

# The Hydraulic Safety Press

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**HSAC**  
Hydraulic Safety Authority  
of Canada Inc.™

YOUR SOURCE FOR HYDRAULIC SAFETY AWARENESS NEWS, TIPS & INFORMATION

## News & Events

### » National Heavy Equipment Show

Toronto International Centre, April 18-19

Visit us at the Levitt-Safety booth. HSAC will be introducing our latest development in hydraulic safety awareness training.

» Live this month is our new website. Visit us at [www.hsac.ca](http://www.hsac.ca). This new site is full of resources and information on hydraulic safety. Also in our new site is the list of course slated for various release dates over the next year. Take a look at these sector geared courses and select one suited to your industry.

» HSAC is pleased to announce that Levitt-Safety is now an authorized provider of HSAC Hydraulic Safety Training Courses and Consulting services. Levitt recently delivered courses in Kamloops BC, Kingston and Ottawa Ontario. Contact [training@levitt-safety.com](mailto:training@levitt-safety.com) for course dates and locations.

» The Board of Canadian Registered Safety Professionals (BCRSP) has awarded the Hydraulic Safety Awareness Course, HSAC High Risk Maintenance Level, 1.0 CMP. The CMP approval number is 13024 for the 2013 calendar year. HSAC would like to congratulate all CRSPs who completed the High Risk Maintenance Course. This course is available online at [www.hsac.ca](http://www.hsac.ca). Contact [info@hsac.ca](mailto:info@hsac.ca) for the CRSP discount.

» The Ontario Water Waste Water Certification Office c/o Ontario Ministry of Environment has approved Hydraulic Safety for Continued Education Units for Certified Water Waste Water Workers. Courses are available both Instructor Led and E-Learning. Contact [info@hsac.ca](mailto:info@hsac.ca) for the associated CEU value.



## Company Charged

The U.S. Department of Labor's Occupational Safety and Health Administration has cited a Peoria company with four safety violations, including two repeat, after a worker was injured while testing hydraulic cylinders for leakage. During that process, the hydraulic coupler on the return line of the hoist stand failed and released pressurized hydraulic fluid, which struck the worker. The employee died two days later from injuries sustained at the truck manufacturing plant in August 2012.

Two repeat violations were cited for failing to develop machine-specific energy control procedures and training to ensure workers understood energy control procedures.

Two serious violations were also cited for failing to evaluate and correct repeated catastrophic failures of critical machine parts, include authorized employees while conducting annual inspections, document annual inspection reviews of energy control procedures and include each authorized employee in the review. A serious violation occurs when there is substantial probability that death or serious physical harm could result from a hazard about which the employer knew or should have known. "This unfortunate incident might have been prevented had the employer addressed previous incidents where the hydraulic coupler had failed" [www.osha.gov](http://www.osha.gov). Proposed penalties total \$82,000. 🍁

# Online Safety Courses

HSAC is very pleased to offer many more online safety training courses. Visit [www.hsac.ca](http://www.hsac.ca)

- Aboriginal Awareness
- Alcohol and Drug Awareness
- Arc Flash Awareness
- Backing Safety Fundamentals
- Bear Awareness
- Bloodborne Pathogens
- Bloodborne Pathogen Exposure
- Boiler & Pressure Vessel Design Registration
- Boom Truck
- Chainsaw Safety – Ontario
- Compliance, Safety and Accountability for Non-Drivers
- D.R.I.V.E
- Electric Safety Training
- Fall Protection Awareness
- Fall Protection Professional Series
- Firefighting Safety
- First Aid Awareness
- First Aid Interactive Refresher
- Forklift Fundamentals
- Forklift Operator Safety
- Four-wheel Drive Fundamentals
- GHS Hazcom 2012
- Goal Setting
- Hazard Assessment
- Lithium Battery Safety
- Lithium Battery Transport
- Personal Protective Equipment: Safe at Work
- Propane Cylinder Handling and Exchange
- Safe Slings and Rigging
- Safety Moments
- Sexual Harassment Part 1 - Hostile Environment
- Sexual Harassment Part 2 - Quid Pro Quo & Retaliation
- Stand Up Forklift
- The Effects of Stress on Driving
- The Supervisor: OH&S and the Law
- Time Management
- Traffic Control Person for Construction
- Transportation of Dangerous Goods TDG
- Trip Inspection
- Utility Bucket Rescue
- WHMIS
- Winter Driving Fundamentals
- Workplace Harassment - The Real Deal

## Poster Campaign A Success

HSAC is pleased to hear many organizations are making awareness of hydraulic hazards through the use of HSAC safety posters. To view the free safety posters please visit us at [www.hsac.ca/survey.html](http://www.hsac.ca/survey.html). All safety posters are available for printing from the HSAC website. Please forward this link to colleagues, supervisors and field personnel for posting on bulletin boards and for use in safety meetings.



Controlling hydraulic energy for lockout





**Left:** Bank of accumulators on plastic injection moulding machine

**Right:** Accumulator and safety manifold

## Accumulators

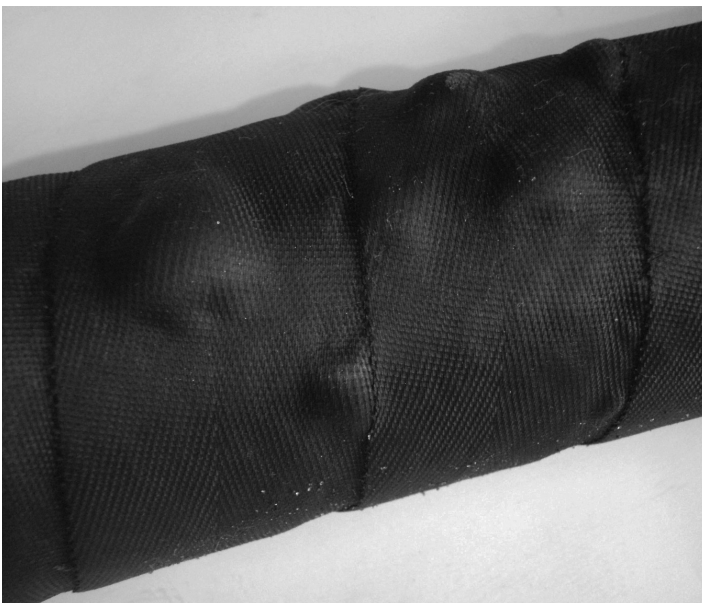
From the perspective of safety, accumulators are the most dangerous component in a hydraulic system. Hydraulic related injuries and death are a result of not being aware of these hazards. Common root causes of injury are not controlling hydraulic energy, accidental contact with controls, and component failure.

Related injuries are from crushing, fractures, dislocations, lacerations, punctures, amputation, burns, soft tissue damage, and fluid injection. Accumulators are used in some but not all hydraulic systems and are used for energy storage or energy absorption.

The potential energy storage is facilitated by the compressing of an inert gas which is contained in part of an accumulator. Hydraulic fluid is isolated from the gas by a bladder or piston. The type of accumulator is also referenced as a bladder or piston accumulator. Accumulators must be clearly identified with labelling.

The uncontrolled release of hydraulic fluid from an accumulator in a hydraulic system can be very violent. The discharge can blast a large amount of fluid out at high pressure in milliseconds. The physical exposure to the accidental release of this stored energy can be fatal. An accumulator circuit must have valves integrated for safely discharging the stored energy internally back to the reservoir bringing the accumulator to a zero energy state.

Never remove an accumulator from a machine unless you first remove the nitrogen gas charge. The accumulator is a stable device when it is part of the machine. Always verify using a pressure gauge to determine if the accumulator contains pressure at the fluid port prior to doing any work on a machine that contains an accumulator. Contact [info@hsac.ca](mailto:info@hsac.ca) for more information.



Blistering on the out shell of a hydraulic hose indicates internal failure and must be removed from service

## Next Issue

- Hydraulic leaks to the environment, prevention through training
- More of what to inspect for
- Sector geared hydraulic safety training

## FAQ

We encourage our viewing audience to send us questions which can be shared to assist others. HSAC received this question from a Safety Coordinator at a mine site.

**Q:** I was asked today at our JHSC meeting about Kevlar sleeves around hydraulic hoses. Is this a common practice and does it have value?

**A:** Protective sleeves do add value by reducing the risk of injury and equipment loss.

There are many misconceptions on the level of protection achieved by utilizing sleeves. Adding sleeves do increase the protection for workers, equipment and also protects the hose from abrasion. There are few manufacturers of hose sleeves and each sleeve must be researched as to their ability to resist abrasion, fire, and the ability to absorb energy from hose failure.

An implemented European Standard ISO 3457 Earth-Moving Machinery-Guards-Definitions and Requirements, under hose guards states that "Hydraulic hoses containing fluid with a pressure of more than 5MPa or 50 bar and/or having a temperature over 50°C, and which are located within 1 meter of the operator, shall be guarded." This standard was developed in recognition that exposure hazards are reduced by guarding.

If personnel can avoid exposure to hydraulic hoses their risk is eliminated. If exposure is unavoidable while a hydraulic hose is conducting fluid under pressure then guarding is highly recommended. In Canada there is no act or standard in place which enforces this method of risk reduction however there are enough related injuries and death to recognize this to be a best practice.

A sleeve can absorb the energy released when a hose fails and can channel the fluid to the ends of the hose allowing the fluid to escape at a much lower velocity, this reduces the risk of fluid injection.

The sleeve will also reduce and redirect atomized fluid which is extremely flammable. When atomized hydraulic fluid contacts hot components the risk of ignition is very high and has caused many equipment fires.

Atomised fluid is created at the rupture from high pressure fluid as it passes through the breach in the hose. Inside a sleeve the atomized fluid is absorbed back into the fluid stream before it exits the end of the sleeve.

In the event of a hose failure where the hose separates completely from the crimp, a hose sleeve may not stay intact and may become part of a whipping hose. Sleeves do reduce the ability to inspect a hose for abrasion and leakage of fluid to the outer shell. Hose management programs and proper installation along with guarding creates a Safety System. This system works extremely well which removes any down side mentioned earlier.

Many equipment manufacturers have taken a proactive approach and have made sleeves an integral part of hose assembly installations.

This topic has become part of many joint health and safety committee meetings in an effort to protect workers from hydraulic hazards. For more information contact [colin@hsac.ca](mailto:colin@hsac.ca)



Close proximity to hydraulic hoses on equipment