

Instructions for shrinking Tie Rods – Cal Rod Method

Read these instructions in their entirety before starting work.

Equipment needed:

- Set of 4 properly sized cal-rods (call BCN for a quote on cal-rods if needed)
- Quenching oil
- Jacks to push lower tie rod nuts up against bed
- Spanner wrench for top tie rod nuts

Procedure:

Press must be in operating position & precision leveled. Pour quenching oil, into cal-rod holes, in the top of the tie rods to fill them about ½ - 2/3 full. Insert cal-rods. Finish filling cal-rod holes with quenching oil being careful to clean up all spillage.

Apply power to cal-rods and allow them to heat up until nuts can be loosened several turns. Turn off cal-rods and let press set at least 12 hours. Place jacks under bottom end of the tie rods and bring nuts up tight against bed.

Measure the distance between the nuts in feet then multiply this by .0083” per foot. Make a feeler gauge to this thickness.

The next day tighten nuts hand tight with a spanner wrench. Then heat tie rods with cal-rods (preferable opposite corners simultaneously) until feeler gauge can be inserted between frame and top nut. Immediately remove feeler gauge and tighten nut with spanner wrench hand tight.

After all four tie rods have been reshunk, let press set overnight before running.

CONTACT



Calculations For Shrinking Tie Rods

Threads per inch	For standard tie rod diameter	Pitch	Degree of tie rod nut rotation per lengths				
			1 Inch	6 Inch	1 Foot	5 Feet	10 Feet
12	1-3/4 thru 2-1/4	.0833	3°	18°	36°	180°	360°
10	2-1/2 thru 3	.100	2-1/2°	15°	30°	150°	300°
8	3-1/4 thru 4	.125	2°	12°	24°	120°	240°
6	4-1/2 thru 5-1/2	.167	1.5°	9°	18°	90°	180°
4	6" and over	.250	1°	6°	12°	60°	120°

To establish the number nut revolutions after rod elongation, **add the largest length** figures from the table above to equal the **length** of the frame between nuts and add the corresponding **degrees** of nut rotation (based on threads per inch).

CONTACT

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Example: 4" diameter rod with 8 threads per inch

Length of frame between nuts = 16' 7"

From the table, select the degrees of rotation based on number of thds/in

$$10 = 240^\circ$$

$$5 = 120^\circ$$

$$1 = 24^\circ$$

Total 16 FT

$$6'' = 12^\circ$$

$$1'' = 2^\circ$$

Total 16ft 7" ...398°

Since 1 revolution = $\frac{360^\circ}{8}$

Plus 38°

The amount to be marked then is 398° or 1 revolution plus 38°

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Instructions For Shrinking Tie Rods – Hydraulic Nut Method

Read these instructions in their entirety before starting work.

Equipment needed:

- 15000 psi hydraulic hand pump
- Jacks to push lower tie rod nuts up against bed
- Spanner wrench or bar stock to initially tighten nuts
- Setting spacers. If new installation measure distance between faces of tie rod nuts and measure thickness of starting spacer, typically .125 inch. Using formula below to determine thickness of hydraulic nut spacer.

Setting spacer thickness in inches = .125” + (.0007 x tie rod length between nuts in inches).

Procedure:

Press must be precision leveled before shrinking.

Place hydraulic jacks under bottom of tie rods and bring nuts up tight against bed.

With starting spacer in position, screw hydraulic nut assembly onto tie rod and tighten snug with spanner or bar.

Check to be sure all tubing, hose and valves are rated to safely hold pump pressure.

If all four hydraulic nuts are manifolded together and the hand pump reservoir has sufficient reservoir volume all four nuts may be shrunk at the same time. If shrinking only on tie rod at a time, they must be tightened corner to diagonal corner. Open shut off valves leading to hydraulic nuts and apply hand pump pressure until there is sufficient space to insert split setting spacer. With split setting spacer in position, release the hydraulic pressure and close shut off valves.

CONTACT



If frame is still gaping, one of these three things is occurring:

1. Press is being overloaded
2. Tie rods have lost their elasticity
3. Tie rods were improperly reshunk

To determine your problem, you should recheck your shrinking procedure, the tonnage rating of the die versus the press, and the age & condition of the tie rods. Tie rods can only be reshunk a limited number of times. If they are frequently reshunk or if they are continuously overloaded, they will lose their elasticity and must be replaced. Also, tie rods and nuts should never be cut or welded. Do not weld extensions on tie rods for use with frame risers. New longer tie rods should be used.

BCN can furnish new tie rods to fit your press, along with risers for increased shutheight. BCN can also furnish special tie rods drilled for cal –rods or su;;y hydraulic tie rod nuts for ease of reshinking the press.

If you have any further questions or are in need of assistance, please call us at 800-642-5477

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Instructions For Shrinking Tie Rods – Torch Method

Read these instructions in their entirety before starting work.

Equipment needed:

- Torch set with large rose bud tip (2 sets preferred)
- Several acetylene & oxygen tanks manifold in sets
- Jacks to push lower tie rod nuts up against bed
- Spanner wrench for top nuts
- Fire resistant material to place inside openings in uprights

Procedure:

Clean upright openings of grease and oil, then place fire resistant material in openings, allowing room for torch flame contact on tie rods. Place jacks under lower end of the tie rods with upward tension placed against tie rods. Heat tie rods with a general equal flame until top nuts can be loosened several turns. Repeat this procedure until all (4) tie rods have been unshrunk. Measure the distance between the nuts in feet, then, multiply this by .0083” per foot. Make a feeler gauge to this thickness. Let press set overnight for tie rods to cool.

The next day tighten nuts hand tight with a spanner wrench. Then heat tie rods with torch (preferably opposite corners simultaneously) until feeler gauge can be inserted between frame and top nut. Immediately remove feeler gauge and tighten nut with spanner wrench hand tight.

After all (4) tie rods have been reshunk, let press set overnight before running, then run press with die, checking for gapping between frame uprights and crown.

If frame is still gapping, one of these three things is occurring:

1. Press is being overloaded
2. Tie rods have lost their elasticity
3. Tie rods were improperly reshunk

CONTACT
