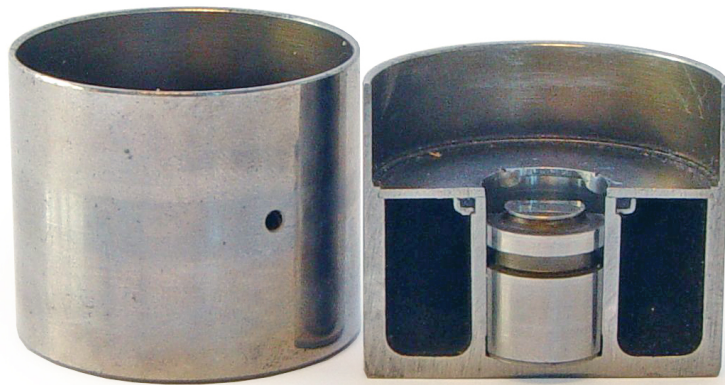


THE COMPETITIVE FLOATING CUP



Hydraulic bucket tappets are used in internal combustion engines to adjust the lash between the intake and exhaust valves and the cam shaft. Inside each tappet is a piston, a cylinder and some oil. The tappets are positioned close to the combustion cylinder. Despite the high oil temperatures, the gap between the piston and the cylinder must be

near leakproof. For this reason the gap height between the piston and the cylinder is less than a micrometer. Yet these components are produced at very low cost, using technologies as fine blanking, precision stamping, and sorting. The floating cup principle is designed for these technologies, combining precision and low cost manufacturing.

COST ADVANTAGES

AUTOMOTIVE PRODUCTION

The floating cup principle brings automotive production technologies to the hydraulic industry. Powder metal, fine blanking, sorting and many other manufacturing processes are used as a basis for the design of the floating cup components. The design is aimed at the same manufacturing price per kilogram as for automotive transmissions and engines.

TOLERANCES

The outer diameter of the piston crowns and the inner diameter of the cups have a tight tolerance. For the pistons and cups a sorting process can be applied, similar to the production of hydraulic bucket tappets. Since the cups are free to move on the barrel plate there are no further tolerance requirements for the piston position.

EFFICIENCY ADVANTAGES

Floating cup pumps and motors have a higher efficiency than current pumps and motors, especially at part load operating conditions. Also the torque efficiency at breakaway is extremely high. As a result the size of hydraulic pumps and motors can be reduced, which will further reduce the costs.

TOTAL COST OF OWNERSHIP

An excavator uses less than 20% of the fuel energy for its task: moving earth. The rest is converted to heat. The use of floating cup pumps and motors will drastically reduce the fuel consumption. For a middle class excavator, a 20% reduction of the fuel consumption results in average savings up to 7500 liters per year, simply by replacing the pumps and motors. Such improvements will also reduce the cooler demands, and costs. The high efficiency of the floating cup motors opens up new opportunities for hydraulic hybrid systems. The minimal friction and wear in floating cup pumps and motors also causes the components to maintain its efficiency over the applications lifetime, further reducing cost of ownership



More information about Innas and the floating cup technology can be found at www.innas.com



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