

# Ideas in motion

**BY ENABLING GREATER INDEPENDENCY THAN BELT- OR PTO-DRIVEN MODELS, HYDRAULICALLY DRIVEN PUMPS ENSURE MORE FLEXIBLE AND PRODUCTIVE OPERATION OF OFF-HIGHWAY EQUIPMENT**

The demands of earthmoving and agricultural machinery operators have led OEMs to produce a wide range of accessories suitable for machines equipped with hydraulic systems. These accessories are essential to enable more flexible and productive use of mini excavators, excavators, skid loaders, wheeled loaders, backhoe loaders and cranes.

The use of hydraulic motors in these applications has many advantages: the location of the pump is not linked to the PTO or the engine driveshaft as it can be mounted in a variety of locations that best suit the application requirements. The performance is only dependent on the supply of hydraulic oil to the motor and is not necessarily tied to the engine speed. A hydraulic-driven pump can produce higher pressures than PTO or belt-driven pumps, and it can also hold constant pressure at varying engine speeds on closed-center hydraulic systems. On a hydraulically driven pump, there are no belts to align or break, while separate pump and hydraulic motor shafts simplify repair and replacement.

These components exploit the hydraulic system of the machine to which the components are connected – consequently all hydraulic components should be extremely reliable across all operating conditions and possibly also resistant to mishandling by the operator. To satisfy the tough demands of the agricultural and construction equipment markets, Marzocchi Pompe has therefore developed a number of specific products.

## ALPC and GHPC pumps

Multiple pumps with reduced axial dimensions have been designed to enable easier integration in the engine compartment of small agricultural machinery. They are available in two configurations: the ALPC with flange and aluminum cover; and the GHPC with cast iron flange and cover.

These new pumps feature reduced axial dimensions of more than 40% compared with standard modular multiple pumps. The connections between the stages are obtained by internal grooved couplings so as to minimize the axial dimensions, while ensuring high torque transmission.

These particular models of multiple pumps can be supplied in either two-stage or three-stage versions; a number of stages greater than three is still available following verification of the operating cycle of the



**A typical gear motor application: bush cutter with T-system gear motor**

hydraulic circuit. The short pumps may accept different configurations of flanges, shafts, and inlet and outlet ports. Also available are common inlet versions where only one port feeds two or more stages of the pump. ALPC and GHPC pumps are available with displacements from 1.4-87cc/rev.

## Pumps and motors

T-System pumps are special models that can also work with radial and axial forces applied to the motor shaft, thereby making possible the transmission of motion by means of pulleys, belts, chains, sprockets, or the direct fitting of large and heavy fans.

The use of the bearing support is essential for these applications because it supports external stresses, leaving the internal bushings free to move, following the movement of the gear without other constraints. The shaft is supported by a double-row angular contact ball-bearing that can withstand heavy radial and axial loads. The bearing is permanently lubricated by the oil hydraulic circuit, thereby ensuring optimal lubrication and a good heat exchange. The compact design means it is ideal for use in conditions where space-saving solutions are needed.

T-system is available in all versions of group 2 and 3 AL and GH pumps and motors in displacements between 4.5-87cc/rev. All these products can be equipped with integrated valves: cavitation valves, relief or electroproportional valves can be integrated in the cover. The use of cavitation valves prevents, in the transient condition of circuit, the motor reversing in the direction of rotation, as well as protection in the event of it not being mounted correctly.

Relief or electroproportional valves are useful to control the rotation speed or to limit the available shaft torque. It is also possible to equip the hydraulic motor of a system with radial sealing at the shaft that can bear internal overpressures or high shaft rotation without damage. This is particularly useful in single-direction hydraulic motors when, in certain conditions of use, high overpressures will be generated at the motor output. With bidirectional motors, the area adjacent to the seal ring of the drive shaft will be maintained at atmospheric pressure by the drainage circuit. **ivt**

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