

## Design and Modeling of Light Duty Trencher

**Authors :** Yegetaneh T. Dejenu, Delesa Kejela, Abdulak Alemu

**Abstract :** From the earliest time of humankind, the trenches were used for water to flow along and for soldiers to hide in during enemy attacks. Now a day due to civilization, the needs of the human being become endless, and the living condition becomes sophisticated. The unbalance between the needs and resource obligates them to find the way to manage this condition. The attempt to use the scarce resource in very efficient and effective way makes the trench an endeavor practice in the world in all countries. A trencher is a construction equipment used to dig trenches, especially for laying pipes or cables, installing drainage, irrigation, installing fencing, and in preparation for trench warfare. It is a machine used to make a ditch by cutting the soil ground and effectively used in agricultural irrigation. The most common types of trencher are wheel trencher, chain trencher, micro trencher, portable trencher. In Ethiopia people have been trenching the ditch for many purposes and the tools they are using are Pickaxe, Shovel and some are using Micro Excavators. The adverse effect of using traditional equipment is, time and energy consuming, less productive, difficult and more man power is required. Hence it is necessary to design and produce low price, and simple machine to narrow this gap. Our objective is to design and model a light duty trencher that is used for trenching the ground or soil for making ditch and used for agricultural, ground cabling, ground piping, and drainage system. The designed machine trenches, maximum of 1-meter depth, 30 cm width, and the required length. The working mechanism is fully hydraulic, and the engine with 12.7 hp will provide suitable power for the pump that delivers 23 l/min at 1500 rpm to drive hydraulic motors and actuators.

**Keywords :** hydraulics, modelling, trenching, ditch

**Conference Title :** ICHP 2016 : International Conference on Hydraulics and Pneumatics

**Conference Location :** Miami, United States

**Conference Dates :** December 05-06, 2016