

GPM of Flow Needed for Fluid Motor Speed:

Motor Displacement x Motor RPM ÷ 231

Example: How many GPM are needed to drive a 3.75 cubic inch motor at 1500 rpm?

Motor Displacement = 3.75 cubic inches per revolution

Motor RPM = 1500

Motor Displacement x Motor RPM ÷ 231 = $3.75 \times 1500 \div 231 = 24.35$ gpm

Fluid Motor Speed from GPM Input:

231 x GPM ÷ Fluid Motor Displacement

Example: How fast will a 0.75 cubic inch motor turn with 6 gpm input?

GPM = 6

Motor Displacement = 0.75 cubic inches per revolution

231 x GPM ÷ Fluid Motor Displacement = $231 \times 6 \div 0.75 = 1,848$ rpm

Fluid Motor Torque from Pressure and Displacement:

PSI x Motor Displacement ÷ (2 x π)

Example: How much torque does a 2.5 cubic inch motor develop at 2,000 psi?

Pressure = 2,000 psi

Motor Displacement = 2.5 cubic inches per revolution

PSI x Motor Displacement ÷ (2 x π) = $2,000 \times 2.5 \div 6.28 = 796.19$ inch pounds

Fluid Motor Torque from Horsepower and RPM:

Horsepower x 63025 ÷ RPM

Example: How much torque is developed by a motor at 12 horsepower and 1750 rpm?

Horsepower = 12

RPM = 1750

Horsepower x 63025 ÷ RPM = 12 x 63025 ÷ 1750 = 432.17 inch pound

Fluid Motor Torque from GPM, PSI and RPM:

GPM x PSI x 36.77 ÷ RPM

Example: How much torque does a motor develop at 1,200 psi, 1500 rpm, with 10 gpm input?

GPM = 10

PSI = 1,500

RPM = 1200

GPM x PSI x 36.7 ÷ RPM = 10 x 1,500 x 36.7 ÷ 1200 = 458.75 inch pounds second