

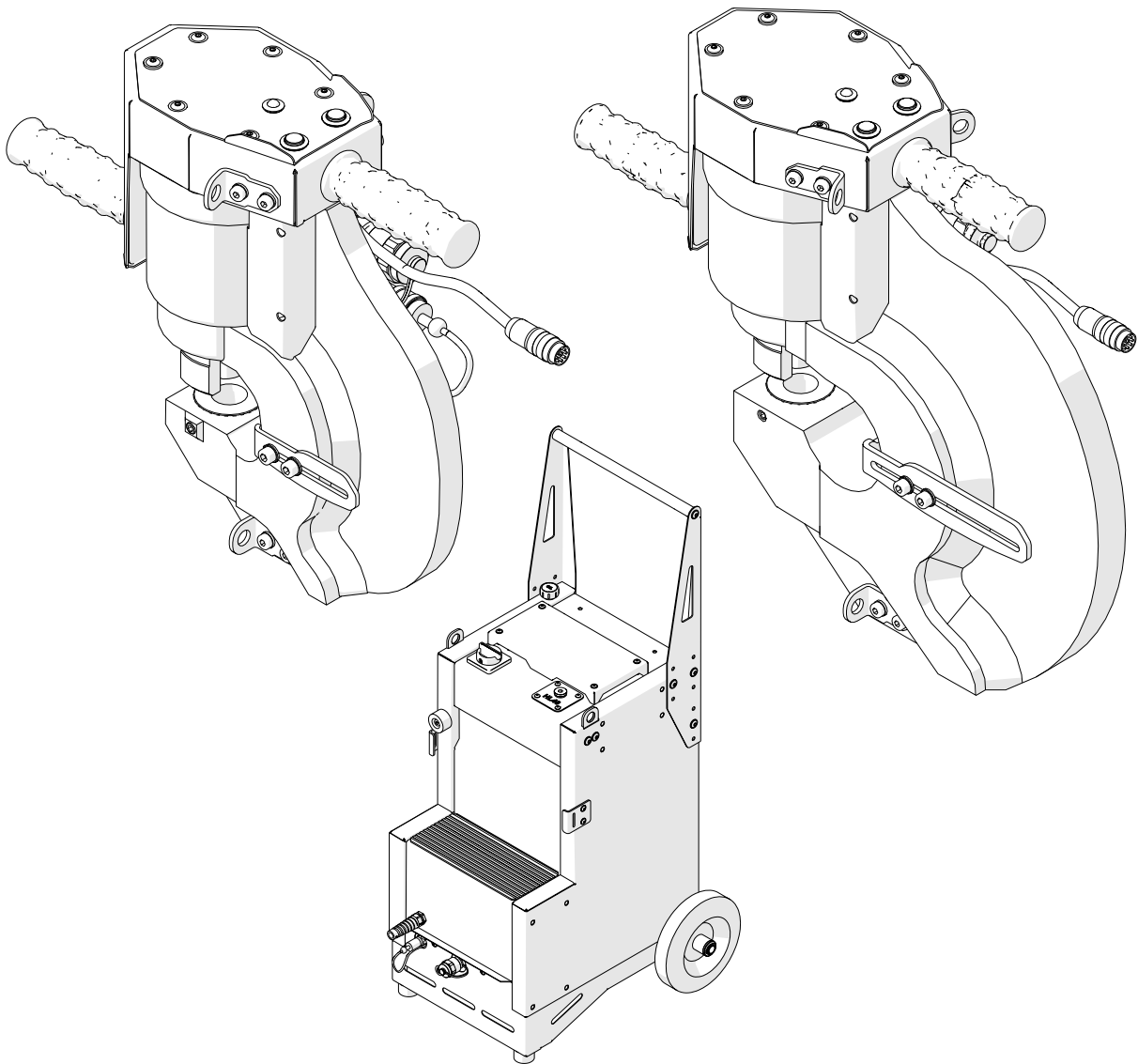


The tools of innovation.

OPERATING MANUAL

HYDRAULIC PUNCH PRO 60 HP, PRO 110 HP

HYDRAULIC POWER PACK HPP 700/1.5



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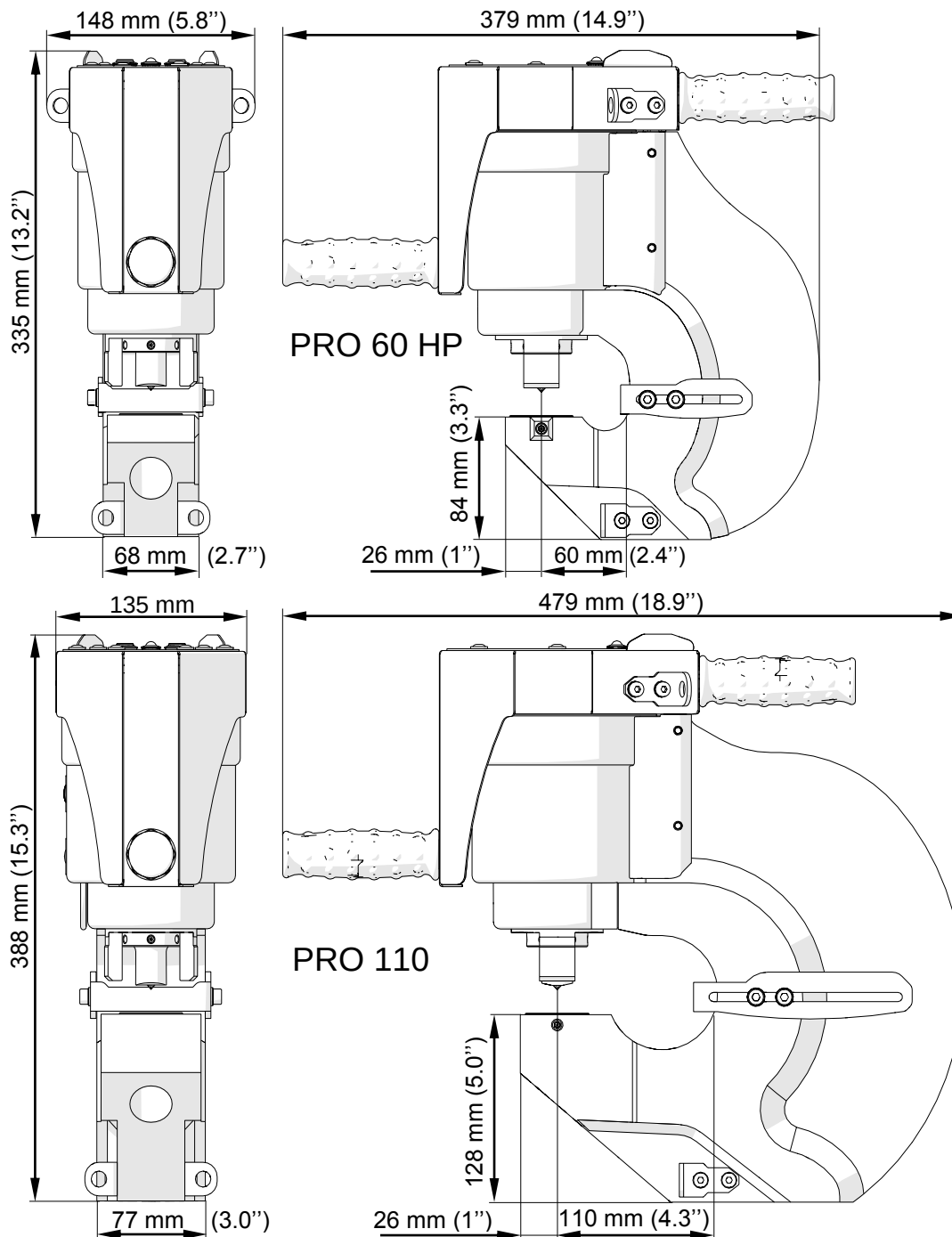
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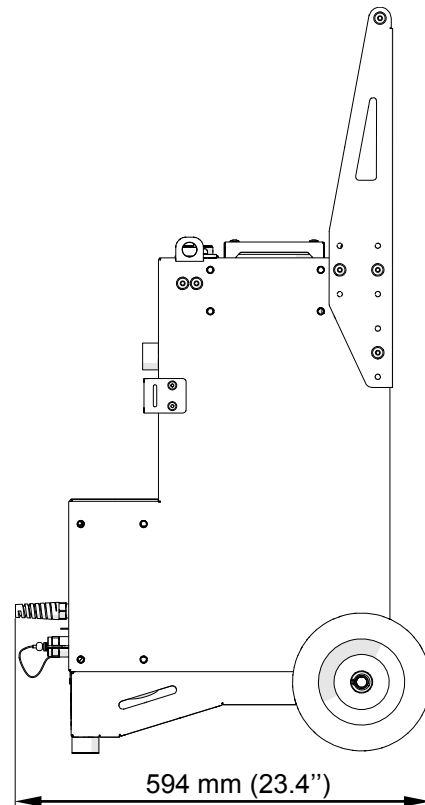
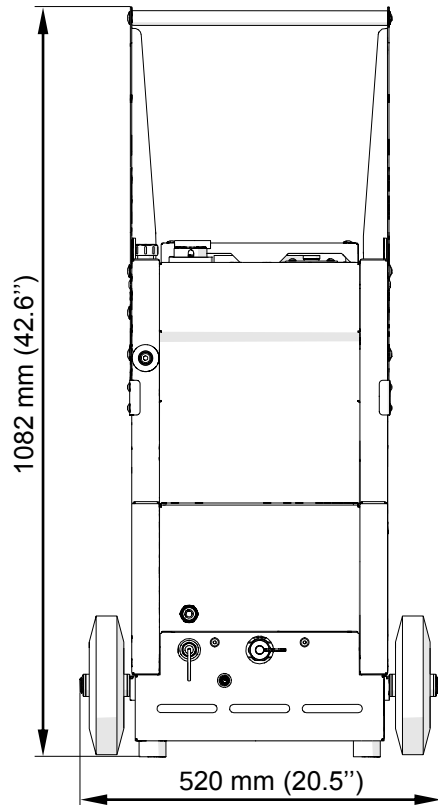
1. GENERAL INFORMATION

1.1. Application

The Hydraulic Punch from Steelmax is designed to punch circular holes with diameters of 1/4" – 1-1/16" (7–27 mm) and oblong or oval holes in metal plates using a cylinder driven by the HPP 700/1.5 Hydraulic Power Pack.

1.2. Technical data





	PRO 60 HP	PRO 110 HP
Throat depth*	2.36" (60 mm)	4.33" (110 mm)
Maximum hole diameter	1 1/16" (27 mm)	1 1/16" (27 mm)
Maximum plate thickness** for S235JR mild steel with a shear strength $R_m < 70,000$ psi (490 MPa)	1/2" (13 mm)	5/8" (16 mm)
Pressing force	35 Ton	47 Ton
Punching time	5 s (50 Hz, 230 V) 6 s (60 Hz, 230 V) 6 s (60 Hz, 115 V) 6 s (50 Hz, 115 V)	8 s (50 Hz, 230 V) 9 s (60 Hz, 230 V) 9 s (60 Hz, 115 V) 10 s (50 Hz, 115 V)
Weight	44 lbs (20 kg)	77 lbs (35 kg)
HPP 700/1.5 Hydraulic Power Pack		
Voltage	1~ 220–240 V, 50 Hz 1~ 220–240 V, 60 Hz 1~ 110–120 V, 50 Hz 1~ 110–120 V, 60 Hz	
Power	1500 Watts	
Flow rate	1.5 liter/minute	
Pressure	10,000 psi (700 bar)	
Oil reservoir capacity	10 liter	
Weight	181 lbs (82 kg)	

* With Depth Stop removed.

** Depends on the material type and diameter/dimensions of the hole to be made.

1.3. Maximum plate thicknesses depending on the material type and diameter/dimensions of the hole to be made

Circular Holes using Circular Punches with Metric Sizes											
Ø [mm]	Inch equivalent		Maximum plate thickness								
	Decimal	Fractional	S235JR mild steel <i>R_m</i> < 490 MPa (70,000 psi)			355J2 G3 hard steel <i>R_m</i> = 490–630 MPa (70,000–90,000 psi)			stainless steel <i>R_m</i> = 630–750 MPa (90,000–110,000 psi)		
			mm	Inch equivalent		mm	Inch equivalent		mm	Inch equivalent	
				Decim.	Fract.		Decim.	Fract.		Decim.	Fract.
PRO 60 HP											
7	0.276	9/32	5.6	0.220	7/32	3.5	0.138	9/64	2.8	0.110	7/64
8	0.315	5/16	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
9	0.354	23/64	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
10	0.394	25/64	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
11	0.433	7/16	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
12	0.472	15/32	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
13	0.512	33/64	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
14	0.551	35/64	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
15	0.591	19/32	12.0	0.472	15/32	7.5	0.295	19/64	6.0	0.236	15/64
16	0.630	5/8	12.8	0.504	1/2	8.0	0.315	5/16	6.0	0.236	15/64
17	0.669	43/64	13.0	0.512	33/64	8.5	0.335	21/64	6.0	0.236	15/64
18	0.709	45/64	13.0	0.512	33/64	9.0	0.354	23/64	6.0	0.236	15/64
19	0.748	3/4	13.0	0.512	33/64	9.5	0.374	3/8	6.0	0.236	15/64
20	0.787	25/32	13.0	0.512	33/64	10.0	0.394	25/64	5.0	0.197	13/64
21	0.827	53/64	13.0	0.512	33/64	10.5	0.413	13/32	5.0	0.197	13/64
22	0.866	55/64	13.0	0.512	33/64	10.3	0.406	13/32	5.0	0.197	13/64
23	0.906	29/32	12.4	0.488	31/64	9.9	0.390	25/64	4.0	0.157	5/32
24	0.945	15/16	11.9	0.469	15/32	9.5	0.374	3/8	4.0	0.157	5/32
25	0.984	63/64	11.4	0.449	29/64	9.1	0.358	23/64	4.0	0.157	5/32
26	1.024	1-1/64	11.0	0.433	7/16	8.7	0.343	11/32	4.0	0.157	5/32
27	1.063	1-1/16	10.6	0.417	27/64	8.4	0.331	21/64	4.0	0.157	5/32
PRO 110 HP											
7	0.276	9/32	5.6	0.220	7/32	3.5	0.138	9/64	2.8	0.110	7/64
8	0.315	5/16	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
9	0.354	23/64	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
10	0.394	25/64	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
11	0.433	7/16	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
12	0.472	15/32	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
13	0.512	33/64	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
14	0.551	35/64	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
15	0.591	19/32	12.0	0.472	15/32	7.5	0.295	19/64	6.0	0.236	15/64
16	0.630	5/8	12.8	0.504	1/2	8.0	0.315	5/16	6.0	0.236	15/64
17	0.669	43/64	13.6	0.535	17/32	8.5	0.335	21/64	6.0	0.236	15/64
18	0.709	45/64	14.4	0.567	9/16	9.0	0.354	23/64	6.0	0.236	15/64
19	0.748	3/4	15.2	0.598	19/32	9.5	0.374	3/8	6.0	0.236	15/64
20	0.787	25/32	16.0	0.630	5/8	10.0	0.394	25/64	6.0	0.236	15/64
21	0.827	53/64	16.0	0.630	5/8	10.5	0.413	13/32	6.0	0.236	15/64
22	0.866	55/64	16.0	0.630	5/8	11.0	0.433	7/16	6.0	0.236	15/64
23	0.906	29/32	16.0	0.630	5/8	11.5	0.453	29/64	6.0	0.236	15/64
24	0.945	15/16	16.0	0.630	5/8	12.0	0.472	15/32	6.0	0.236	15/64
25	0.984	63/64	16.0	0.630	5/8	12.5	0.492	31/64	6.0	0.236	15/64
26	1.024	1-1/64	15.1	0.594	19/32	12.0	0.472	15/32	6.0	0.236	15/64
27	1.063	1-1/16	14.5	0.571	37/64	11.5	0.453	29/64	6.0	0.236	15/64

Oval (Oblong) Holes using Oval (Oblong) Punches with Metric Sizes										
Dim. [mm×mm]	Inch Decimal Equivalent	Maximum plate thickness								
		S235JR mild steel <i>R</i> _m < 490 MPa (< 70,000 psi)			355J2 G3 hard steel <i>R</i> _m = 490–630 MPa (70,000–90,000 psi)			stainless steel <i>R</i> _m = 630–750 MPa (90,000–110,000 psi)		
		mm	Inch equivalent		mm	Inch equivalent		mm	Inch equivalent	
			Decim.	Fract.		Decim.	Fract.		Decim.	Fract.
PRO 60 HP										
16×8	0.630×0.315	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
18×9	0.709×0.354	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
18×11	0.709×0.433	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
20×10	0.787×0.394	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
20×12	0.787×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
20×14	0.787×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
22×11	0.866×0.433	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
22×14	0.866×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
24×12	0.945×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
25×9	0.984×0.354	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
25×12	0.984×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
25×13	0.984×0.512	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
25×14	0.984×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
25×18	0.984×0.709	13.0	0.512	33/64	9.0	0.354	23/64	6.0	0.236	15/64
PRO 110 HP										
16×8	0.630×0.315	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
18×9	0.709×0.354	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
18×11	0.709×0.433	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
20×10	0.787×0.394	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
20×12	0.787×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
20×14	0.787×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
22×11	0.866×0.433	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
22×14	0.866×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
24×12	0.945×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
25×9	0.984×0.354	7.2	0.283	9/32	4.5	0.177	11/64	3.6	0.142	9/64
25×12	0.984×0.472	9.6	0.378	3/8	6.0	0.236	15/64	4.8	0.189	3/16
25×13	0.984×0.512	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
25×14	0.984×0.551	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
25×18	0.984×0.709	14.4	0.567	9/16	9.0	0.354	23/64	6.0	0.236	15/64

Circular Holes using Circular Punches with Imperial Sizes										
Ø [""]	Decimal equivalent	Maximum plate thickness								
		S235JR mild steel $R_m < 490 \text{ MPa}$ ($< 70,000 \text{ psi}$)			355J2 G3 hard steel $R_m = 490\text{--}630 \text{ MPa}$ ($70,000\text{--}90,000 \text{ psi}$)			stainless steel $R_m = 630\text{--}750 \text{ MPa}$ ($90,000\text{--}110,000 \text{ psi}$)		
		mm	Inch equivalent		mm	Inch equivalent		mm	Inch equivalent	
			Decim.	Fract.		Decim.	Fract.		Decim.	Fract.
PRO 60 HP										
5/16	0.3125	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
3/8	0.3750	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
7/16	0.4375	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
1/2	0.5000	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
9/16	0.5625	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
5/8	0.6250	12.8	0.504	1/2	8.0	0.315	5/16	6.0	0.236	15/64
11/16	0.6875	13.0	0.512	33/64	9.0	0.354	23/64	6.0	0.236	15/64
3/4	0.7500	13.0	0.512	33/64	9.5	0.374	3/8	6.0	0.236	15/64
13/16	0.8125	13.0	0.512	33/64	10.5	0.413	13/32	5.0	0.197	13/64
7/8	0.8750	13.0	0.512	33/64	10.3	0.406	13/32	5.0	0.197	13/64
15/16	0.9375	11.9	0.469	15/32	9.5	0.374	3/8	4.0	0.157	5/32
1	1.0000	11.0	0.433	7/16	8.7	0.343	11/32	4.0	0.157	5/32
1-1/16	1.0625	10.6	0.417	27/64	8.4	0.331	21/64	4.0	0.157	5/32
PRO 110 HP										
5/16	0.3125	6.4	0.252	1/4	4.0	0.157	5/32	3.2	0.126	1/8
3/8	0.3750	8.0	0.315	5/16	5.0	0.197	13/64	4.0	0.157	5/32
7/16	0.4375	8.8	0.346	11/32	5.5	0.217	7/32	4.4	0.173	11/64
1/2	0.5000	10.4	0.409	13/32	6.5	0.256	1/4	5.2	0.205	13/64
9/16	0.5625	11.2	0.441	7/16	7.0	0.276	9/32	6.0	0.236	15/64
5/8	0.6250	12.8	0.504	1/2	8.0	0.315	5/16	6.0	0.236	15/64
11/16	0.6875	14.4	0.567	9/16	9.0	0.354	23/64	6.0	0.236	15/64
3/4	0.7500	15.2	0.598	19/32	9.5	0.374	3/8	6.0	0.236	15/64
13/16	0.8125	16.0	0.630	5/8	10.5	0.413	13/32	6.0	0.236	15/64
7/8	0.8750	16.0	0.630	5/8	11.0	0.433	7/16	6.0	0.236	15/64
15/16	0.9375	16.0	0.630	5/8	12.0	0.472	15/32	6.0	0.236	15/64
1	1.0000	15.1	0.594	19/32	12.0	0.472	15/32	6.0	0.236	15/64
1-1/16	1.0625	14.5	0.571	37/64	11.5	0.453	29/64	6.0	0.236	15/64

1.4. Selecting punches for the most common inch plates

PRO 60 HP									
Plate thickness ["]	S235JR mild steel $R_m < 490$ MPa (70,000 psi)			355J2 G3 hard steel $R_m = 490\text{--}630$ MPa (70,000–90,000 psi)			stainless steel $R_m = 630\text{--}750$ MPa (90,000–110,000 psi)		
	Punch type								
	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]
1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16
1/8	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	8–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16
3/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	10–27	18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	3/8 – 1-1/16	12–27	20×12, 20×14, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	1/2 – 7/8
1/4	8–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	13–27	20×14,22×14, 25×13, 25×14, 25×18	1/2 – 1-1/16	N/A	N/A	N/A
5/16	10–27	18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	3/8 – 1-1/16	16–27	25×18	5/8 – 1-1/16	N/A	N/A	N/A
3/8	12–27	20×12, 20×14, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	1/2 – 1-1/16	20–23	N/A	13/16 – 7/8	N/A	N/A	N/A
7/16	14–25	20×14, 22×14, 25×14, 25×18	9/16 – 1	N/A	N/A	N/A	N/A	N/A	N/A
1/2	16–22	25×18	5/8 – 7/8	N/A	N/A	N/A	N/A	N/A	N/A
9/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

PRO 110 HP									
Plate thickness ["]	S235JR mild steel $R_m < 490$ MPa (70,000 psi)			355J2 G3 hard steel $R_m = 490\text{--}630$ MPa (70,000–90,000 psi)			stainless steel $R_m = 630\text{--}750$ MPa (90,000–110,000 psi)		
	Punch type								
	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]	Circular metric [mm]	Oval (Oblong) metric [mm×mm]	Circular imperial ["]
1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16
1/8	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	8–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16
3/16	7–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	10–27	18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	3/8 – 1-1/16	12–22	20×12, 20×14, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	1/2 – 1-1/16
1/4	8–27	16×8, 18×9, 18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×9, 25×12, 25×13, 25×14, 25×18	5/16 – 1-1/16	13–27	20×14, 22×14, 25×13, 25×14, 25×18	1/2 – 1-1/16	N/A	N/A	N/A
5/16	10–27	18×11, 20×10, 20×12, 20×14, 22×11, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	3/8 – 1-1/16	16–27	25×18	5/8 – 1-1/16	N/A	N/A	N/A
3/8	12–27	20×12, 20×14, 22×14, 24×12, 25×12, 25×13, 25×14, 25×18	1/2 – 1-1/16	20–27	N/A	13/16 – 1-1/16	N/A	N/A	N/A
7/16	14–27	20×14, 22×14, 25×14, 25×18	9/16 – 1-1/16	23–27	N/A	15/16 – 1-1/16	N/A	N/A	N/A
1/2	16–27	25×18	5/8 – 1-1/16	N/A	N/A	N/A	N/A	N/A	N/A
9/16	18–27	25×18	11/16 – 1-1/16	N/A	N/A	N/A	N/A	N/A	N/A
5/8	20–25	N/A	13/16 – 15/16	N/A	N/A	N/A	N/A	N/A	N/A
11/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1.5. Design

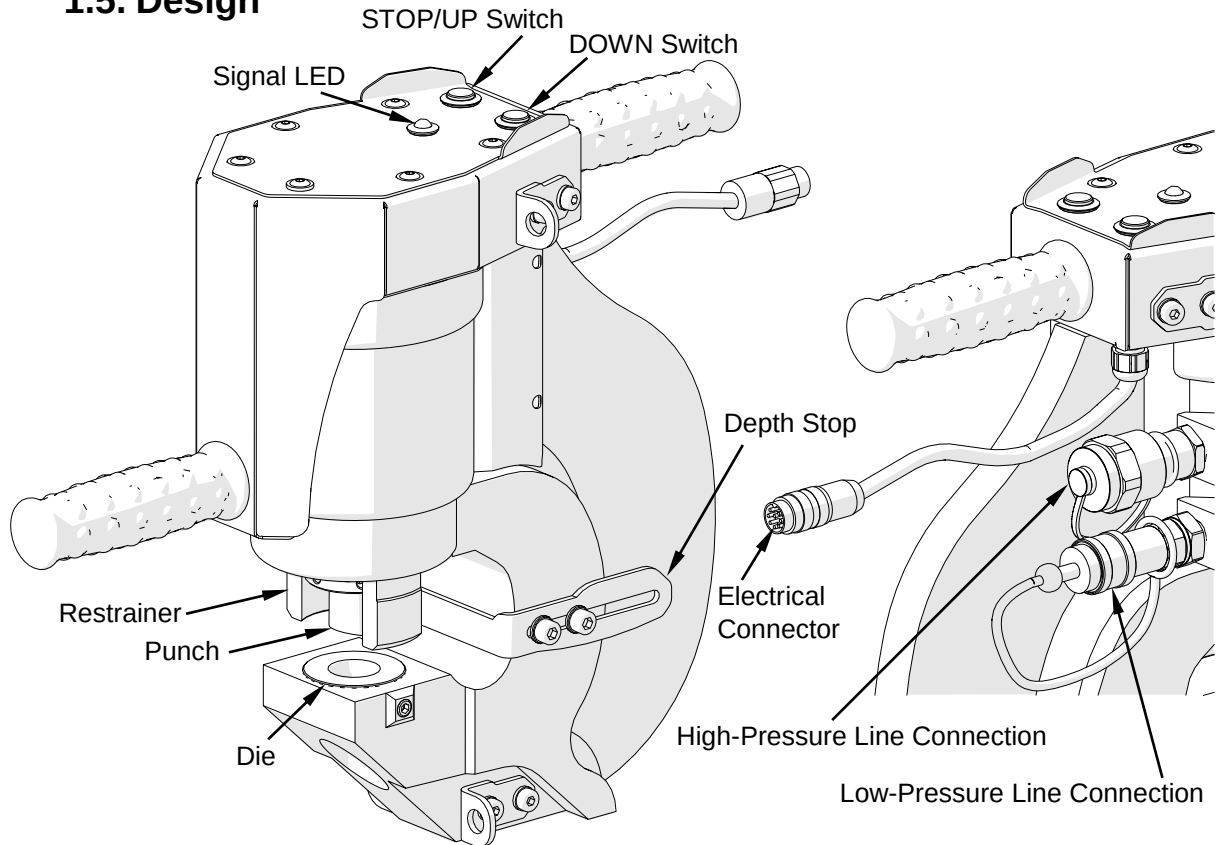


Fig. 1. View of the Hydraulic Punch

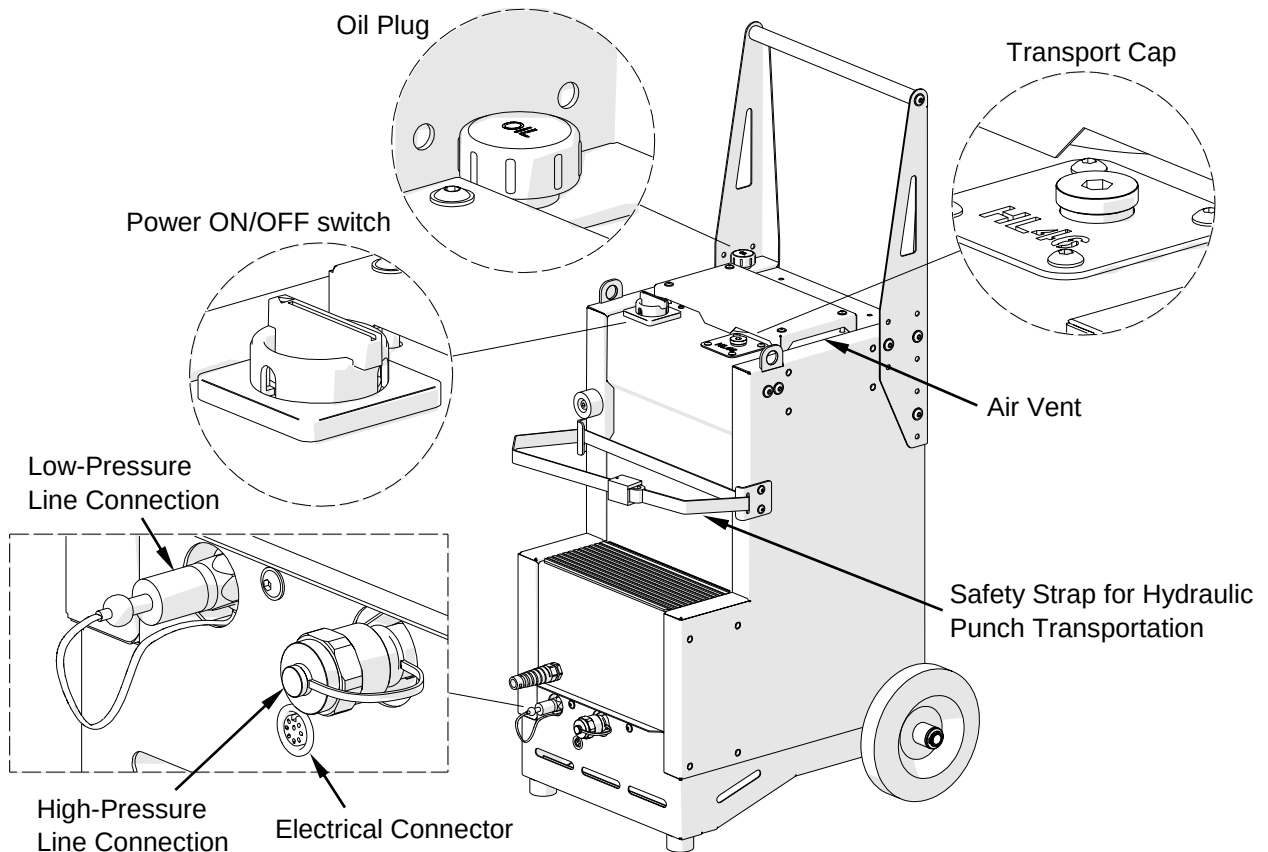


Fig. 2. View of the Hydraulic Power Pack

1.6. Equipment included

The Steelmax Hydraulic Punch includes the following elements.

Punching head	1 unit
Metal box	1 unit
16.5 ft (5 m) hydraulic hoses and control cable	1 set
Wrench	1 unit
Die drift	1 unit
Tool container	1 unit
5 ft (1.5 m) chain	1 unit
4 mm hex wrench	1 unit
5 mm hex wrench	1 unit
6 mm hex wrench	1 unit
27 mm flat wrench	1 unit
30 mm flat wrench	1 unit

The Hydraulic Power Pack is supplied on a pallet and includes the following elements.

700/1.5 Hydraulic Power Pack	1 unit
Transportation jacket	1 unit
Tool box	1 unit
Safety strap	1 unit
5 mm hex wrench	1 unit
8 mm hex wrench	1 unit

1.7. Transportation

Before transporting, fix the machine to the hydraulic power pack by catching the safety strap on the lugs *1* and *2* (Fig. 3), and then place the oil plug and the transport cap as shown in the figure (3, 4).

Never bend the high-pressure hydraulic hose to a radius less than 3.2" (80 mm) or damage to the hose will result. If the hose is bent to a smaller radius, replace the hose immediately.

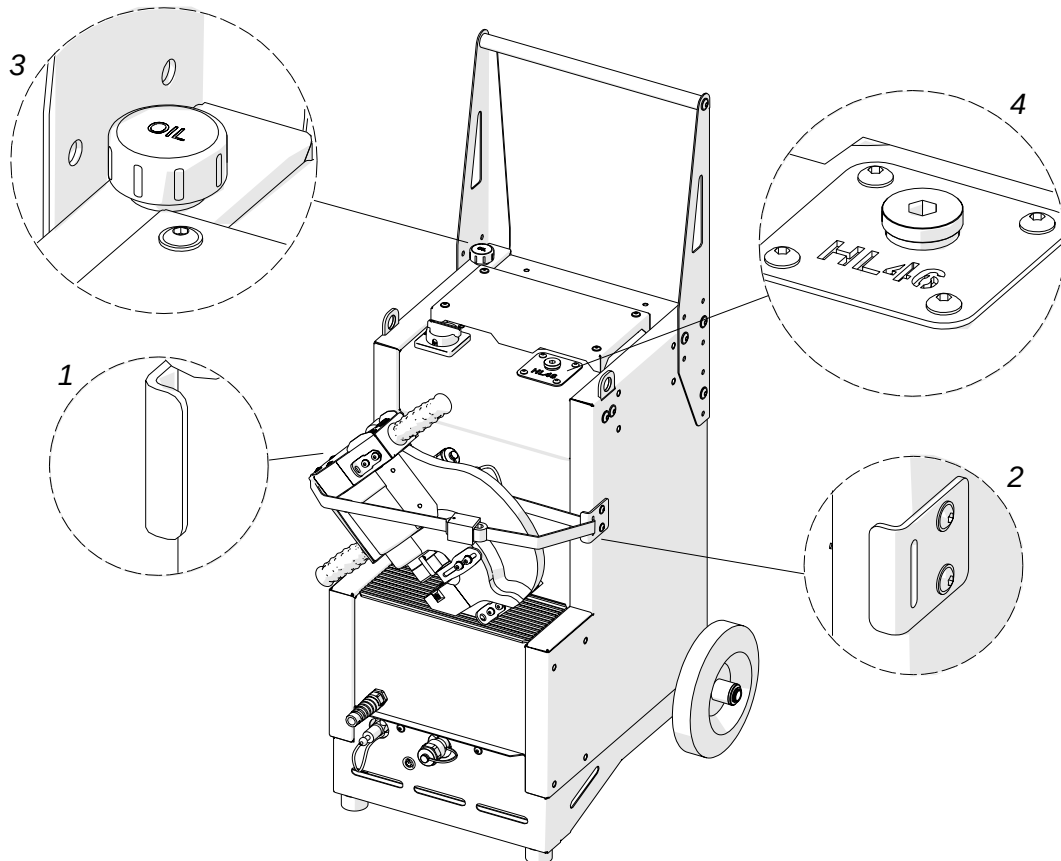


Fig. 3. Transporting the Steelmax Hydraulic Punch

2. SAFETY PRECAUTIONS

1. Before using the Steelmax Hydraulic Punch, read this Operating Manual thoroughly and complete proper occupational safety and health training.
2. The machine must be used only with HPP 700/1.5 Hydraulic Power Pack.
3. The machine, hydraulic power pack, cables, and hoses must be used only in applications specified in this Operating Manual.
4. The machine and hydraulic power pack must be complete and all their parts must be genuine and entirely operational.
5. The electrical supply specifications must conform to those specified on the rating plate of the hydraulic power pack.
6. The hydraulic power pack must be plugged into a properly grounded (earthed) socket-outlet. The electrical supply must be protected with a C25 A fuse for 230 V or a C32 A fuse for 115 V.
7. Do not cover the air vents of the hydraulic power pack.
8. Never crush or pull cables and hoses as this may damage them and result in serious injury.
9. Arrange hoses so that there are no tripping hazards. Wrap the hoses around the power pack if possible.
10. The bending radius of the high-pressure hose must never be less than 3.2" (80 mm). If the hose is bent to a smaller radius or has any signs of wear or damage, replace the hose immediately.
11. Untrained bystanders must not be present near the machine and hydraulic power pack.
12. Before beginning, check the condition of the machine, hydraulic power pack, and electrical supply, including cables and hoses, connectors, sockets, plugs, punch, and die. Make sure the high-pressure hydraulic hose is securely attached to the machine and power pack.
13. Keep the machine, hydraulic power pack, cables, and hoses dry. Exposure to direct sunlight, rain, snow, or frost should be avoided.
14. Keep the work area well lit, clean, and free of obstacles.
15. Never use machine near flammable liquids or gases, or in explosive environments.
16. Use only punches and dies specified in this Operating Manual.

17. Use dies with parallel surfaces for plates with parallel surfaces, while 5° inclined dies for plates with one surface inclined by 5°.
18. Mount punches and dies securely. Remove adjusting keys and wrenches from the work area before powering the hydraulic power pack.
19. Before every use, inspect the machine and hydraulic power pack to ensure they are not damaged. Check whether any part is cracked or improperly fitted. Make sure to maintain proper conditions that may affect the operation of the machine and hydraulic power pack.
20. Always use a face shield, hearing protection, protective footwear, gloves, and protective clothing during operation. Do not wear loose clothing.
21. Do not put hands near the restrainer during operation as this may lead to serious injury.
22. Cover steel parts with a thin anti-corrosion coating to protect the machine from rust when not in use for any extended period.
23. Maintain the machine and mount/dismount punch, die, and restrainer only with the power ON/OFF switch set to position 'O'.
24. Repair only in a service center appointed by the seller.
25. If the machine falls from any height, is wet, or has any other damage that could affect the technical state of the machine, stop the operation and immediately send the machine to the service center for inspection and repair.
26. Never leave the machine or the hydraulic power pack unattended during operation.
27. Remove the machine and power pack from the worksite and store in a secure and dry location when not in use.

3. STARTUP AND OPERATION



Adhere to all safety precautions.

3.1. Unpacking

Open the box, unscrew the lock using the 5 mm hex wrench to remove the machine, and screw in the front handle. Next, use six M8x12 screws and the 5 mm hex wrench to attach the handle to the power pack in the position shown in Fig. 4.

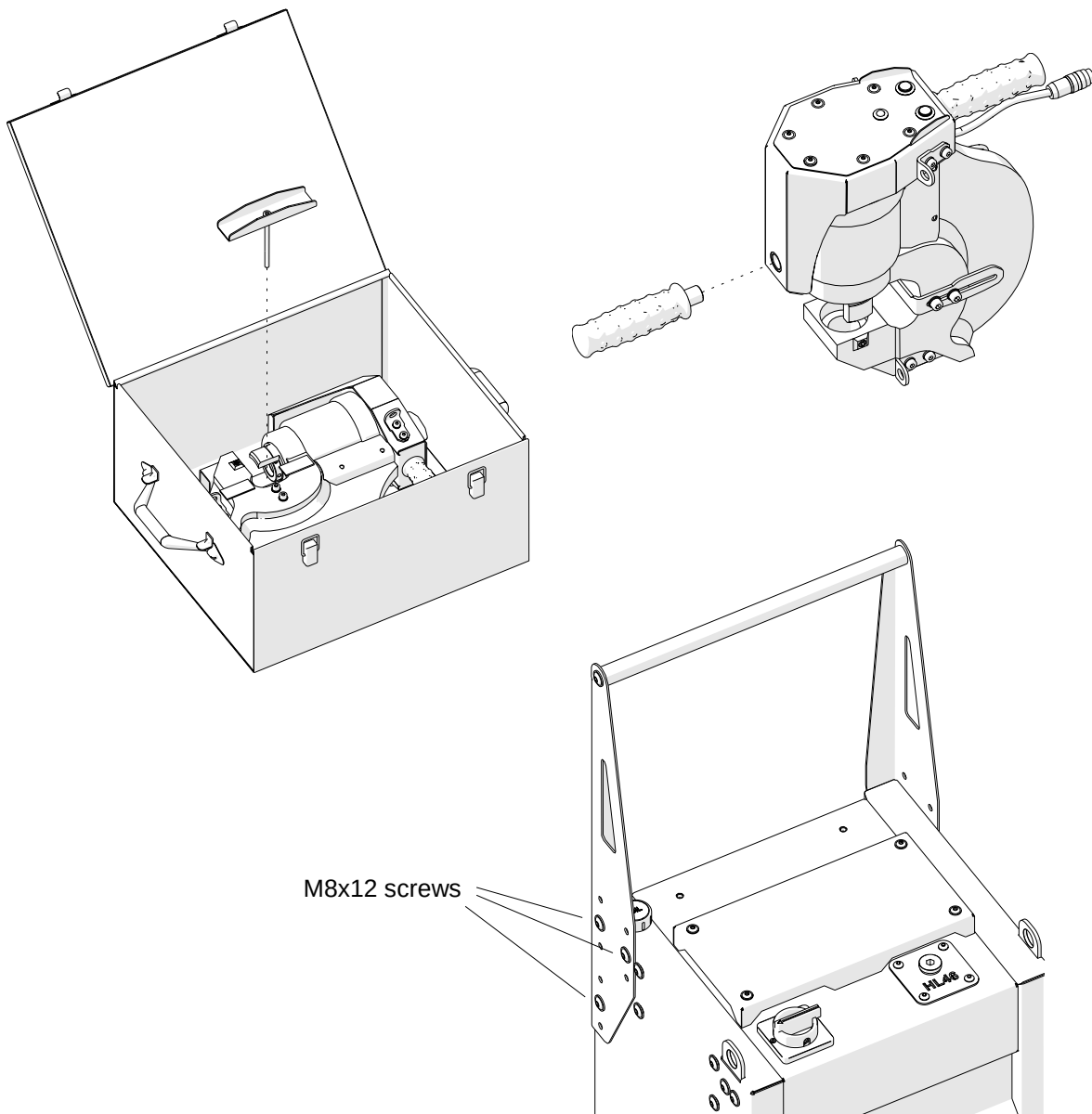


Fig. 4. Assembling the machine and the power pack after unpacking

3.2. Installing the punch and die

Set the power ON/OFF switch to the position 'O'. Then, insert the nut joined with the punch into the machine (1, Fig. 5), and screw the nut manually in the direction 2. Next, insert the wrench into the hole (3) and lock the nut by rotating the wrench in the same direction. If an oblong punch 4 is used, before locking the nut the punch pin must snap into the socket, which will be indicated by a snap sound.

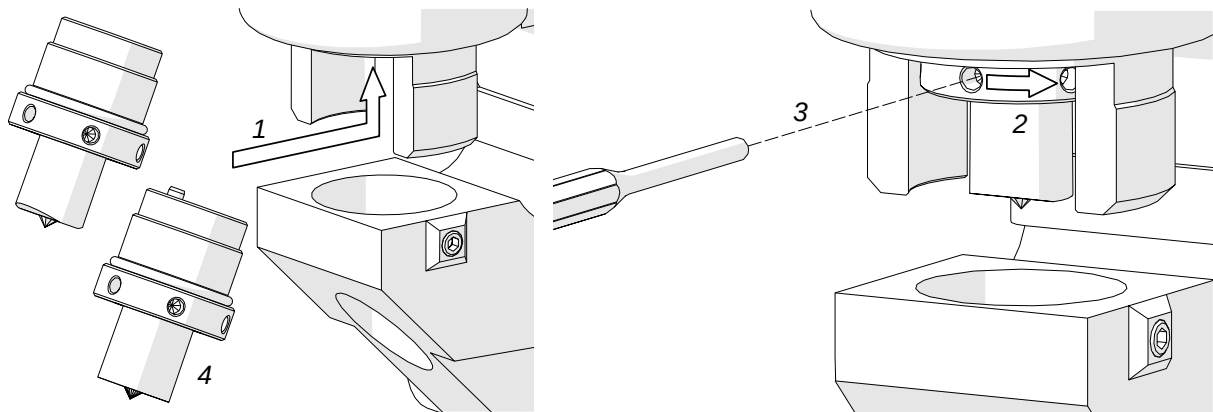


Fig. 5. Installing the punch

Select a proper die for the plate to be punched: use dies with parallel surfaces for plates with parallel surfaces, while 5° inclined dies for plates with one surface inclined by 5° (Fig. 6a). Never use dies with parallel surfaces for plates with one surface inclined, or inclined dies for plates with both surfaces parallel (Fig. 6b).

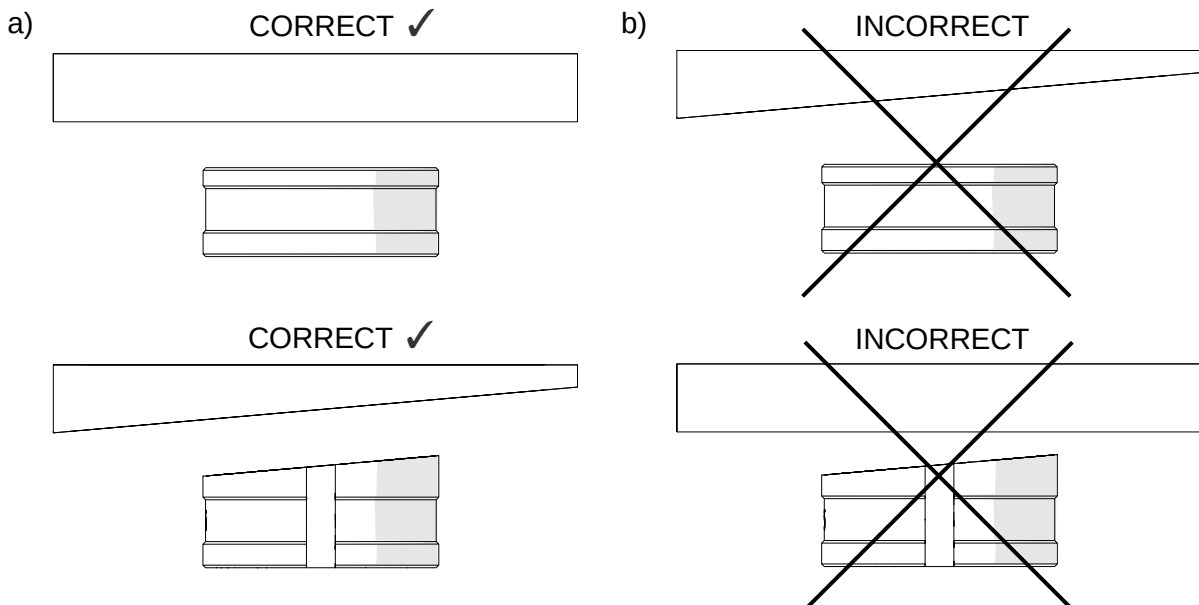


Fig. 6. Selecting a die for the plate used

Retract the restrainer as far as possible (1, Fig. 7a), rest the die onto the drift (2), and lower the drift to insert the die into the socket (3). Then, tighten the die with the 4 mm hex wrench (4). The diameters (dimensions) of the punch and die installed must be the same. Position inclined dies 5 and oblong dies 6 and 7 in such a way to align the groove with the set screw 4. Always install oblong dies and oblong punches in the same orientation (Fig. 7b).

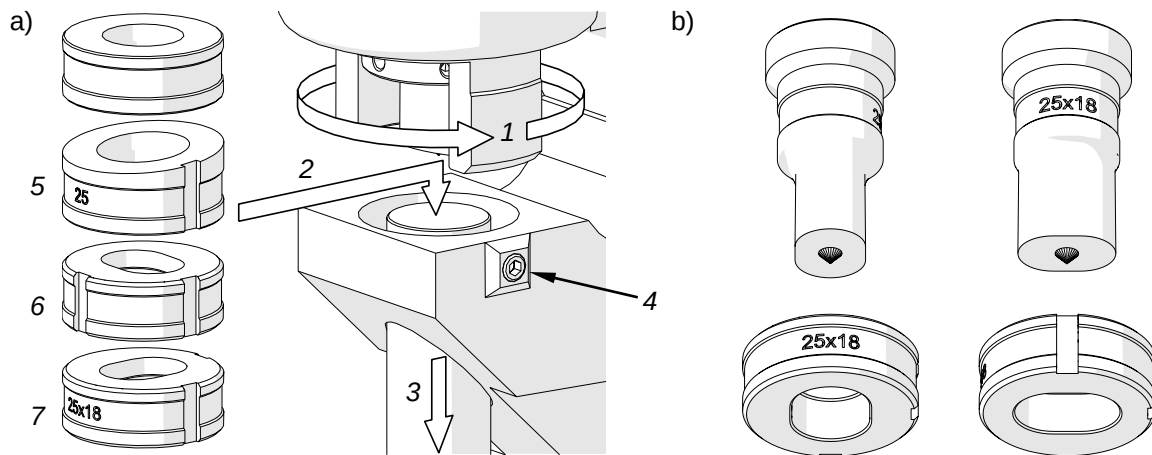


Fig. 7. Installing the die (a); correct orientation of the oblong punch and die (b)

3.3. Connecting the hydraulic power pack

Connect the machine with the hydraulic power pack using the hydraulic hoses and control cable. To do this, remove the caps from the hydraulic sockets of the machine, use the 27 mm and 30 mm flat wrenches to firmly screw the high-pressure line into the connection 1 (Fig. 8), and then plug the low-pressure line into the connection 2 until it snaps into place. Next, connect the control cable to the connector 3 and plug the power cord of the hydraulic power pack into an appropriate power source.

Every time the power pack is connected and the power ON/OFF switch is set to position 'I', the signal LED will flash every 1/2 seconds indicating the need to press and hold the STOP/UP button for about 3 seconds. This will cause the punch to retract fully if it is not already in this position.

Then, use the 8 mm hex wrench to unscrew the transport cap 4 of the hydraulic power pack and place the oil plug in cap's position 5.

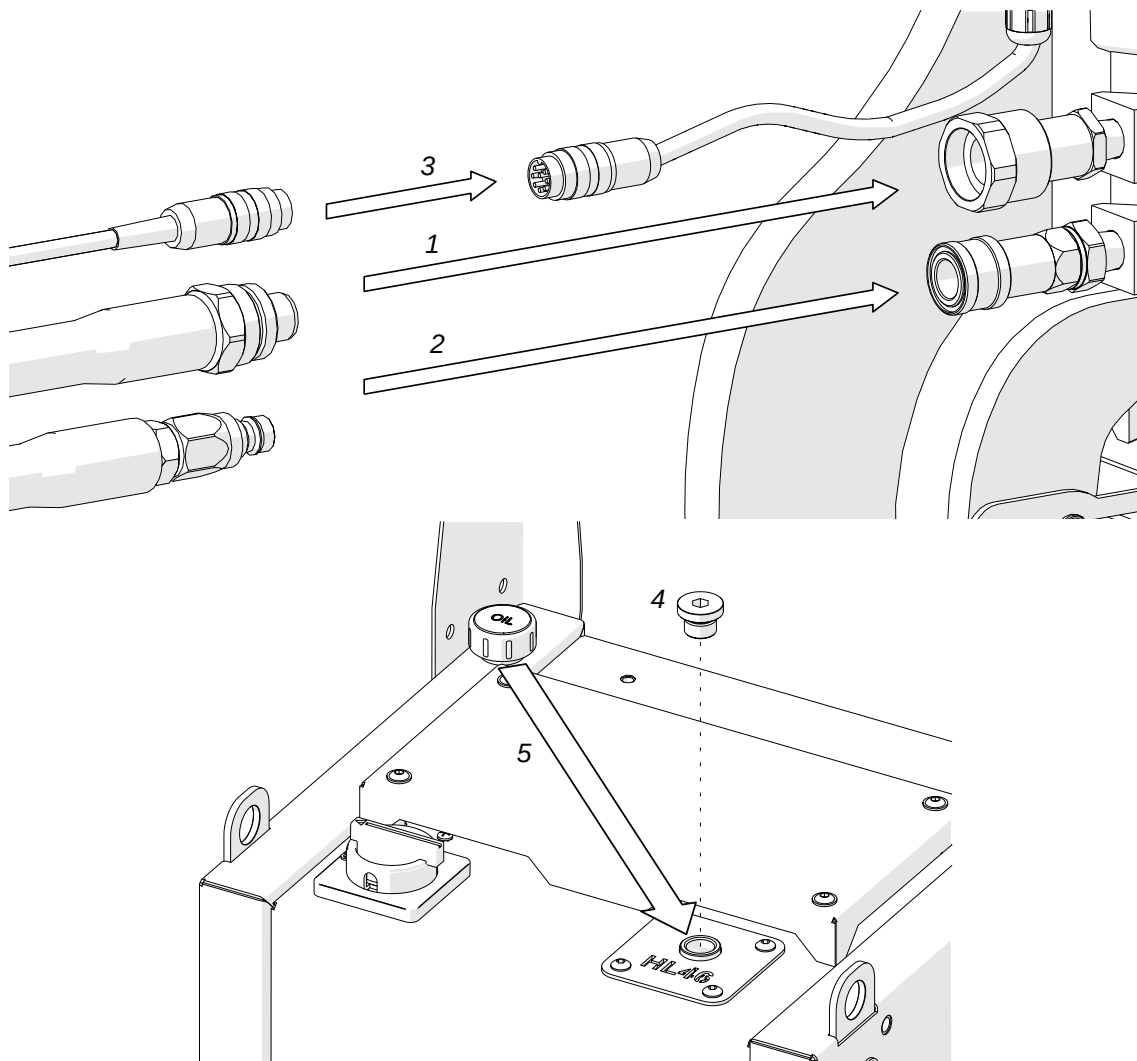


Fig. 8. Connecting the machine to the hydraulic power pack

3.4. Positioning

Hang the machine on the chain. Then, position the machine on a plate as shown in the detail from Fig. 9, with the restrainer located above the plate and the punch tip placed into a center-punch mark indicating the center of the hole to be made, and press the machine down to the plate. The restrainer must be rotated such that to be above the plate, but not outside the plate, to allow the entire support of the restrainer during retraction of the punch. Next, loosen four depth stop screws using the 6 mm hex wrench, adjoin the depth stop to the plate, and tighten in this position.

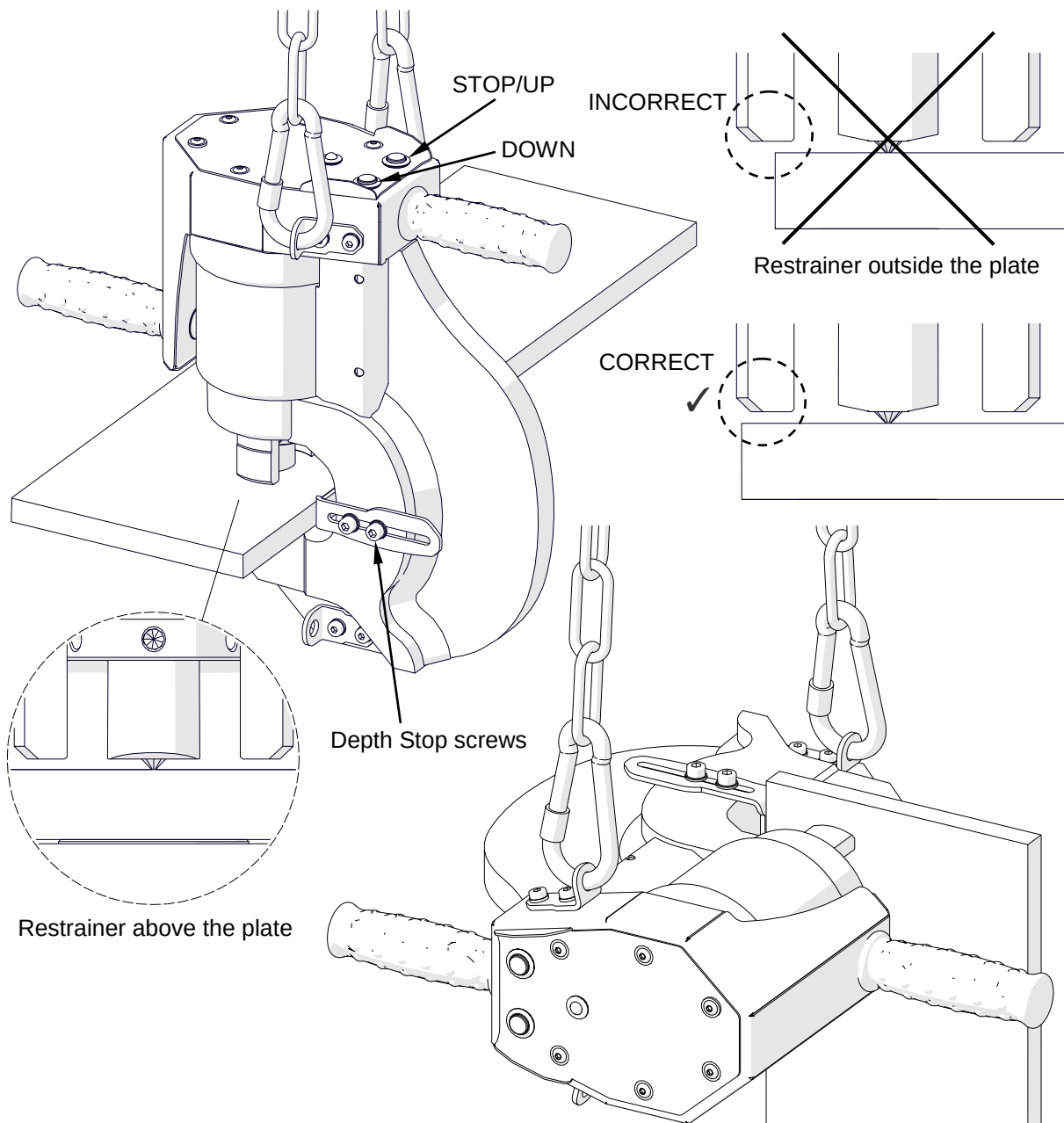


Fig. 9. Positioning the machine on the plate

3.5. Punching

Operate the machine by holding the handles with both hands. The continuous LED light indicates the machine is ready to operate. Press and hold the DOWN button to move the punch toward the plate. This will be indicated by the LED flashing every 0.25 seconds. When the punch reaches the plate, the automatic punching process should start, indicated by the LED flashing every 0.1 seconds. After the end of the punching process the punch will return to the initial position. Punching thin plates may require the DOWN button to be held until the hole is established. To interrupt the motion at any time, press the STOP/UP button. Pressing the STOP/UP button again will retract the punch. If penetrating the material fails because of excessive thickness, the motion will stop. To avoid this, do not exceed the maximum plate thickness or the value of the shear strength R_m specified in “Maximum plate thicknesses...” section.

After establishing the first hole, and then after every 100 holes, check whether the punch and die are tight, and re-tighten as necessary.

To establish a second hole, move the machine to a next center-punch mark. Once the work is finished, toggle the power pack ON/OFF switch to the position ‘O’.

Maintain a proper oil level indication on the gauge of the hydraulic power pack. Change oil after 3,000 operating hours. Use HLP 46 oil.

3.6. Replacing the die and punch

Set the power ON/OFF switch to the position ‘O’. To dismount the die, retract the restrainer fully (1, Fig. 10) and use the 4 mm hex wrench to loosen the set screw 2. Then, use the drift (3) and remove the die (4).

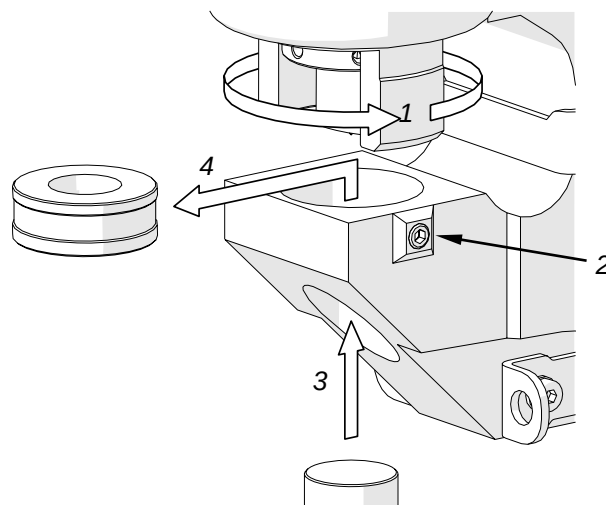


Fig. 10. Dismounting the die

Mount the die as shown in Fig. 7a.

To dismount the punch, insert the wrench into the hole (1, Fig. 11), unscrew the nut by rotating it in direction 2, and remove the nut joined with the punch (3).

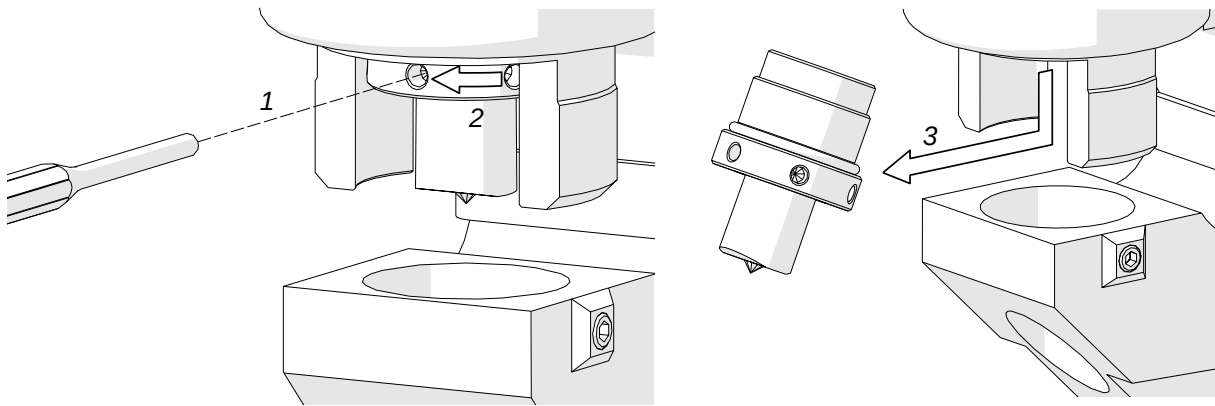


Fig. 11. Dismounting the punch

Mount the punch as shown in Fig. 5.

3.7. Replacing the restrainer

Set the power ON/OFF switch to position 'O', dismount the punch as shown in Fig. 11, and unscrew the restrainer by rotating it in the direction shown in Fig. 12. Screw the new restrainer by rotating in the opposite direction.

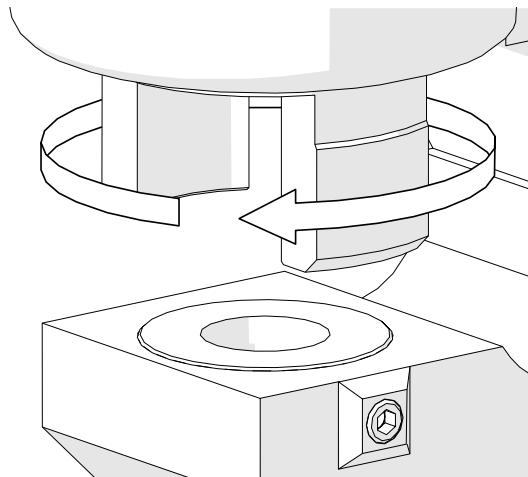


Fig. 12. Removing the restrainer

3.8. Troubleshooting

Problem	Cause	Solution
Punch stuck in the workpiece during up movement after the hole is established.	Die with parallel surfaces used for an inclined plate, 5° inclined die used for a plate with parallel surfaces, or one surface of the plate not inclined by 5° when used with a 5° inclined die. Restrainer not supported on the workpiece during the punching process. Excessive wear of the punch or die.	Use a die with parallel surfaces for a plate with parallel surfaces, while a 5° inclined die for a plate which one surface is inclined by 5°. Position the machine as described in “Positioning” section of the manual. Replace worn tools.
Punch cracked during retraction.	Restrainer was not entirely supported on the workpiece during retraction of the punch.	Position the machine as described in “Positioning” section of the manual.
Punch cracked during punching the workpiece.	Excessive load during punching caused by too high thickness of the plate or too high shear strength R_m of the plate. Punch or die improperly mounted.	Choose a punch of the proper diameter for the plate thickness. Do not exceed the maximum plate thickness or the value of shear strength R_m specified in “Maximum plate thicknesses...”. Mount the punch and die as described in “Mounting the punch and die” section of the manual.
Punch does not retract automatically after the hole is established or while STOP/UP button is held.	High-pressure hydraulic hose not securely attached to either the machine or the power pack. Hydraulic hoses not attached.	Unscrew the high-pressure hose, attach it again, and tighten its sleeve fully. Attach the hoses as described in “Connecting the hydraulic power pack” section of the manual.
Automatic punching process does not start when the punch reaches the plate.	Plate undetected because of low load when punching a thin plate.	Hold DOWN button until the hole is established.
Punch does not retract automatically after the hole is established manually by holding DOWN button.	Automatic punching process was not initialized because of low load when punching a thin plate.	Hold STOP/UP button to retract the punch.

Problem	Cause	Solution
Punch does not move down while DOWN button is held.	Machine not restarted once connected to a supply, which is indicated by the status LED flashing every 0.5 seconds.	Press and hold STOP/UP button for about 3 seconds. LED flashing should turn into continuous light indicating the machine is ready to operate.
	High-pressure hydraulic hose is not securely attached to either the machine or the power pack.	Unscrew the high-pressure hose, attach it again, and tighten its sleeve fully.
	Hydraulic hoses not attached.	Attach the hoses as described in "Connecting the hydraulic power pack" section of the manual.
Punch movement stopped after penetrating the workpiece.	Excessive load during punching caused by too high thickness of the plate or too high shear strength R_m of the plate.	Choose a punch of the proper diameter for the plate thickness. Do not exceed the maximum plate thickness or the value of shear strength R_m specified in "Maximum plate thicknesses...".
	Punch or die improperly mounted, different diameters (dimensions) of the punch and die installed, or oblong die and oblong punch not mounted in the same orientation.	Mount the punch and die as described in "Mounting the punch and die" section of the manual.
	Excessive voltage drop in the power source. Voltage dropped below 200 V for a 230 V supply or below 95 V for a 115 V supply.	Connect the machine as close as possible to the electric power distribution station of sufficiently high power. Use an extension cord with the length of at most 10 m (33 ft), which cross-section is at least 2.5 mm ² .
Punch deformed the workpiece during up movement.	Relatively low width of the plate in relation to the punch diameter.	Lubrication of the cylindrical surface of the punch may help. Use pressing oil or machine oil.
	Excessive wear of the restrainer.	Replace the restrainer as described in "Replacing the restrainer".
	Curved workpiece.	Use a flat workpiece.

4. ACCESSORIES

4.1. Punches and dies

Steelmax offers a comprehensive line of punches and dies for our Hydraulic Punches, in both Imperial and Metric sizes for making both circular and oblong or oval holes in flat plate. In addition, we offer 5° inclined dies for use on beam flanges and other similar applications.

Circular Punches and Dies – Metric Sizes (Including Inclined Dies)									
Ø [mm]	Circular punch	Circular die	Maximum plate thickness [mm]						5° inclined circular die
			PRO 60 HP			PRO 110 HP			
			S235JR mild steel R _m < 70,000 psi	355J2 G3 hard steel R _m = 70,000–90,000 psi	stainless steel R _m = 90,000–110,000 psi	S235JR mild steel R _m < 70,000 psi	355J2 G3 hard steel R _m = 70,000–90,000 psi	stainless steel R _m = 90,000–110,000 psi	
7	STM-0507-20-18-00-0	MTY-0507-40-18-00-0	5.6	3.5	2.8	5.6	3.5	2.8	–
8	STM-0507-20-17-00-0	MTY-0507-40-17-00-0	6.4	4.0	3.2	6.4	4.0	3.2	–
9	STM-0507-20-16-00-0	MTY-0507-40-16-00-0	7.2	4.5	3.6	7.2	4.5	3.6	MTY-0507-50-16-00-0
10	STM-0507-20-15-00-0	MTY-0507-40-15-00-0	8.0	5.0	4.0	8.0	5.0	4.0	MTY-0507-50-15-00-0
11	STM-0507-20-14-00-0	MTY-0507-40-14-00-0	8.8	5.5	4.4	8.8	5.5	4.4	MTY-0507-50-14-00-0
12	STM-0507-20-13-00-0	MTY-0507-40-13-00-0	9.6	6.0	4.8	9.6	6.0	4.8	MTY-0507-50-13-00-0
13	STM-0507-20-12-00-0	MTY-0507-40-12-00-0	10.4	6.5	5.2	10.4	6.5	5.2	MTY-0507-50-12-00-0
14	STM-0507-20-11-00-0	MTY-0507-40-11-00-0	11.2	7.0	6.0	11.2	7.0	6.0	MTY-0507-50-11-00-0
15	STM-0507-20-10-00-0	MTY-0507-40-10-00-0	12.0	7.5	6.0	12.0	7.5	6.0	MTY-0507-50-10-00-0
16	STM-0507-20-09-00-0	MTY-0507-40-09-00-0	12.8	8.0	6.0	12.8	8.0	6.0	MTY-0507-50-09-00-0
17	STM-0507-20-08-00-0	MTY-0507-40-08-00-0	13.0	8.5	6.0	13.6	8.5	6.0	MTY-0507-50-08-00-0
18	STM-0507-20-07-00-0	MTY-0507-40-07-00-0	13.0	9.0	6.0	14.4	9.0	6.0	MTY-0507-50-07-00-0
19	STM-0507-20-06-00-0	MTY-0507-40-06-00-0	13.0	9.5	6.0	15.2	9.5	6.0	MTY-0507-50-06-00-0
20	STM-0507-20-05-00-0	MTY-0507-40-05-00-0	13.0	10.0	5.0	16.0	10.0	6.0	MTY-0507-50-05-00-0
21	STM-0507-20-04-00-0	MTY-0507-40-04-00-0	13.0	10.5	5.0	16.0	10.5	6.0	MTY-0507-50-04-00-0
22	STM-0507-20-03-00-0	MTY-0507-40-03-00-0	13.0	10.3	5.0	16.0	11.0	6.0	MTY-0507-50-03-00-0
23	STM-0507-20-02-00-0	MTY-0507-40-02-00-0	12.4	9.9	4.0	16.0	11.5	6.0	MTY-0507-50-02-00-0
24	STM-0507-20-01-00-0	MTY-0507-40-01-00-0	11.9	9.5	4.0	16.0	12.0	6.0	MTY-0507-50-01-00-0
25	STM-0507-20-00-00-0	MTY-0507-40-00-00-0	11.4	9.1	4.0	16.0	12.5	6.0	MTY-0507-50-00-00-0
26	STM-0507-20-19-00-0	MTY-0507-40-19-00-0	11.0	8.7	4.0	15.1	12.0	6.0	MTY-0507-50-19-00-0
27	STM-0507-20-20-00-0	MTY-0507-40-20-00-0	10.6	8.4	4.0	14.5	11.5	6.0	MTY-0507-50-20-00-0

Oval (Oblong) Punches and Dies – Metric Sizes									
Dimensions [mm×mm]	Inch Decimal Equivalent	Oblong Punch	Oblong Die	Maximum plate thickness [mm]					
				PRO 60 HP			PRO 110 HP		
				S235JR mild steel $R_m < 70,000$ psi	355J2 G3 hard steel $R_m = 70,000-90,000$ psi	stainless steel $R_m = 90,000-110,000$ psi	S235JR mild steel $R_m < 70,000$ psi	355J2 G3 hard steel $R_m = 70,000-90,000$ psi	stainless steel $R_m = 90,000-110,000$ psi
16×8	0.630×0.315	STM-0507-30-13-00-0	MTY-0507-70-13-00-0	6.4	4.0	3.2	6.4	4.0	3.2
18×9	0.709×0.354	STM-0507-30-12-00-0	MTY-0507-70-12-00-0	7.2	4.5	3.6	7.2	4.5	3.6
18×11	0.709×0.433	STM-0507-30-11-00-0	MTY-0507-70-11-00-0	8.8	5.5	4.4	8.8	5.5	4.4
20×10	0.787×0.394	STM-0507-30-10-00-0	MTY-0507-70-10-00-0	8.0	5.0	4.0	8.0	5.0	4.0
20×12	0.787×0.472	STM-0507-30-09-00-0	MTY-0507-70-09-00-0	9.6	6.0	4.8	9.6	6.0	4.8
20×14	0.787×0.551	STM-0507-30-08-00-0	MTY-0507-70-08-00-0	11.2	7.0	6.0	11.2	7.0	6.0
22×11	0.866×0.433	STM-0507-30-07-00-0	MTY-0507-70-07-00-0	8.8	5.5	4.4	8.8	5.5	4.4
22×14	0.866×0.551	STM-0507-30-06-00-0	MTY-0507-70-06-00-0	11.2	7.0	6.0	11.2	7.0	6.0
24×12	0.945×0.472	STM-0507-30-05-00-0	MTY-0507-70-05-00-0	9.6	6.0	4.8	9.6	6.0	4.8
25×9	0.984×0.354	STM-0507-30-04-00-0	MTY-0507-70-04-00-0	7.2	4.5	3.6	7.2	4.5	3.6
25×12	0.984×0.472	STM-0507-30-03-00-0	MTY-0507-70-03-00-0	9.6	6.0	4.8	9.6	6.0	4.8
25×13	0.984×0.512	STM-0507-30-02-00-0	MTY-0507-70-02-00-0	10.4	6.5	5.2	10.4	6.5	5.2
25×14	0.984×0.551	STM-0507-30-01-00-0	MTY-0507-70-01-00-0	11.2	7.0	6.0	11.2	7.0	6.0
25×18	0.984×0.709	STM-0507-30-00-00-0	MTY-0507-70-00-00-0	13.0	9.0	6.0	14.4	9.0	6.0

Circular Punches and Dies – Imperial Sizes									
Ø ["]	Decimal equivalent	Circular Punch	Circular Die	Maximum plate thickness [mm]					
				PRO 60 HP			PRO 110 HP		
				S235JR mild steel $R_m < 70,000$ psi	355J2 G3 hard steel $R_m = 70,000-90,000$ psi	stainless steel $R_m = 90,000-110,000$ psi	S235JR mild steel $R_m < 70,000$ psi	355J2 G3 hard steel $R_m = 70,000-90,000$ psi	stainless steel $R_m = 90,000-110,000$ psi
5/16	0.3125	STM-0507-20-33-00-0	MTY-0507-40-33-00-0	6.4	4.0	3.2	6.4	4.0	3.2
3/8	0.3750	STM-0507-20-32-00-0	MTY-0507-40-32-00-0	8.0	5.0	4.0	8.0	5.0	4.0
7/16	0.4375	STM-0507-20-31-00-0	MTY-0507-40-31-00-0	8.8	5.5	4.4	8.8	5.5	4.4
1/2	0.5000	STM-0507-20-30-00-0	MTY-0507-40-30-00-0	10.4	6.5	5.2	10.4	6.5	5.2
9/16	0.5625	STM-0507-20-29-00-0	MTY-0507-40-29-00-0	11.2	7.0	6.0	11.2	7.0	6.0
5/8	0.6250	STM-0507-20-28-00-0	MTY-0507-40-28-00-0	12.8	8.0	6.0	12.8	8.0	6.0
11/16	0.6875	STM-0507-20-27-00-0	MTY-0507-40-27-00-0	13.0	9.0	6.0	14.4	9.0	6.0
3/4	0.7500	STM-0507-20-26-00-0	MTY-0507-40-26-00-0	13.0	9.5	6.0	15.2	9.5	6.0
13/16	0.8125	STM-0507-20-25-00-0	MTY-0507-40-25-00-0	13.0	10.5	5.0	16.0	10.5	6.0
7/8	0.8750	STM-0507-20-24-00-0	MTY-0507-40-24-00-0	13.0	10.3	5.0	16.0	11.0	6.0
15/16	0.9375	STM-0507-20-23-00-0	MTY-0507-40-23-00-0	11.9	9.5	4.0	16.0	12.0	6.0
1	1.0000	STM-0507-20-22-00-0	MTY-0507-40-22-00-0	11.0	8.7	4.0	15.1	12.0	6.0
1-1/16	1.0625	STM-0507-20-21-00-0	MTY-0507-40-21-00-0	10.6	8.4	4.0	14.5	11.5	6.0

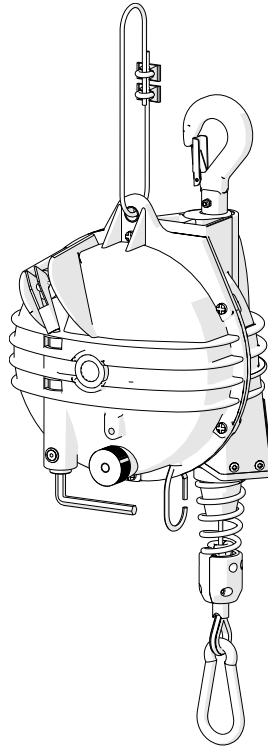
4.2. Balancer

Allows suspending the machine, balancing its weight, and lifting/lowering the machine.

Part number:

BLN-000004 (PRO 60 HP)

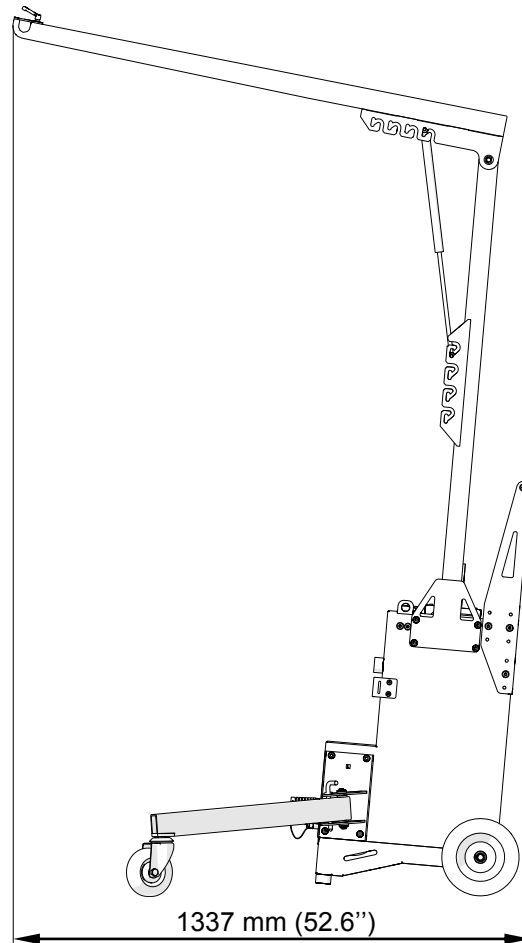
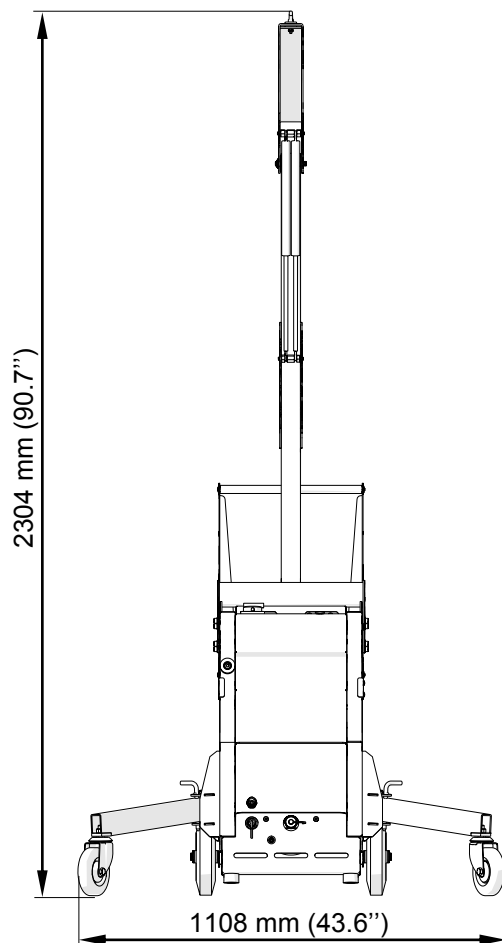
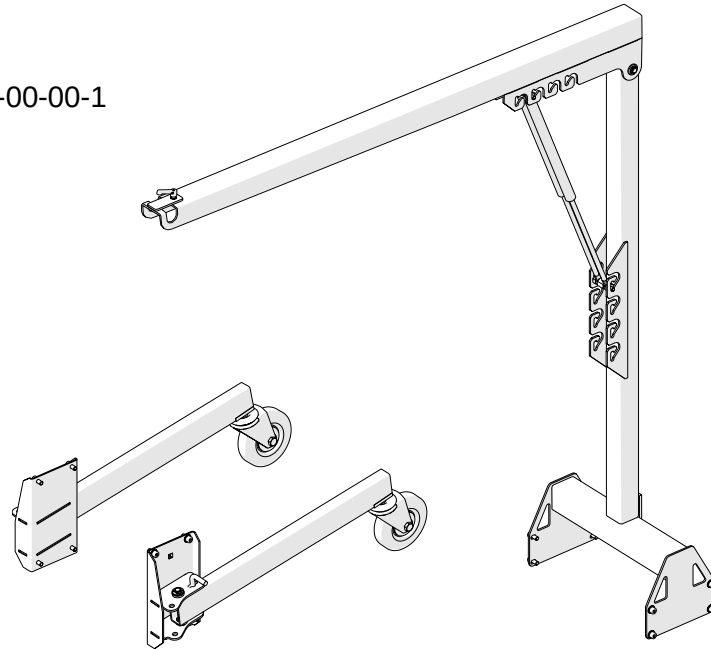
BLN-000005 (PRO 110 HP)



4.3. Crane

Allows suspending the machine, balancing its weight, and moving the machine along with the power pack.

Part number:
ZUR-0517-15-00-00-1



The included equipment consists of:

Crane base with arm	1 unit
Left support	1 unit
Right support	1 unit
M8x16 screw	16 units
8.5 mm round washer	16 units
Gas spring unit	1 unit
Locking pin	2 units
M6x20 handlever	1 unit
6.4 mm round washer	1 unit
Locking plate	1 unit

To mount the crane, screw the crane base into top holes on both power pack sides with eight M8x16 screws and 8.5 mm washers (1, Fig. 13) using the 6 mm hex wrench. Place the locking pins into the supports in position shown in detail 2 and use next eight M8x16 screws and 8.5 mm washers (3) to screw the supports into lower holes of the power pack. Then, remove the pins, slightly tilt the power pack backwards, and rotate the supports according to the arrow direction 4 to rest the power pack on the support wheels. Lock the supports in this position by placing the pins in location 5.

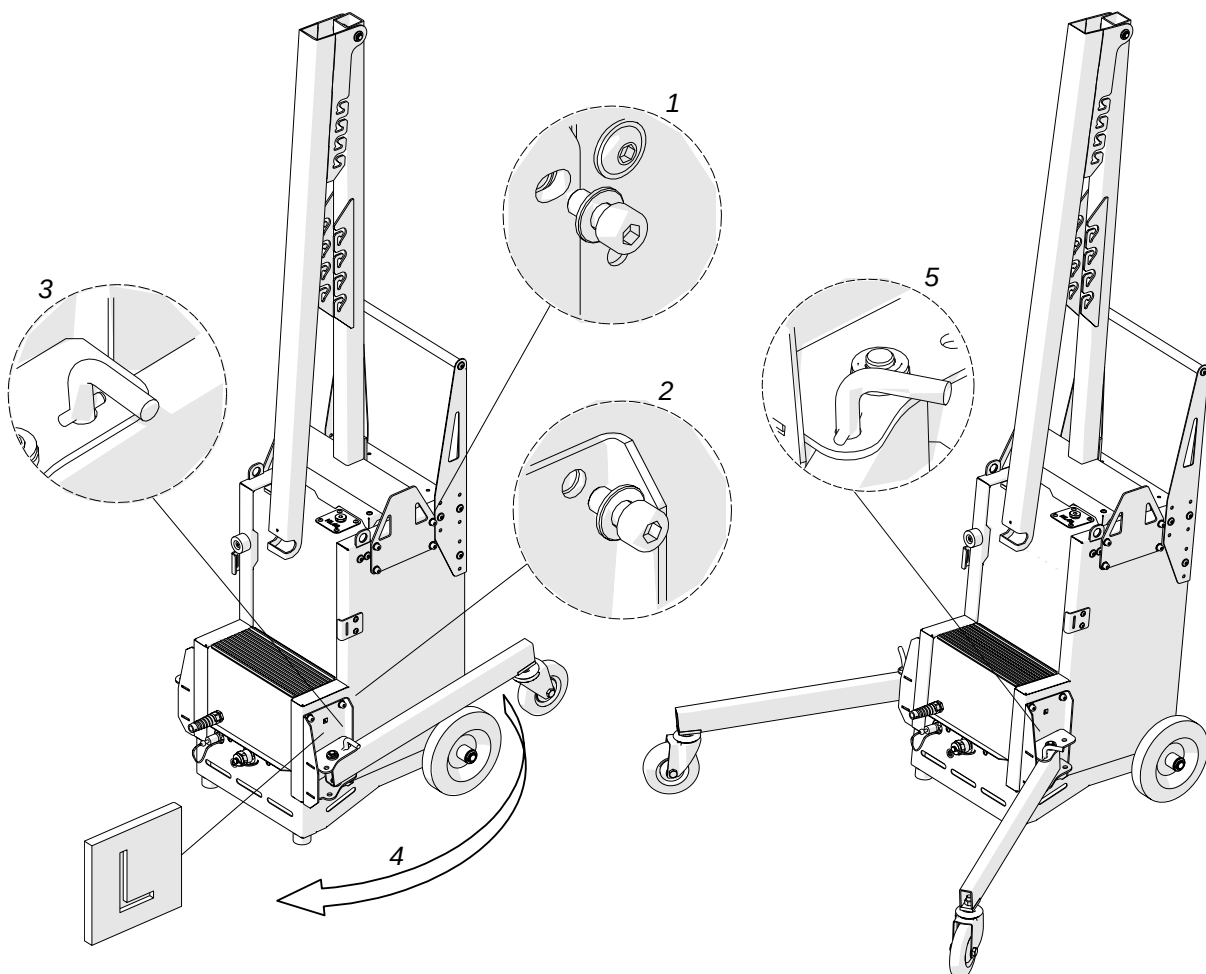


Fig. 13. Mounting the crane base and the supports

Mount the gas spring unit between the crane arm and the crane base as shown in Fig. 14. Place the unit in such an arm socket (1) to set a force that will balance the weight of the machine. Insert the piston rod into the base socket on the required height (2). Finally, hang the machine with the chain on the arm end (3), and lock the chain with the locking plate (4), 6.4 mm washer (5), and M6x20 handlever (6). To set a different force or height, remove the machine with the chain and position the gas spring unit in an adjacent socket of the comb 1 or 2, respectively.

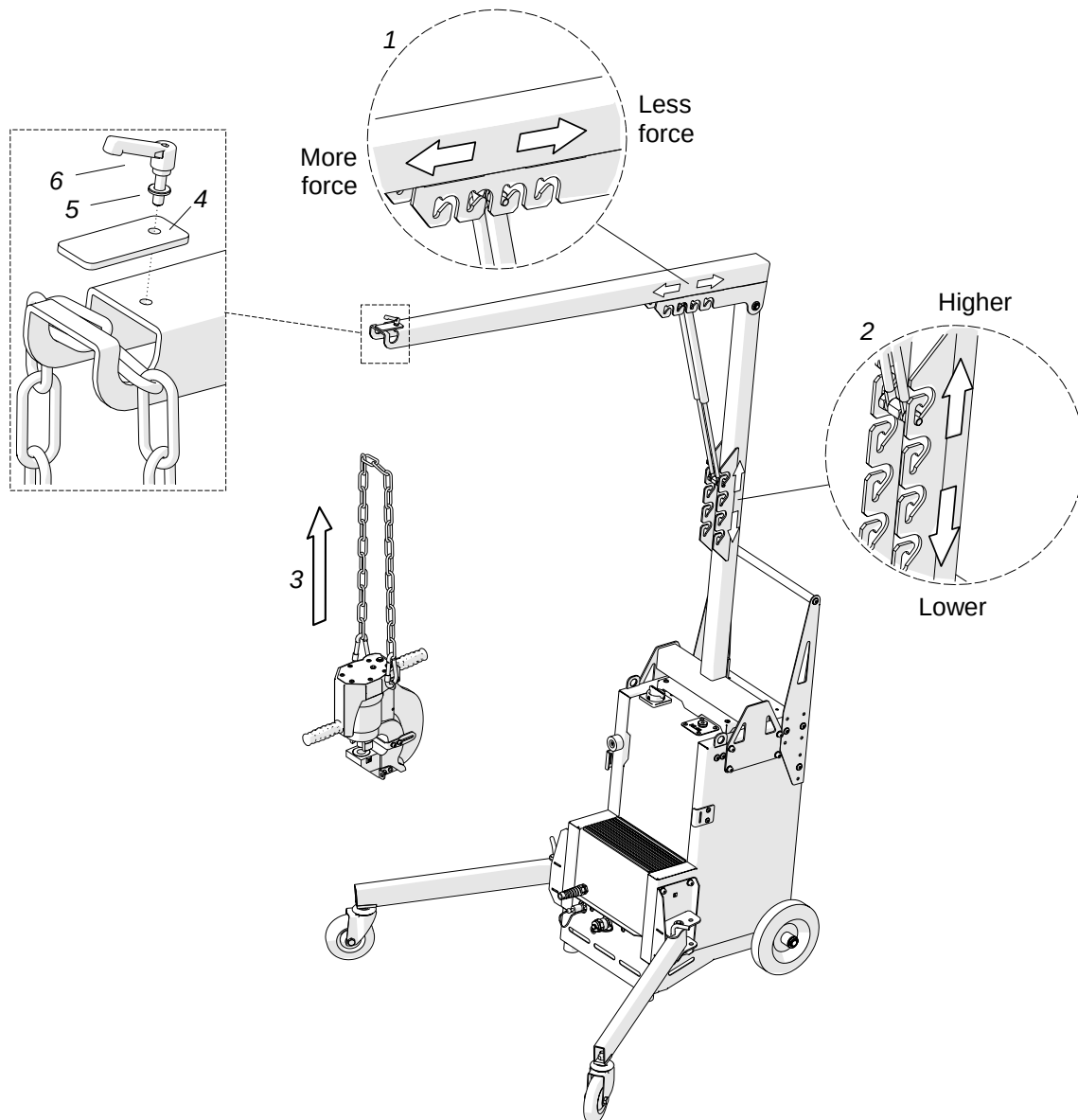
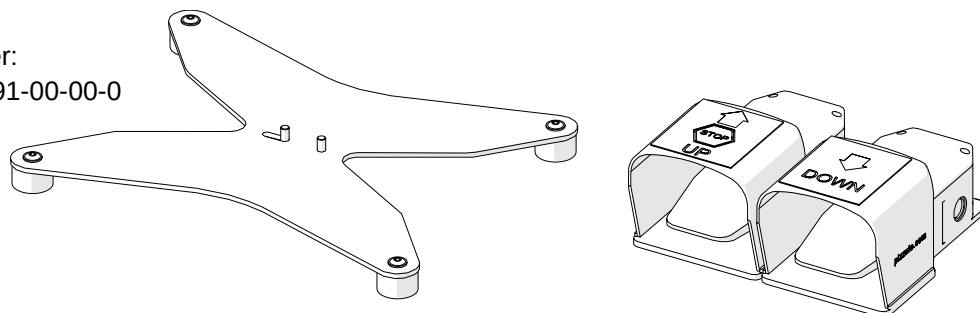


Fig. 14. Mounting the machine and setting the force and height of the crane

4.4. Stationary work set

Allows operating the machine in a stationary position. The dual foot switch functions as the STOP/UP and DOWN machine buttons to allow the punch to stop, raise, and lower.

Part number:
ZST-0507-91-00-00-0



The included equipment consists of:

Support	1 unit
M8x20 screw	2 units
8.5 mm round washer	2 units
Dual foot switch	1 unit

To mount the set, position the machine upside down and attach the support with two M8x20 screws and two 8.5 mm washers using the 6 mm hex wrench (Fig. 15).

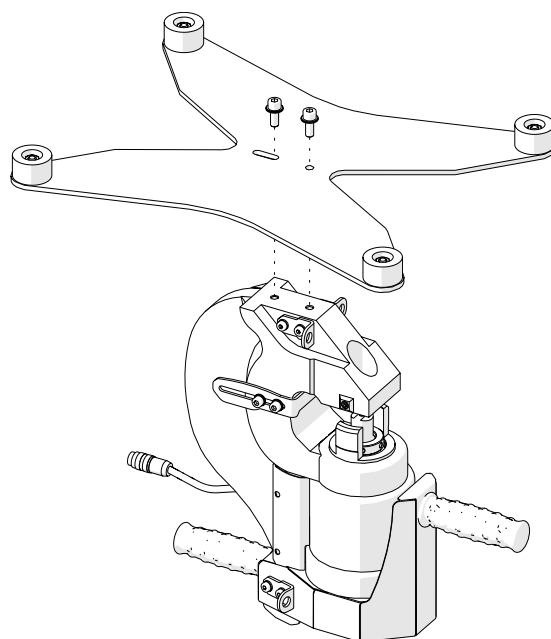


Fig. 15. Mounting the support

Position the machine the right way up and rotate the restrainer in the direction shown in Fig. 16 to position the restrainer 0.08" (2 mm) above the plate. However, never unscrew the restrainer more than 0.35" (9 mm) indicated. Then, connect two cables of the foot switch to the connectors of the machine and control cable.

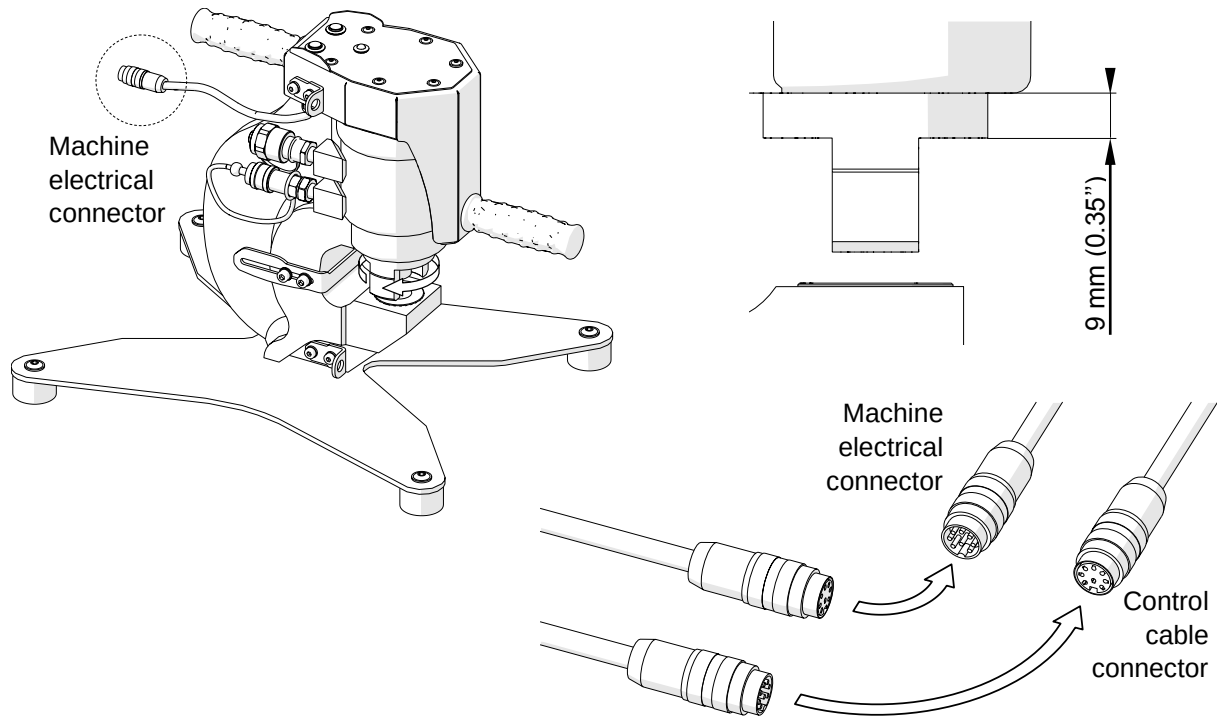
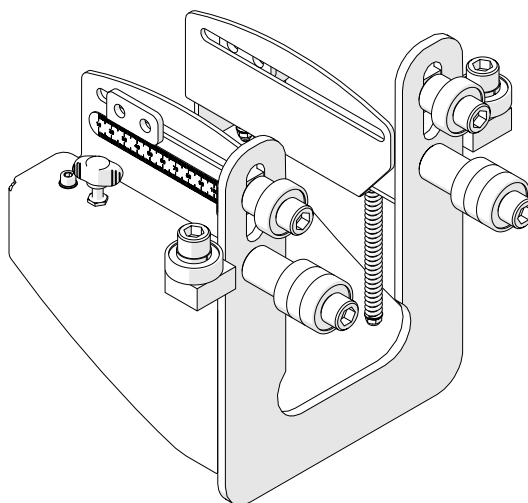


Fig. 16. Connecting the foot switch to the machine and hydraulic power pack

4.5. Guide

Allows guiding the machine along the workpiece.

Part number (for PRO 110 HP):
PRW-0507-90-00-00-0
(two special washers and
10 mm hex wrench included)



Loosen the wing screws (1, Fig. 17) fully and use the 10 mm hex wrench to loosen the upper bearings 2. Next, position the guide on the plate in such a way to bring the lower, upper, and side bearings in close contact with the plate (3). Tighten the upper bearings in this position.

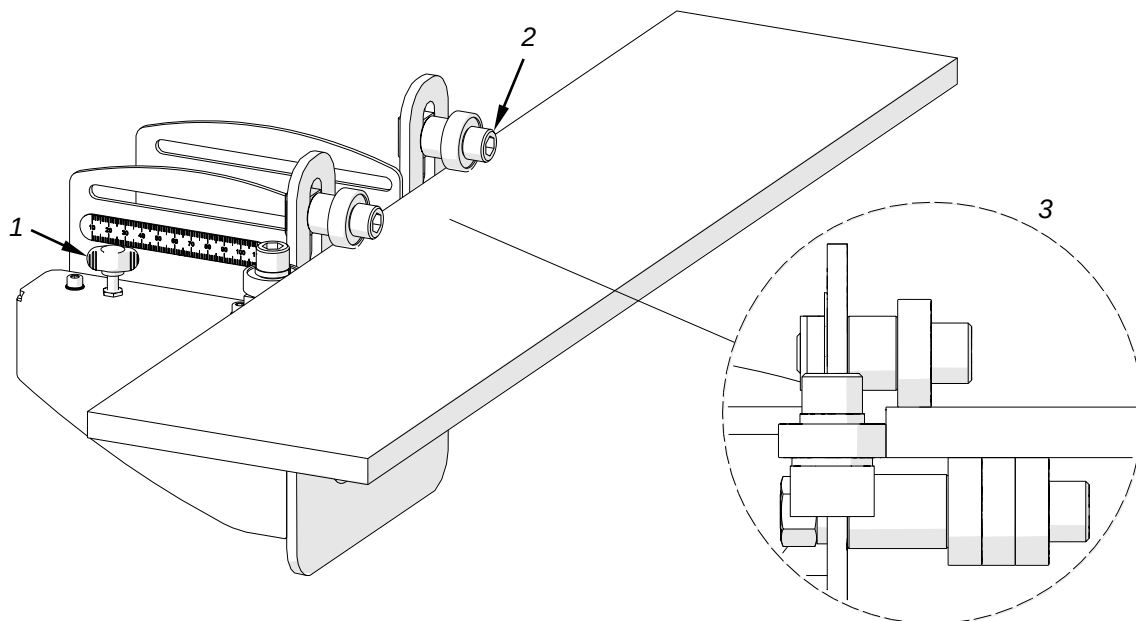


Fig. 17. Mounting the guide on the plate

Dismount the depth stop from the machine using the 6 mm hex wrench and position the machine upside down. Next, mount the guide (1, Fig. 18) by lightly tightening the depth stop screws and washers and two additional special washers (2).

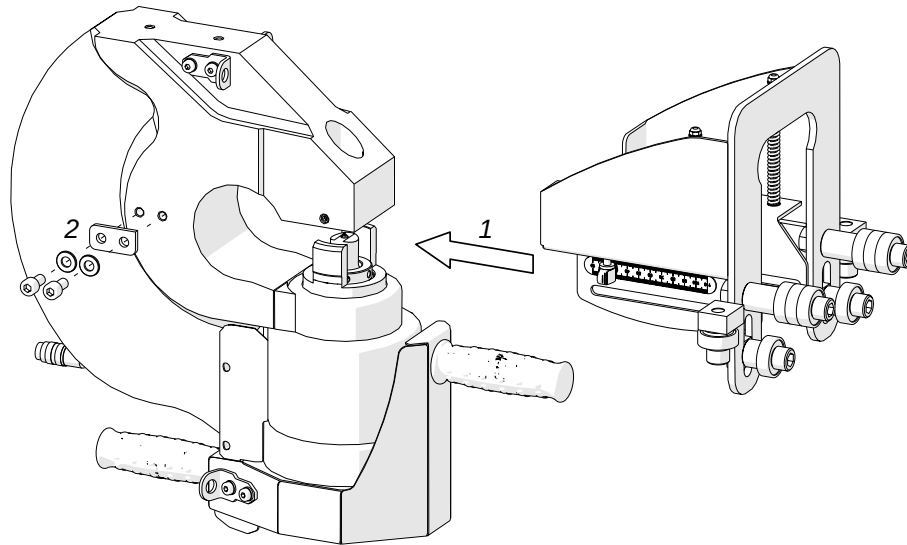


Fig. 18. Mounting the guide on the machine

Position the machine the right way up on the plate in such a manner to place the punch above a previously center-punched mark indicating the center of the hole to be made. Then, use the DOWN button to slightly penetrate the punch into the plate (1, Fig. 19). Next, press the die to the plate by pulling the front handle upwards (2) and fully tighten the screws 3 in this position. Release the front handle and tighten the screws 4 to such an extent that will press the die to the plate again. Then, lower the restrainer to position it 2 mm (0.08") above the plate (5). However, never unscrew the restrainer more than 9 mm (0.35") indicated.

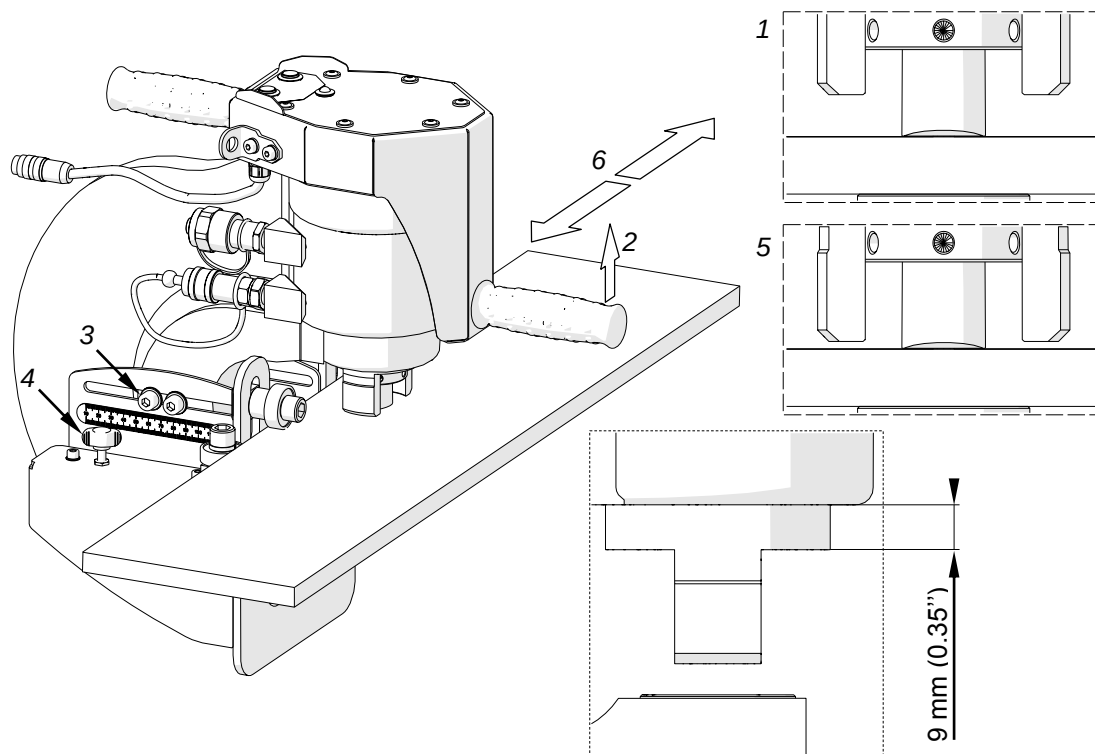


Fig. 19. Positioning the machine with the mounted guide on the plate

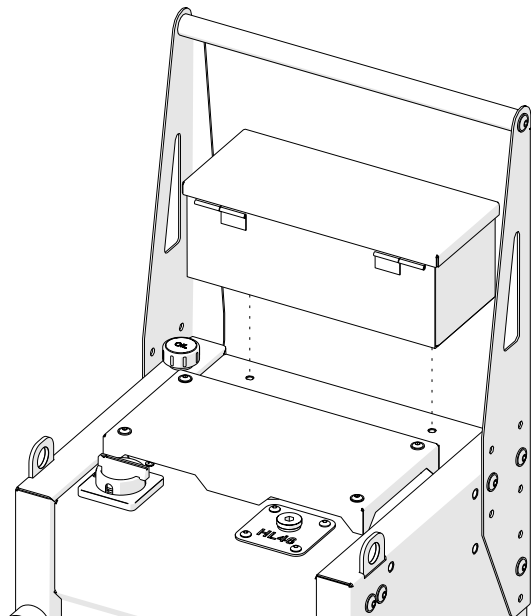
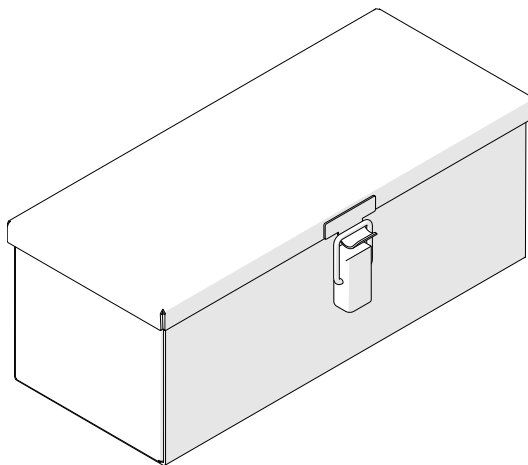
Punch through the plate and once the punch is retracted, move the machine in the direction 6 to a next center-punch mark, pressing the machine against the plate face. If the mark is at a different distance from the plate face than is the center of the first hole, loosen the four screws 3, adjust the position of the guide, and tighten the screws in this new position.

The machine with the mounted guide must always be held with both hands when positioned on the plate.

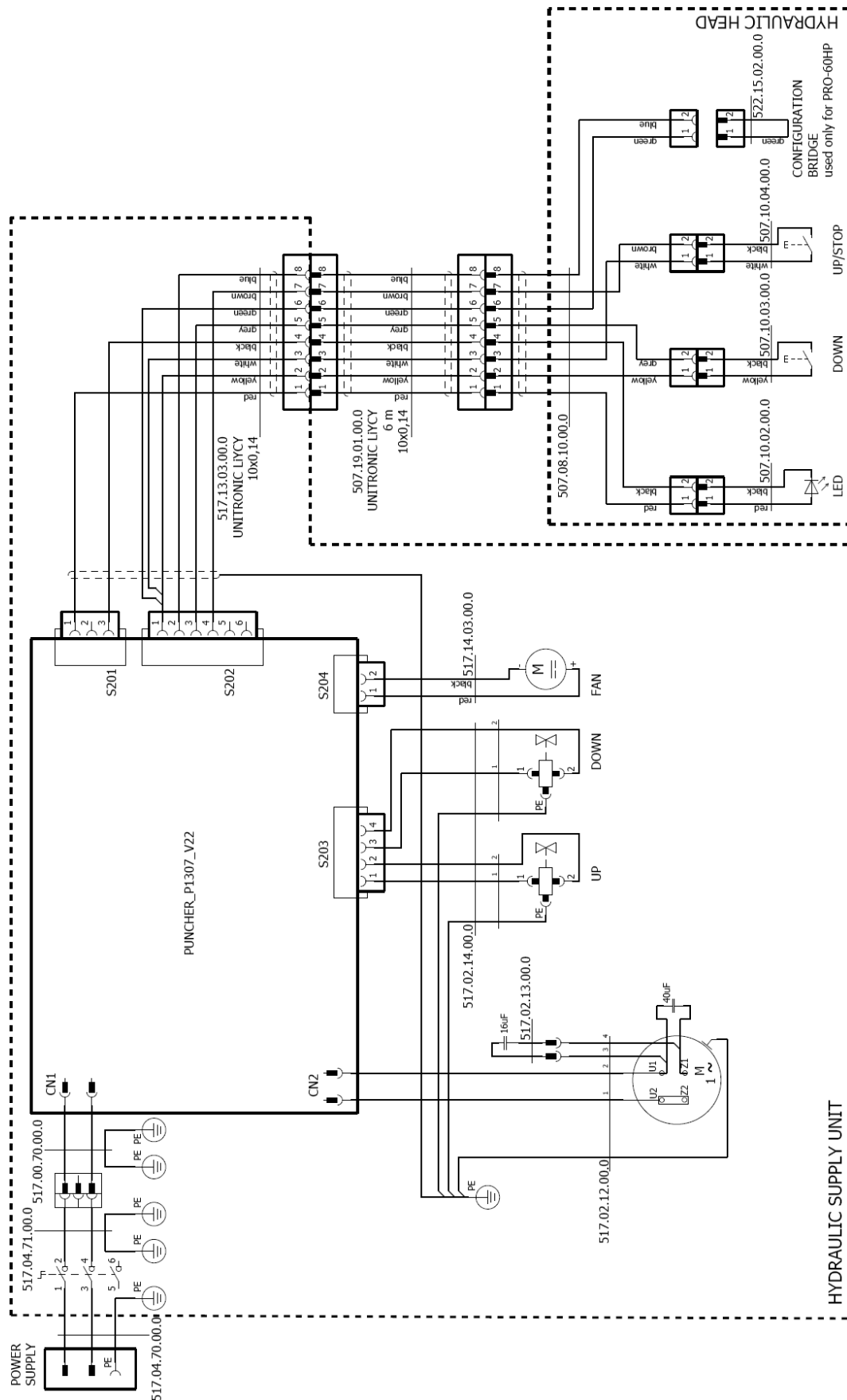
4.6. Tool box

Designed to store tools. Mount on the power pack with two M6x12 screws using the 4 mm hex wrench.

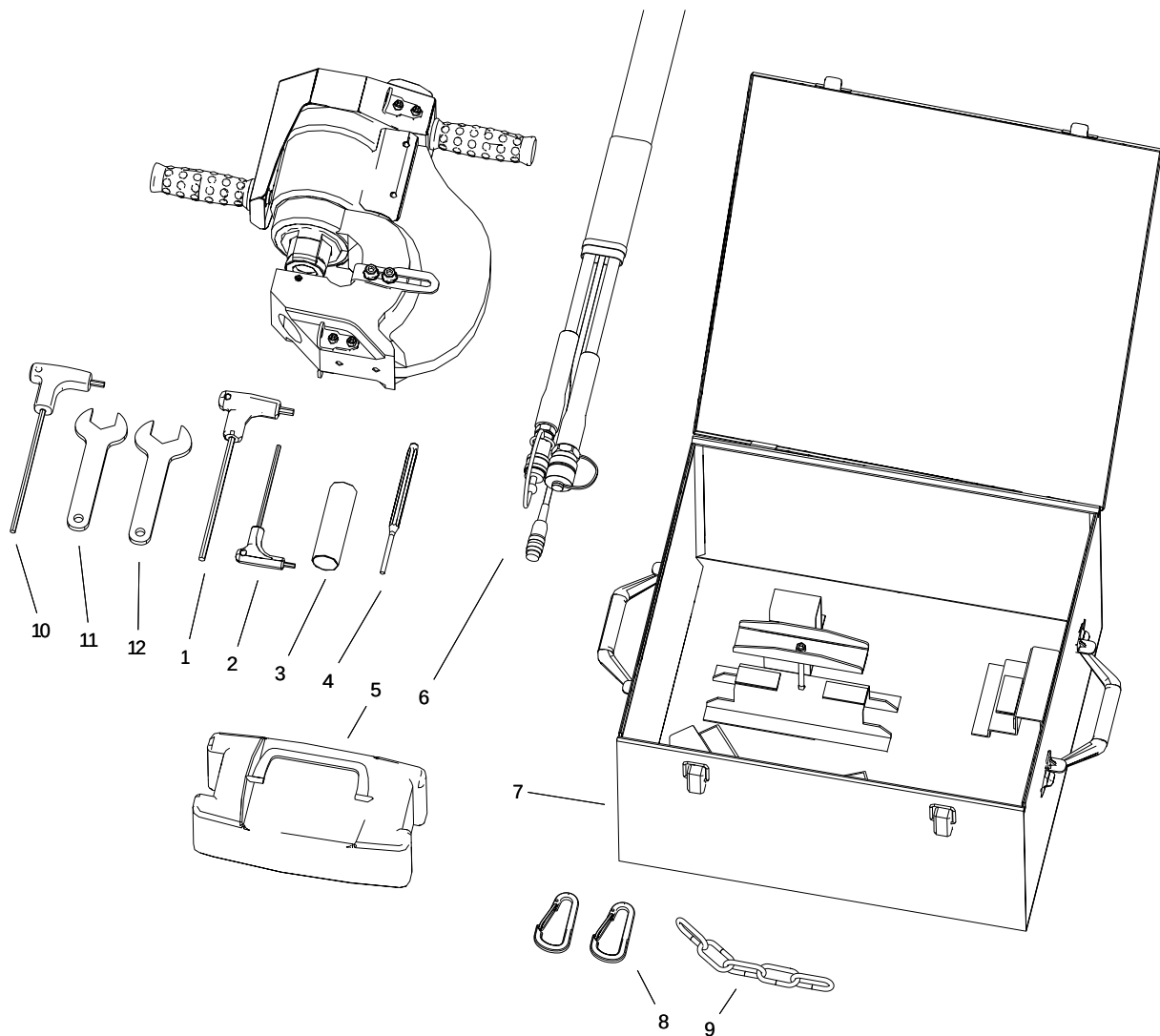
Part number:
SKR-0517-92-00-00-0
(two M6x12 screws included)



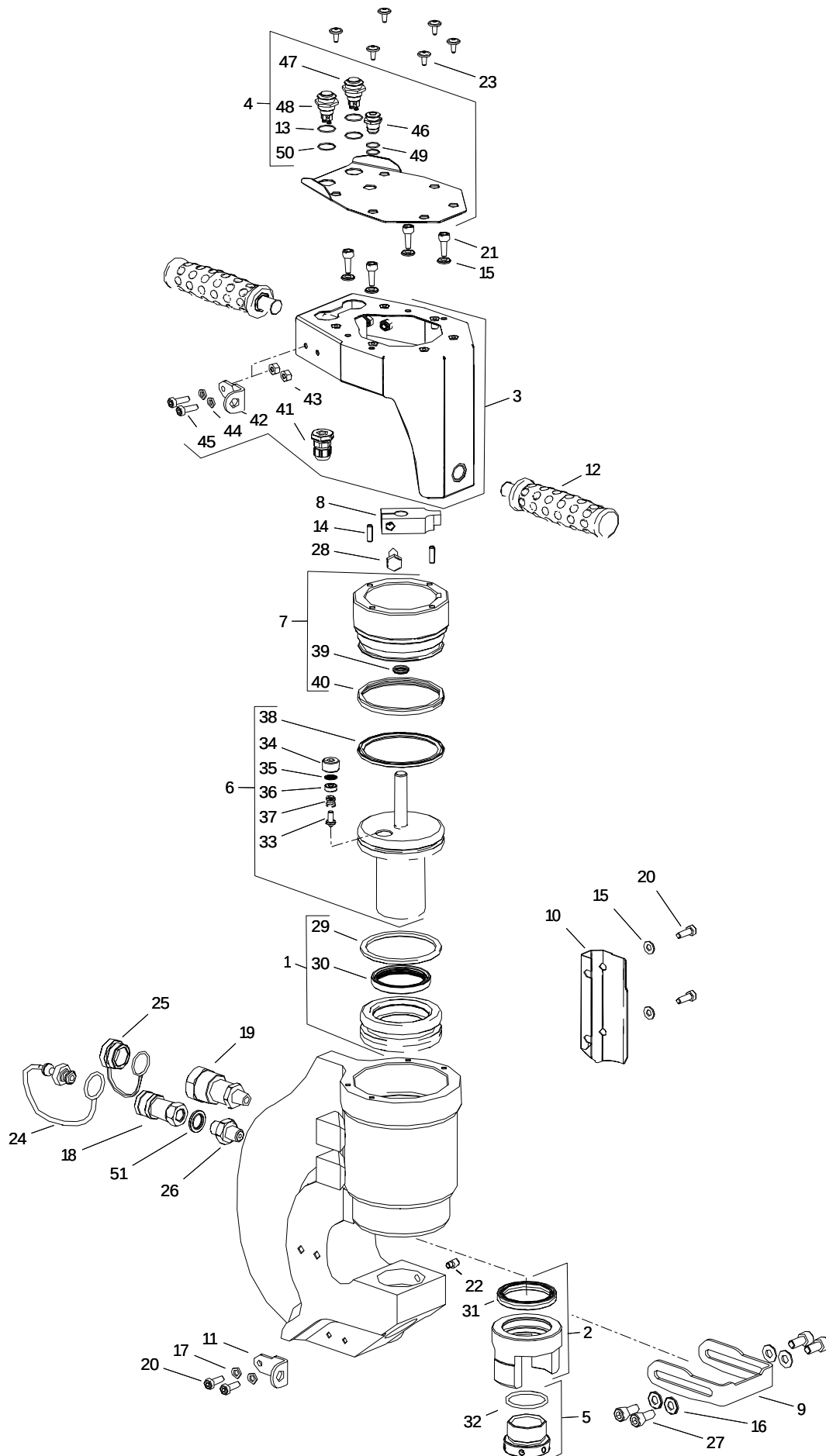
5. WIRING DIAGRAM



6. PRO 60 HP EXPLODED DRAWINGS AND PARTS LIST

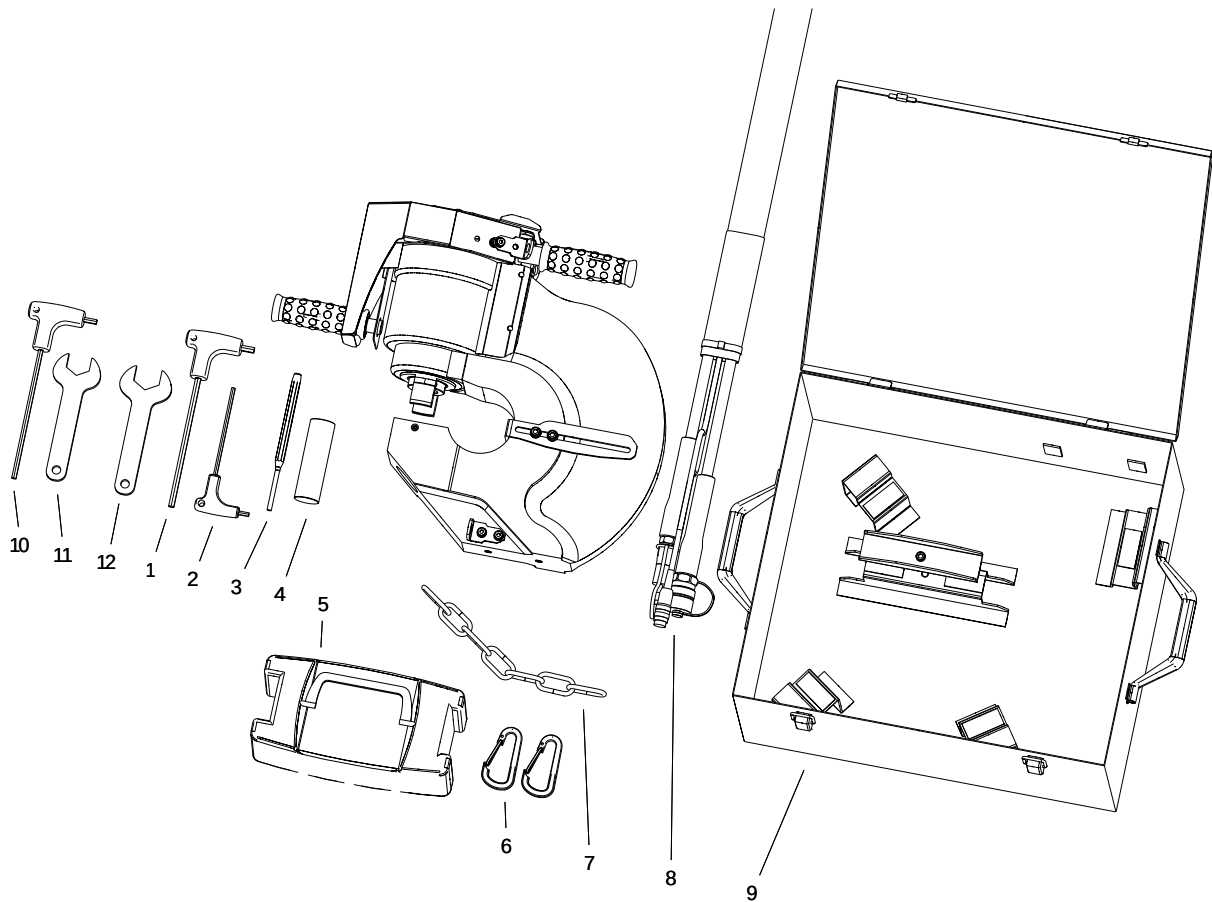


ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	KLC-000038	6 MM HEX WRENCH WITH HANDLE	1
2	KLC-000036	4 MM HEX WRENCH WITH HANDLE	1
3	WBJ-0507-14-00-00-0	DIE DRIFT	1
4	WBJ-000001	WRENCH	1
5	PJM-000010	TOOL CONTAINER	1
6	PWD-0507-19-00-00-5	HYDRAULIC HOSES AND CONTROL CABLE	1
7	SKR-0522-16-00-00-0	METAL BOX	1
8	KRB-000001	SNAP HOOK	2
9	LNC-000008	CHAIN 1.5 m	1
10	KLC-000037	5 MM HEX WRENCH WITH HANDLE	1
11	KLC-0507-92-01-00-0	27 MM FLAT WRENCH	1
12	KLC-0507-92-02-00-0	30 MM FLAT WRENCH	1

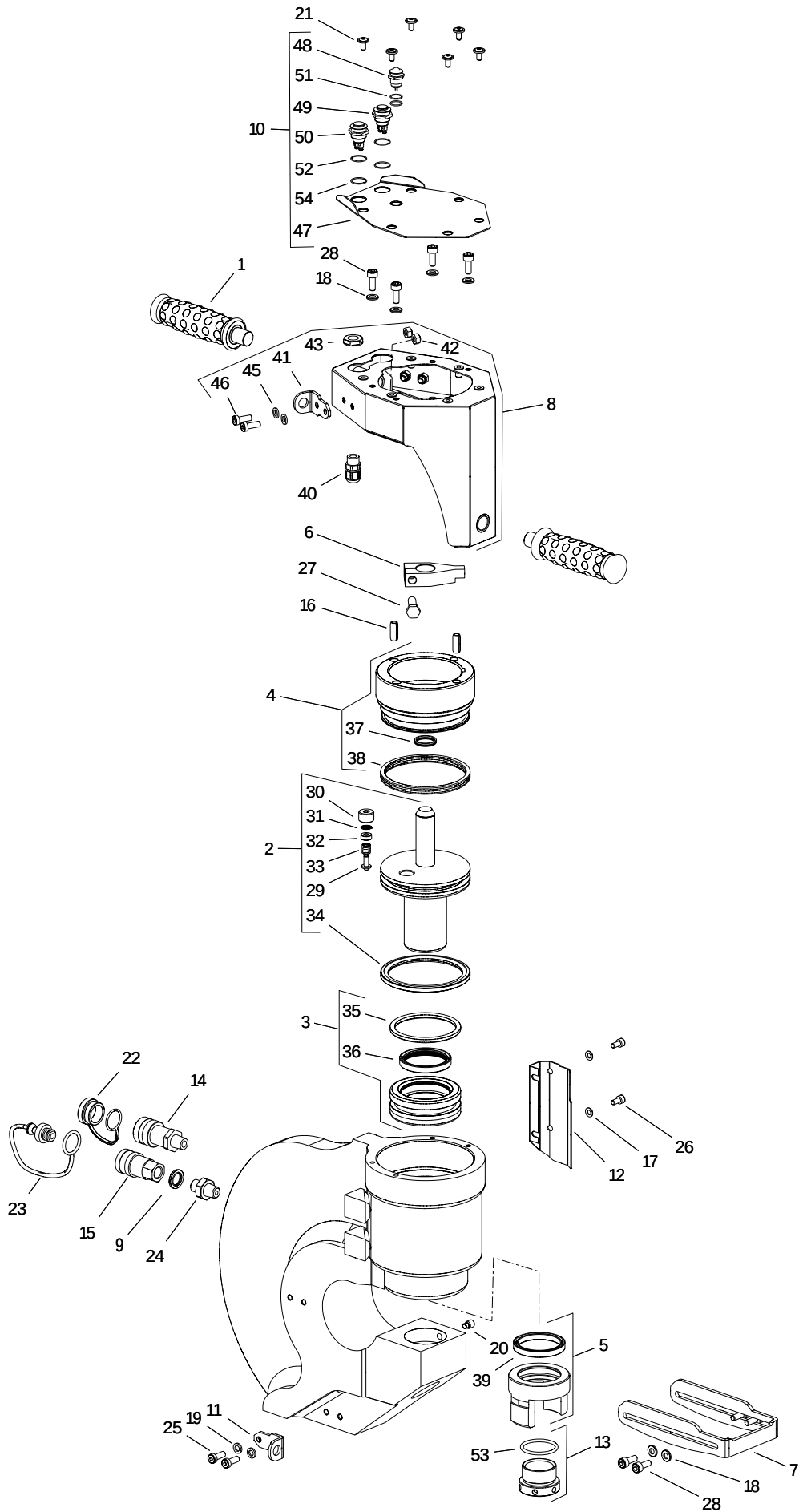


ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	TLJ-0507-03-00-00-0	GUIDING SLEEVE ASSY	1
2	ZRY-0507-05-00-00-1	RESTRAINER ASSY	1
3	WSP-0522-08-00-00-0	HANDLE SUPPORT ASSY	1
4	PKR-0522-10-00-00-0	SUPPORT COVER ASSY	1
5	NKR-0507-60-00-00-1	PUNCH NUT	1
6	TLK-0522-02-00-00-0	PISTON ASSY	1
7	PKR-0522-04-00-00-0	CYLINDER COVER ASSY	1
8	BLD-0522-06-00-00-0	ROTATION LOCK	1
9	ZDR-0522-07-00-00-0	BUMPER	1
10	MSK-0522-13-00-00-0	MASKING COVER	1
11	WSZ-0507-12-00-00-1	BOTTOM LUG	2
12	RKJ-0507-09-00-00-0	HANDLE ASSY	2
13	PRS-000321	SEAL O-RING 12.42x1.78	2
14	KLK-000130	SPRING PIN 6x16	2
15	PDK-000020	ROUND WASHER 6.4	6
16	PDK-000023	ROUND WASHER 8.4	4
17	PDK-000155	SMALL ROUND WASHER 6.4	4
18	SZK-000001	QUICK COUPLING 1-4 BSP	1
19	SZK-000002	QUICK COUPLING PVVM 1-4 NPT	1
20	SRB-000354	LOW HEAD SOCKET CAP SCREW M6x16	6
21	SRB-000107	HEX SOCKET HEAD CAP SCREW M6x16	4
22	WKR-000315	HEX SOCKET SET SCREW WITH DOG POINT M8x12	1
23	WKR-000335	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M5x10	6
24	ZLP-000042	NV COUPLING CAP	1
25	ZLP-000043	PVVM COUPLING CAP	1
26	ZLC-000190	HYDRAULIC CONNECTOR 1/4BSPP – 1/4 NPT	1
27	SRB-000142	HEX SOCKET HEAD CAP SCREW M8x16	4
28	SRB-000029	FULL THREAD HEX HEAD BOLT M8x25-8.8	1
29	PRS-000116	SEAL O-RING 62.2x5.7	1
30	USZ-000035	SEAL 45x55x8	1
31	USZ-000038	SEAL 45x55x7	1
32	PRS-000299	SEAL O-RING 30.2x3	1
33	STZ-0507-02-02-00-0	VALVE CONE	1
34	SRB-0507-02-03-00-0	VALVE SCREW	1
35	FLT-0507-02-05-00-0	FILTER SCREEN	1
36	KSK-0507-02-06-00-0	SPRING BRACKET	1
37	SPR-000057	SPRING 1.8x7.2x13.4	1
38	USZ-000041	SEAL 8x69x4.2	1
39	USZ-000043	SEAL 12.0x1.3x1.4	1
40	USZ-000042	SEAL 80.0x3.1x1.7	1
41	WZK-0507-08-10-00-0	CONTROL SIGNAL WIRE SET	1
42	WSZ-0507-12-00-00-1	BOTTOM LUG	2
43	NKR-000037	HEX NUT M6 WITH POLYAMID INSERT	4
44	PDK-000155	SMALL ROUND WASHER 6.4	4
45	SRB-000354	LOW HEAD SOCKET CAP SCREW M6x16	4
46	WZK-0507-10-02-00-0	SIGNAL DIODE WIRE SET	1
47	WZK-0507-10-03-00-0	DOWN BUTTON WIRE SET	1
48	WZK-0507-10-04-00-0	UP BUTTON WIRE SET	1
49	PRS-000317	SEAL O-RING 10.82x1.78	2
50	PRS-000318	SEAL O-RING 15.60x1.78	2
51	PDK-000207	SEAL 1-4"	1

7. PRO 110 HP EXPLODED DRAWINGS AND PARTS LIST



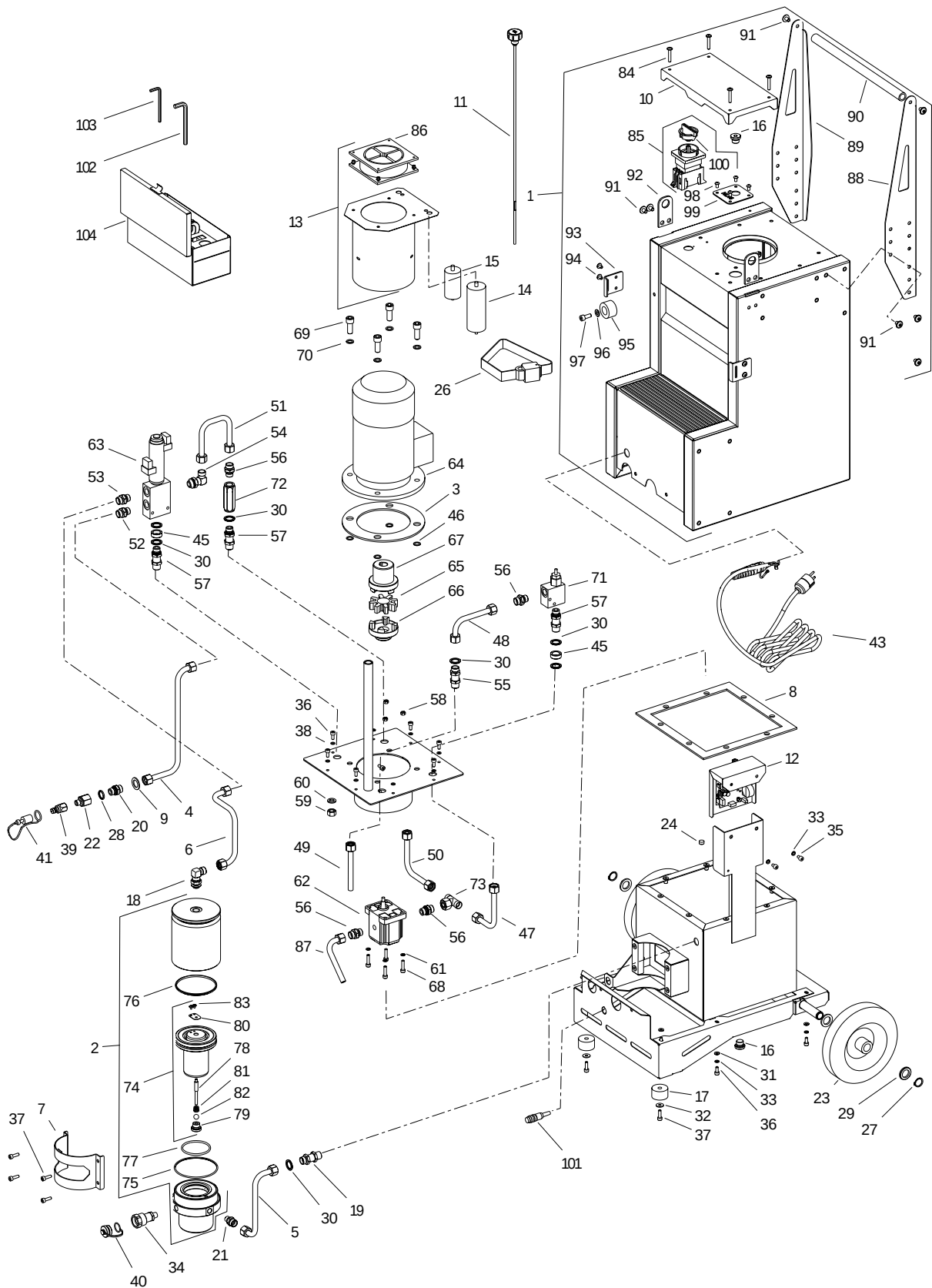
ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	KLC-000038	6 MM HEX WRENCH WITH HANDLE	1
2	KLC-000036	4 MM HEX WRENCH WITH HANDLE	1
3	WBJ-000001	WRENCH	1
4	WBJ-0507-14-00-00-0	DIE DRIFT	1
5	PJM-000010	TOOL CONTAINER	1
6	KRB-000001	SNAP HOOK	2
7	LNC-000008	CHAIN 1.5 m	1
8	PWD-0507-19-00-00-5	HYDRAULIC HOSES AND CONTROL CABLE	1
9	SKR-0507-18-00-00-0	METAL BOX	1
10	KLC-000037	5 MM HEX WRENCH WITH HANDLE	1
11	KLC-0507-92-01-00-0	27 MM FLAT WRENCH	1
12	KLC-0507-92-02-00-0	30 MM FLAT WRENCH	1



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	RKJ-0507-09-00-00-0	HANDLE ASSY	2
2	TLK-0507-02-00-00-0	PISTON ASSY	1
3	TLJ-0507-03-00-00-0	GUIDING SLEEVE ASSY	1
4	PKR-0507-04-00-00-0	CYLINDER COVER ASSY	1
5	ZRY-0507-05-00-00-1	RESTRAINER ASSY	1
6	BLD-0507-06-00-00-0	ROTATION LOCK	1
7	ZDR-0507-07-00-00-2	BUMPER	1
8	WSP-0507-08-00-00-1	HANDLE SUPPORT ASSY	1
9	PDK-000207	SEAL 1-4"	1
10	PKR-0507-10-00-00-1	SUPPORT COVER ASSY	1
11	WSZ-0507-12-00-00-1	BOTTOM LUG	2
12	MSK-0507-13-00-00-2	MASKING COVER	1
13	NKR-0507-60-00-00-1	PUNCH NUT	1
14	SZK-000002	QUICK COUPLING 1-4 NPT	1
15	SZK-000001	QUICK COUPLING 1-4 BSP	1
16	KLK-000129	SPRING PIN 8x20	2
17	PDK-000018	ROUND WASHER 5.3	2
18	PDK-000023	ROUND WASHER 8.4	8
19	PDK-000155	SMALL ROUND WASHER 6.4	4
20	WKR-000315	HEX SOCKET SET SCREW WITH DOG POINT M8x12	1
21	WKR-000469	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M5x10	6
22	ZLP-000043	PVVM COUPLING CAP	1
23	ZLP-000042	NV COUPLING CAP	1
24	ZLC-000190	HYDRAULIC CONNECTOR 1/4BSPP - 1/4 NPT	1
25	SRB-000354	LOW HEAD SOCKET CAP SCREW M6x16	4
26	SRB-000255	HEX SOCKET HEAD CAP SCREW M5x10	2
27	SRB-000194	FULL THREAD HEX HEAD BOLT M8x30	1
28	SRB-000142	HEX SOCKET HEAD CAP SCREW M8x16	8
29	STZ-0507-02-02-00-0	VALVE CONE	1
30	SRB-0507-02-03-00-0	VALVE SCREW	1
31	FLT-0507-02-05-00-0	FILTER SCREEN	1
32	KSK-0507-02-06-00-0	SPRING BRACKET	1
33	SPR-000057	SPRING 1.8x7.2x13.4	1
34	USZ-000040	SEAL 79.5x95x6.3	1
35	PRS-000116	SEAL O-RING 62.2x5.7	1
36	USZ-000035	SEAL 45x55x8	1
37	USZ-000037	SEAL 20x23x4.1	1
38	USZ-000036	SEAL 95x87x8.3	1
39	USZ-000038	SEAL 45x55x7	1
40	WZK-0507-08-10-00-0	CONTROL SIGNAL WIRE SET	1
41	WSZ-0507-12-00-00-1	BOTTOM LUG	2
42	NKR-000037	HEX NUT M6 WITH POLYAMID INSERT	4
43	NKR-000081	GLAND NUT PG7	1
44	NTN-000004	BLIND RIVET NUT M5	6
45	PDK-000155	SMALL ROUND WASHER 6.4	4
46	SRB-000354	HEX SOCKET LOW HEAD CAP SCREW M6x16	4
47	PKR-0507-10-01-00-1	SUPPORT COVER	1

48	WZK-0507-10-02-00-0	SIGNAL DIODE WIRE SET	1
49	WZK-0507-10-03-00-0	DOWN BUTTON WIRE SET	1
50	WZK-0507-10-04-00-0	UP BUTTON WIRE SET	1
51	PRS-000317	SEAL O-RING 10.82x1.78	2
52	PRS-000321	SEAL O-RING 12.42x1.78	2
53	PRS-000299	SEAL O-RING 30.2x3	1
54	PRS-000318	SEAL O-RING 15.60x1.78	2

8. HPP 700/1.5 EXPLODED DRAWINGS AND PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	OBD-0517-04-00-00-0	HOUSING	1
2	WZC-0517-03-00-00-0	AMPLIFIER 2.7-0.17 L	1
3	USZ-0517-02-02-00-0	MOTOR SEAL	1
4	ZST-0517-99-00-06-0	TUBE 6 SET	1
5	ZST-0517-99-00-07-0	TUBE 7 SET	1
6	ZST-0517-99-00-08-0	TUBE 8 SET	1
7	OBJ-0517-08-00-00-0	AMPLIFIER CLASP	1
8	USZ-0517-09-00-00-0	RESERVOIR SEAL	1
9	PDK-0517-10-00-00-0	ROUND WASHER	1
10	PKR-0517-04-10-00-0	AIR VENT COVER	1
11	KRK-0517-12-00-00-0	OIL PLUG WITH DIPSTICK	1
12	STR-0517-13-00-03-0	CONTROLLER ASSY 110-120V 50Hz	1
12	STR-0517-13-00-04-0	CONTROLLER ASSY 110-120V 60Hz	1
12	STR-0517-13-00-01-0	CONTROLLER ASSY 220-240V 50Hz	1
12	STR-0517-13-00-02-0	CONTROLLER ASSY 220-240V 60Hz	1
13	ZSP-0517-14-00-00-0	FAN UNIT	1
14	KND-000150	CAPACITOR 40uF/450V (230V)	1
14	KND-000151	CAPACITOR 110uF/280V (115V)	2
15	KND-000140	CAPACITOR 16uF/450 V (only for 230V)	1
16	KRK-000002	TRANSPORT CAP WITH SEAL 3/8"	2
17	STP-000001	RUBBER FOOT 39	2
18	KRP-000071	ELBOW COUPLING L=250, 3/8"	1
19	KRP-000072	STRAIGHT COUPLING L=315, fi12, M18x1.5	1
20	KRP-000003	STRAIGHT COUPLING 3/8" x M18x1.5	1
21	KRP-000005	STRAIGHT COUPLING 1/4" x M18x15	1
22	KRP-000077	STRAIGHT COUPLING ADAPTER 3/8"-1/4"	1
23	KOL-000090	WHEEL 200x20	2
24	MGS-000019	NEODYMIUM MAGNET 12x6	1
25*	OLJ-000001	HYDRAULIC OIL HL46	11 l
26	PAS-000008	SAFETY STRAP	1
27	PRS-000011	EXTERNAL RETAINING RING 20z	2
28	PRS-000101	O-RING 17x3	1
29	PDK-000190	ROUND WASHER 20	4
30	PDK-000191	WASHER 18	7
31	PDK-000020	ROUND WASHER 6.4	6
32	PDK-000038	ROUND WASHER 6.5	2
33	PDK-000048	SPRING WASHER 6.1	8
34	SZK-000002	QUICK COUPLING PVVM 1-4 NPT	1
35	SRB-000101	HEX SOCKET HEAD CAP SCREW M6x10	2
36	SRB-000208	HEX SOCKET HEAD CAP SCREW M6x14	14
37	SRB-000113	HEX SOCKET HEAD CAP SCREW M6x20	6
38	USZ-000033	SEAL 6x10x1	8
39	WTK-000029	PLUG ANV 1/4" BSP	1
40	ZLP-000043	PVVM COUPLING CAP	1
41	ZLP-000044	NV PLUG CAP	1
42*	WZK-0517-00-70-00-0	CONTROLLER POWER WIRE SET	1
43	PWD-0517-04-70-00-0	POWER CORD 230V (EU)	1
43	PWD-0517-04-70-00-1	POWER CORD 230V (AU)	1
43	PWD-0517-04-70-00-2	POWER CORD 120V (USA)	1
43	PWD-0517-04-70-00-3	POWER CORD 115V (UK)	1
44*	WZK-0517-04-71-00-0	POWER SWITCH WIRE SET	1

ITEM	PART NUMBER	DESCRIPTION	Q-TY
45	TLJ-0517-02-03-00-0	SPACER SLEEVE	2
46	PDK-0517-02-04-00-0	SPACER WASHER	4
47	ZST-0517-99-00-01-0	TUBE 1 SET	1
48	ZST-0517-99-00-02-0	TUBE 2 SET	1
49	ZST-0517-99-00-03-0	TUBE 3 SET	1
50	ZST-0517-99-00-04-0	TUBE 4 SET	1
51	ZST-0517-99-00-05-0	TUBE 5 SET	1
52	DLW-0517-02-10-00-0	GLAND 1	1
53	DLW-0517-02-11-00-0	GLAND 2	1
54	KRP-000071	ELBOW COUPLING L=250, 3/8"	1
55	KRP-000072	STRAIGHT COUPLING L=315, fi12, M18x1.5	1
56	KRP-000003	STRAIGHT COUPLING 3/8" x M18x1.5	4
57	KRP-000073	STRAIGHT COUPLING L=315, fi12, 3/8" M18x1.5	3
58	NKR-000018	HEX NUT M6	4
59	NKR-000094	HEX NUT M12	4
60	PDK-000203	SPRING WASHER 12.2	4
61	PDK-000048	SPRING WASHER 6.1	4
62	PMP-000021	GEAR PUMP FOR 50-60Hz MOTOR	1
63	RZD-000004	DIVIDER	1
64	SLN-000160	INDUCTION MOTOR 230V 50Hz	1
64	SLN-000193	INDUCTION MOTOR 115V 60Hz	1
64	SLN-000194	INDUCTION MOTOR 115V 50Hz	1
64	SLN-000175	INDUCTION MOTOR 230V 60Hz	1
65	LCZ-000001	FLEXIBLE COUPLING	1
66	SPZ-000003	CLUTCH PART 2	1
67	SPZ-000011	COUPLING	1
68	SRB-000117	HEX SOCKET HEAD CAP SCREW M6x25	4
69	SRB-000357	HEX SOCKET HEAD CAP SCREW M12x30	4
70	USZ-000034	SEAL 12x18x1.5	4
71	ZWR-000021	OVERFLOW VALVE	1
72	ZWR-000006	RETURN VALVE 3/8"	1
73	KRP-000074	THREE WAY COUPLING L=315, fi12, M18x1.5	1
74	TLC-0517-03-02-00-0	PISTON ROD ASSY	1
75	PRS-000306	SEAL O-RING 100x3	1
76	USZ-000032	SEAL 100x89x4.2	1
77	USZ-000031	SEAL 60x70.7x4.2	1
78	PPC-0517-03-02-03-0	VALVE PUSHER	1
79	KRK-0517-03-02-04-0	TRANSPORT CAP MODIFIED	1
80	SPR-0517-03-02-05-0	SPRING PLATE	1
81	SPR-0517-03-02-06-0	SPRING	1
82	KUL-000010	BEARING BALL 12	1
83	WKR-000389	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M4x6	2
84	WKR-000480	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M6x35	4
85	RZL-000005	3-GEAR DISCONNECTOR 25A	1
86	WNT-000012	FAN	1
87	ZST-0517-99-00-09-0	TUBE 2-1 SET	1
88	WSP-0517-04-04-00-2	RIGHT HANDLE BRACKET	1
89	WSP-0517-04-05-00-2	LEFT HANDLE BRACKET	1
90	RKJ-0517-04-06-00-0	HANDLE ASSY	1
91	WKR-000461	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M8x12	6
92	UCW-0517-04-07-00-0	HANDLE BRACKET ASSY	2

ITEM	PART NUMBER	DESCRIPTION	Q-TY
93	ZCZ-0517-04-08-00-0	LUG	2
94	WKR-000336	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M6x10	4
95	STP-000001	RUBBER FOOT 39	1
96	PDK-000022	ROUND WASHER 8.4	1
97	SRB-000147	HEX SOCKET HEAD CAP SCREW M8x20	1
98	WKR-000100	HEX SOCKET BUTTON HEAD SCREW M6x10	4
99	MSK-0517-11-00-00-0	OIL INLET MASKING COVER	1
100	PKT-000024	RED YELLOW HANDLE	1
101	WZK-0517-13-03-00-0	SIGNAL WIRE SET	1
102	KLC-000011	8 MM HEX WRENCH	1
103	KLC-000008	5 MM HEX WRENCH	1
104	SKR-0517-92-00-00-0	TOOL BOX	1

* not shown in the drawing

9. DECLARATIONS OF CONFORMITY

EC Declaration of Conformity

We

***PROMOTECH sp. z o.o.
ul. Elewatorska 23/1
15-620 Białystok
Poland***

Declare with full responsibility that:

Steelmax Hydraulic Punch PRO 60 HP, PRO 110 HP

are manufactured in accordance with the following standards:

- EN 60745-1
- EN ISO 12100-1
- EN ISO 12100-2

and satisfy safety regulations of the guidelines: 2006/95/WE, 2006/42/WE.

Białystok, 3 July 2013



Marek Siergiej
Chair

EC Declaration of Conformity

We

***PROMOTECH sp. z o.o.
ul. Elewatorska 23/1
15-620 Białystok
Poland***

Declare with full responsibility that:

HPP 700/1.5 Hydraulic Power Pack

is manufactured in accordance with the following standards:

- EN 60745-1
- EN ISO 12100-1
- EN ISO 12100-2

and satisfies safety regulations of the guidelines: 2006/95/EC, 2006/42/EC.



Białystok, 18 July 2013

Marek Siergiej
Chair

10. QUALITY CERTIFICATES

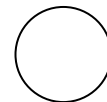
Machine control card

STEELMAX HYDRAULIC PUNCH

- ☐ PRO 60 HP
- ☐ PRO 110 HP

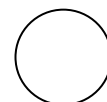
Serial number

Quality control



Adjustments, inspections

Quality control



Machine control card

HPP 700/1.5 HYDRAULIC POWER PACK

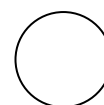
- ☐ 230 V / 50 Hz
- ☐ 230 V / 60 Hz
- ☐ 115 V / 50 Hz
- ☐ 115 V / 60 Hz

Serial number

Electric test

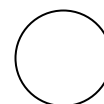
Type of test	Result	Name of tester
Test with sinusoidal voltage of 1000 V and frequency of: ☐ 50 Hz ☐ 60 Hz		 Date
Resistance of the protective circuit	 Ω	 Signature

Quality control



Adjustments, inspections

Quality control



11. WARRANTY CARDS

WARRANTY CARD No.....

..... in the name of Manufacturer warrants the Hydraulic Punch to be free of defects in material and workmanship under normal use for a period of 12 months from the date of sale.

This warranty does not cover punches and dies as well as damage or wear that arise from misuse, accident, tempering, or any other causes not related to defects in workmanship or material.

Date of production

Serial number

Date of sale

Signature of seller.....

WARRANTY CARD No.....

..... in the name of Manufacturer warrants the HPP 700/1.5 Hydraulic Power Pack to be free of defects in material and workmanship under normal use for a period of 12 months from the date of sale.

This warranty does not cover damage or wear that arise from misuse, accident, tempering, or any other causes not related to defects in workmanship or material.

Date of production

Serial number

Date of sale

Signature of seller.....

1.08 / 13 May 2015

WE RESERVE THE RIGHT TO MAKE CHANGES IN THIS MANUAL WITHOUT NOTICE