1½" (29 mm) diameter boom pendants.

Mounting — crawler; 9' 0" (2.74 m) gauge, 15' 7" (4.75 m) overall length.

Counterweights — Refer to chart on page 1.

Boom						Counterweight "A"				Counterweight "AB"			
Length	Radius		Angle	Boom point height ^①		Dragline		Clamshell-magnet		Dragline		Clamshell-magnet	
	Feet	meters		Feet	meters	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms
40' (12.19 m)	10	3.05	80.2	45' 10"	13.97	—	—	13,600	6 168	—	—	13,600	6 168
	12	3.66	77.2	45' 5"	13.85	—	—	13,600	6 168	—	—	13,600	6 168
	15	4.57	72.8	44' 8"	13.60	—	—	13,600	6 168	—	—	13,600	6 168
	20	6.10	65.1	42' 8"	13.02	—	—	13,600	6 168	—	—	13,600	6 168
	25	7.62	56.9	39' 11"	12.17	11,330	5 139	10,200	4 626	11,800	5 352	12,210	5 538
	30	9.14	47.9	36' 1"	11.00	8,810	3 996	7,940	3 601	10,630	4 821	9,550	4 331
	35	10.67	37.3	30' 8"	9.34	7,120	3 229	6,410	2 907	8,640	3 919	7,760	3 519
	40	12.19	23.0	22' 0"	6.71	—	—	5,310	2 408	—	—	6,500	2 948
50' (15.24 m)	12	3.66	79.8	55' 8"	16.96	—	—	13,600	6 168	—	—	13,600	6 168
	15	4.57	76.3	55' 0"	16.76	—	—	13,600	6 168	—	—	13,600	6 168
	20	6.10	70.3	53' 6"	16.31	—	—	13,600	6 168	—	—	13,600	6 168
	25	7.62	64.1	51' 5"	15.67	—	—	9,950	4 513	—	—	12,000	5 443
	30	9.14	57.5	48' 7"	14.82	8,550	3 878	7,690	3 488	10,380	4 708	9,350	4 241
	35	10.67	50.5	45' 0"	13.71	6,860	3 111	6,180	2 803	8,380	3 801	7,540	3 420
	40	12.19	42.6	40' 3"	12.26	5,640	2 558	5,070	2 299	6,950	3 152	6,250	2 834
	45	13.72	33.2	33' 10"	10.31	4,730	2 145	4,250	1 927	5,870	2 662	5,280	2 394
60' (18.29 m)	50	15.24	20.5	23' 11"	7.30	—	—	3,600	1 632	—	—	4,530	2 054
	15	4.57	78.6	65' 3"	19.89	—	—	13,600	6 168	—	—	13,600	6 168
	20	6.10	73.7	64' 0"	19.51	—	—	13,450	6 100	—	—	13,600	6 168
	25	7.62	68.7	62' 4"	18.99	—	—	9,740	4 417	—	—	11,760	5 334
	30	9.14	63.4	60' 1"	18.31	—	—	7,450	3 379	—	—	9,120	4 136
	35	10.67	58.0	57' 3"	17.46	6,600	2 993	5,940	2 694	8,120	3 683	7,300	3 311
	40	12.19	52.1	53' 9"	16.39	5,380	2 440	4,850	2 199	6,690	3 034	6,010	2 726
	45	13.72	45.8	49' 5"	15.07	4,460	2 023	4,020	1 823	5,610	2 544	5,050	2 290
	50	15.24	38.7	43' 11"	13.39	3,750	1 700	3,380	1 533	4,770	2 163	4,300	1 950
	55	16.76	30.3	36' 8"	11.17	3,170	1 437	2,850	1 292	4,100	1 859	3,690	1 673
	60	18.29	18.7	25' 8"	7.82	—	—	2,430	1 102	—	—	3,190	1 446

① Measured vertically from center of boom head sheave to ground.

Notes — dragline/clamshell/magnet capacities

- The capacities included in this chart are the maximum allowable and are based on machine standing level on firm supporting surface under ideal job conditions.
- Capacities are not more than 75% of tipping loads for dragline; 67½% for clamshell/magnet.
- Capacities are maximum recommended by PCSA Standard #1. User must make allowances for soft or uneven supporting surfaces, rapid cycle operations, bucket suction or other unfavorable conditions which may require smaller buckets or magnets for most efficient operation.
- Weight of bucket or magnet, plus load, should not exceed these capacities.
- Retractable high gantry must be fixed in raised position for boom lengths over 55' (16.76 m).
- Dragline operation with boom angle less than 35° is not recommended.
- Boom length for dragline/clamshell/magnet operation should not exceed 60' (18.29 m).
- These capacities apply only to the machine as originally manufactured and normally equipped by FMC Corporation, Cable Crane and Excavator Division.

GENERAL INFORMATION ONLY

We are constantly improving our products and therefore reserve the right to change designs and specifications.



FMC Corporation Cable Crane and Excavator Division Cedar Rapids Iowa 52406

Link-Belt® cranes & excavators manufactured in: Cedar Rapids Iowa • Lexington & Bowling Green Kentucky • Ontario Canada • Milan Italy • Queretaro Mexico & Nagoya Japan (Under license)



Upper Revolving Superstructure

Frame — All-welded, stress-relieved, precision machined unit. Side housings bolted to upper frame. Special cover plates under frame protect hydraulic tubing.

Turntable Rollers — Six adjustable, heat treated, conical, hook-type rollers mounted on anti-friction bearings. Two equalized pairs front, two single rear. Eight rollers optional - four equalized pairs; 2 front and 2 rear.

Transmission — Quadruple roller chain enclosed in oil-tight chain case with integral sump. Pump driven oil stream lubrication. Engine pinion and chain wheel have machine-cut teeth.

Reduction Shaft — Two-piece shaft, joined by involute splined coupling; mounted in line bored side housings on anti-friction bearings.

Drive Pinions — Two pinions; heat treated, machine-cut teeth, involute splined to shaft. Pinions mounted on shaft outside of machinery side housings.

Clutches — Speed-o-Matic® power hydraulic for all functions (other than engine master clutch). Internal expanding two-shoe type, aluminum alloy shoes; clutch drums, 20" (.51 m) dia., 5" (.13 m) face width. Third drum operating clutch drum 17¼" (.44 m) dia., 4" (.10 m) face width. Clutch drums bolted to spur gears.

Clutch Spiders — Involute splined to shafts.

Drums — Front and rear main, and optional third, operating drums.

Front Drum — Serves as inhaul drum for hoe and dragline, holding or closing drum for clamshell, and hoist drum for lifting crane.

Shaft — Mounted in line bores on anti-friction bearings. Extended to accommodate power load lowering clutches.

Spur Gear — Machine-cut teeth; mounted on anti-friction bearings on shaft.

Brake — Two-piece, external contracting band; mechanically foot pedal operated. Mechanical latch on brake foot pedal permits locking drum brake in applied position. Brake band 4" (.10 m) face width.

Brake Drum — Involute splined to shaft, 27" (.69 m) dia., 4½" (.11 m) face width.

Rear Drum — Serves as hoist drum for all attachments.

Shaft — Mounted in line bores on anti-friction bearings. Extended to accommodate auxiliary rear drum brake.

Spur Gear — Machine-cut teeth; mounted on anti-friction bearings on shaft.

Brake — Two-piece, external contracting band; mechanically foot pedal operated. Mechanical latch on brake foot pedal permits locking drum brake in applied position. Brake band 4" (.10 m) face width.

Brake Drum — Involute splined to shaft, 27" (.69 m) dia., 4½" (.11 m) face width.

Third Drum — Optional. Mounts forward of front operating drum. Functions as third operating drum with control and design similar to front and rear main operating drums. Descriptions of shaft, spur gear, clutch drum, brake drum, and brake are the same as those used on front and rear drums except brake drum band has 3" (76.20 mm) face width and brake drum has 18" (.46 m) dia. and 3½" (88.90 mm) face width. Mechanical latch on brake foot pedal permits locking drum brake in applied position.

Operational Limitations — Dragline; if equipped with third drum, all wire rope must be removed from third drum to avoid interference with inhaul rope (front drum). Minimum four wraps of inhaul rope must be left on anchor end of front drum to avoid inhaul rope interference with third drum brake enclosure. Crane; if equipped with third drum, quantity of front drum wire rope must be limited in some cases to avoid interference between front drum rope and third drum brake enclosure.

Drum Laggings — For front, rear, and optional third drums. Two-piece, removable; bolted to brake drum.

Planetary Drive Units for Front and Rear Drums

Optional. For hoist only on front and/or rear main drums. Planetary drive unit mounts between spur gear and 2-shoe clutch drum on extended shaft; provides 70% increase or 40% decrease of standard load hoist rope speeds. Not available for optional third operating drum.

Auxiliary 2-shoe Rear Drum Brake — Standard. Increases brake lining contact area. Pressure on mechanical brake pedal applies standard rear drum brake band and auxiliary 2-shoe brake simultaneously. Mechanical linkage actuates control mechanism of variable pressure valve to direct hydraulic pressure to auxiliary brake cylinder. Note: Power load lowering clutch or planetary drive unit on lowering (left) side

for rear drum not available on machine equipped with auxiliary 2-shoe rear drum brake.

Drum Rotation Indicators — Standard for both front and rear main operating drums. Dial indicators mounted on control stand; dials actuated by flexible shaft drives attached to drum shafts.

Independent Boomhoist — Spur gear driven, with precision boom raising through clutch and boom lowering controlled by engine compression through ratchet and pawl mechanism. Precision lowering controlled through Speed-o-Matic® power hydraulic 2-shoe clutch is optional. Standard on all machines is an automatic boomhoist brake plus an operator controlled wire rope drum locking pawl.

Drum Shaft — Mounted in line bore on anti-friction bearings.

Spur Gears — Machine-cut teeth; mounted on anti-friction bearings.

Brake — External contracting band; spring applied, hydraulically released.

Rope Drum — Involute splined to shaft; single drum with grooved lagging standard.

Boomhoist Limiting Device — When properly adjusted, device prohibits booming up beyond pre-determined minimum operating radius. As boom approaches minimum radius, it contacts head of an adjusting bolt on rocker arm which mechanically returns boomhoist control lever to neutral position thus disengaging boomhoist clutch and causing simultaneous engagement (setting) of spring applied boomhoist brake.

Upper Machinery Power Train

Independent Swing/Travel — Standard. Includes two-speed travel.

Horizontal Travel Shaft — Mounted in line bore on anti-friction bearings.

Spur Gears — Machine-cut teeth; mounted on shaft on anti-friction bearings.

Bevel Gear — Involute splined to shaft; fully enclosed and running in oil.

Vertical Center Drive Shaft For Travel — Mounted on anti-friction bearings. Gears and jaw clutch fully enclosed and running in oil.

Bevel Gear — Heat treated, involute splined to shaft.



Jaw Clutch — Heat treated, involute splined to shaft. Clutch engages jaws on top side of spur gear beneath it to transfer power to vertical travel shaft for high speed travel.

Spur Gear — For high speed travel. Heat treated, machine-cut teeth; mounted on bronze bushings. Gear has integral clutch jaws on top side.

Spur Gear — For low speed travel. Heat treated, machine-cut teeth; involute splined to shaft.

Vertical Travel Shaft — Two-piece, tubular shaft; joined by splined sleeve, mounted on anti-friction bearings.

Spur Gear — For high speed travel. Heat treated, machine-cut teeth; involute splined to shaft. Gear has integral clutch jaws on bottom side.

Spur Gear — For low speed travel. Heat treated, machine-cut teeth; mounted on bronze bushings. Gear has integral clutch jaws on top side.

Bevel Gear — Heat treated; involute splined to shaft.

Horizontal Swing Shaft — Mounted in line bore on anti-friction bearings.

Spur Gears — Machine-cut teeth; mounted on anti-friction bearings; right-hand spur gear is heat treated.

Bevel Gear — Heat treated; involute splined to shaft; fully enclosed and running in oil.

Vertical Center Drive Shaft For Swing — Heat treated; mounted on anti-friction bearings. Gears enclosed and running in oil.

Bevel Gear — Heat treated; involute splined to shaft.

Brake Mounting — Mounted on lower end of extended vertical drive shaft for swing.

Swing Lock — Mechanically controlled pawl engages with internal teeth of ring (swing) gear.

Swing Speed — 4.07 r.p.m.

Control System — Speed-o-Matic® power hydraulics, a variable pressure system. Operating pressure is transmitted through oil to all operating two-shoe clutch cylinders, swing brake and boomhoist drum brake cylinders. System includes a pump to provide a constant flow of oil, an accumulator to maintain operating pressure, and variable pressure operator-controlled valves to regulate pressure to each clutch cylinder.

Pump — Vickers; rated at 4.7 gal. per minute (17.79 liters per minute) at 1,200 r.p.m.

Oil Filter — FMC; replaceable Skinner ribbon-type filter element.

Relief Valve — FMC; set to operate at 1,250 p.s.i. (88 kg/cm²).

Unloader Valve — FMC; set to unload pump at a maximum 1,050 p.s.i. (74 kg/cm²) and to load pump when pressure drops below 900 p.s.i. (63 kg/cm²).

Accumulator — FMC; piston-type, precharged with nitrogen gas to 650 p.s.i. (46 kg/cm²).

Sump Tank — FMC; 7 gal. (26.50 liters) capacity with air breather filter and oil strainer assembly.

Control Valves — FMC; variable pressure type.

Gantry — Mounted on upper revolving frame to rear of machinery side housings; supports boom suspension system.

Low Gantry — Standard.

Retractable Gantry — Optional, and required for booms over 55' (16.76 m) long.

Bail — With standard low gantry, pinned to gantry frame. Contains three sheaves mounted on bronze bushings for 8-part boomhoist reeving.

Bail — With optional retractable gantry, pinned to gantry frame. Contains three sheaves mounted on non-metallic bushings for 8-part boomhoist reeving.

Cab — Operator's door, rear and front roll on ball bearing rollers. Full vision operator's compartment with safety glass panels. Standard equipment includes dry chemical fire extinguisher, electric horn warning device, roof-top access ladder, skid-resistant finish on roof, machinery guards, hinged machinery access doors, hand grab rails, and bubble-type level.

Elevated Operator's Cab — Optional — Cabs 2' (.61 m), 4' (1.22 m) and 7' (2.13 m) higher than standard are available. Upper portions of 2' (.61 m) and 4' (1.22 m) elevated cabs hinged to reduce over-all clearance height. 7' (2.13 m) elevated cab equipped with quick disconnect fittings in hydraulic control lines to facilitate removal of upper portion of cab to reduce over-all clearance height.

Optional Cab Accessories — Sound reduction material, steel window covers, electric windshield wiper, cab heater, defroster fan. (Cab heater and defroster fan not recommended for machine equipped with elevated cab. Sound reduction material and steel window covers for standard cab only.)

Catwalks — Optional; along operator's side and/or right-hand side of cab, with overhead grab rails.

Counterweights — Removable, held in place by "T"-bolts. May be power removed if machine is equipped with optional retractable high gantry.

Cwt. "A" — Standard for hoe operation.

Cwt. "AB" — Standard for hydraulic hoe, lifting crane, dragline, and clamshell operations.

Cwt. "ABC" — Optional for lifting crane only.

Cwt.	GM4-71N		GM6-71N ^① Cat. 3306-T	
	Pounds	Kilograms	Pounds	Kilograms
"A"	6,650	3,016	5,750	2,608
"AB"	11,070	5,021	10,170	4,613
"ABC"	14,220	6,450	13,320	6,042

^①For machine equipped with hoe attachment with hydraulic digging bucket only.

GENERAL INFORMATION ONLY



Engines — Diesel. Full-pressure lubrication, oil filter, extra-deep oil pan, air cleaner, fuel filter, hand throttle, optional foot throttle and/or hand throttle (lever type) on swing control lever.

Specifications	GM4-71N	GM4-71N ^①	Cat. 3306-T	GM6-71N ^②
Number of cylinders	4	4	6	6
Bore and stroke — inches	4¼ x 5	4¼ x 5	4¾ x 6	4¼ x 5
— (mm)	108 x 127	108 x 127	120.7 x 152.4	108 x 127
Piston displacement — cu. in.	283.7	283.7	638	425.6
— (cm ³)	4,649.8	4,649.8	10,456.8	6,975.6
High idle speed — rpm	1,990	1,990	2,020	1,990
Engine rpm @ full load speed	1,850	1,850	1,890	1,850
Net engine h.p. @ full load speed	112	112	110	125
Peak torque — ft. lbs.	351	351	368	410
— (kgm)	48.54	48.54	50.89	56.70
Peak Torque — rpm	1,200	1,200	1,200	1,000
Electrical system	12-volt	12-volt	12-volt	12-volt
Batteries	2/6 volt	2/6 volt	2/12 volt	1/12 volt
Clutch or power take-off	Friction Twin Disc #SP111-HP-1	Hyd. coupling Twin Disc	Friction Twin Disc #SP111-HP-1	Friction Twin Disc #SP111-HP-1
Transmission				
No. chain wheel teeth	161	161	161	161
No. engine pinion teeth	17	17	17	17

^① Twin Disc hydraulic coupling.

^② For machine equipped with hoe attachment with hydraulic digging bucket only.

Fuel Tanks — 60 gal. (227.12 liters) capacity fuel tank with flame arrester fill unit, self-closing cap with locking eye for padlock, and fuel level gauge — mounted rear of machine under engine. Also standard is a 43 gal. (162.76 liters) capacity auxiliary fuel tank, equipped with same accessories, designed for mounting within cab in right front corner forward of chain wheel case.

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Drum Wire Rope Capacities, Line Speed and Pull — (Available line pull, not based on wire rope strength.)

Front Drum																		
Attachment	Wire Rope Diameter		Lagging			Type	Line Speed and Pull								Drum Capacity			
			Root Diameter		First Layer Rope				Full Drum Rope				First Layer		Full Drum			
	Line Speed				Line Pull		Line Speed		Line Pull									
	Inches	Milli-meters	Inches	Meters	F.P.M.		M/Min.	Lbs.	Kgs.	F.P.M.	M/Min.	Lbs.	Kgs.	Feet	Meters	Feet	Meters	
Crane	¾	15.88	13¼	.34	Smooth	149	45.42	23,200	10,533	283	86.26	12,200	5,539	66	20.12	993	302.67	
						253	77.11	12,889	5,852	481	146.61	6,778	3,077					
Clamshell (closing)	¾	19.05	15¼	.39	Grooved	171	52.12	20,100	9,125	252	76.81	13,700	6,220	49	14.94	367	111.86	
						291	88.70	11,167	5,070	428	130.45	7,611	3,455					
Dragline or Hoe	¾	22.23	13¼	.34	Grooved	152	46.33	21,487	9,732	246	74.98	12,707	5,769	44	13.41	343	104.55	
						258	78.64	11,909	5,407	418	127.41	7,059	3,205					

Note: First line in each category is standard machine.

Second line in each category is machine equipped with planetary-driven high speed drum.



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Drum Wire Rope Capacities, Line Speed and Pull —

(Available line pull, not based on wire rope strength.)

Rear Drum																	
Attachment	Wire Rope Diameter		Lagging		Type	Line Speed and Pull								Drum Capacity			
			Root Diameter	First Layer Rope		Full Drum Rope				First Layer		Full Drum					
						Line Speed	Line Pull	Line Speed	Line Pull								
	Inches	Milli-meters	Inches							Meters	F.P.M.	M/Min.	Lbs.	Kgs.	F.P.M.	M/Min.	Lbs.
Crane	5/8	15.88	13 1/4	.34	Smooth	149	45.42	23,200	10,524	283	86.26	12,200	5,534	66	20.12	993	302.67
						253	77.11	12,889	5,846	481	146.61	6,778	3,075				
Clamshell, Dragline, or Hoe	3/4	19.05	15 1/4	.39	Grooved	171	52.12	19,600	8,891	252	76.81	13,300	6,033	58	17.68	451	137.46
						291	88.70	10,889	4,939	428	130.45	7,389	3,352				

Note: First line in each category is standard machine.

Second line in each category is machine equipped with planetary-driven high speed drum.

Boomhoist Drum																
Wire Rope Diameter		Lagging		Type	Line Speed and Pull								Drum Capacity			
					First Layer Rope				Full Drum Rope				First Layer		Full Drum	
		Line Speed			Line Pull		Line Speed		Line Pull							
		Inches	Milli-meters		Inches	Meters	F.P.M.	M/Min.	Lbs.	Kgs.	F.P.M.	M/Min.	Lbs.	Kgs.	Feet	Meters
5/8	15.88	9	.23	Grooved	123	37.49	27,100	12,293	267	81.38	12,500	5,670	22	6.71	342	104.24

Third Drum																
Wire Rope Diameter		Lagging		Type	Line Speed and Pull								Drum Capacity			
					First Layer Rope				Full Drum Rope							
		Root Diameter			Line Speed		Line Pull		Line Speed		Line Pull		First Layer		Full Drum	
		Inches	Milli-meters		Inches	Meters	F.P.M.	M/Min.	Lbs.	Kgs.	F.P.M.	M/Min.	Lbs.	Kgs.	Feet	Meters
5/8	15.88	9	.23	Grooved	123	37.49	10,000	4,536	202	61.57	6,000	2,722	35	10.67	297	90.53

Crane Boom And Auxiliary Equipment

Angle Boom — Two piece; basic 40' (12.19 m) length, all-welded box lattice design with 20' (6.10 m) upper and lower sections. Boom 34" (.86 m) deep and 34" (.86 m) wide at the connections. Lower section constructed with 3" (76.2 mm) x 3" (76.2 mm) x 3/8" (9.53 mm) alloy steel main chord angles. Upper section constructed with 3" (76.2 mm) x 3" (76.2 mm) x 5/16" (7.94 mm) alloy steel main chord angles.

Boomfoot — 1 1/2" (41.28 mm) thick with 38" (.97 m) centers.

Boomfoot Pin — Steel, heat treated.

Peak Shaft — Steel, heat treated.

Peak Sheaves — Cast steel, mounted on anti-friction bearings. For lift crane, 2 sheaves are standard and 3 sheaves optional. For dragline, 2 sheaves are standard and 1 wide-flared sheave is optional. For clamshell, 2 sheaves are standard.

Boom Connections — Pin connections standard; permit quick removal or addition of boom extensions. Bolted connections optional.

Boom Extensions — Available in 5' (1.52 m), 10' (3.05 m), 15' (4.57 m) and 20' (6.10 m) lengths.

Boom Stops — Dual, rigid type with spring-loaded bumpers.

Boomhoist Bridle — Serves as a connection between pendant ropes and boomhoist wire rope reeving.

Low Gantry Sheaves — Ductile iron; 3 sheaves in bail and one on gantry head shaft for 8-part line.

High Gantry Sheaves — Ductile iron; three, four, or five sheaves in bail and two sheaves on gantry head shaft for eight, ten, or twelve part line.

Load Hoist Rope Deflector Rollers — To deflect main hoist line over top of boom. Required when third drum rope passes over crane boom. Rollers mounted on anti-friction bearings. The following



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number of rollers recommended for specific boom lengths: For booms up to 45' (13.72 m) long, one required; for booms 50' (15.24 m) to 60' (18.29 m) long, two required.

Boom Angle Indicator — Mounted on boom near base.

Boompoint Head Sheave Guards — Standard; formed, rigid, round steel.

Optional — roller-type guards. Note: Roller guards do not permit use of center head sheave.

Auxiliary Equipment for Boom

Fairlead — Full-revolving type with barrel, sheaves and guide rollers

mounted on anti-friction bearings.

Tagline Winders — Rud-O-Matic model 648; spring wound drum type mounted on crane boom. Rope pull off drum — 60' (18.29 m) to 75' (22.86 m) from neutral. Morin Tagmaster model BR — 0' to 100' (30.48 m); adjustable.

Backfill Board — 9' (2.74 m) wide; for use in backfilling material into trench.

Hoe Attachment

Boom — All-welded box section. 20' (6.10 m) boom length is measured from center of boomfoot pins to center of boom peak shaft.

Boomfoot Idler Roller and Pin — Steel boomfoot roller pin, heat treated, bolted in fixed position to boomfoot adaptor. Boom oscillates on heat treated bronze bushings in boomfoot.

Inhaul Rope Sheave on Boom — Ductile iron, heat treated; mounted on bronze bushings. Sheave supports inhaul rope as it passes from front drum to bucket bail.

Boompeak Shaft For Arm — Steel, secured from turning by bolt through hub. Arm oscillates on heat treated bronze bushings.

Deflector Rollers on Boom — Two grooved ductile iron rollers, one on each side of boom; turn on steel roller pin.

Arm — All-welded box section design.

Arm Machinery — Hoist sheave, heat treated; mounted on bronze bushing which turns on steel shaft.

Bridle — Welded plate construction, mounted on bronze bushings; connected to arm with steel pin.

Pitch Brace — Double channel, reinforced welded construction; secured to bucket with steel pins. Arm and pitch brace connections on bucket have case hardened steel bushings.

Bucket — Esco, 1¼ cu. yd. (.96 cu. m), 39" (.99 m) outside lip width, with Esco tooth-type side cutters for 47" (1.19 m) cutting width.

Bucket Bail — Horizontal sheave type. Connected to bucket on each side with four steel, heat treated links, and two steel pins.

Sheave — Ductile-iron, heat treated; mounted on bronze bushing which turns on steel shaft.

Mast — 9' (2.74 m) long; pinned to boomfoot adaptor.

Mast Stops — Standard; dual telescoping type.

Mast Machinery — 3 part hoist.

Head Shaft — Steel, heat treated.

Head Shaft Sheave — Ductile-iron, heat treated, mounted on sintered iron bushing.

Deflector Sheave — Cast-iron.

Bail Sheave — Ductile-iron, heat-treated; mounted on sintered iron bushing.

Mast Sheaves For 4-Part Boomhoist — Two sheaves, ductile-iron, heat treated; mounted on bronze bushings.

Optional Hoe Attachment With Hydraulic Digging Bucket — Includes special 23" (.58 m) x 6" (.15 m) clutch assembly utilized as auxiliary rear drum brake,

complete hydraulic system, and bucket actuating cylinder, and attachment handling lugs mounted on both boom and arm. Note: Available only on machine equipped with GM6-71N or Caterpillar 3306T engines with friction clutch.

Hydraulic Pump — Gear-type pump coupled to engine disconnect clutch output shaft by flexible coupling. Pump capacity, 51.2 g.p.m. (194 liters per minute) @ 2,000 p.s.i. (141 kg/cm²).

Bucket — Esco, 1¼ cu. yd. (.96 cu. m), 39" (.99 m) outside lip width, with Esco tooth type side cutters for 47" (1.19 m) cutting width.

Bucket Cylinder — One hydraulic cylinder; 6½" (.17 m) dia. bore, 4" (.10 m) dia. rod, 42½" (1.08 m) stroke. Cycle time — extended 7.96 seconds; retract 5.19 seconds. The double-acting cylinder is protected from shock loadings at full extend or retract by internal hydraulic cushioning at each end. Cylinder also equipped with polyurethane shock absorber at rod end, and each end of cylinder is mounted on self-aligning steel bushings.

Bucket Cylinder Control Valve — Hydraulic spool valve actuated by solenoid valve which is actuated by toggle switch mounted on top of swing control lever.

Sump Tank — All-welded unit; baffled for strength, improved deaeration, and heat rejection. Mounted on right-hand rear side of extended cab. Capacity, 50 gallons (189 liters), equipped with suction line and return line filters to assure clean oil.

Wire Rope

Application — Type and Size Used

Boomhoist — For crane, dragline, clamshell — Type "N", ⅝" (15.88 mm) dia.

Boomhoist — For logging boom — Type "A", ¾" (19.05 mm) dia.

Main Load Hoist — Type "A", ⅝" (15.88 mm) dia.

Dragline Hoist — Type "N", ¾" (19.05 mm) dia.

Dragline Inhaul — Type "D", ⅞" (22.23 mm) dia.

Clamshell Holding and Closing — Type "N", ¾" (19.05 mm) dia.

Tagline — Type "A", ⅝" (7.94 mm) dia.

Boom Pendants — Type "N", 1⅝" (28.58 mm) dia.

Hoe Hoist — Type "A", ¾" (19.05 mm) dia.

Hoe Inhaul — Type "D", ⅞" (22.23 mm) dia.

Hoe Mast Hoist — Type "A", ⅝" (15.88 mm) dia.

**Wire Rope Types**

Type "A" — 6 x 25 (6 x 19 class), filler wire, improved plow steel, preformed, fiber center, right lay, regular lay.

Type "D" — 6 x 25 (6 x 19 class), filler wire, improved plow steel, preformed, independent wire rope center, right lay, lang lay.

Type "N" — 6 x 25 (6 x 19 class), filler wire, extra improved plow steel, preformed, independent wire rope center, right lay, regular lay.

Main Load Hoist Wire Rope Lengths

Parts of Line	Boom Length					
	40' (12.19 m)		50' (15.24 m)		60' (18.29 m)	
	Feet	Meters	Feet	Meters	Feet	Meters
1	95	28.96	115	35.05	135	41.15
2	140	42.67	170	51.82	200	60.96
3	185	56.39	225	68.58	265	80.77
4	230	70.10	280	85.34	330	100.58
5	275	83.82	335	102.11	395	120.40
6	320	97.54	390	118.87	460	140.21

Boom Hoist Wire Rope Lengths

Gantry	Parts of Line	Rope Length	
		Feet	Meters
Low	8	240	73.15
High	8	255	77.72

Dragline Wire Rope Lengths

	Parts of Line	Boom Length									
		40' (12.19 m)		45' (13.72 m)		50' (15.24 m)		55' (16.76 m)		60' (18.29 m)	
		Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
Hoist	1	95	28.96	105	32.00	115	35.05	125	38.10	135	41.15
Inhaul	1	52	15.85	58	17.68	64	19.51	70	21.34	76	23.16

**Clamshell Wire Rope Lengths**

	Parts of Line	Boom Length									
		40' (12.19 m)		45' (13.72 m)		50' (15.24 m)		55' (16.76 m)		60' (18.29 m)	
		Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
Holding	1	105	32.00	115	35.05	125	38.10	135	41.15	145	44.20
Closing	1	140	42.67	150	45.72	160	48.77	170	51.82	180	54.86
Tagline		Furnished with Rud-O-Matic Tagline Winder									

Wire Rope Lengths — Hoe

Application		20' (6.10 m) Hoe Wire Rope Length	
		Feet	Meters
Boomhoist — low gantry	(4 part line)	92	28.04
Boomhoist — high gantry	(4 part line)	97	29.57
Hoist	(3 part line)	110	33.53
Inhaul	(2 part line)	65	19.81

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We are constantly improving our products and therefore reserve the right to change designs and specifications.



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