

For the case of $k=7/5$, the solution to Eq. (5) is

$$I_T = \frac{7}{15} \left\{ \left[3 \left(\frac{P_2}{P_i} \right)^{-4/7} + 4 \left(\frac{P_2}{P_i} \right)^{-2/7} + 8 \right] \left[\left(\frac{P_2}{P_i} \right)^{-2/7} - 1 \right]^{1/2} - \left[3 \left(\frac{P_2}{P_f} \right)^{-4/7} + 4 \left(\frac{P_2}{P_f} \right)^{-2/7} + 8 \right] \left[\left(\frac{P_2}{P_f} \right)^{-2/7} - 1 \right]^{1/2} \right\} \quad (6)$$

The corresponding solution for the nondimensional time parameter τ is written

$$\tau = \left(\frac{7}{2} \right) \ln \left(\frac{5}{6} \right) + \frac{35\sqrt{5}}{648} \left\{ \frac{428\sqrt{5}}{125} - \left[3 \left(\frac{P_2}{P} \right)^{-4/7} + 4 \left(\frac{P_2}{P} \right)^{-2/7} + 8 \right] \left[\left(\frac{P_2}{P} \right)^{-2/7} - 1 \right]^{1/2} \right\} \quad (7)$$

Equation (6) above does not agree with Eq. (7b) of Ref. 1. As a consequence, Eq. (7) above also differs from Eq. (19) of Ref. 1. A check of Eq. (6) was made by differentiating it and comparing the result of Eq. (5) evaluated at $k=7/5$. This comparison verified that Eq. (6) presented herein is the correct solution.

Acknowledgment

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References

- ¹Yang, H. T., "Formulas for Venting or Charging Gas from a Single Volume," *AIAA Journal*, Vol. 24, Oct. 1986, pp. 1709-1711.
- ²Kato, H. T., "Transient Solutions for Venting and Charging a Constant Volume Chamber," Ford Aerospace and Communications Corp., TN ITN-2.17, April 26, 1968.

Reply by Author to H.T. Kato

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IT is gratifying to see that more general solutions to the venting problem exist and are now widely available to the engineering and scientific community. We verified Eq. (6) of the Comment¹ by applying its recurrence formula (3).

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References

- ¹Kato, H.T., Comment on "Formulas for Venting or Charging Gas from a Single Volume," *AIAA Journal*, Vol. 25, Sept. 1987, pp. 1273-1274.

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