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**CLUBHEAD VELOCITY versus SHAFT LENGTH**



*     is the velocity of the clubhead
*      is the length of the shaft
*   is the angular speed of the clubhead in radian per second

If  = 10 radians/second

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| Velocity vs Shaft Length | radians/second | inches/second |
| 43 inches | 10 | 430 |
| 44 | 10 | 440 |
| 45 | 10 | 450 |
| 46 | 10 | 460 |
| 47 | 10 | 470 |
| 48 | 10 | 480 |

If the clubhead velocity at ball impact is 100 mph with a 43 inch shaft, the increase in clubhead velocity will be:

**VELOCITY INCREASE PER INCH**

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| Ratio of velocities | Percent Increase | Increase in |
| 430/430=1 | 1-1=0 | 43” 100 mph |
| 430/440=0.997 | 1-0.997=0.023 2.3% | 44” 102.3 mph |
| 430/450 = 0.956 | 1-0.956 = 0.044   4.4% | 45” 104.4 mph |
| 430/460 = 0.935 | 1-0.935 = 0.065   6.5% | 46” 106.5 mph |
| 430/470 = 0.915 | 1-0.915 = 0.085   8.5% | 47” 108.4 mph |
| 430/480 = 0.896 | 1-0.896 = 0.104   10.4% | 48” 110.4 mph |

There must be an increase inapplied to the grip to realize this increase in clubhead speed. Seeto Shaft Length for the calculations.

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| radians and degrees are the same in SM math | *r*  ** |  |