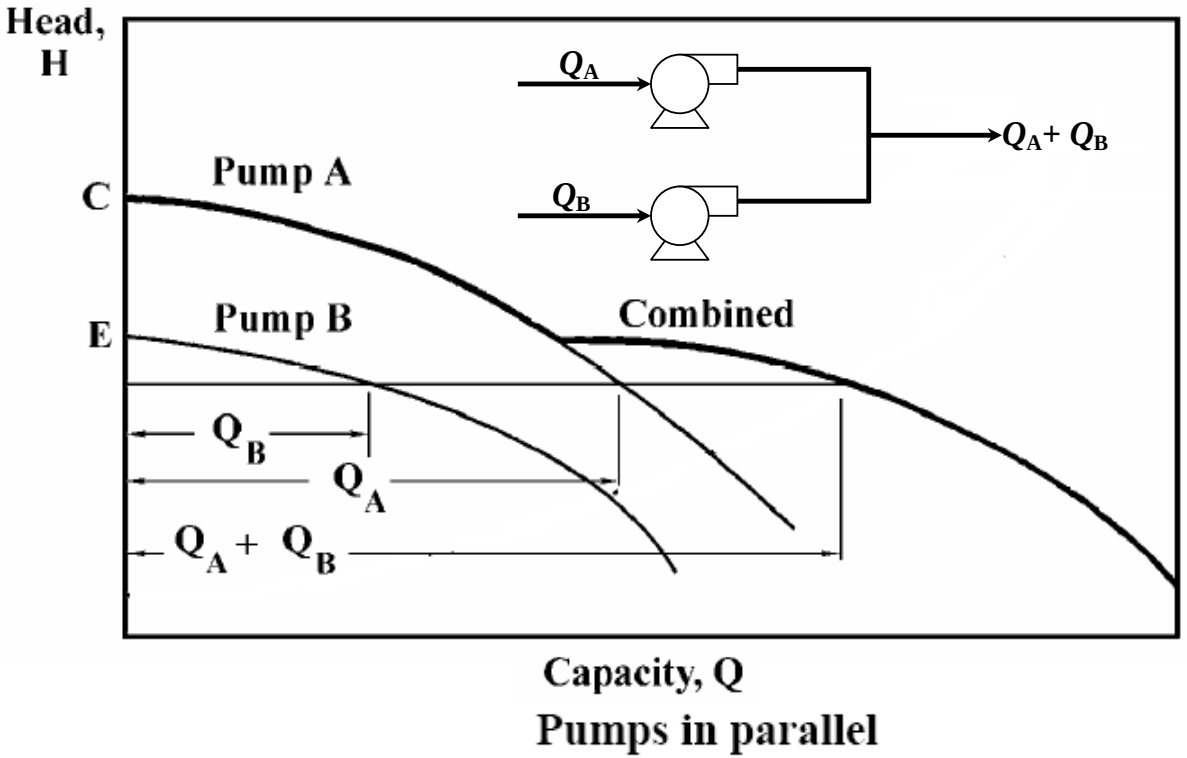
Parallel and series operation

Pumps in Parallel: Usually used when large capacities are required

$$\eta = \rho g H \frac{\sum Q}{\sum BHP}$$

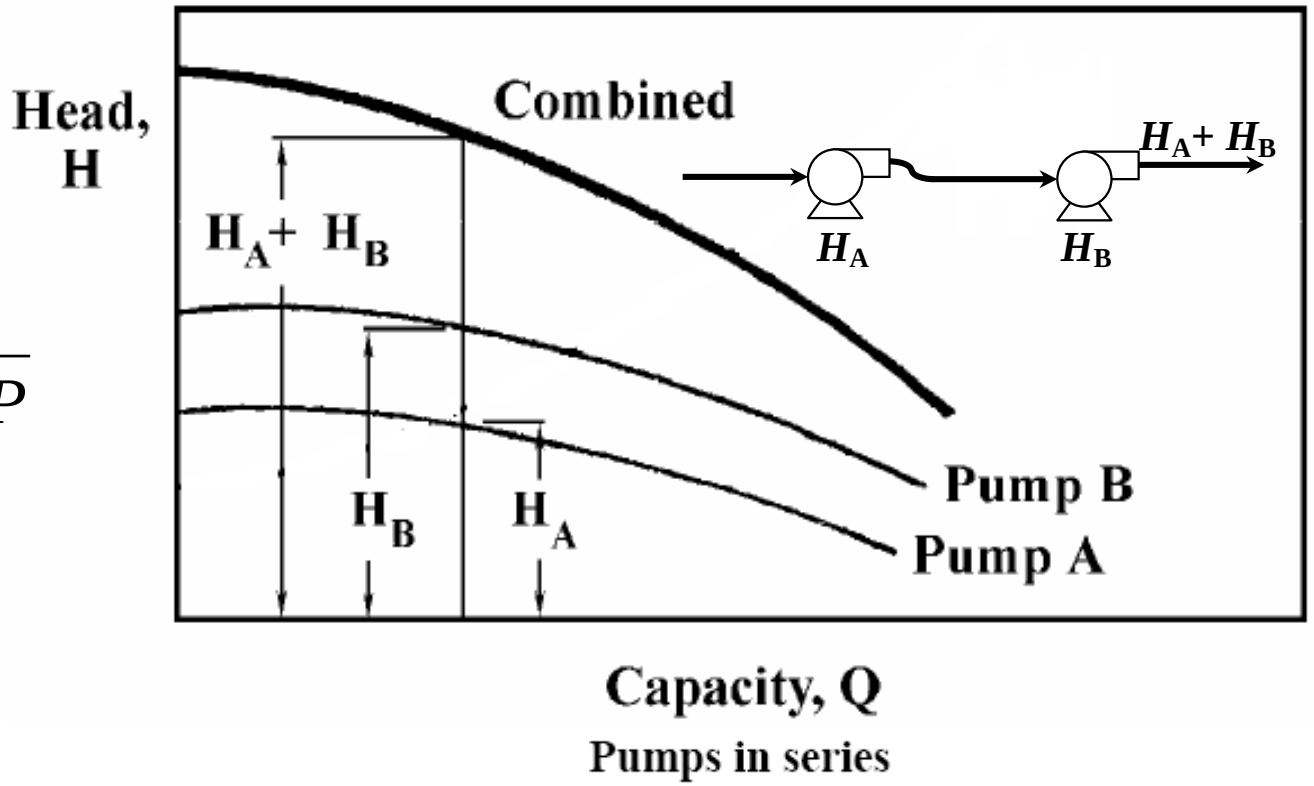


Pumps in parallel

Parallel and series operation

Pumps in Series: When a high head is required,

$$\eta = \rho g Q \frac{\sum H}{\sum BHP}$$



Pumps in series

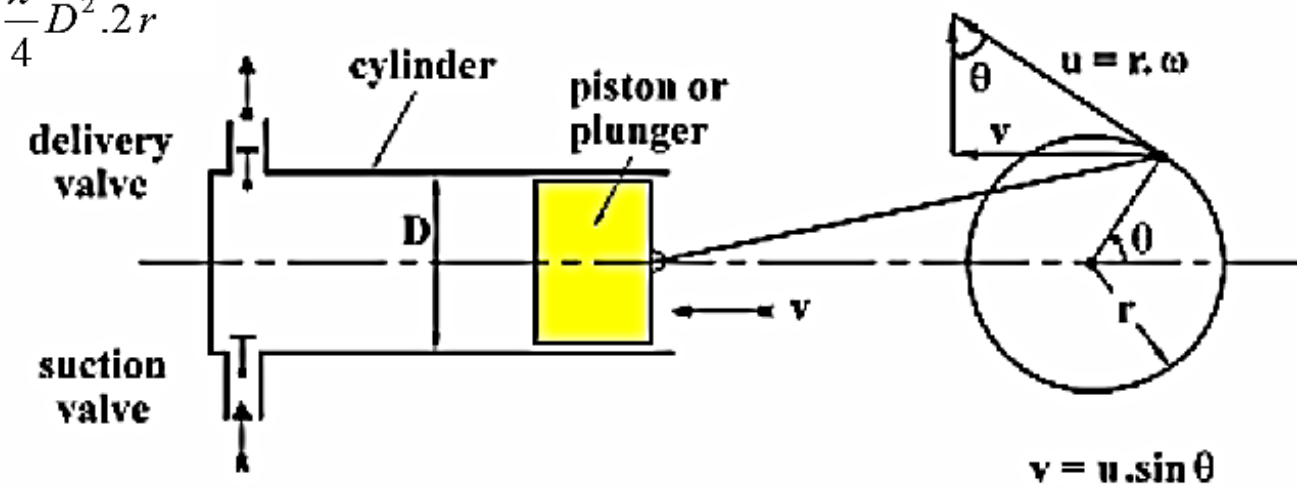
Positive-displacement pumps

Reciprocating Pump

$$Q = \frac{\pi}{4} D^2 \frac{2rn}{60}$$

where: D = diameter of ram
r = crank radius
n = speed in r.p.m.

The swept volume $= \frac{\pi}{4} D^2 .2r$



Positive-displacement pumps

Gear Wheel Pump

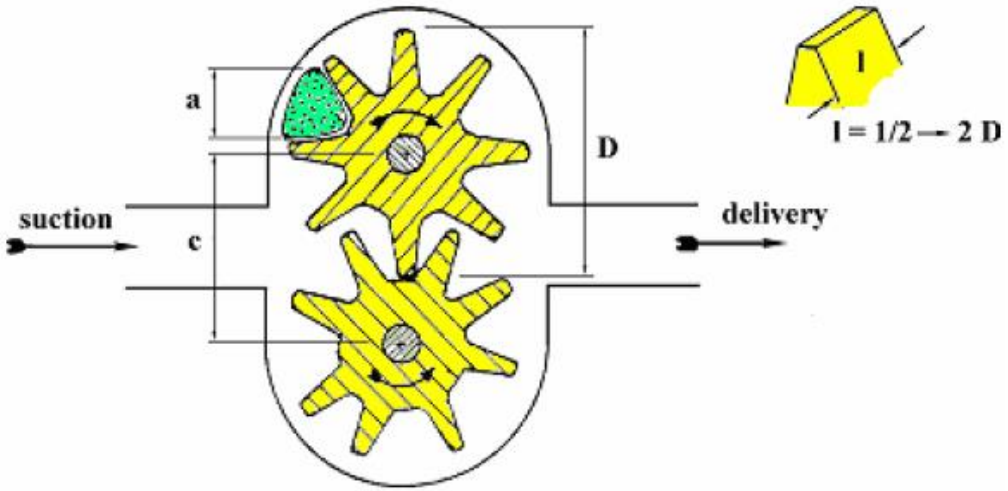
$$Q = \frac{2.a.l.n.N}{60}$$

a = area enclosed between any two adjacent teeth and the casing.

l = axial length of teeth.

n = number of teeth in each gear.

N = speed in rpm.



$$Q = K\,C\,(D - C)\,l$$

where:

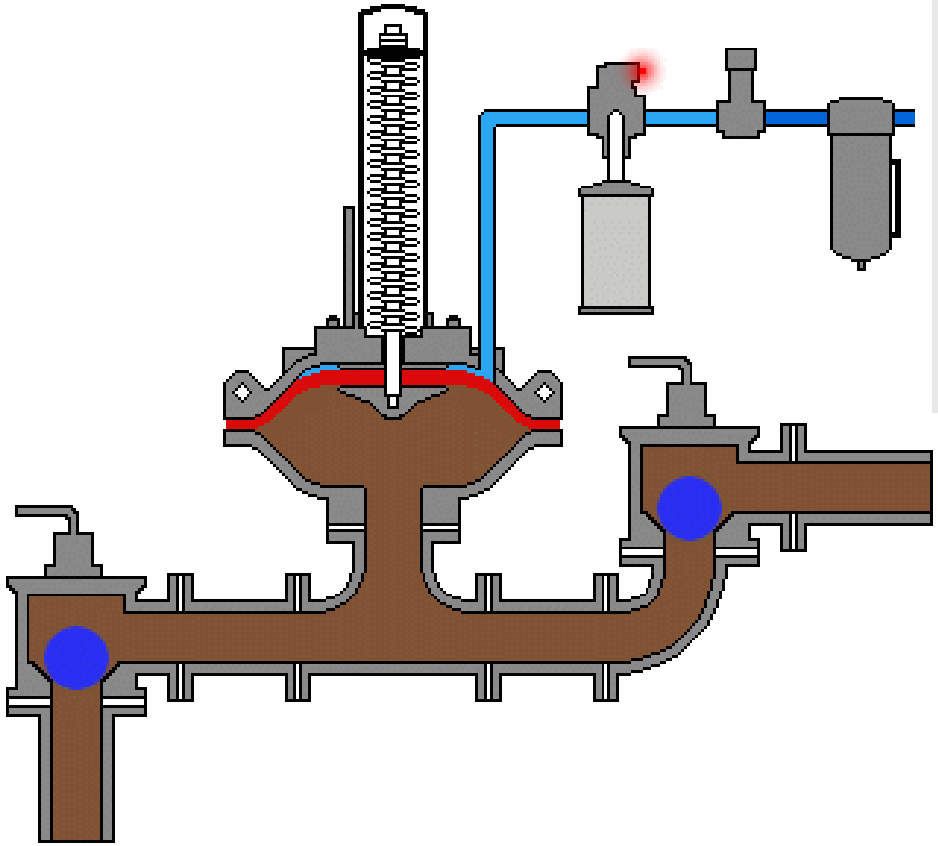
K is a constant = 2.983

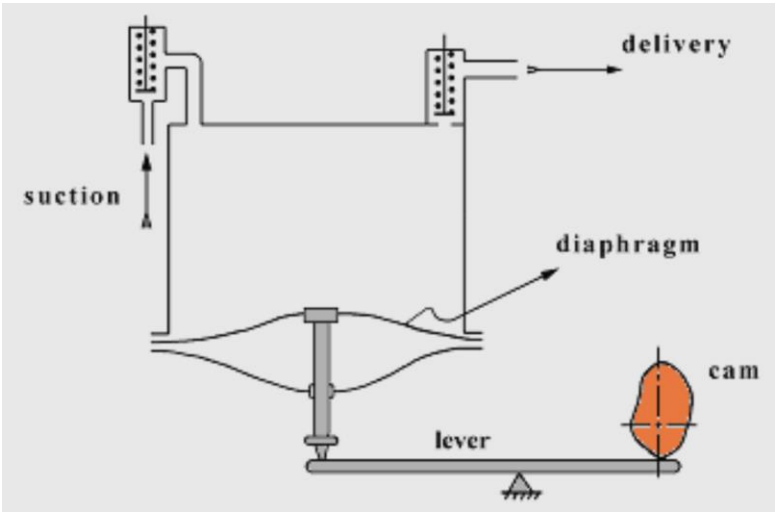
D is the gear diameter.

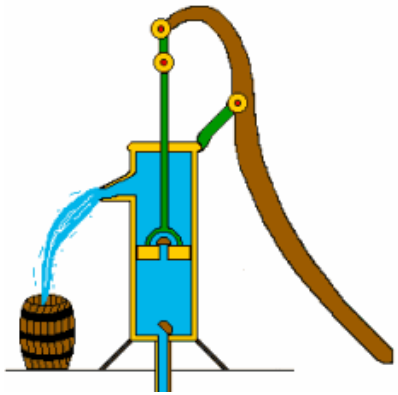
C is the distance between the two gear centers.

Positive-displacement pumps

Diaphragm pump

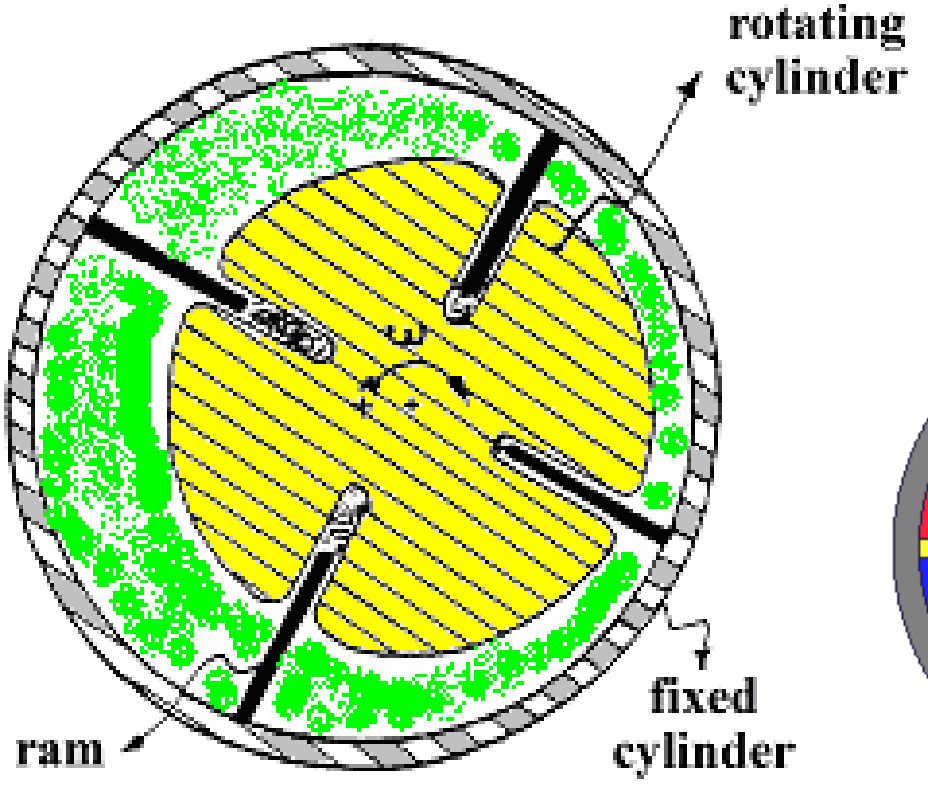


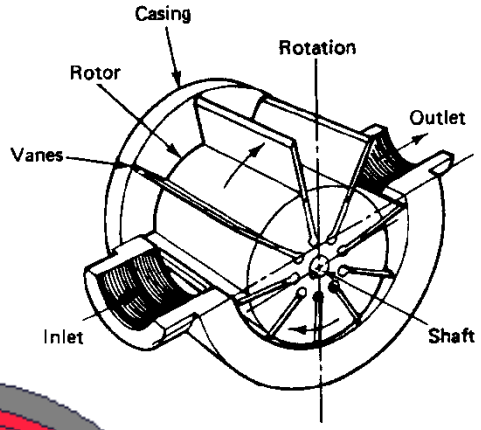


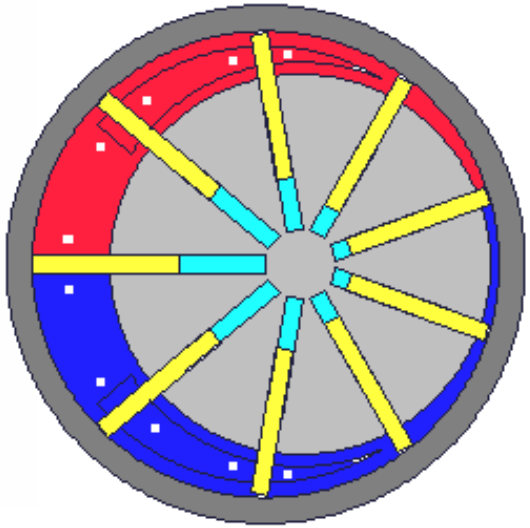


Positive-displacement pumps

Rotating cylinder pump

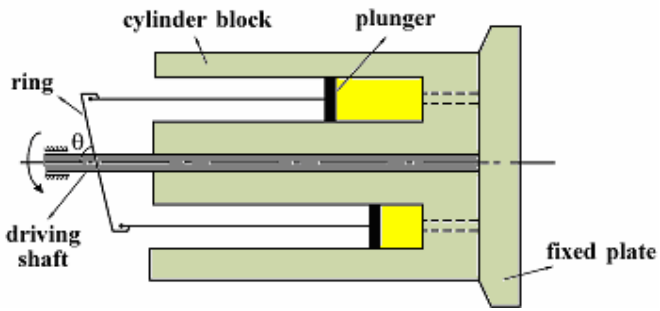


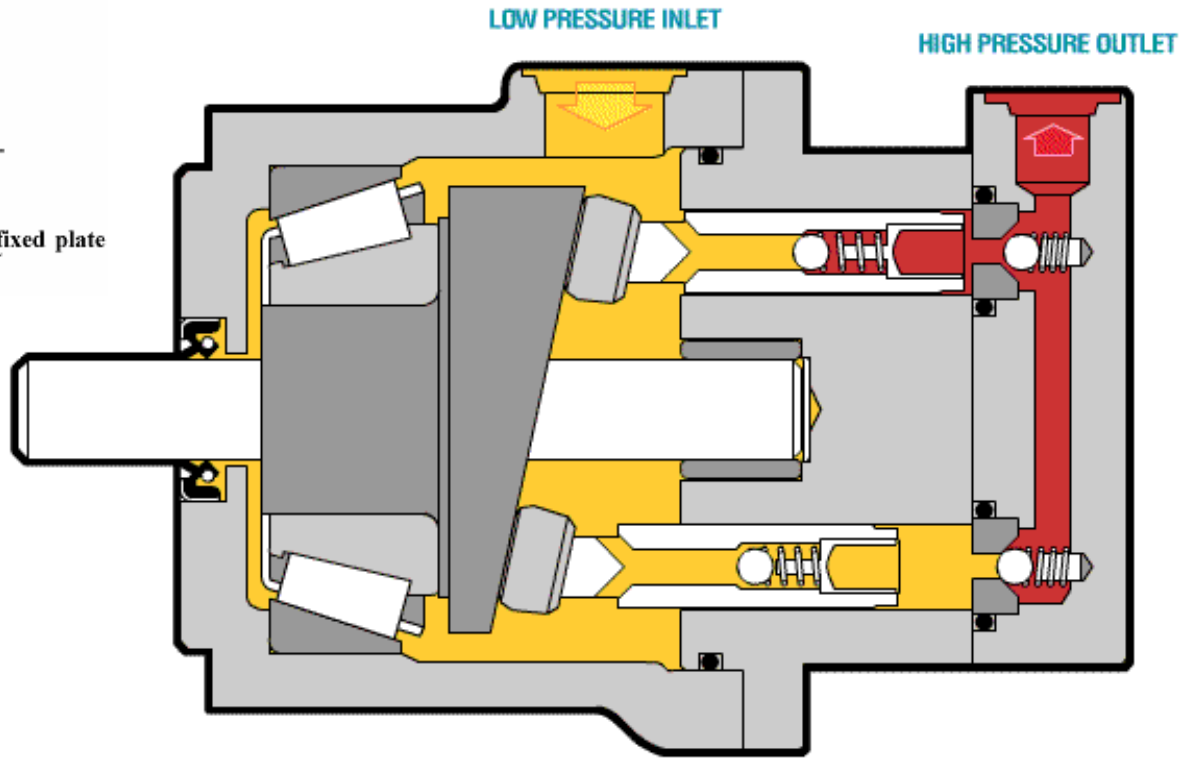




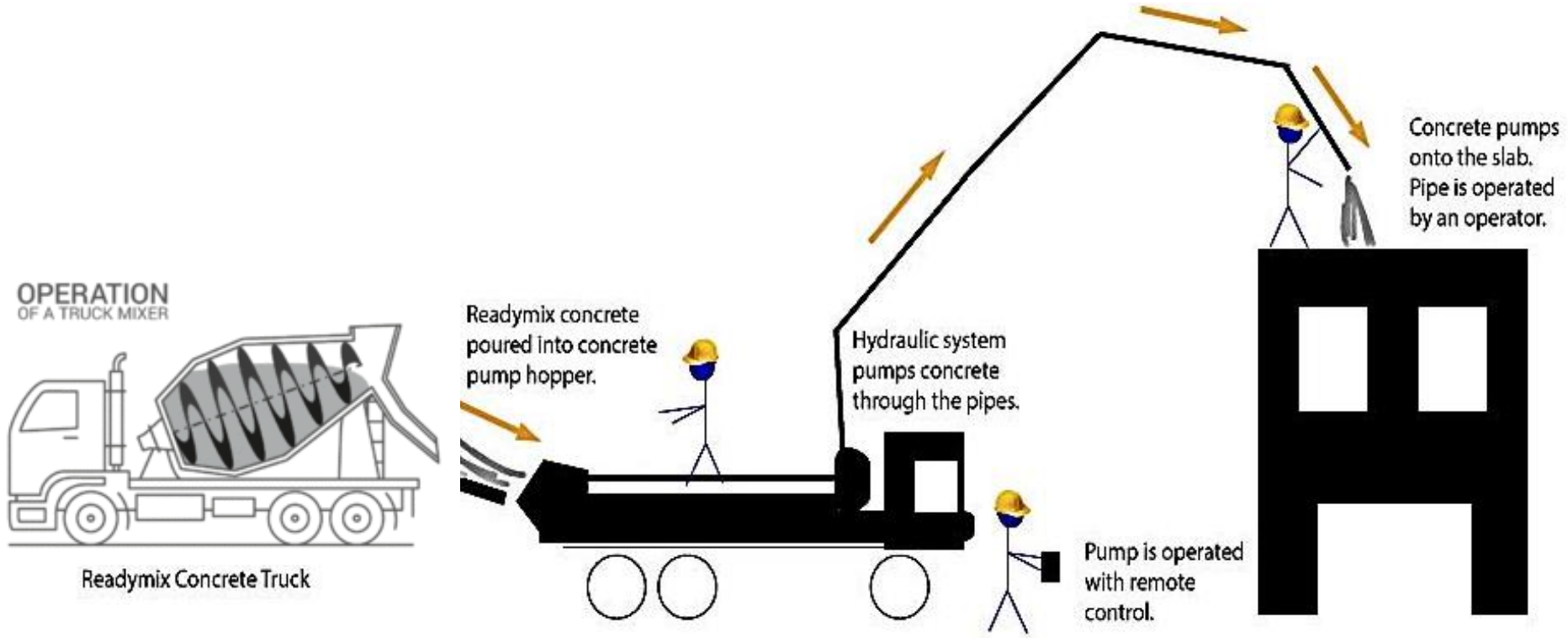
Positive-displacement pumps

Rotating piston pump

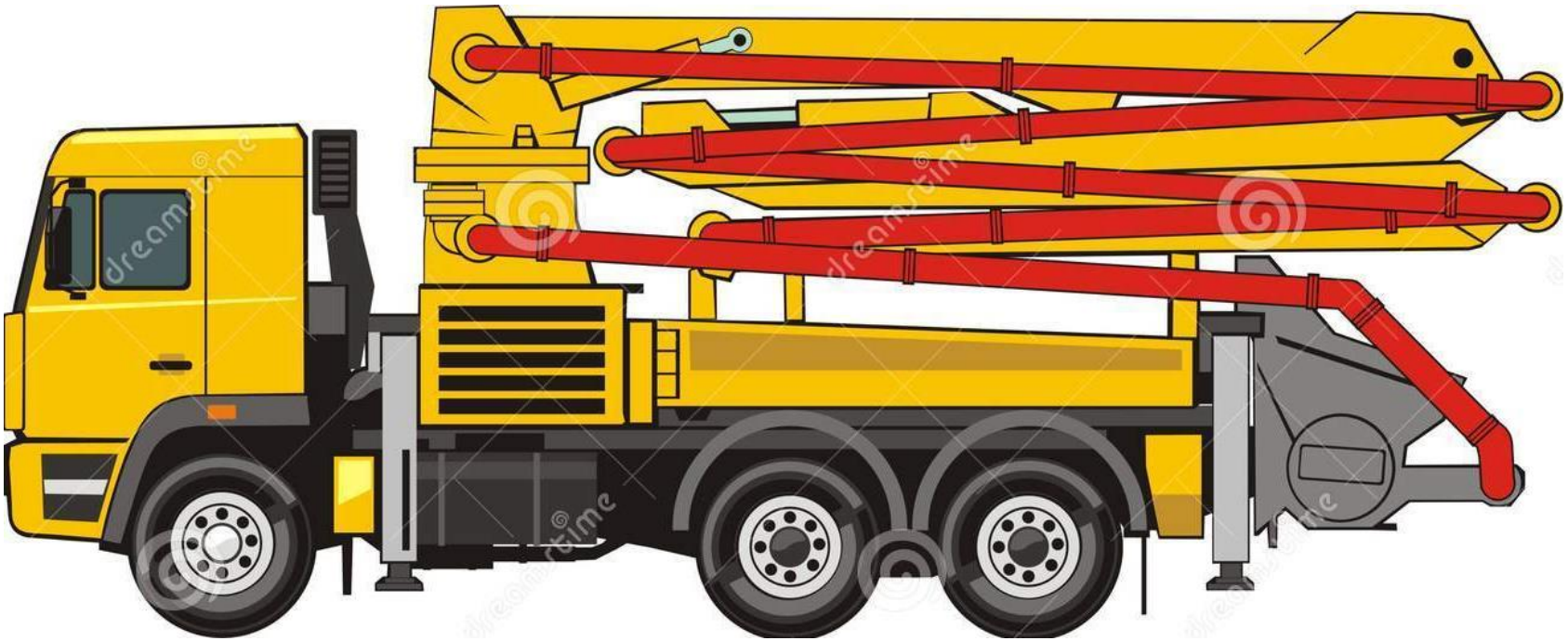




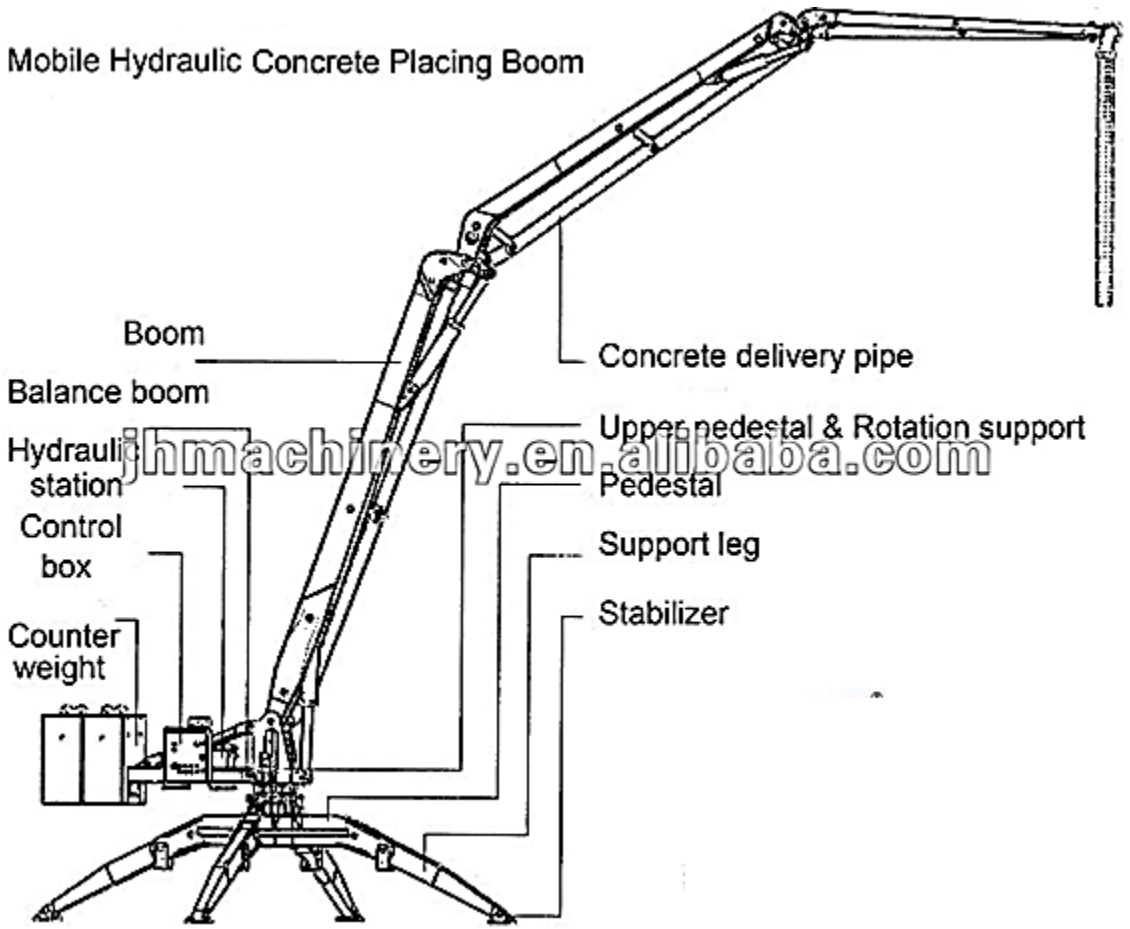
Hydraulic Concert Pumping System



Hydraulic Concert Pumping System

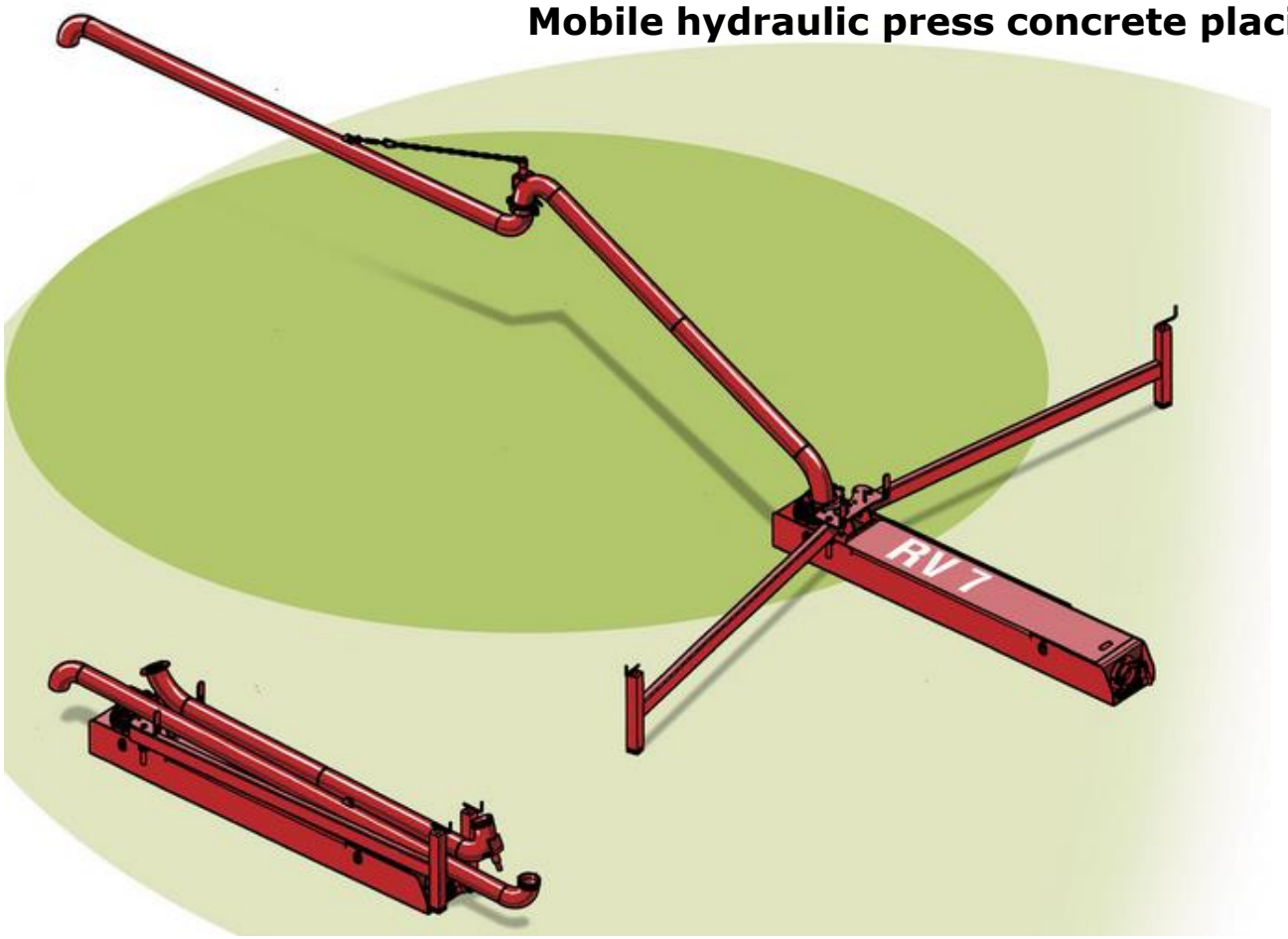


Hydraulic Concert Pumping System



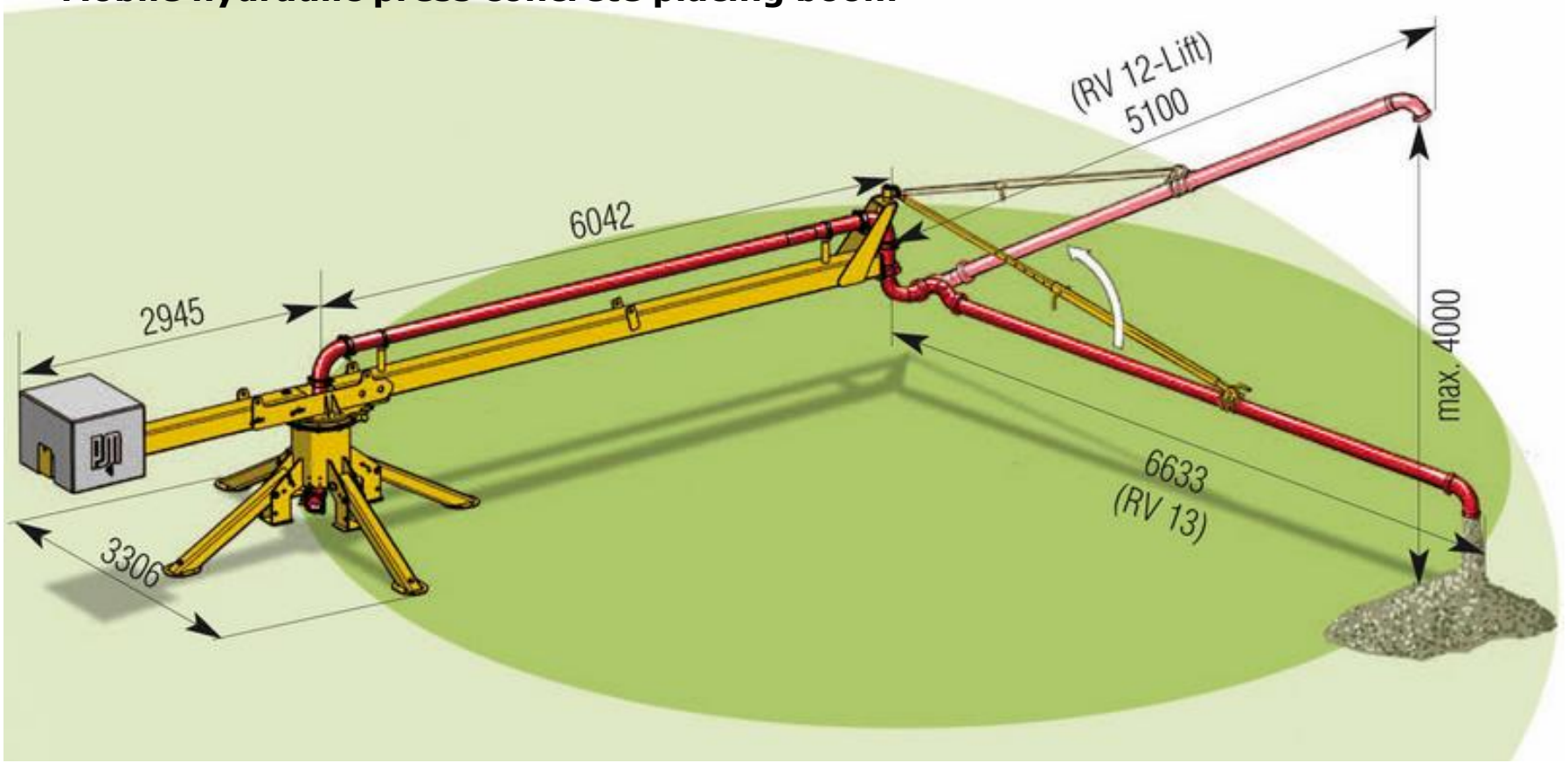
Hydraulic Concert Pumping System

Mobile hydraulic press concrete placing boom



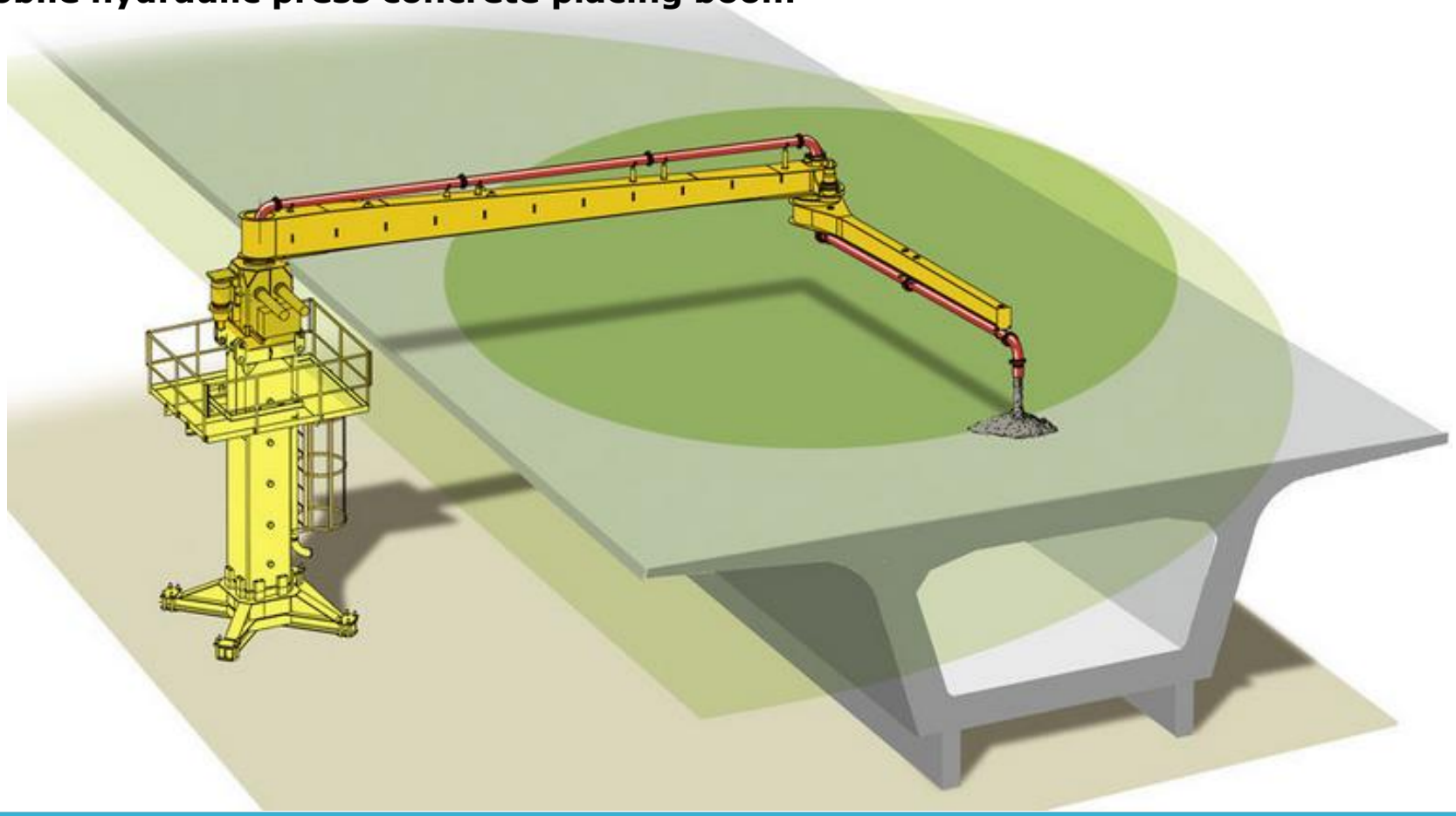
Hydraulic Concert Pumping System

Mobile hydraulic press concrete placing boom

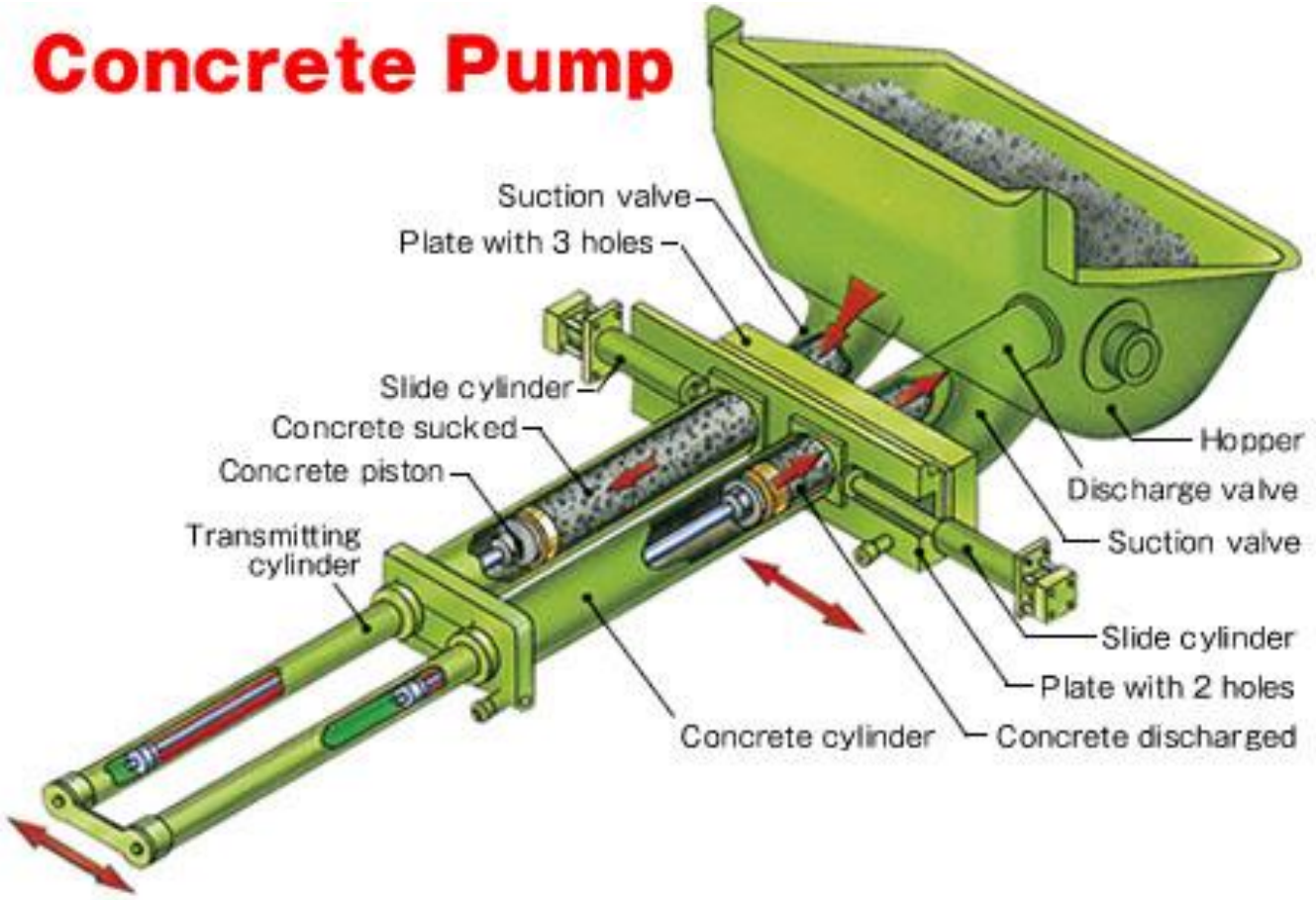


Hydraulic Concert Pumping System

Mobile hydraulic press concrete placing boom

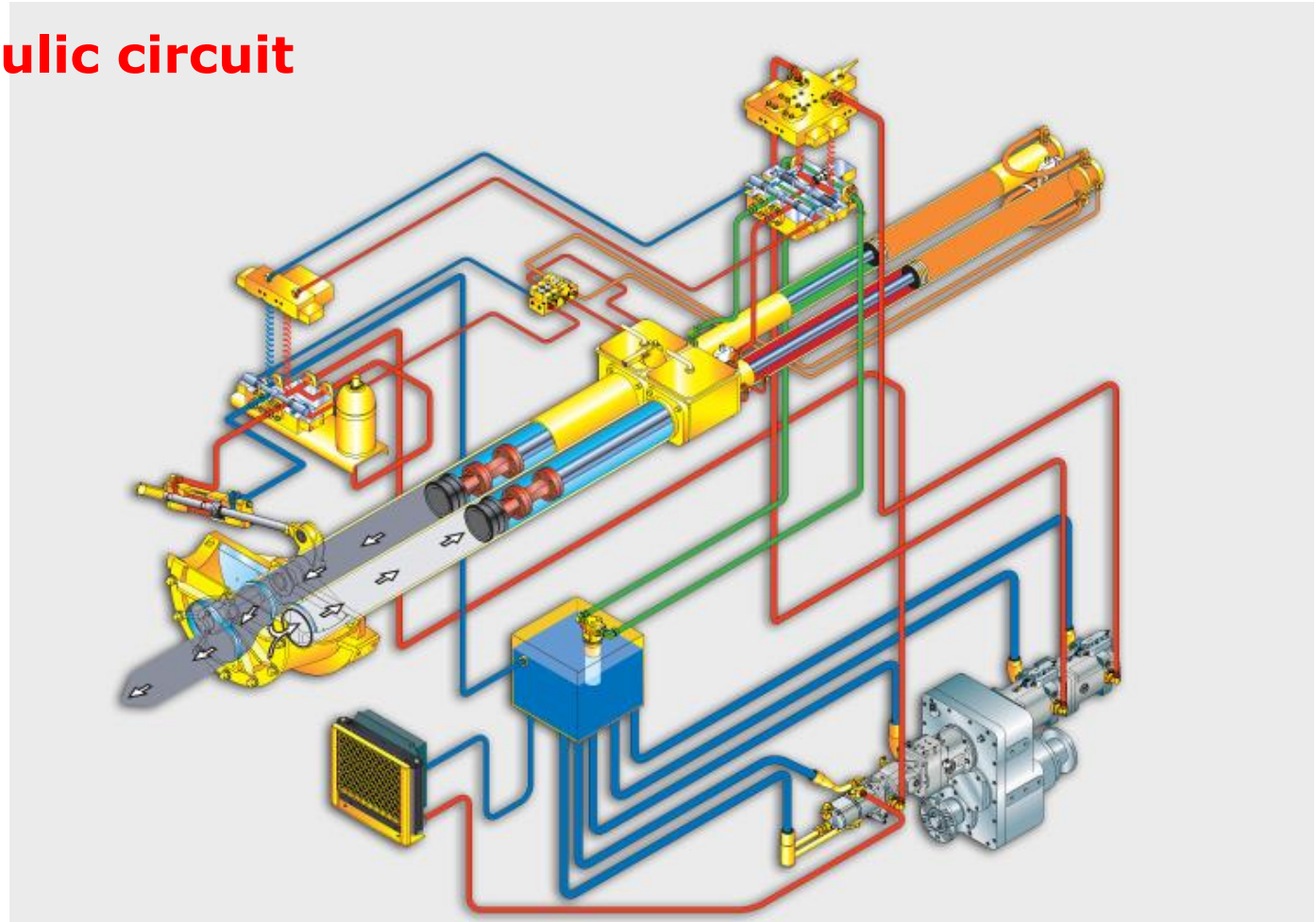


Hydraulic Concert Pump

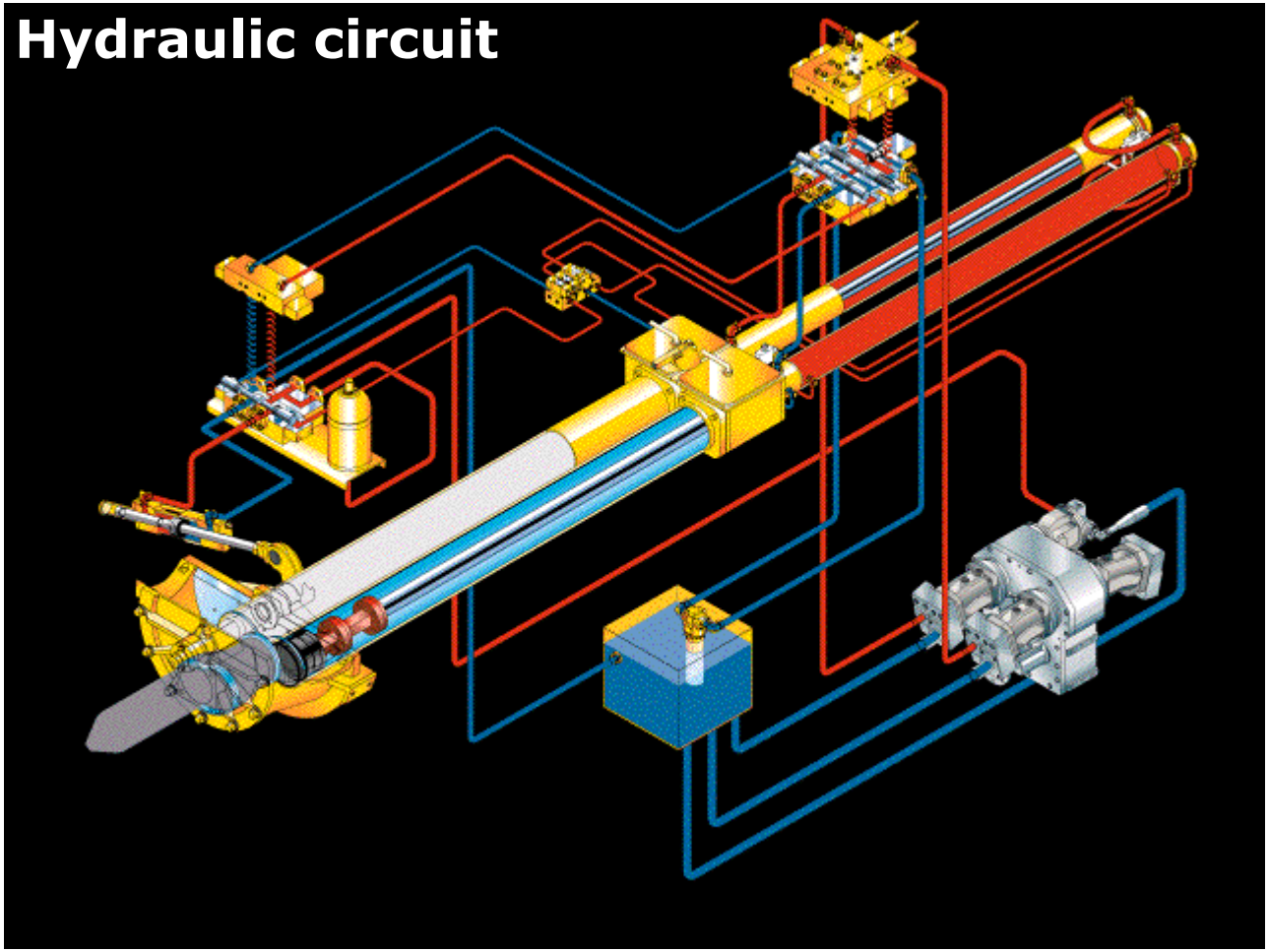


Hydraulic Concert Pump

Hydraulic circuit



Hydraulic Concert Pump




Thank You