Neon undergoes a two-step process in a piston-cylinder assembly. The first process is isothermal compression from (1 atm, 80 F) to 100 psia. The second process is reversible and adiabatic expansion back to the initial pressure (1 atm). The gas constant for Neon is .0984 Btu/lbm-R. The isochoric heat capacity for Neon is .246 Btu/lbm-R.

1. Sketch this sequence of processes on Pv and Ts diagrams. Show
how to use these diagrams to estimate the sign and relative magnitude
of heat transfer and work transfer for each process.
2. Find the entropy change for each process.
3. Find the final temperature for each process.
4. Find the heat transfer and work transfer for each process.
5. Find the overall heat transfer and work transfer.

**Tips:**

Remember that for an inert gas, heat capacities are constant and the entropy change can be found by:

 and if it is isothermal it becomes:

For an gas undergoing a polytropic process:

 And if that process is isothermal, n = 1

And work for a polytropic process where n = 1 can be found by:

For isentropic processes we have the relationship:

cp for neon is 0.246 Btu/lbm-R and cv is 0.148 Btu/lbm-R

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how to use these diagrams to estimate the sign and relative magnitude
of heat transfer and work transfer for each process.

# For Process 1-2





Neon - reversible isothermal compression from (1 atm, 80 F) to 100 psia.

# For Process 2-3



Neon - reversible and adiabatic expansion back to the initial pressure (1 atm).