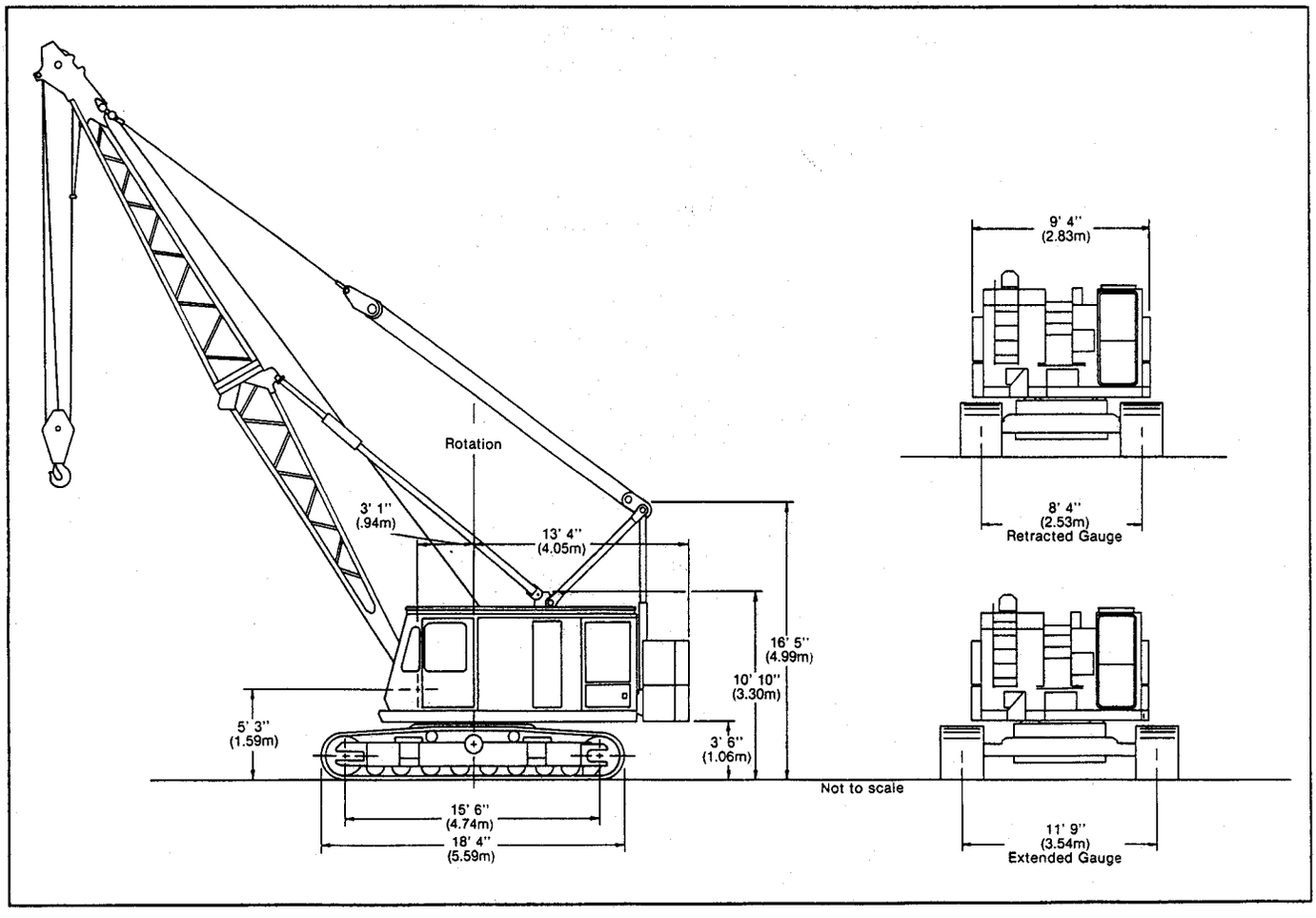
LS-110C Specifications

50 ton (*45 metric ton*)

Wire rope crawler crane/excavator



General dimensions	Feet	meters
Basic angle boom length,	40' 0"	12.19
Overall width side frames extended		
—30" (0.76 m) track shoes	14' 3"	4.35
—36" (0.91 m) track shoes	14' 9"	4.50
Overall width side frames retracted		
—30" (0.76 m) track shoes	10' 10"	3.30
—36" (0.91 m) track shoes	11' 8"	3.55
Minimum ground clearance	13"	0.33

General dimensions	Feet	meters
Ground clearance - ctwt. "A"	3' 6"	1.06
Ground clearance - ctwt. "AB"	3' 6"	1.06
Overall width of counterweight	9' 10"	3.00
Tailswing of counterweight "A"	13' 4"	4.05
Tailswing of counterweight "AB"	13' 4"	4.05
Overall width less catwalks	9' 4"	2.83
Overall height for transport, gantry lowered	10' 10"	3.30

Litho in USA 6/88

#5073

Machine working weights - approximate

Complete basic machine with Isuzu 6SA1 diesel engine and friction clutch, turntable bearing, independent swing and travel, swing brake, front and rear drum laggings with necessary hoist lines, independent boomhoist with lowering clutch, 40' (12.19 m) angle boom but no bucket or hookblock.	Track shoes	
	30" (0.76 m)	36" (0.91 m)
	pounds	pounds
15,430 pound counterweight "A"	90,670	93,360
29,760 pound counterweight "AB"	105,000	107,690

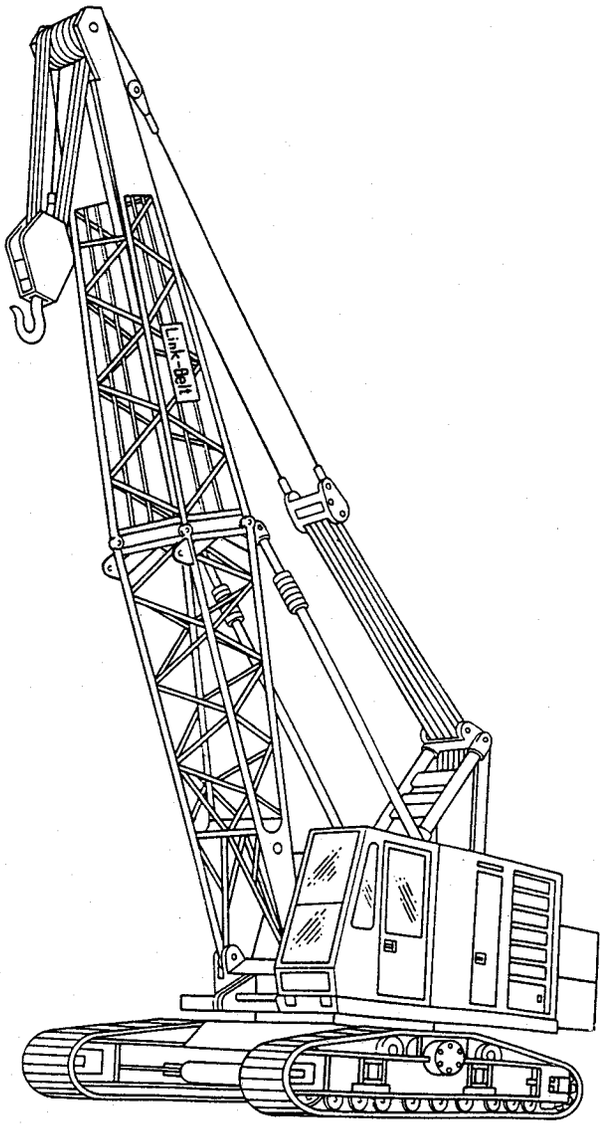
Ground contact area

Note: Determining ground bearing pressure - divide the total weight of machine as shown above by the respective ground contact area.

Track shoes		Ground contact areas	
inches	meters	in^2	cm^2
30	0.76	11,900	76,790
36	0.91	14,310	92,300

Weight deductions for transporting – approximate

Deduct for the removal of the following components:	pounds
Counterweight "A"	15,430
Counterweight "AB"	29,760
Basic 40' (34") angle boom:	
Tip: (includes head machinery)	2,360
Base (includes backstops, bridle frame, boom pendants and necessary wire rope.)	4,100
Catwalk	200
Side frames	
30" track shoes	25,350
36" track shoes	28,040
Add for: Fairlead	600
10' extension and pendants	840
20' extension and pendants	1,395
30' extension and pendants	1,915
Tagline winder (single drum)	325



LS-110C Performance Specifications

Wire rope and rope drum data

Main load hoist wire rope length – using 3/4" (19 mm) diameter wire rope

Parts of line	Boom lengths													
	40' (12.19 m)		50' (15.24 m)		60' (18.29 m)		70' (21.34 m)		80' (24.38 m)		90' (27.43 m)		100' (30.48 m)	
	ft.	meters	ft.	meters	ft.	meters	ft.	meters	ft.	meters	ft.	meters	ft.	meters
1	95	28.96	115	35.05	135	41.15	155	47.24	175	53.34	195	59.44	215	65.53
2	140	42.67	170	51.82	200	60.96	230	70.10	260	79.25	290	88.39	320	97.54
3	185	56.39	225	65.58	265	80.77	305	92.96	345	105.16	385	117.35	425	129.54
4	230	70.10	280	85.34	330	100.58	380	115.82	430	131.06	480	146.30	530	161.54
5	275	83.82	335	102.11	395	120.40	455	138.68	515	156.97	575	175.26	635	193.55
6	320	97.54	390	118.87	460	140.21	530	161.54	600	182.88	670	204.22	740	225.55
7	365	111.25	445	135.64	525	160.02	605	184.40	685	208.79	765	233.17		
8	410	124.97	500	152.40	590	179.83	680	207.26	770	234.70				

Parts of line	Boom lengths							
	110' (33.53 m)		120' (36.58 m)		130' (39.62 m)		140' (42.67 m)	
	ft.	meters	ft.	meters	ft.	meters	ft.	meters
1	235	71.63	255	77.72	275	83.82	295	89.92
2	350	106.68	380	115.82	410	124.97	440	134.11
3	465	141.73	505	153.92	545	166.12	585	178.31
4	580	176.78	630	192.02	680	207.26	730	222.50
5	695	211.84	755	230.12	815	248.41		
6	810	246.89						

Dragline or clamshell wire rope lengths – using one part of line

Attachments	Function	Boom Lengths							
		40' (12.12 m)		50' (15.24 m)		60' (18.29 m)		70' (21.34 m)	
		Feet	meters	Feet	meters	Feet	meters	Feet	meters
Clamshell	Holding	110	33.53	130	39.62	150	45.72	170	51.82
	Closing	160	48.77	180	54.86	200	60.96	220	67.06
Dragline	Hoist	110	33.53	130	39.62	150	45.72	170	51.82
	Inhaul	72	21.95	76	23.16	80	24.38	84	25.60

Drum wire rope capacities:

Wire rope layer	Front or rear drum -14-1/4" (0.36 m) root diameter grooved lagging, 3/4" (19 mm) wire rope				Third drum - 12" (0.30 m) root diameter smooth lagging, 5/8" (16 mm) wire rope				Boomhoist drum - 12" (0.30 m) root diameter grooved lagging, 5/8" (16 mm) wire rope			
	Rope per layer		Total wire rope		Rope per layer		Total wire rope		Rope per layer		Total wire rope	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	74	22.7	74	22.7	74	22.6	74	22.6	38	11.6	38	11.6
2	82	25.0	156	47.8	81	24.8	155	47.5	41	12.7	79	24.3
3	89	27.3	246	75.1	88	27.1	244	74.6	45	13.9	124	38.2
4	97	29.6	343	104.6	96	29.3	340	103.5	49	15.0	174	53.2
5	104	31.8	447	136.5	103	31.6	444	135.5	53	16.2	227	69.4
6	111	34.1	559	170.6	111	33.8	555	169.3	56	17.3	284	86.7
7	119	36.3	679	206.9	118	36.1	673	205.4	62	18.5	345	105.2
8									64	19.6	409	124.8

LS-110C Load Hoisting Performance

Available line speed and line pull - based on ISUZU 6SA1 with friction clutch, at 2000 rpm full load speed.

Line pulls are not based on wire rope strength. See wire rope chart for maximum permissible single part of line working loads.

Rope Layer	14¼" Front or Rear Drum				12" Third Drum			
	fpm	m/min	pounds	kilograms	fpm	m/min	pounds	kilograms
1	156	47.4	27,125	12304	157	48.0	24,398	11067
2	171	52.1	24,665	11188	173	52.8	22,196	10067
3	186	56.8	22,615	10258	189	57.6	20,357	9234
4	202	61.6	20,877	9470	204	62.3	18,801	8528
5	218	66.3	19,389	8795	220	67.1	17,465	7922
6	233	71.0	18,100	8210	236	71.9	16,305	7396
7	248	75.7	16,971	7698	251	76.9	15,291	6936

Rope Layer	15¼" Inhaul Drum			
	fpm	m/min	pounds	kilograms
1	167	51	25,192	11 427

Wire rope: size, type and working strength

Wire rope application	Size: diameter		Type	Maximum permissible load	
	inches	mm		pounds	kilograms
Boomhoist	5/8	16	W	11,700	5 307
Main load hoist	3/4	19	N	16,800	7 620
Dragline inhaul	7/8	22	M	22,700	10 297
Dragline hoist	3/4	19	N	16,800	7 620
Clamshell Holding (hoist)	3/4	19	N	16,800	7 620
Clamshell closing	3/4	19	N	16,800	7 620
Third drum	5/8	16	N	11,700	5 307
Boom pendants - 42" angle boom	1-1/4	32	N	45,600	20 680

Wire rope: types available

- Type "M" - 6 X 25 (6 X 19 class), filler wire, extra 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.
- Type "W" - 6. X 26 (6 X 19 class), extra improved plow steel, preformed, independent wire rope center, right lay, alternate lay.

General Specifications

Crawler lower

☐ Lower frame

All welded precision machined; line bored 11' 9" extended, 8'4" retracted gauge X 18'4" length.

☐ Turntable bearing

Outer race with integral external swing gear bolted to lower frame. Inner race bolted to upper frame.

☐ Crawler side frames

Hydraulically extended / retracted and removable without disconnecting track drive chains.

☐ Track drive sprockets and idler wheels

Cast steel, heat treated; mounted on bronze brushings. Sealed for lifetime lubrication.

☐ Track rollers

Nine per side. Tractor type, oil filled for lifetime lubrication.

☐ Track carrier rollers

Two tractor type rollers mounted on top of each crawler side frame. Oil filled for lifetime lubrication.

☐ Tracks

Heat treated, self cleaning, multiple hinged track shoes joined by one piece full floating pins: 58 shoes per side frame. Standard shoes 30" wide; optional shoes 36" wide.

Track chain adjustment - Track drive chain adjusted by positioning axle of chain drive sprocket with jack screw and shims. Track adjusted with threaded adjusting bolt attached to track idler (wheel) axle.

☐ Independent travel

Travel independent of swing; permits simultaneous swing and travel with separate set of shafts and clutches. Horizontal traction shaft powered through bevel gear drive enclosed in oil. Travel / steer jaw clutch splined to shaft; all shaft components mounted within lower frame.

Travel speed – 0.75 mph (1.2 km/h)

Gradeability – 30%

Steering - Power hydraulic. Travel/steer jaw clutches hydraulically engaged, spring released. Spring applied, hydraulically released travel/steer/digging/parking external contracting band brakes simultaneously released by interconnecting mechanical linkage to jaw clutches. Brakes automatically set when steer lever is in neutral. Two18" diameter by 4" wide brake bands. Steer brakes also serve as parking/digging brakes.

Revolving upperstructure

☐ Frame

All-welded, precision machined unit; machinery side housing bolted to upper frame.

☐ Fuel tank

66 gallon (250 L) capacity

Engine Specifications	Isuzu 6SA1 with friction clutch
Number of cylinders	6
Bore and stroke - inch	4 - 17 / 32 X 5 - 5 / 16
- (mm)	(115 X 135)
Piston displacement - cubic inches	513
- (cm^2)	(8413)
Engine rpm at full load speed	1850
Net engine horsepower at full load speed, (H·P)	120 (89520W)
Peak torque - foot pounds	377
- (joule)	510
Peak torque - rpm	1300
Electrical system	24 volt
Batteries	2 - 12 volt
Type of clutch or take-off	Friction clutch / gear reduction

Power train

Transmission

Triple roller chain enclosed in oil-tight chain case and running in oil.

Machinery gear train

"Full function" design; two directional power available to all operating shafts; shafts mounted on anti-friction bearings in precision bored machinery side housings. Load hoist, swing and boom-hoist functions completely independent of one another.

Principal operating functions

Control system

Speed-o-Matic® power hydraulic control system, a variable pressure system requiring no bleeding. Operating pressure transmitted to all two-shoe clutch cylinders, and other hydraulic clutches as required. System includes a constant displacement, engine driven, vane type hydraulic pump to provide constant flow of oil; accumulator to maintain system operating pressure, unloader valve to control pressure in accumulator, relief valve to limit maximum pressure build-up in system, full-flow 40 micron disposable filter and variable control valves.

Independent travel

Travel independent of all other functions standard; spur gear driven single speed travel.

Clutches – One clutch each for forward and reverse. Clutch drum 18" diameter, 4½" wide. Swept area is 254 sq. in..

Load hoisting and lowering

Independent load hoisting and lowering. *Standard* - hoisting controlled by Speed-o-Matic®, power hydraulic two-shoe clutch and lowering controlled by foot controlled brake. *Optional* – load lowering controlled by Speed-o-Matic®, power hydraulic two-shoe clutch in addition to foot controlled brake.

Load hoist drums

Front and rear main operating drums – Two piece, removable, grooved laggings bolted to brake drums. Lift crane and clamshell are 14¼" root diameter.

Dragline – Front drum (inhaul) is 15¼" root diameter. Rear drum (hoist) is 14¼" root diameter.

Third operating drum – *Optional* mounts forward of front main operating drum. Two piece 12" root diameter smooth drum lagging bolted to brake drum. Brake drum splined to shaft.

Note – Third drum limitations
For dragline operation third drum shaft cannot be mounted. For crane / clamshell operations, 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 clutches

Speed-o-Matic® power hydraulic two-shoe clutches; internal expanding, lined shoes. Clutch spiders are splined to shafts; clutch drums are bolted to drum spur gears and mounted on shafts on anti-friction bearings.

Load hoist clutches – Front and rear main drums - clutch drums 20" diameter, 5" face width. Swept area is 314 square inches.

Optional third operating drum – clutch drum 18" diameter, 4½" face width. Swept area is 254 square inches.

Load lowering clutches – *Optional*; available on front and rear main operating drums. Clutch drums 18" diameter, 4½" face width. Swept area is 254 square inches.

Drum brakes

External contracting band type; brake drum splined to shaft. Mechanically foot pedal operated; each brake foot pedal equipped with latch to permit locking brake in applied position.

Front and rear main drums – Brake drum 30" diameter, 4" face width. Swept area is 376 square inches.

Optional third drum – Brake drum 22" diameter 3" face width; swept area is 207 square inches.

Drum rotation indicators

Optional – for front and rear drums. Audible-type indicators.

Swing system

Spur gear driven; single bevel gears (enclosed and running in oil) on horizontal swing shaft. Swing pinion splined to vertical swing shaft, meshes with external teeth of swing gear.

Swing clutches

Clutch drums 20" diameter 5" face width. Swept area is 314 sq. inches.

Swing brake – External contracting band; spring applied, hydraulically released by operator controlled lever. Brake drum 14" diameter, 1½" face width.

Swing lock – Mechanically controlled, drop pin.

Maximum swing speed – 3.4 rpm.

☐ Boomhoist / lowering system

Independent, spur gear driven. Precision control boom hoisting and lowering through power hydraulic two-shoe clutches.

☐ Boomhoist drum

Single grooved lagging splined to shaft. 12" root diameter.

☐ Boomhoist drum locking pawl

Operator controlled spring applied and mechanically released.

☐ Boomhoist / lowering clutches

One each for boom hoisting and boom lowering; clutch drum 18" diameter, 4½ face width.

☐ Boomhoist brake

External contracting band brake; automatic, spring applied, hydraulically released.

Boomhoist limiting device – When properly adjusted, device limits booming up beyond predetermined operating radius.

☐ Electrical system

24 volt negative ground system. Includes: two 12-volt batteries. Standard battery lighting system includes one interior light and two adjustable floodlights on front of R.H. machinery cab roof and in front of L.H. platform. *Optional*: one adjustable floodlight mounted on boom.

Note: Three flood lights are the maximum quantity recommended.

☐ Operator's cab

Modular type cab with hinged door and safety glass panels. Standard equipment includes dry chemical fire extinguisher, bubble-type level, electric windshield wiper, cab heater, defroster fan and sound reduction material.

☐ Machinery cab

Hinged doors on both sides for machinery access. Equipped with roof-top access ladder, electric warning horn and machinery guards.

☐ Catwalks

Standard for operator's side, optional on right side of cab. includes hand grab rails. Hinged to permit folding to reduce overall width.

☐ Gantry

Retractable high gantry mounted at rear of cab may be raised or lowered under power. May also be used for power raising or lowering of counterweight.

☐ Gantry bail

Pinned to retractable high gantry. Six sheaves are provided for 14-part boomhoist wire rope reeving. Sheaves mounted on anti-friction bearings, sealed for lifetime lubrication.

☐ Counterweight

Removable, held in position by hooks. Power raising and lowering by standard retractable high gantry - controlled by boom hoist or boom lowering system.

"A" (15,430 lbs.) used for dragline, clamshell and magnet service.

"AB" (29,760 lbs.) used for lifting crane service only.

Booms

☐ 42" (1.06 m) angle boom

Two piece 40'basic length 42" wide, 42" deep at center line of connections. Main chord angles high strength low alloy steel: base section 4" X 4" X 3/8" top section and extensions 4 X 4 X 5/16". Maximum boom length 140'.

Boom base section – 20' long; boom feet 2-3/8" thick on 50" centers.

Boom extensions – Available in 10', 20' and 30' lengths with appropriate length pendants.

Boom connections – pin connections.

Boom top section – Open throat 20' long.

Boompoint machinery – 18" root diameter head sheaves mounted on anti-friction bearings. Four for lift crane, two for dragline or clamshell. *Optional:* single wide flared sheave for dragline.

Boom stops

Dual, tubular telescopic type with spring loaded bumper ends.

Boomhoist bridle

Serves as connection between boom pendants and boomhoist reeving. Equipped with 9½" root diameter sheaves mounted on anti-friction bearings, sealed for lifetime lubrication. 7 sheaves required for 14-part boomhoist reeving.

Boompoint sheave guards - Standard; rigid, round steel rod bolted over top of sheaves and rigid round rods between sheaves. *Optional*; roller-type guards, mounted on anti-friction bearings, mounted on brackets beneath sheaves.

Note: Roller type guards do not permit use of center sheave unless center guard is removed.

Deflector rollers – to deflect main drum load hoist line over top side of boom; also required when third drum load hoist line passes over top side of boom. Rollers mounted on anti-friction bearings.

Basic boom – One roller standard on top section.

Recommended: *Optional rollers:* one per boom extension.

Auxiliary equipment

Boom angle indicator

Pendulum type, mounted on operator's side of boom base section.

Fairlead

Optional: full revolving type with barrel, sheaves and guide rollers mounted on anti-friction bearings.

Tagline

Rud-o-Matic® model 648; spring wound, drum-type.