

# OSHA - Lockout Tagout

## Forms of Hazardous Energy

### OSHA's Lockout/Tagout Standard - Forms of Hazardous Energy

The OSHA Lockout/Tagout standard applies when we perform servicing or maintenance on certain pieces of equipment or machinery. Most of us recognize that electricity is the primary source of hazardous energy we face, but it's certainly not the only one. Here is an overview of some of the forms of actual AND potential hazardous energy we may have to deal with when we perform work covered by this standard:

**Electrical energy** - Electricity directly drives many of the motors on our equipment, but it also powers many of our switches and valves. In addition, some equipment with certain types of rectifiers or capacitors may retain potentially hazardous electrical energy even after we disconnect the main power supply.

**Pneumatic energy** - Air pressure is used to power some cylinders and control switches. It is critical to recognize that in some cases, this form of power could still be present even after we turn off power to the compressor, disconnect a supply line, or turn off a valve.

**Hydraulic energy** - Just like with pneumatic power that we just discussed, hydraulic pressure is also used to move cylinders and switches. And it, too, can remain under pressure even after the hydraulic pump has been de-energized.

**Mechanical energy** - Turning flywheels, springs under compression or tension, cams; these are all forms of mechanical energy that must be released or restrained on some equipment and machinery, even after the main power source has been de-energized.

**Thermal energy** - When the temperature rises, many gases will expand. If this takes place inside of a closed pipe, supply line, or vessel, a corresponding increase in pressure can occur. This increased pressure could result in a nasty surprise if we have not anticipated and controlled this form of energy before, we start working on the equipment.

**Chemical energy** - As with thermal energy, some chemical reactions create heat and/or pressure (think of the gas bubbles generated when an Alka-Seltzer is dropped into a glass of water). Think of how that could be hazardous if this reaction occurs inside of a sealed vessel, pipe, or supply line; and finally,

**Gravity** - An object, such as the block and hook of an overhead hoist, the upper die of a press, or the elevated mast of a forklift, could come crashing down even after the main power supply has been turned off. All it would take is the release of a brake, the activation of a valve, or the

loosening of a hose or supply line.

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