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Repair Parts Sheets for this product are available from the Enerpac web site at www.enerpac.com, or from your nearest Authorized Enerpac Service Center or Enerpac Sales office.

1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is **not** covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

SAFETY FIRST

2.0 SAFETY ISSUES



Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Enerpac cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Contact Enerpac when in doubt as to the safety precautions and operations. If you have never been trained on high-pressure hydraulic safety, consult your distribution or service center for a free Enerpac Hydraulic safety course.

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A **DANGER** is only used when your action or lack of action may cause serious injury or even death.



WARNING: Wear proper personal protective gear when operating hydraulic equipment.



WARNING: Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be blocked mechanically.



WARNING: USE ONLY RIGID PIECES TO HOLD LOADS. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.



WARNING: Do not exceed equipment ratings. Overloading causes equipment failure and possible personal injury. The vice is designed for a max. pressure of 700 bar [10,000 psi]. Do not connect the vice to a pump with a higher pressure rating.



Never set the relief valve to a higher pressure than the maximum rated pressure of the pump. Higher settings may result in equipment damage and/or personal injury.



WARNING: The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system.



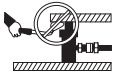
CAUTION: Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure.



Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.



IMPORTANT: Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or other means of safe transport.



CAUTION: Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C [150°F] or higher. Protect hoses and cylinders from weld spatter.



DANGER: Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.



Avoid situations where objects are not directly centered in the vice jaws. Off-center objects can produce considerable strain on vice. In addition, the object may slip or fall, causing potentially dangerous results.



BE SURE SETUP IS STABLE BEFORE CLAMPING. Vice should be securely bolted to a flat, solid surface capable of supporting the load. Do not weld or otherwise modify the vice cylinder to attach a base or other support.



IMPORTANT: Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Authorized ENERPAC Service Center in your area. To protect your warranty, use only ENERPAC oil.



WARNING: Immediately replace worn or damaged parts with genuine ENERPAC parts. Standard grade parts will break causing personal injury and property damage. ENERPAC parts are designed to fit properly and withstand high loads.

3.0 HYDRAULIC VICE OPERATING SAFETY



WARNING: Failure to observe the following safety precautions and instructions may result in serious personal injury or death.

- Always wear safety glasses before operating vice.
- Keep all body parts, including hands and fingers, away from vice jaw clamping area during vice operation. Failure to observe this precaution may result in serious personal injury. See Figure 1.
- Small parts should be held with pliers or other suitable tool when clamping an object in the vice jaws. If necessary, use a magnetic jaw plate to assist with holding the object in place until the jaw is retracted.
- Never use your fingers to hold an item in place during clamping. Use a pliers, magnetic clips or other suitable tools.
- Center the object in the jaws so that the force will be as evenly distributed as possible. Be certain that any odd shaped objects are positioned securely, so that they do not fly out when the jaw is retracted.
- The moving vice jaw is spring tensioned, and will extend immediately when pressure is relieved. Stay clear of the area in front of the jaw. Before relieving pressure, be certain that no personnel are in front of the jaw.

- The hydraulic vice offers three to five times more clamping force than a standard bench vice. For this reason, exercise care to ensure that objects are not accidentally crushed and damaged in the vice.

- Always shut-off pump and disconnect hydraulic hose from pump when finished using vice. Do not leave vice connected and unattended.

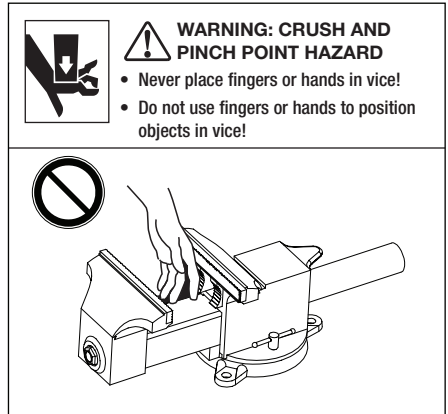


Figure 1 - Crush and Pinch Point Hazard.

4.0 INSTALLATION

4.1 Pump Requirements

A 10,000 PSI [700 bar] hydraulic pump equipped with a pressure release valve is recommended for use with the vice. If desired, a pump equipped with a three-way control valve (allowing oil flow back to tank) may also be used.

Always check the pump hydraulic relief valve setting before connecting the vice. The relief valve setting must not exceed 10,000 PSI [700 bar].

If an air-powered hydraulic pump is used, an air regulator must be installed in the air supply line, limiting the maximum hydraulic pressure to 10,000 PSI [700 bar].

4.2 Preparation for Mounting

Prepare the vice mounting surface as shown in Figure 2. Three 0.61 inch diameter [15,5 mm] holes must be provided for the swivel base mounting bolts. An additional 1.5 inch [38,1 mm] diameter hole must be provided for the hydraulic hose.

Install the vice only on a solid mounting surface, such as a workbench, rigid platform or structural support member.

The mounting surface must be capable of supporting the combined total weight of the vice, the swivel base, and the object to be secured. It must also be capable of withstanding any external forces that could be transmitted to the vice and/or the object being secured.

Note: The total weight of the vice and hydraulic hose is approximately 66 pounds [29,9 kg].

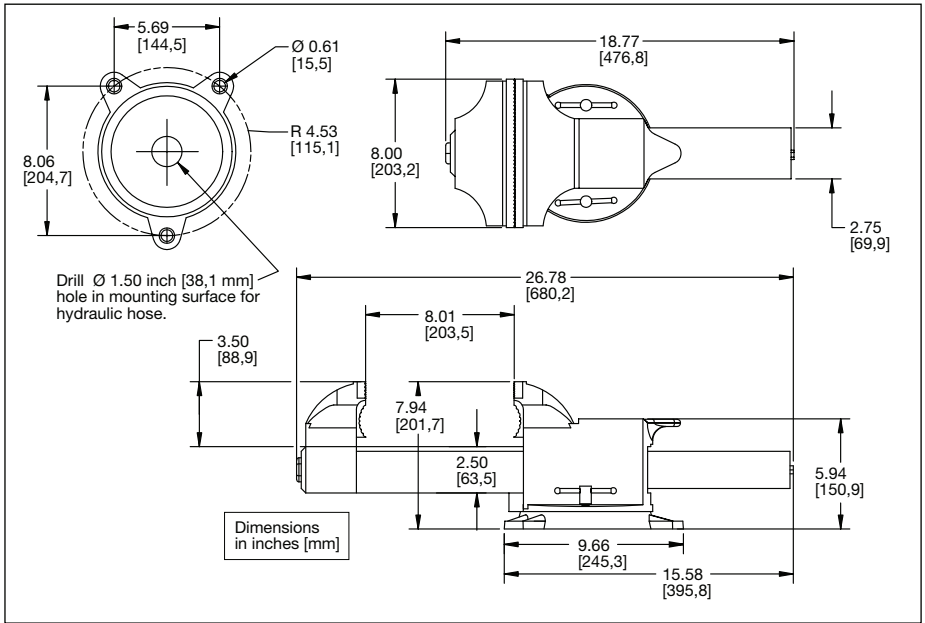


Figure 2 - Vice Installation and Mounting Details.

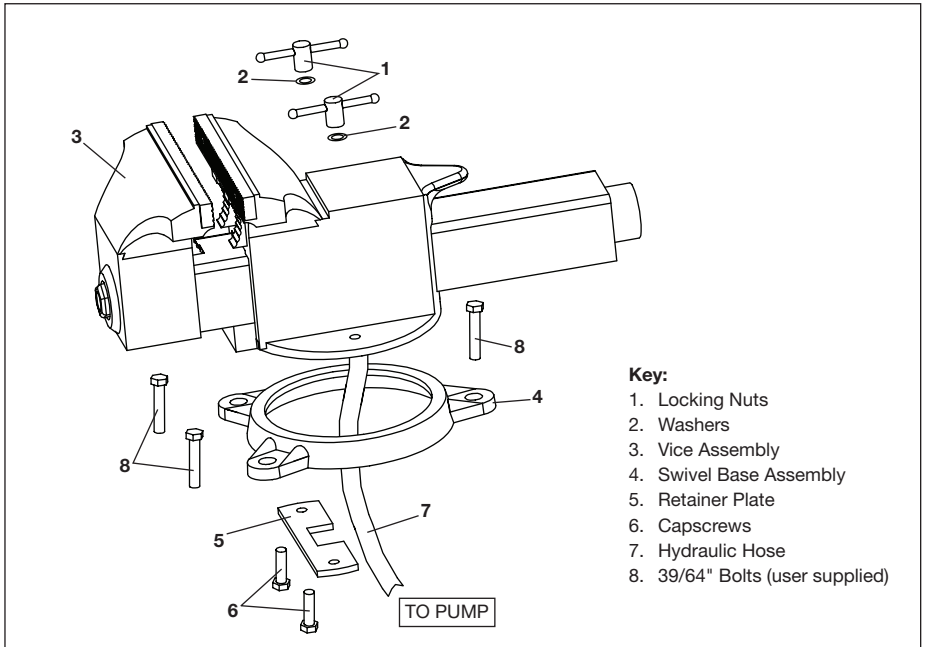


Figure 3 - Vice Assembly and Installation.

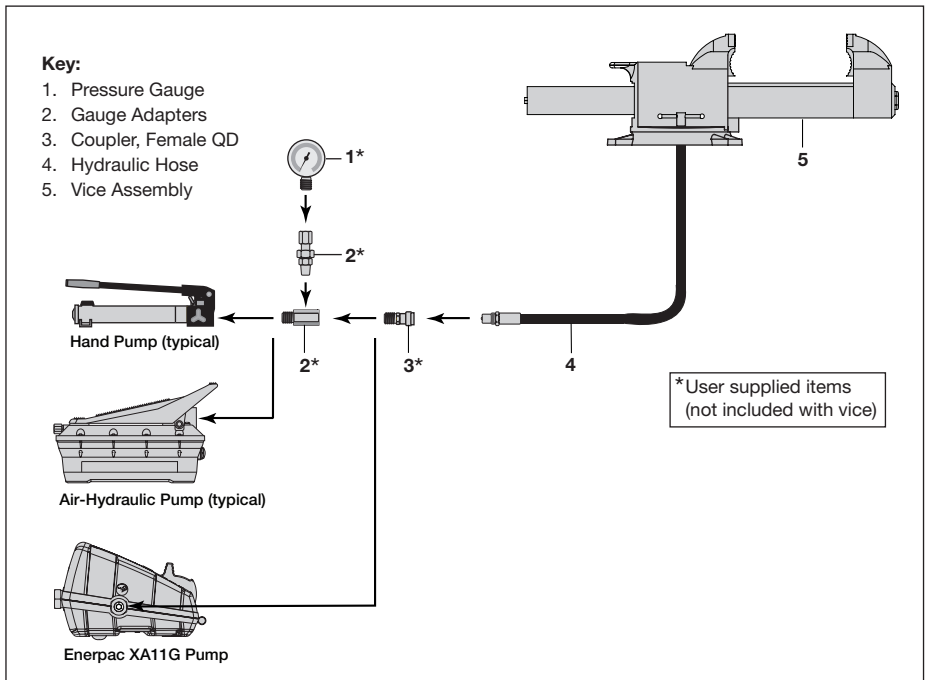


Figure 4 - Hydraulic Connections (typical).

Verify that there will be adequate clearance, so that the vice jaw can be fully extended to its maximum 8 inch [203 mm] opening without contacting other objects. Also, verify that there will be sufficient room to rotate the vice on the swivel base.

The vice is intended primarily for horizontal mounting. However, if desired, the vice can also be mounted vertically.

4.3 Vice Installation

Install the vice as described in the following steps:

1. Assemble the vice to the swivel base as shown in Figure 3. Tighten the locking nuts hand tight.
2. Route the hydraulic hose through the 1.5 inch [38,1 mm] diameter hole in the support surface.

IMPORTANT: One end of the hose is connected to the vice at the factory prior to shipment. To prevent air entry, do not disconnect the hose from the vice.

3. Firmly secure the vice and swivel base to the support surface as an assembly. Use three 39/64" bolts (user-supplied).
4. Rotate the vice to the desired position on the swivel base. To change vice position, loosen each locking nut about one full turn and rotate the vice to the desired position. After making adjustments, retighten the locking nuts to secure the vice.

4.4 Hydraulic Connections

Refer to Figure 4 for hydraulic connection diagrams.

A 10,000 PSI [700 bar] rated thermoplastic hydraulic hose is supplied with the vice.

The hose end contains an Enerpac CH-604 male quick-disconnect coupler.

A female quick-disconnect coupler (Enerpac CR-400 or equivalent) must be installed in the pump hydraulic outlet.

If the pump is not equipped with a gauge, install a 0-10,000 PSI [0-700 bar] hydraulic pressure gauge between the pump outlet and the hydraulic hose.

IMPORTANT: Be sure that all couplers are properly connected. Loose or partially connected couplers will block the flow of oil between the pump and the vice.

5.0 OPERATION



WARNING: Read and understand the precautions contained in Section 3.0, *Hydraulic Vice Operating Safety*, before operating the vice. Failure to observe the precautions in Section 3.0 may result in serious personal injury or death.

Note: On vented pumps, be sure that the vent/fill cap is in the "vent" position to allow reservoir venting. If a vent screw or plug is used, be sure it is loosened (open).

Operate the vice as described in the following steps:

1. To retract (close) the vice jaw, close the pump release valve and operate pump.
2. To lock (hold) the vice jaw in position, stop operating the pump, but keep the pump release valve closed.
3. To extend (open) the vice jaw, *slowly* open the pump release valve.

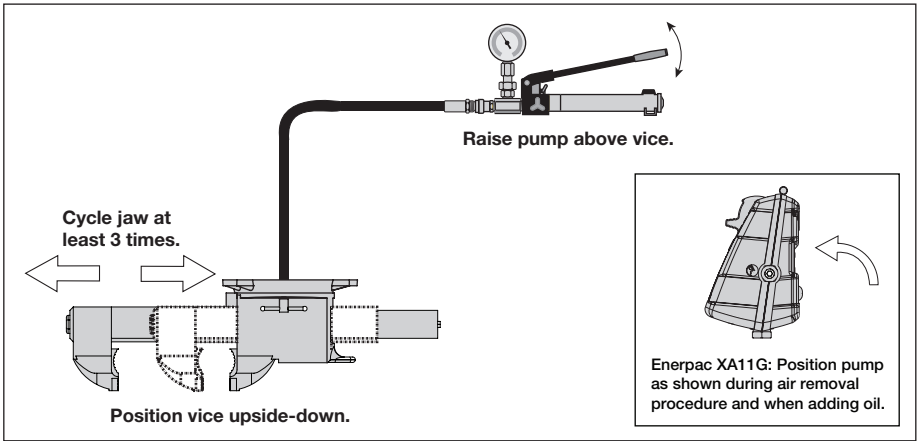


Figure 5 - Air Removal.

Operating Characteristics:

- Increasing the hydraulic flow will cause the jaw to close faster.
- If using an air-powered hydraulic pump, increasing the air flow will cause the jaw to close faster.
- Increasing the hydraulic pressure will result in greater clamping force.
- 1000 psi [70 Bar] of hydraulic pressure will provide approximately 650 pounds [2,89 kN] of clamping force. **Note:** Actual clamping force provided will vary depending on condition of vice, amount of use and other factors.



CAUTION: Always monitor the hydraulic pressure gauge when operating the vice. Excessive clamping force can damage and/or crush objects placed in the vice.

6.0 MAINTENANCE



WARNING: Always relieve pressure and disconnect pump from vice before performing any inspection, maintenance or repair procedures.

1. Use only Enerpac hydraulic oil with the vice. The use of any other oil may void your warranty.
2. Cover hydraulic fittings with dust caps when the hydraulic hose is disconnected.
3. Keep vice external surfaces clean.
4. To help ensure smooth operation, periodically lubricate the sliding tube of the vice with grease.
5. Periodically inspect the jaw wear plates for damage or excessive wear. Replace as required.
6. Periodically inspect the vice for loose or damaged components. Make repairs and/or replace parts as required before operating vice.
7. Store the vice upright on a firm surface, in a cool, dry place to prevent seal distortion.

7.0 AIR REMOVAL

If the vice jaw does not retract smoothly, this may be caused by air trapped in the pump, hydraulic hose or vice cylinder. Refer to the following steps for air removal instructions:

1. Remove the vice from the swivel base.
2. Place the vice on the ground and position it upside-down. See Figure 5.



WARNING: Vice jaw will move during the following steps. Keep fingers, hands and all other body parts away from the vice jaw clamping area.

IMPORTANT: The following steps are intended only as a guide. Pump venting arrangements and air purging procedures will vary, depending on pump model and type. Refer to your pump's instruction sheet for additional information.

3. **VENTED PUMPS:** Be sure that the vent/fill cap is in the "vent" position to allow reservoir venting. If a vent screw or plug is used, be sure it is loosened (open).
4. Raise the pump above the vice. See Figure 5.
5. Operate the pump to fully extend and retract the vice jaw at least three times. Verify that the jaw moves smoothly.
6. **VENTED PUMPS:** Remove the vent/fill cap and check oil level. Add oil if level is low. Use only Enerpac Oil.
7. **ENERPAC MODEL XA11G:** Place the pump in the vertical position as shown in Figure 5. Remove the oil fill plug to allow any trapped air to escape. Check pump oil level. Add oil if level has dropped. Use only Enerpac oil.
8. Reinstall vent/fill cap or oil fill plug as applicable.
9. **VENTED PUMPS:** Be sure the vent/fill cap is returned to the "vent" position after checking oil level or adding oil. If a vent screw or plug is used, be sure it remains loosened (open).
10. Reinstall the vice on the swivel base.

8.0 TROUBLESHOOTING

Only qualified hydraulic technicians should service the hydraulic vice and its components.

The troubleshooting chart (see the following page) is to be used only as an aid in determining if a problem exists. For repair service, contact your local Authorized Enerpac Service Center.

Troubleshooting Chart - Enerpac Model BV5 Hydraulic Bench Vice	
Problem	Possible Cause
Vice jaw will not retract.	Pump release valve open. Coupler not fully connected or tightened. Oil level in pump is low. Pump malfunctioning. Solid object in vice preventing movement.
Vice jaw retracts part way.	Oil level in pump is low. Coupler not fully connected or tightened. Vice cylinder plunger binding.
Vice chatters or vibrates as jaw retracts.	Air in hydraulic system. Dirt, burrs or corrosion on jaw sliding tube. Sliding tube needs cleaning and lubrication.
Vice jaw retracts in spurts.	Air in hydraulic system. Vice cylinder plunger binding.
Vice jaw retracts slower than normal.	Leaking connection. Pump oil flow too low. Coupler not fully connected or tightened. Pump malfunctioning.
Vice jaw retracts, but will not hold.	Vice cylinder seals leaking. Pump malfunctioning. Leaking connection. Incorrect system set-up.
Vice leaks oil.	Worn or damaged seals. Internal damage to vice cylinder. Loose connection.
Vice jaw will not advance or advances slower than normal.	Pump release valve is closed. Coupler not fully connected or tightened. Pump reservoir over-filled. Narrow hose restricting flow. Broken or weak tension spring. Vice damaged internally.
Oil leaking from external relief valve.	Coupler not fully connected or tightened. Restriction in return line.
Oil leaking from vice.	Coupler not fully connected or tightened. Leakage from vice cylinder.
Vice jaws are bent or cracked.	Load shift. Load too heavy for vice.

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