

# Hydraulic Power Transducer

## TECHNICAL FIELD:

Mechanical Engineering related to heavy machineries and long arm operations of cranes etc.

## BACKGROUND ART:

In distant arm operations of heavy machineries, power transmission from the main engine is a difficult task. Moreover two power engines are used for distant operations or unless Electric Motors are used. But the efficiency of the power transducer system is not satisfactory and the power output is not adequate to do the distant work due to intermediate losses.

The invention 'Hydraulic Transducer' introduces a novel power transmission technique for high efficiency of the process.

## DESCRIPTION:

### 1. Theoretical analysis:

Under same temperature and confined conditions, a homogeneous liquid does not change its Volume against Pressure.

'Water Hammer' phenomenon in hydraulic Engineering is the principle applied for this invention. In hydropower generating plants, a big pressure wave is created in the tunnel and the penstock line as well when valve gates are suddenly shut down. pressure in the tunnel is instantly increased and the pressure wave is instantly driven back towards the reservoir. In contrary, a vacuum is created at the penstock side and instantly it was driven towards the turbines in the power house.

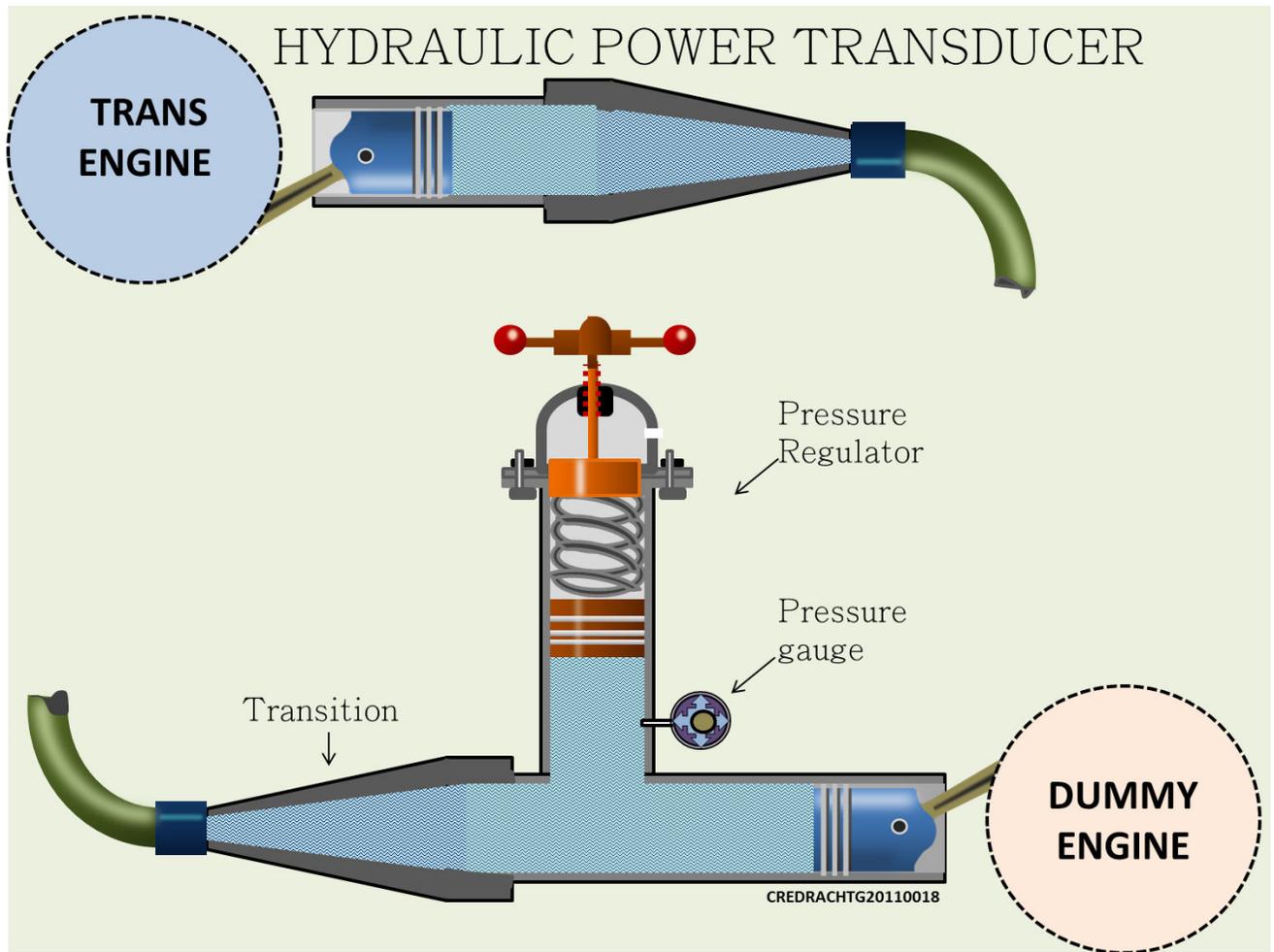
Briefly it is a pressure wave in the line which transfers a big momentum towards distant destinations. The same phenomenon is introduced herein to transmit mechanical energy output of an engine, to a distant trans-engine by means of a pressure wave in a hydraulic tube.

The wave is created by a piston of the Dummy Engine, driven from the crank shaft of the Main Engine. At the far end of the hydraulic tube, a piston of the Trans Engine is driven by the wave itself. The forward stroke of the driving piston creates the Pressure Hike for the wave, and the consequent reverse stroke creates the Vacuum Hike to draw the medium wave back. Frequency of the FM medium wave is the same RPM of the Dummy Engine.

The Trans-Engine too is driven at the same rate of frequency and that is the basic theory behind the innovative technology.

Pressure inflation within the system is controlled by a 'Pressure Regulator' just as pressure variation in a hydropower tunnel is regulated by the 'Surge Tank' in hydropower generating systems.

## 2. The way how it works:



**FIGURE** (demonstration of the 'Hydraulic Power Transducer' technique)

The Main Engine is coupled to the Transducer Unit through a belt or gearoperated Dummy Engine which is also belonged to the Transducer Unit. The piston of the Dummy Engine transfers power in to the liquid creating a wave like Pressure Hike.

There is a Pressure Regulator fixed to the Transducer Unit, as shown in the figure, and the initial pressure of the liquid has to be set to a fixed value, which is to be calculated upon what percentage of HP from of the Main Engine should be transferred in to the distant Trans Engine.

The wave like Pressure Hike and consequent Vacuum Hike is instantly transmitted towards the piston of the Trans Engine to drive it at the same frequency of the Dummy Engine.

The Transition Cones fixed at both ends of the flexible pressure hose, play the important role of accelerating and decelerating of the impulsive fluid momentum to transfer as a FM wave through the flexible pipe line. Frequency of the FM wave is the same frequency of the Dummy Engine.

### 3. Advantageous effects: :

1. Power transferring ability for distant operations through a flexible hose is much economical than use of long arm propellershafts with lots of universal joints.
2. Power loss is minimized by this novel technique to improve the Overall Efficiency in the power transmission.