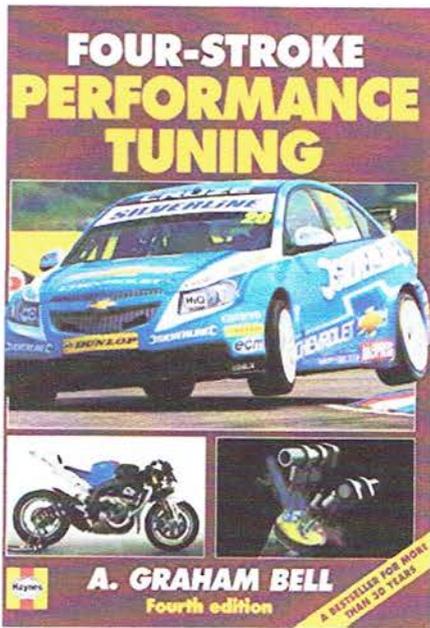


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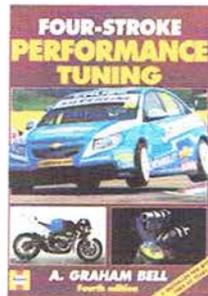


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## Exhaust Calculator

Induction and Exhaust length calculations for Singles, Twins, and fours

The formulas used are from the book "Four-stroke Performance Tuning by A Graham Bell".



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The values you need to enter are for only ONE cylinder.

Exhaust Open <i>BBDC.</i>	Exh close <i>ATDC.</i>	Engine <i>R.P.M</i>	CC of one "Cylinder"	Calculate
65	25	5500	394	Reset
Exhaust valve duration in Degrees.				270
Carburetor induction Length in Inches .				11.172
Exhaust valve correctly timed full lift withdegrees after TDC .				110
Overlap in Degrees.				50
1, Tuned length From the Valve Head....."P"				35
2, Primary inside Diameter is in Inches .				1.352
3, Secondary Pipe Length in Inches ..... "P2"				20
4, Two Secondary pipe inside diameter.				1.778
5, Fours Primary Pipe Always (15" Inch)Long....."P1"				15
6, Collector box Length in Inches..... "CL"				5.343
7, Tailpipe Inside diameter in Inches.				1.822
8, Tailpipe Length in Inches..... "TL"				33.057

*Beer*

*12"*

*36*

*1.25*

*19*

*1.375*

*17*

*4"*

*1 7/8"*

*19" to mottler  
29" Mottler to TP.*

Lengths (induction or exhaust ) are measured from "the valve head" and through the theoretical centreline of the run (tube or pipe)



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With the intake or induction length it is measured to the bell-mouth.

- For Single engine use: #s 1,2,8
- For Twin engine use: #s 1,2,6,7,8
- For Fours use: #s 2,3,4,5,6,7,8.....(1)+(6)+(8)
- For 4-2-1 use: #s (2,5,) (3,4,) (6,7,8,)

#### Notes 1

For road , you'll be best off with a 4-2-1 system on a four cylinder engine.

For high performance & race use, the only way to go is a 4-1 system.

The 4-2-1 system gives good all-round power, with no special power peaks or dips, while a 4-1 system give the best power at higher revs - At the expense of low end power.

Speaking of 4-2-1 extractors, this is the WRONG WAY to do it on a four cylinder engine! A 4-2-1 system must have cylinders #1 & #4 joined up, and #2 & #3 joined up, then further down those two pipes join into one.

This is because four cylinder engines have a 180° crank, whereas virutally all V-8's have a 90° crank (the angle between the crankpins) and so the order in which the exhaust pulses come down the pipes is different.

#### Notes 2

Moving peak torque can be accomplished by increasing or decreasing the primary pipe diameter.

An 1/8" change in primary diameter will move it 650-800rpm up or down. +1/8" diameter will move it up in the RPM range and -1/8" will move it down in the RPM range.

Making the primary longer will move power from the upper RPMs and increase low and mid-range power.

Making the primary shorter will increase power to the upper RPMs while sacrificing low and mid-range power.

Making the primary longer or shorter will have little effect on max torque.

