AME 538
Homework 25
Due: Wednesday, 13 November 2002, in class

1. Air, considered to be calorically perfect and ideal, is at rest in a tube $P = 100\ kPa$ and $T = 273\ K$. A retractible piston rests at $x = 0$ for $-\infty < t < 0$. For $t \geq 0$, the piston is given the motion, $u_p = -U(1 - \exp(-t/\tau))$, $x_p(t = 0) = 0$, where $U = 500\ m/s$, and $\tau = 0.003\ s$. Find the pressure, velocity, and density at $x = 0.4\ m$, $t = 0.002\ s$.