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DERIVE ALTERNATE EXPRESSION FOR k'' (2-PHASE ISENTROPIC EXPONENT)

- IN THE EQN. FOR EXHAUST VELOCITY, THE PRESSURE RATIO EXPONENT IS GIVEN BY:

GAS-ONLY $\frac{k-1}{k}$

GAS-PARTICLE n
WHERE

$$n = \frac{R}{\frac{x}{1-x} C_s + C_p}$$

$\therefore$ LET $n = \frac{k''-1}{k''}$

$$\Rightarrow \frac{k''-1}{k''} = \frac{R}{\frac{x}{1-x} C_s + C_p}$$

$$1 - \frac{1}{k''} = \frac{R}{\frac{x}{1-x} C_s + C_p}$$

$$1 - \frac{R}{\frac{x}{1-x} C_s + C_p} = \frac{1}{k''}$$

$$\Rightarrow k'' = \frac{1}{1 - \frac{R}{\left(\frac{x}{1-x}\right) C_s + C_p}}$$