The following is a list of some common hydraulic circuit elements.

A hydraulic circuit consists of one or more fluid-power devices connected by piping or tubing. In a diagram or drawing of a hydraulic circuit, a solid line represents a pipe, a tube, or some other conductor capable of handling major fluid flow in the circuit. This type of pipe is often termed a major conductor.

A dashed line with longer dashes represents a pilot line. These types of lines are usually smaller in diameter and have a smaller fluid carrying capacity than the major conductor lines. The fluid pressure in pilot lines is usually the same pressure in the major piping lines.

A dashed line with smaller dashes represents a fluid-drain line or an air-exhaust line. These types of lines can be made from lighter weight materials and may not be able to withstand the high pressures that the two previous types of lines can withstand.

Pipes that cross each other but do not interconnect are drawn in a hydraulic circuit diagram with a small loop. The picture to the left shows two major conductor lines crossing. Note that any combination of fluid lines may cross and not interconnect with each other.

Pipes may also be joined together where the fluid from one pipe flows into the other pipe. This occurs at a point of junction and is denoted by the use of a connector dot shown in the drawing to the left.

Most fluid-power systems have a tank or reservoir where fluid is stored during some part of the cycle. Pipes that are connected to the reservoir can affect the operation of the hydraulic system, so it is important to know where the end of the pipes (either above or below the surface of the fluid in the tank), are located. A U-shaped symbol indicates a hydraulic fluid tank or reservoir that is vented.

In the drawing to the left, the main fluid line touches the bottom of the U, this indicates that the pipe terminates below the fluid level in the tank. Pipe lines from pumps and fluid motors are connected below the surface of the fluid in the tank so that air will not enter the device or the system through the pipeline.
The drawing to the left shows a drain line that is terminated below the fluid level in the tank. These drain lines can come from pumps, hydraulic motors, valves, and a variety of other hydraulic components.

In some industrial applications it is desirable to drain a fluid-power machine during its idle periods. This is accomplished by terminating a major pipe line above the fluid level in the tank and is denoted by the symbol drawn to the left. Note that the solid line ends before reaching the bottom of the U.

The basic circular symbol to the left represents a pump. Lines outside the circle are not part of the symbol but represent pipes connected to the pump. Rotating shafts in the pumps are shown by curved arrows along side the circle. One arrow indicates that the shaft rotates in only one direction, it follows that two arrows indicates that the shaft turns in either direction.

An equilateral triangle is typically used to show energy flow of the fluid. When it is used in conjunction with a pump symbol, it represents a fixed-displacement unidirectional pump. It follows that two equilateral triangles used in conjunction with a pump symbol indicates a fixed-displacement bidirectional pump like the one shown to the left.

A pump symbol with an arrow across it indicates that the pump displacement can be varied. This symbol represents a bidirectional variable displacement pump.

The basic circle used for pump symbols is also used for rotary fluid motors. A solid equilateral triangle shows the direction of energy and fluid flow in a motor as seen in the symbol shown to the left. The most important difference between a pump and a motor is that the fluid-energy flow is away form a pump and into a motor as indicated by the direction of the arrows. This symbol is for a bi-directional motor.

A motor symbol with an arrow across it indicates that the motor displacement can be varied. This symbol represents a bidirectional variable displacement fluid motor.

The circle with the M in the center represents an electric motor. The directional arrow indicates the direction that the shaft is rotating.

This is the symbol used for a pressure gage. This pressure gage may be used in several places. There is one usually built into the system next to the pressure relief valve. It may be desirable to know the pressures at different locations along the hydraulic line.
A double-acting cylinder with a single rod end is shown to the left. The cylinder is able to move in both directions. Note that the area of the cylinder is greater on the bottom end. This means that it will take more pressure on the top end to generate the same force as a lesser pressure acting on the bottom end.

A device to decelerate the piston and its load at the ends of the piston stroke is indicated by the small rectangular box inside the cylinder. A common device to accomplish this task is a cushion. The slash arrow indicates that the device is adjustable so that the deceleration can be controlled. This cylinder is also double-acting with a single rod end.

The device that is represented to the left is called a Three-position, four connection (way), spring-offset, mechanical control valve. The middle section that looks like the letter H is the default (or center) position. The springs on both sides hold the valve position in the center. The H symbol represents four connections, two ports A and B, a pressurized line P, and the tank line T. If the system is pressurized while the valve is in the centered position, then flow will be enabled through the horizontal line and then back to tank. The lever indicates that the valve is mechanical. If the lever is pulled to the left, then the left side with the vertical lines is opened. This allows fluid to flow into the system through port A and back out through port B. If the lever is pushed in to the right, then the valve opens according to the crossed arrows. This action forces fluid to enter the system through port B, instead of port A, and the fluid then exits through port A. Note that the flow rate can be controlled a little by the position of the lever.

The symbol to the left is similar to the previous one but with a few differences. This valve is controlled by a solenoid that is represented by the small boxes on both sides of the rectangle. The solenoid does not allow any control over the flow rate. It moves the valve spool completely left or right. The other difference is when the valve is set in the default (center) position no flow is permitted and pressure builds up. This is called dead-heading the system.

Often it is desirable to restrict the fluid flow in parts of the system. This can be accomplished through the use of a flow restriction (throttle) valve with a fixed size. It is represented by the symbol to the left.

The symbol to the left is also a flow restriction (throttle) valve. The arrow indicates that the flow restriction can be varied to a desirable level.

The symbol to the left represents a check valve. Its function is to allow flow in one direction but not in the other direction. As shown, flow is allowed to the left and blocked to the right.
A variable flow restriction valve can be coupled with a check valve. As shown, flow from left to right passes through the restriction, and flow from right to left passes freely through the check valve.

A pressure relief valve is used in most systems. It is initially closed with a spring load. When a critical pressure is reached the valve opens to allow fluid to flow. The arrow on the spring indicates a variable pressure relief valve. The pilot line indicates that the valve will open when the upstream pressure reaches the preset value. Often the flow out of the valve is directed back to the tank.

This valve is similar to the one above except that the valve is initially open. Pressure buildup occurring downstream from the valve will causes the valve to close as indicated by the pilot line. This is also a variable pressure control valve.

A pressure compensated variable flow restriction valve is used to try to maintain a constant flow rate when the system is experiencing pressure fluctuations. If flow through the valve increases, the pressure drop across the valve will increase, and the valve will reduce the orifice to decrease the flow rate. If flow through the valve decreases, the pressure drop across the valve will decrease, and the valve will enlarge the orifice to increase the flow rate. The valve adjusts the flow restriction to maintain a constant pressure drop across the valve.

The symbol for a filter is a diamond shape with a dashed line perpendicular to the flow direction. Filters are a necessity in hydraulic systems. If they are not used, contaminates will plug up the lines and it will be imposable to control the system.

The symbol for a manual shutoff valve is shown to the left. In case of an emergency this valve is the quickest way to shut the system down before any more damage can occur.

It is desirable to know the flow rate of the fluid at specified locations in the system. This is accomplished through the use of a flow meter as shown in the symbol to the left.