

CR calculations

input values for cells in BLUE others are fixed or calculated

$$CR = (V_{cyl} + V_{cc}) / V_{cc} \quad V_{cyl} = V_{cc} * (CR - 1) \quad V_{cc} = V_{cyl} / (CR - 1)$$

where :

V_{cc} = total combustion chamber volume

$$= V_{head} + V_{gasket} + V_{deck} + V_{recess}$$

where:

V_{head} = volume in head

V_{gasket} = volume due to head gasket thickness

V_{deck} = volume due to difference between piston TDC and block deck

V_{recess} = volume of recess in top of piston (a negative value for crowned pistons)

$$V_{cyl} = \text{stroke} * \pi * (\text{bore} / 2)^2$$

starting 1500 values:

stroke	87,5 mm		
bore	73,7 mm	std	type "std" or 0.010 or 0.020 or 0.030 or 0.040 or 0.050 or 0.060 depending on starting piston size
V_{cyl}	373,3 cc		1493 cc engine displacement
V_{gasket}	3,7 cc		0,034 inches compressed head gasket thickness
V_{deck}	2,2 cc		0,020 inches of piston top to block deck clearance; change this value from nominal 0.020 if block has been decked or non-Spitfire pistons used
V_{recess}	6,7 cc	dish	type "dish" if dished pistons, "flat" if flat-top pistons
CR	7,5 :1		fill-in starting value (e.g., 7.5 for stock dished-piston North America 1500, 9 for stock flat-top piston UK 1500)
therefore:			
V_{cc} old	57,4 cc		
V_{head} old	44,9 cc		input measured value of head volume here, if available--otherwise, leave blank and nominal value used (useful if substituting a non-stock or already-shaved head)

solution for milling head to achieve new CR:

target CR	9,50		
V_{head} old	44,9 cc	nominal	if a measured value entered above, then measured value is used--otherwise nominal value used
new bore	73,70 mm	std	type "std" or 0.010 or 0.020 or 0.030 or 0.040 or 0.050 or 0.060 depending on new piston size
V_{cyl} new	373,3 cc		1493 cc engine displacement
V_{deck} new	2,2 cc		0,020 inches of piston top to block deck clearance; change this value from nominal 0.020 if block has been decked or non-Spitfire pistons used
V_{recess}	0,0 cc	flat	type "dish" for dished pistons, "flat" for flat-top pistons
V_{cc} new	43,9 cc		
V_{head} new	38,1 cc		
cc to remove	6,8 cc		
to mill off	1,95 mm		
to mill off	0,077 inches		