

Times to reposition by 10 bp:

$$T_{5\text{-bp-shift}} = 2.4 \times 10^9 \text{ steps}$$

$$T_{\text{rotation}} = 1.5 \times 10^{11} \text{ steps}$$

$$T_{\text{loop}} = 2.2 \times 10^{13} \text{ steps}$$

