Turning Equations

***Rotational Speed*: N (RPM's)**

$$N = \frac{v}{\pi D_O}$$

N = Rotational Speed (RPM's)
v = Cutting Speed (SFPM)
D_O = Original Diameter

***Feed Rate*: f_r ($^{Dist}/_{Min}$)**

$$f_r = N f$$

f_r = Feed Rate ($^{Dist}/_{Min}$)
N = Rotational Speed (RPM's)
f = Feed ($^{Dist}/_{Rev}$)

Turning Equations

Machining Time (Min.)

$$T_m = \frac{L}{f_r}$$

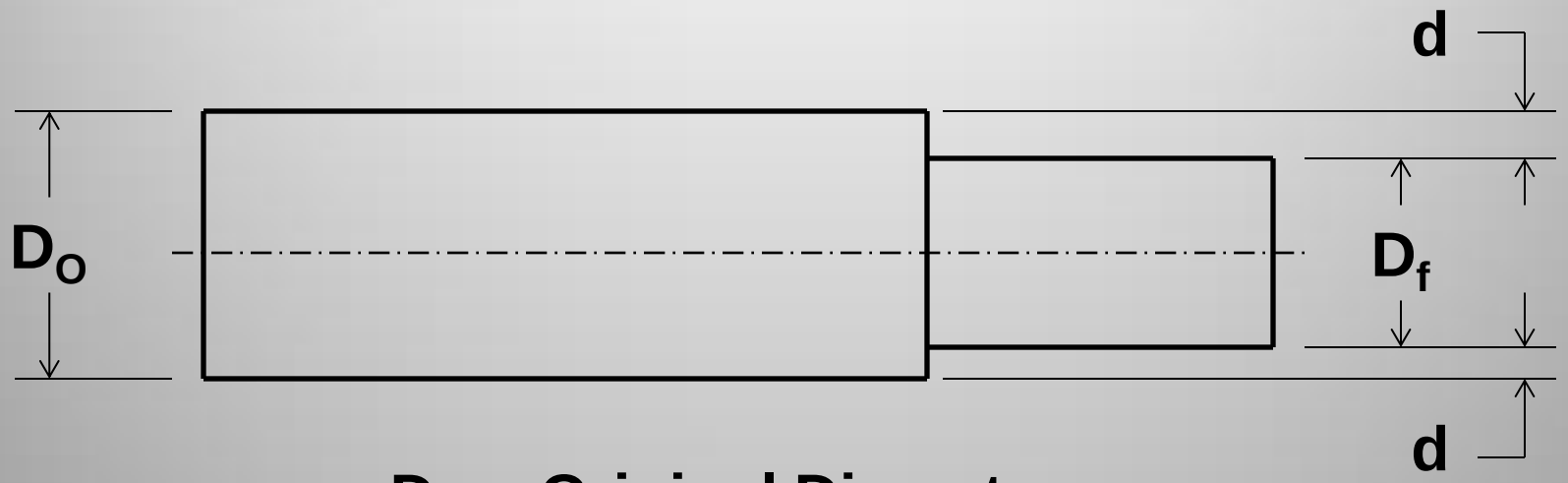
T_m = Machining Time (Min.)
L = Length of Cut
f_r = Feed Rate ($^{In.}/_{Min.}$)

Material Removal Rate ($^{in.\ cu.}/_{Min}$)

$$MRR = v\ f\ d$$

MRR = Material Removal Rate ($^{in.cu.}/_{Min}$)
v = Cutting Speed (SFPM)
f = Feed ($^{Dist.}/_{Rev.}$)
d = Depth of Cut

Turning Operations



D_O = Original Diameter
D_f = Final Diameter
d = Depth of Cut

$$d = \frac{Do - Df}{2}$$

Turning Example

Data: v = 125 SFPM; f = 0.0015 $^{in}/_{rev}$

Turning Example

Rotational Speed

$$N = \frac{v}{\pi D_o}$$

$$N = \frac{(125)\ (12)}{\pi\ 0.250}$$

$$N = \underline{1909.8593}\ \text{RPM's}$$

Feed Rate

$$f_r = N\ f$$

$$f_r = (1909.8593)\ (0.0015)$$

$$f_r = \underline{2.8648}\ {}^{in}/_{min}$$

Turning Example

Machining Time

$$Tm = \frac{L}{f_r}$$

$$Tm = \frac{6.250}{1.7189}$$

$Tm = \underline{2.1817}$ Min

Depth of Cut

$$d = \frac{D_o - D_f}{2}$$

$$d = \frac{0.250 - 0.125}{2}$$

$d = \underline{0.0625}$”

Turning Example

Material Removal Rate

MRR = v f d

MRR = (125 x 12) (0.0015) (0.0625)

MRR = 0.1406 $in^3/_{min}$