# A study to calculate the length of the missing cone extrapolated from neck taper and to calculate the Frequency (Frs) of the missing cone including the neck

Revised 9/6/14
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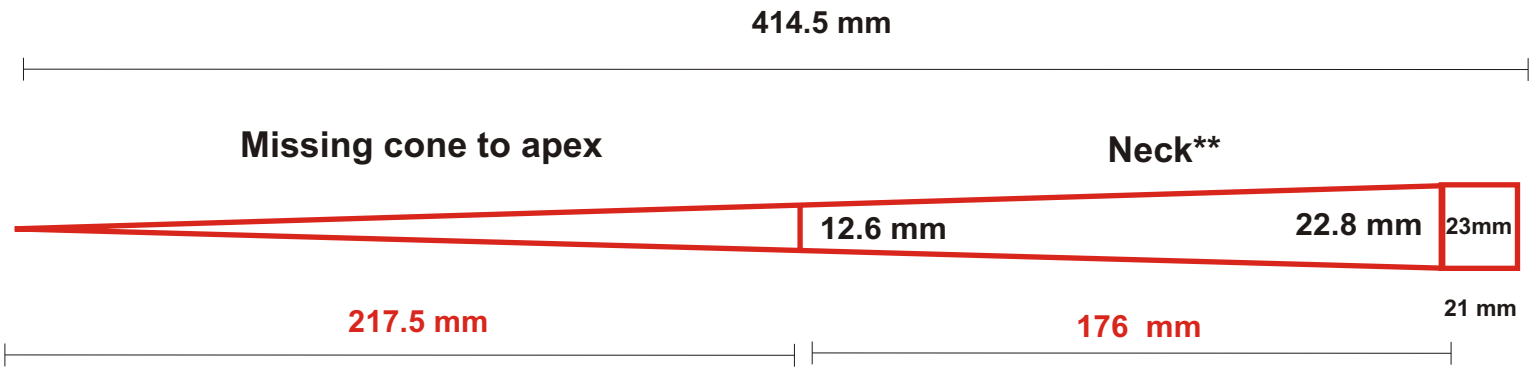
## Actual neck and estimated missing cone




## Missing Cone Pitch Calculations

Length of neck including tenon = 197 mm

Calculated length of missing cone = 217.5 mm

Length of neck + cone to apex = 414.5 mm

Speed (velocity) of sound v = 345 m/s

Formula for frequency of missing cone F = v/2xo

F = 345/(2)(.4145) = 416.2 vps (hz)

Ab4 Concert (written alto sax F2) F = 415.3 hz

Calculated pitch of 415.3 hz is .9 hz (4 cents) above Ab4 Concert Pitch

If a .3 D end correction is added to the length, then the calculated frequency drops below Ab3 Concert Pitch by approximately 25 cents.

## Ferron's formulas from p.101 "The Saxophone is my Voice"

Slope of the neck $S = 28.65 (D - d) / L$ where D = lg diam, d = sm diam, $L$ = length

Slope of neck = 28.65 X (22.8 - 12.6) / 176 = 1.66 degrees

Length of missing cone = 28.65 (d - 0)/ $S$

Length of missing cone = 28.65 X (12.6 - 0) / 1.66 = 217.5 mm

** Selmer SBA alto