

*This short article, submitted by Jim Sime, appeared in a 2005 Prairie Promoter*

## **Care of Back Pack Fire Pumps**

There are two components of this major fire fighting tool: the water storage container of metal, fabric or plastic with its various straps, caps and hose, and the brass pump itself.

The **brass pump** is composed of three parts -- a **piston** tube (with check valve) that moves inside a **cylinder** tube (with foot valve), and a **gland nut** (with O-ring) which is at the top of the cylinder, seals the moving surface between the piston tube and the top of the cylinder.

The **cylinder** has a ball bearing foot valve that almost never fails, though it might stick. It should be free to move. Give the cylinder a shake and listen for the ball to rattle at the end where the hose attaches. If the ball rattles it's free. If the ball is not free you will need to disassemble the bottom of the cylinder. **Note the order of assembly so you can reassemble it correctly.** Screw off the fitting, taking care to not lose the washer or the rings etc. that seal this fitting to the bottom of the cylinder. If the ball is stuck or corroded to its seat you need to free it with a plastic or soft metal rod. Take care to not scratch the ball or its seat. A shot of W 40 will dissolve most gums and help prevent corrosion. Store the cylinder dry to prevent future corrosion or sticking.

The **Gland Nut** contains a packing seal between the piston and the cylinder. This packing seal consists of a neoprene O-ring or in the D.B. Smith pumps a special U-ring. The Gland Nuts are interchangeable. The seals are not. Failure here is evidenced by water leaking in the area of the Gland Nut when pumping. This leakage indicates a poor seal. The pump will also suck air past the Gland Nut instead of completely filling with water through the check valve. You should be able to stop this seal from leaking by tightening the nut. If it still leaks, oil it and wipe it clean. These seals can last a very long time but often fail in a year or so because of poor lubrication, grit, corrosion of the piston tube or excessive tightening of the Gland Nut. Keep it lubricated during use, wipe off any grit and most of the oil before storage and loosen the nut when not in use. Check the piston for roughness or corrosion. Polish the piston tube with a SOS pad or with one of the plastic scouring pads to remove any roughness. Anything more abrasive than fine steel wool may defeat your efforts by scratching the brass tube. If it continues to leak, replacing the O-ring or U-ring should fix it. Store the piston completely dry. Use a cloth lightly dampened with oil to wipe on a light coating for protection against corrosion. Thick coats of oil collect dirt and grit

The **Check Valve** is screwed on the end of the piston tube opposite the nozzle. This assembly is the weak link. Partial failure here shows up with water dribbling from the nozzle when the pump is not actually pumping. This will not actually stop the pump from functioning but it is annoying. The Check Valve consists of a brass fitting with a ball held in place with a spring and a spring retainer. Theoretically this spring should not lose its elasticity ever. Wrong!! These things fail too often leaving you with a perfectly good (expensive) brass fitting that leaks because of the weak spring. Chapin valves (identified by a star shaped retainer clip) can be disassembled so the spring can be stretched or even replaced cheaply. The internal ball (1-4999), spring (1-5505), and retainer clip (1-5658) are still available from **Chapin (800) 444-3140**. The valve body is no longer available. The Smith valve (available from many forestry suppliers approx, \$10) is interchangeable. The D.B. Smith valves (identified by a brass pigtail on the ball) have resisted efforts to stretch the spring in the

assembled valve or to reassemble the valve after removing the retainer. Check the operation of this valve by poking the ball with a plastic rod or pencil to see that it is movable. Then blow through it. If you can force air through it against the spring, it will leak. Occasionally some debris in the valve prevents the ball from seating. Clear and polish the seat with lead pencil (not really lead but a graphite ceramic). Scour the seating surface with the "lead". Allowing water to freeze in the piston will blow out the spring retainer destroying the valve, then it won't pump at all. Carry a spare replacement valve in your emergency supplies because failure here is major. The other malfunctions are mostly just annoyances.

Optional air bleeder: Mount a rubber umbrella valve (Tessman Seed Co (800) 286-0679 SP kit 02CH) in a flat area of the cap or the top of the tank. Drill a 13/64" mounting hole in the center of a flat area at least 1 1/4" diameter. Drill a 1/8" air bleed hole 3/8" away from the mounting hole. Pull the rubber tab (lubricate with liquid soap) through the mounting hole from inside to the outside of the tank. The umbrella will cover the bleed hole on the inside. This permits air to bleed into the tank while preventing water from getting out and down your neck. Plug the original bleed hole with epoxy putty. Epoxy putty stops leaks in metal tanks and other hard surfaces.

## Check List

### Brass Pump

- \_\_\_\_\_ Foot Valve rattles (store cylinder dry)
- \_\_\_\_\_ Bottom of cylinder doesn't leak at hose fitting.
- \_\_\_\_\_ Gland Nut can be snugged enough to stop leaking (loosen after use)
- \_\_\_\_\_ Neoprene ring inside Gland Nut soft enough to seal (oil before each use)
- \_\_\_\_\_ Spare Neoprene O-ring , or U-ring in emergency kit
- \_\_\_\_\_ Piston dry inside and out (remove check valve for drying - store lightly oiled)
- \_\_\_\_\_ Check Valve ball not stuck (check with pencil or plastic rod)
- \_\_\_\_\_ Check Valve spring strength OK (cannot blow air past ball against spring)
- \_\_\_\_\_ Check Valve gasket intact (neoprene O-ring seals valve fitting to piston tube)
- \_\_\_\_\_ Nozzle holes clear (standard 5/64". Larger hole -- easier pumping with less range)
- \_\_\_\_\_ Nozzle retainer chain and nozzle gasket functional

### Water Container

- \_\_\_\_\_ Hose not collapsed or kinked (replace with 36" of 1/2" radiator hose)
- \_\_\_\_\_ Hose functional not frayed or leaky
- \_\_\_\_\_ Tank or fabric bag no leaks (epoxy putty)
- \_\_\_\_\_ Filler Cap gasket seals satisfactorily (coat lightly with Vaseline)
- \_\_\_\_\_ Filler Cap air bleed hole open or replaced with rubber umbrella valve
- \_\_\_\_\_ Filler Cap tether/chain functional
- \_\_\_\_\_ Filler Cap alignment arrows visible (mark location of cam tabs on cap)
- \_\_\_\_\_ Tank alignment arrows visible (mark location of cam slots on can top)
- \_\_\_\_\_ Shoulder straps functional (not frayed and solidly attached)

\_\_\_\_(Optional) Hip Belt buckles functional (belt not frayed, solidly attached)