

HYDRAULIC FORMULE

• Torque

$$\text{Torque (Nm)} = \frac{\text{displacement (cc/rev)} \times \text{pressure (bar)}}{62.83}$$

$$\text{Torque (Nm)} = \text{specific torque (Nm/bar)} \times \text{pressure (bar)}$$

• Shaft speed

$$\text{Speed (rpm)} = \frac{\text{flow rate (l/min)} \times 1000}{\text{displacement (cc/rev)}}$$

• Power

$$\text{Power (kW)} = \frac{\text{torque (Nm)} \times \text{speed (rpm)}}{9549.3}$$

FORMULE IDRAULICHE

• Coppia

$$\text{Coppia (Nm)} = \frac{\text{cilindrata (cc/rev)} \times \text{pressione (bar)}}{62.83}$$

$$\text{Coppia (Nm)} = \text{coppia specifica (Nm/bar)} \times \text{press. (bar)}$$

• Velocità

$$\text{Velocità (rpm)} = \frac{\text{portata (l/min)} \times 1000}{\text{cilindrata (cc/rev)}}$$

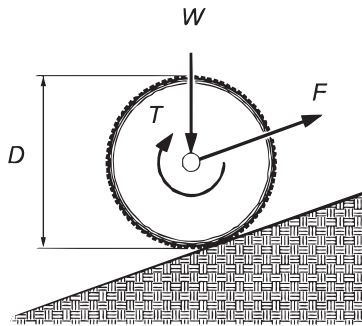
• Potenza

$$\text{Potenza (kW)} = \frac{\text{coppia (Nm)} \times \text{velocità (rpm)}}{9549.3}$$

VEHICLE CALCULATIONS

• Maximum motor torque

- F - traction force (N)
- W - vehicle weight (Kg)
- T - motor torque (Nm)
- D - ext. wheel diameter (m)
- n - number of hydraulic motors
- R - sin (slope angle°) or traction resistance (%)



$$F \text{ (N)} = \frac{W \times R \times 9,81}{n}$$

CALCOLI PER VEICOLI

• Coppia massima del motore

- F - sforzo di tiro (N)
- W - peso del veicolo (Kg)
- T - coppia motore (Nm)
- D - diametro est. ruota (m)
- n - numero di motori idraulici
- R - sen (angolo di pendenza°) oppure resistenza all'avanzamento (%)

$$T \text{ (Nm)} = \frac{F \times D}{2}$$

• Motor displacement

$$\text{Displ. (cc/rev)} = \frac{\text{max. motor torque (Nm)} \times 62.83}{\text{max. system pressure (bar)}}$$

if a gearbox is used:

$$\text{Displ. (cc/rev)} = \frac{\text{max. motor torque (Nm)} \times 62.83}{\text{max. pressure (bar)} \times \text{gearbox ratio}}$$

• Required pump flow rate

$$\text{Speed (rpm)} = \frac{\text{vehicle speed (Kmh)} \times 5.305}{\text{ext. wheel diameter (m)}}$$

$$\text{Flow (l/min)} = \frac{\text{displ. (cc/rev)} \times \text{motor speed (rpm)}}{1000}$$

• Cilindrata motore

$$\text{Cilindrata (cc/rev)} = \frac{\text{max. coppia motore (Nm)} \times 62.83}{\text{max. pressione di sistema (bar)}}$$

con il motore abbinato ad un riduttore:

$$\text{Cilindrata (cc/rev)} = \frac{\text{max. coppia richiesta (Nm)} \times 62.83}{\text{max. press. (bar)} \times \text{rapp. di riduzione}}$$

• Portata della pompa

$$\text{Velocità (rpm)} = \frac{\text{velocità (Kmh)} \times 5.305}{\text{diametro est. ruota (m)}}$$

$$\text{Portata (l/min)} = \frac{\text{cilindrata mot. (cc/rev)} \times \text{velocità (rpm)}}{1000}$$

If more than one motor is connected in parallel to the same pump, then the total pump flow rate is the sum of the individual motor flow rates.

If more than one motor is connected in series, then the pump flow rate is equal to the single motor flow rate.

Se più di un motore è collegato in parallelo la portata della pompa è la somma delle portate individuali dei motori.

Se più di un motore è collegato in serie la portata della pompa è la portata di un singolo motore.

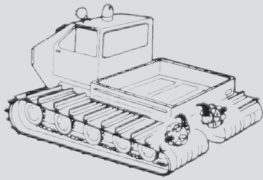
MOTOR SIZING / SCELTA MOTORE

TIPICAL VALUES

R: traction resistance V: vehicle speed

VALORI TIPICI

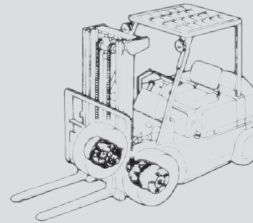
R: resistenza all'avanzamento V: velocità veicolo



Snowmobile
Gatto delle nevi

R: 100 - 110%

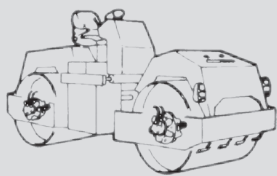
V: 20 - 25 Kmh



Fork-lift
Carrello elevatore

R: 25 - 35%

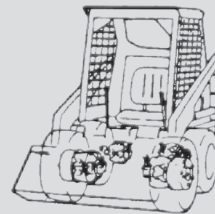
V: 20 - 25 Kmh



Road roller
Rullo compattatore

R: 25 - 30%

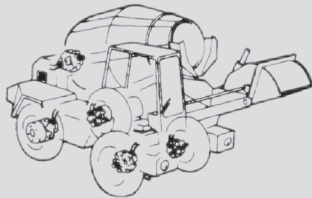
V: 12 Kmh



Skid steer loader
Caricatore

R: 50 - 80%

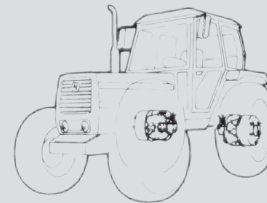
V: 10 - 15 Kmh



Cement mixer
Betoniera

R: 50 - 60%

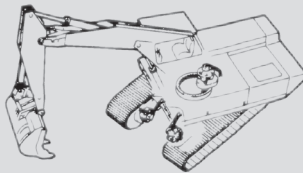
V: 25 Kmh



Tractor
Trattore

R: 100%

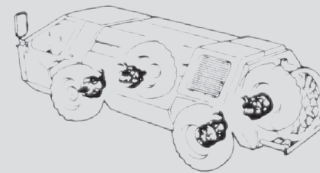
V: 25 - 50 Kmh



Tracked excavator
Scavatore cingolato

R: 90 - 100%

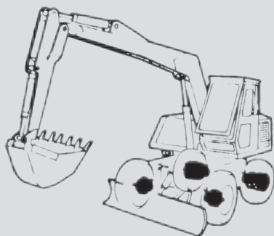
V: 5 Kmh



Tree sprayer
Atomizzatore

R: 35 - 40%

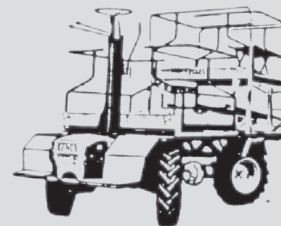
V: 25 - 30 Kmh



Tyred excavator
Scavatore gommato

R: 60 - 70%

V: 25 Kmh



Fruit picking vehicle
Veic. raccolta frutta

R: 60 - 80%

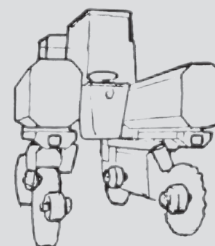
V: 0.5 - 25 Kmh



Dumper
Ribaltabile

R: 100%

V: 20 - 25 Kmh



Crop sprayer
Irroratrice

R: 40 - 60%

V: 0.5 - 25 Kmh