

BEVEL GEAR JACKS EXAMPLE AND THERMAL GRAPHS

Example: A 5000-pound load must be raised 30 inches in 15 seconds. The load remains in position for two minutes. It is then lowered and remains lowered for 30 seconds. The cycle begins again. Determine the appropriate bevel gear jacks and calculate horsepower required.

Step 1 Load = 5000 pounds

Step 2 Velocity = 30 inches in 15 seconds = 10 fpm

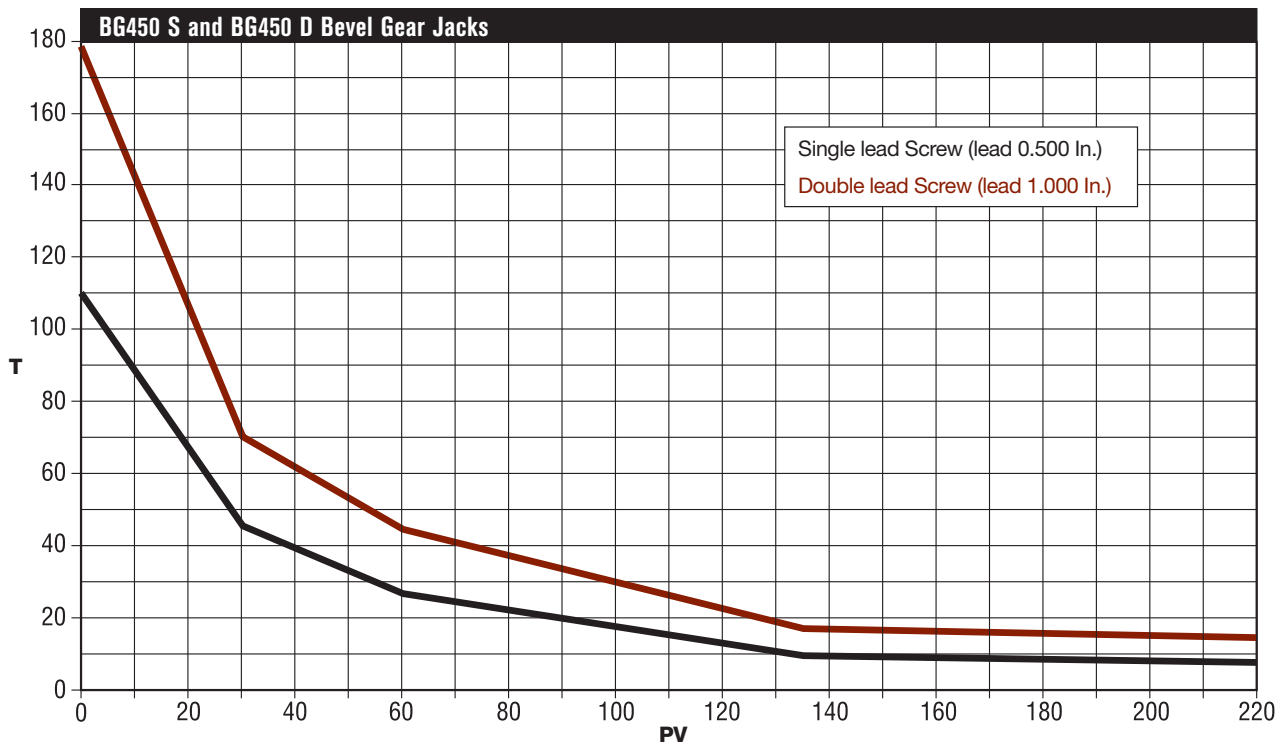
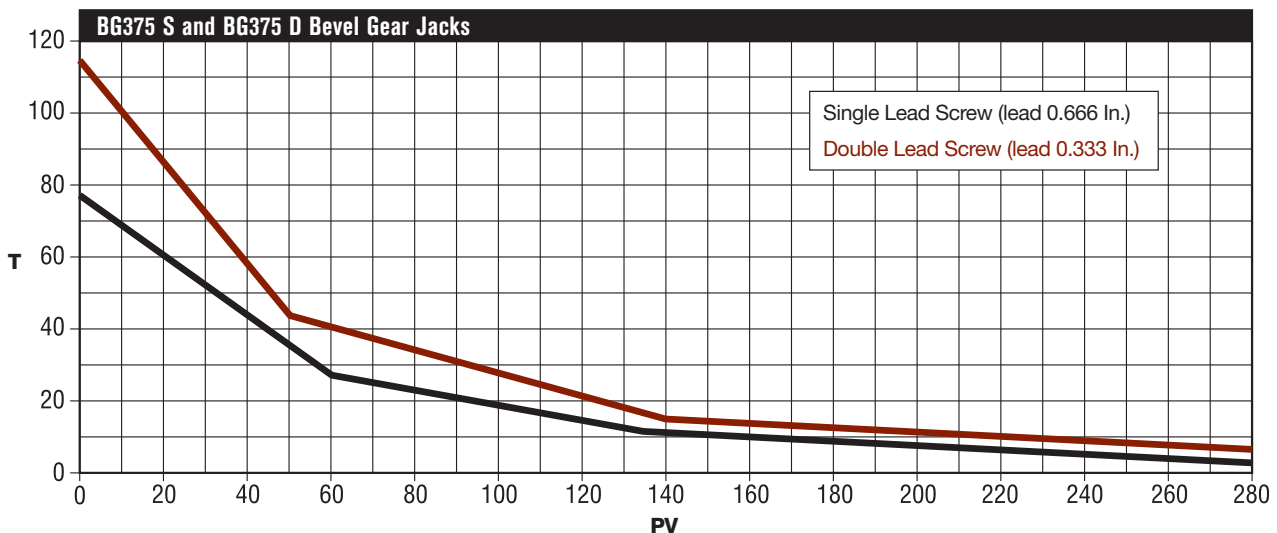
Step 3 Duty cycle = Time on / Time off
Time on = 15 seconds up + 15 seconds down = 30 seconds = 0.5 min
Time off = 2 minutes up + 30 seconds down = 2 minutes 30 seconds = 2.5 minutes

Step 4 $PV = (5000 \times 10) / 1000 = 50$

Step 5 $T = 38 \text{ (for BG150)} \times (0.5 / 2.5) = 7.6$

Step 6 The point for PV, 50. and T, 7.6 falls below the line for BG 150 D and above the line for BG 150S, therefore BG 150 D is appropriate. (reference BG150 chart on p. 152)

Step 7 $RPM = 10 \times 12 \times 5.38 = 645.6$
Horsepower = $(.066 \times 5000 \times 646) / 63,025 = 3.38$



Note: $PV = \frac{\text{load} \times \text{velocity (fpm)}}{1000}$

T = the maximum running time in minutes before a complete cooling time is required.