INFORMATION

HOW TO SELECT A HYDRAULIC PUMP

To ensure that the PTO will not be overloaded, and get the correct flow requirements, with the speed of the engine chosen, it is important use a pump with the right capacity.

Pump capacity (D), expressed in cm^3/rot, can be calculated using the following formula:

$$D = \frac{Q \times 1000}{N \times Z}$$

D = Pump Capacity (cm^3/rot)
Q = Flow Required (l/min)
N = Motor Speed (rpm)
Z = Engine to PTO ratio

Example

What is the capacity that the pump should have the required flow is 80l/min, the engine to PTO ratio is 1:0,82, and engine speed is 1300 rpm ?

$$D = \frac{80 \times 1000}{1300 \times 0{,}82} = 75cm^3/rot$$

The right Pump Capacity to this case is 75cm^3/rot or higher.

In order to not overload the PTO mechanical units, it is important to calculate the torque and the power consumed by the pumps.

Torque and power are calculated with the following expression:

$$M = \frac{D \times Pb}{63}$$

$$P = \frac{D \times N \times Z \times Pb}{600 \times 0{,}90 \times 1000}$$

M = Torque (Nm)
D = Pump Capacity (cm^3/rot)
Pb = Pressure (bar)
P = Power (kW)
N = Motor Speed (rpm)
Z = PTO ratio
0,90 = Pump efficiency
Can change from one Pump to Another

Example

What is the torque and power required in the PTO with the selected pump, if the system is at 200 bar?

$$M = \frac{75 \times 200}{63} = 238\ Nm$$

$$P = \frac{75 \times 1300 \times 0{,}82 \times 200}{600 \times 0{,}90 \times 1000} = 29{,}6kW$$

The torque on the PTO will be 238 Nm.
Power output from the PTO will be 29,6 kW.

IMPORTANT: If the calculated load exceeds the maximum allowed for the PTO, a different combination should be selected.