

Pump and dump

A COMPACT, ROBUST GEAR PUMP AT THE HEART OF MESSERSI MINI-DUMPERS IS KEY TO ENSURING THESE MACHINES RISE ABOVE EVERY CHALLENGE THAT COMES THEIR WAY



By virtue of its continuous cooperation with many of the leading off-highway equipment manufacturers, Marzocchi Pompe is an ideal partner for the development of machinery for the earthmoving and other industrial vehicle sectors.

Take Messersi, a first-class manufacturer of compact equipment, for example. Established in Italy in 1957, it has now become a world leader in the manufacture of tracked mini-dumpers and boasts a wide range of models, from 0.5t to 2.5t in payload.

Through the use of the most up-to-date design technologies and high-quality components and materials, these Messersi machines can meet every type of challenge with the guarantee of high performance and superb durability. The tracked mini-dumpers' main advantage of allowing one worker to carry out a number of jobs at one time means a saving in time and labor for the building company, while helping to maintain the optimum safety and working conditions inside the building yard.

The power and torque of the engine, rapidity of movement and compatibility with a wide range of accessories make its mini-transporter an ideal solution to meet materials handling needs, even in confined spaces, as well as many other jobs inside the building yard. With its hydrostatically driven and patented track layout, the TCH-R812D in particular delivers a larger footprint on the ground, providing superb stability and enhanced driving comfort during all loading conditions.

At the heart of the power unit is the 1BK7 gear pump, which Marzocchi supplies to Messersi in several different displacements. This is housed in the main hydraulic circuit and, together with the small main engine, generates the hydraulic power required to operate the motors and the cylinders. The Marzocchi pumps were chosen as they were of the correct displacement to obtain optimum performance from the engine used. Tests carried out by Messersi also highlighted the good behavior of the pump in terms of low rotational speed and exceptional ability to maintain pressure.

Belying their compact dimensions, Marzocchi BK7 gear pumps are extremely robust and available in aluminum (ALP) and cast iron (GHP) versions, in displacements between 1.4cc/rev and 35.2cc/rev. The spheroid cast-iron flange and cover construction



allows the GHP pumps to easily handle peak pressure up to 310 bar and rotational velocity up to 6,000rpm. The optimized design provides the operator with outstanding volumetric and mechanical efficiency over most working conditions with maximum values that reach 98%. Those high values of efficiency offer improved autonomy and economy of the platform.

The use of hydraulic equipment in this kind of small earthmoving and material handling machinery offers numerous advantages. Chief among these is the installation versatility – the mounting of the pump, and of the hydraulic motors, is no longer constrained by the position of the PTO, as this can now be positioned freely to meet application requirements. Pumps and gear motors are also very compact power units, and their speed of operation depends on the oil flow in the circuit rather than being dependent on the speed of the combustion engine. The rotation speed can also be hydraulically increased in order to obtain values of speed or torque much higher than what is being currently produced. And finally, any repairs and replacement of different hydraulic components are simple and fast.

Production range

To satisfy the demands of off-highway equipment manufacturers, Marzocchi Pompe has developed a number of specific pump and motor products that integrate anti-cavitation, electroproportional, priority

ABOVE: Marzocchi 1BK7 gear pump, as used in the Messersi tracked undercarriage model TCH-R812D (previously TCH-R16D)

and relief valves, and high-low systems. The current Marzocchi production range varies between 0.19cc/rev and 200.3cc/rev and it is divided into eight groups according to gear size. Within each group, different displacements are obtained by changing the gear width. A wide range of flange, shaft and coupling configurations is available; in fact, these components can also be designed to meet customer specifications. The cast-iron versions exist in groups 1, 2 and 3.

Maximum operating pressure depends on pump displacement and type, varying on average from 230 bar on aluminium models to 280 bar for cast-iron versions. All products can also be supplied with Viton seals, while special versions are available for use in temperatures between -40°C and +120°C. Mono-directional and bidirectional motors are divided into three families (1, 2 and 3) that cover a range of displacements between 2.8cc/rev and 87cc/rev. The maximum working pressures for the motors are similar to those established for the pumps and they can deliver torque up to 250Nm and power up to 60kW. **IVT**

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