Oil is confined in a 10 [cm] diameter cylinder by a piston with a clearance of 0.0002 [cm]. The piston is 5 [cm] long, and the oil has a viscosity coefficient of 0.05 [kg/ms] and a density of 920 [kg/m³].

A total weight of 100 [kg] is applied to the piston. Estimate the leakage rate of oil past the piston, in liters/day. Justify any approximations you use in arriving at your estimate.