units, where V is the volume of the spacecraft (Ti = initial temperature), this gives you the time "t" to leak down to pf in seconds (assuming the cabin gas is air).ĊThis assumed that the blow-down was isentropic. In practice, any blow-down that will last tens of seconds to minutes, the process in the spacecraft is more likely to be isothermal: mass of spacecraft has huge thermal capacity compared to the (decreasing) mass of gas inside and will keep the gas warm as it expands. With the assumption of isothermal blow-down, the time required becomes:Ċt = 0.086 (V/A) Ln[pi/pf]/(Sqrt[T]) (eqn. 5)Ċwhere T is the (constant) spacecraft temperature.ĊIf the atmosphere inside the spacecraft starts out at room temperature, 293K, this simplifies to:Ċt = 0.005 (V/A) Ln[pi/pf] (eqn. 6)ĊA spacecraft with a volume V=10 m