

## World Renowned Landis Hydraulic Ram Pump

Hydraulic ram pumps have been used for over 200 years to pump water to a storage reservoir using no energy source other than that available from a small dam or stream providing a Fall of water. Typically, a hydraulic ram pump can pump water to at least 10 times the height of the water Fall to the pump. Click [HERE](#) to see the Wikipedia information about hydraulic ram pumps.

***This hydraulic ram pump is dedicated to our good friend and affiliate, Harry Landis, who died in an ultralight airplane accident on 1 November 2015 while in Guatemala at his [Finca Ixobel](#) hydraulic ram pump testing site. As requested by his family and in honor of Harry, we are now manufacturing and selling this water pump to keep it available to those competent, self-reliant/sufficient people who need this pump and who have made it famous for being highly reliable, not requiring any maintenance and lasting several decades if not several lifetimes. This is the improved 2-inch diameter drive line version of the hydraulic ram pump that we helped Harry Landis design and which he sold on eBay for many years. Thank you Harry for all your contributions in improving the state-of-the-art of hydraulic ram pumps. You are and will be sorely missed!***

The Landis hydraulic ram pump is made entirely of welded steel and all bolts and fasteners are stainless steel:

**Dimensions (without bladder tank or tee fitting) 13" (33 cm) X 7" (18cm) X 11" (28 cm)**

**Weight 18 lb (8KG)**

**Designed, manufactured and assembled in USA**

**Cost is \$450 plus shipping (\$22 for USPS Flat Rate in USA) or \$472 total.**

**Tank, tee fitting, shutoff valves and pressure gauge are NOT included!!!**

We have sold our entire inventory of Landis ram pumps and we don't know when we will have them available again. In the meantime, you may contact our friend and Amish affiliate to see if he has any of his fully completed "Water Worker" units available for sale:

**Shrock Machining**

**Attn: Andrew Shrock**

**S 3918 Chicken Hollow Rd**

**Hillsboro, WI 54634**

The tank, tee, shutoff valves and pressure gauge are NOT included because people require different components depending on what they will use for their delivery line diameter and they may also prefer a different component material quality to either reduce overall cost or to increase installation life (e.g., galvanized steel versus 316 stainless steel). The shutoff valves and pressure gauge are NOT absolutely required, but they do make pump setup and any required maintenance easier. Furthermore, if you want a pressure gauge, you need to select one that has a range suitable for your specific installation site.

We have seen hydraulic ram pumps made with plastic or aluminum components, but they never work very well and don't last very long because the plastic flexes which reduces efficiency and the aluminum/plastic eventually fails from the large number of water hammer pressure stress cycles, often in excess of 150,000 cycles per day. Plastic is also subject to sunlight UV degradation. You will notice that manufacturers who sell production aluminum/plastic hydraulic ram pumps often sell repair kits for them too. And these mass produced aluminum/plastic hydraulic ram pumps that always seem to come and go on the marketplace often cost way more than the 40+ year time tested Landis hydraulic ram pump. Furthermore, drinking water that comes in contact with aluminum or plastics containing BPA has been shown to be detrimental to one's health. The Landis hydraulic ram pump is constructed mostly of carbon steel (stronger and more rust resistant than cast iron) and the remaining pump other components are constructed from NSF certified materials. ***Unlike many hydraulic ram pumps, every component of the Landis hydraulic ram pump is DIY friendly and can be easily DIY customized, modified and repaired as needed for each unique installation site and each unique application. This is a very significant advantage and benefit to competent, self-reliant/sufficient people who live in remote areas.***

Traditionally, hydraulic ram pumps have used a waste (clack) valve much like the valves in a car engine to close the drive pipe and generate the pressure pulse which pumps the water to the storage reservoir. The main cause of failure or reduced efficiency in these pumps has been the wearing of the waste valve guide due to metal against metal movement, sometimes aggravated by silt or grit in the water, as well as uneven wear on the valve seat, leading to incomplete sealing and loss of pressure.

The Landis hydraulic ram pump design is a considerable improvement over traditional hydraulic ram pumps, as it basically eliminates this cause of failure and poor operation. In the Landis design, the waste valve and guide is replaced by a polished glass ball which closes against a thick rubber seat. The ball rests in a sort of cage, and when the flow of water past it is sufficient, it is carried upward against the rubber seat, thus stopping the flow, and causing a water hammer pressure pulse in the drive pipe. This pressure pulse opens the check valve beneath the ballast tank which causes water to flow into the ballast tank until the pressure pulse is dissipated. The check valve then closes, the waste valve ball drops, and the cycle repeats. Since the waste valve ball is round, it will wear evenly (if it ever wears at all), so it will always seal well against the rubber seat. The frequency setting of the Landis hydraulic ram pump is adjusted by loosening a nut on the bottom of the clack/waste valve cylinder, turning the shaft to raise or lower the cage holding the glass ball, and then tightening the nut after the required operating frequency is achieved. Raising the cage increases the operational frequency and lowering the cage decreases the operational frequency.

Harry Landis built the first hydraulic ram pump of this type in 1980 at his [Finca Ixobel](#) hydraulic ram pump testing site which had no electricity. They are now a hotel, restaurant and tourist destination as well as a working farm. This installation site has a 5 foot dam on a natural artesian spring which supplies all their water needs. Originally in the 1970s, there were two standard type hydraulic ram pumps, which worked adequately, but required frequent maintenance and valve replacement. After some 5 years of repairing and working with these standard type hydraulic ram pumps, Harry Landis came up with this new design. His first such hydraulic ram pump is still working there, as well as several other similar ones which replaced the original standard type hydraulic ram pumps. Together, they pump around 2800 gallons per day to a storage tank about 25 feet above the pumps. **Click [HERE](#) to see a YouTube video of the original Landis hydraulic ram pump operating.** **Click [HERE](#) to see a YouTube video of our own personal Landis hydraulic ram pump operating.** **Click [HERE](#) to see a YouTube video of one of our customer's Landis hydraulic ram pump operating.**

A minimum water Fall to the pump of 3 feet is recommended and Falls in excess of 100 feet have been successfully accomplished with DIY customized, modified Landis hydraulic ram pumps. Typically, a hydraulic ram pump can pump water to at least 10 times the height of the water Fall to the pump. The higher the Fall and the lower the Lift to the storage tank, the more water it will pump. However, the Lift has to be greater than two times the Fall for the pump to operate at all.

The Landis hydraulic ram pump has a heavy steel flange for connection to the drive pipe to make installation and removal easy. The flange takes a 2 inch standard steel or galvanized drive pipe coupling. The tank that should be used is just a standard expansion bladder tank, available for around \$40 from Home Depot or similar suppliers. They generally come with either 1/2 inch or 3/4 inch male fittings, so you will also need a 3/4 inch tee and possibly an expansion bushing for the diameter of your delivery line to convey the pumped water to your storage tank.

We can also offer a little advice and assistance on how best to install this Landis hydraulic ram pump. Basically all you will usually need is 42 feet (two lengths) of 2 inch steel pipe for the drive pipe and 1 inch or larger potable water (e.g., NSF certified) plastic delivery line to your storage tank. The pump speed can be adjusted to maximize delivery flow rate by raising or lowering the ball cage with the threaded stainless shaft. Normally about 30 to 60 cycles per minute works best. **To be sure this pump is suitable for your installation site and that the water delivery flow rate is adequate for your needs, please use our [Landis Hydraulic Ram Pump Performance Calculator](#).** **We do not accept any returned pumps!**

If your water has debris or is silty, you will want a settling pool ahead of the drive pipe to keep this debris and silt out of the pump. And a screen to keep out fish and snails is also a good idea. You will want to reduce the pressure in the ballast tank to a little less than the pressure in the delivery line. That will be about 1/2 PSI for

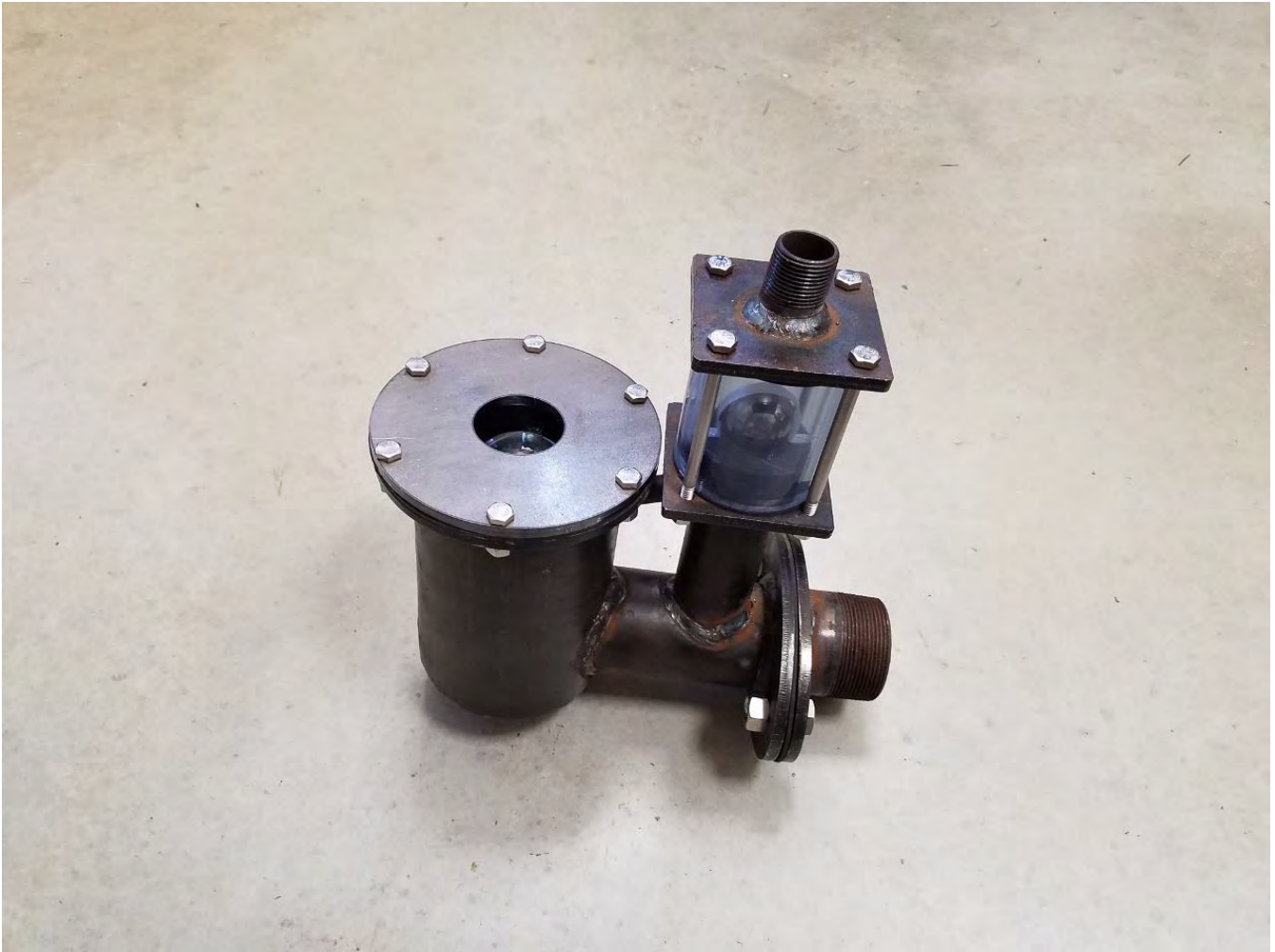
each foot that the storage tank is above the pump. These tanks generally come pressurized to about 20 or 30 PSI. And if you are in an area subject to freezing, you will also want to take related precautions. In most climates, the pump will not freeze while it is operating. In severe freezing climates you may want to take the pump out of service for the Winter. The flange and bolts make this easy to do.

Please email [Support@BorstEngineeringConstruction.com](mailto:Support@BorstEngineeringConstruction.com) for installation questions and any required follow-on support. If you only have this information in paper form, an online version with Hyperlinks may be found here:

[https://www.borstengineeringconstruction.com/Landis\\_Hydraulic\\_Ram\\_Pumps\\_for\\_Sale.pdf](https://www.borstengineeringconstruction.com/Landis_Hydraulic_Ram_Pumps_for_Sale.pdf)



**Example of an Amish Nicely Fully Completed and Finished Pump**



**The Assembled Raw Pump Parts Sold Here**



**The Raw Pump Parts Sold Here**



**Details of the Pump Clack and Check Valves**