

## TIP 8a — #0 Morse Taper Holder for a #1 Center Drill/Ross Heitt

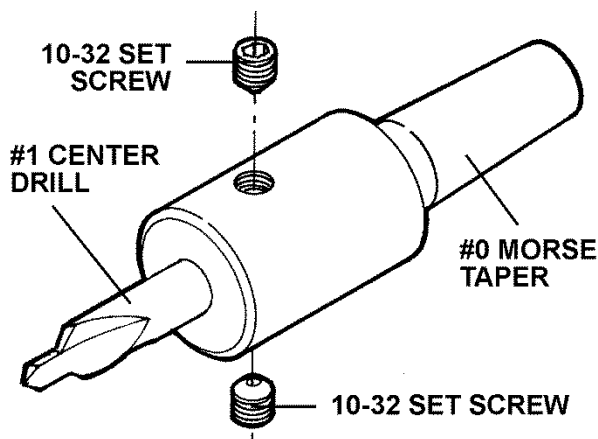
At work, Ross Heitt runs 30" manual and CNC machines for a Canadian gear manufacturer, but at home he works on Sherline tools. One of his first projects when he got his new Sherline lathe was to make a center drill holder to see how well the lathe could turn a Morse taper. It worked fine, and he finds his center drill holder a very convenient fixture. This one is sized to hold a #1 center drill. The drawing and plan below describe the part. For your own information, a Morse taper is 0.05205" of taper in one inch or about 5/8" per foot. (Note that in reality, each Morse taper is slightly different. A list of the exact tapers for each size can be found in the Sherline Shop Accessories Guide and Machinery's Handbook.

### DRAWING NOTES:

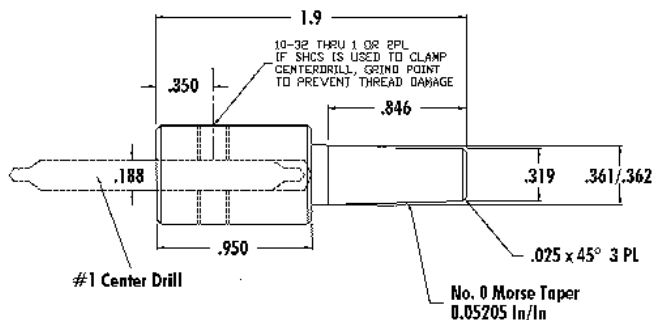
1. Material-12L14 steel, 5/8" diameter
2. Break all sharp edges
3. Case harden .030 deep
4. Check Morse taper with #0 taper gage and bluing.
5. Locking screw: 10-32 cone point set screw or 10-32 socket head cap screw with point ground on end.

**NOTE:** There is a full page, high quality version of the above plan on the following page.

**CORRECTION TO PLAN DRAWING:** Please note that the outside diameter of the body is not indicated on the drawing. It should be 5/8" diameter. Incorrectly listed in the title block is 1/2" diameter stock, although the overall dimension of the outside of the body is not critical to its function.



(Above) Perspective view. (Below) Dimensioned plan.

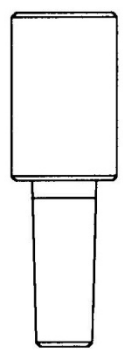
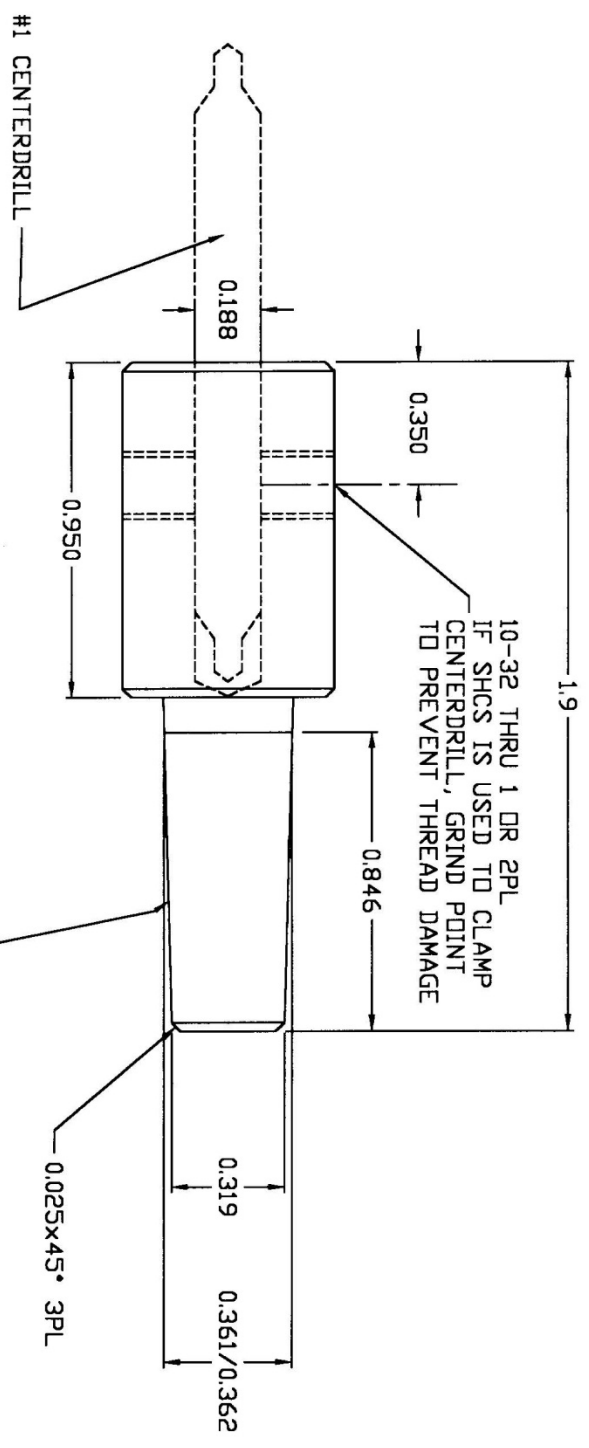


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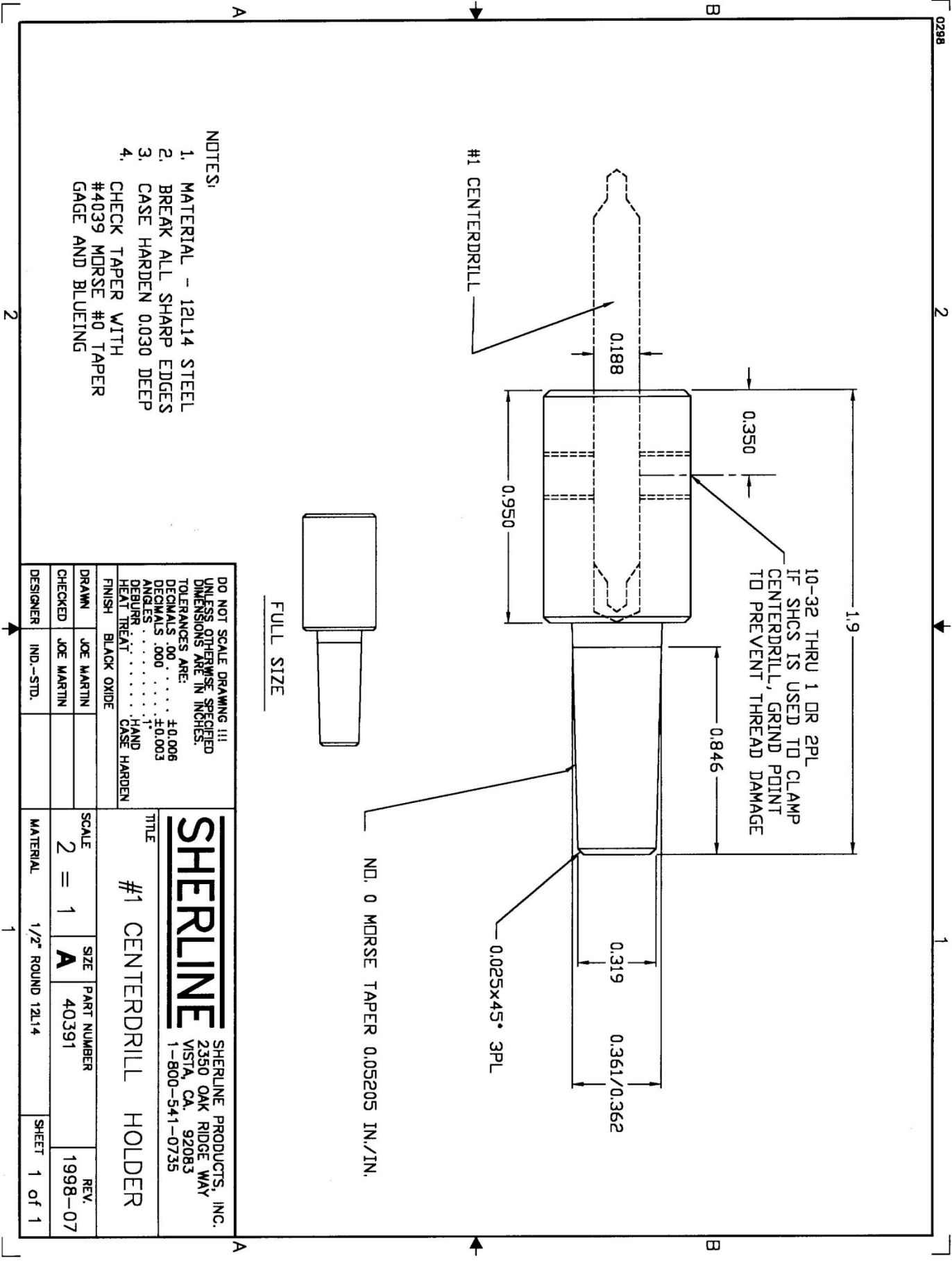
1



FULL SIZE

- NOTES:
1. MATERIAL - 12L14 STEEL
  2. BREAK ALL SHARP EDGES
  3. CASE HARDEN 0.030 DEEP
  4. CHECK TAPER WITH #4039 MORSE #0 TAPER GAGE AND BLUEING

|  |            |   |                  |
|--|------------|---|------------------|
| DO NOT SCALE DRAWING !!!<br>UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES.<br>TOLERANCES ARE:<br>DIMENALS .00 ±0.006<br>DECIMALS .000 ±0.003<br>ANGLES . . . . . 1<br>DEBURR . . . . . HAND<br>HEAT TREAT . . . . . CASE HARDEN |            | TITLE<br><b>#1 CENTERDRILL HOLDER</b>   |                  |
| FINISH BLACK OXIDE   |            | SHERLINE PRODUCTS, INC.<br>2350 OAK RIDGE WAY<br>VISTA, CA. 92083<br>1-800-541-0735 |                  |
| DRAWN  | JOE MARTIN | SCALE   | 2 = 1            |
| CHECKED  | JOE MARTIN | SIZE  | A                |
| DESIGNER   | IND.-STD.  | PART NUMBER   | 40391            |
|  |            | MATERIAL  | 1/2" ROUND 12L14 |
|  |            | SHEET   | 1 of 1           |
|  |            | REV.  | 1998-07          |



## TIP 8b — Tailstock Drill Tooling/David M. Grause

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This is a different approach to Machinist Tip #8 above. If you ever had to triple drill multiple parts in the lathe for example, center drill, tap drill, and then chamfer or clearance drill part of the hole, then you know the time lost and the frustration of finding the right drill and changing out the drill chuck for each operation. Or the same sized hole is drilled repetitively, on each project, such as an 8-32 tap drill. An easy but expensive solution is to simply purchase a number of #0 Morse taper drill chuck tailstock adapters (part #11890) and mount an equal number of drill chucks (part #11900). However, a more practical solution is to just purchase the #0 Morse taper adapters and make your own tooling.

Cut a piece of 5/8" round, hex, or square bar stock 1-1/2" long. Clean up both ends in the lathe. Then drill and tap one end for 3/8-24 threads a 1/2" deep. Part must seat against the collar of the adapter.

Mount the tooling blank and a tailstock adapter together in the tailstock. Machine a hole to fit the drill or tool and to a depth as required. Finish machining by drilling a hole with a #25 drill 0.375" back from the front completely through the part, perpendicular to the centerline. If the drill or tool to be mounted has a flat, adjust the position of this hole accordingly. Tap this hole with a 10-32 tap for the set-screws.

The final operation is to mark and identify the finished tooling as to thread or drill size, and if it is either a tap or body drill. A flat can be milled down the outside of round stock to hold this identification, or flat shallow holes drilled and a dab of paint added to color code - or both.

### NOTES:

- If working in tight spaces where clearances are a problem, a step or taper can be machined on the working end of the part. [Try doing this to a drill chuck.] However, do this operation last after all the holes have been drilled and tapped.
- Drill a small undersized hole along the part's centerline in the lathe through the rear mounting hole [not through the Morse adapter] into the front hole cavity to aid in the removal of broken bits, tooling, etc. [This can be a real lifesaver.]
- DO NOT Loctite the two parts together! If parts need to be separated often, use some Teflon tape on the threads. [The kind found in the plumbing department.]
- Make each tool holder on its own separate adapter for accuracy and efficiency.
- Keep each tool holder and its adapter together as a unit to avoid potential run-out problems.
- This type of tooling can also be used to hold small taps. A square hole can be either filed, broached, or EDM'd inside to fit the wrench end of the tap, or a second set of set-screws added.
- This same tooling can also be used with the #1 Morse taper adapter (part #11880) in the mill. Depending upon the spindle speed, balancing may be required.

(TIP 8c continued on next page)

## TIP 8c — #0 Morse Blank Tool Holders Now Offered by Sherline

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If you want to make your own tool holders as illustrated in the previous tips, now you have a third option to turning your own taper or threading a hole to fit the #0 Morse drill arbor. Sherline has introduced a #0 Morse Blank for just this purpose as [P/N 3051](#). Just drill/bore it to fit your particular tools, cross-drill and tap for a set screw and you have a quick-change tailstock tool set without have to turn a taper or drill and tap a piece of stock. The blank billet is 3/4" in diameter and 1" long.

