

# CLAMPING TECHNOLOGY

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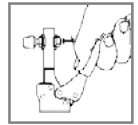
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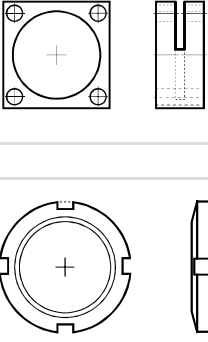
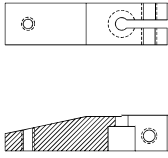

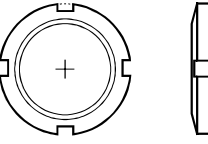

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# HYDRAULIC POWER CLAMPS

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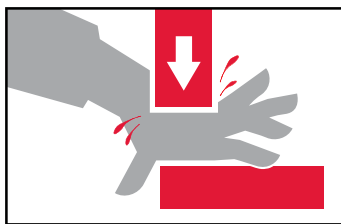
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# BUILDING SAFE HYDRAULIC SYSTEMS

## Hydraulic Power Clamps | Safety

**Safety** means paying attention to the smallest details. A hastily assembled workholding system can result in a hazardous operator environment. Hydraulic workholding is not a generic technique where most anything will work, nor is there one right or best answer for all situations. Each application is different and can be approached in many different ways. Because of this versatility, there is no rule-of-thumb to follow to guarantee safety. A careful balance of knowledge, fixture design and common sense are key to avoiding injuries.

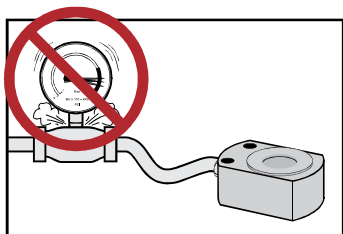
**Plan** your fixture installation with operator safety in mind. By nature, most clamping devices have pinch points. Many times the fixture can be designed to shield the operator from a pinching hazard. Often the placement of the clamping device in the fixture can minimize the gap between the clamp and the workpiece, thus reducing or eliminating the pinch point. Perhaps the clamping control valve or switch can be located such that the operator cannot reach the fixture and the control at the same time. Dual palm buttons on electrically-actuated systems serve the same purpose.



**Do not** require the operator to hold the workpiece in position during the clamping operation. Make sure that the workpiece is self-supporting and self-locating so that operator hands are out of

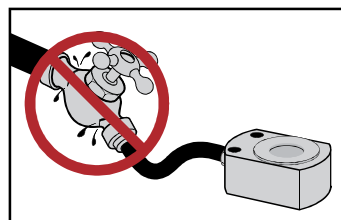
danger when the hydraulic system is actuated. Often a simple spring plunger is all that is necessary.

The lowest pressure rating of any component in the clamping system sets the *maximum* pressure rating for the entire system.



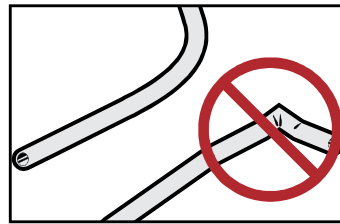
Most hydraulic workholding components are rated at 5,000 PSI maximum.

However, some components are rated at less than 5,000 PSI. The maximum pressure is listed on each product page of this catalog. *Never exceed this rating.*



Just having a clamp that is rated at 5,000 PSI is not enough. Every hose, fitting, valve, adapter and tube exposed to pressure must be rated at or above the maximum hydraulic system pressure. Most

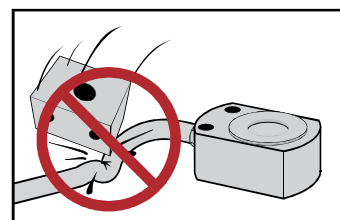
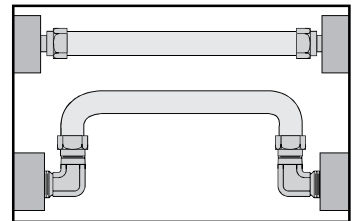
“hardware store” fittings are intended only for low pressure plumbing. *Never use water pipe fittings or copper tubing and brass fittings for hydraulic service.*



Use proper tools when bending tubing, and maintain proper minimum bend radii for hoses and tubing. If a hose or tube is ever kinked, replace it. Don't risk a rupture. Fluid escaping

under high pressure is dangerous. The resulting loss in pressure could release the workpiece from the fixture and cause serious injury and equipment damage by being ejected from the machine or breaking tooling.

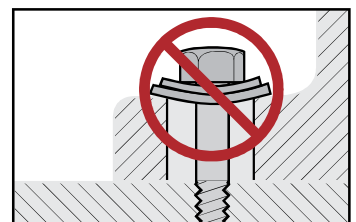
Tubing and hoses do flex when pressurized. Allow for that movement by supporting the fluid lines away from surfaces which could abrade the surface and eventually cause damage. Avoid straight lengths of hose and tubing. A bend will allow for this deflection without putting too much stress on the line.



Even if proper hydraulic tubing and fittings are specified, be sure to protect them from abuse. Components damaged from abrasion or accidental dropping of a workpiece will no longer

have the strength and safety of the original design.

Use **proper mounting hardware** when installing workholding clamps and other components. Always use the largest bolt available to fit in the mounting hole. In many cases, the recommended cap screw or thread is specified on the product page of this catalog. Sometimes the mounting hardware is included with the component. Always use supplied hardware.



**Safety means paying attention to the smallest details.**