Benefits:

Increase spindle life. A toolholder that fits the spindle properly will have the following benefits: less noise, little or no chatter, better finishes, better tool wear, deeper and faster cutting capabilities, hold better finishes, eliminate unexpected tool breakage, hold closer tolerances, and increase production.

Other JM Performance Products:

High Torque Retention Knobs
Our High Torque retention knob has been engineered to stop toolholder expansion. An expanded toolholder is free to move in the spindle causing excessive harmonics and poor tool-life. By design, the HT knob has a relief cut beneath the flange of the retention knob. This relief allows the force of the threads to be applied into a deeper cross section of the toolholder, thus eliminating expansion. JMPP has found that when a toolholder is properly mated with the spindle, carbide tool-life can be increased by 10% to 300%.

ClampForce Drawbar Gages, Hydraulic and Electronic
Whether you have one machine or many machines to monitor, our ClampForce Gages are the easiest products to use for checking draw bar force. Both gages are able to check all types of V-flange, Capto, HSK, and KM spindles. In seconds, it indicates the amount of force being applied to the toolholder. Once drawbar force drops below 80% of the original manufacturer's setting, it is time to schedule maintenance.

Spindle Cleaners
Many spindles are neglected and not kept clean on a regular maintenance program. As grease and oil build up in the spindle, the toolholder is no longer making proper contact with the spindle. A dirty spindle leads to poor tool life, runout, and poor tolerances. We offer spindle cleaner kits in 30, 40, 45 and 50 tapers and feature replaceable cleaning strips.

Spindle Restoration Kits
Over time grease, dirt, and materials get galled into the spindle affecting tooling performance. To recondition spindle tapers, we have introduced our Spindle Taper Restoration Kit. The AT3, precision-taper head used with the refinishing media can restore the original taper finish. The media will remove materials that has been galled into the spindle taper without damaging the original taper. Available in 30, 40, 45 and 50 tapers.

JM PERFORMANCE PRODUCTS, INC.
The Industry Leader in Milling Machine Optimization

For more information, visit our website at:
www.jmperformanceproducts.com

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Taper Shank Test Fixture

Operating Instructions

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www.jmperformaceproducs.com

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Thread Master Test Instructions

(Included in Taper Shank Test Fixture Kit or can be purchased separately)

Non-destructive test method for testing toolholders that are heat treated and finish ground.

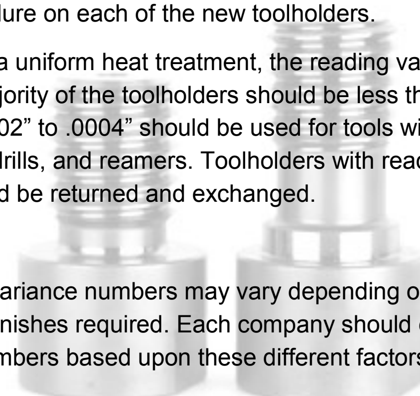
While testing for toolholder distortion, there was a variation in expansion when using the same retention knob in many toolholders of the same brand. When the test was repeated with a second retention knob, the same variation in readings was noticed. This revealed there is an inconsistency between toolholders.

By using the new, hardened Thread Test Masters with the Taper Shank Test Fixture, and tightening 40 taper size toolholders to the same tightness on each test (60 FT/lbs), the reading variance from the average reading indicate that some toolholders are softer than others. Toolholders that show a great deal of expansion over the average expansion should be returned to the tool distributor and exchanged for new toolholders. When checking different spindle size toolholders, tighten enough so that all toolholders in the test group have readings of .0002” min.

Instructions:

1. Clean the toolholder and threaded test masters with solvent and blow off excess solvent.
2. Clean the inside angle of the Taper Shank Test Fixture with a lint free rag.
3. With a small artist brush, apply a very minute amount of WD-40 to the thread master.
4. Insert the toolholder to be tested into the test fixture and set all indicators to “0”.
5. Remove the toolholder and insert the thread master into the toolholder and tighten it to 60 FT/LBS.
6. Wipe off the toolholder again and insert it into the fixture. Take the readings from the three indicators, average them and record the number.
7. Repeat this procedure on each of the new toolholders.

If the toolholders have a uniform heat treatment, the reading variance over the average readings of the majority of the toolholders should be less than .0002” total. A reading variance of .0002” to .0004” should be used for tools with mainly axial force used such as: c-drills, drills, and reamers. Toolholders with reading variances .0004” over the average should be returned and exchanged.



Note: The acceptable variance numbers may vary depending on the materials, hardness, tolerances, and finishes required. Each company should develop their own expansion variance numbers based upon these different factors.

Calculating the Run Out of the Cutting Tool

If the gage moves 4 lines (.0004") the run out at the gage line is .0004". Multiply this value by the number of times the tool tip is greater than the length of the toolholder from the small end to the gage line.

> **Example:** The length from the small end to the gage line on an ANSI toolholder is 2.687". The tool tip is 8.000" from the face of the spindle.
>
> Therefore **8.000 / 2.678 = 2.9**
> Toolholder length / gage length = 2.97 gage lengths
> 2.97" X .0004" = .0011"
> Gage length X Run out at gage line = 0011"TIR
> .0011" + .0004" = .0015" TIR at the tool tip.

Using this example, the closest tolerance a boring bar could hold would be .0015" in diameter. There should be no movement at the gage line (side gage) if the tools are to perform as designed.

Checking Tools in a CNC Mill for Bulge

Take a toolholder directly from the machine. Do not remove the retention knob.

1. Wipe the toolholder with a lint-free rag.
2. Place the toolholder in the test gage and set the gage so the small indicator reads .005" and the large gage is on "0". This will allow for +/- movement of the indicators.
3. Remove the toolholder from the test gage and remove the retention knob.
4. Place the toolholder back in the test gage and read the three dial indicators. Average the readings and multiply that value by .000029" to determine the total growth of the toolholder caused by the retention knob.

**Note that an expanded toolholder will show a negative movement on the indicators.

Storage of the Taper Test Gage

Return the Taper Shank Test fixture to the storage case when not in use. The test fixture should be oiled to prevent rust. Oil on indicator lenses should be removed for storage

Scope

The Taper Shank Test Fixture (patent pending) measures toolholder movement or expansion due to the pressure of retention knob threads on the small end of the toolholder. The inside diameter (I.D.) of the gage is ground to mirror CNC mill spindle tapers. Three indicators mounted on the top of the test gage measure any movement or growth of the toolholder in increments of 1/10,000 of an inch. 1/10,000" in movement of the indicators equals .000029"change in diameter of the toolholder shank. An identical indicator on the fixture's side measures any movement of the toolholder perpendicular to the axis of the toolholder at either end of the fixture.

Note: The indicators in the test fixture are set short of the position for checking toolholders when shipped.

Caution!

> The Taper Shank Test Fixture has three legs at the large end of the gage. The gage should be set on the legs on a mouse pad to eliminate any shock when not being used. One leg is larger than the others and functions as a locator, ensuring that the toolholder is in the same position when testing. Always rotate the test gage in the same direction, keeping the rotational pressure steady, so that the pin touches the side of the drive slot when performing a test. This ensures the readings are taken in the same location in case the flange is not ground and is not perpendicular with the centerline of the toolholder.

Test Fixture Set-up

Test Fixture will come pre-set for CAT toolholders. If you are using JIS, JMTBA, or dual-contact toolholders please follow these instructions first.

1. Loosen the set screws on all of the gages of the test fixture to allow each gage to move freely. This will prevent gages from exceeding the limits and damaging indicators.
2. Continue with set-up directions below.

Indicator set-up for ANSI, DIN or ISO Standard Toolholders:

1. Clean the inside angle of the taper test gage and the taper of the toolholder with a lint free shop towel.
2. Carefully insert the toolholder into the test fixture. Do not allow the small end of the toolholder to nick the inside of the test fixture.
3. Rotate the toolholder until the large locator pin on the bottom of the test fixture is in the slot of the toolholder with the drilled hole for balancing. In the case of toolholders without a balancing hole, mark a point of reference on the toolholder using a marking pen or permanent marker. The toolholder should be rotated while it is being pushed upwards lightly, until the pin is against the side of the toolholder drive slot. (Note: The toolholder will rotate clockwise or counter-clockwise. Always rotate in the same direction for each test sequence.)
4. Loosen the set screw holding one of the three indicators and move the indicator until the small indicator needle moves to the number 1, (one full revolution or .010") and tighten the set screw. **Do not over tighten the setscrew. Over-tightening will cause the indicator stem to bind and not move freely.** (Adjusting the indicators so that the "0" is in the same orientation on each dial, this will make them easier to read during testing.
5. Repeat this procedure until all three indicators are set the same.
6. **Set the side indicator** in the same manner as the three top indicators. Future adjustment of this indicator should be unnecessary.

Warning:

If the test fixture indicators are set for **JIS or JMTBA standard** toolholders and a toolholder from an **ANSI, DIN or ISO standard** is inserted into the test fixture, the three indicators on the top of the test fixture will hit the limits of travel and the indicators may be damaged.

Performing Toolholder Tests

Note:** Remember to always clean the test gage and toolholder before testing using a lint-free rag.* ***Both the test fixture and the toolholder(s) should be at room temperature for valid results.

1. After setting the test indicators, insert the toolholder that is to be tested into the fixture and set all indicators to "0". (Refer to #3 inTest Fixture Set-up instructions).
2. Remove the toolholder and insert and tighten the retention knob to the desired torque setting.
3. Wipe off the toolholder again and insert it into the fixture.
4. Rotate the toolholder until the large locator pin on the bottom of the test fixture is in the slot of the toolholder with the drilled hole for balancing. In the case of toolholders without a balancing hole, mark a point of reference on the toolholder using a marking pen or permanent marker. The toolholder should be rotated while it is being pushed upwards lightly, until the pin is against the side of the toolholder drive slot. (Note: The toolholder will rotate clockwise or counterclockwise. Always rotate in the same direction for each test sequence.)
5. Read the three top indicators. The exact distance moved by the toolholder is determined by averaging the readings from all three top indicators. The **AT3 grind limit** on the toolholder shank has a total tolerance of **.0000787**.

If the average of the movement of the toolholder out of the test fixture is .0007" of an inch, calculate the increase in diameter in the following way:

Example: 7 X .000029" = .000203"
.000203" /.0000787" = 2.57 Grind limits or 1.57 grind limits over high limit.

Check the Toolholder for Looseness

Hold the test gage with one hand and toolholder with the other hand. Rock the toolholder back and forth, trying to force the large end of the toolholder toward and away from the indicator mounted at the base of the gage. Try to move the toolholder away from the indicator. If there is any movement at this point (the gage line of the toolholder) the toolholder will move when a cut is taken. The tool will not locate in the same exact position when it is loaded into the spindle by the tool arm of the machine.