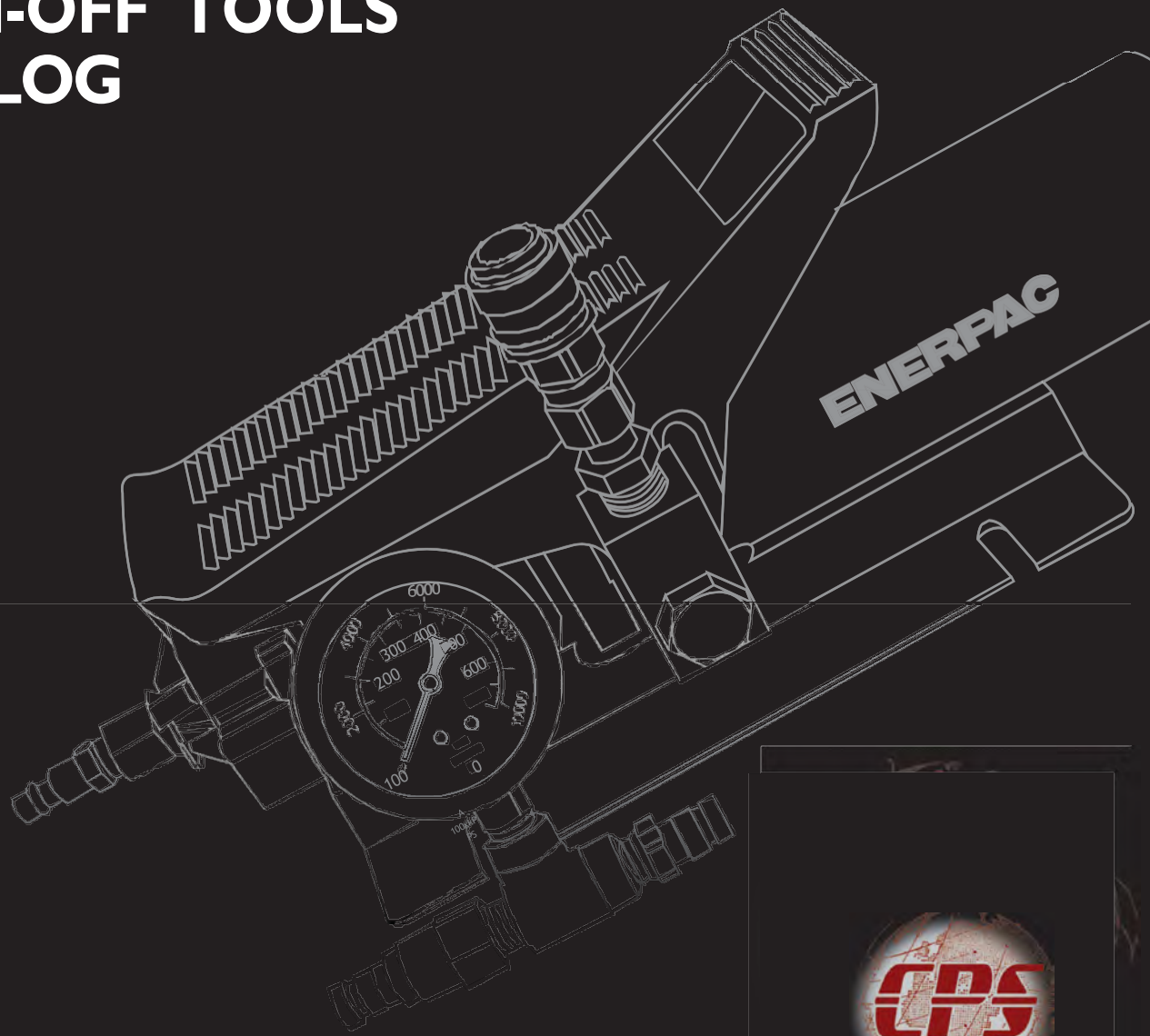


# PT-SERIES HYDRAULIC PINCH-OFF TOOLS CATALOG



## APPLICATION DATA

### COLD WELD

The PT-Series Hydraulic Pinch-Off Tools were developed to produce a permanent, bilateral seal in ductile metal tubing by symmetrically collapsing and severing tabulation with no loss of vacuum or pressure.

**Conditions for these cold welds must always be correct.** Materials of the highest purity, surfaces thoroughly machined and thoroughly cleaned should be used. With the correct conditions, only a small amount of exerted force will bring atoms close enough together to form a metallurgical bond or cold weld.

## TUBULATION SELECTION

The most used metal for a pinch-off application is OFHC (ASTM B68-83, B75-84, B133-83 AND B170-82). These materials meet the specifications, chemistry and state of ductility requirements for billet-certified 99.9% pinch-off grade copper. It is important that the material be bright annealed at 650° C to 850° C for 30 minutes in a dry hydrogen atmosphere. This is needed because the material will undergo a deformation of approximately 350% during pinch-off.

High purity nickel (A Nickel, N1270, N1200 or 99.4% nickel ASTM-B161) is another commonly used material. High purity nickel offers several advantages: (1) Minimal out-gassing during bake out and pinch-off, (2) minimal oxidation and (3) higher temperature bake ability. Nickel tabulation must be fully annealed at 1150° C for 30 minutes before pinch-off.

Reliable results can also be obtained using aluminum (annealed 3003 H14, 98% classified non-heat treatable), pure iron, gold, platinum, silver and columbium. The cold-welded area will be work-hardened during the pinch-off. The size and length of the cold-welded area will depend on material, type of annealing, cleanliness, wall thickness and radius of the pinch-off anvil inserts (rollers) on the tool.



Oxygen Free High Conductivity Copper



Nickel



Aluminum



Iron



Gold  
2



Silver

## PINCH-OFF PREPARATION

The tubular material being used must be totally free of contamination at the welding point. Mechanical or sonic cleaning, rather than chemical cleaning, just prior to pinch-off yields the best cold welds.

The O.D. of the tubing should be polished with 320 grit emery cloth to remove oxide crystals.

The tungsten carbide inserts on the pinch jaws must be cleaned before each pinch-off. Any contamination pressed into the metal at the weld point can injure the cold weld seal. The pinch-off is a cold extrusion and a lubricant should be used to aid the material flow. Clean #10 machine oil works well on most metals. If an oil-based lubricant cannot be used due to the nature of your specific application, then it is recommended that water be used for this purpose prior to each pinch cycle.

During the pinch-off process, pressure must be applied evenly until the tubing severs suddenly. Any interruption of this process while the material is in a plastic state will result in an incomplete cold weld. Leaks are apt to occur if the pinch-off phase is incomplete and the tubing needs to be “wiggled” to carry out tubular separation. The HY-Series hydraulic tools will provide a reliable cold-welded joint if all the processes listed above are followed.

## AFTER PINCH-OFF

There are a few methods for checking the finished crimp for leakage. Vacuum insulation time rates and electric resistance measurements can be avoided if a sample tube is carried through the entire process, then subjected to a helium test or microscopic examination, using the sample for comparative analysis. Process procedures should be duplicated precisely. Changes as subtle as bending a piece of copper tubing will change its grain structure and work-harden the piece considerably. There also will be significant changes in grain size, crystal structure and ductility occurring during any thermal process such as brazing, bake-out, soldering or welding. Therefore, the cold welded joint achieved through the cold weld process should NOT be subjected to any process that involves heating the joint.

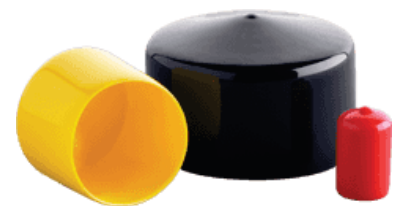
The cold-welded section of the tubing should be permanently protected with a plastic cap, epoxy, silicone, etc. after the pinch-off is completed, as it is both a delicate seal and very sharp.



320 Grit Emery Cloth



#10 Machine Oil



Plastic Caps

## PT-SERIES PUMP & TOOL OPERATION

### PROCESS FOR PINCHING OFF METAL TUBING

- The best quality pinch-off will be done by locating the tubing near the "center" of the jaw.
- When the jaws close, the carbide rollers will meet at the tip before they meet at the throat of the jaw.
- For best results, lubricate the pinch rollers with light oil. If oil cannot be used, water will suffice.
- If a pump was bought with a PT handset, CPS will ship the pump with pressure pre-set.

*4-7 seconds is all the time it takes to affect a high quality pinch off.*

*Cycle time to open jaws: 1-2 seconds. Cycle time to close jaws & pinch-off tubing: 3-5 seconds.*

- Excess tubing will separate completely and be expelled from the jaws.
- Move foot pedal to the "back" position (or release footswitch) to relieve hydraulic pressure and open jaws.

The PT-Series Hydraulic/Pneumatic pinch-off tools are shipped fully assembled and ready to install. CPS ships Hydraulic pumps with pressure pre-set per the customer's tube samples. If no samples were provided, pump pressure will be pre-set to a "safe" setting and we will work with the end user to decide the proper pressure setting for user's specific application and tube material. Customer needs to install a quick-disconnect nipple in the "Source Air Input" port on the pump.

- The "Standard" #PASTD pump's Air Input is found at the end of the pump.
- The "Remote-Actuated" #PAFSC pump's Air Input is found on the end of the handle.

*IMPORTANT: The air / hydraulic pumps use an internal air motor which MUST be lubricated to prevent premature wear or damage. Install a water filter and lubricator (FRL) to your source air line, within 15-20 ft. of the pump. Air entering the pump MUST be free of moisture, and light air tool oil MUST be injected into the air input side of the pump. If you need an FRL for this tool, please advise and CPS can recommend the proper unit.*

- Once the source air is connected to the pump, connect the hydraulic hose to the handset.
- Install the pressure gauge to the hydraulic "output" quick coupler on the pump.
- Connect the hydraulic hose to the quick coupler on the pressure gauge.

*Pumps will be pre-set and calibrated before shipping. Hydraulic pressure could read between 2000 - 4500 PSI depending upon the application. If the pump pressure gauge shows pressure more than 4500 PSI, contact CPS before proceeding.*

- The tool is now ready to use.
- To activate the "Standard" #PASTD pump, rock the foot peddle forward to engage the hydraulic valve.
- For #PAFSC style pumps, the remote footswitch will activate the pump.
- The pump will pulsate while it builds pressure, and the jaws will close (3-5 seconds).
- Rocking the foot peddle to back position will release the pressure and the jaws will open.
- If the jaws do not close when the pump is activated, it is likely due to trapped air in the pump or hydraulic line.
- To expel the air from the system, place the pump on your workbench. Hold the handset at a position "lower" than pump and cycle the pump several times.

*Maximum hydraulic pump pressure should not exceed 4500 PSI. Contact CPS if pump pressure exceeds that level. (Jaw breakage can occur with excessive hydraulic pump pressure)*



### HANDSET AND PINCH JAW WARRANTY

The handset and pinch jaws are warranted against defects in material or workmanship for a period of 1 year. Jaws are NOT warranted against breakage, as CPS cannot control the tool's usage.

### HYDRAULIC PUMP WARRANTY

*Hydraulic pumps are warranted by the pump manufacturer. If your pump fails to operate correctly, contact the pump manufacturer's nearest service center for advice and warranty repair instructions.*





For use with OFHC Copper, High Purity Nickel or Aluminum Tubing.  
 Models are available for pinching off tubes from 0.063" to 0.750" diameter.  
 Jaws use precision carbide rollers for creating a hermetic seal. Hand-guided,  
 1-step crimp, pinch-off & seal.  
 Standard jaws are set at 45, 30 or 0 (straight) degree angle.  
 Ends the necessity for a secondary solder or braze sealing operation.

## HYDRAULIC HANDSETS



*Jaw Set (45-deg)*



*Jaw Set (30-deg)*



*Jaw Set (0-deg)*

## SPECIFICATIONS

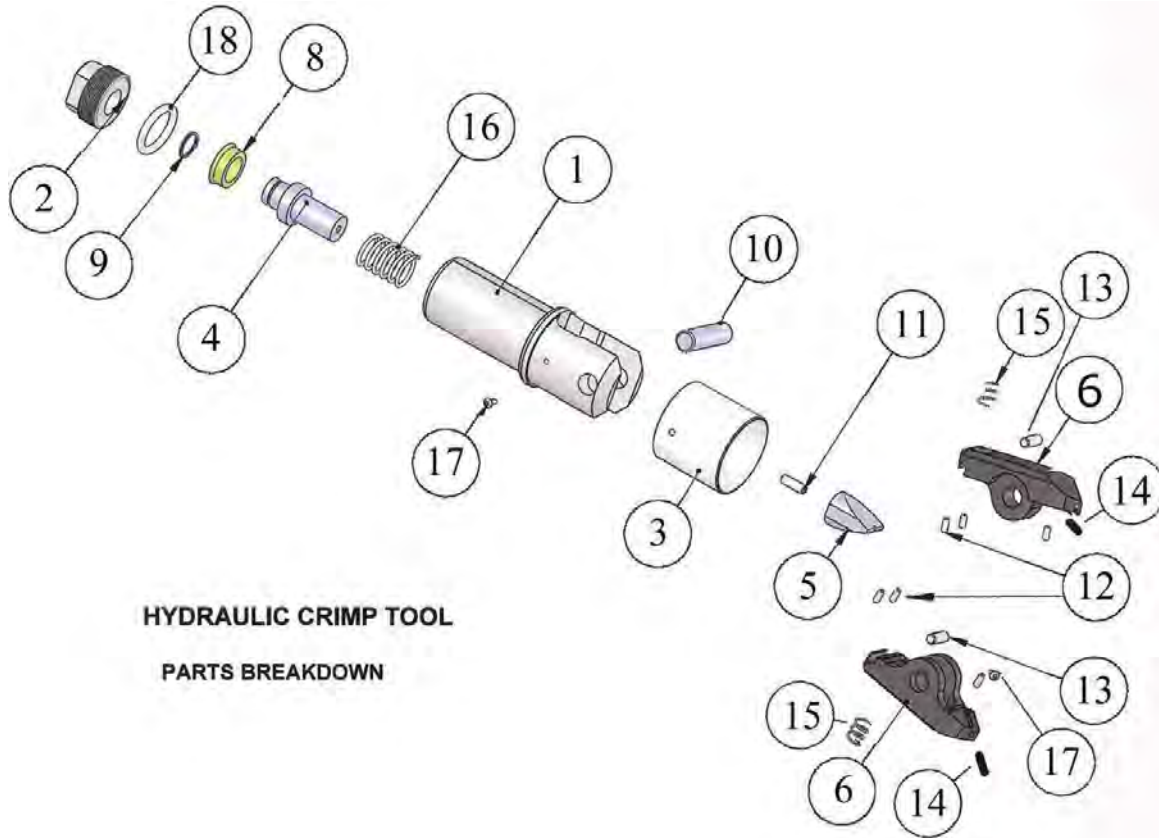
HANDSET MODEL NUMBER	JAW ANGLE	HANDSET WT./LENGTH/DIA.	TUBING DIA. SIZE
PT-2545	45-degree	1.5 lbs. / 5-1/4" / 1-1/4"	0.187" - 0.250"
PT-2530	30-degree	1.5 lbs. / 5-1/4" / 1-1/4"	0.187" - 0.250"
PT-2500	0-degree	1.5 lbs. / 5-1/4" / 1-1/4"	0.187" - 0.250"
PT-5045	45-degree	4.5 lbs. / 8-1/4" / 1-3/4"	0.250" - 0.500"
PT-5030	30-degree	4.5 lbs. / 8-1/4" / 1-3/4"	0.250" - 0.500"
PT-5000	0-degree	4.5 lbs. / 8-1/4" / 1-3/4"	0.250" - 0.500"
PT-7545	45-degree	12.5 lbs. / 12-1/2" / 2-1/2"	0.500" - 0.750"
PT-7530	30-degree	12.5 lbs. / 12-1/2" / 2-1/2"	0.500" - 0.750"
PT-7500	0-degree	12.5 lbs. / 12-1/2" / 2-1/2"	0.500" - 0.750"

*All hydraulic pumps are ordered separately. End users may also provide their own.*

## TYPICAL TUBE DEFORMATION

MODEL NUMBER	TUBING DIA. (X .035" Wall)	ELONGATION (Per Side)	FLARE (Razor Edge)	DISTORTION (Min. Stub Length)
PT-2545	1/4"	0.050" (1/8")	0.350"	0.250"
PT-5045	1/2"	0.055" (3/16")	0.750"	0.500"
PT-7545	3/4"	0.075" (3/8")	1.150"	0.750"





**HYDRAULIC CRIMP TOOL**  
**PARTS BREAKDOWN**

## Parts for ALL PT-Series Hydraulic Pinch-Off Tool Handsets

Wear items shown in **RED** should be replaced in recommended intervals. (See Page 10)

DRG #	PT25xx	PT50xx	PT75xx	DESCRIPTION	QTY
1	PT25	PT50	PT75	Housing	1
2	PTP25-D02	PTP50-D02	PTP75-D02	End Cap (Plug)	1
3	PTP25-D03	PTP50-D03	PTP75-D03	Jaw Guard	1
4	PTP25-D04	PTP50-D04	PTP75-D04	Piston Shaft	1
5	PTP25-D05	PTP50-D05	PTP75-D05	Cam	1
6	PJ2545-D06	PJ5045-D06	PJ7545-D06	Jaw Set, 45-deg. (left & right)	1
6	PJ2530-D06	PJ5030-D06	PJ7530-D06	Jaw Set , 30-deg. (left & right)	1
6	PJ2500-D06	PJ5000-D06	PJ7500-D06	Jaw Set, 0-Deg. (left & right)	1
8	PTP25-D08	PTP50-D08	PTP75-D08	Piston Cup	1
9	PTP25-D09	PTP50-D09	PTP75-D09	Snap Ring	1
10	PTP25-D10	PTP50-D10	PTP75-D10	Pivot Pin	1
11	PTP25-D11	PTP50-D11	PTP75-D11	Pivot Shaft Screw	1
12	PTP25-D12	PTP50-D12	PTP75-D11	Roller Stop	4
13	<b>PTP25-D13</b>	<b>PTP50-D13</b>	<b>PTP75-D13</b>	<b>Rear Jaw Rollers</b>	<b>2</b>
14	<b>PTP25-D14</b>	<b>PTP50-D14</b>	<b>PTP75-D14</b>	<b>Front Jaw Carbide Rollers</b>	<b>2</b>
15	<b>PTP-25-D15</b>	<b>PTP50-D15</b>	<b>PTP75-D15</b>	<b>Jaw Springs</b>	<b>2</b>
16	PTP25-D16	PTP50-D16	PTP75-D16	Internal Piston Spring	1
17	PTP25-D17	PTP50-D17	PTP75-D17	Carbide Roller Stop	2
18	PTP25-D18	PTP50-D18	PTP75-D18	Housing O-Ring	1
19	PTP25-D19	PTP50-D19	PTP75-D19	Jaw Guard Retention Screw	1

## HYDRAULIC PUMP SYSTEMS

Model #PE120 Electric / Hydraulic Pump or Model #PB120 Battery / Hydraulic Pump



- Equipped with "remote" footswitch.
- Standard voltage: 120V. European voltages are also available.
- Battery Unit: (2) ea. 18V Milwaukee Batteries & (1) ea. 120V or 230V Charger.
- Includes hydraulic pressure gauge.
- Includes 72" Hydraulic hose to connect handset to pump with quick- disconnect fittings.
- Pump pressure is easily adjustable.



Model #PASTD Standard Air / Hydraulic Pump

- Foot Switch mounted on pump body.
- Air actuated pump.
- Source air pressure: 100 - 110 PSI.
- Inline FRL recommended.
- Includes: 72" hydraulic hose with quick-disconnect fittings.
- Includes: Hydraulic pressure gauge.
- End user provides air hose from source to hydraulic pump.
- Pump pressure is easily adjusted.



Model #PAFSC Standard Air / Hydraulic Pump with Remote Foot Switch

- Equipped with remote foot switch.
- Air actuated pump.
- Source air pressure: 100 - 110 PSI.
- Inline FRL recommended.
- Includes: 72" hydraulic hose with quick-disconnect fittings.
- Includes: Hydraulic pressure gauge
- End user provides air hose from source to hydraulic pump.



## STANDARD PUMP SPECIFICATIONS

Maximum Operating Pressure (PSI)	5,000
Cylinder Compatibility	Single-acting
Reservoir Capacity (in <sup>3</sup> )	37
Usable Oil Capacity (in <sup>3</sup> )	36.6
Maximum Flow at Rated Pressure	60 in <sup>3</sup> /min
Output Flow Rate (in <sup>3</sup> /min) at 0 PSI	60
Valve Function	Advance / Retract
Valve Operation	Manual
Air Pressure Range (PSI)	60 - 100
Air Consumption (scfm)	12
Weight (lbs.)	14.3



## REMOTE FOOTSWITCH PUMP SPECIFICATIONS

Maximum Operating Pressure (PSI)	10,000
Cylinder Compatibility	Single-acting
Reservoir Capacity (in <sup>3</sup> )	127
Usable Oil Capacity (in <sup>3</sup> )	127
Maximum Flow at Rated Pressure	10 in <sup>3</sup> /min
Valve Function	Advance/Hold /Retract
Valve Type	3-way, 3-position
Pump Control	Footswitch
Weight (lbs.)	22



## ELECTRIC PUMP SPECIFICATIONS

Description	Base model pump with 1/4 hp motor
Cylinder Compatibility	Single-acting
Reservoir Capacity (in <sup>3</sup> )	60
Valve Type	2 Way/ Auto. Dump
Valve Function	Advance Return (Auto.)
Valve Operation	Manual
Valve Number	9561
Control Switch	Rocker Type off, Momentary on
Motor	1/4 hp, 110/115V 50/60 Hz, Single Phase



## PREVENTATIVE MAINTENANCE RECOMMENDATIONS

Preventative maintenance on these tools is important to ensure long term performance and prevent costly down time. These tools will perform well for many years, if normal wear components are checked and/or replaced regularly.

### Initial Setup / Pump and Handset

- Filter, Regulator, and Lubricator: A unit that combines filtration, regulation, and lubrication to improve the efficiency and durability of pneumatic tools. FRLs are essential for keeping an efficient air line system and reducing the risk of dust and moisture in the air line. FRL should be within 10-15 ft. from the hydraulic pump. Input air pressure should be set to 100-120 PSI.
- The handset is fully assembled and ready to later connect to the (included) hydraulic hose.
- Install the hydraulic pressure gauge by simply connecting the "T" assembly to the quick-disconnect fitting on the air/hydraulic pump. Install the hydraulic hose to the other end of the "T" fitting. Install the handset to the quick-disconnect fitting on the hydraulic hose.
- If you supplied us with samples of your tubes being processed with this tool prior to shipment, the pump pressure has been adjusted properly and no further adjustments should be necessary. If you experience an issue or difficulty with the tube pinch-off process, contact our technical support for guidance before changing the pump settings.
- Connect your air source hose to the quick disconnect air fitting supplied with the pump. You may change this fitting if it does not match your standard air fitting.
- Install supplied air hose to the power pack. Wrap hose fitting threads with Teflon sealant.
- Your system is now ready to use.

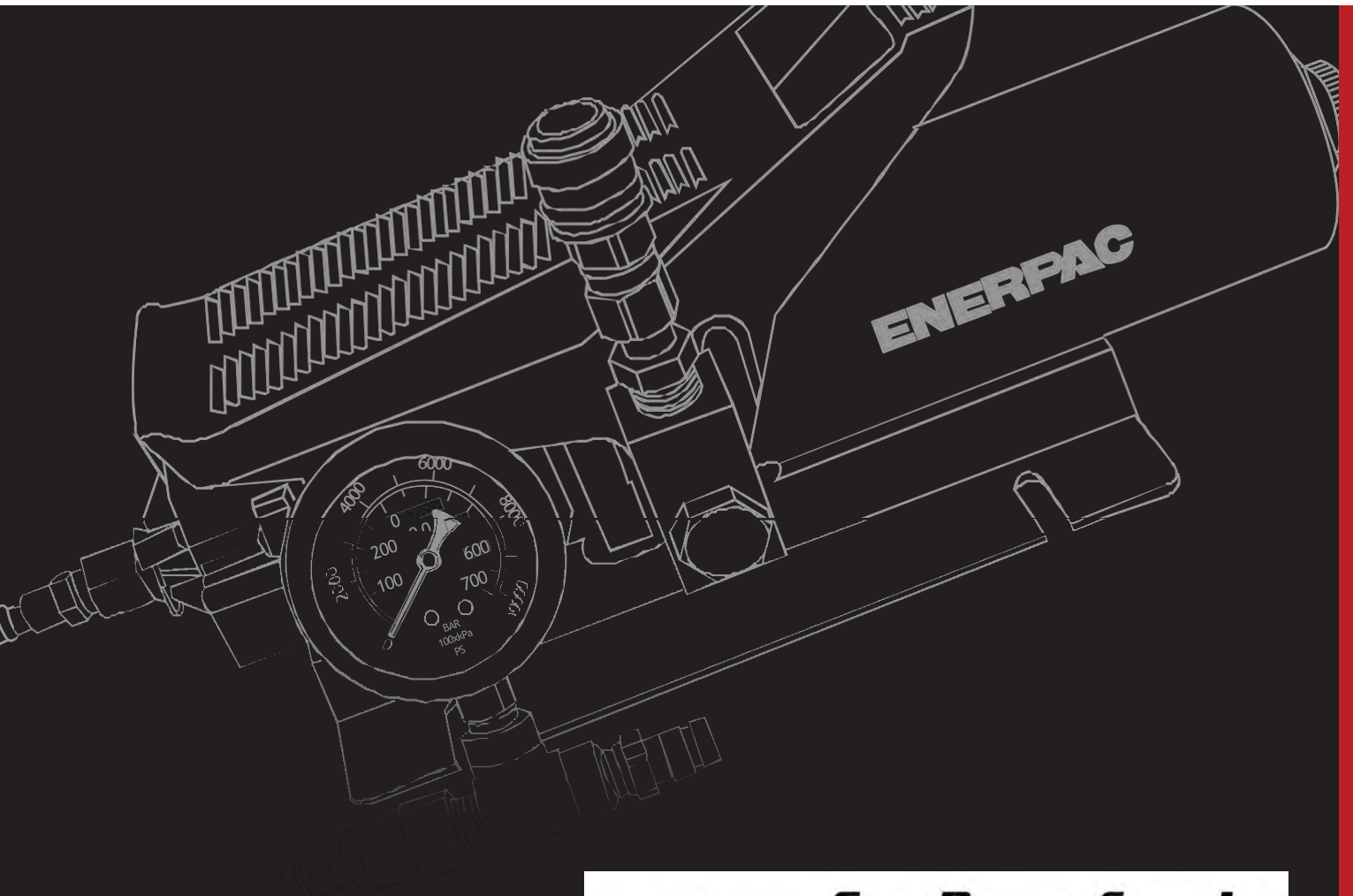
### Weekly Maintenance

(Reference exploded view drawing on page 7.)

- Using a light machine oil, place a couple of drops on the jaw rollers (#13 back end of jaws) and to the carbide pinch-off rollers.
- Clean and remove any copper transfer contamination on the carbide rollers (#14) with alcohol or very fine emery cloth.
- Light machine oil can be used to lubricate any metal-to-metal surfaces in the jaw area.
- Make certain the FRL is injecting oil into the power pack. Keeping the O-rings lubricated requires only minute amounts of oil. If oil is being expelled through the trigger valve, reduce the amount of oil being injected.

### 3-6 Month Maintenance (or 20,000 + cycles)

- Periodically, remove the carbide rollers (#14) from the jaws to clean the machined channel and lubricate with light oil. This will ensure the carbide rollers move freely in the channel.
- The carbide rollers only need to be replaced if they are chipped or show signs of a flat, worn area. These rollers are rarely replaced.
- Replace the rear Jaw Rollers (if your tubes are NOT sealing) and lubricate with light machine oil. These rollers are steel and do wear over time.
- Replace both internal jaw springs (#15). Refer to our website for the proper technique when replacing these springs. They can be damaged if installed improperly which may impede proper jaw closure.



**CUSTOM PRODUCTS & SERVICES, INC.**

2910 Waters Rd. #110, Eagan, MN 55121

888-444-1202 TOLL-FREE or 651-452-0113

[info@custom-products.com](mailto:info@custom-products.com)

[www.custom-products.com](http://www.custom-products.com)

**YOUR SOURCE FOR WORKPLACE SOLUTIONS**

