PART 1: THE HYDRAULIC RAM PUMP

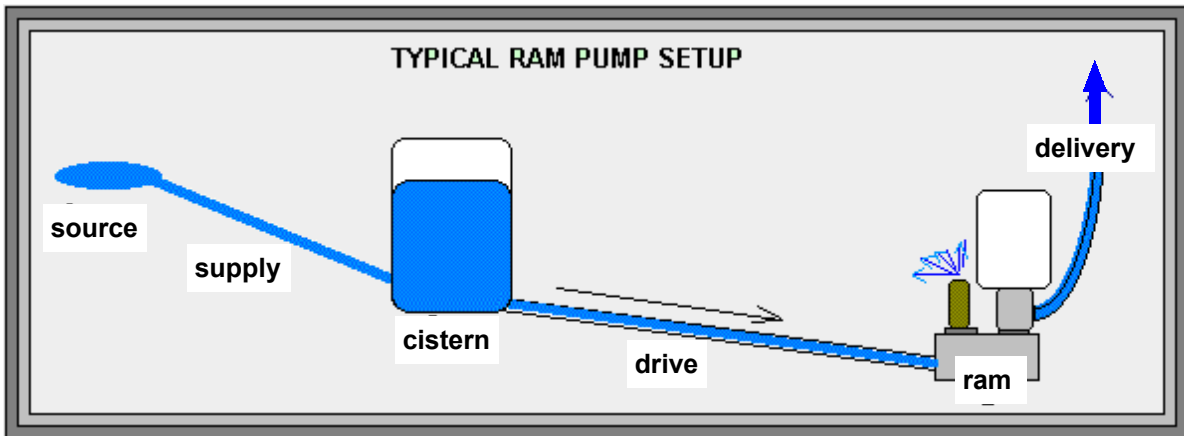
The Hydraulic Water Ram Pump is a piece of Americana that is as useful today as ever. Utilizing a simple principle, the hydraulic ram can pump water from a flowing source of water to a point above the source of water with no other power required. How can this be?

Moving water contains a small amount of kinetic energy (inertia); this is the energy of water falling downstream under the force of gravity, for our purposes called the FALL. The ram pump utilizes this inertial energy to pump water to a height greater than the source of the water. It runs all the time, requires no fuel, and needs only minor adjustment and cleaning for maintenance after the initial setup. The ram pump uses much more water than it pumps; it uses the energy of a lot of water to move a portion of it, about 10-15%. Because it runs all the time, even a small output really adds up! There are two things needed to operate a ram pump:

(1) Enough water — about 4 gallons per minute, minimum.

(2) Enough fall — about 6 feet, minimum.

Hydraulic rams have been around for many years, in many differing configurations, falling off in popularity as electric power became more widely available. Many people have never heard of a ram pump, and as a result some sites get an expensive setup. Or else no water at all.
The ram pump occupies a narrow niche in the array of water pump systems available today. Because it is somewhat more involved to set up than a powered pump, a ram is generally used only where electricity is too expensive or not available (or too far from the water source). But where it is called for, a ram pump water system is a dependable, economical alternative to a conventional electric or gasoline water pumping system. It will give years of reliable service with very minimal setup and operating costs.



A popular use for a ram pump is the small homestead or remote house site. A spring, creek or river is the water source. Water running downhill provides the power. The water is pumped to a storage tank above the level of the house or garden.

The clack valve in the Atlas can operate without any spring tension because gravity, and suction from the drive pipe, serve to open it. This is much more reliable than a spring that always needs to be adjusted. In operation, this valve is forced to close by the water rushing out of it from the drive pipe. It closes **suddenly**, which causes the water hammer effect that opens the check valve. At the same time the closing of the clack valve causes a shock wave to travel up the drive pipe to the intake. When the shock wave hits the intake, pressure is reduced at the clack valve, which suctions the clack valve open for the next ram stroke. This is why the period between strokes is changed by altering the drive pipe LENGTH. And that is the reason for specific drive pipe lengths for any setup. In a nutshell, this is about 80-100 feet for a 1 inch Atlas ram. The clack weight can be adjusted to open the valve just a little sooner and hold it open longer, which gives a better delivery amount. This is not usually needed unless the water supply amount is less than optimum.