APE CLAMP MANUAL

THE WORLD'S LARGEST PILEDRIVERS

Image shown, 36 APE Clamps getting ready to clamp onto a 30m x 34m pile.

AMERICAN PILEDRIVING EQUIPMENT

800-248-8498

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Contents

COMPANY PROFILE

APE: We're on the job

American Piledriving Equipment Inc. has a unique way of doing business in the deep foundation construction industry. We devise, manufacture, load, and ship our own products. We don't rely on distributors; we rent and sell directly to the contractor. We get our equipment to the job site and we set it up. We get our people in the field where they can help, teach and learn with the customers.

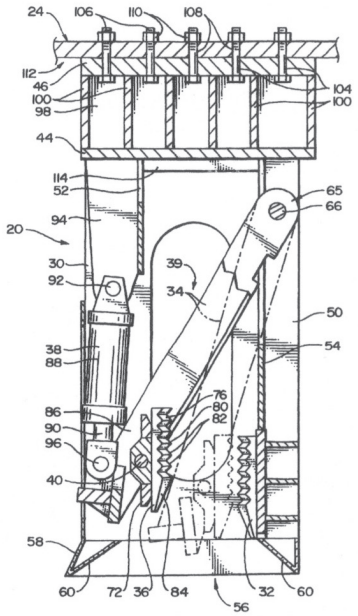
From design to production to installation, APE professionals are involved.

APE is committed to providing outstanding products and service, and being on the job site is crucial to upholding this commitment. We learn first hand what problems need to be addressed for a particular job before going to the engineering table to solve them. Since our machining and fabrication facilities are in-house, we have the flexibility to respond to job situations almost instantly. Transforming a good idea into a job site reality is our specialty. APE is the best in the industry when it comes to supporting our customers with innovative technology. This is the key to APE's successful research and development program, making us the industry leader in patents issued worldwide.

Vibro Types	Compatible Clamps		
50 **60**	**50** Sheet **150** Sheet **126B** Sheet	**100** Caisson All Single Beams	**20** Wood **25** Wood
100	**50** Sheet **150** Sheet **126B** Sheet	**100** Caisson All Single Beams	**20** Wood **25** Wood
150 **150T**	**50** Sheet **150** Sheet **126B** Sheet	**100** Caisson **200** Caisson All Single Beams	**C102** Wood **Hybrid** Wood **20** Wood **25** Wood
200 **200T**	**150** Sheet **200** Sheet **126B** Sheet **196** Sheet **300** Sheet	**100** Caisson **200** Caisson All Single Beams	**C102** Wood **Hybrid** Wood **20** Wood **25** Wood **32** Wood
200-6	**200** Sheet **196** Sheet **300** Sheet	**200** Caisson All Single Beams **10'** Quad Beam	**C102** Wood **Hybrid** Wood **20** Wood **25** Wood **32** Wood
300	**50** Sheet **150** Sheet	**100** Caisson All Single Beams	**20** Wood **25** Wood
300-2	**50** Sheet **150** Sheet	**100** Caisson All Single Beams	**20** Wood **25** Wood
300-4	**150** Sheet **200** Sheet **196** Sheet **300** Sheet	**100** Caisson **200** Caisson All Single Beams **10'** Quad Beam	**20** Wood **25** Wood **32** Wood
300-6	**196** Sheet **200** Sheet **300** Sheet **350** Sheet	**200** Caisson All Single Beams **10'** Quad Beam	**20** Wood **25** Wood **32** Wood
400	**196** Sheet **300** Sheet **350** Sheet	**200** Caisson All Single Beams **10'** Quad Beam	**20** Wood **25** Wood **32** Wood
600	**300** Sheet **350** Sheet	**200** Caisson All Single Beams All Quad Beams	

Wood and Concrete Pile Clamps

APE single-arm wood and concrete clamps incorporate patented features not found on any other type of clamps. These features provide the contractor with an edge over his competition. APE developed the first wood and concrete pile clamps with a pivoting jaw and an open window that allows a pile crew to actually see the clamping jaws. APE clamps feature a topside anvil so piles can be driven without impacting the mounting bolts. The T-Bar mounting design eliminates the need to ever crawl inside the clamp jaws for attachment installation. The jaws are removable, making it easy to change from wood to concrete or pipe piles.



United States Patent
B1 5,609,380
Sep 12, 2000

Cage Clamp

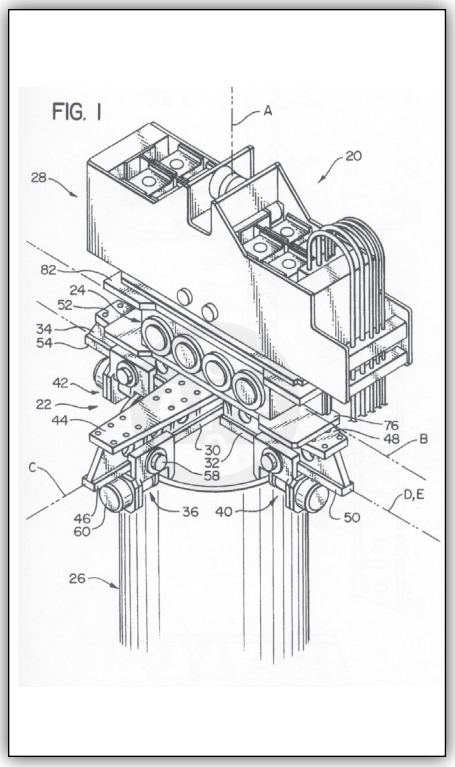
The APE Cage Clamp System streamlines the handling and placement of full length CFA cages into the pre-drilled pile. The Cage Clamp System can be used with any diameter and cage design. Consult the factory for further details.

Caisson Beam With Two Clamps

APE caisson beams are the highest quality available on the market. They feature a T-Bar configuration with a double row of mounting bolts. This design allows APE caisson beams to use short, stretch-resistant bolts without sacrificing beam strength. The centered, single row design favored by our competitors results in the clamps blocking access to the bolts. On the APE T-bar design, all bolts are easy to access and can handle piles from 16” (406 mm) to 20’ (6.09 m) piles. Moreover, APE has engineered every clamp attachment to take the same exact length of bolt. One size and length fits all, making for easy maintenance and repair.

Quad Clamp System

Caissons and large diameter piles become impossible to drive due to a phenomenon called deflection which causes diaphraming. To solve this problem, APE engineers developed a four way beam and clamp system. The clamps grip the pile every 90 degrees for balanced energy transfer. Side-by-side tests show that using four clamps mounted 90 degrees greatly reduces deflection and increases net amplitude to the pile tip while allowing for cost saving on casing wall thickness. The APE quad clamp system is vastly superior to the old style X beam which can cause deflection. The quad beam can be divided into two single beam systems for maximum versatility.



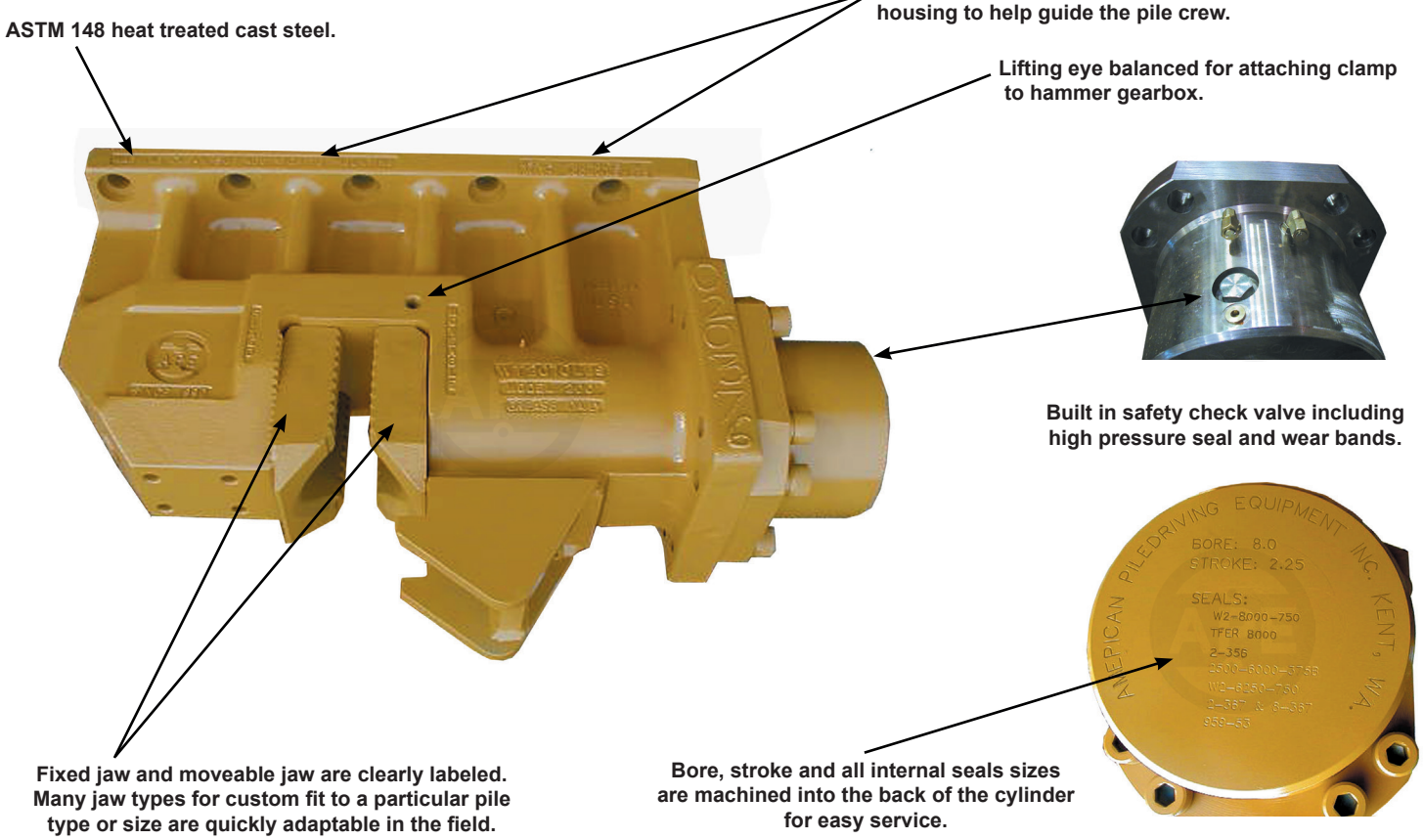
United States Patent August 5, 1997

Attachments Vibratory Drivers/Extractors

Attachments adapt a driver/extractor to fit a particular pile type, such as an H-beam, steel sheet pile, or pipe pile. Most vibratory pile driver/extractors come equipped with the APE standard universal clamp that has the ability to fit double sheet piles and H-beams. The universal clamp can be quickly adapted to fit flat plates or small diameter pipe piles including train rail. APE can also manufacture adapters to mount competitor attachments on APE hammers and APE attachments on competitor equipment.

APE manufactures attachments for every type of pile, yet all APE attachments use the same mounting bolts, so contractors don't experience delays in the field due to improper bolt sizes. APE clamp cylinders are machined from solid blocks of steel for maximum strength and durability. Safety check valves keep the jaws closed even in the event of a hose failure and every seal in the clamp is listed on the cylinder.

The APE Standard Universal Clamp Attachment

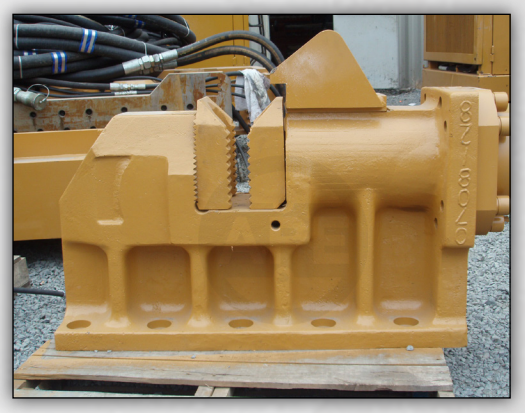


Model 50E with a standard 50 Clamp and single/double jaws

Model 20 Vibro with a Model 20 clamp.

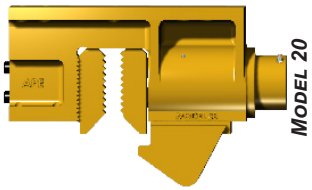
Model 150T Vibro with a Model 150 Clamp.

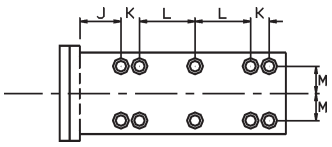
Model 200 vibro with a Model 200 sheet clamp equipped with double sheet jaws.



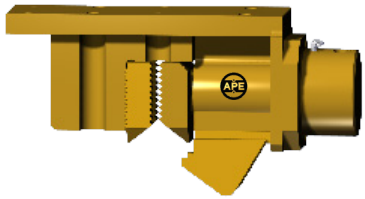
Model 20, 50, 150, 200, 300 and 350 Universal Clamps

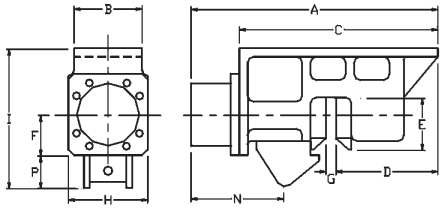
Model	Weight	Piston Dia.	Piston Stroke	Cyl. Force	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R
20	790 lbs 358 kg	5 in 127 mm	2.25 in 57 mm	88 kips 391 kN	29.63 in 752 mm	10 in 254 mm	28.63 in 727 mm	11.75 in 298 mm	8.56 in 217 mm	4.62 in 117 mm	2.12 in 54 mm	6 in 152 mm	13.5 in 343 mm	4.62 in 117 mm	2.75 in 70 mm	8.25 in 209 mm	4 in 101 mm	7 in 178 mm	5 in 127 mm	
50	1350 lbs 612 kg	8 in 203 mm	2.25 in 57 mm	226 kips 1005 kN	44 in 1117 mm	12 in 304 mm	35 in 889 mm	12.25 in 311 mm	10.25 260 mm	7.19 in 182 mm	1.44 in 38 mm	14 in 356 mm	22.38 in 568 mm	5 in 127 mm	11in 279 mm	8.25 in 209 mm	4 in 101 mm	15.17 in 385 mm	5 in 127 mm	
150	1540 lbs 698 kg	8 in 203 mm	2.25 in 57 mm	226 kips 1005 kN	44 in 1117 mm	12 in 304 mm	35 in 889 mm	12.88 in 327 mm	10.25 260 mm	7 in 178 mm	1.44 in 41 mm	14 in 356 mm	27.75 in 705 mm	5 in 127 mm	11 in 279 mm	8.25 in 209 mm	4 in 101 mm	15 in 383 mm	5 in 127 mm	
200	2200 lbs 998 kg	8 in 203 mm	2.25 in 57 mm	226 kips 1005 kN	50 in 270 mm	11.75 in 298 mm	41 in 1041 mm	18.25 in 463 mm	9 in 228 mm	7 in 178 mm	1.69 in 44 mm	15 in 381 mm	29.88 in 759 mm	5.75 in 146 mm	8.25 in 210 mm		4 in 102 mm	21 in 533 mm	5 in 127 mm	
300	2850 lbs 1295 kg	10 in 254 mm	3 in 76 mm	392 kips 1744 kN	57 in 1450 mm	45.25 in 1200 mm	12 in 305 mm	15 in 381 mm	35.25 in 819 mm	22.63 in 575 mm	2.5 in 64 mm	10.88 in 276 mm		9 in 229 mm	7.38 in 187 mm	5.88 in 149 mm	8.25 in 210 mm	4.28 in 109 mm	4 in 102 mm	24.13 in 613 mm
350	3650 lbs 1655 kg	10 in 254 mm	3 in 76 mm	392 kips 1744 kN	63 in 1600 mm	51.75 in 1314 mm	12 in 305 mm	14.5 in 368 mm	35.25 in 895 mm	5.88 in 149 mm	2.6 in 66 mm	15 in 381 mm	24.75 in 629 mm	10.5 in 267 mm	5.875 in 149 mm	6.125 in 156 mm	8.25 in 210 mm	6.5 in 165 mm	8 in 203 mm	16.5 in 419 mm

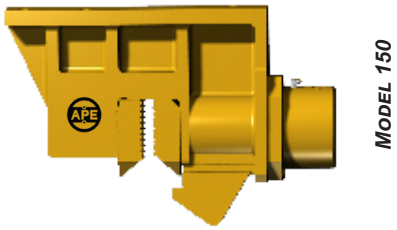


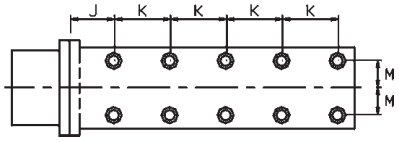


20 Bolt Pattern

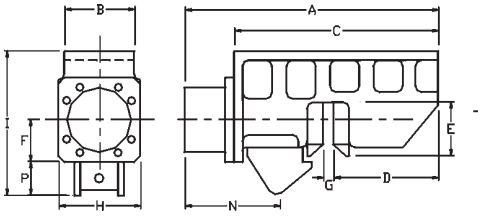




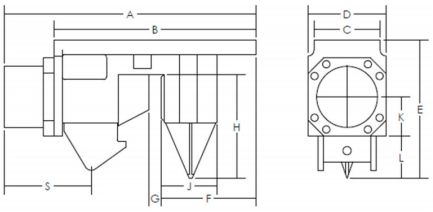


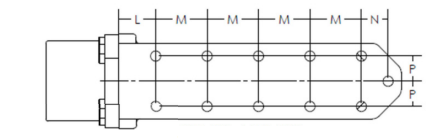


50/150 Bolt Pattern

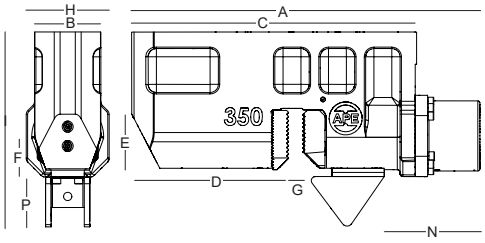


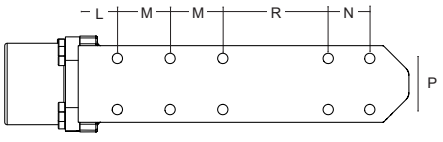
200 Bolt Pattern





300 Bolt Pattern

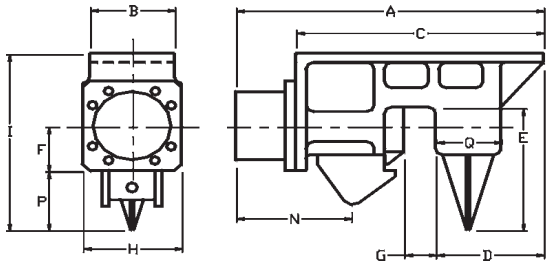


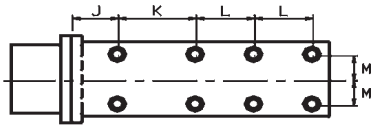


350 Bolt Pattern

Model 50 and 150 Dunce Clamps

Model	Weight	Piston Dia.	Piston Stroke	Cyl. Force	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q
50	1,350 lbs 612 kg	8 in 20.3 cm	2.25 in 5.7 cm	226 kips 1,005 kN	44 in 111.7 cm	12 in 30.4 cm	35 in 88.9 cm	12.25 in 31.1 cm	10.25 26.0 cm	7 in 17.8 cm	1.75 in 44.5 cm	14 in 35.6 cm	22.75 in 57.7 cm	5 in 12.7 cm	11 in 27.9 cm	8.25 in 20.9 cm	4 in 10.1 cm	15 in 38.3 cm	5 in 12.7 cm	11.5 in 29.2 cm
150	1,540 lbs 698 kg	8 in 20.3 cm	2.25 in 5.7 cm	226 kips 1,005 kN	44 in 111.7 cm	12 in 30.4 cm	35 in 88.9 cm	12.88 in 32.7 cm	10.25 26.0 cm	7 in 17.8 cm	1.75 in 44.5 cm	14 in 35.6 cm	27.75 in 70.5 cm	5 in 12.7 cm	11 in 27.9 cm	8.25 in 20.9 cm	4 in 10.1 cm	15 in 38.3 cm	5 in 12.7 cm	11.5 in 29.2 cm

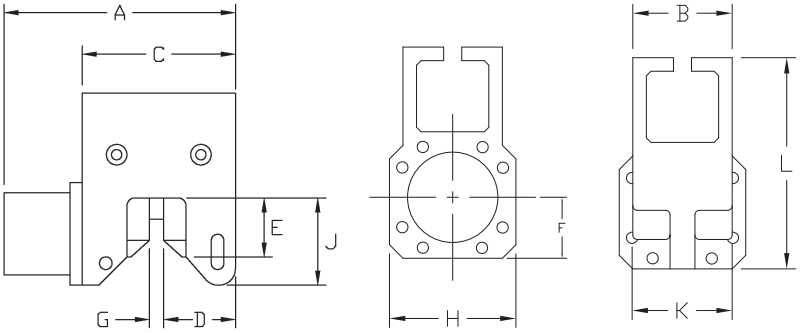


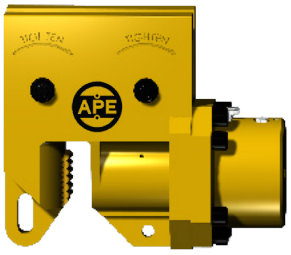


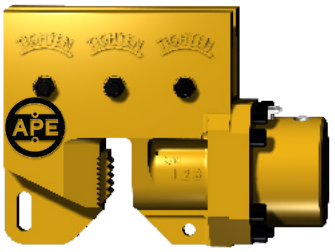
Model 150 Dunce

Model 100 and 200 Caisson Clamps

Model	Weight	Piston Dia.	Piston Stroke	Cyl. Force	A	B	C	D	E	F	G	H	J	K	L
100	1,100 lbs 498 kg	8 in 203 mm	2.25 in 57 mm	226 kips 1,005 kN	25.63 in 651 mm	11 in 279 mm	18.63 in 473 mm	6 in 152 mm	6.63 in 168 mm	6.25 in 159 mm	1.5 in 38 mm	14 in 355 mm	10.63 in 270 mm	11 in 279 mm	23.38 in 594 mm
200	1,340 lbs 608 kg	8 in 203 mm	2.25 in 57 mm	226 kips 1,005 kN	28.56 in 725 kN	11 in 279 mm	22.56 in 573 mm	10.81 in 274 mm	6.63 in 168 mm	7.25 in 184 mm	1.5 in 38 mm	14 in 355 mm	11 in 270 mm	11 279 mm	23.25 in 590 mm



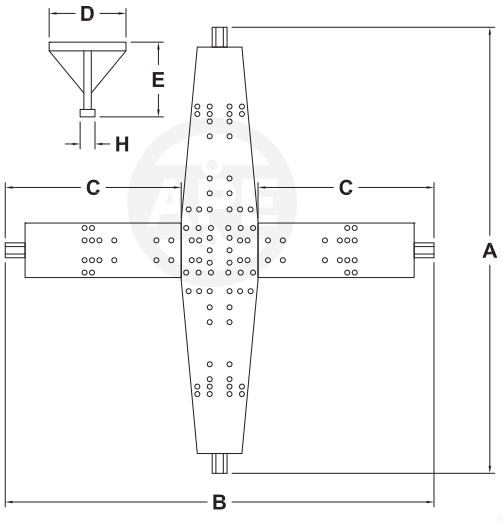




Quad Beam

Minimum Caisson Diameter: 21 in (0.53m)

Model	Weight	A	B	C	D	E	H
10 ft	7000 lbs 3175 kg	120 in 304.8 cm	118 in 300 cm	49 in 124.5 cm	22 in 55.9 cm	24 in 61 cm	6 in 152 mm
11 ft	9,500 lbs 4,309 kg	134 in 340 cm	136 in 345 cm	53 in 134.6 cm	31 in 78.7 cm	21 in 53.3 cm	6 in 152 mm
12 ft	8650 lbs 3920 kg	144 in 365.8 cm	144 in 365.8 cm	57.81 in 146.8 cm	28.38 in 72.1 cm	24 in 61 cm	6 in 152 mm
13 ft	13570 lbs 6155 kg	156 in 386 cm	156 in 386 cm	62.5 in 158.8 cm	31 in 78.7 cm	30 in 76.2 cm	6 in 152 mm
15 ft	13,000 lbs 5896 kg	180 in 457.2 cm	184 in 467.3 cm	75 in 190.5 cm	31 in 78.7 cm	30 in 76.2 cm	6 in 152 mm
17 ft	15,000 lbs 6803 kg	206 in 523.2 cm	208 in 528.3 cm	89 in 226 cm	31 in 78.7 cm	40 in 101.6 cm	6 in 152 mm

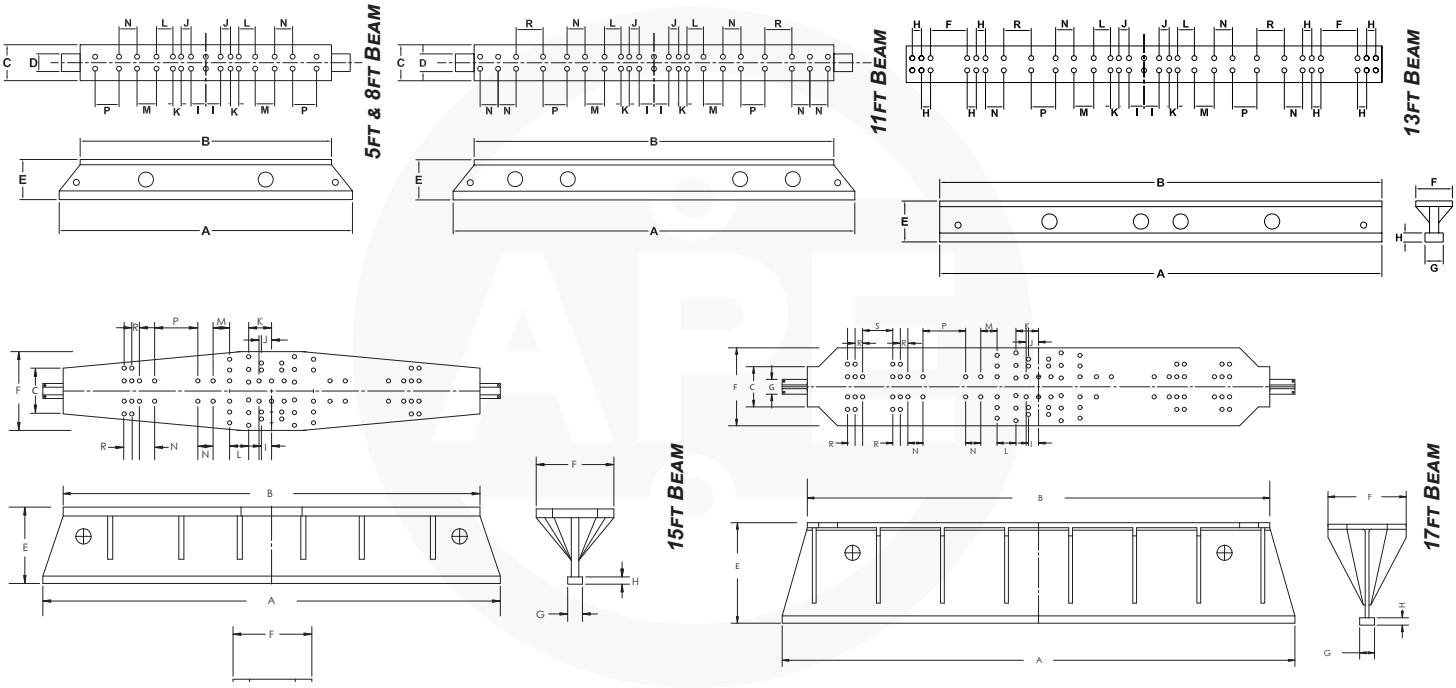


CLAMP EQUATIONS	
Clamp Cylinder Force	$(dm^2 * 0.7854 * p) / 2,000$
Clamp Gripping Force	Clamp Cylinder Force * 2
Clamp and Gripping Force Variables	dm = Diameter, p = Pressure

Standard Caisson Beams

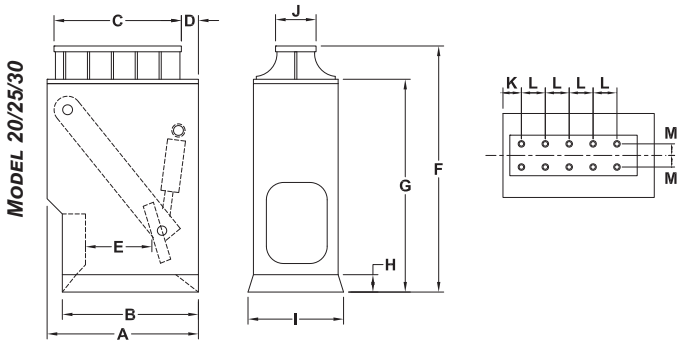
Minimum Caisson Diameter: 21 in (0.53M)

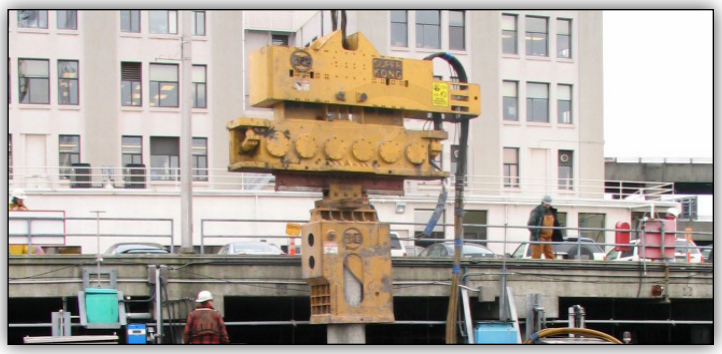
Model	Max Dia. Caisson	Weight	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S
5 ft	33.15 in 0.84 m	1,000 lbs 454 kg	60 in 1.52 m	84 in 2.13 m		5.9 in 150 mm	13.75 in 349 mm	12 in 305 mm	5.9 in 150 mm	3 in 76 mm	4.94 in 125 mm	3.31 in 84 mm	2.75 in 70 mm	5.5 in 140 mm	6.5 in 165 mm	6 in 152 mm	8 in 203 mm	-	
8 ft	69.15 in 1.75 m	1,500 lbs 680 kg	98 in 2.48 m	84 in 2.13 m		5.9 in 150 mm	13.75 in 349 mm	12 in 305 mm	5.9 in 150 mm	3 in 76 mm	4.94 in 125 mm	3.31 in 84 mm	2.75 in 70 mm	5.5 in 140 mm	6.5 in 165 mm	6 in 152 mm	8 in 203 mm	-	
11 ft	106.00 in 2.69 m	3,030 lbs 1,374 kg	132.5 in 3.35 m	120 in 3.04 m		5.9 in 150 mm	13.41 in 340 mm	12 in 305 mm	5.9 in 150 mm	3 in 76 mm	4.94 in 125 mm	3.31 in 84 mm	2.75 in 70 mm	5.5 in 140 mm	6.5 in 165 mm	6 in 152 mm	8 in 203 mm	9 in 229 mm	
13 ft	129.5 in 3.29 m	3,593 lbs 1,630 kg	156 in 3.96 m	156 in 3.96 m			18 in 457 mm	13.5 in 343 mm	5.9 in 150 mm	3 in 76 mm	5 in 127 mm	3.31 in 84 mm	2.75 in 70 mm	5.5 in 140 mm	6.5 in 165 mm	6 in 152 mm	8 in 203 mm	9 in 229 mm	
15 ft	153.5 in 3.9 m	8889 lb 4032 kg	180 in 4.57 m	164 in 4.165 m	18 in 45.72 cm		30.04 in 76.30 cm	31 in 78.74 cm	5.9 in 150 mm	2.91 in 73.9 mm	4.00 in 101.6 mm	4.94 in 125.73 mm	9 in 228.6 mm	7.5 in 190.5 mm	6.5 in 165.1 mm	6 in 152.4 mm	17 in 431.8 mm	3 in 76.2 mm	
17 ft	177.5 in 4.51 m	8368.7 lb 3800.5 kg	204 in 5.18 m	184 in 4.674 m	16 in 40.64 cm		40 in 101.6 cm	31 in 78.74 cm	5.9 in 150 mm	2.91 in 73.9 mm	4.00 in 101.6 mm	4.94 in 125.73 mm	9 in 228.6 mm	7.5 in 190.5 mm	6.5 in 165.1 mm	6 in 152.4 mm	17 in 431.8 mm		12 in 304.8 mm



Wood/Concrete Clamps

Model	Weight	Piston Dia.	Cyl. Force	Clamp Force	A	B	C	D	E	F	G	H	I	J	K	L	M
20	4,500 lbs 2,041 kg	7 in 178 mm	135 kips 600 kN	270 kips 1200 kN	44 in 117 cm	42 in 106.7 cm	44 in 117.8 cm	-	20.5 in 52 cm	72 in 182.9 cm	58 in 147.3 cm	6.0 in 15.2 cm	31.91 in 81.05 cm	14 in 35.6 cm	4 in 10.2 cm	8.25 in 21 cm	4 in 10.2 cm
25	6,200 lbs 2,811 kg	7 in 178 mm	135 kips 600 kN	270 kips 1200 kN	52.25 in 13.2 cm	47 in 119.4 cm	44 in 117.8 cm	6 in 12.7 cm	25.5 in 64.8 cm	77 in 195.6	68 in 172.7 cm	6.0 in 15.2 cm	34.94 in 88.75 cm	14 in 35.6 cm	10 in 25.4 cm	8.25 in 21 cm	4 in 10.2 cm
30	7,000 lbs 3,175 kg	7 in 178 mm	135 kips 600 kN	270 kips 1200 kN	60 in 15.2 cm	52 in 132 cm	44 in 117.8 cm	10 in 25.4 cm	30.5 in 76.2 cm	83 in 21.1 cm	68 in 172.7 cm	6.0 in 15.2 cm	44.38 in 112.73 cm	14 in 35.6 cm	14 in 35.6 cm	8.25 in 21 cm	4 in 10.2 cm

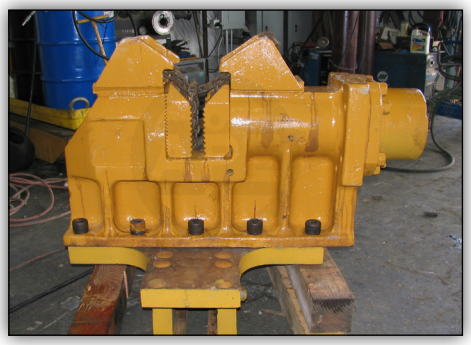




Attachment Accessories

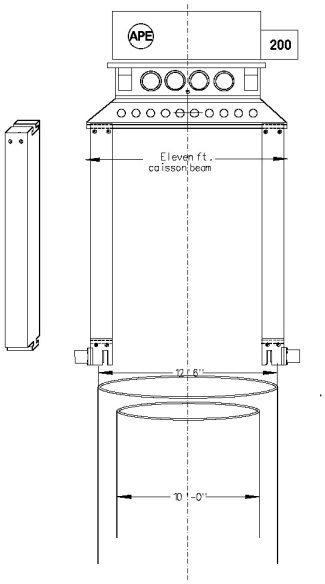
DRIVER/EXTRACTOR ACCESSORIES									
Specification	**Weight**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
90 Degree Turn Plate	600 lb 272 kg	12 in 30.48 cm	8 in 20.3 cm	8.25 in 21 cm	11 in 28 cm	16.5 in 42 cm	37 in 94 cm	3.5 in 8.9 cm	
4' extension	2,500 lb 1134 kg	37 in 94 cm	11 in 28 cm	8.25 in 21 cm	4.94 in 12.55 cm	48 in 122 cm	12 in 3-.5 cm	8 in 20.3 cm	
8' extension	4,000 lb 1,814 kg	37 in 94 cm	11 in 28 cm	8.25 in 21 cm	4.94 in 12.55 cm	96 in 243.8 cm	12 in 30.5 cm	8 in 20.3 cm	
Caisson Beam to Attachment Adapter	1,200 lb 680 kg	4.94 in 12.5 cm	8.00 in 20 cm	8.25 in 21 cm	11 in 28 cm	16.5 in 42 cm	37 in 94 cm	11.5 in 29.21 cm	14 in 35.56

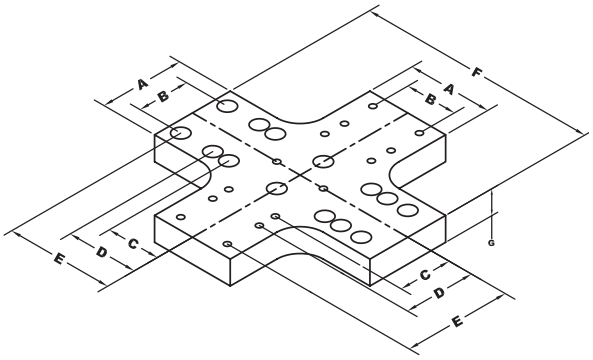
Caisson to sheet adapter with a 90 degree turn plate.



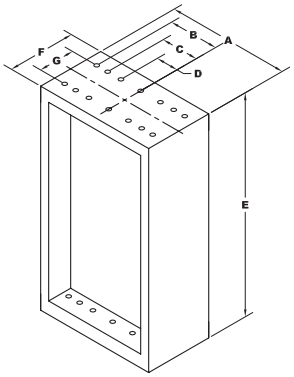
Hybrid extension called the California Stinger for tight working dimensions.

Attachment adapters used to allow the extraction of a casing with an extended rebar cage.

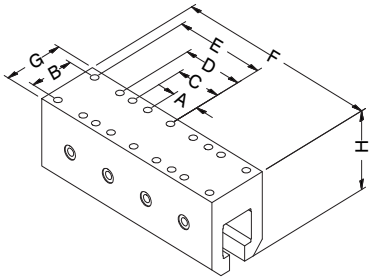




90 Degree Turn Plate.

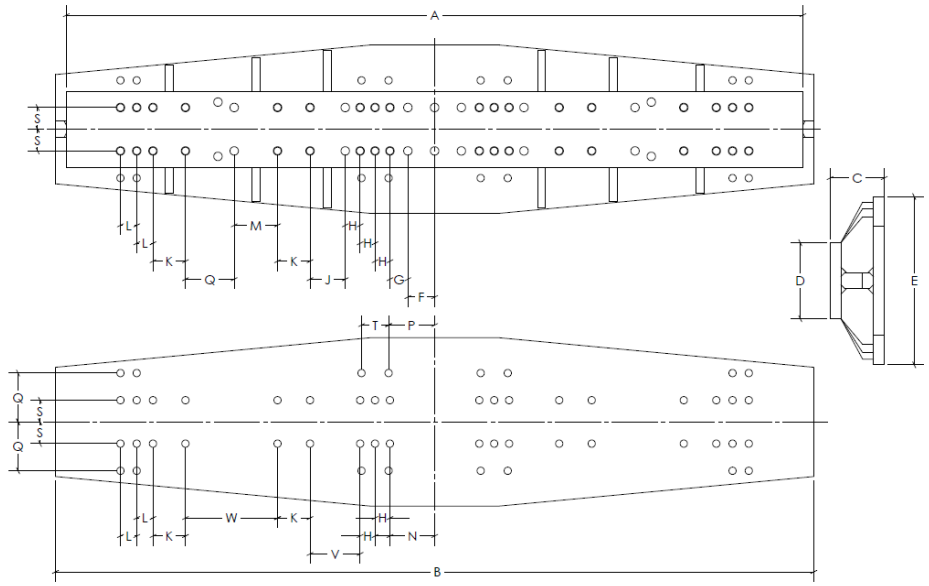


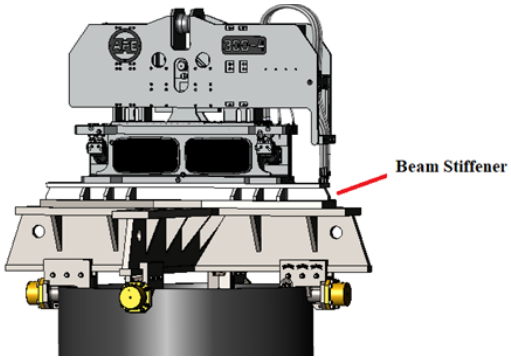
4'&8' Extension.



Caisson beam to attachment adapter.

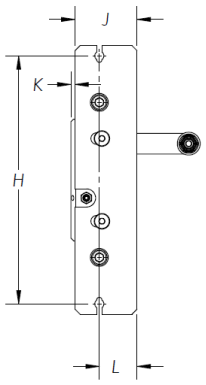
Beam Stiffener



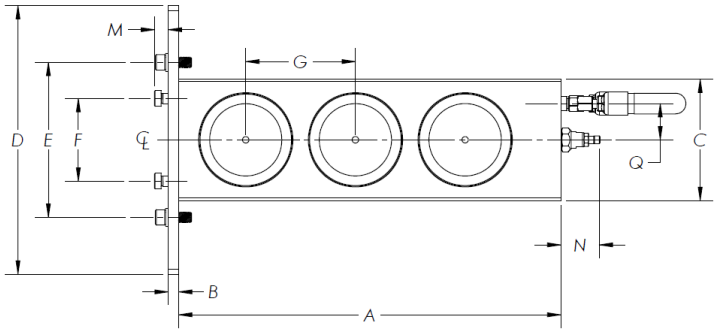


	Weight	A	B	C	D	E	F	G	H	J	K	L
	4021 lb 1825 kg	136 in 3454.4 mm	140 in 3556 mm	10.0 in 254 mm	14.0 in 355.6 mm	31.0 in 787.4 mm	4.94 in 125.5 mm	3.31 in 84 mm	2.75 in 69.9 mm	6.5 in 165.1 mm	6.0 in 152.4 mm	3.0 in 76.2 mm
	M	N	P	Q	S	T	V	W				
	8.0 in 203.2 mm	8.25 in 209.5 mm	8.5 in 215.9 mm	9.0 in 228.6 mm	4.0 in 101.6 mm	5.0 in 127 mm	9.25 in 234.95 mm	17.0 in 431.8 mm				

HydroLocks

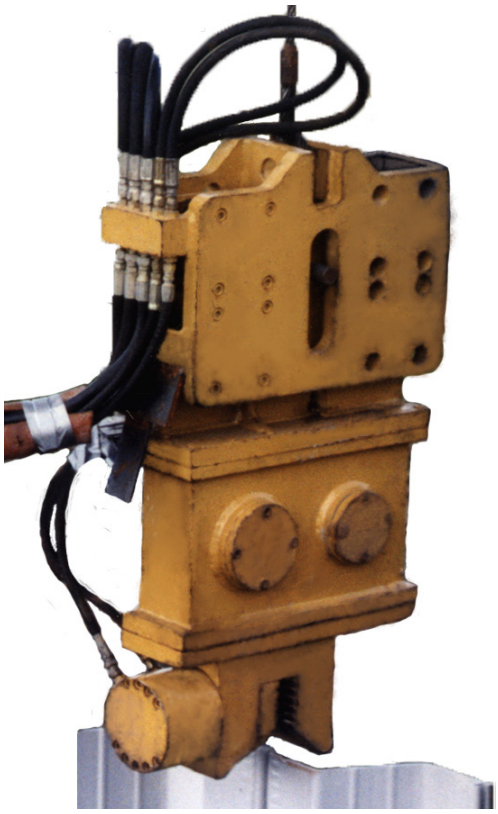


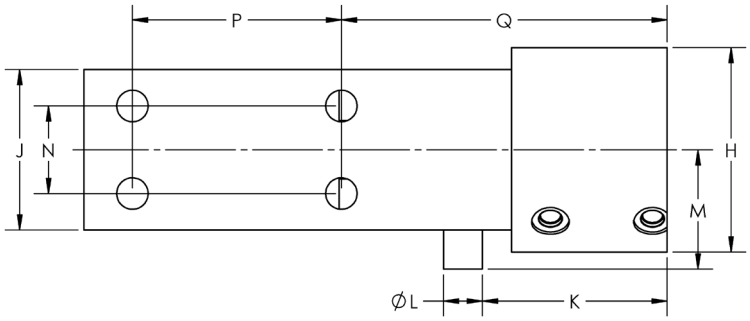
Generic APE Hydrolock Dimensions

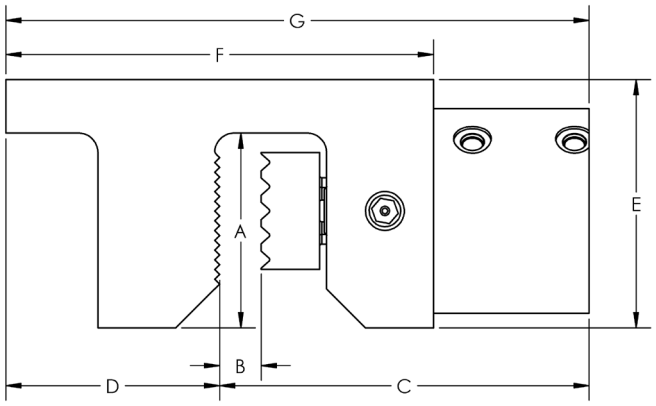


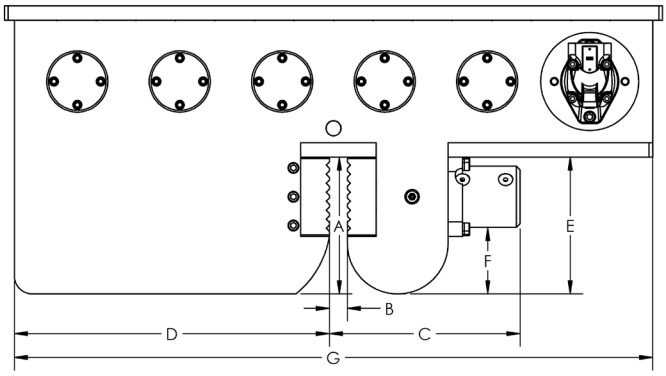
Model	Weight				Piston Diameter				Cylinder Force						
100CC	67.7 lbs 30.7 kg				4.5 in 114.3 mm				107.4 short tons 955.1 kN						
200CC	87.2lbs 39.5 kg				4.5 in 114.3 mm				143.1 short tons 1273.4 kN						
Caisson Beam Adapter	121.6 lb 55.2 kg				4.5 in 114.3 mm				214.7 short tons 1910.1 kN						
/	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
100CC	18.5 in 470 mm	0.5 in 12.7 mm	5.88 in 149.4 mm	13 in 330.2 mm	7.5 in 190.5 mm	4 in 101.6 mm	5.31 in 134.8 mm	12 in 304.8 mm	3 in 76.2 mm	0.195 in 4.95 mm	1.82 in 46.2 mm	.66 in 16.8 mm	1.86 in 47.2mm	4 in 101.6 mm	1.75 in 44.5 mm
200CC	25 in 635 mm	0.5 in 12.7 mm	5.88 in 149.4 mm	13 in 330.2 mm	7.5 in 190.5 mm	4 in 101.6 mm	5.69 in 144.5 mm	12 in 304.8 mm	3 in 76.2 mm	0.195 in 4.95 mm	1.82 in 46.2 mm	.66 in 16.8 mm	1.90 in 48.2 mm	4 in 101.6 mm	1.75 in 44.5 mm
Caisson Beam Adapter	37 in 939.8 mm	0.5 in 12.7 mm	5.88 in 149.4 mm	13 in 330.2 mm	7.5 in 190.5 mm	4 in 101.6 mm	5.69 in 144.5 mm	12 in 304.8 mm	3 in 76.2 mm	0.32 in 8.1 mm	1.82 in 46.2 mm	0.437 in 11.1 mm	1.90 in 48.2 mm	18.85 in 479 mm	1.75 in 44.5 mm

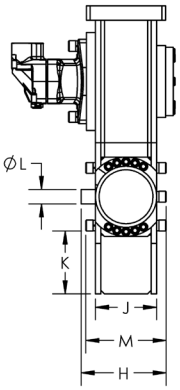
Small and Gearbox Incorportate Universal Clamps

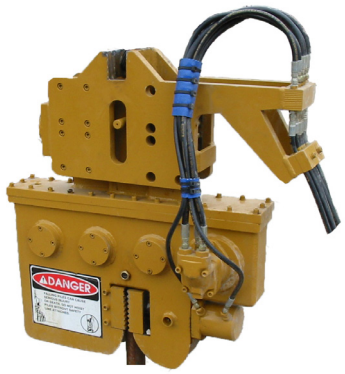










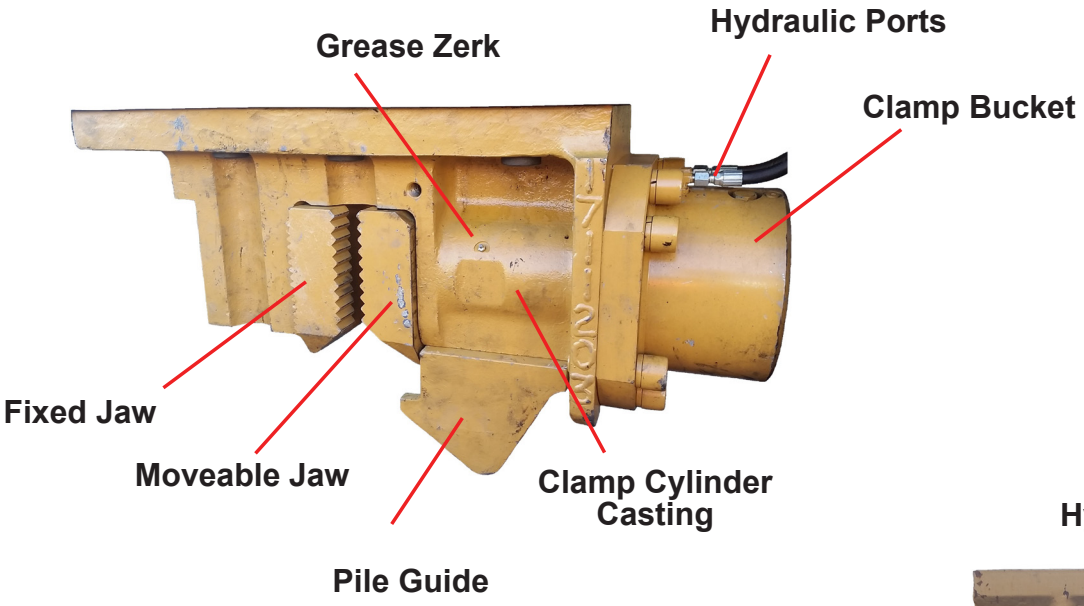


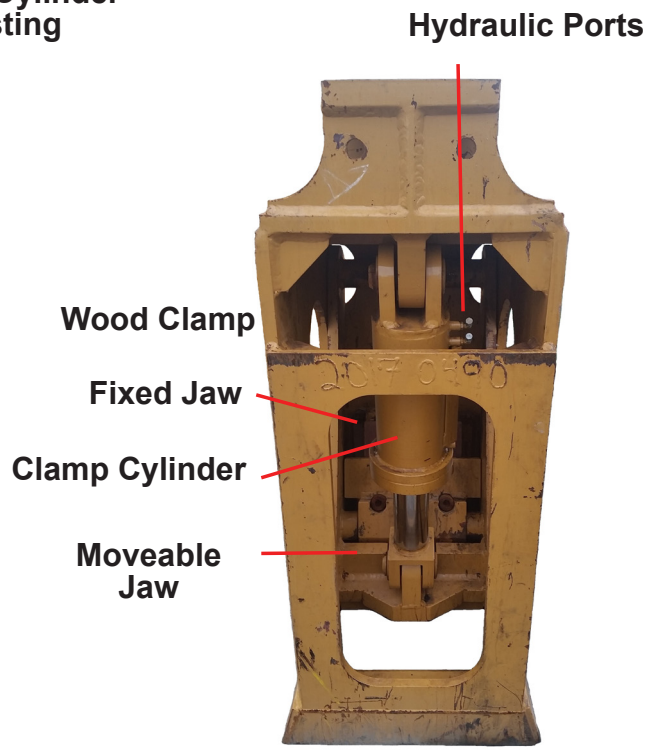
Item	Weight	Piston Diameter	Piston Stroke	Cylinder Force **	A	B
Special Model 6	70 lbs 31.75 kg	3.35 in 85.1 mm	1.68 in 42.7 mm	13 short tons 117 kN	5.0 in 127 mm	1.06 in 27 mm
Standard Model 6	660 lbs* 300 kg*	3.49 in 88.6 mm	2 in 50.8 mm	14 short tons 127.7 kN	9.5 in 241.3 mm	1.25 in 31.75 mm
Model 9	900 lbs 408 kg*	3.49 in 88.6 mm	2 in 50.8 mm	14 short tons 127.7 kN	9.5 in 241.3 mm	1.25 in 31.75 mm

/	C	D	E	F	G	H	J	K	L	M	N	P	Q
Special Model 6	9.5 in 241.3 mm	5.5 in 139.7 mm	6.38 in 161.9 mm	11 in 279.4 mm	15 in 381 mm	5.25 in 133.4 mm	4.13 in 104.8 mm	4.75 in 120.7 mm	1 in 25.4 mm	3.06 in 77.8 mm	2.25 in 57.2 mm	5.38 in 136.5 mm	8.38 in 212.7 mm
Standard Model 6	13.25 in 336.6 mm	14.81 in 376.2 mm	9.5 in 241.3 mm	4.63 in 117.5 mm	30.13 in 765.2 mm	5.79 in 147.1 mm	4.13 in 104.8 mm	4.38 in 111.1 mm	1 in 25.4 mm	5.46 in 138.7 mm	/	/	/
Model 9	13.25 in 336.6 mm	21.9 in 556.3 mm	9.5 in 241.3 mm	4.63 in 117.5 mm	44.38 in 112.7 mm	5.92 in 150.4 mm	4.25 in 108 mm	4.38 in 111.1 mm	1 in 25.4 mm	5.59 in 142 mm	/	/	/

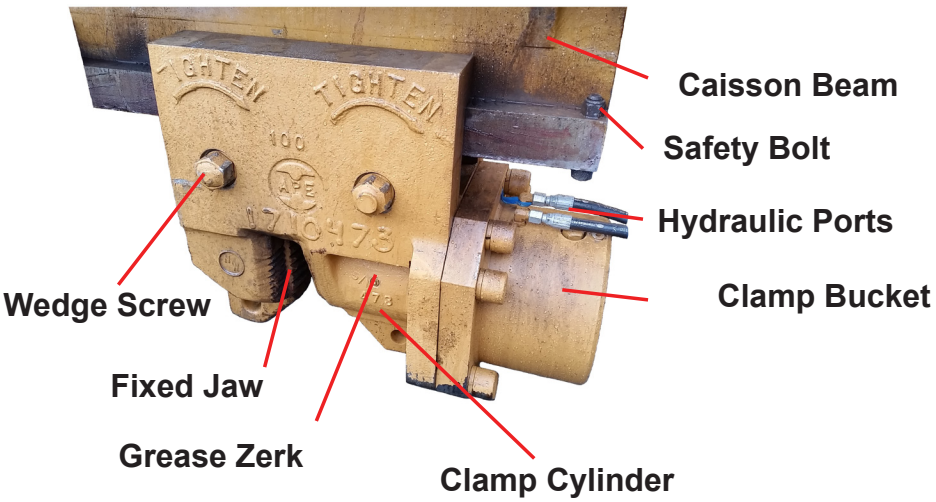
Component Overview

Common Sheet Clamp





Caisson Clamp on Beam



Component Controls Overview

Engine Throttle

Clamp Switch

Drive Switch

Remote vs Local Toggle

Engine Start / Power On

Emergency Stop

Engine Throttle

Clamp Switch

Drive Switch

Emergency Stop

Clamp Switch

Power On

Engine Throttle

Remote vs Local Toggle

WIRELESS PENDANT CONTROL

OPTIONAL

GOVERNOR
DECREASE ENGINE RPM
Press to decrease RPM by increments of 50 RPM. Hold for Min RPM.

DRIVE REVERSE
Press DRIVE REV button to ENGAGE
ENABLE BUTTON REQUIRED
Press DRIVE REV button again to disengage

CLAMP OPEN
Press CLAMP OPEN button to ENGAGE
(MOMENTARY)
ENABLE BUTTON REQUIRED

DRILL HIGH/LOW
Press DRILL HIGH / LOW to toggle between modes.
ENABLE BUTTON REQUIRED

ATTENTION

ENABLE BUTTON
Must be depressed to activate a function:
ENGINE START
DRIVE FWD
DRIVE REV
CLAMP OPEN
CLAMP CLOSE
DRILL HIGH/LOW

GOVERNOR
INCREASE ENGINE RPM
Press to increase RPM by increments of 50 RPM. Hold for Max RPM.

DRIVE FORWARD
Press DRIVE FWD button to ENGAGE
ENABLE BUTTON REQUIRED
Press DRIVE FWD button again to disengage

CLAMP CLOSE
Press CLAMP CLOSE button to ENGAGE / DISENGAGE ***(MAINTAIN)***
ENABLE BUTTON REQUIRED

CLAMP PRESSURIZED
NOTE: BLUE LED = CLAMP PRESSURE is ACTIVE

ENGINE START/STOP
START
Press Engine Start button to start.
ENABLE BUTTON IS REQUIRED
STOP
Press Engine Stop button to shut down the engine.

NOTE: **"WHILE DRIVING"** *If remote is out of range, Drive will go into neutral, Engine rpm will decrease to idle, and if clamp is active, clamp will stay closed.*

Control Panel Overview

EMERGENCY USE ONLY

Disclaimer: *Do not use unless it's an emergency.*
This will shut off the engine, disengage drive and all valves instantly. The control panel power will stay on.
Clamp will stay closed but will not stay energized unless the emergency stop is disengaged.

Note: The color of the light does not matter, Some Keypads are all green or mix with red.
Please call 1-800-248-8498 to have an A.P.E Certified Technician to enable functions.

Clamp Engravings

Model Number

Cast on the clamp body, usually near the cylinder, this number is essential when contacting APE for parts or service

Warning: Clean Surface prior to mounting

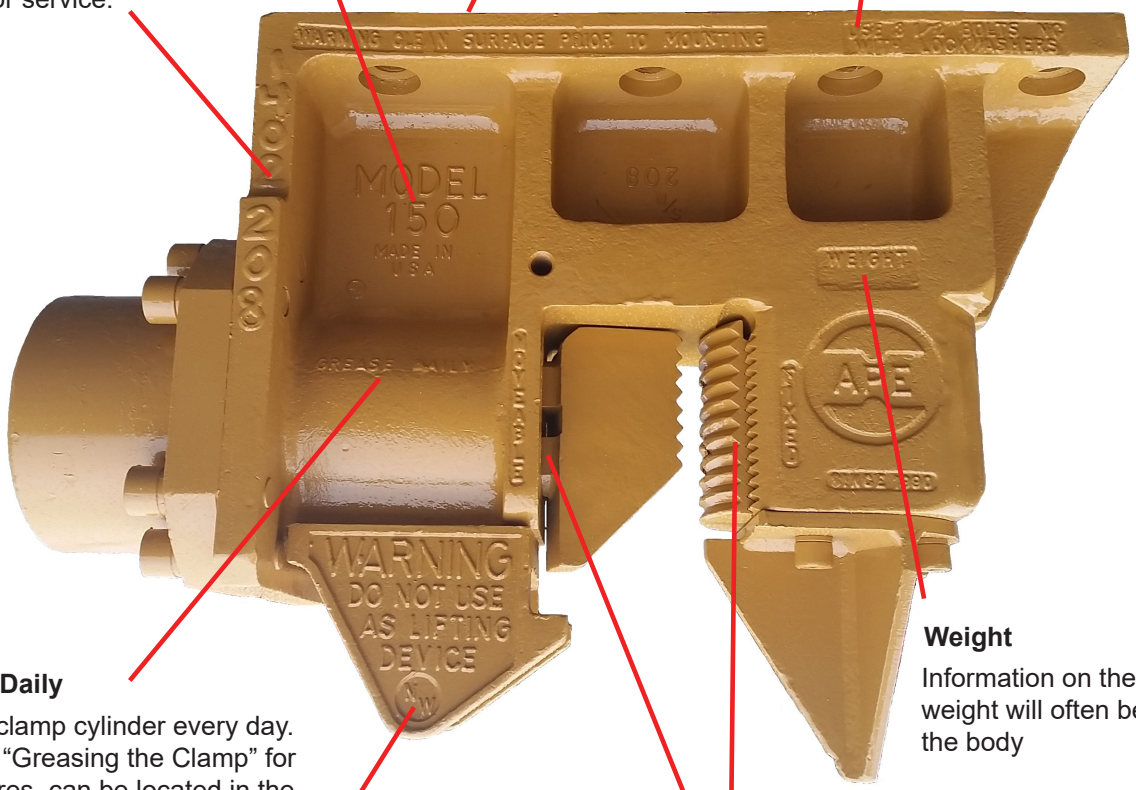
Clean mating surfaces before attaching clamp to vibro. Dirt or debris may cause imporper mating and broken bolts.

Serial Number

Welded on the top lip, this number is essential when contacting APE for parts or service.

Using the correct length of bolts when mounting

Each clamp has specific bolts to use when attaching the clamp to the vibro. See Bolt Clamp list.



Weight

Information on the clamp's weight will often be cast on the body

Grease Daily

Grease clamp cylinder every day. Refer to "Greasing the Clamp" for procedures, can be located in the back of this manual. Do not allow paint or other foreign materials to block the grease fittings.

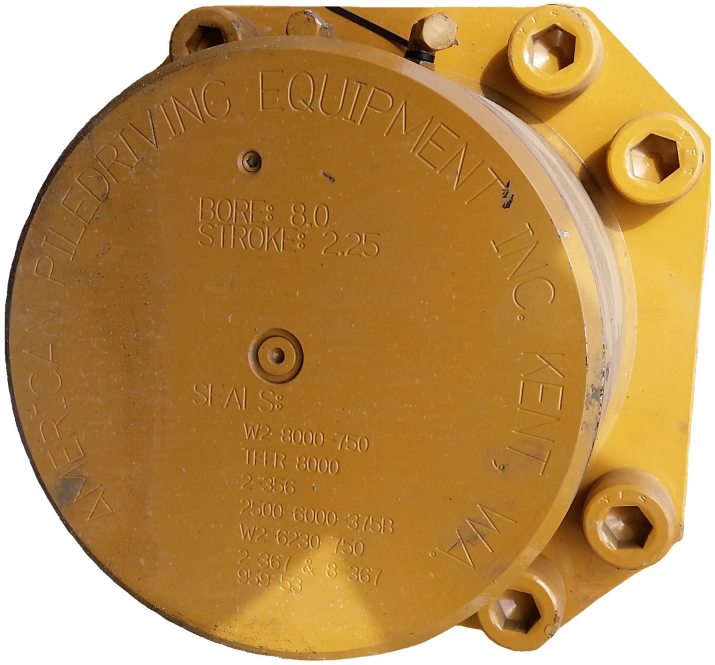
Moveable / Fixed

Most clamp casting will indicate which side of the clamp jaws are move-able and fixed. The moveable jaw will always be on the same side of the clamp as the clamp bucket

Warning: Do not use as lifting device

Do not use clamp to lift piles. Clamp may lose pressure and drop load, causing property damage, serious injury, or death.

Clamp Engravings

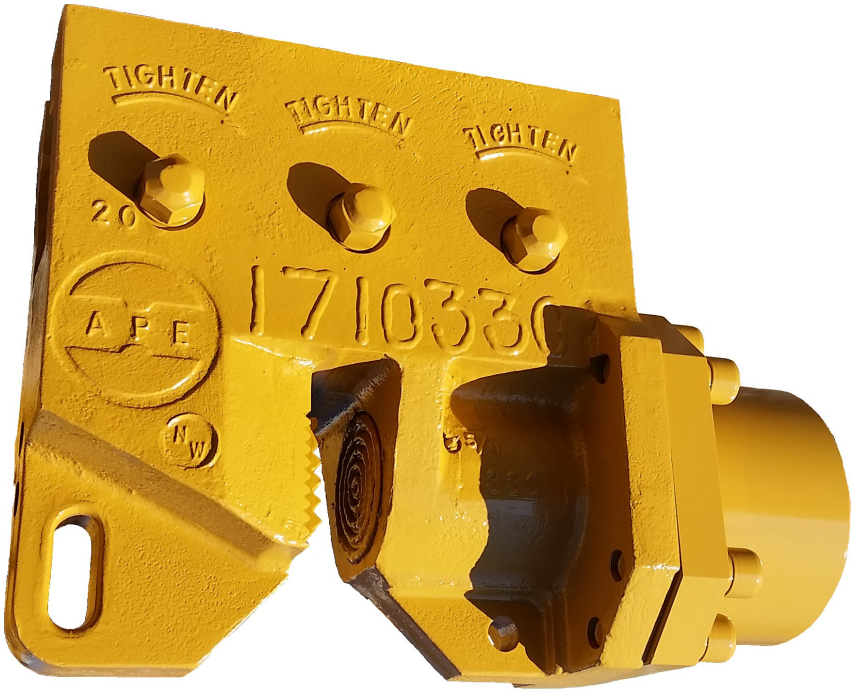


Clamp Bucket Face

Contains information on cylinder diameter, stroke, length, and clamp seals.

Tighten / Loosen

Tighten or loosen caisson wedge bolts only from the side where the “TIGHTEN” label is displayed. Attempting to tighten from the incorrect side may damage the clamp.



Model Number

Cast on the clamp body, usually near the cylinder, this number is essential when contacting APE for parts or service.

Serial Number

Welded on the top lin, this number is essential when contacting APE for parts or service.

Attaching the Clamp to the Vibro

The vibrator is usually shipped with the hydraulic clamp already attached and hooked up. If this is not so, or the job requires multiple clamps to be used on the same vibrator, a working knowledge of how to change the clamp is necessary. All bolts should be socket head cap screws. Do not use grade five bolts.

These instructions are written with sheet clamps in mind. They are also appropriate for attaching turn plates, extensions, caisson beams, and caisson adaptors.

1. Clean all drilled and tapped threads on the bottom surface of the gearbox. Use a 1½-6 UNC tap to clean rusted threads then blow out remaining fragments with compressed air. If there is a cutting torch on the jobsite then use the oxygen setting to blast the threads clean. Hold a rag over the tapped hole to prevent flying dirt from blasting into eyes.
2. Clean both the machined bottom surface of the gearbox and the surface of the clamp/attachment. Make sure the surfaces are flat and void of all dirt. Eyeball the surface for damage.
3. Orient the clamp/attachment holes with those of the vibrator. If attaching a sheet clamp, place the clamp bucket on the same side as the vibrator hoses when possible.
4. Insert the center bolt first and work outwards. Use anti-seize and note the K value.
5. Tighten bolts according to the torque specifications in “Bolt Torque-Tension Charts” on page 58. Go around all bolts at least three times making sure they are tight.
6. After vibrating the first pile check the bolts again.
7. If one bolt breaks replace them all since they may be weak or cracked.
8. Never operate the vibrator with missing clamp/attachment bolts.

Clamp and Beam Mounting Bolts		
Type	1.5 - 6x3.5”	1.5 - 6x5.0”
20 Sheet	10	-
50 Sheet	8	-
150 Sheet	8	-
200 Sheet	10	-
300 Sheet		10
350 Sheet	-	10
126 Sheet	-	8
196 Sheet	-	10
20 Wood	8	-
25 Wood	8	-
32 Wood	14	-
20 Hybrid	10	-
5ft Caisson	18	-
8ft Caisson	26	-
11ft Caisson	42	-
13ft Caisson	58	-
All bolts are socket head cap screws with high collar lockwashers.		

DANGER

Failure to follow cleaning steps will prevent the bolts from fully tightening, causing the clamp bolts to break. If the clamp bolts break, check the machined surfaces with a straight edge to make sure they are flat. Replace all bolts, not just those broken, when reinstalling.

NOTICE

Do not tighten bolts until all bolts have been engaged.
Do not tighten bolts while the clamp/attachment is hanging from the vibrator.

Note:
The pile must be clean of any surface coatings in the clamping area of the clamping system.
Coatings may include but are not limited to Galvanization, Epoxy, Rust, etc.
Failure to clean piles in the clamping area may cause clamp slippage and dropped Piles.
In addition, the clamping teeth must be in good condition and all the teeth of the jaws must be in the work of the pile. (see Worn Jaw Protocol)
Always have a safety line attached to the pile while driving or extracting.
Never carry the pile with the clamp.

Attaching the Clamp to the Vibro

To Place a Caisson Clamp on a Beam:

1. Loosen the wedges by turning the wedge screws counter clockwise. One face of the clamp will bear the TIGHTEN label. Tighten or loosen the wedge screw by turning only this side.
2. When the wedge screw is loosened, free the wedge by striking the face of the wedge screw with a sledgehammer.
3. Slide the caisson clamp onto the beam and into position. Ideally all clamp buckets will face outwards.
4. Once at the desired separation, partially tighten the wedge screw with a wrench or impact driver. If using an impact driver do not tighten the nuts all the way.
5. Finish tightening the nuts with a 20lbs sledgehammer and 2” lug wrench.
6. Install safety bolts onto the ends of the caisson beam with nuts on the bottom. These will help prevent the caisson clamps from falling off during adjustments and operation.

Caisson TIGHTEN label appears on one side of the clamp above the wedge screws.

Hooking up a Vibro to the Power Unit

As shipped, most vibrators will be laid over with their hoses bundled on top. To run the clamp, the two 3/8” clamp lines from the vibro will need to be hooked up.

1. Check pressures at the power unit. If there is any pressure in the clamp CLOSE line, turn on the power unit and set the clamp switch to OPEN. Return it to neutral and continue with the procedure.
2. Clean both ends of the clamp QD’s thoroughly.
3. Hook up the QD’s. Trace the lines to ensure CLOSE is joined to CLOSE. Alternatively, set the QD’s to either port then follow the Bleeding Lines procedure on the next page.

Power Unit quick disconnects, OPEN on left and CLOSE on right.

NOTICE

Any Contaminates that enter the hydraulic fluid will severely reduce the life of the components

Bleeding and Hooking up Vibro Lines

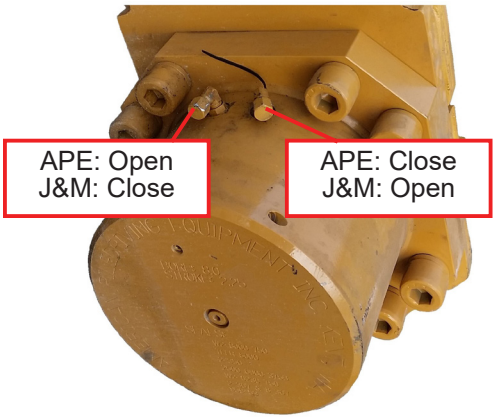
When the vibrator and hydraulic clamp are shipped with all hoses attached the hoses are usually full of oil and may be used immediately. Two hoses should connect the vibrator and each clamp.

This procedure should be performed as part of routine maintenance. Other reasons to bleed the hydraulic clamp are if a hose is connected at the job site, a damaged clamp hose replaced, or an old unit returned to service.

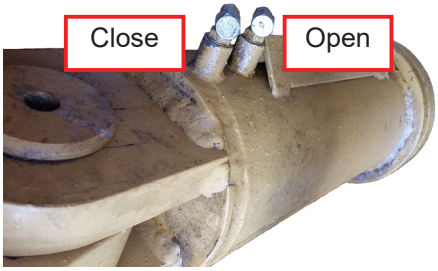
1. Clean all clamp bucket fittings with ether.
2. Start and warm up the power unit. Run the unit at a low idle.
3. Set clamp switch to CLOSED.
4. When the clamp is fully closed set clamp switch to Neutral.
5. Disconnect the hose at the clamp OPEN side.
6. Cap the OPEN port on the clamp bucket.
7. Place loose hose end in an empty container and set the clamp switch to OPEN for 30 seconds.
8. Set the clamp switch to Neutral and reattach the clamp OPEN hose.
9. Set the clamp switch to OPEN.
10. When the clamp is fully open set switch to Neutral.
11. Unplug the clamp CLOSE hose. Cap the CLOSE port on the clamp bucket.
12. Place the loose hose end in an empty container and set the clamp switch to CLOSE for 30 seconds.
13. Set the clamp switch to Neutral. Plug the clamp CLOSE hose back into the clamp bucket.

NOTICE

Any contaminants that enter the hydraulic fluid will severely reduce the life of the components.



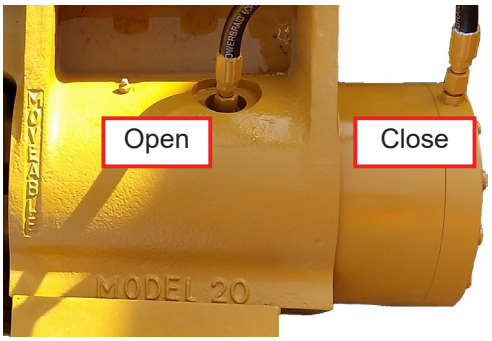
OPEN/CLOSE ports on caisson and sheet clamps



OPEN/CLOSE ports on wood clamp cylinders

WARNING

NEVER tighten or loosen connections while there is oil running through the clamp system. High pressure oil could spray and cause serious injury.



OPEN/CLOSE ports on Model 20 sheet clamp

Changing Clamp Jaws and Pile Guides

For some jobs it will be necessary to switch out the jaws on the clamp. Ensure that the vibrator and/or clamp are laid over and supported by dunnage before beginning. For added safety disconnect the drive hoses from the power unit.

To change the fixed jaw on sheet and caisson clamps:

1. Turn on and warm up the power unit. Bleed clamp lines as described previously in this chapter if necessary before beginning the rest of the procedure. When the power unit is warmed up OPEN the clamp jaw fully.
2. Remove the bolts on the fixed jaw. If force is required to loosen the fixed jaw from the clamp body, avoid damaging the jaw teeth.
    a. If also installing moveable jaw, pause procedure here and move to that task.
3. Insert new bolts according to the specifications on this page. Ensure bolts have an appropriate amount of anti-seize and note its K value.
4. Hold jaw against bolts and engage threads by hand. Once all bolts are engaged run them in without fully tightening.
5. Fully CLOSE the clamp. Maintain clamp pressure on the jaws.
6. Tighten bolts to the torque specifications given in “Bolt Torque-Tension Charts” on page 58.

To change the moveable jaw on sheet clamps:

1. Turn on and warm up the power unit. Bleed clamp lines as described previously in this chapter if necessary before beginning the rest of the procedure.
    a. If a fixed sheet jaw is already installed on the unit, remove it before proceeding. Do not reinstall the fixed jaw until the moveable jaw is fully installed.
2. When warmed up CLOSE the clamp jaw fully.

KEEP LIMBS AND TOOLS CLEAR OF CLAMP JAWS WHILE CLAMP IS ENERGIZED.

Bolt specifications for fixed jaw replacement:

- Model 20, 50, 150, and 200 Sheet: 2 SHCS 1.0-8x9.0” bolts each with a 1” HCLW.
- Model 350 Sheet: 2 SHCS 1.0-8x4.25” bolts each with a 1” HCLW.
- J&M Model 126 Sheet: 2 SHCS 1.0-8x4.0” bolts each with a 1” HCLW.
- J&M Model 196 Sheet: 2 SHCS 1.0-8x4.5” bolts each with a 1” HCLW.
- Model 80b Caisson: 2 SHCS 5/8-11x2.75” bolts each with a 5/8” HCLW.
- Model 100 Caisson: 2 SHCS 5/8-11x3.75” bolts with a 5/8” HCLW.
- Model 200 Caisson: 2 SHCS 5/8-11x4.0” bolts with a 5/8” HCLW.

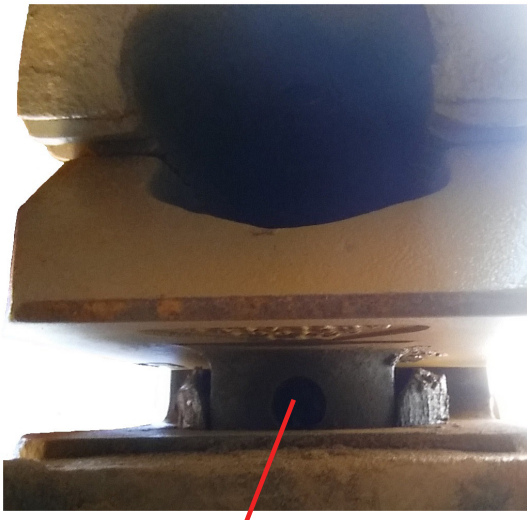
3. Insert two equally sized metal spacers between the rear of the moveable jaw and the clamp body so that the moveable jaw will receive even resistance when the clamp is set to OPEN.
4. OPEN the clamp. The roll pin between the moveable jaw and the clamp plunger should shear.
5. Remove the moveable jaw once the clamp is fully OPEN.
    a. If the roll pin did not fully shear, CLOSE the clamp and repeat steps 2 through 4 with larger metal spacers.
6. CLOSE the clamp. Use a hammer and pin to remove the remains of the roll pin from both the moveable jaw and the clamp plunger.
7. Align the new moveable jaw on the clamp plunger. Some adjustment of clamp plunger position may be needed to align the holes.
8. Insert a new roll pin into holes and tap down until it is exactly halfway, with equal depths extending into the cylinder plunger on each side of the jaw.
9. OPEN and CLOSE the clamp to make sure it has a full range of motion.

To install sheet and dunce pile guides:

1. Remove any guides that are not needed.
2. Clean bolt holes with wire brush and compressed air. If threads are rusted use a tap to clear them.
3. Bolt specifications are listed in the pop out box. Use appropriate anti-seize and note the K value.
4. Align guide on the holes and engage all bolts. Dunce guides may only be fitted on the fixed jaw side.
5. Once all bolts are started, tighten them in a star pattern to the torque specified in the torque chart in “Bolt Torque-Tension Charts” on page 58.

DANGER

KEEP LIMBS AND TOOLS CLEAR OF CLAMP JAWS WHILE CLAMP IS ENERGIZED.



Bottom view of roll pin hole on moveable jaw

Bolt specifications for dunce and sheet pile guides:

- Model 20, 50, 150, and 200 Sheet clamp pile guides: 4 SHCS 1.0-8x3.0” bolts each with a 1” HCLW.
- Model 50 and 150 dunce spikes: 4 SHCS 1.0-8x2.0” bolts each with a 1” HCLW.
- Model 400 Sheet pile guide: 4 SHCS 1.0-8x2.5” bolts each with a 1” HCLW.
- J&M Model 126 and 196 Sheet pile guides: 4 SHCS 1.0-8x2.5” bolts each with a 1” HCLW.

To install square or circular jaws on wood clamps:

1. While the clamp is still upright, loosen the bolts on the fixed jaw.
2. Turn on and warm up the power unit. Bleed clamp lines as described previously in this chapter if necessary before beginning the rest of the procedure.
3. Lay the clamp and/or vibrator over so that it securely rests on dunnage.
4. OPEN the clamp jaws fully. Secure the arm with wedges.
5. Follow these steps to remove the moveable jaw.
    a. Two bolts will be exposed at the rear. Loosen these but do not remove them.
    b. Turn the moveable plate with a long bar and secure it open with wedges. Remove the bolts that are exposed.
    c. Return the plate to a neutral position. Secure the teeth from below so that they won't fall when the final bolts are removed then remove the bolts and jaw.
6. Position the replacement jaw, supporting it as necessary, and insert the rear bolts. Bolt specifications are given in the pop out box. Make sure they have fresh anti-seize, noting the K value. Engage the bolts without fully tightening them.
7. Pry open the jaw and secure it as in step 6b. Insert and tighten all remaining bolts to the torques specified in "Bolt Torque-Tension Charts" on page 58.
8. Remove bolts on the fixed jaw. Position replacement jaw and engage bolts by hand. Use anti-seize, noting the K value. Bolt specifications are noted on this page.
9. When all fixed jaw bolts are hand tight, remove the wedges on the moveable arm.
10. Stand the vibrator and/or clamp upright and tighten the fixed jaw bolts to the torque specified oi

WARNING

BEWARE OF SHEAR AND PINCH POINTS, ESPECIALLY BETWEEN THE MOVEABLE ARM AND THE CLAMP FRAME GAPS.

DANGER

The hydraulic cylinder is NOT designed to hold pressure in this position. Oil may drain from the cylinder, gradually releasing the moveable arm.

Bolt specifications for wood clamp moveable jaw:

- Model 20, 25, and 32 Wood clamp moveable jaw: 6 SHCS 1.5-6x4.0" bolts each with a 1.5" HCLW.

Bolt specifications for wood clamp fixed jaw:

- Model 20 Wood clamp fixed jaw: 6 SHCS 1.5-6x6.5" bolts each with a 1.5" HCLW.
- Model 25 and 32 Wood clamp fixed jaw: 6 SHCS 1.5-6x3.25" each with a 1.5" HCLW.

WARNING

Use caution when removing the wedges. Abrupt motion of the arm is possible and could result in property damage or serious injury.

Clamping Force Calculations

An accurate calculation of the clamps gripping force is essential for safe operation. The values provided in the specifications pages are accurate only for a specific pressure setting and it may be necessary to calculate a new one on the job site.

- Cylinder diameters can be found on the specifications pages.
- Use the clamp CLOSE pressure value displayed by the power unit, which can be adjusted by changing the clamp relief valve setting as described in the power unit manual.
- The 20” Hybrid and C102 Wood Clamps use two pistons closing from the rod end. For these clamps only, Cylinder Area = 20.32 in2 (13110 mm2). Carry out the rest of the equations as normal.

Power unit clamp CLOSE dial as seen beside the power unit control poanel. Pressure measured in psi and bar.

Formulas

Cylinder Area=0.7854 × Cylinder Diameter²

Cylinder Force in lbs, using in² and PSI
=Cylinder Area × Clamp CLOSE Pressure

Cylinder Force in kN, using mm² and Bar

$$=\frac{(\text{Cylinder Area} \times \text{Clamp CLOSE Pressure})}{1{,}000}$$

Cylinder Force in kN, using mm² and KPa

$$=\frac{(\text{Cylinder Area} \times \text{Clamp CLOSE Pressure})}{1{,}000{,}000}$$

DANGER

The true cylinder force is lower than the theoretical cylinder force. The true cylinder force depends on the coefficient of friction between the jaw teeth and the pile.

Clamp Working Pressures

Clamp			Standard Pressure
Model 6/9 Gearbox	Model 6 Removable		3000 PSI (205 Bar)
20 WC	25 WC	32 WC	3500 PSI (241 Bar)
20 SC OLD 150 SC 80B CC	20 SC New 200 SC 100 CC	50 SC 350 SC 200 CC	4500 PSI (310 Bar)
126 SC C102	196 SC Hybrid 20	300 SC	5000 PSI (345 Bar)

Greasing the Clamp

At the start of each work day the clamp cylinder should be greased.

1. Make sure the clamp OPEN and CLOSE ports are tightly attached.
2. Clean the grease-zerk. If the grease-zerk is blocked, replace it.
3. Run the clamp cylinder back and forth while applying grease to the grease-zerk. Use **NLGI Grade 2 EP2 or equivalent**.
4. Continue to apply grease and run the clamp until grease escapes around the plunger near the jaws.

Grease-zerks are on the clamp cylinder near the jaws.

Clamp Thermal Relief

Heat from the environment or vibro operation will cause hydraulic oil in the clamp to expand. This is a hazard to personnel and the equipment.

- Do not leave the clamp pressurized during downtimes longer than 1 hour.
- Every 30 to 45 minutes of work, stop and relieve clamp pressure. Re-clamp before resuming work.

NOTICE

Do not use a pneumatic gun to apply grease. Excessive air bubbles may be introduced to the space around the clamp plunger.

Check Valve Test

Many clamp pressure loss issues are related to a faulty check valve.

1. While clamp is hooked up, turn on and warm up power unit. Leave it on a low idle.
2. Remove the OPEN side hose at the clamp.
3. While taking precautions against oil spray and leakage, set clamp switch to CLOSE.
4. When clamp is fully closed check OPEN side port for bypass oil. A drip rate of roughly one drop per five seconds is acceptable.
5. If drip rate is low reattach the OPEN hose.

   a. If the oil is streaming or spraying do not attempt to attach the hose. Allow the leak to relieve the CLOSE side pressure and order a new check valve.

WARNING

Extreme hydraulic pressure can crack the clamp cylinder casing, burst hoses, or rupture the clamp seal cartridge. All may cause severe injury or death.

Do not attempt to relieve clamp pressure while vibro is in drive forward.

WARNING

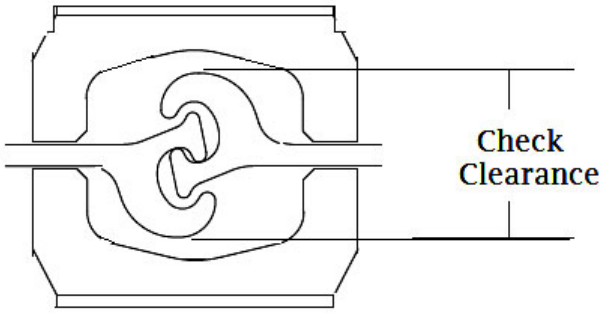
USE CAUTION, HIGH PRESSURE OIL MAY SPRAY FROM PORT.

DO NOT ATTEMPT TO TOUCH THE PORT OR REATTACH THE HOSE IF OIL IS SPRAYING.

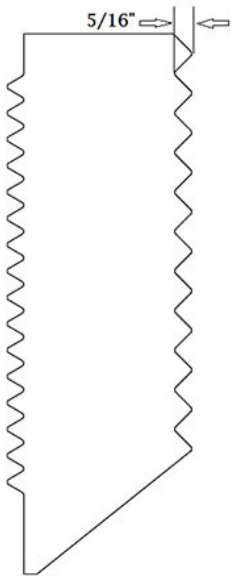
Worn Jaw Check

Periodic checks of the sheet clamp jaws are required to ensure safe operation of the vibro. Follow this procedure on the first day of work and weekly after. More frequent checks will be required in abnormal operating conditions.

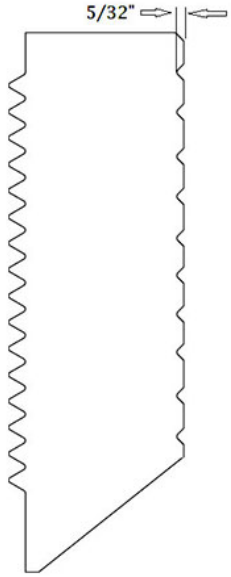
1. If the clamp jaws are not fully open, turn on the power unit and open them. Turn off the power unit and keep it off for the rest of the procedure.
2. Measure between teeth valleys and peaks.
3. Teeth can be worn up to half of their original depth of 5/16” or 8mm if the teeth are evenly worn. Depth less than 5/32” or 4mm requires replacement of the clamp jaw.
4. All teeth must engage the pile. If values fall within the acceptable range but show uneven levels of wear, especially on the bottom few teeth, replace the jaw.
5. Also ensure that, at the present level of tooth wear, there is clearance in the concave region of the sheet clamp jaws to allow the inner-lock of the sheet piles.



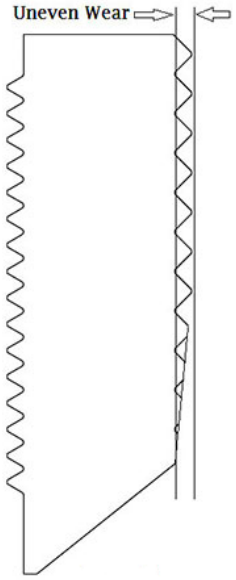
Appearance of internal clearance of sheet jaws



New



Used



Unacceptable

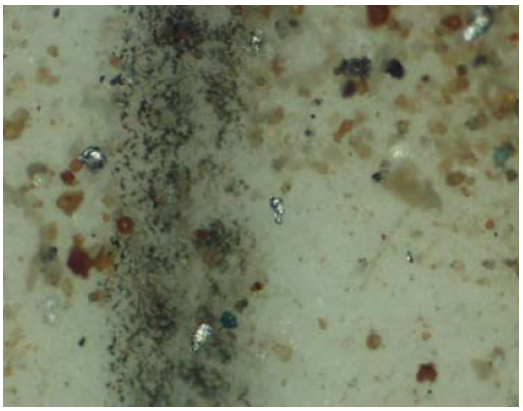
Unevenly worn jaws in need of prompt replacement

It is imperative that the hydraulic fluid is kept clean to a minimum ISO Code 17/15/11. Bulk oil does not typically meet the cleanliness standards required by APE equipment.

See ”ISO Hydraulic Fluid Cleanliness Codes” on page 60.

NOTICE

New hydraulic fluid is NOT clean oil.



New hydraulic oil under microscope

Storage

During short-term storage of the clamp, the following steps should be taken:

- Ensure the clamp has been freshly lubricated.
- Fully OPEN the clamp cylinder.
- Disconnect hoses.
- Cover any pressure openings and open threaded holes with suitable caps.
- Protected the unpainted surfaces from dirt and moisture. DO NOT PAINT OVER GREASE-ZERK.
- Do NOT store the clamp in an area with substances that have an aggressive corrosive nature, i.e. solvents, acids, alkalis, or salts.

For long-term storage (over 9 months) the following additional actions are recommended:

Repair any damage to surface paint before item is stored.

- Protect the unpainted surfaces with suitable anti-corrosion treatment such as CRC SP-350, CorrosionC corrosion inhibitor, or WD-40 Long Term Corrosion inhibitor.
- Make sure the clamp hydraulic components are completely full of clean hydraulic fluid.

If these instructions are followed the clamp may be stored for approximately 2 years. However, as storage conditions do have a significant effect, all suggested time frames should only be considered as guide values.

150 Sheet clamp painted for storage. The machined surface on the bottom will still require protection

Daily Checklist

At the beginning of each shift, check the following:

- Visually inspect all bolts, nuts and screws, including those that mount the clamp to the gearbox. Vibration loosens bolts, check carefully.
- Visually inspect clamp jaws and teeth for cracking.
- Tighten bolts holding gripping jaws to the clamp.
- Grease clamp piston in accordance with the procedure found in “Greasing the Clamp”
- Visually inspect all hydraulic fittings for leaks.
- Visually inspect hoses for damage or cuts that might cause hose failure during operation.
- After starting power unit make sure that hydraulic hoses are hanging freely. Check for leaks.
- Close clamp jaws. Ensure green clamp switch lights come on.

NOTICE

Check the entire unit prior to and during set up each day or at the beginning of each shift.

DANGER

Vibration loosens bolts. Check them thoroughly.

NOTICE

It is absolutely imperative that no dirt or other impurities be permitted to contaminate the hydraulic fluid. Any contamination will drastically shorten the life of the high-pressure hydraulic system.

Metal hose braiding badly frayed, rendering the hose unsuitable for use

Long Term Maintenance

Non-Daily Maintenance Tasks		
Weekly	**Six Months**	**Yearly**
◦ Unhook clamp lines and follow “Bleeding and Hooking Up Vibro Lines” on page 38. ◦ Follow “Worn Jaw Check	◦ Replace fixed and moveable clamp jaws. ◦ Use dye penetrant inspection to check clamp body for cracking around clamp jaws.	◦ Replace clamp line hoses. ◦ Examine O-Rings for wear.

Preventative maintenance includes normal servicing that will keep the clamp in peak operating condition and prevent unnecessary trouble from developing. This servicing consists of periodic lubrication and inspection of moving parts and accessories of the unit. Lubrication is an essential part of preventative maintenance controlling the useful life of the clamp.

To prevent minor irregularities from developing into serious conditions that might involve shutdown and major repair, several other services or inspections are recommended. The purpose of these services or inspections is to assure the uninterrupted operation of the unit.

The intervals given in the schedule are based upon normal operation. Perform these services, inspections, etc., more often as needed for operations under abnormal or severe conditions.

- When the average temperature is above 80°F (26°C) or below -10°F (-23°C) reduce the service time intervals by one half of those specified in the chart.
- When operating in the presence of dust or sand reduce service time intervals by one-half of those specified in the chart.
- When operating more than 12 hours per day, reduce the service time intervals by one-half of those specified.
- For extended inactive periods the clamp should be run and greased once a week.

NOTICE

Thoroughly clean all lubrication ports and fittings along with their surrounding surfaces before servicing.

Prevent dirt from entering with lubricants and hydraulic oil.

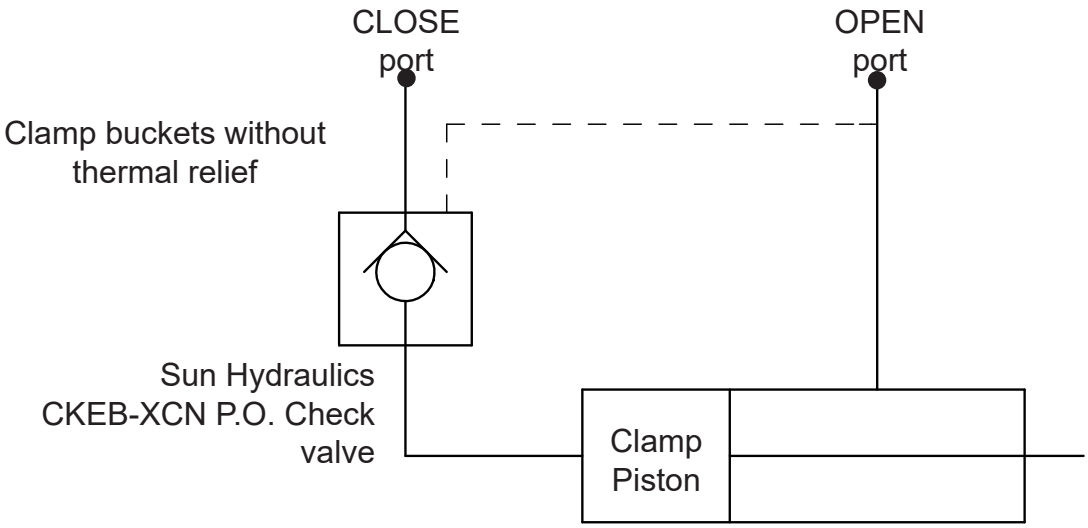
Problem Identification

Symptom	Possible Cause	Remedy
Clamp light doesn't illuminate when pressure is at or above 4500 PSI. OR Clamp is losing pressure over time, or clamp light doesn't illuminate when pressure is below 4500 PSI.	Relief valve set too low	Release clamp pressure and disconnect QD's. Test clamp pressure at power unit console. If below 4500 PSI reference your power unit manual for the procedure on adjusting clamp pressure.
	Quick disconnects not fitted properly.	Release clamp pressure. Remove, inspect, clean, and reattach QD's.
	There is an electrical fault.	-Check lights on both power unit console and pendant for failed bulbs. -Check electrical connections for corrosion or broken wires.
	Hoses are leaking.	Depressurize clamp and check hoses and QD's for leaks. Immediately halt work and replace any hose found to leak.
	Faulty clamp check valve.	Follow the "Check Valve Test" on page 43.
	Seals are leaking internally.	Check clamp rod for bad O-rings.
Opening and closing clamp jaws seems spongy or slow.	Quick disconnects not fitted properly.	Release clamp pressure and tighten QD's. It may be necessary to clean QD's of dirt or rust first.
	The clamp hoses have air in them	Follow procedure for "Bleeding and Hooking Up Vibro Lines" on page 38.
	Oil leaks are slowing the clamp.	Inspect hoses and clamp seals, replacing if needed. Follow procedure for "Check Valve Test" on page 43.
	The plunger shaft is not properly lubricated or needs cleaning.	Remove the moveable jaw from the clamp according to the instructions given in "Changing Clamp Jaws and Pile Guides" on page 39. Inspect the plunger shaft and check for lubrication or debris build up. Clean the shaft if needed then lubricate using the grease-zerk on the clamp body.
Clamp CLOSE pressure rises and falls repeatedly.	Leaks, internal or external, are triggering the clamp CLOSE pressure switch	Examine hoses, QD's, and power unit clamp manifold for leaks.
		Follow procedure for "Check Valve Test" on page 43.

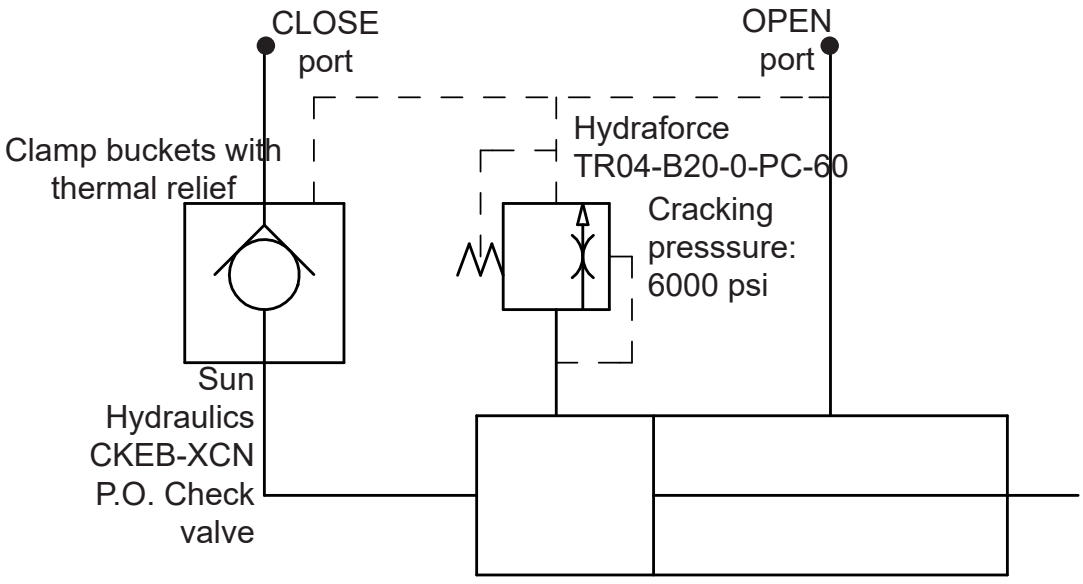
Symptom	Possible Cause	Remedy
Clamp won't close or open when the clamp switch is engaged.	Vibrator is running.	The clamp won't open while the vibrator is in operation. To open the clamp, stop the vibrator.
	Quick disconnects not fitted properly.	Release clamp pressure and tighten QD's.
	Hoses are not properly routed.	Toggle the clamp switch to see if the desired operation occurs.
	Diesel engine not running.	Start the power unit and allow clamp pressure to build.
	Leaks are allowing oil to bypass the clamp circuit.	Check for leaks and faulty components as with clamp lights failing to illuminate.
	There is an electrical fault.	Check for the following: -Defective clamp switch. -Broken or loose wire in the pendant or pendant cable. -Defective OPEN solenoid. -Broken or loose wires. -Defective or sticking clamp timing delay relay.
	Clamp rod seized.	Check lubrication history and examine clamp rod if possible.
	Clamp pump is defective.	Check for proper clamp pump operation and replace if needed.
Bolts attaching clamp to vibrator break.	Mating surfaces not adequately cleaned. OR The bolts were not torqued properly.	Detach the clamp from the vibro and follow the procedure in "Attaching the Clamp to a Vibrator" on page 36. Perform the cleaning steps diligently and use all new bolts. Ensure every bolt is properly torqued.
Cracks found in clamp body near jaws.	Clamp body is old or was exposed to excessive force.	Contact APE for advice and evaluation, replacement may be required.
Clamp jaw teeth are cracked.	Clamp teeth are old or were exposed to excessive force.	Replace clamp jaws with procedures in "Changing Clamp Jaws and Pile Guides" on page 39.
Hydraulic oil leaking from bucket in area other than clamp line fittings.	Plug or seal on the clamp bucket body has come loose, or a crack has appeared.	Tighten fittings at leak site. If this does not solve the problem or the leak is not coming from a fitting, contact APE. DO NOT SERVICE EQUIPMENT WHILE CLAMP IS UNDER PRESSURE.

Hydraulic Schematics

These schematics are for use with all APE caisson and sheet clamps (except Model 20). The Model 20 and Wood Clamps link directly from the OPEN/CLOSE ports to the clamp cylinder. Refer to your power unit manual for adjusting the power unit clamp circuit pressure.

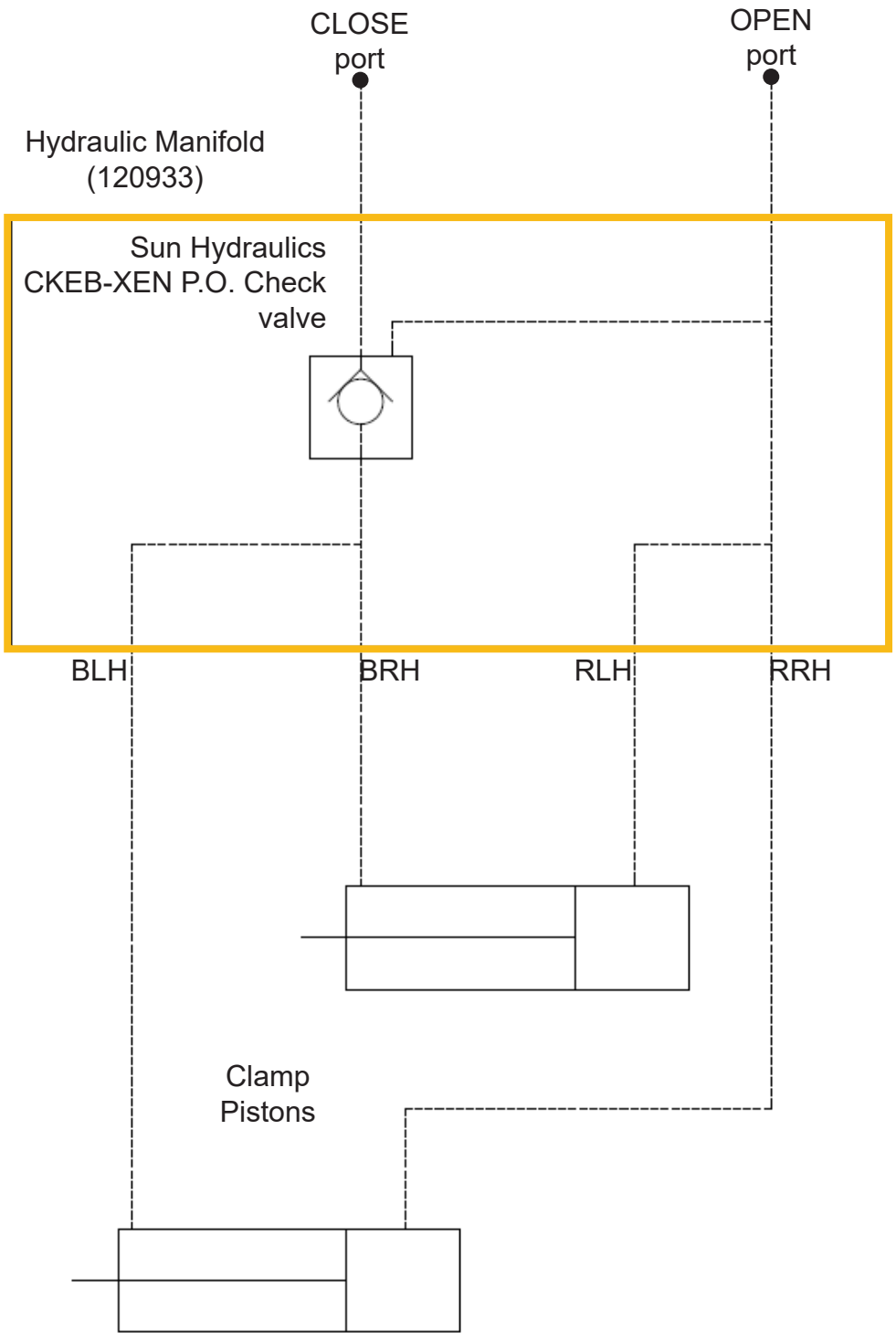


Thermal relief indicated by 2nd off-center plug on clamp bucket face.



Hydraulic Schematics

This schematic is appropriate for both the C102 and Hybrid 20 clamps.



Ordering Parts

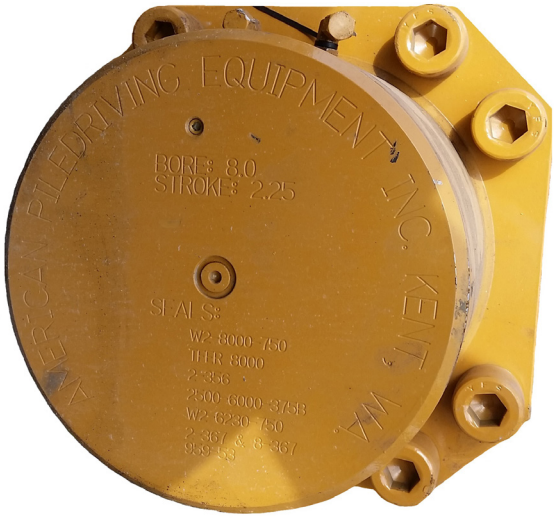
When ordering parts be sure to include the model and serial number of the unit or component. The serial number may be located by referring to “Clamp Engravings” on page 34. Confirm all telephone orders in writing immediately to avoid duplicating shipment.

ORIGINAL EQUIPMENT: Where component serial numbers are given, these apply only to equipment and components originally furnished with the unit. Where equipment has been changed or upgraded these numbers may not be an adequate description.

SHIPMENT: State to whom shipment is to be made and method of shipment desired, otherwise our own judgment will be used.

SHORTAGES: Claims for shortages or errors should be made immediately upon receipt of parts. No responsibility will be assumed for delay, damage, or loss of material while in transit. Broken, damaged, or lost material should be refused, or a full description made of damage or loss to the carrier agent on the freight or express bill.

RETURN OF PARTS: If for any reason you desire to return parts to the factory or to any distributor from whom these parts were obtained, you must first secure permission to return the parts. Shipping instructions will be given along with this permission. A ten percent handling charge must be assessed against the returned shipment unless an error is made by the factory or by the distributor when filling your order.



Hose and Fitting Replacements

FITT 2 L - 16 M 12 J 00 0 - 00L 0 0 0 1

SELECTOR INDEX
2 - INCH FITTING
9 - METRIC FITTING

CONFIGURATION OR SHAPE OF FITTING
S - STRAIGHT FITTING
L - 90 Deg. ELBOW
V - 45 Deg. ELBOW
T - TEE
C - CAP
P - PLUG
U - UNION
X - CROSS
(FOURTH END FITT'G REQ'D.)

FIRST END SIZE
* IN 1/16THS OF AN INCH (INDEX 2)
IN MILLIMETERS (INDEX 9)
SEE GENERAL SPECIFICATION SHEET FOR SEQUENCE OF ORDER

FIRST END FITTING STYLE
SEE FITTING STYLE SELECTOR CHART SC-1

SECOND END SIZE
IF APPLICIABLE - SEE FIRST END SIZE

SECOND END FITTING STYLE
IF APPLICABLE - SEE FIRST END FITTING STYLE

THIRD END SIZE
IF APPLICABLE - SEE FIRST END SIZE

THIRD END FITTING STYLE
IF APPLICABLE - SEE FIRST END SIZE

* EXCEPTIONS
90 = 10" 96 = 6"
92 = 12" 98 = 8"
94 = 14" 99 = NON CODE SIZE

MATERIAL
1 - CARBON STEEL
2 - BRASS
4 - STAINLESS STL
5 - AAR MAL IRON
6 - MALEABLE IRON
8 - FORGED STEEL

SPECIAL NOTATIONS

PRESSURE RATING
0 - NONE
1 - 125 LB.
3 - SCH 40
4 - SCH 80

INSTALLATION AID OR STYLE OF HEAD
0 - NOT APPLICABLE
H - REGULAR HEX
Q - SQUARE HEAD (EXT.)
R - SQUARE HEAD (INT.)
S - HEX HEAD (INT SOCKET)
T - HEX HEAD (EXT.)

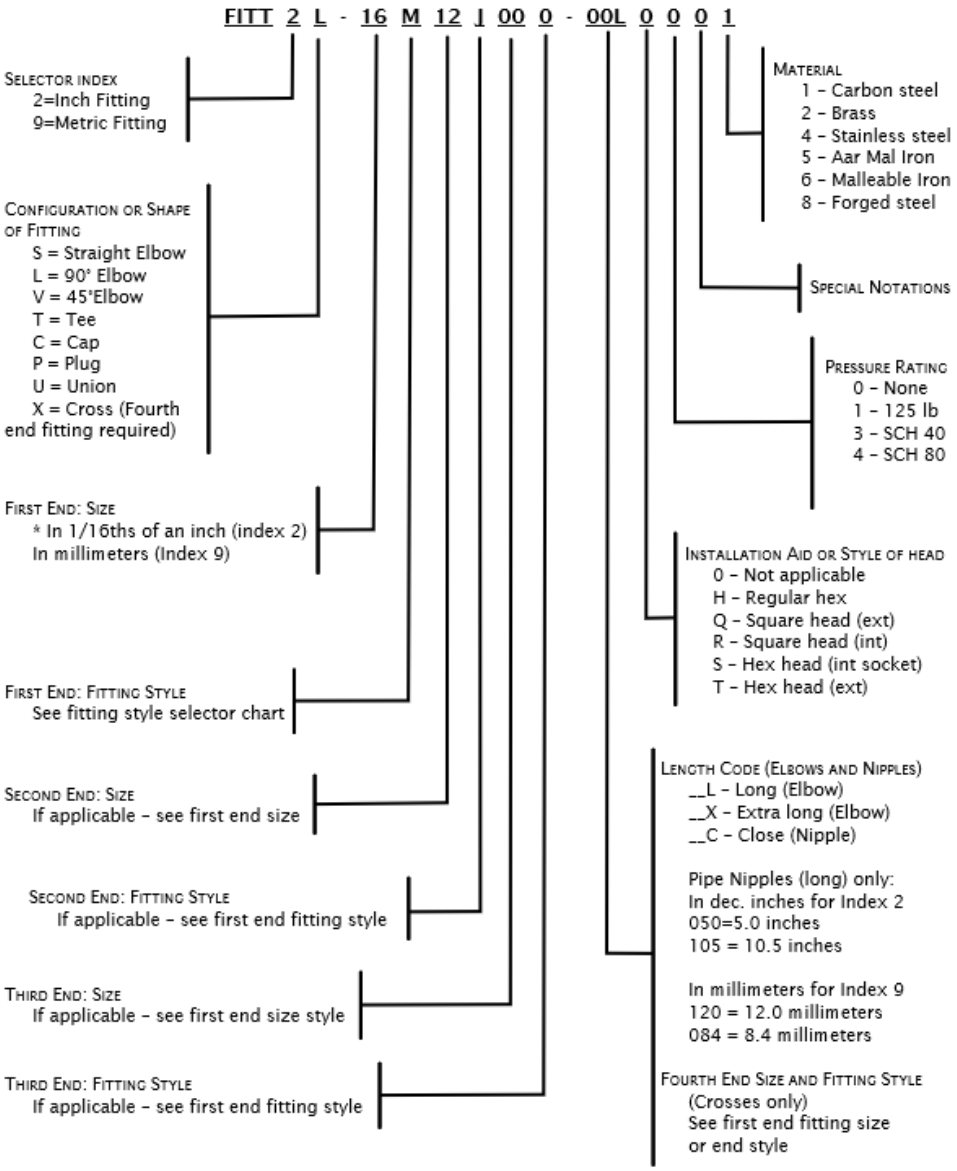
LENGTH CODE
(ELBOWS & NIPPLES)
__L - LONG (ELBOW)
__X - EXTRA LONG (ELBOW)
__C - CLOSE (NIPPLE)

PIPE NIPPLES (LONG) ONLY
IN DEC. INCHES FOR INDEX 2
050 = 5.0 INCHES
105 = 10.5 INCHES

IN MILLIMETERS FOR INDEX 9
120 = 12.0 MILLIMETERS
084 = 8.4 MILLIMETERS

FOURTH END SIZE & FITTING STYLE
(CROSSES ONLY)
SEE FIRST END FITTING SIZE OR END STYLE

Like the Hose Description Code, the Fitting Key described below will aid in the identification and ordering of fittings.

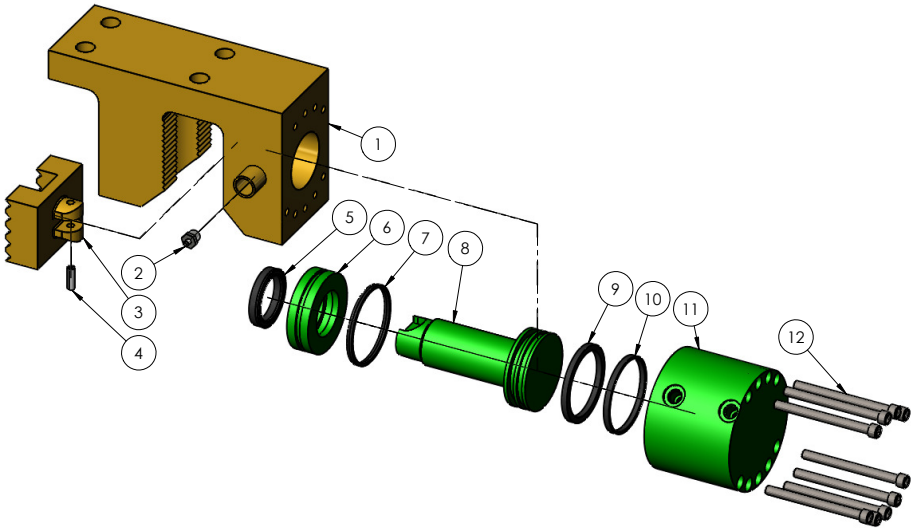


Fitting Style Selector Chart for End Fitting

M		JIC MALE 37 Deg. FLARE	J		JIC FEMALE 37 Deg. FLARE (& SWIVEL)
P		MALE PIPE NPT	Q		FEMALE PIPE NPTF
R		S.A.E. MALE O-RING (& ADJUSTABLE)	K		S.A.E. FEMALE O-RING
B		JIC MALE 37 Deg. FLARE BULKHEAD	N		FEMALE PIPE NPSM-SWIVEL
D		MALE PIPE NPT SWIVEL	F		SPLIT FLANGE 3000 PSI. CODE 61
S		B.S.P. MALE PIPE	H		SPLIT FLANGE 6000 PSI. CODE 62

Replacement Parts

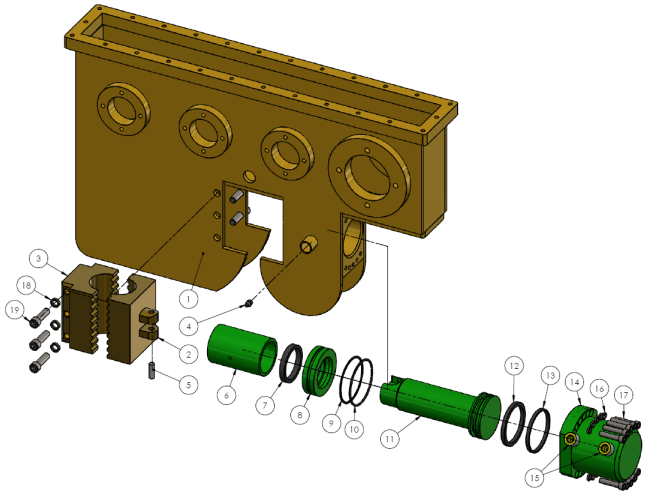
Model 6
Removeable Clamp



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1007061	Clamp Body	
2	1	221001	Grease Zerk	Straight 1/8" NPT
3	1	1006936	Jaw, Model 3/6/9	
4	1		Rod Pin	
	1	1006938	Cylinder Assembly	
5	1		*Rod Seal	2500-2000-375B
6	1	1006934	Hydraulic Gland	
7	1		*Gland Seal	Parker 2-236 O-Ring and 8-236 Backup
8	1	1006935	Cylinder Rod	
9	1		*Piston Seal	Custom Bronze Filled Ring with PTFE
10	1		*Piston Wear Band	W125-03375-0250
11	1	1006933	Cylinder Housing	
12	9	130131	Bolts, Cylinder Mounting	SHCS 3/8-16x4.5x1.5

**Included in Seal or Bolt kit.*

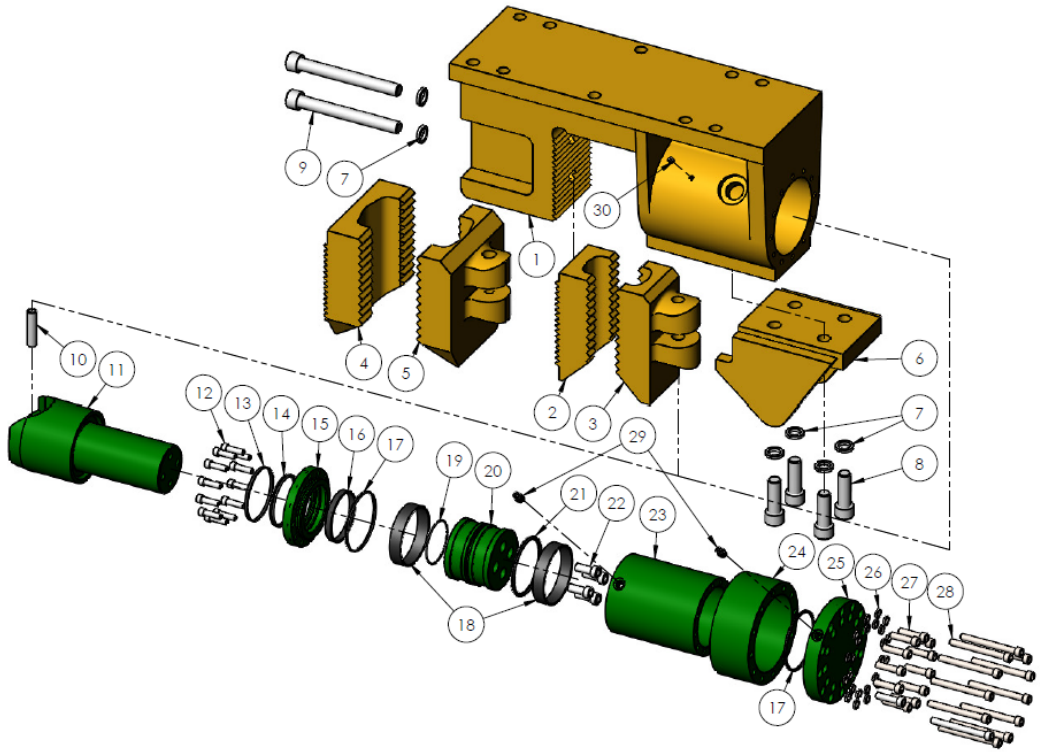
Model 6 and 9 Combined Gearbox and Clamp



Item	Quantity	APE Number	Description	Manufacturer Information
1	1		***Vibro Gearbox Type***	
		1006659	Gearbox, Model 6	
		1001624	Gearbox, Model 9	
2	1	205005	Moveable Jaw, Model 3/6	
3	1	205006	Fixed Jaw, Model 3/6	
4	1	221001	Grease Zerk	Straight 1/8" NPT
5	1	205102	Jaw Pin	
		1006668	***Cylinder Assembly***	
6	1	1001643	Cylinder Sleeve Insert, Model 6	
7	1		Rod Seal	250-02.500-375B Polyseal
8	1	1001645	Hydraulic Cylinder Gland, Model 6	
9	1		Gland Seal Backup	8-238 Backup 90 Duro Nitrile
10	1	1002151	Gland Seal	2-238 O-Ring 90 Duro Nitrile
11	1	1001642	Cylinder ROd, Model 6	
12	1		Piston Seal	PS1850-56
13	1		Rod Wear Ring 3-1/2" OD	612-350-025
14	1	1001644	Cylinder Bucket, Model 6	
15	2		SAE Boss 3/8"	
16	10	1003050	Washers, Cylinder Bucket	HCLW 3/8"
17	10	160333	Bolts, Cylinder Bucket	SHCS 3/8-16x1.75
18	6	100027	Washers, Fixed Jaw	HCLW 1/2"
19	6	100163	Bolts, Fixed Jaw	SHCS 1/2-13x1.75

Replacement Parts

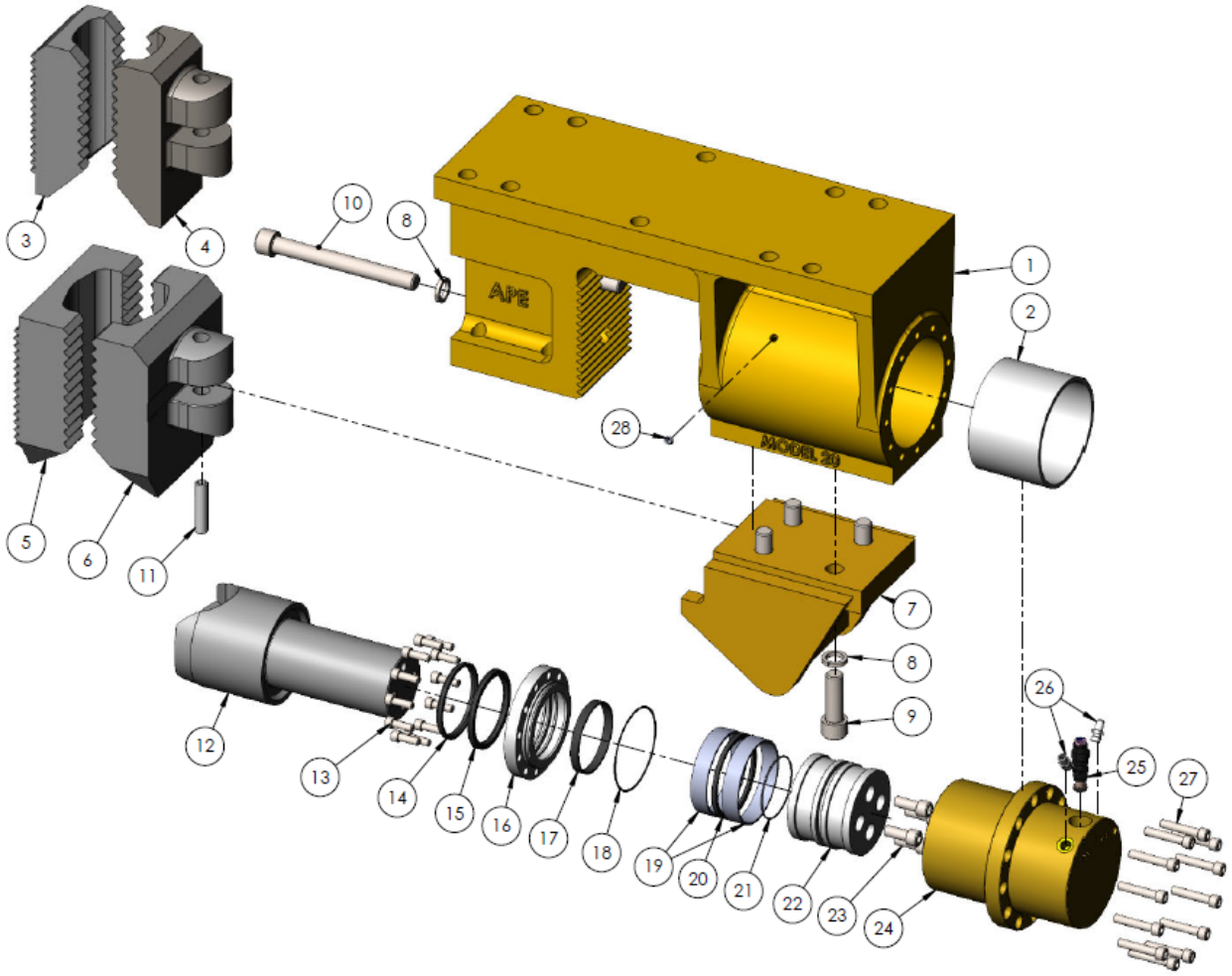
Model 20 Sheet Clamp, Old Style



Item	Quantity	APE Number	Description	Manufacturer Information
1	1		Model 20 Sheet Clamp Body w/ Nylon Sleeve	
2	1	221014	Fixed Jaw, Single Sheet	
3	1	221008	Moveable Jaw, Single Sheet	
			Double Sheet Jaws	
4	1	221011	Fixed Jaw, Double Sheet	
5	1	221005	Moveable Jaw, Double Sheet	
6	1	221017	Sheet Pile Guide	
7	6	1003063	*Washers, General	HCLW 1.0”
8	4	1003018	*Bolts, Pile Guide	SHCS 1.0-8x3.0”
9	2	124206	*Bolts, Fixed Jaw	SHCS 1.0-8x9.0”
10	1	221002	Jaw Pin	Spiral Pin 0.75” dia x 3.25”
	1	208001	***Model 20 Clamp Cylinder Assembly***	
11	1	208015	Model 20 Piston Rod	
12	12	100851	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.44-14x1.5”
13	1		*Rod Wiper	DT-4000 Wiper U-1003
14	1		*Rod Seal and Backup	568-345 N-7002 and 80-345 Contoured Backup
15	1	208019	Rod End Cap, Cylinder Gland	
16	1		*Rod Wear Ring	Wear Ring 8000-68B
17	2		*Mounting Flange and End Cap Seal O-Ring and Backup	568-248 N-7002 and 80-248 Contoured Backup
18	2		*Piston Wear Ring	Wear Ring 612-500-100
19	1		*Rod and Cap Seal O-Ring	568-238 CMPD N-7002
20	1	208006	Piston Vibro Model 20	
21	1		*Piston Seal	PS1850-80 Bronze PTFE w/ Energizer
22	4	110411	Bolts, Piston Cap	SHCS 0.63-18x1.5”
23	1	208017	Cylinder Shell - Model 20	
24	1	208013	Spacer (20 Clamp Cylinder)	
25	1	208021	Cylinder MOunting Flange	
26	12	40043	Bolts, Flange	SHCS 0.5-13x1.5”
27	12	160337	*Bolts, Cylinder Mounting	SHCS 0.5-13x5.5”
28	2	100053	Straight Fitting, #6 JIC to #6 ORB	FITT2S-06M06R
29	1	221001	Grease Zerk	Straight 1/8” NPT

Replacement Parts

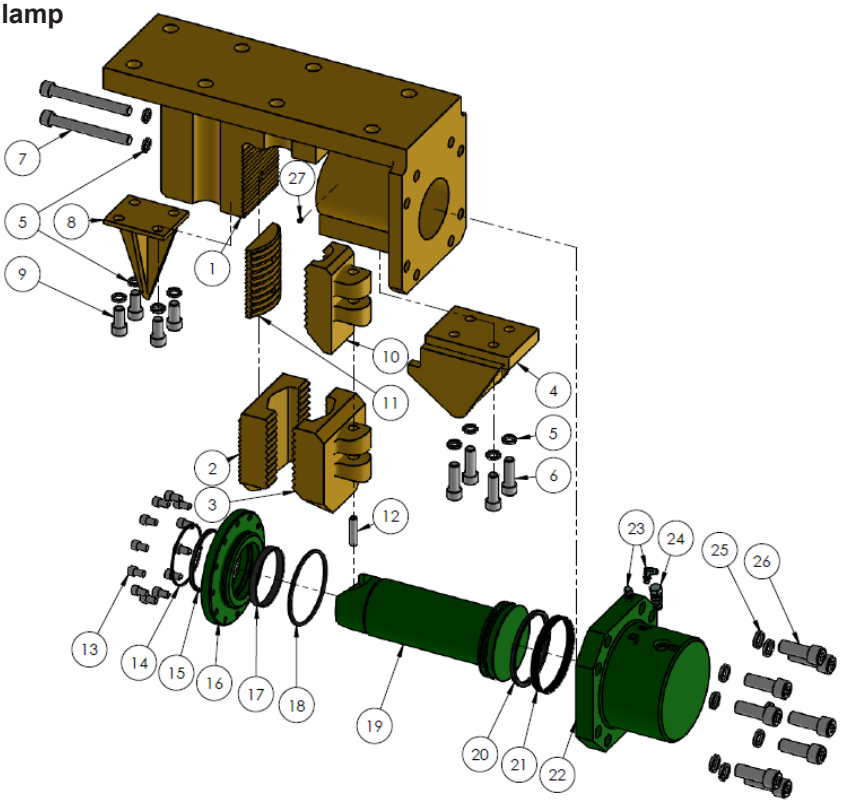
Model 20 Sheet Clamp, New Style



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1006029	Model 20 Sheet Clamp Body	Revision B
2	1	1006029*	20 Sheet Clamp Bushing	*Included with Sheet Clamp Body machining drawing
3	1	221014	Fixed Jaw, Single Sheet	
4	1	221008	Moveable Jaw, Single Sheet	
			Double Sheet Jaws	
5	1	221011	Fixed Jaw, Double Sheet	
6	1	221005	Moveable Jaw, Double Sheet	
7	1	221017	Sheet Pile Guide	
8	6	1003063	*Washers, General	HCLW 1.0”
9	4	1003018	*Bolts, Pile Guide	SHCS 1.0-8x3.0”
10	2	124206	*Bolts, Fixed Jaw	SHCS 1.0-8x9.0”
11	1	221002	Jaw Pin	Spiral Pin 0.75” dia x 3.25”
	1	208001	***New Style Model 20 Clamp Cylinder Assembly***	
12	1	208015	Model 20 Piston Rod	
13	12	100851	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.44-14x1.5”
14	1		*Rod Wiper	DT-4000 Wiper U-1003
15			Rod Inner Seal	Polypak 31204000-4615
16	1	208019	Rod End Cap, Cylinder Gland	
17	1		*Rod Wear Ring	Wear Ring 8000-68B
18	1		*Rod Seal and Backup	568-248 N-7002 and 80-248 Contoured Backup
19	2		*Piston Wear Ring	Wear Ring 612-500-100
20	1		*Piston Seal	PS1850-80 Bronze PTFE w/ Energizer
21	1		*Rod and Cap Seal O-Ring	568-238 CMPD N-7002
22	1	208006	Piston Vibro Model 20	
23	4	110411	Bolts, Piston Cap	SHCS 0.63-18x1.5”
24	1	2000510	20 Clamp Bucket with Check	
25	1		Counterbalance Valve	Sun CBCH-LJN
26	2	100053	Straight Fitting, #6 JIC to #6 ORB	FITT2S-06M06R
27	12	400043	Bolts, Flange	SHCS 0.5-13 X 1.5”
28	1	221001	Grease Zerk	Straight 1/8” NPT

Replacement Parts

Model 50 Sheet Clamp

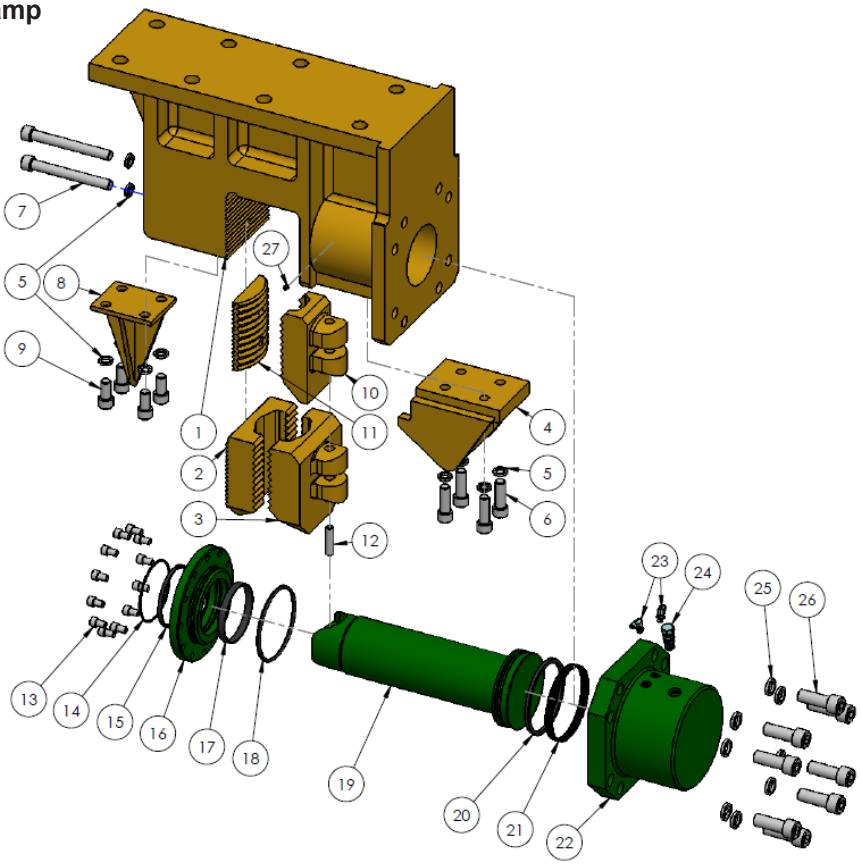


Item	Quantity	APE Number	Description	Manufacturer Information
1	1		Model 50 Sheet Clamp Body w/ Rod Bushing	
2	1	221011	Fixed Jaw, Double Sheet	
3	1	221005	Moveable Jaw, Double Sheet	
4	1	221017	Sheet Pile Guide	
5	10	1003063	*Washers, Common	HCLW 1.0”
6	4	1003018	*Bolts, Sheet Pile Guide	SHCS 1.0-8x3.0”
7	2	124206	*Bolts, Fixed Jaw	SHCS 1.0-8x9.0”
			Dunce Clamp Configuration	
8	1	221017	Dunce Pile Guide	
9	4	1003015	Bolt, Dunce Pile Guide	SHCS 1.0-8x2.0”
10	1	221016	Moveable Jaw, Single Pipe	
11	1	221015	Dunce Fixed Jaw	
12	1	221002	Jaw Pin	Spiral Pin 0.75” dia x 3.25”
	1	222000	***Sheet Clamp Cylinder 8” Assembly***	
13	12	1003804	*Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-18x1.0”
14	1	1004852	*Rod Wiper	AN Wiper SH959-53
15	1	1004542	*Rod Seal	250-06.000-375B Lubrithane Polyseal
16	1	222004	Front Seal Plate, Cylinder Gland	
17	1	222014	*Rod Wear Band	Wear Guide 06250-0750-125
18	1		*Head Seal O-Ring and Backup	568-367 O-Ring CMPD F-7001 and 80-367 Contoured Backup
19	1	222007	8” Sheet Cylinder Rod	
20	1	1006105	*Piston Seal	PS1850-128 Bronze PTFE w/ Energizer
21	1		*Piston Wear Band	Wear Guide 08000-0750-125
22	1	1001409	8” Hydraulic Cylinder Barrel	
23	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
24	1	222016	P.O. Check Valve	CKEB-XCN
25	8	1000848	*Washers, Cylinder Mounting	HCLW 1.25”
26	8	124204	*Bolt, Cylinder Mounting	SHCS 1.25-12x4.0”
27	1	221001	*Grease Zerk	Straight 1/8” NPT

**Included in Seal or Bolt kit.*

Replacement Parts

Model 150 Sheet Clamp

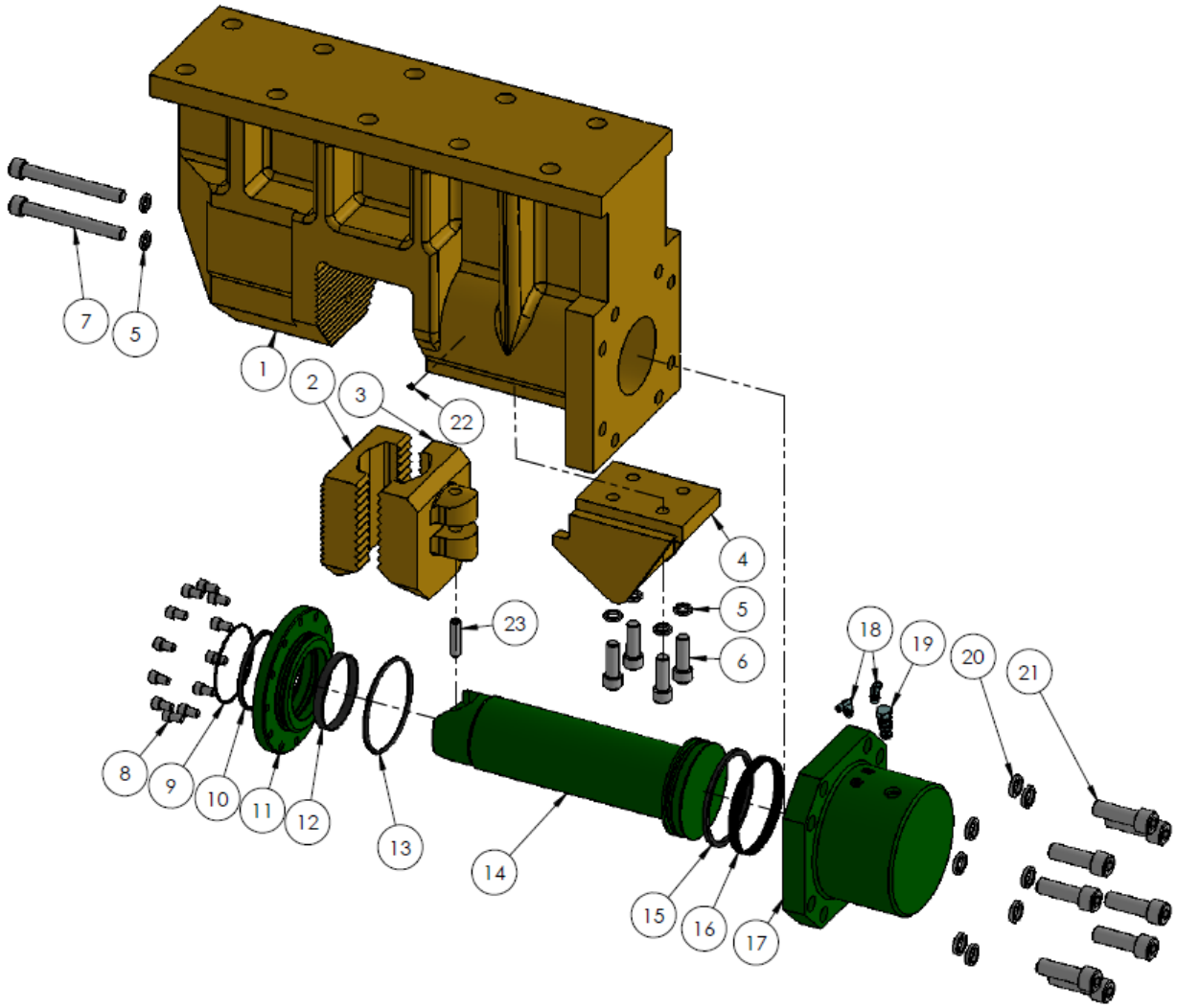


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	221019	Model 150 Sheet Clamp Body w/ Rod Bushing	
2	1	221011	Fixed Jaw, Double Sheet	
3	1	221005	Moveable Jaw, Double Sheet	
4	1	221017	Sheet Pile Guide	
5	10	124207	*Washers, Common	HCLW 1.0”
6	4	1003018	*Bolts, Pile Guide	SHCS 1.0-8 x 3.0”
7	2	124206	*Bolts, Fixed Jaw	SHCS 1.0-8 x 9.0”
			Dunce Clamp Configuration	
8	1	221017	Dunce Pile Guide	
9	4	1003015	Bolts, Dunce Pile Guide	SHCS 1.0-8 x 2.0”
10	1	221016	Moveable Jaw, Single Pipe	
11	1	221015	Dunce Fixed Jaw	
12	1	221002	Jaw Pin	Spiral Pin 0.75” dia x 3.25”
	1	222000	***Sheet Clamp Cylinder 8” Assembly***	
13	12	1003804	*Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-18 x 1.0”
14	1	1004852	*Rod Wiper	AN Wiper SH959-53
15	1	1004542	*Rod Seal	250-06.00-375B Lubrithane Poiyseal
16	1	222004	Front Plate Seal, Cylinder Gland	
17	1	222014	*Rod Wear Band	Wear Guide 06250-0750-125
18	1		*Head Seal O-Ring and Backup	568-367 CMPD F-7001 and 80-367 Contoured Backup
19	1	222007	8” Sheet Cylinder Rod	
20	1	1006105	*Piston Seal	PS1850-128 Bronze PTFE w/ Energizer
21	1		*Piston Wear Band	Wear Guide 08000-0750-125
22	1	1001409	8” Hydraulic Cylinder Barrel	
23	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
24	1	222016	P.O. Check Valve	CKEB-XCN
25	8	124205	*Washers, Cylinder MOunting	HCLW 1.25”
26	8	124204	*Bolts, Cylinder Mounting	SHCS 1.25-12 x 4.0”
27	1	221001	*Grease Zerk	Straight 1/8” NPT

*Included in Seal or Bolt kit.

Replacement Parts

Model 200 Sheet Clamp

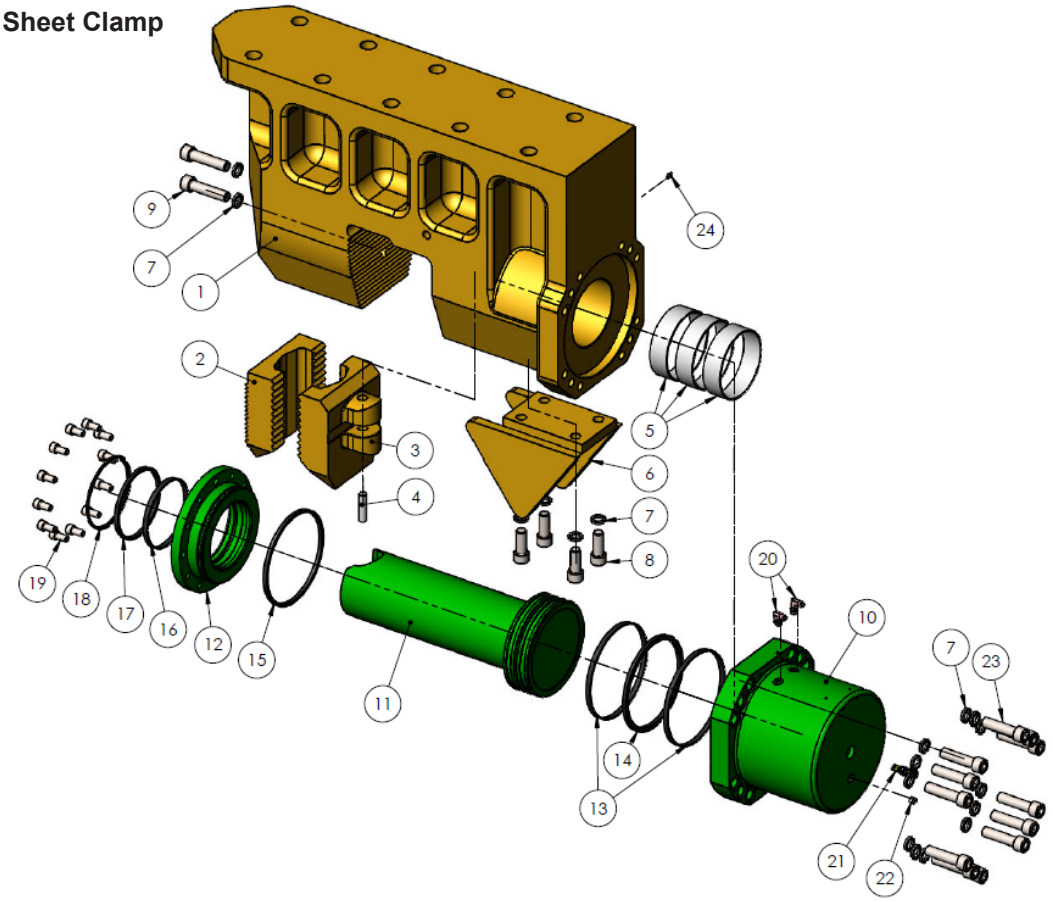


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	232001	Model 200 Sheet Clamp Body w/ Rod Bushing	
2	1	221011	Fixed Jaw, Double Sheet	
3	1	221005	Moveable Jaw, Double Sheet	
4	1	221017	Sheet Pile Guide	
5	6	124207	*Washers, General	HCLW 1.0”
6	4	1003018	*Bolts, Pile Guide	SHCS 1.0-8 x 3.0”
7	2	120206	*Bolts, Fixed Jaw	SHCS 1.0-8 x 9.0”
	1	222000	***Sheet Clamp Cylinder 8” Assembly***	
8	12	1003804	*Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-18 x 1.0”
9	1	1004852	*Rod Wiper	AN Wiper SH959-53
10	1	1004542	*Rod Seal	250-06.00-375B Lubrithane Polyseal
11	1	222004	Front Plate Seal, Cylinder Gland	
12	1	222014	*Rod Wear Band	Wear Guide 06250-0750-125
13	1		*Head Seal O-Ring and Backup	568-367 O-Ring CMPD F-7001 and 80-367 Contoured Backup
14	1	232007	8” Sheet Cylinder Rod 200	
15	1		*Piston Seal	PS1850-128 Bronze PTFE w/ Energizer
16	1		*Piston Wear Band	Wear Guide 08000-0750-125
17	1	1001409	8” Hydraulic Cylinder Barrel	
18	0	130057	90 Elbow FItting, #6 JIC to #6 ORB	FITT2L-06M06R
19	1	222016	P.O. Check Valve	CKEB-XCN
20	8	120205	*Washers, Cylinder Mounting	HCLW 1.25”
21	8	124204	*Bolts, Cylinder Mounting	SHCS 1.25-12 x 4.0”
22	1	221001	*Grease Zerk	Straight 1/8 NPT
23	1	221002	Jaw Pin	Spiral Pin 0.75” dia x 3.25”

**Included in Seal or Bolt kit.*

Replacement Parts

Model 300 Sheet Clamp

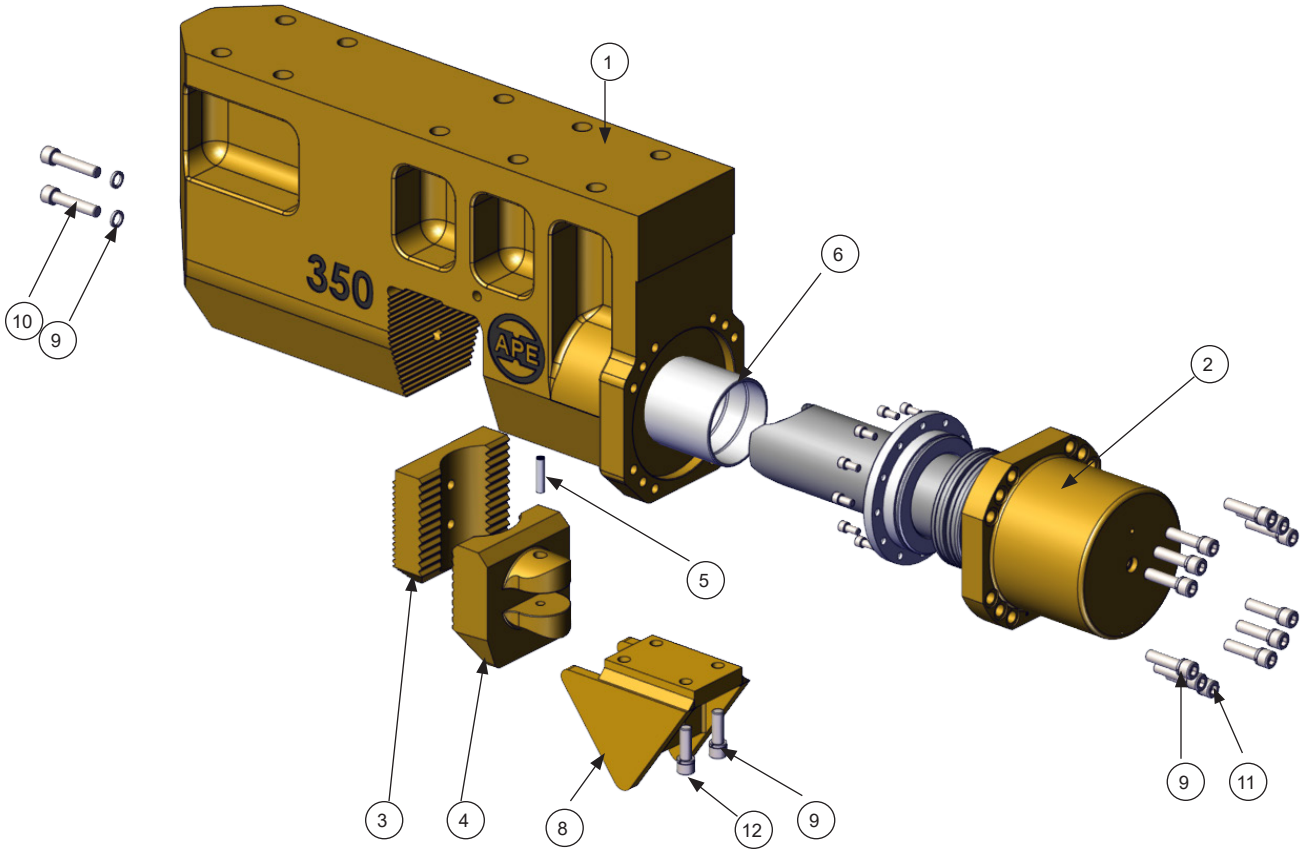


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1009879	APE 300 Clamp Body Mach	
2	1	221011	Fixed Jaw, Double Sheet	
3	1	221005	Moveable Jaw, Double Sheet	
4	1	221002	Jaw Pin	Spiral Pin 0.75 x 3.0”
5	3	120929	Rod Wear Ring	7.0 ID x 7.25 OD x 2.0” Verco Cool Blue ultra precision wear ring
6	1	100983	Pile Guide	
7	18	100209	Washers, Common	HCLW 1.0”
8	4	100213	*Bolts, Pile Guide*	SHCS 1.0-8 x 2.5”
9	2	1003081	Bolts, Fixed Jaw	SHCS 1.0-8 x 4.25”
	1	1009877	***300 Cylinder Assembly***	
10	1	120917	196 Cylinder Bucket	
11	1	1009878	SC 300 Piston Rod	
12	1	120919	Rod End Cap - 196	
13	2	120551	*Piston Bearing	612-1000-050
14	1	120915	*Piston Seal and Expander	PR-10000-60B w/ 447 Expander
15	1	120549	*Gland Seal	448 GT Ring
16	1	120555	*Rod Bearing	0.5 x 7.00 x 0.12
17	1	120553	*Rod Seal	TR-056
18	1	120921	*Rod Wiper	SH959-57
19	12	100575	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-11 x 1.25”
20	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
21	1	120629	Check Valve	Sun CKCD-XEN
22	1	122014	#6 MORB Plug	6408-H06-O
	1	1003082	**Soc Set Cone PT	1/2-13x1.0”
23	12	100212	Bolts, Cylinder Mounting	SHCS 1.0-8 x 4.0”
24	1	221001	Grease Zerk	Straight 1/8” NPT

**Included in Seal or Bolt kit.*

Replacement Parts

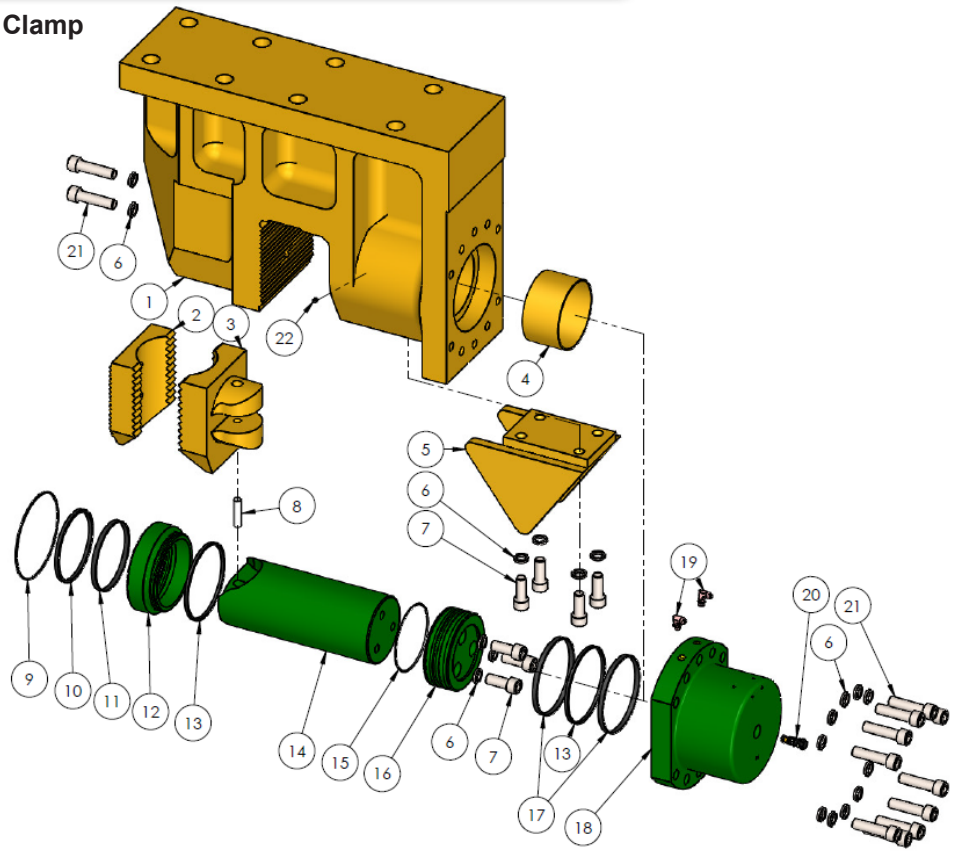
Model 350 Sheet Clamp



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	2008981	350 Sheet Clamp Machined	
2	1	2010134	350/196 Sheet Clamp Cylinder Assembly	
3	1	810463	Jaw -Fixed - Finished-196	
4	1	810461	Jaw - Moveable - Finished-196	
5	1	2006434	Spiral Jaw Pin	10282-00223, 11606450
6	1	120929B	Seal Ring Wear Rod Verco Blue	7idx7.25odx2.10x2 VercoBlue
7	1	221001	Grease Zerk Fitting 1/8”	60102 Zerk 1/8” Pipe Straight
8	1	100983P	Sheet Pile Guide Plate - 125/126/196	
9	18	1003063	Bolts, Cylinder, Fixed Jaw, Pile Guide Mounting	Hi-Alloy helical Spring LW 1
10	2	1003081	Bolts, Fixed Jaw Mounting	HX-SHCS 1-8x4.25
11	12	100212	Bolts, Cylinder Mounting	HX-SHCS 1-8x4
12	4	100213	Bolts, Pile Guide Mounting	HX-SHCS 1-8x2.5

Replacement Parts

Model 126 Sheet Clamp

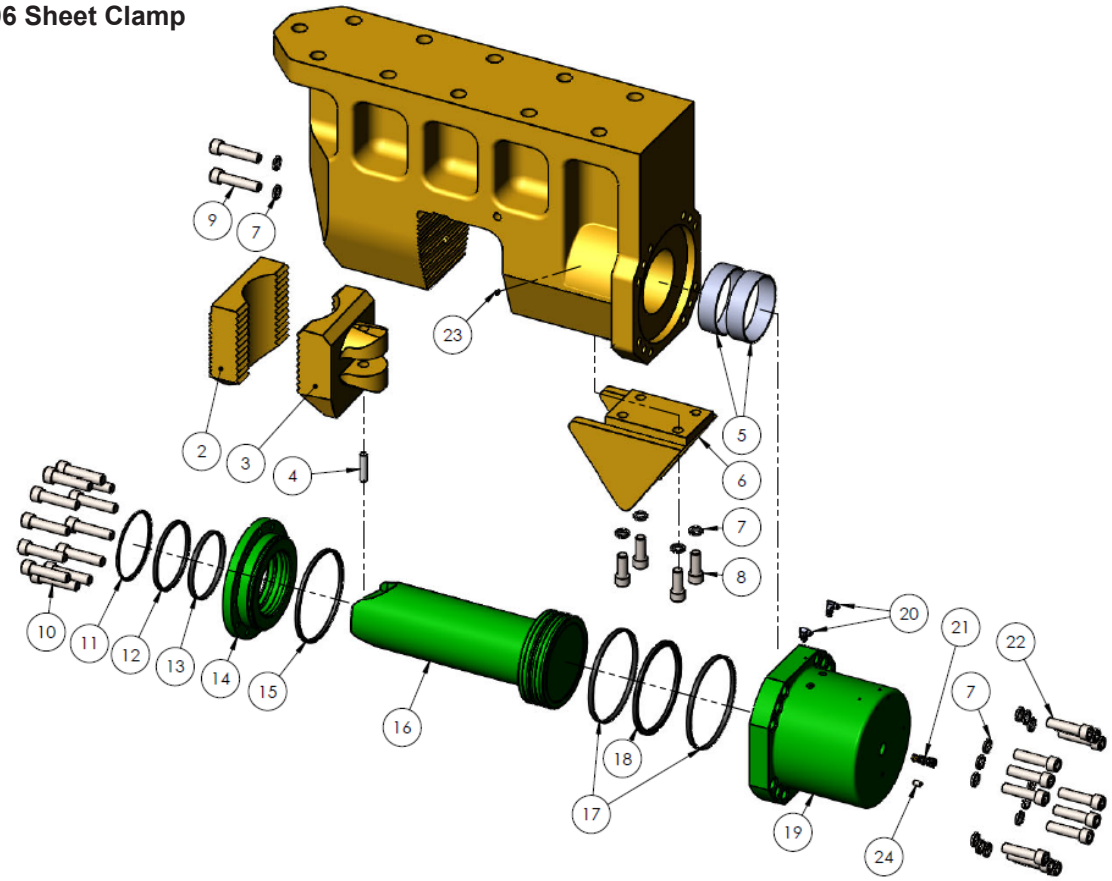


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	810493	126 Clamp Body	
2	1	110419	Fixed Jaw, DS	
	1	110515	*(or) Fixed Jaw, Universal*	
	1	110541	*(or) Fixed Jaw, H-Beam*	
3	1	810499	Moveable Jaw, DS	
	1	810495	*(or) Moveable Jaw, 126b Universal*	
	1	810497	*(or) Moveable Jaw, 126b H-Beam*	
4	1	120929	Wear Ring	7 ID x 7.25 OD x 4.010 Verco Cool Blue Ultra Precision Wear Ring
5	1	100983	Pile Guide	
6	16	100209	Washers, Common	HCLW 1.0”
7	4	100213	Bolts, Pile Guide and Cylinder/Piston	SHCS 1.0-8 x 2.5”
8	1	130449	Jaw Pin	Spiral Pin 0.75” x 3.0”
	1		***126 Cylinder Assembly***	
9	1	120401	*Gland Seal	2-269 O-Ring 90 Durometer
10	1	120553	*Rod Seal	TR-056 Rod T-Seal Buna-N
11	1	120555	*Rod Bearing	0.5W x 7.00ID x 0.12
12	1	120567	126B Rod End Cap	
13	2	120283	120283	TP-064 Piston T-Seal Buna-N
14	1	120931	126B 1pc Piston & Rod	
	1	120575	126 Cylinder Rod **	
	1	120849	Piston & Cylinder Rod Seal **	2-261 O-Ring 90 Durometer
	1	120569	126 Piston **	
	3	100213	Bolts, Cylinder/Piston	SHCS 1.0-8 x 2.5”
15	2	120285	* Piston Bearing	912-8000-500
16	1	810491	126 Clamp Bucket	
17	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
18	1	120629	P.O. Check Valve	Sun CKCD-XEN
19	12	100212	Bolts, Cylinder Mounting and Fixed Jaw	SHCS 1.0-8 x 4.0”
20	1	221001	Grease Zerk	Straight 1/8” NPT
21	1	1003082	Soc Set Cone PT	0.5-13 x 1.0”

**Included in Seal or Bolt kit.*

Replacement Parts

Model 196 Sheet Clamp

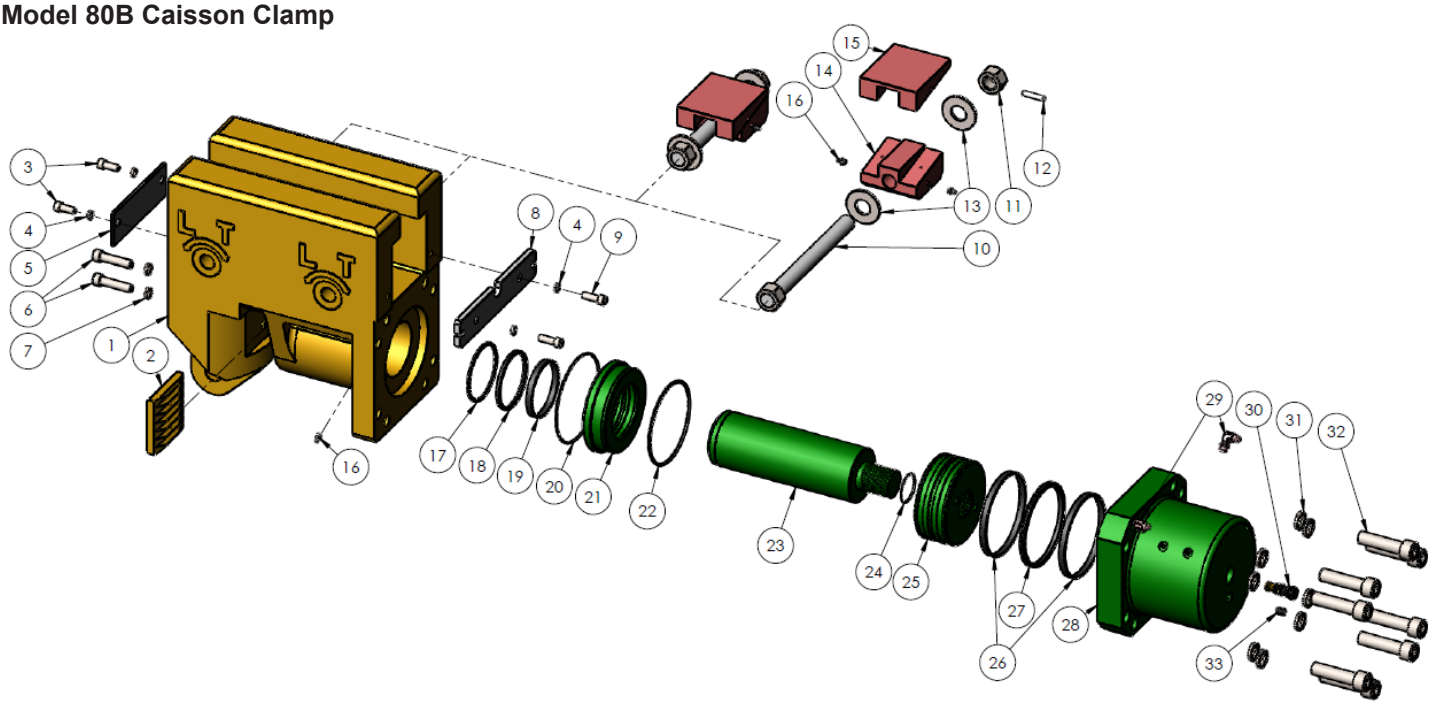


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	810947	196 Clamp Casting Assembly	
2	1	810463	Fixed Jaw, 196 Clamp	
3	1	810461	Moveable Jaw, 196 Clamp	
4	1	130449	Jaw Pin	Spiral Pin 0.75" x 3.0"
5	2	120929	Rod Wear Ring	7.0 ID x 7.25 OD x 2.0" Verco Cool blue ultra precision wear ring
6	1	100983	Pile Guide	
7	18	100209	Washers, Common	HCLW 1.0"
8	4	100213	Bolts, Pile Guide	SHCS 1.0-8 x 2.5"
9	2	1003021	Bolts, Fixed Jaw	SHCS 1.0-8 x 4.5"
	1		***196 Cylinder Assembly***	
10	12	100575	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-11 x 1.25"
11	1	120921	Rod Wiper	SH959-57
12	1	120553	*Rod Seal	TR-056 Rod T-Seal Buna-N
13	1	120555	*Rod Bearing	612-0725-050
14	1	120919	Rod End Cap - 196	
15	2	120915	Head Seal	TP-069 T-Seal Buna-N
16	1	120913	196 1pc Piston & Rod	
	1	120535	196 Cylinder Rod **	
	1	120347	* Piston/Cylinder Rod Seal**	2-261 O-Ring 90 Duro
	1	120537	196 Piston **	
	3	1001628	Bolts, Piston/Cylinder Rod**	SHCS 1.5-6 x 3.0"
17	2	120551	*Piston Bearing	612-1000-050
18	1		*Piston Seal	PS1850-160 Bronze PT
19	1	120917	196 Cylinder Bucket	
20	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
21	1	120629	Check Valve	Sun CKCD-XEN
22	12	100212	Bolts, Cylinder Mounting	SHCS 1.0-8 x 4.0"
23	1	221001	Grease Zerk	Straight 1.8" NPT
24	1	1003082	Soc Set Cone PT	0.5-13 x 1.0"

**Included in Seal or Bolt kit.*

Replacement Parts

Model 80B Caisson Clamp

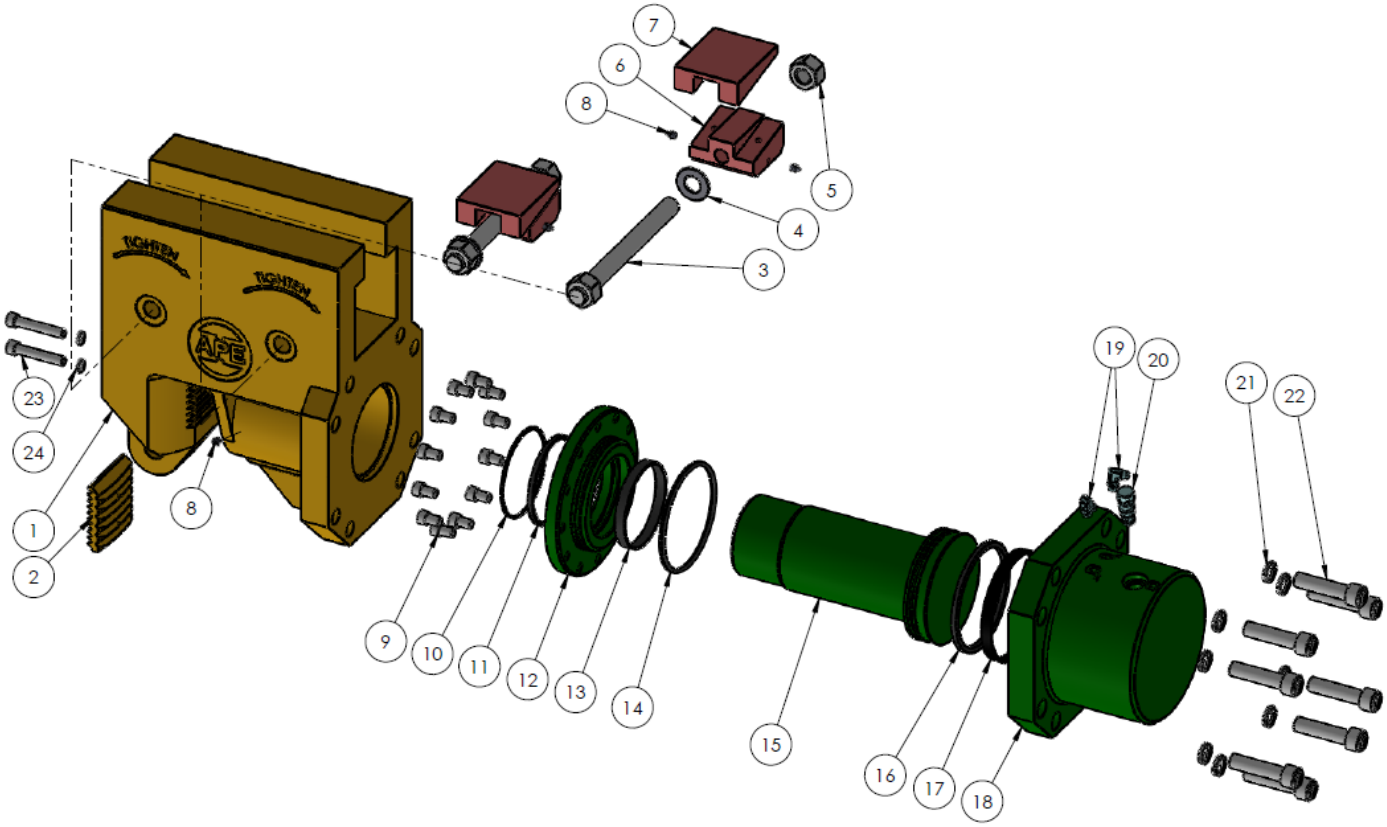


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	810061	80B Clamp Housing	
2	1	120107	Fixed Jaw, Caisson	
3	2	100119	*Bolts, Wedge Guard	SHCS 0.5-13 x 1.25”
4	4	100121	*Washers, Wedge Guard and Chain Anchor	HCLW 0.5”
5	1	120119	Wedge Guard	
6	2	400157	*Bolts, Fixed Jaw	SHCS 0.63-11 x 2.75”
7	2	124115	Washers, Fixed Jaw	HCLW 0.63”
8	1	120751	Chain Anchor	
9	2	100513	*Bolts, Chain Anchor	SHCS 0.5-13 x 1.5”
	2	810109	***80b Screw Assembly*** *(**Quantities below given per subassembly)*	
10	1**	120201	Threaded Rod	1.25 x 13.75” Long ACME
11	2**	120199	Wedge Nut	1.25-4 Hex Nut ACME
12	1**	120521	Spring Pin	.38 x 2.0”
13	4	120111	*Washers, Screw Assembly	1.25 H.S. Flat Washer
14	2	120101	Wedge, Male Half, Brass	
15	2	120103	Wedge, Female Half, Steel	
16	5	221001	*Grease Zerk	Straight 1.8” NPT
	1		***Model 80 Clamp Cylinder Assembly***	
17	1	120345	*Rod Wiper	AN Wiper SH959-41
18	1	120625	*Rod Seal	Parker BR 3120 4500
19	1	120627	Rod Bearing	W0-4750-500
20	1	120100	Plate Seal	Parker 2-263 90 Durometer
21	1	120623	Rod End Cap	
22	1	120347	*Gland Seal O-Ring and Backup	Parker 2-261 90 Durometer and 8-261 Backup
23	1	120631	Cylinder Rod	
24	1	120281	*Rod and Cap Seal O-Ring	Parker 2-140 90 Durometer
25	1	120313	Piston	
26	2	120355	*Piston Bearings	W2-7000-500
27	1	120357	*Piston Seal	TP-060 Piston T-Seal Buna-N
28	1	120621	80B Clamp Cylinder Bucket	
29	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
30	1	120629	P.O. Check Valve	Sun CKCD-XEN
31	8	100209	*Washers, Cylinder Mounting	HCLW 1.0”
32	8	100212	*Bolts, Clamp Mounting	SHCS 1.0-8 x 4.0”
33	1		*Set Screw	1/2-13 x 1.0” HSSS

*Included in Seal or Bolt kit.

Replacement Parts

Model 100 Caisson Clamp

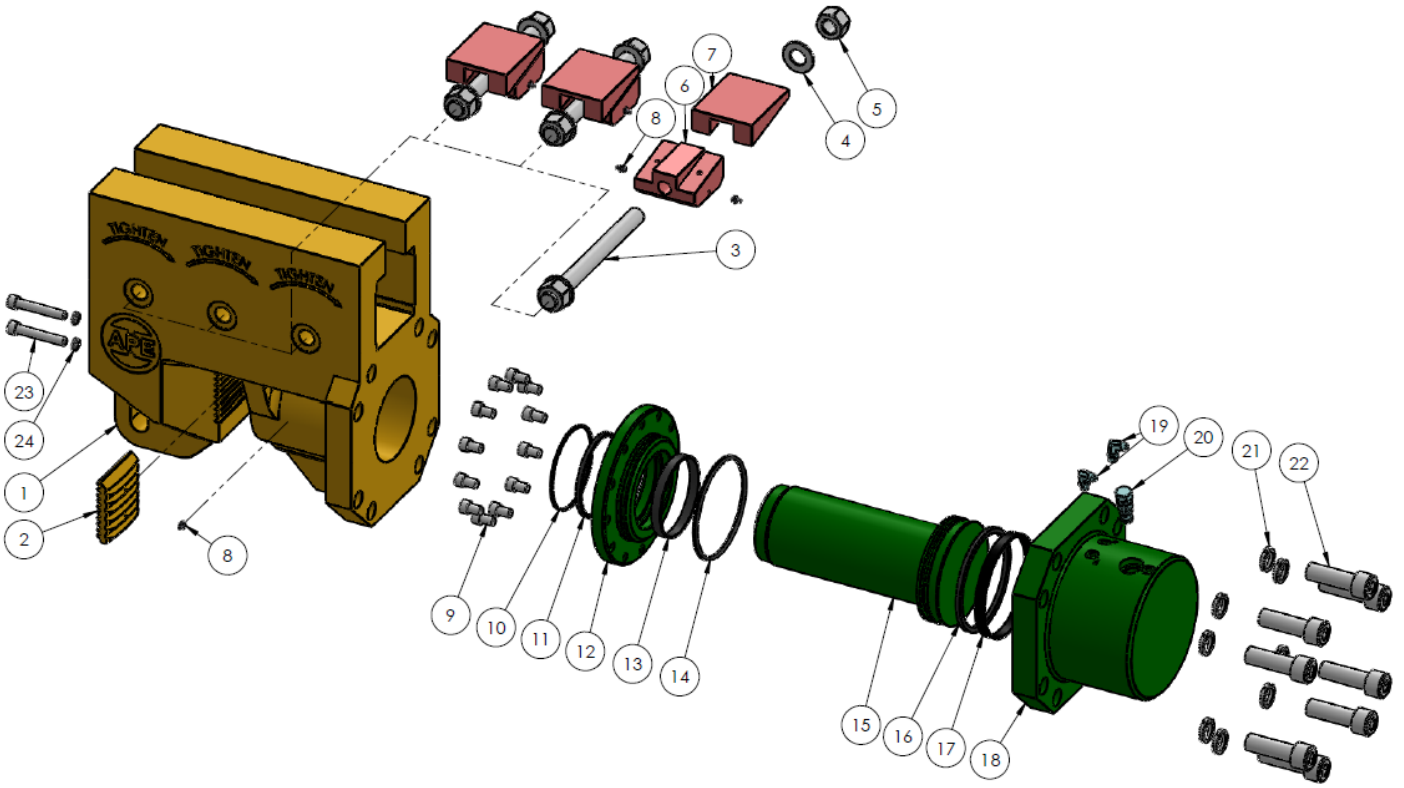


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	250101	Model 100 Caisson Clamp Body	
2	1	250202	Fixed Jaw, Caisson 1.25" Thick	
	1	250202N	*(or) Fixed Jaw, Caisson 0.75" Thick*	
	2	124211A	***APE Caisson Screw Assembly*** *(**Quantities below given per subassembly)*	
3	1**		Threaded Rod	1.25-5 x 14" Long ACME rod
4	2**	120111	1.25" H S Flat Washer	Fastenal 33124, 1/8" thick, plain F436
5	2**	124212	Wedge Nut	1.25-5 ACME Hex Nut
6	2	250102	Wedges, Male Half, Bronze	
7	2	250105	Wedges, Female Half, Steel	
8	5	221001	*Grease Zerk	Straight 1/8" NPT
	1	250001	***Caisson Clamp Cylinder Assembly***	
9	12	1003804	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-18 x 1.0"
10	1		*Rod Wiper	AN Wiper SH959-53
11	1		*Rod Seal	250-06.000-375B Lubrithane Polyseal
12	1	222004	Cylinder Gland	
13	1		*Rod Wear Band	Wear Guide 06250-0750-125
14	1		*Head Seal O-Ring and Backup	568-367 O-Ring CMPD F-7001 and 80-367 Contoured Backup
15	1	250003	8" Caisson Piston and Rod	
16	1		*Piston Seal	PS1850-128 Bronze PTFE w/ Energizer
17	1		*Piston Wear Band	Wear Guide 08000-0750-125
18	1	1001409	8" Hydraulic Cylinder Bucket	
19	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
20	1	222016	P.O. Check Valve	Sun CKEB-XCN
21	1	122014	#6 MORB Plug	6408-H06-O
22	8	124205	*Washers, Cylinder Mounting	HCLW 1.25"
23	8	124204	*Bolts, Cylinder Mounting	SHCS 1.25-12 x 4.0"
24	2	110308	*Bolts, Fixed Jaw	SHCS 0.63-11 x 4.0"
25	2	124115	*Washers, Fixed Jaw	HCLW 0.63"

**Included in Seal or Bolt kit.*

Replacement Parts

Model 200 Caisson Clamp

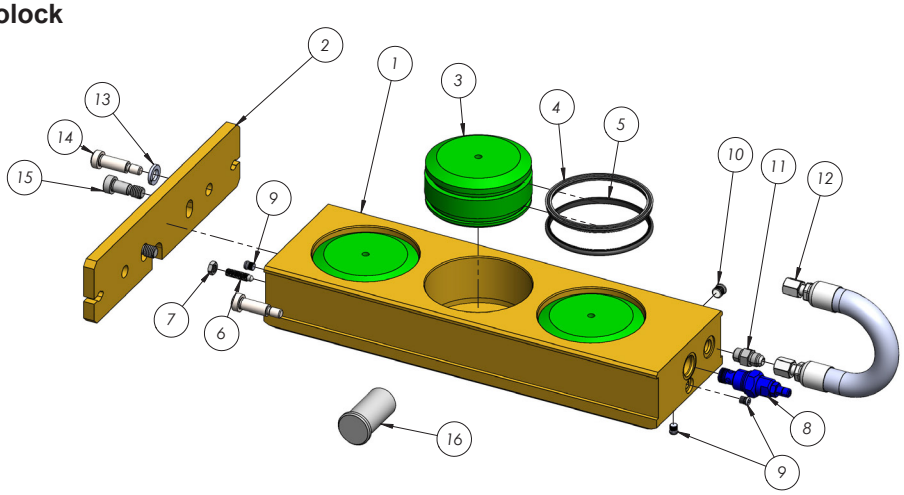


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	260101	Caisson Clamp 200 Body w/ Rod Bushing	
	1	2004061	**200B Caisson Clamp Body	
2	1	250202	Fixed Jaw, Caisson 1.25" Thick	
	1	250202N	(or) Fixed Jaw, Caisson 0.75" Thick	
	1	250202H	(or) Fixed Jaw, Caisson 1.5" Thick	
	1	2001736	** 200B Standard Jaw	
	1	2001737	** 200B Thin Jaw	
	3	124211A	***APE Caisson Screw Assembly*** *(**Quantities below given per subassembly)*	
3	1**		Threaded Rod	1.25-5 x 14" Long ACME rod
4	2**	120111	1.25" H S Flat Washer	Fastenal 33124 1/8" thick, plain F436
5	2**	124212	Wedge Nut	1.25-5 ACME Hex Nut
6	3	250102	Wedge, Male Half, Bronze	
7	3	250105	Wedge, Female Half, Steel	
8	7	221001	*Grease Zerk	Straight 1/8" NPT
	1	250001	***Caisson Clamp Cylinder Assembly***	
9	12	1003804	Bolts, Cylinder Gland (LOCTITED)	SHCS 0.63-18 x 1.0"
10	1		*Rod Wiper	AN Wiper SH959-53
11	1		*Rod Seal	250-06.000-375B Lubrithane Polyseal
12	1	222004	Cylinder Gland	
13	1		*Rod Wear Band	Wear Guide 06250-0750-125
14	1		*Head Seal O-Ring and Backup	568-367 O-Ring COMPD F-7001 and 80-367 Contoured Backup
15	1	250003	8" Caisson Piston and Rod	
16	1		*Piston Seal	PS1850-128 Bronze PTFE w/ Energizer
17	1		*Piston Wear Band	Wear Guide 08000-0750-125
18	1	1001409	8" Hydraulic Cylinder Bucket	
19	2	130057	90 Elbow FItting, #6 JIC to #6 ORB	FITT2L-06M06R
20	1	222016	P.O. Check Valve	Sun CKEB-XCN
21	1	122014	#6 MORB	6408-H06-O
22	8	124205	*Washers, Cylinder Mounting	HCLW 1.25"
23	8	124204	*Bolts, Cylinder Mounting	SHCS 1.25-12 x 4.0"
24	2	124214	*Bolts, Fixed Jaw	SHCS 0.63-11 x 4.25"
25	2	124115	*Washers, Fixed Jaw	HCLW 0.63"

**Included in Seal or Bolt kit.*

Replacement Parts

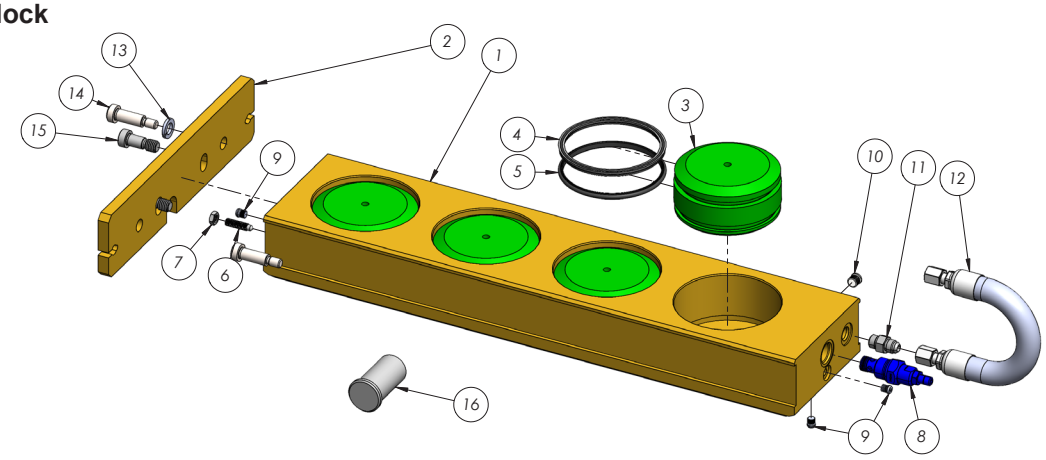
100CC Hydrolock



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	2010125	80 Hydrolock Lock Body	
2	1	2005886	L.B. Retainer Plate	
3	3	2006144	Piston	
4	3	120649	Piston Wiper 4.5” Poly O Seal	
5	3	120647	Piston T-Seal 4.5” OD	Parker TP-043 two backups
6	1	2006152	Modified Steel Cone Point Set Screw 5/16-24 X 1.25 Lg	
7	1		5/16”-24 Medium Strength Steel Thin Hex Nut	McMaster Carr 94846A510
8	1	120651	Throttle Check Valve	HYDAC SDR10A-01-C-N-15V
9	3	2006150	#2 SAE EPCO Plug	
10	1	2006151	#4 SAE EPCO Plug	
11	1	100053	3/8” MJIC X 3/8” MORB Straight Fitting	6400-06-06-O
12	1		3/8” FJIC to 3/8” FJIC Hose, 20” Long	HOSE038R02J006J006L0200C
13	2	100121	Regular 1/2” Lockwasher	
14	2	100119	1/2” X 1-1/4” Socket Head Shoulder Screw	
15	2	140143	1/2” X 3/4” Socket Head Shoulder Screw	
16	6	120643	*Hydrolock Button	

**Shipped Loose*

200CC Hydrolock

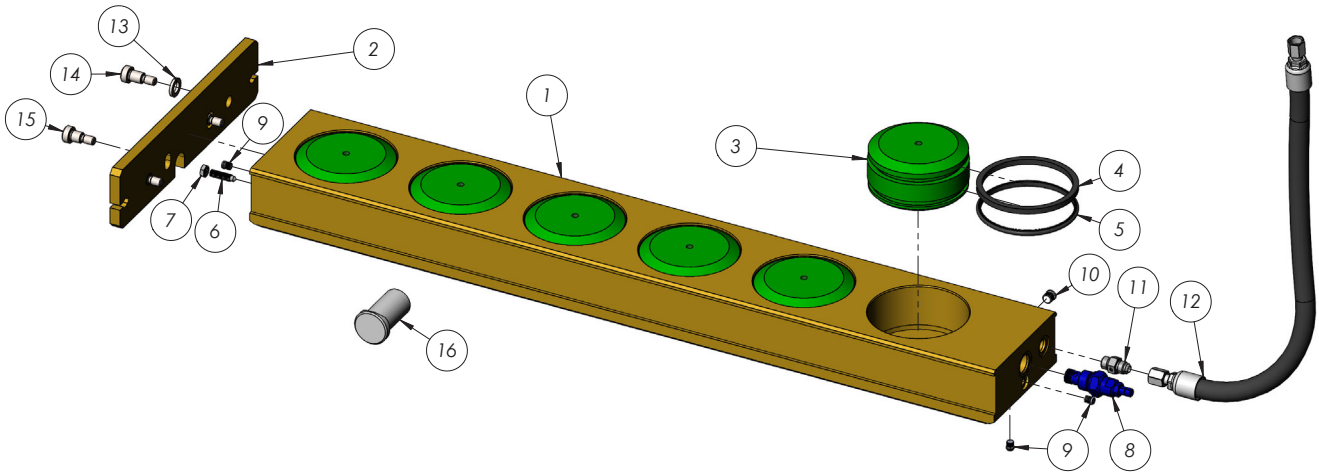


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	2006145	122 Hydrolock Lock Body	
2	1	2005886	L.B. Retainer Plate	
3	4	2006144	Piston	
4	4	120649	Piston Wiper 4.5” Poly O Seal	
5	4	120647	Piston T-Seal 4.5” OD	Parker TP-043 two backups
6	1	2006152	Modified Steel Cone Point Set Screw 5/16-24 X 1.25 Lg	
7	1		5/16”-24 Medium Strength Steel Thin Hex Nut	McMaster Carr 94846A510
8	1	120651	Throttle Check Valve	HYDAC SDR10A-01-C-N-15V
9	3	2006150	#2 SAE EPCO Plug	
10	1	2006151	#4 SAE EPCO Plug	
11	1	100053	3/8” MJIC X 3/8” MORB Straight Fitting	6400-06-06-O
12	1		3/8” FJIC to 3/8” FJIC Hose, 8” Long	HOSE038R02J906L00800
13	2	100121	Regular 1/2” Lockwasher	
14	2	100119	1/2” X 1-1/4” Socket Head Shoulder Screw	
15	2	140143	1/2” X 3/4” Socket Head Shoulder Screw	
16	6	120643	*Hydrolock Button	

**Shipped Loose*

Replacement Parts

Caisson Beamn Adapter Hydrolock Assembly

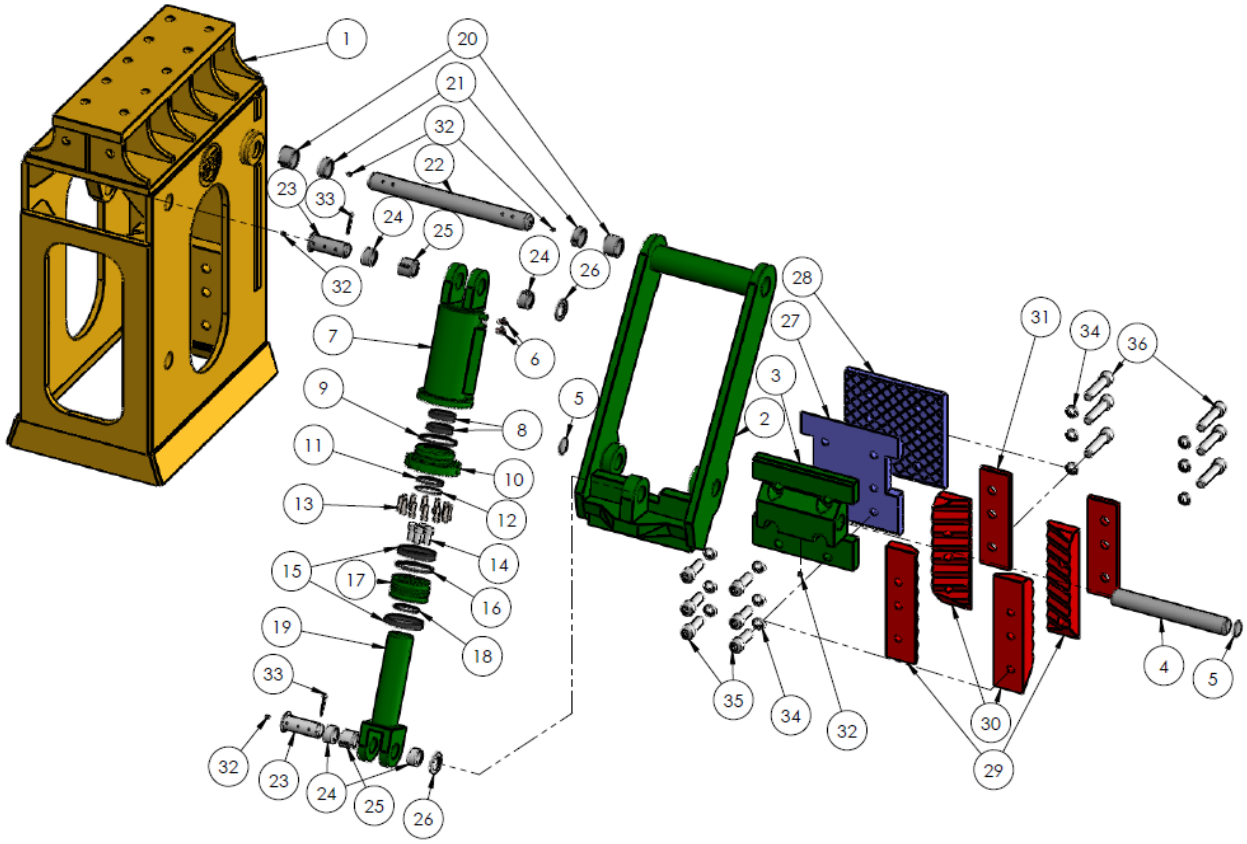


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	2010125	Caisson Beam Adapter Hydrolock Body	
2	1	2005886	L.B. Retainer Plate	
3	6	2006144	Piston	
4	6	120649	Piston Wiper 4.5” Poly O Seal	
5	6	120647	Piston T-Seal 4.5” OD	Parker TP-043 two backups
6	1	2006152	Modified Steel Cone Point Set Screw 5/16-24 X 1.25 Lg	
7	1		5/16”-24 Medium Strength Steel Thin Hex Nut	McMaster Carr 94846A510
8	1	120651	Throttle Check Valve	HYDAC SDR10A-01-C-N-15V
9	3	2006150	#2 SAE EPCO Plug	
10	1	2006151	#4 SAE EPCO Plug	
11	1	100053	3/8” MJIC X 3/8” MORB Straight Fitting	6400-06-06-O
12	1		3/8” FJIC to 3/8” FJIC Hose, 20” Long	HOSE038R02J006J006L0200C
13	2	100121	Regular 1/2” Lockwasher	
14	2		1/2” X 5/8” Socket Head Shoulder Screw	
15	2	140143	1/2” X 3/4” Socket Head Shoulder Screw	
16	8	2010127	*Caisson Beam Adapter Hydrolock Button	

**Shipped Loose*

Replacement Parts

Model 20 Wood Clamp BOM

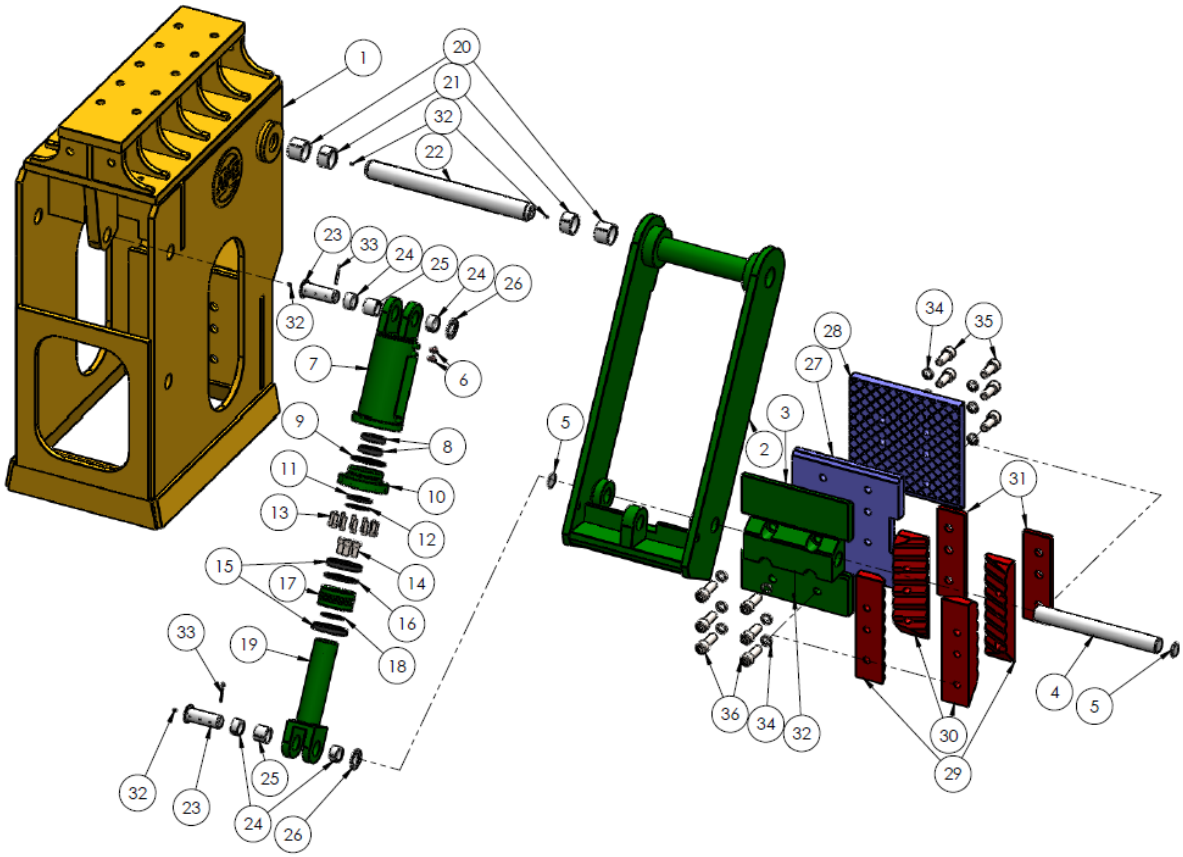


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1002218	Model 20 Wood Clamp Body	
	1	1002125	***20" Swing Arm Assembly***	
2	1	1002219	20" WC Swing Arm	
3	1	1002124	20" WC Moveable Jaw Pivot	
4	1	1002123	20" WC Moveable Jaw Shaft	
5	2		Swing Arm Cover	3.0" Dia x 3/16" Thick
		1002126	***Wood Clamp Cylinder Assembly***	
6	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
7	1	1002127	Cylinder Barrel Assembly	
		1002131	***Cylinder Rod Assembly***	
8	2		*Rod Wear Rings	8000-76E
9	1		*Gland Seal O-Ring and Backup	568-363 O-Ring N70 and 80-363 Contoured Backup
10	1	1002130	Cylinder Gland	
5	1		*Rod Seal	250-04.500-375B-PO Lubrithane Polyseal
12	1		*Rod Wiper	AN Wiper AN-41-SH Urethane
13	12		Bolts, Cylinder Gland	SHCS 0.63-18 x 2.0"
14	4	400401	Bolts, Piston	SHCS 1.0-8 x 2.0"
15	2		*Piston Wear Rings	Wear Ring 612-700-100
16	1		*Piston Seal	TFE-R-7000 Teflon
17	1	1002129	Cylinder Piston	
18	1		*Rod and Cap Seal w/ Double Backups	568-246 O-Ring N70, (x2) 80-246 Contoured Backups
19	1	1002128	Cylinder Rod and Clevis Assembly	
20	2	1002133	Spring Bushing	Connex 3.5" OD x 3.0" ID x 2.25" Long
21	2	1002134	Spring Bushing	Connex 3.5" OD x 3.0" ID x 1.25" Long
22	1	1002136	Swing Arm Shaft	
23	2	1002137	Cylinder Pin	
24	4	1002132	Spring Bushing	Connex 3.0" OD x 2.5" ID x 1.5" Long
25	2	1002135	Spring Bushing	Connex 3.0" OD x 2.5" ID x 2.5" Long
26	2	1002138	Cylinder Pin Keeper	
			Jaws for Concrete	
27	1	1002212	Moveable Jaw - Concrete 20"	
28	1	1002213	Fixed Jaw - Concrete 20"	
			Jaws for Wood	
29	2	1002140	APE Wood Jaw, Right Hand 23"	
30	2	1002139	APE Wood Jaw, Left Hand 23"	
31	2	1002211	Spacer - Wood Jaws	
32	5	221001	Grease Zerk	Straight 1/8" NPT
33	2		Cotter Pin	Stainless Steel 0.25" x 4.0" or longer
34	12	124202	washers, Jaws	HCLW 1.5"
35	6	120819	Bolts, Moveable Jaw	SHCS 1.5-6 X 4.0"
36	6	100193	Bolts, Fixed Jaw	SHCS 1.5-6 X 6.5"

**Included in Seal or Bolt kit.*

Replacement Parts

Model 25 Wood Clamp BOM

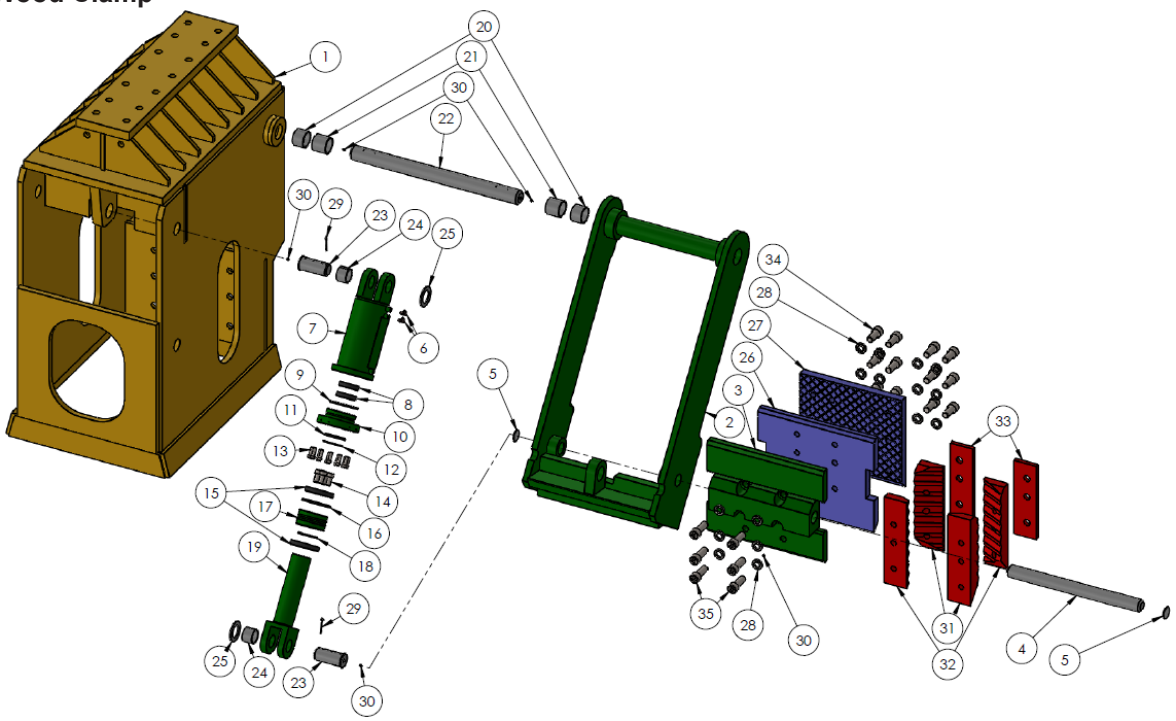


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1002224	Model 25 Wood Clamp Frame	
	1	1002231	***25" Swing Arm Assembly***	
2	1	1002226	25" WC Swing Arm	
3	1	1002227	25" WC Moveable Jaw Pivot	
4	1	1002228	25" WC Moveable Jaw Shaft	
5	2	1002230	Swing Arm Cover	3.0" dia x 0.25" Thick
		1002126	***Wood Clamp Cylinder Assembly***	
6	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
7	1	1002127	CYlinder Barrel Assembly	
		1002131	***Cylinder Rod Assembly***	
8	2		*Rod Wear Rings	8000-76E
9	1		*Gland Seal O-Ring and Backup	568-363 O-Ring N70 and 80-363 Contoured Backup
10	1	1002130	Cylinder Gland	
5	1		*Rod Seal	250-04.500-375B-PO Lubrithane Polyseal
12	1		*Rod Wiper	AN Wiper AN-41-SH Urethane
13	12		Bolts, Cylinder Gland	SHCS 0.63-18 x 2.0"
14	4	400401	Bolts, Piston	SHCS 1.0-8 x 2.0"
15	2		*Piston Wear Rings	Wear Ring 612-700-100
16	1		*Piston Seal	TFE-R-7000 Teflon
17	1	1002129	Cylinder Piston	
18	1		*Rod and Cap Seal w/ Double Backups	568-246 O-Ring N70, (x2) 80-246 Contoured Backups
19	1	1002128	Cylinder Rod and Clevis Assembly	
20	2	1002233	Spring Bushing	Connex 4.0" OD x 3.5" ID x 3.0" Long
21	2	1002232	Spring Bushing	Connex 4.0" OD x 3.5" ID x 2.25" Long
22	1	1002229	Swing Arm Shaft	
23	2	1002137	Cylinder Pin	
24	4	1002235	Spring Bushing	Connex 3.0" OD x 2.5" ID x 1.5" Long
25	2	1002234	Spring Bushing	Connex 3.0" OD x 2.5" ID x 2.5" Long
26	2	1002138	Cylinder Pin Keeper	
			Jaws for Concrete	
27	1	1002236	Moveable Jaw, Concrete 25"	
28	1	1002237	Fixed Jaw, Concrete 25"	
			Jaws for Wood	
29	2	1002140	APE Wood Jaw, Right Hand 23"	
30	2	1002139	APE Wood Jaw, Left Hand 23"	
31	2	1002211	Spacer - Wood Jaws	
32	5	221001	Grease Zerk	Straight 1/8" NPT
33	2		Cotter Pin	Stainless Steel 0.25" x 4.0" or longer
34	12	124202	Washer, Common	HCLW 1.5"
35	6		Bolts, Fixed Jaw	SHCS 1.5-6 X 3.25"
36	6	120819	Bolts, Moveable Jaw	SHCS 1.5-6 X 4.0"

**Included in Seal or Bolt kit.*

Replacement Parts

Model 32 Wood Clamp

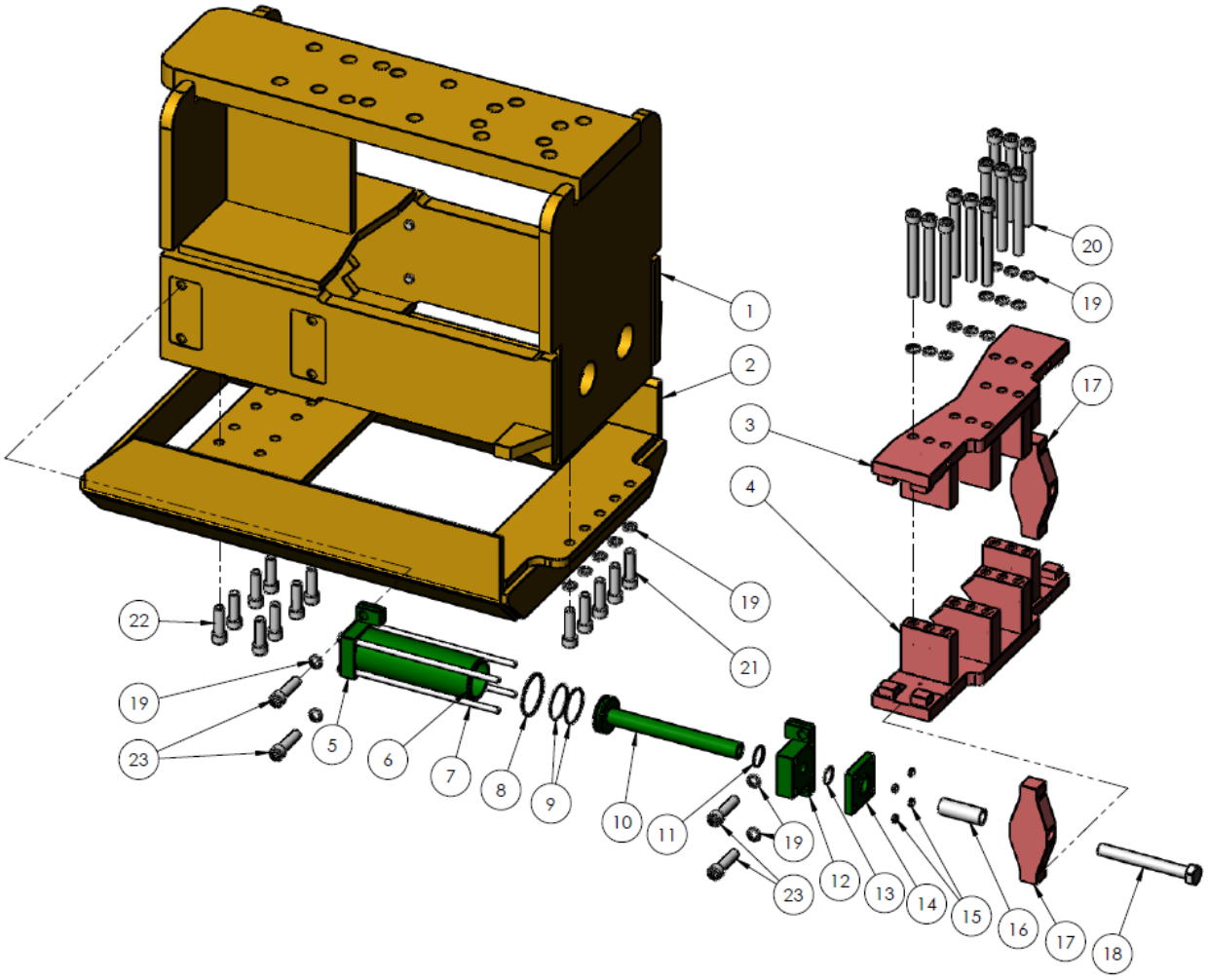


Item	Quantity	APE Number	Description	Manufacturer Information
1	1		Model 32 Wood Clamp Frame	
	1		***32" Swing Arm Assembly***	
2	1		32" WC Swing Arm	
3	1		32" WC Moveable Jaw Pivot	
4	1		32" WC Moveable Jaw Shaft	
5	2		Swing Arm Cover	3.0" dia x 0.31" Thick
			Wood Clamp Cylinder Assembly	
6	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
7	1		Cylinder Barrel Assembly	
			Cylinder Rod Assembly	
8	2		*Rod Wear Rings	8000-76E
9	1		*Gland Seal O-Ring and Backup	2-363 O-Ring N70 and 8-363 Backup
10	1	1002130	Cylinder Gland	
11	1		*Rod Seal	250-04.500-375B-PO Lubrithane Polyseal
12	1		*Rod Wiper	AN Wiper AN-41-SH Urethane
13	12		Bolts, Cylinder Gland	SHCS 0.63-18 x 2.0"
14	4	400401	Bolts, Piston	SHCS 1.0-8 x 2.0"
15	2		*Piston Wear Rings	Wear Ring 612-700-100
16	1		*Piston Seal	TFE-R-7000 Teflon
17	1	1002129	Cylinder Piston	
18	1		*Rod and Cap Seal w/ Double Backups	568-246 O-Ring N70, (x2) 80-246 Contoured Backups
19	1	1002128	Cylinder Rod and Clevis Assembly	
20	2		Spring Bushing	Connex 3.5" OD x 4.0" ID x 2.75" Long
21	2		Spring Bushing	Connex 3.5" OD x 4.0" ID x 3.5" Long
22	1		Swing Arm Shaft	
23	2		32" WC Cylinder Pin	
24	4	1002234	Spring Bushing	Connex 3.5" OD x 4.0" ID x 2.5" Long
25	2	1002138	Cylinder Pin Keeper	
			Jaws for Concrete	
26	1	909015	Moveable Jaw, Concrete 32"	
27	1	909013	Fixed Jaw, Concrete 32"	
28	18	124202	Washers, Common	HCLW 1.5"
29	2		Cotter Pin	Stainless Steel 0.25" x 4.0" or longer
30	5	221001	Grease Zerk	Straight 1/8" NPT
			Jaws for Wood	
31	2	1002140	APE Wood Jaw, Right Hand 23"	
32	2	1002139	APE Wood Jaw, Left Hand 23"	
33	2	1002211	Spacer - Wood Jaws	
34	12		Bolts, Fixed Jaw	SHCS 1.5-6 x 3.25"
35	6	120819	Bolts, Moveable Jaw	SHCS 1.5-6 x 4.0"

**Included in Seal or Bolt kit.*

Replacement Parts

Model 20 Hybrid Clamp

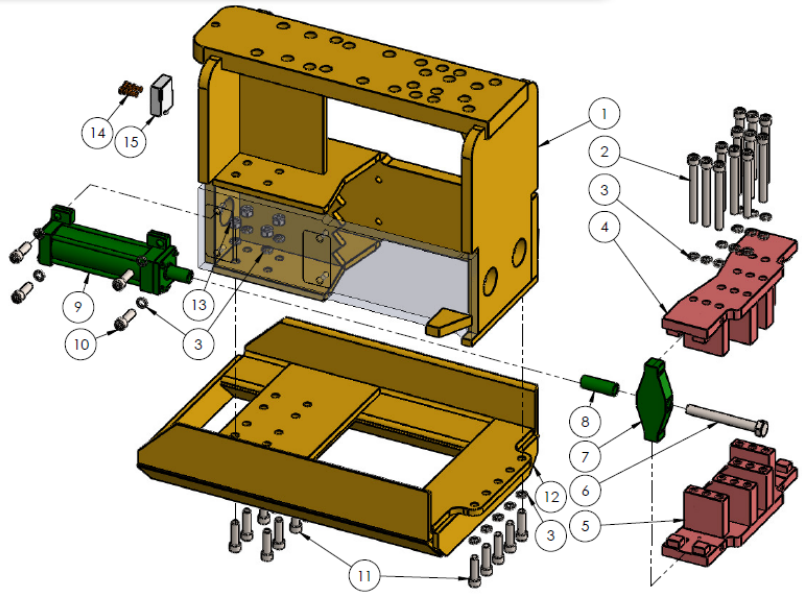


Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1007195	Model 20 Hybrid Clamp Body	
2	1	1007193	Guard Guide	
3	1	1007197	Inside Moveable Jaw	
4	1	1007199	Outside Moveable Jaw	
5	2	1007201	Adaptor Pipe	
6	2	1007200	Cross Head	
7	2		Bolts, Arm Mount	HHBolt 1.25-12 x 11.0
8	2	120859	Georgia-Yates Hydraulic Cylinder	Yates H6A-N4.0 x 12 x 1.75 T4S11
		1000432	*Seal Kit and Replacement Gland	GHC-HH-PRG-017
9	25	1003063	Washers, General	HCLW 1.0”
10	12	140731	Bolts, Moveable Jaw	SHCS 1.0-8 x 9.5”
11	8	1003020	Bolts, Cylinder Mounting	SHCS 1.0-8 x 4.0”
12	8	1003019	Bolts, Guards Guide Attachment Rear	SHCS 1.0-8 x 3.25”
13	5		Bolts, Guard Guide Attachment Front	SHCS 1.0-8 x 3.5
14	8		Nuts, Guard Guide Attachment	Stover Nut 1.0-8
15	4	221001	Grease Zerk	Straight 1/8” NPT
	1	120861	***Combined Clamp Manifold***	
16	1	120861	Clamp Manifold C102	
17	1	120933	Check Valve	Sun CKCB-XEN
18	2	120877	Straight Fitting, #6 JIC to #6 ORB	FITT2S-06M06R
19	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
20	2		90 Elbow Fitting, #6 JIC to #6 ORB double long	FITT2L-06M06R000-00X
21	4	130645	Straight Fitting, #6 JIC to #8 ORB	FITT2S-06M08R

**Included in Seal or Bolt kit.*

Replacement Parts

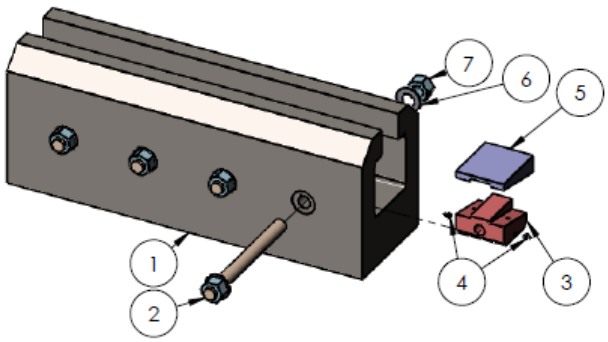
C102 Clamp



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	810879	Clamp Body Assembly	
2	1	120865	Guard Guide	
3	1	120867	Inside Moveable Jaw	
4	1	120869	Outside Moveable Jaw	
5	2	120871	Cross Head	
6	2		Bolts, Arm Mount	SHCS 1.25-12 x 6.0”
7	12	140731	Bolts, Moveable Jaw	SHCS 1-8 x 9.5
8	2	120859	Georgia-Yates Hydraulic Cylinder	Yates H6A-N4.0 x 12 x 1.75 T4S11
		1000432	*Seal Kit and Replacement Gland	GH-HH-PRG-017
9	33	1003063	Lockwashers, COmmon	HCLW 1”
10	2	1003065	Lockwasers, Arm Mount	HCLW 1.25”
11	8	400051	Hex Nut, Guard Guide Mount	HHNUT 1.0-8
12	13	140145	Bolts, Guard Guide Mount Rear	SHCS 1.0-8 x 3.5”
13	8	1003018	Bolts, Guard Guide Mount Front	SHCS 1.0-8 x 3.0”
14	4	221001	Grease Zerk	Straight 1/8” NPT
	1	120861	***Combined Clamp Manifold***	
15	1	120933	Clamp Manifold C102	
16	1	120877	Check Valve	Sun CKCB-XEN
17	2	100053	Straight FItting, #6 JIC to #6 ORB	FITT2S-06M06R
18	2	130057	90 Elbow Fitting, #6 JIC to #6 ORB	FITT2L-06M06R
19	2		90 Elbow Fitting, #6 JIC to #6 ORB, Double Long	FITT2L-06M06R000-00X
20	4	130645	Straight Fitting, #6 JIC to #8 ORB	FITT2S-06M08R

**Included in Seal or Bolt kit.*

Caisson Beam Adapter



Item	Quantity	APE Number	Description	Manufacturer Information
1	1	1004820	Caisson Beam Adaptor Body	
2	4	124211A	Caisson Wedge Screw Welded Assembly	
3	4	250102	Wedge, Male Half, Bronze	
4	8	221001	Grease Zerk	Straight 1/8” NPT
5	4	250105	Wedge, Female Half, Steel	
6	4	120111	1.25” H S Flat Washer	Fastenal 33124 1/8” Thick, plain F436
7	4	124212	Wedge Screw End Nut	1.25”-5 ACME Hex Nut

**Included in Seal or Bolt kit.*

Clamp Seal Kits

New Style Model 3/6	
Kit #205210A	**Quantity**
2-236 O-Ring	1
8-236 O-Ring Backup	1
2500-2000-375B	1
Custom Bronze Filled Ring with PTFE	1
W125-03375-0250	1
Model 20 Sheet Clamp	
Kit #208010	**Quantity**
568-238 O-Ring CMPD N-7002	1
568-248 O-Ring CMPD N-7002	2
568-345 O-Ring CMPD N-7002	2
80-248 Contoured Backup	1
80-345 Contoured Backup	1
Wear Ring 612-500-100	2
Wear Ring 8000-68B	1
DT-4000 Wiper U-1003	1
PS1850-80 Bronze PTFE w/ Energizer	1
Model 50, 150, 200 Sheet AND Model 100, 200 Caisson	
Kit #1003614	**Quantity**
AN Wiper SH959-53	1
250-06.000-375B	1
Wear Guide 06250-050-125	1
568-367 O-Ring CMPD F-7001	1
80-367 Contoured Backup	1
PS1850-128 Bronze PTFE w/ Energizer	1
Wear Guide 08000-0750-125	1
568-356 O-Ring CMPD F-7001	1
Model 20, 25, 32 Wood Clamp	
Kit #221022	**Quantity**
568-246 O-Ring N70	1
80-246 Contoured Backup	2
250-04.500-375B-PO Lubrithane Polyseal	1
80-363 Contoured Backup	1
568-363 O-Ring N70	1
Wear Ring 612-700-100	2
Wear Ring 8000-76E	2
AN-41-SH Urethane AN Wiper	1
TFE-R-7000 Teflon1	1

Hybrid 20 Clamp	
Kit #1000432	**Quantity**
GHC-HH-PRG-017 Combined Glands/Seals	1
Model 80 Caisson Clamp	
Kit #810227	**Quantity**
AN Wiper SH959-41	1
Parker BR 3120 4500 Rod Seal	1
TP060 Piston T-Seal Buna-N	1
W2-7000-500 Piston Bearing	2
2-261 O-Ring 90 Duro	1
8-261 Backup	1
2-140 O-Ring 90 Duro	1
Model 400 Sheet	
Kit #1002262	**Quantity**
2-458 Gland O-Ring	1
8-458 Gland O-Ring Backup	1
P-50014000-750 Deep Polypak	1
15" OD x 1.0" Wide x 1.8" Thick Bronze Filled Teflon Wear Ring	1
10" OD x 1.0" Wide x 1.8' Thick Bronze Filled Teflon Wear Ring	1
D010000 10" Rod Wiper Slotted	1
P-50010000-750 Deep Polypack	1
Model 126 Sheet Clamp	
Kit #810515	**Quantity**
2-269 O-Ring 90 Duro	1
0.5Wx7.00IDx0.12	1
TR-056 Rod T-Seal Buna-N	1
TP-064 Piston T-Seal Buna-N	2
912-8000-500	2
2-261 O-Ring 90 DUro	1
Model 196 / 350 Sheet Clamp	
Kit #810473	**Quantity**
568-261 N90	1
Wear Ring 612-1000-050	2
Wear Ring 612-725-050	1
PS1850-160 Bronze PT	1
TP-069 T-Seal Buna N	2
TP-056 T-Seal, 2 Backups	1

Clamp Bolt Kits

Model 50, 150 Sheet Clamps	
Kit #1007377	**Quantity**
SHCS 1.25-12 x 4.0"	8
HCLW 1.25"	8
SHCS 1.0-8 x 9.0"	2
HCLW 1.0"	6
SHCS 1.0-8 x 3.0"	4
SHCS 1.5-6 x 3.5"	8
HCLW 1.5"	8
Grease Zerk Straight 1/8" NPT	1
SHCS 0.63-18 x 1.0"	12
Model 20 Sheet Clamp	
	Quantity
SHCS 1.5-6 x 3.5"	10
HCLW 1.5"	10
SHCS 1.25-12 x 4.0"	8
HCLW 1.25"	8
SHCS 1.0-8 x 3.0"	4
SHCS 1.0 x 9.0"	2
HCLW 1.0"	6
Grease Zerk Straight 1/8" NPT	1
SHCS 0.63-18 x 1.0"	12
Model 400 Sheet Clamp	
	Quantity
SHCS 0.63-18 x 1.75"	15
SHCS 1.0-8 x 5.0"	30
HCLW 1.0"	40
SHCS 1.0-8 x 11.0"	2
SHCS 1.0-8 x 3.0"	8
Jaw Pin	1
Grease Zerk, Straight 1/8" NPT	1
Model 350 Sheet Clamp	
	Quantity
SHCS 0.63-11 X 1.25"	12
SHCS 1.0-8 X 4"	12
SHCS 1.0-8 X 2.5"	4
SHCS 1.0-8 X 4.25"	2
HCLW 1.0"	18
Grease Zerk, Straight 1/8" NPT	1

Model 100 Caisson Clamp	
Kit #1007378	**Quantity**
HCLW 1.25"	8
SHCS 0.63-11 x 4.0"	2
HCLW 0 63"	2
SHCS 1.25-12 x 4.0"	8
Grease Zerk, Straight 1/8" NPT	5
Model 80 Caisson Clamp	
	Quantity
SHCS 0.63-11 x 2.75"	2
H.S. Flat Washer 1.25"	4
Grease Zerk, Straight 1/8" NPT	3
SHCS 0.5-13 x 1.25"	2
HCLW 0.5"	4
SHCS 1.0-8 x 4.0"	8
HCLW 1.0"	8
SHCS 0.5-13 x 1.5"	2
Pointed Set Screw 1/2-13 x 1.0"	1
Model 200 Caisson	
Kit #1007379	**Quantity**
SHCS 1.25-12 x 4.0"	8
HCLW 1.25"	8
SHCS 0.63-11 x 4.25"	2
HCLW 0.63"	2
Grease Zerk Straight 1/8" NPT	7
Model 20 Sheet Clamp	
	Quantity
SHCS 1.0-8 x 3.0"	14
SHCS 1.0-8 x 9.0"	2
HCLW 1.0"	16
SHCS 0.5-13 x 5.5"	12

Bolt Torque-Tension Charts

Torque-Tension Relationship ASTM A307 Grade A, SAE J429 Grade 5 & 8, Holo-Krome Grade 9 and ASTM A574 Coarse Thread

Caution: All material included in this chart is advistory only, and its use by anyone is voluntary. In developing this information, Fastenal has made a determined effort to present its contents accurately. Extreme caution should be used when using a formula for torque/tension relationships. Torque is only an indirect indication of tension. Under/over tightening fasteners can result in costly equipment failure or personal injury.

	Nominal Dia (in)	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
	threads per inch	20	18	16	14	13	12	11	10	9	8	7	7	6	6
ASTM A307 Grade A	Min Tensile (lbs)	1909	3146	4649	6379	8514	10917	13560	20068	27704	36345	45797	58147	69293	84315
	Clamp Load (lbs)	859	1416	2092	2870	3831	4912	6102	9030	12467	16355	20608	26166	31182	37942
							Torque (ft-lbs)								
	Lubricated	2.7	5.5	9.8	15.7	23.9	34.5	47.7	85	136	204	290	409	536	711
	Dry	3.6	7.4	13.1	20.9	31.9	46.1	63.6	113	182	273	386	545	715	949
SAE J429 Grade 5	Min Tensile (lbs)	3819	6292	9299	12757	17028	21833	27120	40135	55408	72689	80144	101757	121263	147551
	Min Proof Strength (lbs)	2705	4457	6587	9036	12061	15465	19210	28429	39247	51488	56482	71714	85461	103989
	Clamp Load (lbs)	2029	3342	4940	6777	9046	11599	14408	21322	29436	38616	42362	53786	64096	77991
							Torque (ft-lbs)								
	Ecoguard	5.5	11.3	20.1	32.1	49.0	70.7	97.6	173	279	418	516	728	955	1267
	Lubricated	6.3	13.1	23.2	37.1	56.5	81.6	112.6	200	322	483	596	840	1102	1462
	Dry	8.5	17.4	30.9	49.4	75.4	108.7	150.1	267	429	644	794	1121	1469	1950
SAE J429 Grade 8	Min Tensile (lbs)	4773	7865	11623	15946	21285	27292	33900	50169	69260	90862	114491	145367	173232	210788
	Min Proof Strength (lbs)	3819	6292	9299	12757	17028	21833	27120	40135	55408	72689	91593	116293	138586	168630
	Clamp Load (lbs)	2864	4719	6974	9568	12771	16375	20340	30101	41556	54517	68695	87220	103939	126473
							Torque (ft-lbs)								
	Ecoguard	7.8	16.0	28.3	45.3	69.2	99.8	137.7	245	394	591	837	1181	1548	2055
	Lubricated	8.9	18.4	32.7	52.3	79.8	115.1	158.9	282	455	681	966	1363	1786	2371
	Dry	11.9	24.6	43.6	69.8	106.4	153.5	211.9	376	606	909	1288	1817	2382	3162
Holo-Krome Grade 9	Min Tensile (lbs)	5728	9437	13948	19136	25542	32750	40680	60203	83112	109034				
	Min Proof Strength (lbs)	4476	7374	10899	14952	19958	25590	31787	47042	64943	85198				
	Clamp Load (lbs)	3357	5531	8174	11214	14969	19193	23840	35281	48707	63899				
					Torque (ft-lbs)										
	Ecoguard	9.1	18.7	33.2	53.2	81.1	117.0	161.4	287	462	692				

Minimum tensile and proof strengths per ASTM A307, SAE J429, and H-K Gr 9 where applicable.
The torque values can only be achieved if nut (or tapped hole) has a proof load greater than or equal to the bolt's minimum ultimate tensile strength.
Clamp load calculated as 75% of the proof load when specified by the standard. ASTM A307 utilizes 75% of the 36,000 PSI.
Torque values calculated from formula T=K x D x F, where:

- K estimated at 0.13 for Ecoguard. 0.15 used for "lubricated" conditions and 0.20 for "dry" conditions.
- D = Nominal Diameter
- F = Clamp Load

Note: When using Zinc Plated (lubricated with wax) Top Lock Nuts, the K value can vary between 0.12-0.16.

Bolt Torque-Tension Charts

Torque-Tension Relationship for ASTM A574 Socket Head Cap Screws

Nominal Dia (in.)	Unified Coarse Thread Series					
	threads per inch	Tensile Stress Area (sq. in.)	Clamp Load (lbs)	Tightening Torque		
				K = 0.15 (ft-lbs)	K = 0.16 (ft-lbs)	K = 0.20 (ft-lbs)
1/4	20	0.0318	3341	10	11	14
5/16	18	0.0524	5505	22	23	29
3/8	16	0.0775	8136	38	41	51
7/16	14	0.1063	11162	61	65	81
1/2	13	0.1419	14899	93	99	124
5/8	11	0.2260	22883	179	191	238
3/4	10	0.3345	33864	317	339	423
7/8	9	0.4617	46751	511	545	682
1	8	0.6057	61332	767	818	1022
1 1/8	7	0.7633	77282	1087	1159	1449
1 1/4	7	0.9691	98123	1533	1635	2044
1 3/8	6	1.1549	116932	2010	2144	2680
1 1/2	6	1.4053	142282	2668	2846	3557
1 3/4	5	1.8995	192320	4207	4487	5609
2	4.5	2.4982	252945	6324	6745	8432

Nominal Dia (in.)	Fine Thread Series					
	threads per inch	Tensile Stress Area (sq. in.)	Clamp Load (lbs)	Tightening Torque		
				K = 0.15 (ft-lbs)	K = 0.16 (ft-lbs)	K = 0.20 (ft-lbs)
1/4	28	0.0364	3819	12	13	16
5/16	24	0.0581	6097	24	25	32
3/8	24	0.0878	9222	43	46	58
7/16	20	0.1187	12465	68	73	91
1/2	20	0.1600	16795	105	112	140
5/8	18	0.2560	25916	202	216	270
3/4	16	0.3730	37762	354	378	472
7/8	14	0.5095	51584	564	602	752
1	14	0.6799	68839	860	918	1147
1 1/8						
1 1/4	12	1.0729	108636	1697	1811	2263
1 3/8	12	1.3147	133115	2288	2440	3051
1 1/2	12	1.5810	160079	3001	3202	4002

Clamp load calculated from formula T=K x D x F, where:

K = 0.15 for “lubricated” conditions, K = 0.16 “as-recieved” and K = 0.20 for “dry” conditions

D = Nominal Diameter

F = Clamp Load

ISO Hydraulic Fluid Cleanliness Codes

The ISO cleanliness code is used to quantify particulate contamination levels per milliliter of fluid at 3 sizes 4µ[c], 6µ[c], and 14µ[c]. The ISO code is expressed in 3 numbers (ie 19/17/14). Each number represents a contaminant level code for the correlating particle size. The code includes all particles of the specified size and larger. It is important to note that each time a code increases the quantity range of particles is doubling.

ISO 4406 Chart

Range Code	Particles per milliliter	
	More than	Up to/including
24	80000	160000
23	40000	80000
22	20000	40000
21	10000	20000
20	5000	10000
19	2500	5000
18	1300	2500
17	640	1300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5
8	1.3	2.5
7	0.64	1.3
6	0.32	0.64

Sample 1 (see photo 1)

Particle Size	Particles per ml*	ISO 4406 Code range	ISO Code
4µ[c]	151773	80000~160000	24
6µ[c]	38363	20000~40000	22
10µ[c]	8229		
14µ[c]	3339	2500~5000	19
21µ[c]	1048		
38µ[c]	112		

Sample 2 (see photo 2)

Particle Size	Particles per ml*	ISO 4406 Code range	ISO Code
4µ[c]	492	320 ~ 640	16
6µ[c]	149	80 ~ 160	14
10µ[c]	41		
14µ[c]	15	10 ~ 20	11
21µ[c]	5		
38µ[c]	1		

Photo 1

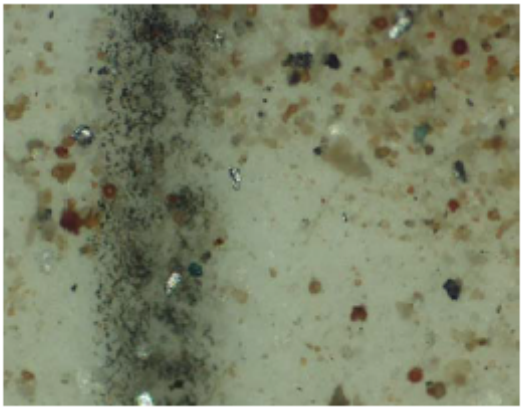
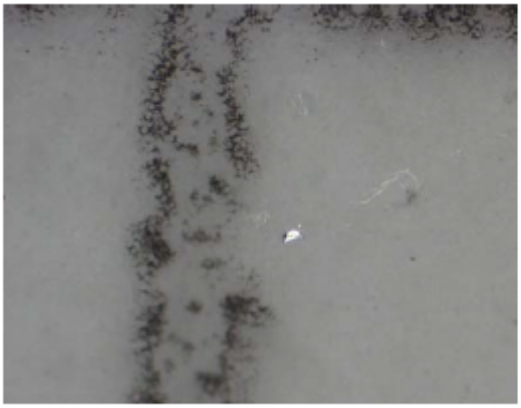


Photo 2

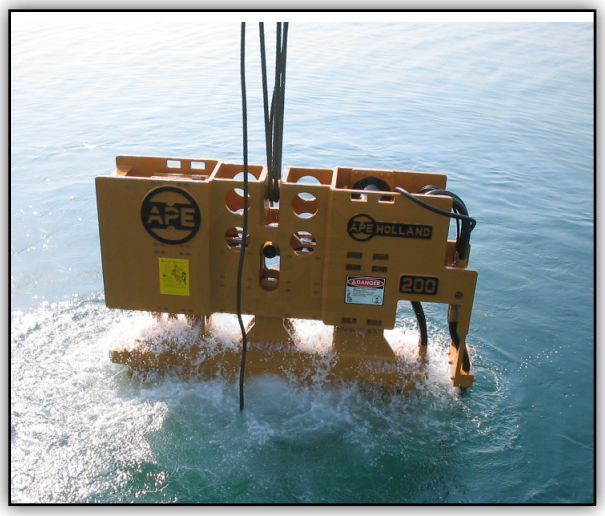


Vibratory Driver/Extractors

APE Vibratory Driver/Extractors Features and Benefits:

- One-piece gear/eccentric eliminates fasteners inside the gearbox.
- Heavy-Metal technology raises energy for more amplitude.
- Multistage suppressor doubles the line pull at 1/3 of the hammer weight.
- Bolt-on suppressors adjust the height and weight to job site needs.
- Helical-cut gears add precision to the gear strength and eccentric speed.
- Spherical bearings allow the vibro to handle side loads on batter piles.
- Vibro can be used horizontally for stuck horizontal casing.
- Field-designed assembly makes maintaining APE products simple and easy.
- Gun-drilled top plate and manifolds eliminate unnecessary hydraulic hoses.
- O-ring sealed gearbox makes transition to underwater operations easy.
- Vegetable hydraulic oil reduces environmental impact and fines if a spill occurs.
- The suppressor is symmetrical and balanced for better looking and level-hanging vibro.
- The brake manifold is designed to stop the vibro faster.
- Bearing covers designed to keep vibro cooler and run longer."Silverback" Radiant technology "Currently offered on the new 300 series"
- Long-term warranty protection provides security on the investment.

VIBRATORY EQUATIONS	
Amplitude	$\frac{em * 2}{vm}$
Drive Force In U.S. Tons	$\frac{em * f^2 * 0.0142}{1{,}000{,}000}$
Amplitude & Drive Force Variables	em = Eccentric Moment f = Frequency vm = Vibrating Mass (lb)
Pile Weight per Foot	(od - wt) * wt * 10.69
Pile Weight Variables	od = Pile Diameter (in) wt = Pile Wall Thickness (in)
Vibrating Mass equals the total of the vibratory gearbox, inner suppressor, pile and a minimum of 4% for soil bond to pile.	



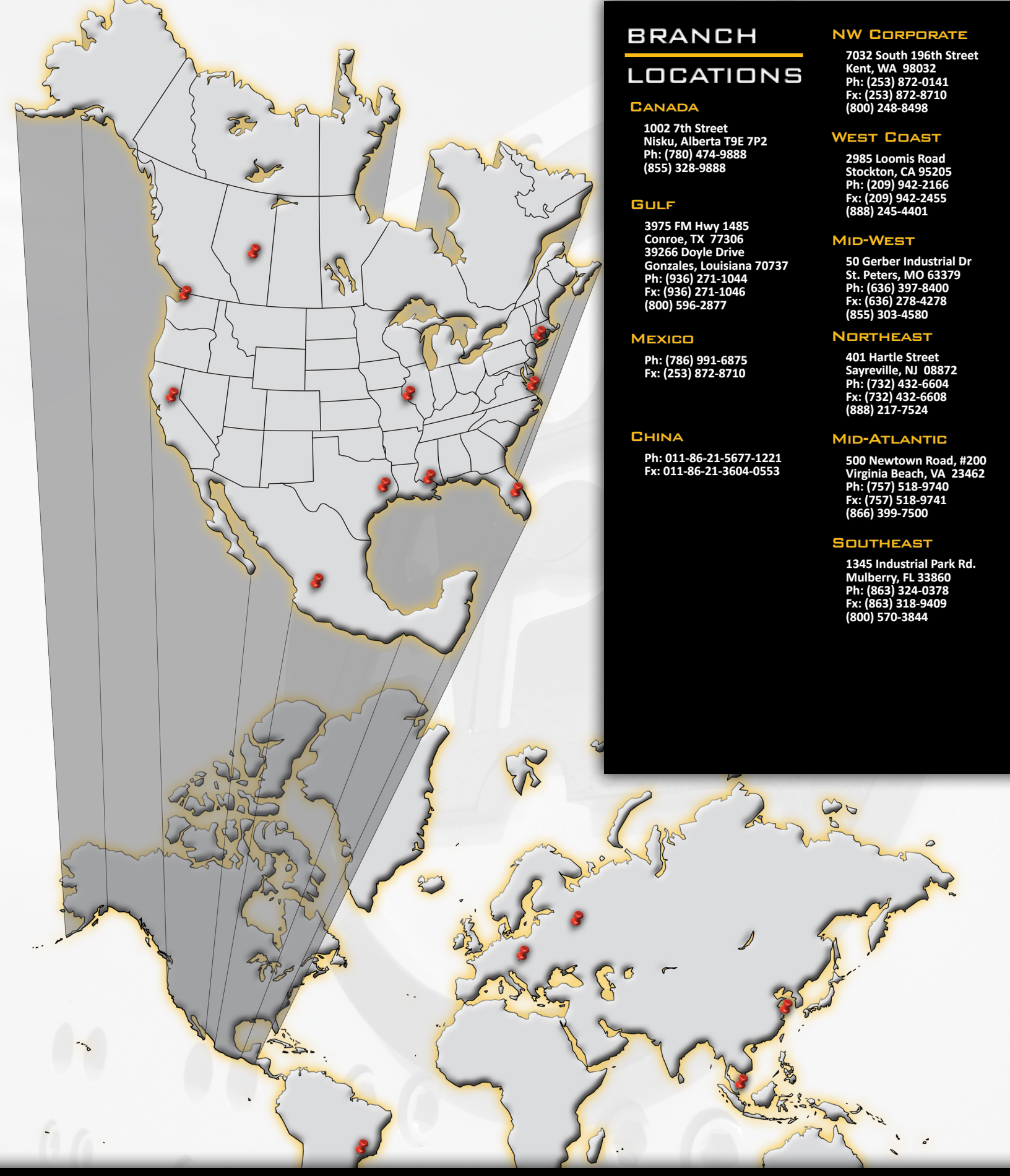
VIBRATORY DRIVER / EXTRACTOR SPECIFICATIONS

	6	20	50	60	100	150T	200	200-6	400	600	600B
Eccentric Moment	60 in-lbs (.69 kg-m)	900 in-lbs (10.37 kg-m)	1,300 in-lbs (14.98 kg-m)	1,245 in-lbs (14.35 kg-m)	2,200 in-lbs (25.35 kg-m)	2,600 in-lbs (29.96 kg-m)	4,400 in-lbs (50.69 kg-m)	6,600 in-lbs (76.04 kg-m)	11,500 in-lbs (132.49 kg-m)	17,200 in-lbs (198.17 kg-m)	17,200 in-lbs (198.17 kg-m)
Drive Force at Rated Frequency	4 tons (37 kN)	35 tons (310 kN)	50 tons (447 kN)	61 tons (538 kN)	85 tons (757 kN)	101 tons (894 kN)	170 tons (1,513 kN)	255 tons (2,270 kN)	298 tons (2,648 kN)	445 tons (3,960 kN)	445 tons (3,960 kN)
Rated Frequency	0 - 2,200 vpm	0 - 1,650 vpm	0 - 1,650 vpm	0 - 1850 vpm	0 - 1,650 vpm	0 - 1650 vpm	0 - 1,650 vpm	0 - 1,650 vpm	0 - 1,350 vpm	0 - 1,350 vpm	0 - 1,350 vpm
Max Line Pull	6 tons (53 kN)	28 tons (249 kN)	56 tons (498 kN)	56 tons (498 kN)	45 tons (400 kN)	108 tons (961 kN)	133 tons (1,183 kN)	185 tons (1,646 kN)	234 tons (2,082 kN)	351 tons (3,123 kN)	451 tons (4,012 kN)
Max Bare Hammer Weight	720 lbs (327 kg)	2,510 lbs (1,139 kg)	4,550 lbs (2,064 kg)	4,542 lbs (2,060 kg)	5,900 lbs (2,676 kg)	8,500 lbs (3,856 kg)	12,760 lbs (5,788 kg)	18,900 lbs (8,573 kg)	34,010 lbs (15,427 kg)	45,225 lbs (20,514 kg)	59,000 lbs (26,762 kg)
Throat Width	6.00 in (15 cm)	12.00 in (30 cm)	14.63 in (37 cm)	19" (48 cm)	14.50 in (37 cm)	14.25 in (36 cm)	14.75 in (37 cm)	14.75 in (37 cm)	33.00 in (84 cm)	37.00 in (94 cm)	37.88 in (96 cm)
Length	36.25 in (92 cm)	36.50 in (93 cm)	57.25 in (145 cm)	93.88 in (238.45 cm)	61.88 in (157 cm)	88.75 in (225 cm)	104.00 in (264 cm)	140.00 in (356 cm)	151.00 in (383 cm)	183.50 in (466 cm)	183.50 in (466 cm)
Height w/o Clamp (Model 3 & 6 Incl. Clamp)	38.00 in (97 cm)	45.00 in (114 cm)	53.50 in (136 cm)	54.26" (137 cm)	54.13 in (137 cm)	72.38 in (184 cm)	65.50 in (166 cm)	75.00 in (191 cm)	106.75 in (271 cm)	108.19 in (275 cm)	127.07 in (323 cm)

Silverback™ VIBRATORY DRIVER HIGH PERFORMANCE SPECIFICATION

	300-2	300-2	300-4	300-6	300-6
Power Unit	456/C9	577/C13	800/C18	800/C18	950/C27
Eccentric Moment	2,660 in-lbs (31 kg-m)	2,660 in-lbs (31 kg-m)	5,320 in-lbs (61.29 kg-m)	8,000 in-lbs (92.17 kg-m)	8,000 in-lbs (92.17 kgm)
Drive Force at Rated Frequency	103 tons (915 kN)	129 tons (1,150 kN)	259 tons (2,300 kN)	309 tons (2,751 kN)	389 tons (3,458 kN)
Rated Frequency	0 - 1,650 vpm	0 - 1,850 vpm	0 - 1,850 vpm	0 - 1,650 vpm	0 - 1,850 vpm
Max Line Pull	129 tons (1,150 kN)	129 tons (1,150 kN)	133 tons (1,183 kN)	185 tons (1,646 kN)	185 tons (1,646 kN)
Max Bare Hammer Weight	9,480 lbs (4,300 kg)	9,480 lbs (4,300 kg)	16,850 lbs (7,643 kg)	21,200 lbs (9,616 kg)	21,200 lbs (9,616 kg)
Throat Width	22.00 in (55 cm)	22.00 in (55 cm)	21.67 in (55 cm)	23,00 in (58 cm)	23.00 in (58 cm)
Length	94.00 in (239 cm)	94.00 in (239 cm)	125.60 in (319 cm)	155.00 in (394 cm)	155.00 in (394 cm)
Height w/o Clamp (Model 3 & 6 Incl. Clamp)	71.40 in (181 cm)	71.40 in (181 cm)	81.62 in (207 cm)	81,62 in (207 cm)	81.62 in (207 cm)

Note: All technical specifications are subject to change without notice. rev: 02/25



BRANCH LOCATIONS

Canada

1002 7th Street
Nisku, Alberta T9E 7P2
Ph: (780) 474-9888
(855) 328-9888

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3975 FM Hwy 1485
Conroe, TX 77306
39266 Doyle Drive
Gonzales, Louisiana 70737
Ph: (936) 271-1044
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(800) 596-2877

Mexico

Ph: (786) 991-6875
Fx: (253) 872-8710

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