Hydraulic Ram Pump

What is a Hydraulic Ram Pump?

A Hydraulic Ram Pump uses downhill water pressure to pump water much higher than its origin. Ram Pumps have proven their reliability for more than 200 years. They are often the only solution when there is no access to electricity or gasoline. They are extremely simple, have just two moving parts and no external source of power is needed.

Uses of Hydraulic Ram Pumps:

- Lifting water from springs, wells, streams, rivers to settlements on higher ground.
- Pumping water from springs, wells, streams, rivers that have a significant slope.
- Lifting irrigation water from streams or raised irrigation channels

Whenever a water source is available and the area is not completely flat, there is always a possibility to install a Hydraulic Ram Pump.
Parts & function of a ram pump

- **Delivery Pipe** - pipe from the ram pump to a collection tank.
- **Pressure Vessel** - serves as a buffer and catches the over pressure up.
- **Pressure Valve** - catches the over pressured water up.
- **Waste Water Valve** - stops the inrushing water and is mainly responsible for the over pressure.
- **Drive Pipe** - supplies the ram pump with water for a proper operation.
How does a Hydraulic Ram Pump work?

1. Initial Position of the Ram Pump

- in the pressure vessel is uncompressed air
- actually no water flow at the delivery pipe
- the pressure valve is closed
- water flows into the pump
- the waste water valve is open

2. Start of the Ram Pump cycle

- the pressure vessel is still closed
- still no water flow at the delivery pipe
- the pressure valve is still closed
- water speed (flow) increase

3. Over pressure phase

- while flowing water under pressure passes the pressure vessel, the air becomes compressed
- slowly the water begins to flow
- because of the over pressure in the pump body, the pressure valve opens
- because the waste water valve is closed, the water flow stops abruptly and creates an over pressure in the pump body
- the waste water valve is now completely closed
4. Start of the delivery phase

- the pressure in the pressure vessel is now at its highest point and the air starts to expand
- the waste valve now starts to slowly open because the over pressure was caught up from the pressure vessel
- because of the expanding air from the pressure vessel, the water is “forced” through the delivery pipe
- at this stage the “water shock” swings between the tank and the pump until the waste water valve opens again completely and the water flow starts again

5. Delivery phase

- the compressed air expands completely until the pressure equalizes between the pressure vessel and the amount of water in the delivery pipe
- now the compressed air cushion forces the water through the delivery pipe
- the pressure valve is now completely closed
- the waste water valve is fully open and the flow starts again

6. End phase and beginning of a new cycle

- in the delivery pipeline the flow has stopped until the air cushion gets compressed again and water streams into the air chamber
- the air has now completely extended and there is equal pressures in the pressure vessels
- the pressure valve is and stays closed until the next over pressure phase
- the water is flowing now with increasing speed until the waste valve closes
- the waste water valve is now completely open and the water flow starts to speed up
What does the Rain Tree Foundation do?

The Rain Tree Foundation aims to provide the villagers with access to a sufficient amount of water for their daily needs and to make it possible to conduct successful farming. Especially in the seasons with no or little rain, as then the villagers spend most of their time carrying water and therefore they are not able to irrigate and grow their own vegetables and fruits in their village or community. The Rain Tree Foundation uses Hydraulic Ram Pumps from their competent partner Meribah Ram Pump, for their projects. We deliver and install the pumps with the villagers.

What can you do?

Installing the Hydraulic Ram Pump costs money. With your donation you can give a whole village access to water. Please contact us if you are interested in making a donation.