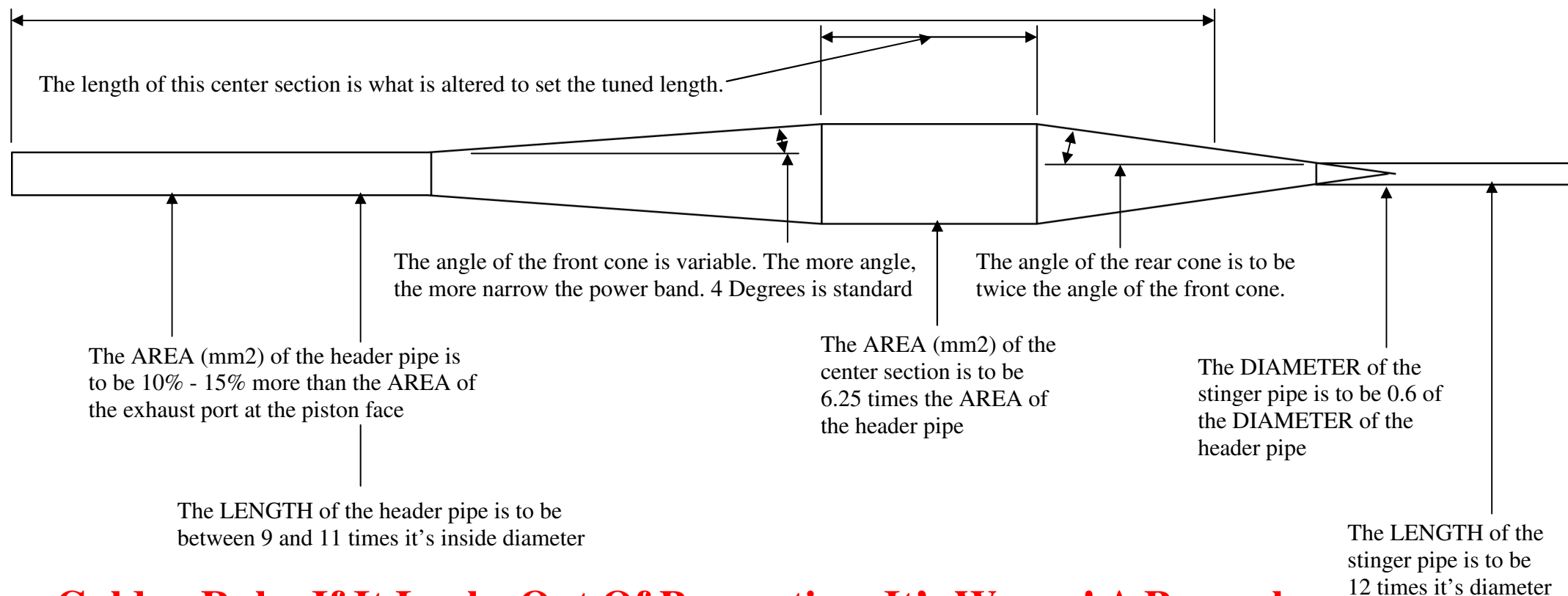# Expansion Chamber Design and Theory

Tuned Length = Exhaust Port Open Period in Degrees, Divided By The R.P.M Where Max Power Is To Be Produced, Multiplied by 1700 (Exhaust Wave Speed in Feet Per Second)

$$\frac{\text{Exhaust Port Open Period}}{\text{R.P.M.}} \times 1700 = \text{Tuned Length in Inches}$$

From piston face to half way down the rear cone taken to a point = Tuned Length

The length of this center section is what is altered to set the tuned length.

The angle of the front cone is variable. The more angle, the more narrow the power band. 4 Degrees is standard

The angle of the rear cone is to be twice the angle of the front cone.

The AREA (mm2) of the header pipe is to be 10% - 15% more than the AREA of the exhaust port at the piston face

The AREA (mm2) of the center section is to be 6.25 times the AREA of the header pipe

The DIAMETER of the stinger pipe is to be 0.6 of the DIAMETER of the header pipe

The LENGTH of the header pipe is to be between 9 and 11 times it's inside diameter

The LENGTH of the stinger pipe is to be 12 times it's diameter

Golden Rule: If It Looks Out Of Proportion, It's Wrong! A Properly Built Expansion Chamber Will ALWAYS Look In Proportion!

Written by Greg Fulcher
Cycle Pro Motors