

INJECTION INJURY: PLANNING AND PREVENTION

By Gary Kleiner and Doug Honig

An injection injury is a jobsite hazard that can result in tissue damage, amputation, or at worst, death. For contractors, planning for prevention and treatment should begin immediately. When an injury occurs, the time to prepare is gone.

Hydraulic fluid, used to power mobile equipment, can escape from pinhole leaks in hoses caused by factors such as age, incompatible fluids, hose twist, and minimum bend radius violations. Pressurized fluids travel at bullet speed and can penetrate deep under the skin. The injured person may feel only a slight "electric shock" or pricking sensation. Rarely does the initial pain indicate the actual severity of the injury.

What looks like a simple puncture wound is, in fact, life threatening. Hydraulic fluids contain a wide range of chemical compounds that are highly toxic within the bloodstream.

Rob Shimko, product sales manager for Parker Hannifin's Hydraulic Valve Division, understands this all too well.

"My injury happened in the blink of an eye when my left hand was blown back from a pressurized valve," he recalls. "At first it looked harmless—just a red mark, and no pain to speak of."

IMMEDIATE TREATMENT

Injection injuries demand immediate treatment. Hydraulic fluid can quickly destroy tissue, leading to gangrene and the need to amputate. Simply rushing the injured person to the nearest hospital may not be adequate. Medical professionals classify an injection injury as a surgical emergency. Because the initial presentation of the wound appears harmless, the treatment protocol is often given a mistakenly low priority. The sooner treatment is received, the less chance long-term disability will occur.

PROPER MEDICAL CARE

It's also important to understand that many doctors are not experienced in treating injection injuries. It can take hours to locate a qualified medical professional. Time wasted can cost the injured person his or her limb (or life), reinforcing the need for proper pre-emergency planning.

"The doctor treated my injury like a burn, with salve and a bandage, and sent me home," Shimko adds. "That's when I remembered seeing injection injury warnings printed in an old service manual. I found it and took it back to the hospital, which led to the scheduling of immediate surgery. Fortunately it wasn't necessary, but a \$6,000 skin graft to repair the damage was."



This is NOT the way to check for leaks!

FAST RESPONSE WALLET CARDS

Begin planning now for proper treatment. Locate a practiced caregiver, such as a hand surgeon, and issue each employee a wallet card with the address and phone number of the medical facility and/or surgeon proficient in the treatment of injection injuries. On the back, list critical information that must be relayed—

type, amount and pressure of the fluid injected, as well as the exact time, body location, and penetration angle of the injury. Parker, through its SafetyWorks program, offers pre-printed "Fast Response for Injection Injuries" wallet cards.

FOLLOW SAFE PRACTICES

Prevention is always the best treatment. Equipment operators and service technicians must follow safe practices when checking for pinhole leaks and when repairing or replacing hose assemblies.

The body should never come in close proximity to fluid power components (hoses and fittings especially) when the system is

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pressurized. The most common cause of an injection injury is using hands or fingers to detect leaks. Even thick leather gloves offer little protection against a highly pressurized, extremely concentrated stream of hydraulic fluid. Under normal operating conditions, a pinhole-size leak can propel the fluid at more than 600 feet-per-second. To perform a proper visual inspection, shut down the system and wait for the pressure to be relieved entirely. When a system must remain pressurized or when hoses are routed in hard-to-see locations, use a pole of suitable length with a piece of cardboard attached to check for leaks.

CORRECT COMPONENTS

The safest hydraulic hose assemblies are made with hoses, fittings, and crimping equipment from the same manufacturer who has designed, manufactured, and tested these components to specifically work together. “Mixing and matching” components from different manufacturers is never a good idea and can lead to premature failure, including pinhole leaks at the fitting. Components from different manufacturers should never be combined to create hose assemblies apart from rare instances when both manufacturers have approved the exception in writing.

KNOW THE INDUSTRY SPECS

Also be aware of common misconceptions. Fittings that look similar may perform quite differently. Parker, for instance, subjects its fittings to a substantial number of tests prior to approving them for use with a particular hose. Only use hose and fitting combinations that have been tested together in accordance

with industry specifications.

Another misconception is that all crimping machines are essentially the same and therefore, if the crimp it makes looks good, it will be fine. The truth is that a manufacturer’s formal crimp specifications rarely (if ever) support different manufacturers’ hose, fitting, and crimper combinations. Only crimp a hose and fitting with equipment approved by the manufacturer of the hose and fitting.

The Parker Safety Guide for Selecting and Using Hose, Tubing, Fittings, and Related Accessories (4400-B1) provides more information about proper hose assembly. Contractors can find it within the Parker Hose Products Division catalog or download it at www.parkerhose.com.

SAFE PRACTICES PREVENT INJURY

Planning for and planning to prevent injection injuries is the responsibility of all employees who work with, on, or around hydraulic systems under pressure. Parker’s SafetyWorks program is part of the company’s commitment to help professionals working alongside fluid power systems to learn, understand, and follow safe practices. It is available to the contractor to educate equipment operators, service technicians, and safety managers about the personal injury and property damage hazards posed by escaping fluids and component failures. Instructional materials include participant workbooks, videos, and product samples.

Injection injuries can be life threatening and costly. Contractors who prepare for them and make a commitment to minimizing the risk of hose failure will help ensure the health of their workers and business. ◆