

# BEVEL GEAR JACKS SPECIFICATIONS AND DESIGN TIPS

Model	Dynamic Capacity	Static Load Capacity		Screw		Bevel Gear Ratio	Pinion Turns for 1" Travel	Pinion Torque (In. Lbs.)	Screw Torque	Jack Efficiency	Jack† Cooling Time	Base Weight (Lbs.)	Add for Each Inch of Travel (Lbs.)
		Upright Assembly: screw-in compression/ Inverted Assembly: screw-in tension	Upright Assembly: screw-in tension/ Inverted Assembly: Screw-in compression	Dia.	Pitch/Lead								
BG150-S	Please Use JAX® V2 Software or contact Joyce/Dayton	14,000 lbs.	14,000 lbs.	1 1/2"	.375P STUB ACME	2.69:1	7.18	.059W*	.151W*	38.5%	38 min.	42	.8
BG150-D*					.250P / .500L ACME 2C	2.69:1	5.38	.066W*	.169W*	45.6%	38 min.	42	.8
BG250-S		30,000 lbs.	30,000 lbs.	2 1/2"	.500P ACME 2C	2.15:1	4.31	.111W*	.227W*	34.2%	82 min.	140	2.6
BG250-D*					.375P / .750L ACME 2C	2.15:1	2.87	.133W*	.272W*	42.6%	82 min.	140	2.6
BG375-S		66,000 lbs.	40,000 lbs.	3 3/4"	.666P ACME 2C	3.52:1	5.29	.098W*	.329W*	31.5%	192 min.	230	4.1
BG375-D*					.666P / 1.333L STUB ACME	3.52:1	2.64	.134W*	.448W*	46.0%	192 min.	230	4.1
BG450-S		218,000 lbs.	200,000 lbs.	4 1/2"	.500P ACME 2C	3:1	6	.125W*	.356W*	21.9%	262 min.	650	5.5
BG450-D*					.500P / 1.00L ACME 2C	3:1	3	.154W*	.438W*	35.5%	262 min.	650	5.5

**Important Note:** \*Not self-locking, may lower under load. Brake motors or external locking systems are recommended.

**D:** Double Lead Screws.

**S:** Single Lead Screws. These jacks are self-locking.

**\*W:** Load in Pounds.

**Pinion Torque:** The torque required to continuously raise a given load.

**Screw Torque:** The torque required to resist screw rotation (translating jack design) and traveling nut rotation (keyed for traveling nut design).

**Lead:** The distance traveled axially in one rotation of the lifting screw.

**Pitch:** The distance from a point on the screw thread to a corresponding point on the next thread, measured axially.

†: Cooling time based on time to cool from 200°F to 70°F (ambient).

## Design Tips:

1. A PV (load/velocity) value must be calculated for each application. The continuous running time should not exceed the corresponding T (time) value. Refer to instructions and graphs on pages 152 and 153.
2. Cooling time data on these charts is calculated based on limiting the lifting nut temperature rise from 70°F to 200°F (100° below dropping point of grease).
3. Check single lead versus double lead screws in each case. A double lead screw may be the appropriate choice due to increased efficiency while offering the same performance characteristics.
4. JAX® software is a useful design aid to determine the following:
  - The allowable static compression load for a given rise (or use Column Loading Chart on page 154)
  - The allowable dynamic load for a given rise
  - System horsepower and torque – also see item #5
5. When a direct motor drive is used in a system, consideration must be given to the input starting torque requirements and the motor horsepower will need to be increased accordingly (JAX® software will not do this). Contact Joyce/Dayton for assistance.
6. When selecting multiple bevel gear jacks for an interconnected row or system (page 195) careful attention must be given to the input and output shaft rotations. For example, if the input shaft rotation on the first jack is clockwise, the output shaft(s) on that same jack will rotate counter-clockwise. To insure all jacks raise and lower in unison, alternating jacks must be specified with right and left hand acme screw threads. For example, if you have five jacks interconnected in a straight line and the first jack is right hand, the third and fifth jack will also need to be ordered as right hand and the second and fourth jack will need to be ordered as left hand. Bevel gear jacks are supplied standard with right hand acme screws. To order the left hand acme screw option, add an "L" to the end of your bevel gear jack part number as shown on page 150.
7. Joyce Bevel Gear® "S" Series (single lead) jacks are inherently self-locking. A brake is required for "D" series (double lead) jacks, which may lower under load.
8. Bevel gear jacks are furnished with one input shaft in position #2. Jacks may be ordered with up to three input shafts located at any combination of positions # 1, 2, or 3.
9. Joyce Bevel Gear® jacks are designed for oil bath (EP-90 gear lubricant) or grease operation. The upper bearing is grease lubricated through a fitting on top of the jack. Grease must be applied directly to the lifting screw.
10. Typically jacks are mounted upright with the base plate parallel to the horizon. If the base plate is oriented any other way, contact Joyce/Dayton for lubrication and other instructions.