

# P&H<sup>®</sup> 4100 Series A

DC ELECTROTORQUE<sup>®</sup> MINING SHOVEL  
DUAL PLANETARY PROPEL & SWING

## ERECTION PROCEDURE

### ERECTION ASSISTANCE

With the purchase of your Model 4100A electric mining shovel, a P&H MinePro Services advisor or MinePro Contract Services person will be provided for a period of 50 working days to assist the purchaser or the purchaser's erection contractor with the erection of the machine. The purchaser should arrange to erect, test and place the machine into operation during this 50 day period.

The P&H MinePro Services advisor can provide advice only. He is available to advise the purchaser or the purchaser's erection contractor on erection sequences, commissioning procedures, testing and other erection details as requested, but is not authorized to supervise workers or to direct the erection, testing or commissioning in any way. The purchaser will be required to provide all tools, equipment and personnel needed to erect the machine, as well as supervision of personnel erecting the machine. For example, the P&H MinePro Services advisor is available to consult with supervisory personnel on questions such as places to make hitches on components, but P&H Mining Equipment will not be responsible for placement of such hitching or for working with lifting equipment. P&H Mining Equipment will not be liable in any event for any indirect, special or consequential damages. Purchaser shall indemnify and hold P&H Mining Equipment harmless for all liability for damage to property or personal injury (including death) arising out of purchaser's erection, testing or placing into service of the machine.

The P&H MinePro Services advisor is not authorized to approve modifications to the machine that are not covered by the machine data sheet, nor will P&H Mining Equipment accept any back-charge for any unauthorized modifications made. (See section titled "Machine Modification Procedure".)

The purchaser or the purchaser's erection contractor should contact the nearest P&H Mining Equipment regional office to schedule the P&H MinePro Services advisor. We ask the purchaser, prior to the arrival of P&H MinePro Services advisor, to issue a purchase order covering the P&H MinePro Services advisor. The first 50 normal working days will be on a no charge basis. Any days beyond the first 50 days will be charged against the purchase order at established service rates.

The normal working day for the P&H MinePro Services advisor is eight hours on site per day. The normal work week is five days per week (Monday through Friday excluding holidays). Time spent on site beyond the normal work week or day will be charged against the purchase order at established service overtime rates.

### ERECTION PERSONNEL REQUIREMENTS

The erection history for the Model 4100A indicates erection can be made within 5200-5500 man-hours. The history also indicates that if proper manpower is not available, the 50 working day period of erection and placement into operation will be exceeded. We therefore advise that the following labor types should be available at various stages of machine erection.

- 4—Laborers (for the purpose of cleaning parts before they undergo assembly)
- 3—Mechanics
- 1—Millwright
- 3—Electricians
- 2—Welders

After the initial cleaning and opening of the packing cases, the four laborers may be replaced by additional mechanics and mill-wrights, as the tasks of the mechanics and millwrights will be more prevalent.

We have not included the supervision mentioned previously. The necessary mechanical and electrical supervision should be present when the various trades are involved in the erection of the machine.

This listing does not include crane operators or oilers (if there is a requirement for their use).



**SAFETY:** All safety related equipment requirements and procedures are the responsibility of the Purchaser and or designated Erection Contractor and should be in accordance with all applicable MSHA, Local Mine, State Authorities and regulations.

**NOTE:** The purchaser is to supply all necessary start-up lubrication materials, oils, greases, etc., per P&H specifications.

### ERECTION SITE AND MATERIAL LOCATION

Erection site preparation is the responsibility of the Purchaser and should be a flat leveled area, with good drainage, and stable under footing to support the lifting equipment and their floats or outriggers during any lift to be made.

The area required is approximately 300 feet (91.4 m) square, with a tool shed.

### MACHINE MODIFICATION PROCEDURE

During the shovel erection process, the shovel purchaser will sometimes request alterations to the standard machine design. Some of the more-commonly requested modifications affect lubrication systems, walkways, hand rails, lighting systems, guards and PLCs.

While some modifications might improve the ability of the purchaser to utilize and maintain the shovel, some modifications might in fact adversely affect productivity over time or have significant safety implications not readily ascertainable.

Accordingly, it is imperative that any modifications sought by the shovel purchaser of the kind noted above (or any other significant modifications) be discussed with your P&H MinePro Services shovel project manager. In turn, your shovel project manager will discuss your requests with P&H Mining Equipment shovel design engineers to determine if the modifications can be carried out. P&H Mining Equipment and P&H MinePro Services make every effort to accommodate the purchaser's requests while taking into consideration the machine's optimal productivity and mine application, as well as current design and safety specifications and regulations.

It is most important that any modification to the machine be documented so that P&H Mining Equipment and P&H MinePro Services can maintain current drawings and specifications for your electric shovel. Furthermore, any future service involving the P&H Mining Equipment engineering staff can be expedited if modifications are known and documented.

Please be aware that any modification performed without P&H Mining Equipment and P&H MinePro Services concurrence might void the warranty.

Some modifications requested by the purchaser can be accommodated at no additional charge. However, some modifications require additional welding or other services that cannot be absorbed by P&H Mining Equipment or P&H MinePro Services. The purchaser will be notified of such costs in advance of the work being performed.

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**BASIC RIGGING MATERIAL REQUIREMENTS**

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**Cranes**

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Two (2) heavy-lift cranes are required at the start of the erection, staying on-site until all the heavy lifts are completed and the boom has been pinned to the revolving frame. After raising the boom, the balance of the erection process can proceed with one (1) rough-terrain crane in the 30-ton to 50-ton (27,216-kg to 45,360-kg) class.

Heavy-lift crane size requirements are based on many factors, including crane access to heavy lifts, type of crane used, cold weather capacity de-rating, reach, and pick-and-carry capability.

Therefore, in extreme cold weather erection environments, two 225-ton (204,120-kg) cranes are recommended. In moderate weather, one 150-ton (136,080 kg) and one 190-ton (172,368-kg) crane are recommended for heavy lifts.

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**Cables**

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4—2.5" x 25'	4—1-3/4" x 20'	4—1-1/2" x 20'
4—1" x 12'	2—1-1/2" x 20'	4—3/4" x 10'
2—1-1/4" x 20'	2—5/8" x 20'	

10—smaller cables (1/2" and 3/8", 15' long) to handle the miscellaneous material, such as brakes, blower motors, boxes, cab sections, etc.

Assortment of nylon slings

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**Shackles and Pins**

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- Four (4) 85-ton shackles
  - Four (4) 55-ton shackles
  - Four (4) 35-ton shackles
  - Four (4) 25-ton shackles
  - Pins -- six (6) each in the following sizes: 1/4", 3/8", 1/2", 3/4", 1"
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**Blocking (Hardwood)**

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- 40 ea. 8" x 8" or 10" x 10" in 6', 4', and 2' lengths
- Plywood and 2" lumber (available from shipping crates / boxes)

This material is used for setting the various components on the ground. The carbody is blocked 48" high for side frame clearance with shoes on.

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**Optional Time-Saving Equipment**

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- One 10-ton\* (9.072 kg.) forklift.
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**BASIC TOOL REQUIREMENTS**

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**Basic Hand Tools**

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- 2—6" screwdrivers 1/4" face
  - 2—8" screwdrivers 3/8" face
  - 2—12" screwdrivers 1/2" face
  - 2—15" adjustable open end wrenches
  - 2—12" adjustable open end wrenches
  - 4—12" long bastard files
  - 6—4" paint brushes for use with cleaning solvent
  - 1—crosscut saw
  - 3—36" wrecking bars
  - 2—20 lb. sledge hammers
  - 4—2 lb. ball peen hammers
  - 6—putty knives 3" wide
  - 1—heavy-duty mechanic's tool set
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**BASIC HAND TOOLS (continued)**

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- 2—wire brushes
  - 3—each tapered drifts, 12" long, 5/8" and 3/4" dia.
  - 2—1/2" drive socket wrench sets, including two extensions, ratchet and sockets, from 7/16" to 1-1/4", in 1/8" increments
  - 1—3/4" drive socket wrench set, including two extensions, ratchet and sockets, from 1" to 3", in 1/8" increments
  - 6—3-ton P&H hoists
  - 2—standard bolt tap set—1/4" to 1-1/2" in 1/8" increments
  - 2—drill bit set—3/16" to 5/8" in standard increments
  - 1—set of rotary files for pencil grinder
  - 1—torque wrench
  - 1—torque multiplier (2,500 ft.-lbs. capacity)
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**Basic Power Tools**

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- 1—1/2" drive reversible electric drill motor 110 vac
  - 1—pneumatic air wrench, 1/2" drive, with sockets from 1/2" to 1-1/4", in 1/8" increments
  - 1—spray paint gun
  - 1—air powered grinder, 9" right angle disc
  - 1—air powered 1/4" pencil grinder
  - 1—air powered chipping hammer
  - 1—welding machine, 400 amp capacity (portable gasoline or diesel driven), including 100' long welding cables
  - 1—portable air compressor, 150 CFM capacity, with 2 ea. 100' long hoses with inline oilers
  - 1—portable light plant or electric power supply if needed
  - 1—electric heated rod oven
  - 2—oxygen acetylene burning sets with 75' hose
  - 2—50-ton hydraulic jacks
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**Basic Miscellaneous Items**

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- 3—tarpaulins, 30' x 30'
  - 2—15' step ladders
  - 2—24' extension ladders
  - 2—barrels of cleaning solvent
  - 20—rolls masking tape 1"
  - 50—sheets of fine emery cloth
  - 50—sheets of medium emery cloth
  - 2—wooden stairway with railing for boarding
  - 25—rolls black plastic electrical tape
  - 25—rolls of friction tape
  - 5—anti-seize lubricant (cans)
  - 5—dye check kits for checking welds (NDT-PT)
  - 6—fire extinguishers—20 lb. dry chemical type
  - 100—lbs. each—3/16" and 3/32" weld rod—hydrogen (pre-dried)
  - 300—feet manila rope
  - 100—lbs. cleaning rags
  - 2000-lbs. (approx.) dry ice (the exact quantity required will depend upon location of source and ambient temperature) or, Liquid Nitrogen - 4 bottles, approximately 370 lbs. of product each bottle and must have liquid withdrawal capabilities
  - 1—6-foot step ladder
  - 1—8-foot step ladder
  - Painting supplies
  - Assorted-color electrical tape
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The above tool listing indicates the basic minimum range and quantity of tools recommended. The list is not intended to be all-inclusive.

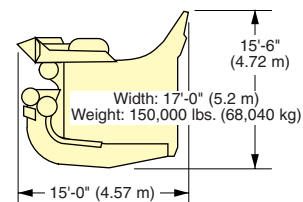
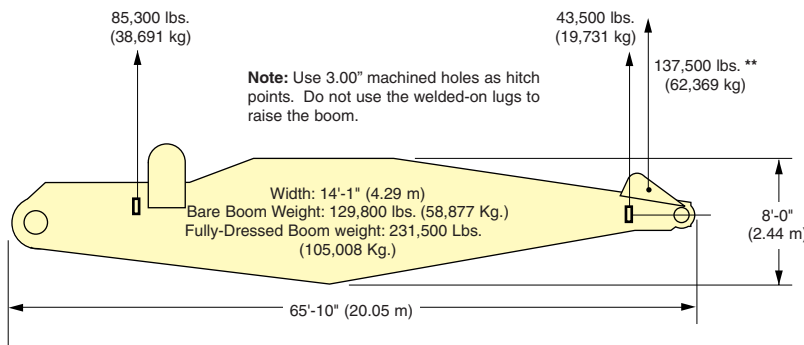
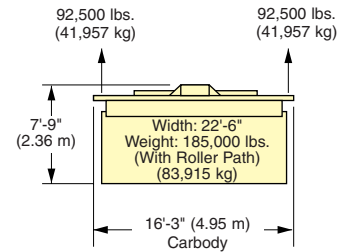
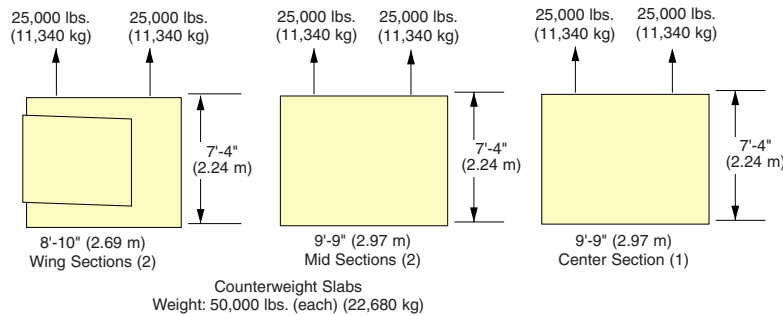
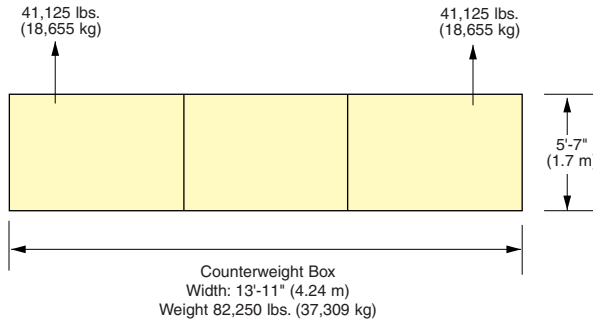
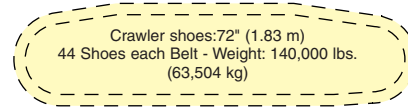
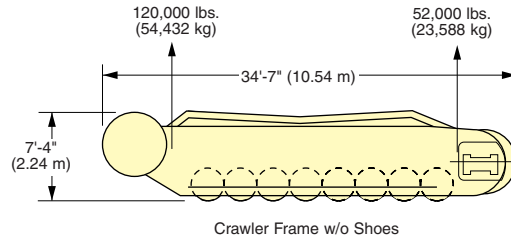
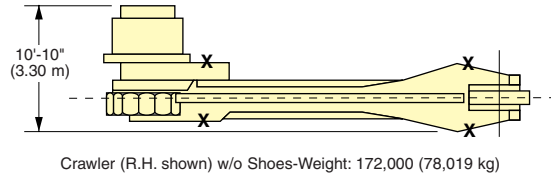
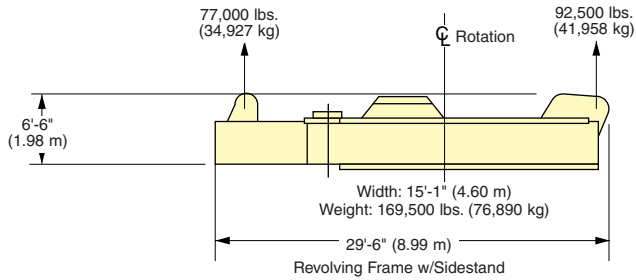
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**Data Codes**

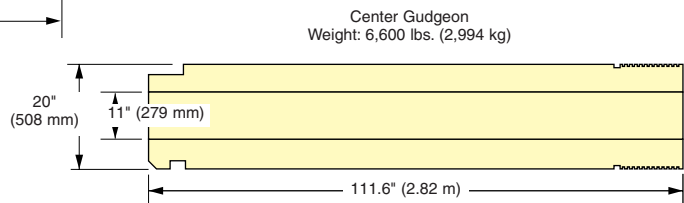
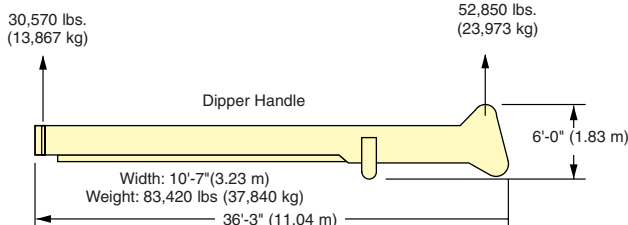
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- \*1 ton = 2,000 pounds (907.2 kg)
  - 10' = 10 feet (305 cm) 10" = 10 inches (25.4 cm)
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# 4100A LIFTING OR HITCHING POINTS AND APPROXIMATE WEIGHTS\* OF MAJOR ITEMS



56 yd<sup>3</sup> (42.8 m<sup>3</sup>) Bail-less Dipper  
Typical values only; there is no standard dipper.



Dry ice to freeze center gudgeon (shown above) for field installation into carbody. The quantity will depend on location of supplier, and ambient temperature.

\*Weights are ±10%. For actual weight of each component, refer to packing list.

\*\* Hitch point load encountered when raising a fully-dressed boom into position.

Caution: The side loading to any welded-on lifting lug cannot exceed ±5° from the vertical.

**Figure 1**

**U.S. AND CANADIAN SHIPMENTS**

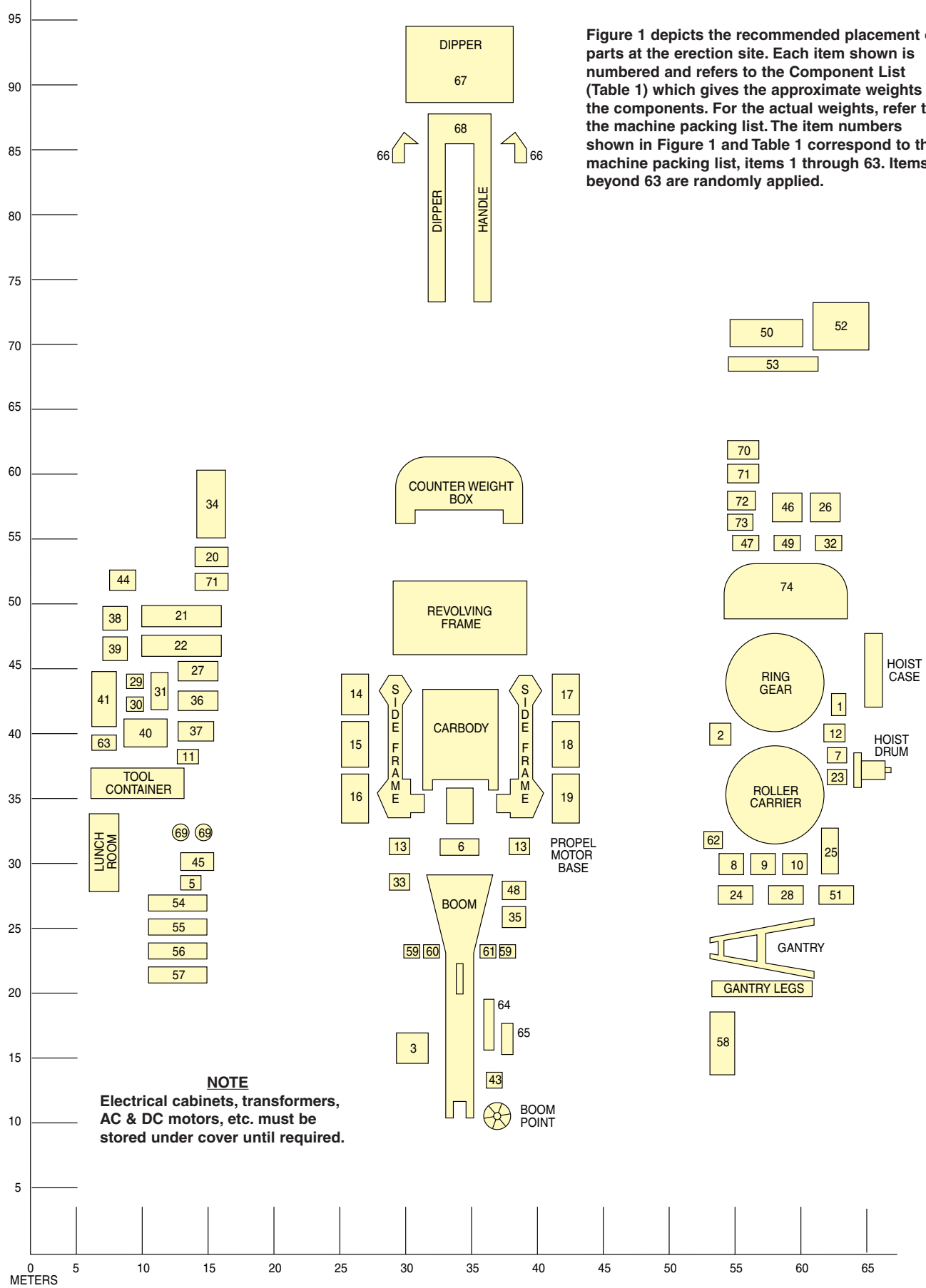


Figure 1 depicts the recommended placement of parts at the erection site. Each item shown is numbered and refers to the Component List (Table 1) which gives the approximate weights of the components. For the actual weights, refer to the machine packing list. The item numbers shown in Figure 1 and Table 1 correspond to the machine packing list, items 1 through 63. Items beyond 63 are randomly applied.

**NOTE**  
 Electrical cabinets, transformers, AC & DC motors, etc. must be stored under cover until required.

**Table 1 4100A COMPONENT LIST - U.S. & CANADA**

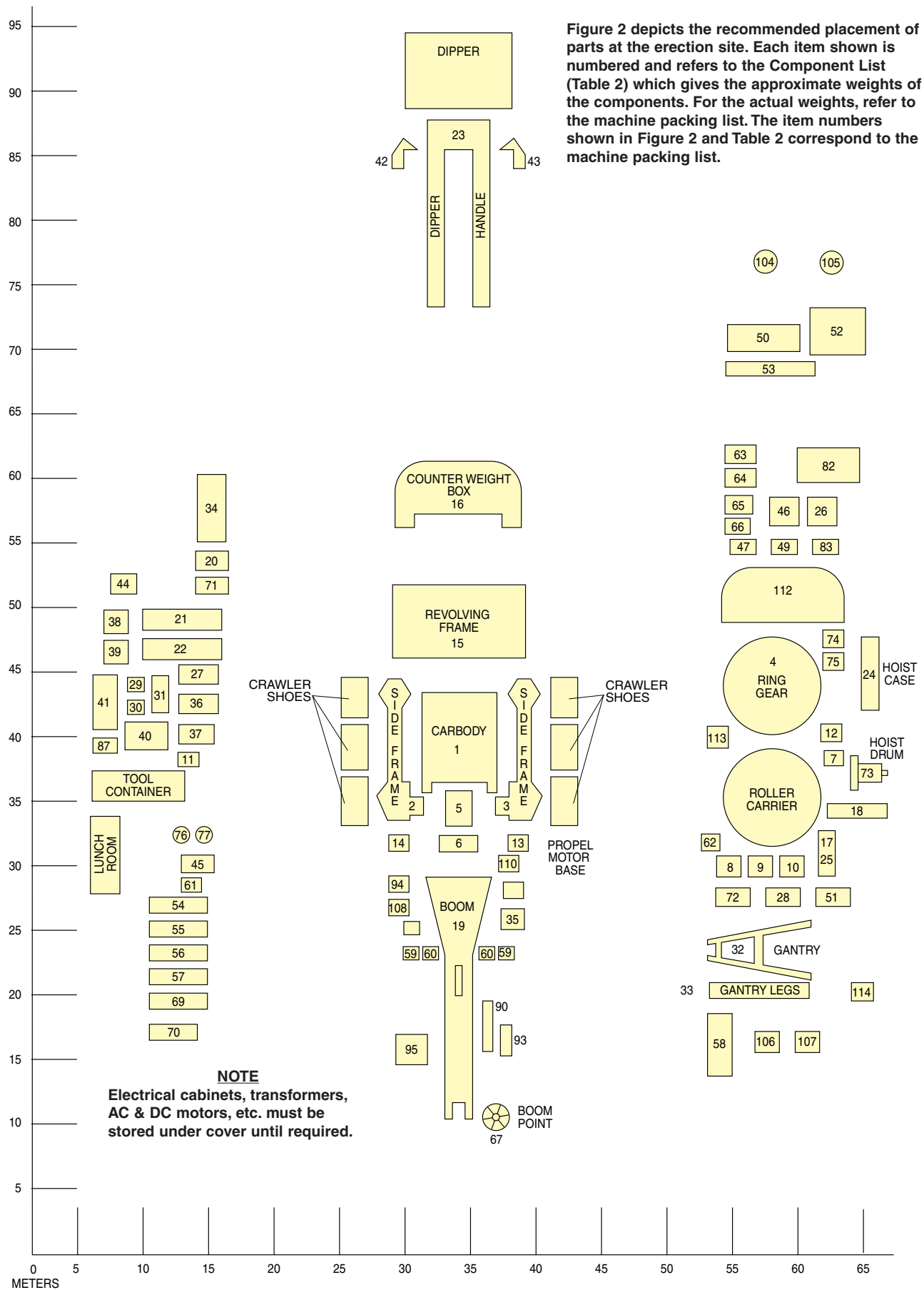
BOX or CRATE #	DESCRIPTION OF CONTENTS	APPROX. WEIGHT*	
		LBS.	KG.
1	Kit #1 Hardware for Revolving Frame	855	388
2	Kit #2 Hardware for Carbody	1,170	531
3	Kit #3-If this is packed inside of the boom hardware box, then the boom hardware box will be box #3		
		300	136
4	Contains Kit #4 Hardware for Cab & Upper	1,205	546
5	Contains Kit #5 Hardware for Catwalk & Railing	515	234
6	Corduroy Bolt Box	6,000	2,721
7	Lower Assembly Parts	4,000	1,814
8	House Rollers	2,150	975
9	House Rollers	2,150	975
10	House Rollers	2,150	975
11	Assembly Tools	950	431
12	High-Voltage Guards	1,550	703
13	Crawler Shoe Pin and Hardware	9,210	4,177
14	Crawler Shoe Pin and Hardware	9,210	4,177
	Shoe Size	5.0" Pins	5.0" Pins
15	Crawler Shoe 72" (183 cm)	3,460	1,573
16	Crawler Shoe 76" (193 cm)	3,795	1,725
17	Crawler Shoe 84" (213 cm)	3,720	1,691
18	Crawler Shoe 87" (221 cm)	3,915	1,780
19	Crawler Shoe 96" (244 cm)	4,820	2,191
	Crawler Shoe 108" (274 cm)	5,095	2,316
20	House Cab Parts	450	204
21	House Panels	3,800	1,723
22	Boarding Stairway/Ladder	2,630	1,193
23	Spherical Washer	400	181
24	Low-Voltage Collector	1,200	544
25	Air Compressor	2,350	1,066
26	Troughs and False Floor	2,550	1,156
27	Swing Shafts	9,650	4,377
28	Gantry Parts	2,150	975
29	Paint	450	204
30	Carbon Dioxide Cylinders	200	91
31	Upper Assembly Parts	750	340
32	Air Duct Kit "Bleed Rear Roof"	350	159
33	Shear Bar Kit "Carbody"	2,200	998
34	Left Hand and Right Hand Platforms	15,600	7,075
35	Boom Electrical	950	431
36	Miscellaneous-Electrical	1,500	680
37	Miscellaneous-Wire	1,050	476
38	Floodlights	600	272
39	Heaters "Portable"	500	227
40	House Lighting Kit	850	385
41	Buss Bars	3,500	1,587
42	Boarding Ladder Material	200	91
43	Shipper Shaft Adjusters	450	204
44	Remaining Floodlight Assy. & Hard.	600	272
45	Air Conditioner Parts	150	68
46	Logo Letters	1,175	533
47	Counterweight Box Reinforcement	2,050	930
48	Boom-Sealtite-4"	500	227
49	Mounting Bolts-Cast Counterweight	300	136
50	Canopy Arch	9,600	4,354
51	Hoist Cable Hoods	3,950	1,791
52	Hatch Covers	6,800	3,084
53	Side Beams	3,500	1,587
54	Railing Crate	3,400	1,542
55	Catwalks #1	1,850	839
56	Catwalks #2	3,500	1,587
57	Catwalks #3	3,650	1,655
58	Boom Platforms	7,750	3,515
59	Shipper Shaft Pinions	4,450	2,018

BOX or CRATE #	DESCRIPTION OF CONTENTS	APPROX. WEIGHT*	
		LBS.	KG.
60	Shipper Shaft Retainer w/Washer	650	295
61	Shipper Shaft Retainer w/Washer	650	295
62	Lower Disconnect Switch	850	385
63	House Heaters	150	68
	<b>Assemblies without Pre-Assigned Box or Crate Numbers</b>		
	<b>DESCRIPTION OF CONTENTS</b>	<b>APPROX. WEIGHT*</b>	<b>APPROX. WEIGHT*</b>
		<b>LBS.</b>	<b>KG.</b>
	Air Tugger Bracket	850	385
	Auxiliary & Field Transformer	5,200	2,358
	Auxiliary Control Cabinet	1,200	544
	Boom	128,800	58,423
	Boom Point Sheave Assembly	14,250	6,463
	Carbody with Lube and Collector Shoes	185,000	83,915
	Center Gudgeon Assembly	9,000	4,082
	Control Cabinet	2,000	907
	Converter	10,300	4,672
	Counterweight Box	81,850	37,127
	Counterweight Cast Assembly-4 pcs.	50,000	22,680
	Crowd Motor Assembly	13,800	8,260
	Crowd Motor Base	2,950	1,338
	Crowd Motor Cover	15,800	7,166
	Crowd Transmission	15,800	7,166
	Dipper (See Packing List for Weight)		
	Gantry Compression Member Assembly	21,900	9,932
	Gantry Tension Members	11,950	5,420
	Handle	84,600	38,374
	High Voltage Cabinet	1,300	590
	Hoist Cable Reels (each)	5,740	2,603
	Hoist Drum Assembly	52,600	23,860
	Hoist Motor Base, Front	3,900	1,769
	Hoist Motor Base, Rear	3,900	1,769
	Hoist Motor Front	17,000	7,711
	Hoist Motor Rear	17,000	7,711
	Hoist Transmission Assembly	34,075	15,454
	Left Hand Elevated Section	12,850	5,828
	Main Transformer & Supp. Cabinet	21,475	9,739
	Operator's Coop	12,500	5,669
	Propel Motor Base	23,300	10,569
	Propel Motor	7,060	3,202
	Rear Enclosures	14,100	6,395
	Rear Roof Section	12,243	5,554
	Revolving Frame (Including Sidestand)	171,750	77,905
	Right Hand Elevated Section	17,850	8,097
	Right Hand Platforms	11,117	5,042
	Roller Carrier Ring	2,584	1,172
	RPC Cabinets	15,900	7,211
	RPC Switching Cabinet	2,700	1,224
	Saddle Blocks (each)	11,150	5,057
	Shipper Shaft	13,000	5,896
	Shipper Shaft Gear	6,900	3,129
	Sideframe Left with Transmission	156,400	70,943
	Sideframe Right with Transmission	156,400	70,943
	Suspension Cables (each)	11,350	5,148
	Swing Gear	21,000	9,525
	Swing Motor Front	8,600	3,900
	Swing Motor Rear	8,600	3,900
	Swing Transmission/Front Motor	14,300	6,486
	Swing Transmission/Rear Motor	14,300	6,486
	Transfer Cabinet	1,200	544

\*Weights are ±10%. For actual weight of each component, refer to packing list.

**Figure 2**

**EXPORT SHIPMENTS**



**Table 2 4100A COMPONENT LIST - EXPORT**

BOX or CRATE #	DESCRIPTION OF CONTENTS	APPROX. WEIGHT*		BOX or CRATE #	DESCRIPTION OF CONTENTS	APPROX. WEIGHT*	
		LBS.	KG.			LBS.	KG.
1	Carbody with Lube and Collector Shoes	185,000	83,915	57	Catwalks #3	3,550	1,610
2	Sideframe (Left) with Transmission	156,400	70,943	58	Boom Platforms	7,750	3,515
3	Sideframe (Right) with Transmission	156,400	70,943	59	Shipper Shaft Pinions	4,450	2,018
4	Swing Gear	21,000	9,525	60	Crowd Motor Blower	750	340
5	Propel Motor Base	23,300	10,568	61	Dipper Trip Motor	1,875	850
6	Corduroy Bolt Box	6,000	2,721	62	Lower Disconnect Switch	850	385
7	Lower Assembly Parts	4,000	1,814	63	Counterweight Cast Assembly - 4 pcs.	50,000	22,680
8	House Rollers	2,150	975	64	Counterweight Cast Assembly - 4 pcs.	50,000	22,680
9	House Rollers	2,150	975	65	Counterweight Cast Assembly - 4 pcs.	50,000	22,680
10	House Rollers	2,150	975	66	Counterweight Cast Assembly - 4 pcs.	50,000	22,680
11	Assembly Tools	7,500	3,401	67	Boom Point Sheave Assembly	14,250	6,463
12	High-Voltage Guards	1,550	703	68	Center Beams	3,500	1,587
13	Crawler Shoe Pin and Hardware	9,210	4,177	69	Catwalks #4	1,350	612
14	Crawler Shoe Pin and Hardware	9,210	4,177	70	Catwalks #5	2,500	1,134
15	Revolving Frame (Including Sidestand)	171,750	77,905	71	Right Hand Elevated Section	17,850	8,097
16	Counterweight Box	81,850	37,126	72	Left Hand Elevated Section	12,850	5,828
17	Air Receiver Tank Box (Optional)	1,100	499	73	Hoist Drum Assembly	52,600	23,859
18	Center Gudgeon Assembly	9,000	4,082	74	Hoist Motor Base, Front	3,900	1,769
19	Boom	128,800	58,423	75	Hoist Motor Base, Rear	3,900	1,769
20	House Cab Parts	950	431	76	Swing Transmission/Front Motor	14,300	6,486
21	House Panels	3,800	1,723	77	Swing Transmission/Rear Motor	14,300	6,486
22	Boarding Stairway/Ladder	2,630	1,193	78	Hoist Motor Front	17,000	7,711
23	Handle	84,600	38,374	79	Hoist Motor Rear	17,000	7,711
24	Low-Voltage Collector (Part of Box 11)			80	Swing Motor Front	8,600	3,900
25	Air Compressor	2,350	1,066	81	Swing Motor Rear	8,600	3,900
26	Troughs and False Floor	2,550	1,156	82	Pressurization System	21,000	9,526
27	Swing Shafts	9,650	4,377	83	Air Duct Kit "Bleed Rear Roof"	1,900	862
28	Gantry Parts	2,150	975	84	Air Duct Kit "Bleed Rear Roof"	1,900	862
29	Paint	450	204	85	Air Conditioner	2,600	1,179
30	Carbon Dioxide Cylinders	200	91	86	Right Hand Boom Extension	4,500	2,041
31	Upper Assembly Parts	8,000	3,628	87	Operator's Coop	12,500	5,670
32	Gantry Compression Member	22,500	10,206	88	Boom Catwalk #1	3,000	1,361
33	Gantry Tension Members	11,950	5,420	89	Boom Catwalk #2	3,250	1,474
34	Left Hand and Right Hand Platforms	15,600	7,076	90	Shipper Shaft	13,000	5,896
35	Boom Electrical	850	386	91	Bearing Retainers	2,200	998
36	Gantry Platform	2,800	1,270	92	Crowd Motor Assembly	13,800	6,259
37	Miscellaneous - Wire	1,050	476	93	Crowd Case Cover	15,800	7,166
38	Floodlights	600	272	94	Crowd Motor Base	2,950	1,338
39	Platform Supports R/L Hand	3,000	1,361	95	Boom Hardware	1,050	476
40	House Lighting Kit	850	385	96	Load Center Panel	2,500	1,134
41	Buss Bars	3,500	1,587	97	Main Transformer & Supp. Cabinet	21,475	9,741
42	Saddle Blocks (each)	11,150	5,057	98	High Voltage Cabinet	1,300	590
43	Saddle Blocks (each)	11,150	5,057	99	Auxiliary & Field Transformer	5,200	2,358
44	Floodlight Assembly and Hardware	1,125	510	100	Converter	10,300	4,672
45	Air Tugger Bracket	850	385	101	Transfer Cabinet	1,200	544
46	Logo Letters	1,175	533	102	RPG Switching Cabinet	2,700	1,224
47	Counterweight Box Reinforcement	2,050	930	103	Dipper Trip Resistor Assembly	1,950	884
48	Boom-Sealite - 4"	500	227	104	Reel Hoist Cable	5,800	2,630
49	Low Voltage Cover Guard	700	317	105	Reel Hoist Cable	5,800	2,630
50	Canopy Arch	9,600	4,354	106	Suspension Cables (each)	11,350	5,148
51	Hoist Cable Hoods	3,950	1,791	107	Suspension Cables (each)	11,350	5,147
52	Hatch Covers	6,800	3,084	108	Shipper Shaft Gear	6,900	3,129
53	Side Beams	3,500	1,587	109	Left Hand Boarding Ladder	1,750	794
54	Railing Crate	3,400	1,542	110	Kit Boxes		
55	Catwalks #1	1,850	839	111	Air Conditioner Parts		
56	Catwalks #2	3,500	1,587	112	Rear Enclosure Panels		

\*Weights are ±10%. For actual weight of each component, refer to packing list.

## ELECTRICAL TEST EQUIPMENT REQUIREMENTS

Basic Electrical Test Instrumentation Required by Customer to Commission and Maintain Electrotorque Mining Excavator.

Description	P&H Part #
Multimeter	89Z514D12
Oscilloscope & Accessories	89Z515D16
High Voltage Differential Probe	89Z515D21
Recorder, Waveform	R10945D28
Megger	89Z496
Mod Assy, Drv, Keypad Terminal	R46072D7
Mod Assy, Drv, Lead for CDP 312	R46072D8
Tool, RS-232/485 Interface	R49117D1
Computer Sim. to R24834D5 but w/ Windows XP Pro	TBA
Software, Computer	R41705D1
Software, Drives Window	R40775D3
Network Connection Cable (7 foot)	R44337D2
Test Fixture Capacitor Unit	89Z508D1
Resistor Assembly, Voltage Divider	R1192F1
SCR (Thyristor) Tester	89Z511D1
Static Grounding Wrist Strap	R48105D5
Flexible Current Probe	R55482D1
Power Supply (Optional)	R55482D2
Resistor Assembly, Startup Limiting (Optional)	80Z984D1

**NOTE:** All designs, specifications and components of equipment described above are subject to change at manufacturer's sole discretion at any time without advance notice.

Data published herein is informational in nature and shall not be construed to warrant suitability of machine for any particular purpose as performance may vary with conditions encountered.  
The only warranty applicable is our standard written warranty for this machine.

**P&H** P&H MINING EQUIPMENT  
A Joy Global Inc. Company

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