

GUNSMITHING TOOLS – Sako Extractor Jig/Headspace Tool

June 24-28, 2024

\$400 or 2 credit hours

Class is limited to 8 students

This class discusses the construction of tools and fixtures in general, as well as the manufacture of either a Sako extractor jig, or a headspace checking tool (depending on your experience, you may not have time for both). Consult with the instructor to determine if other, or additional, projects will fit within the scope of the class.

PREREQUISITE: Basic Machine Shop, Machine Shop 1 (from TSC), or the consent of the instructor.

Instructor: Logan Schmit

Tool list:

Tools specifically for the Sako extractor jig

- 1/2" Diameter, 4 flute double ended, endmill, (carbide preferred), (two single ended endmills are also acceptable) (only required for the Sako extractor jig)
- 3/16" Diameter, carbide endmill, with a 5/8" length of cut (only required for the Sako extractor jig)
- 3/8" diameter, carbide endmill, with a 1" length of cut (only required for the Sako extractor jig)
- 1/4" 90° Chamfer mill (is **not required**, but can add a decorative touch) MSC #09550724 (only used for the Sako extractor jig)

Tools specifically for the headspace tool

- 1/4" or 5/16" size, High speed steel lathe tool bit blanks (qty: 2), (only required for the headspace tool)
- 3/8" chucking reamer, or one that matches the stem diameter of your 2" travel dial indicator, similar to MSC #02310241 (only required for the headspace tool)
- 1/2" Diameter shank boring bar (with a max bore depth of around 3") similar to MSC #78058096 (Carbide shank insertable bars are acceptable as well, and can be found at reasonable prices online. If you are selecting this option, a total length of around 4" is preferred and be sure to have a proper insert, or two, for the bar) (only required for the headspace tool)
- Indexable carbide shank boring bar (with a minimum bore diameter of less than 3/8", and a max bore depth of around 3") similar to MSC #42639997, with an insert similar to MSC #74161464. (Other carbide shank insertable bars are acceptable as well, and can be found at reasonable prices online.) be sure to have a proper insert, or two, for the bar) (only required for the headspace tool)

Required Tools, Regardless of the Project

- #3 or #4 Center drill
- 6" Dial caliper
- Mighty Mag, indicator holder
- 0-1" Dial indicator
- Dial test indicator with either 0.0005", or 0.0001", resolution

- Magnetic base indicator holder (Noga Model: NF10433 preferred).
- Edge finder
- 6" Steel rule
- Tap guide (similar to MSC #95267472)
- Tap wrench (similar in size to a Starrett brand, model 93B), (it should have a center hole in the back of it for alignment purposes)
- Assorted files with handles (if you only bring one, a 6", single cut, smooth file with handle is preferred)
- Carbide tip scribe
- 115 Piece drill bit set
- 320, 400 Grit wet/dry polishing paper (2 sheets each)
- Layout dye
- Safety glasses
- 6" or 8" Adjustable wrench
- Allen wrench set up to 3/8"
- 18oz to 24oz Deadblow hammer
- Pliers
- Tool box
- Precision Machining Technology, Third Edition (ISBN: 978-1-3377-9530-2) is not required but can be a beneficial reference.

Please note that this list is bare minimum. If you have other tools or supplies that may be useful, bring them. You can never have too many tools.

Sako extractor jig material list:

- 1-3/4" x 2" x 5-1/4" The metal composition is up to the student. (Stainless, low/medium/high carbon, or Tool steel – should be annealed and stress free)

Headspace tool material list:

(this amount of material allows the fabrication of one tool, if you are interested in creating multiple tools in different sizes, please multiply by the number you are planning on making)

- 1-1/4" x 3" Round steel, stainless or low carbon (if you are constructing a tool for large tenon barrels, with a major diameter greater than 1.100, you may consider 1-3/8" x 3")
- 0-2" Dial indicator, 0.001" resolution, (continuous face preferred)
- 3/8" diameter, flat contact point (compatible with your 2" indicator)
- 10-24 x 1/4" long, nylon tipped, set screw, qty: 1

Please reach out to learn about student discounts available from certain vendors.