

Setup and Operation
for the Hardinge®
Manual and Pneumatic Tailstocks

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I. Tailstock Description and Operation

I.1 Preparation

Fill out the warranty information by visiting "www.hardinge.com/rotarywarranty" on the internet.

Clean bottom surface of the tailstock casting and machine table before mounting to the mill table. If there are any noticeable burrs or nicks on the mounting surface, remove them with a deburring stone. Apply a light coating of machine oil to the tailstock and table surface before mounting.



I.2 Manual Tailstock

The tailstock spindle is extended and retracted through the use of the hand wheel. The tailstock has 2.52" (64mm) of travel.

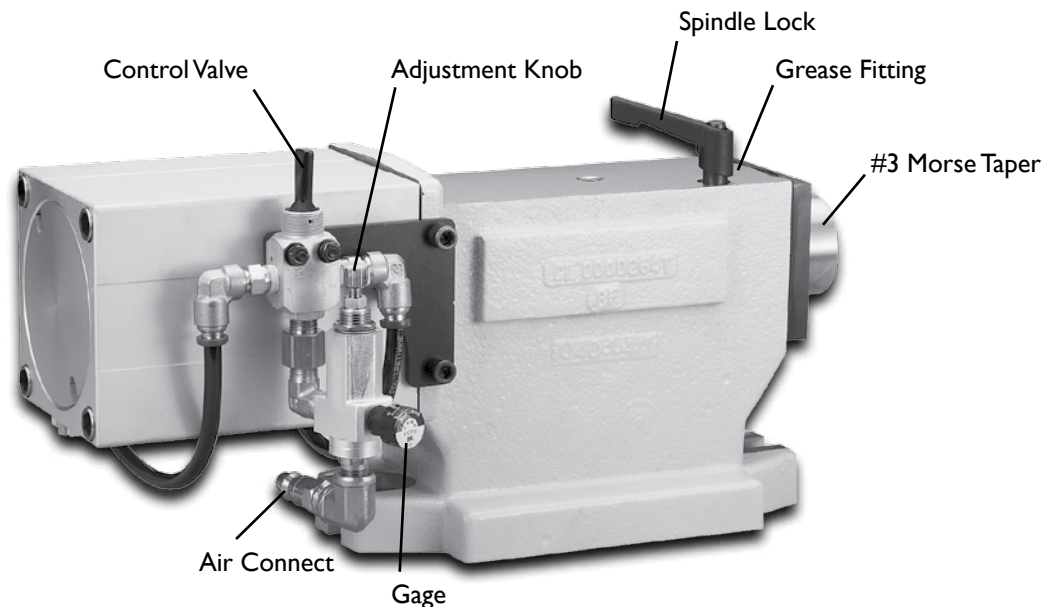
The spindle of the tailstock accepts #3 Morse Taper tooling.

A grease fitting connection is provided for periodic lubrication.

There is a spindle lock provided (packaged separately) to lock the spindle once it is extended. Install spindle lock in the provided hole as shown above. Be sure to release the spindle lock prior to trying to adjust the hand wheel.

When the tooling comes in contact with the workpiece/fixture, apply only enough force on the hand wheel to hold the workpiece/fixture securely. The force required on the hand wheel to accomplish this is similar to the force used in closing a typical garden faucet.

CAUTION! USE LIVE CENTERS ONLY. DEAD CENTER CONTACT WITH PART WHILE INDEXING WILL DAMAGE THE ROTARY INDEXER.



I.3 Pneumatic Tailstock

The tailstock spindle is extended and retracted through the use of a manual control valve. The tailstock has 2.52" (64mm) of travel.

The spindle of the tailstock accepts #3 Morse Taper tooling.

A grease fitting connection is provided for periodic lubrication.

There is a spindle lock provided (packaged separately) to lock the spindle once it is extended. Install spindle lock in the provided hole as shown above. Be sure to release the spindle lock prior to trying to adjust the hand wheel.

There is a quick-disconnect air hose fitting supplied to connect the incoming air supply.

The operating pressure of the tailstock can be adjusted through the supplied air regulator. The reading on the pressure gage of the tailstock is the outgoing air pressure divided by 10. Therefore a reading of 10 on the pressure gage means 100 psi of outgoing air pressure. To adjust the air pressure, turn the adjustment knob shown in the diagram above.



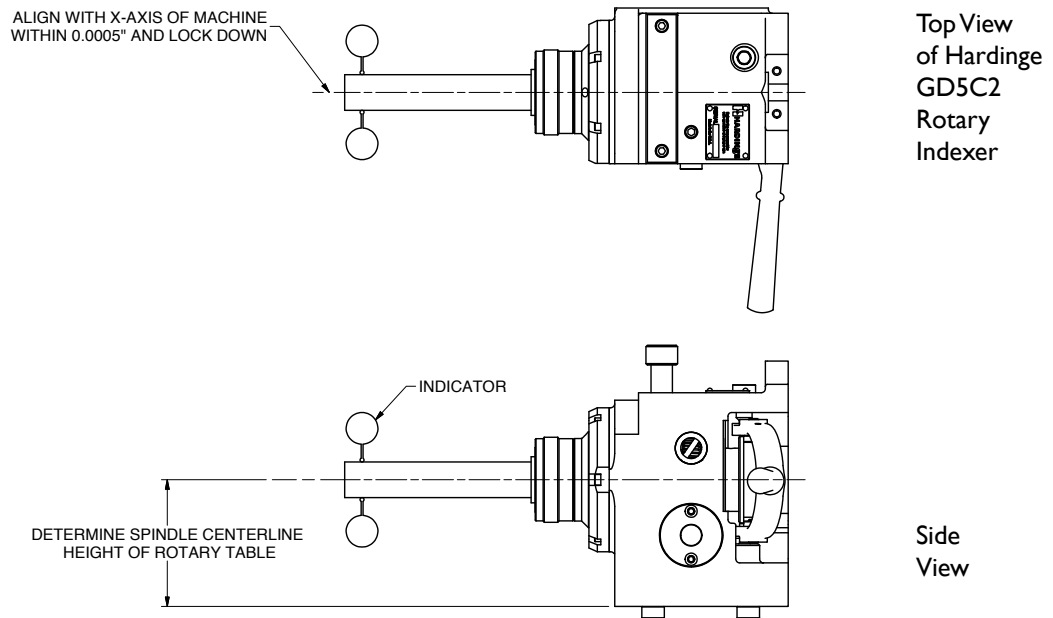
7. The cylinder used on the pneumatic tailstock provides an output force of 7x the supplied air pressure. There is a chart in the back of the manual which can be used by the operator to quickly identify this output force.
8. The manual control valve can be replaced by a solenoid valve should the customer require automating the tailstock function. In this case, the pressure regulator and gage would be moved to the location of the solenoid valve to control the air pressure.

Part No. BA -0009500-0159

2. Setup

2.1 Tailstock alignment

Measure the rotary table indexer spindle centerline height. Use an arbor and indicator to determine the height as shown. Align the spindle centerline with the X-axis of your machine within 0.0005" (0.0127mm). Measure and record the spindle centerline in the Y direction.



Once the rotary table indexer table information is recorded, align the tailstock so that approximately one inch of travel will engage the workpiece.

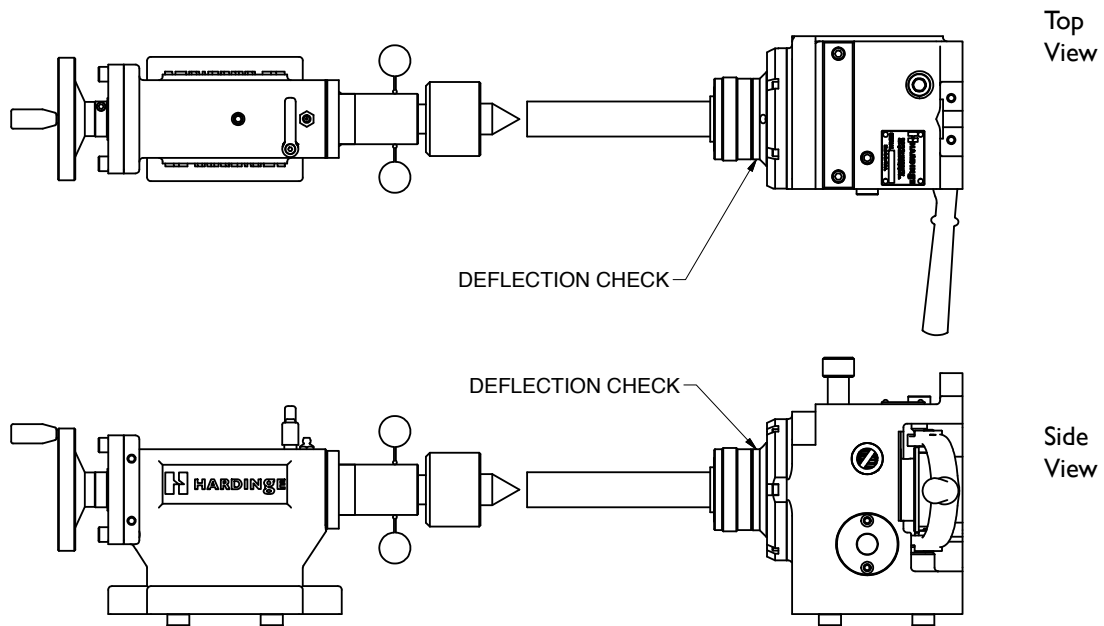
Indicate the height of the tailstock spindle centerline and compare with the rotary table indexer. Centerline height should be within 0.001" (0.0254mm). If greater than 0.001" (0.0254mm), shims are required either under the rotary table indexer or tailstock.

Indicate the tailstock in the X-axis and Y-axis to put the tailstock on centerline with the rotary table indexer within 0.001" (0.0254mm).

Some applications may require the tailstock to be more precisely aligned to the rotary spindle including applications with parts > than 10" in length.

Secure the tailstock to the mounting surface.

The goal of this procedure is to align the tailstock and rotary table indexer so that when extended into the workpiece, the tailstock exerts minimal deflection on the rotary table indexer spindle. This deflection should be measured and not exceed 0.0002" (0.005mm). Deflection greater than 0.0002" (0.005mm) may cause the rotary table indexer to bind. Refer to illustration on the following page. Measure the deflection as illustrated. If >.0002" (0.005mm), re-align tailstock and re-check.



Once aligned, tighten the two 1/2-13 hex head bolts to secure the tailstock.

2.2 Installation and Removal of Morse Taper Accessories



INSTALLATION:

NOTE: When using the Hardinge tailstock with Hardinge rotary table indexers, **ONLY LIVE** centers or **LIVE** tooling is recommended. Live refers to the device being able to rotate freely when the indexing device rotates. Use **ONLY FLANGED CENTERS** with pneumatic tailstocks for removal with a wedge. Centers without flanges may get stuck in tailstock spindle and will require disassembly of tailstock to retrieve center.

Inspect and clean tailstock taper and tapered surface of the live center.

Apply a light coat of oil on the center before inserting into the spindle. This aids in removing the center and also prevents corrosion buildup.

REMOVAL:

To remove the live center in the manual tailstock, retract the spindle into the body and the lead screw will force the center out. To remove the live center in the pneumatic tailstock, wedge an aluminum bar between the face of the spindle and the rear surface of the live center's flange and lightly tap with a brass bar until free.

3. Setup and Operation of Preset Tailstock and GD5C2 Rotary Indexer Combination

3.1 Set Up and Operation

The single preset unit weighs 206lbs/93kg while the double unit weighs 266lbs/121kg, therefore care should be used whenever lifting or handling the unit. When an overhead lift assist is available, install a lifting eye-bolt into the center tapped hole in the mounting plate and use it to lift the assembly. The tapped hole is a 5/8"-11 thread.

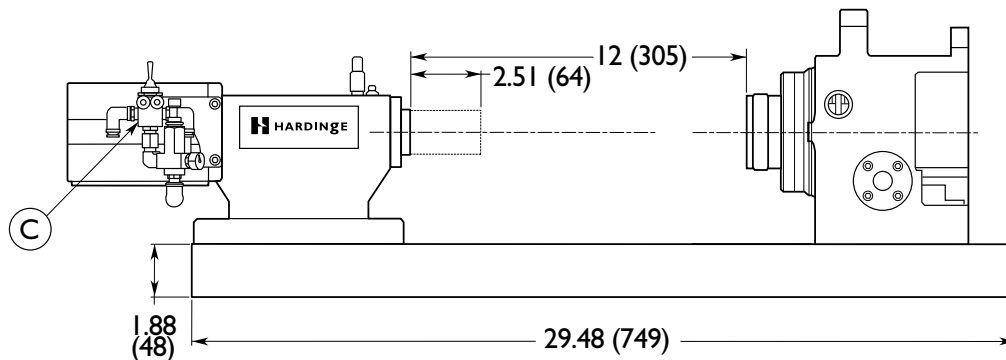
Position the tailstock relative to the workpiece within the first 3/4" to 1 1/4" of spindle travel. This will optimize spindle rigidity. (Fig. 2, Item A)

Tailstock-to-Indexer head alignment can be accomplished by simply pushing the tailstock (Fig. 2, Item B) to one side of the T-slots prior to tightening the hex head bolts to 50 ft.-lbs. Precision locating pins mounted on the bottom of the tailstock allow for quick alignment as the pins are parallel within 0.001" (0.025mm) of the spindle bore. However, make sure both tailstock units are positioned to the same side of the T-slot. This general alignment is all that is needed for the recommended use of live centers.

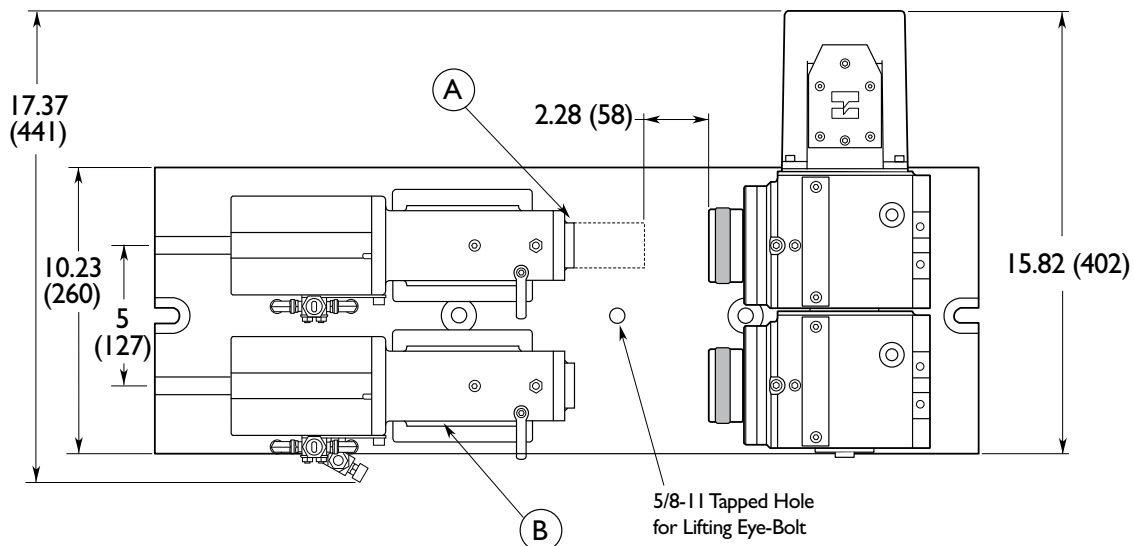
Tailstock Pressure Settings: Set the air regulator (Fig. 1, Item C) to the normal operating range for the Rotary Indexer (10 to 40 psi) with a maximum of 60 psi. Hardinge recommends using the lowest air pressure setting that provides the required rigidity for the part to be machined.

CAUTION: When using tailstocks, Hardinge recommends using **LIVE CENTERS ONLY!**

Single Unit: (1) Pneumatic Tailstock, (1) GD5C2 Rotary Indexer with Pneumatic Closer and (1) Double Mounting Plate (Fig. 1)



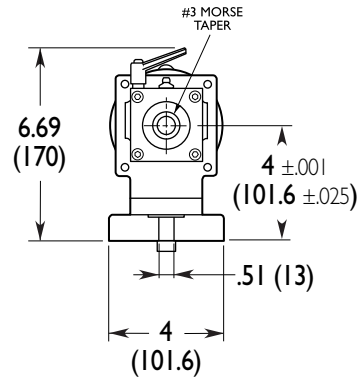
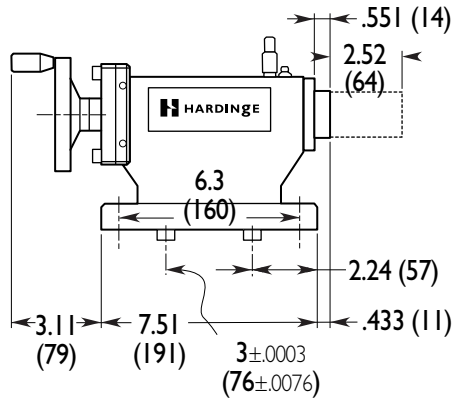
Double Unit: (2) Pneumatic Tailstocks, (2) GD5C2 Rotary Indexers with Pneumatic Closers and (1) Double Mounting Plate (Fig. 2)



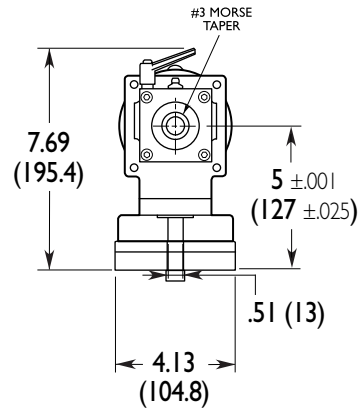
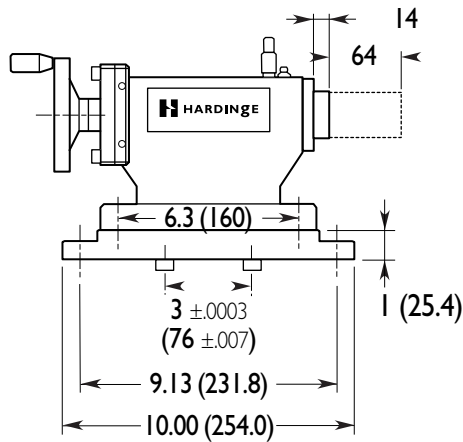
4. Dimensions

4.1 Manual Tailstocks

GD5C2 and DD100 Manual Tailstock

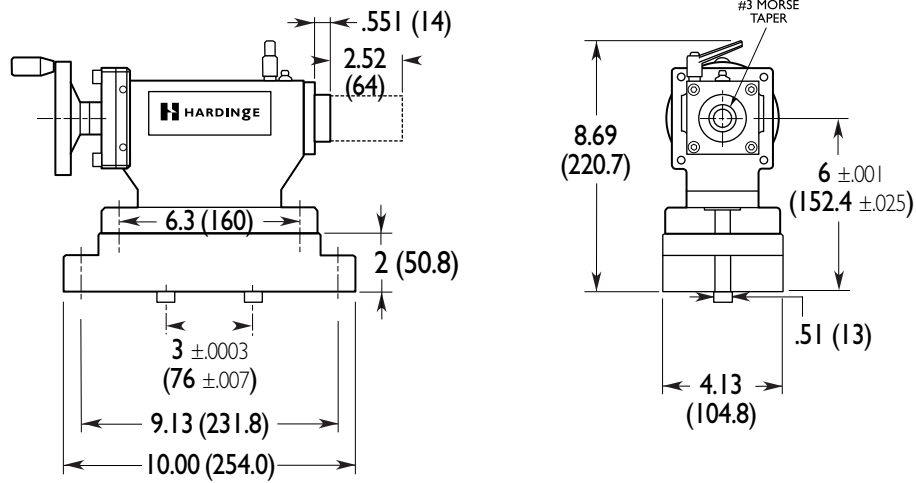


GD160LP Manual Tailstock with 1"/25.4mm Riser

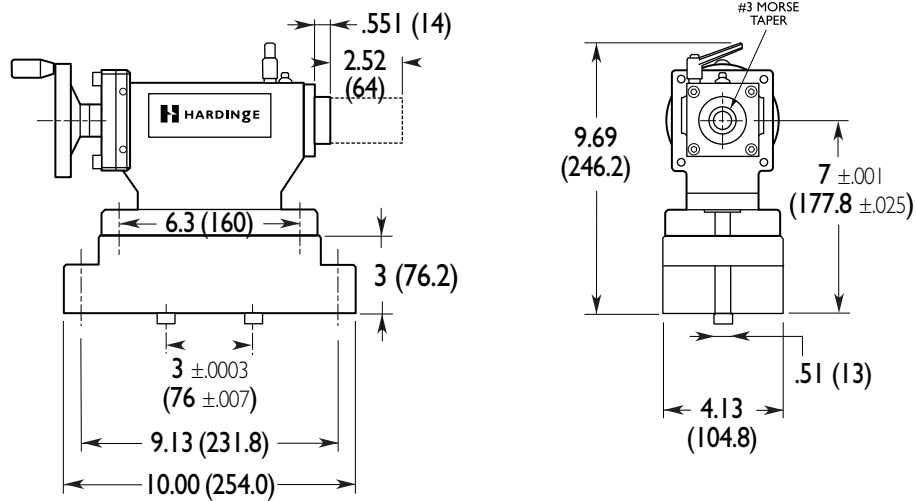


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GD16C2, GD3J2, DD200 and GD210LP Manual Tailstock with 2"/50.8mm Riser



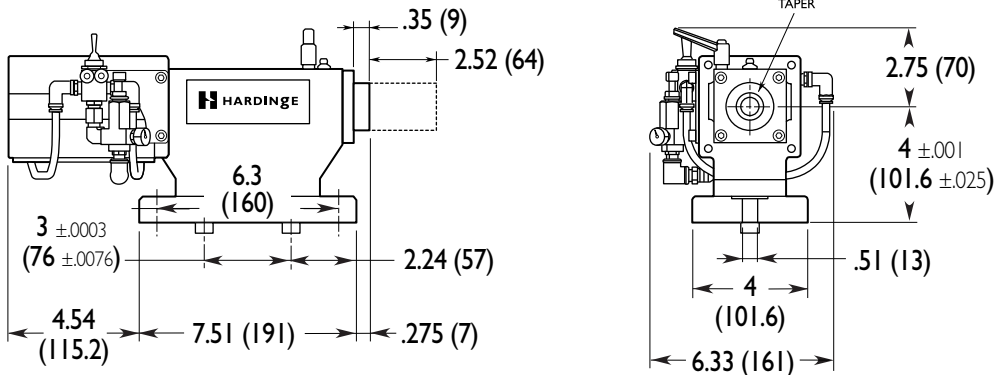
DD300 Manual Tailstock with 3"/76.2mm Riser



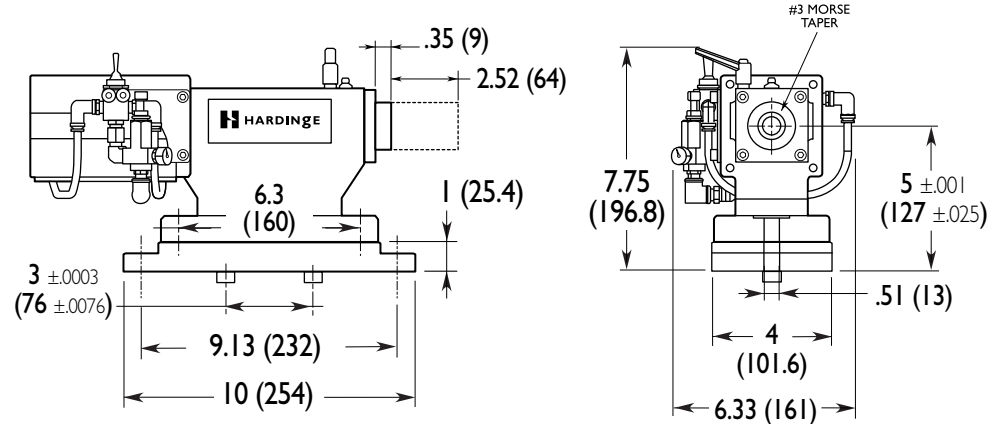
Example showing riser plate used for center heights over 4" (101.6mm)

4.2 Pneumatic Tailstocks

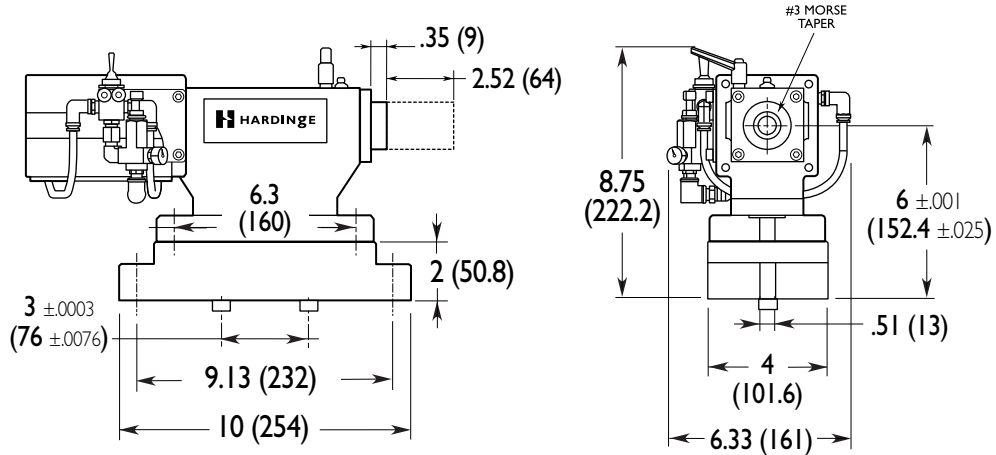
GD5C2 and DD100 Pneumatic Tailstock



GD160LP Pneumatic Tailstock with 1"/25.4mm Riser

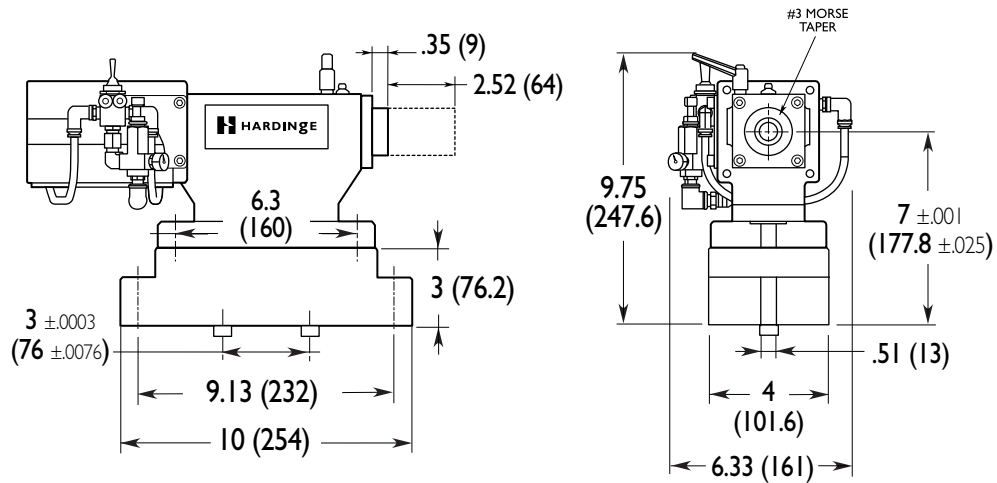


GD16C2, GD3J2, GD210LP and DD200 Pneumatic Tailstock with 2"/50.8mm Riser



Part No. BA -0009500-0159

DD300 Pneumatic Tailstock with 3"/76.2mm Riser

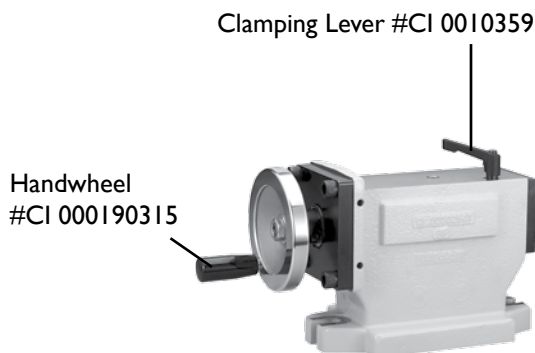


5. Tailstock Maintenance

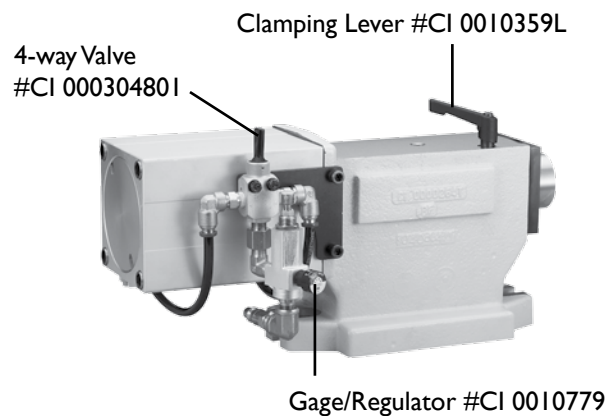
- Monthly** Use a standard grease gun and apply 1-2 full strokes to the top mount zerk fitting for a manual tailstock.
- Weekly** Use a standard grease gun and apply 1 full stroke to the top mount zerk fitting for a pneumatic tailstock.
- Daily** Use a shop rag to thoroughly clean the unit free of chips and apply a rust preventative such as WD-40.

Lubrication Use MOBIL multipurpose grease with MOLY (Molybdenum disulfide) or equivalent.

6. Part's List - Recommended spare parts to have on hand:



MANUAL TAILSTOCK



PNEUMATIC TAILSTOCK

7. Tailstock Force Chart

GAGE READING	PSI	FORCE (lbs)	FORCE (kg)
.5	5	35	15
1	10	70	31
1.5	15	105	47
2	20	140	63
2.5	25	175	79
3	30	210	95
3.5	35	245	111
4	40	280	127
4.5	45	315	142
5	50	350	158
5.5	55	385	174
6	60	420	190
6.5	65	455	206
7	70	490	222
7.5	75	525	238
8	80	560	254
8.5	85	595	269
9	90	630	285
9.5	95	665	301
10	100	700	317

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