COMPRESSION RATIO CHANGES

One of the best ways to increase the efficiency of any internal combustion engine is to raise the compression ratio. As long as fuel with a high enough octane rating is available (so it will burn without detonation), raising the compression ratio can be a very effective performance boost.

The amount of material which must be milled from heads (or cylinders) to change compression ratios may be easily determined. Although the formula listed in the next column may look strange (or too simple) it is correct and it does work! One of the things we see most often is stock heads with chambers that out of spec . A stiock chamber should be 84 cc for a twin cam, but we se them in the 85-87 most often and there are times where we se some really wild numbers such as 90 CC's. SO it pays to check this out if you are not planning on head work and just installing a cam. You may end up with issu's due to chambers being out of spec. We do mill (deck) heads inhouse, see our service section.

Only the stroke length, the original and new compression ratios need to be known. As an example, how much must be milled off EV80 heads to raise the compression ratio from 8.5 to 9.73? Stroke length=4.25 for a stock EV80. With this formula, T=.080 (see table in next column). All of the values in the following table were calculated with this formula. This formula also assumes that combustion chamber volumes and cylinder bores are not changed for this calculation.

Knowing only this information, the exact thickness, (T) to mill from the heads (or cylinders) can be calculated:

$$\text{Stroke Length} \times \left(\frac{1}{\text{original CR-1}} - \frac{1}{\text{new CR-1}} \right)$$

T = 4.25 x (1 / 7.5 - 1 / 8.73) = .080 in. (EV80; 9.73:1)

T = 4.00 x (1 / 8.0 - 1 / 9.09) = .060 in. (TW88; 10.09:1)

For EV80 and Twin 88 (Stock bore & stroke):

Head Milling(T)	Compression Ratio EV80	Twin 88
.000	8.50	9.00
.020	8.77	9.33
.040	9.07	9.69
.060	9.39	10.09
.080	9.73	10.52
.100	10.11	11.00