

<b>Title of Training</b>	Hydraulic Jack Training	
<b>Equipment Info.</b>	Make/Type/Size/Model	<b>Enerpac/P392 &amp; P391/Hydraulic Jack</b>
<b>Material Needed</b>	<b>Operators Manual along with specific type of Jack needed for training</b>	<b>PPE:Hard Hat- Sturdy Gloves-Safety Glasses-Face Shield-Work Boots</b>

## Hydraulic Jack Training

This Training Topic is a supplement to the Brieser Safety Training titled, *Hand and Portable Powered Tool Safety*, which discusses tool safety in general. This training summarizes federal Occupational Safety and Health Administration (OSHA) standards applicable to lever and ratchet, screw, and hydraulic jacks. The most common hazard associated with jack use is collapse from trying to lift beyond the capacity of the jack; jack placement on uneven surfaces; and load slipping off the jack. The OSHA requirements are designed to minimize these hazards



### SAFETY FACTORS

High pressure hydraulic tools are designed to be safely operated up to the manufacturer's ratings. They are not designed with an unspecified safety factor that allows you to exceed the equipment rating. In fact, it is safer to use high pressure tools at 80% of their maximum instead of 100%.

#### REMEMBER:

**The 80% Rule-It is safer to use high pressure tools at 80% of their maximum rating instead of 100%.**

### LIFTING FORCES

This section briefly explains some of the forces at work while you are lifting a load with a jack or cylinder. The main line of force is through the center of the plunger. The weight should be distributed as close to this center line as possible. The entire base of the jack or cylinder needs to be on a solid and level surface for a stable lift. Good and bad lifts are pictured below

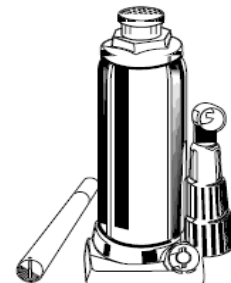


If the load is not centered or the entire face of the plunger saddle does not contact the load, side loading will occur. Side loading creates an unstable setup which may shift or fall. It also damages the jack or cylinder by distorting the wiper seal and bending the plunger. Side loading increases with distance. The further you extend the plunger, the more unstable it becomes.

### COMPONENTS

#### Jacks

In this section you will find information about the basic components that make up a hydraulic system. The jack is one of the oldest and most familiar pieces of hydraulic equipment. This familiarity contributes to misuse which can lead to personal injury.



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The jack is a load lifting device and should never be used as a load holding device, especially when a person will be going underneath the supported load. Keep the following in mind when using a jack:

- The base of the jack should be fully supported and as level as possible. When working on soft surfaces, put a sturdy metal plate under the base of the jack for stability.
- The saddle on the end of the plunger should make full contact with the load. Try to move the load on the center line of force to prevent side loading.
- Do not try to lift a load more than the rated stroke. If you need to lift the load further, block the load, raise the level of the jack with a sturdy support, and continue the lift.

**REMEMBER:**

**Do not go under a load supported by a jack. After the load has been raised, it should be blocked.**

**CYLINDERS**

The cylinder (or ram) operates much the same as the jack, except that it is more versatile. Since the pump is separate, the cylinder can be used in several positions. By adding extensions and attachments to the cylinder, you can create a wide variety of hydraulic tools.



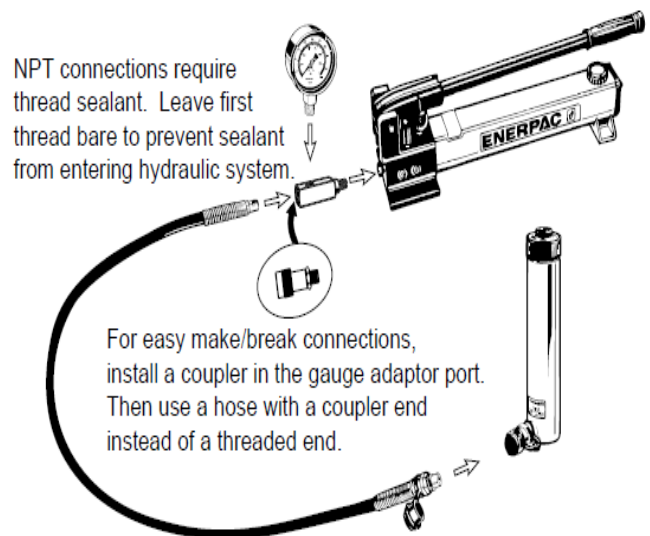
The saddle in the plunger serves two important purposes. It protects the plunger threads from damage and it keeps the end of the plunger from becoming deformed. Keep the saddle in place at all times. Do not thread attachments into the plunger and rely on the plunger threads for support. The load must be transferred to the face of the plunger. The threads in the plunger may be stripped if loaded.



As with the jack, the cylinder is a load lifting device and should never be used as a load holding device, especially when a person will be going underneath the supported load.

**Keep the following in mind when using a cylinder:**

- The base of the cylinder should be fully supported. Where applicable, use a cylinder base for added stability. Do not weld or otherwise modify the cylinder to attach a base or other support.
- The saddle on the end of the plunger should make full contact with the load. Try to move the load on the center line of force to prevent side loading. Be especially careful about side loading long-stroke cylinders.
- Do not try to lift a load more than the rated stroke. If you need to lift the load further, block the load, raise the level of the cylinder with a sturdy support, and continue the lift.



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**REMEMBER:**

**Do not go under a load supported by a cylinder. After the load has been raised, it should be blocked.**

## HYDRAULIC SYSTEMS

### Basic Hydraulic System

The components described in this section are connected together to form a basic hydraulic system as shown on pic shown on your right.

**Before using the hydraulic system:**

- Check that all connections are tight and leak free. It is especially important to check all coupler connections because, after the system has been pressurized, you will not be able to tighten the couplers by hand and using tools will damage the couplers.
- Remove air from system.
- Check oil level in pump reservoir. Fill only to level indicated on the pump. Over-filling the reservoir may cause the pump to malfunction. Fill the reservoir only when all cylinders have been retracted. If you add oil when the cylinder is extended, the reservoir will overflow or be pressurized when you retract the cylinder.
- When using an electric, air, or gas powered hydraulic pump energize the pump only when the directional control valve is in the neutral position.
- In lifting systems, use lifting bases that spread out the load. This reduces the contact pressure between the cylinder and the floor and avoids sinking or punching of the floor. Most working floors cannot withstand high loads.
- Use shut-off valves for temporary load holding. Never hold a load on a coupler or directional control valve.
- Never get under a load.
- Use cribbing for load holding for long periods.
- Do not use hose to lift or pull equipment.



**Remember:** When using jacks, always try to block as you go. Never use jacks for long-term support. Block properly instead.

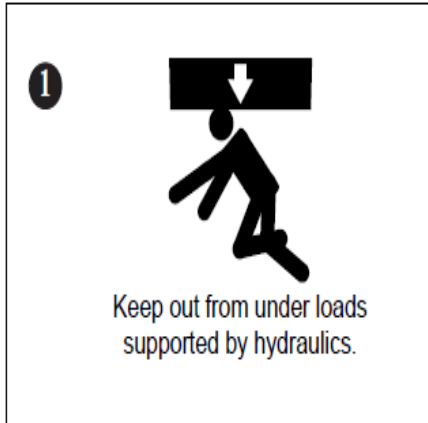
**INSPECTION:**

Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections must be not less frequent than the following:

- For constant or intermittent use at one locality, once every 6 months;
- For jacks sent out of shop for special work, when sent out and when returned;
- For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.
- Repair or replacement parts must be examined for possible defects.
- Jacks in need of repair must be tagged and immediately removed from service.

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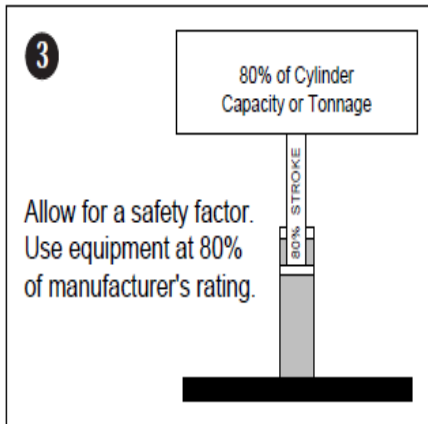
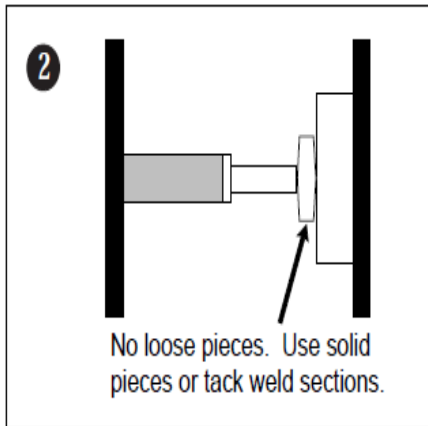
**SUMMARY IN BRIEF**

You should be familiar with all of the information presented in the Hydraulic Safety Training.

However, the 3 practices shown on the left side are essential to promoting personal safety and will help you to protect yourself and others.

- You must be diligent when it comes to safety. We can provide high quality tools and accessories, but it is up to you to be aware of the situation that you put yourself and others into.

- When you practice safety, you also benefit by being more efficient and by increasing the useful life of your tools.



**Important Notice**

*This Safety Training Topic (STT) does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with equipment manual. It is designed as a guide to be used to compliment training in the field at Brieser Construction and as a reminder to users prior to equipment use.*

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