

Tuned Pipe Design

by

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Expansion Chamber Design Formulae

$$L_t = (E_0 \cdot V_s) / N$$

tuned length
L_t ~~Length-tuned pipe~~ (inches)
E₀ Exhaust-open period (degrees)
V_s Sonic wave speed (use 1700 feet per second)
N Crankshaft speed (RPM)

$$L_1 = L_t - (L_2 / 2)$$

$$L_2 = (D_2 / 2) * \cot(A_2)$$

$$L_3 = D_1 * (6 \text{ to } 11)$$

$$L_4 = (D_2 - D_1) / 2 * \cot(A_1)$$

$$L_5 = L_1 - (L_3 + L_4)$$

$$L_6 = (D_2 - D_3) / 2 * \cot(A_2)$$

$$L_7 = D_3 * 12$$

$$D_1 = (\text{see John})$$

$$D_2 = 2.5 * D_1$$

$$D_3 = D_1 * (.58 \text{ to } .62)$$

A₁ = half the diffusers angle of divergence

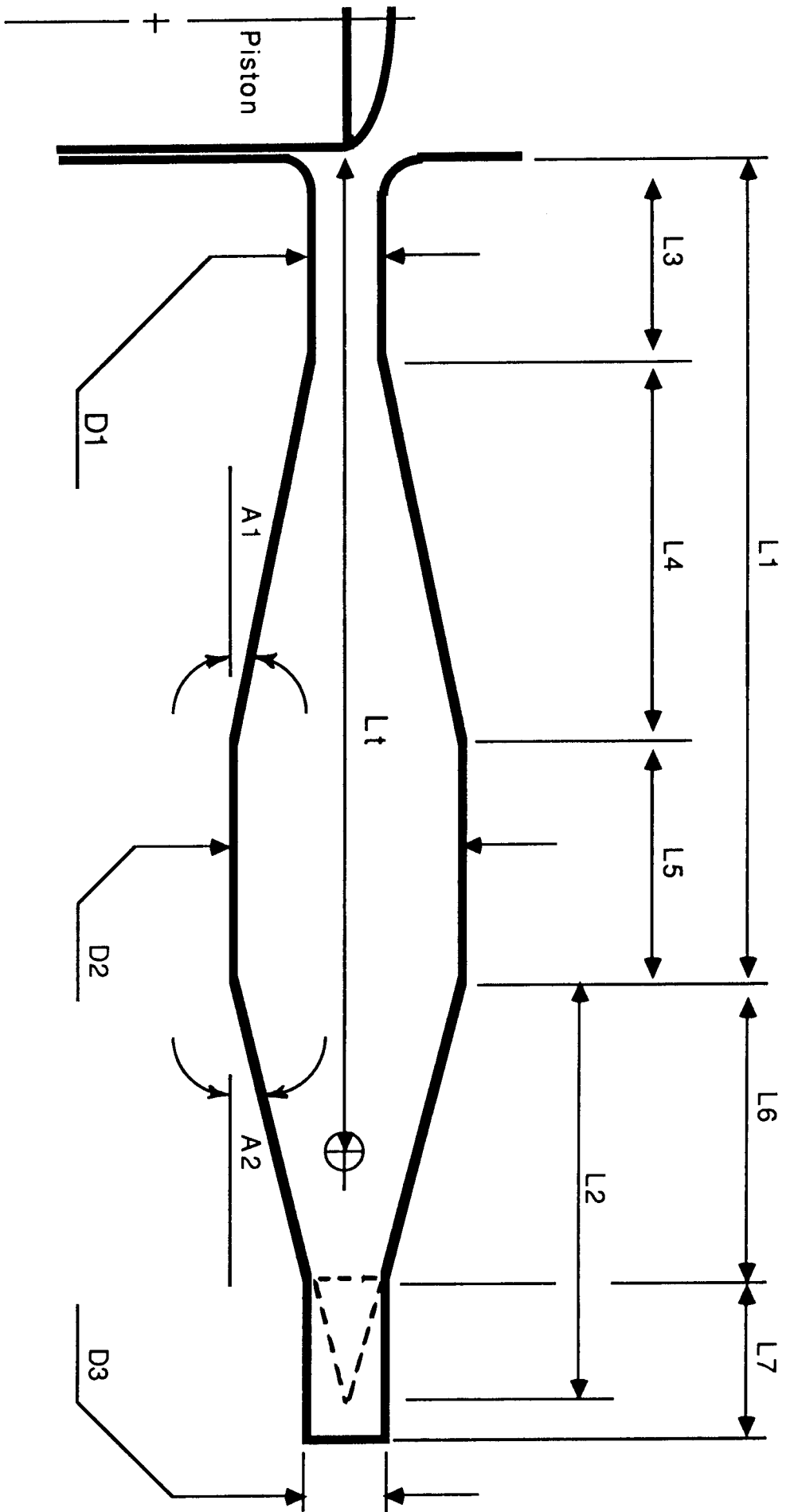
A₂ = half the baffle cones angle of convergence

Useful Cotangents

<u>Degrees</u>	<u>Cotangent</u>
3.0	19.0811
3.5	16.3499
4.0	14.3077
4.5	12.7062
5.0	11.4301
5.5	10.3854
6.0	09.51436
6.5	08.77689
7.0	08.14435
7.5	07.59575
8.0	07.11537
8.5	06.69116
9.0	06.31375
9.5	05.97576
10.	05.67128
11.	05.14455
12.	04.70463
13.	04.33148
14.	04.01078
15.	03.73205

Centerline Length of a Curved Pipe

$$L = R * 0.01745 * (\text{angle of bend})$$



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