



Tormach 770M – Setup and Upgrades

Installation

- Instead of using Tormach's 770M lifting bar and engine hoist, I built my own lifting bar for use with my overhead electrical hoist.

Machine Stand

- For my individual use case and especially my limited floor space Tormach's stand for the 770M is not the optimal solution.
 - Too wide to fit into the assign position
 - Not easily moveable after machine is installed on top of it
 - No need for flood cooling reservoir
 - No additional storage space
- I designed and built a custom stand based on an off-the-shelf heavy duty steel table with the following features:
 - Basis: Welded 3/16" steel table
 - Dimensions: 30" W x 28" D x 24" H
 - Capacity: 10,000 lbs
 - 4 heavy duty casters (for moving stand incl. machine in place only)
 - 4 heavy duty swivel levelling mounts
When in position, the stand/machine is lifted off the casters with the levelling mounts
 - Machine table levelled with machinists' level to <0.001" over 6inch
 - 4 drawers for tools, measuring equipment etc.

Monitor, Keyboard, Pathpilot Stand

- Typically, the Monitor, Keyboard and Pathpilot controller are attached to Tormach's Machine stand with a swiveling holder
- Unfortunately, space limitations prevented me from using this setup and I designed my own solution utilizing a (very) rarely used transmission lift
- I mounted an off-the-shelf monitor/keyboard holder on top of a transmission lift. Since this lift sits on four casters it can be freely moved around (out of the way of other Machines).

Power draw bar

Installed the optional power draw bar from Tormach

Enclosure

- The enclosure and chip pan offered for the 770M are unfortunately too big for my floor space. Since I don't intend to use flood cooling, I should be ok without a full enclosure.
- I built a "partial" enclosure with two chip pans attached to the left and right side of the stand
- The top of the chip pans is level with the top of the stand so that chips can easily be moved from the machine/stand into the bins
- Both chip pans have sliding bottoms to allow for easy emptying



Splash guards

- The (max) work envelop is surrounded by splash guards made of clear acrylic (which gives unobstructed view to the work area from all sides)
- The splash guards are height adjustable to allow for easy access to the work piece

Table protectors

- Designed/built two surface protectors made of stainless-steel sheet metal to keep T-slot clean of chips and to protect the table surface

TTS Tool Rack

- In order to keep frequently used cutting tools organized and within reach I designed and installed a TTS Tool Rack with the following features
 - Six “tool shelves” for five “permanently assigned” TTS tool holders each (total of 30 positions).
 - Each tool position is labeled with an individual number from 1-30
 - Four additional, unlabeled positions for not permanently assigned TTS tools holders (drill chucks, tension/compression holders etc.)
 - Six unassigned positions for project specific, or rarely used tools (drills etc.). Each of these six positions has a 3-digit number block to indicated the assigned tool number of the tool in this position (e.g. tool library number for a specific drill)

MQL – Micro Quantity Lubrication System

- The Fogbuster system offered by Tormach is for sure a great, but to fit my individual needs even better I decided to design/built my own version of a mist cooling system
 - Two separate nozzles for mist and for air only
 - The mist nozzle allows for individual adjustment of air and coolant volume
 - The System is activated via a Solenoid, which can be manually controlled with the “Mist” button in Pathpilot (or by G-Code of course)
 - Function:
 - High pressure air goes through a pressure regulator and is reduced form 120psi to 30psi
 - The air then enters the cut-off solenoid
 - After the solenoid, the air is split in two ways:
 - 1: “Air-only” is routed through a manual cut-off valve directly to the air nozzle
 - 2: “Mist-air” is routed through a manual cut-off valve and is than split again.
 - 2a: One portion goes directly to the air-intake of the mist-nozzle
 - 2b: The other portion pressurizes a fluid container, and pushes coolant/lubricant through a separate tube to mist nozzle.
- The mist nozzle has two separate valves to adjust the mixture of air and coolant/lubricant

Passive Probe holder

- In order to keep the passive probe easily accessible, without the need to connect/disconnect for every use, I 3D printed a probe holder and attached it within easy reach to the right of the headstock



TTS Surface plate and tightening/loosening Holder

- While a ceramic surface plate for measuring tool offsets has its advantages, I prefer – and built - a magnetic plate for my (magnetic) height gauge
- Attached to the surface plate is a TTS tightening/loosening holder made of Aluminum and unidirectional needle bearings

Vacuum

- Attached a “dedicated” vacuum to the machine stand to make cleaning easier

Dust Collector/Shoe

- Since I do not have a full enclosure, I designed and built a Dust Collector or Dust shoe which connects to a Dust Collecting System I already had installed for my wood working machines.
- Features:
 - Clamps onto spindle housing
 - Height adjustable to accommodate different cutting tool lengths
 - “See-through” design to keep tool and machining process visible
 - Mounting/Dismounting within seconds and without the need for tools

Saunders Fixture Plate

- Installed a fixture plate from Saunders Machine works (SMW)

Saunders Mod Vise (Gen 3)

- Installed the Gen 3 mod vise from Saunders Machine Works (SMW)