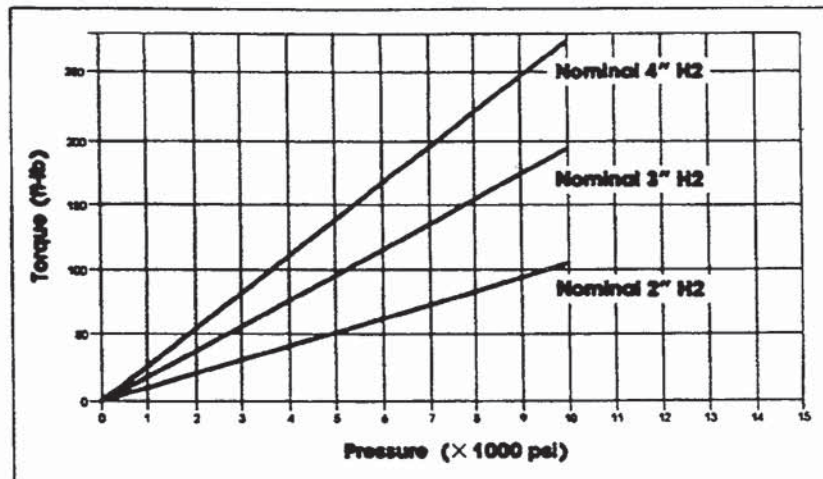


5.2 TORQUE TO CLOSE -vs- PRESSURE



Note: Torque values apply only to liquid flow.

SD-658R

5.3 VALVE FLOW COEFFICIENT*

Flow through a choke can be determined from the pressure differential, specific gravity of fluid flowing, and the valve flow coefficient (C_v). The C_v factor is the number of U.S. gallons of water that pass through a given orifice area in one minute at a pressure drop of one psi. Cameron provides graphs of the coefficient versus choke travel such as the one displayed below. The data can be used to find a flow coefficient

(and choke configuration for a given flow volume) or to find the flow for a given set of conditions.

Flow Equation: $Q = C_d A_o \sqrt{\frac{2\Delta P}{\rho}}$

Mathematical Definition of the C_v Factor:

$$Q = \left[C_d A_o \sqrt{\frac{2}{\rho_w}} 0.26 \right] \sqrt{\frac{\Delta P}{S.G.}}$$

Q = Flow (in³/sec)

C_d = Orifice Discharge Coefficient (0.611 for a sharp-edged orifice)

A_o = Area of Orifice (in²)

ΔP = Pressure Drop Across the Orifice (lb/in²)

ρ = Density of the Fluid Passing Through the Orifice (lb-sec²/in⁴)

ρ_w = Density of Water

S.G. = Specific Gravity of Fluid

*Parker Hannifin, Fluid Power Design Engineers' Handbook