Maintenance Checklist for Student Shop

SEMESTER

Equipment	Task	Frequency	Week Number															
-	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
General	Clean safety glasses	*weekly*																
	Sweep shop and outside doors	*weekly*																
	Organize mill table	*weekly*																
	Check calipers / caliper boxes	*weekly*																
	Check sign-in sheets	*weekly*																
	Check training signup sheet	*weekly*																
	Inspect/refill drill index	*biweekly*																
	Inspect endmills	*biweekly*																
	Mop floor	*biweekly*																
	Refill oil/Simple Green bottles	*monthly*																
	Inventory drills in storage bins	*semesterly*																
Mills	Oil spindles and ways	*weekly*																
	Clean, oil, & organize collets	*weekly*																
	Tram vises	*monthly*																
	Clean & wax painted surfaces	*monthly*																
	Wax non-oiled surfaces	*monthly*																
	Oil lead screws	*monthly*																
	Tram milling heads	*semesterly*																
Lathe	Oil ways	*weekly*																
	Inspect inserts / organize tools	*monthly*																
	Oil lead screws	*monthly*																
	Check chuck and tail stock	*semesterly*																
	Grease chuck jaws	*semesterly*																
Drill Press	Organize clamps and work area	*weekly*																
	Wax machine & table	*semesterly*																
	Clean and oil vise	*semesterly*																

Maintenance Checklist for Student Shop (cont)

Equipment	Task	Frequency	Week Number															
-	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vert. Bandsaws	Check blade condition	*weekly*																
	Check blade tension	*weekly*																
	Wax blade	*weekly*																
	Empty swarf bin	*weekly*																
	Wax table	*monthly*																
	Check hydraulic feed cylinder	*monthly*																

Check hydraulic feed cylinder

Sander/Grinder	Check grinding wheels	*biweekly*																
	Adjust support pedestals	*monthly*																
	Check sanding disk	*biweekly*																
	Check table squarness	*bimonthly*																

NOTES:

Maintenance Instructions

Equipment	Task	Instructions
General	clean safety glasses	*use glass cleaner or soap and water in a spray bottle; discard any glasses with scratches that make forward vision uncomfortable*
	sweep outside door	*sweep the hallway and discard any scrap; the only material which should be stored in the shop or hallway are those that fit in the small cabinet in the hallway, directly outside the doors to the student shop; we should NOT store material in the lab*
	organize mill table	*(1) organize shadow box of tools, parallels (blow out box), caliper boxes, hammer and punches, mallets, deburring tools, rags, degreaser and oil bottles; (2) blow off table; (3) put anything that doesn't belong on the table in a box and place it in a box for organization or discarding*
	check calipers, sharpies, rules	*blow out caliper boxes and rack & pinion gears; check caliper function by ensuring they return to zero within +/- 0.002"; check Sharpies are present and working; verify 6" x 3/4" steel rule is present; if Sharpies or rules are not present, replacements can be found in the shop storage cabinets*
	consolidate and empty trash	*consolidate trash bags so they are about 3/4 full, twist tie the bags and place them outside the double doors in the concrete planter for pickup and disposal; place new trash bags in the cans, tying the top so they don't fall inside the can when used; replacement trash bags are in the safety and cleaning supplies cabinet*
	check sign-up sheets	*review the week's equipment sign-up sheets so you don't allow a walk-in to use a piece of equipment which has been reserved*
	inspect/refill drill indexes	*blow out the drill index; inspect condition of the drills, especially commonly used sizes like 1/8", 1/4", #21; small chips are okay, but if in doubt test any questionable drills by drilling a hole; replace missing and damaged drill bits so the index remains complete, but note any replacement tools used so I can keep track of their use*

	inspect endmills	*inspect endmills in plastic tackle box on main shop table for large chips or built up edge (if unsure, perform a test cut with the tool and check surface finish); note damaged tools on the shop's damaged tool list and give to Mike for replacement*
	mop floor	*hopefully this is self explanatory :)*
	refill oil/Simple Green bottles	*fill each SG bottle with approx. 3/4" water and the remaining volume with water; top off oil bottles using the bottle marked "Cutting Oil" in the chemicals cabinet*
	inventory drills in storage bins	*the drill storage bins are located in the left steel storage cabinet; we should stock the following quantities based on drill size: 1/4" or smaller (12); between 1/4" and 1/2" (6)*
Mills	clean, oil, & organize collets	***blow all chips and residue out of the collet bores and threads (over a trashcan); if the threads look dry, lubricate them with a little oil; organize collets in sequence; place the drill chucks towards the rear of the collet racks***
	oil spindles and ways	*turn on the spindles and fill the two chrome steel oil cups located at the top of the machines with spindle oil (yellow top bottle); put on nitrile gloves, remove chips or debris from the X, Y, Z ways, apply a light but complete coating of way oil (green top bottle) to X, Y, Z ways*
	oil lead screws	*put on nitrile gloves and rub way oil (green top bottle) on X, Y, Z axis lead screws; Y-axis requires opening way cover for access; apply a light but complete coating (i.e. not so much oil as to cause it to drip on the floor)*
	tram vises	*clean the non-moveable (i.e. rear) vise jaw with a piece of scotchbrite or steel wool; use an indicol and miniature dial indicator to check the parallelism of the non-moveable vise jaw with the X-axis, which should be <0.001" over 6" of travel*
	clean & wax painted surfaces	*clean the chips and residue off the machine as normal, including chips under the table covers; apply a thorough coat of Meguire's liquid wax (maroon bottle) to all painted surfaces, let wax set for 30min and wipe off excess residue*

	wax non-oiled surfaces	*remove any surface rust with scotchbrite; apply a thorough coat of Johnson's hardwood wax (yellow can) to all non-painted surfaces (except guideways!), let wax set for 30min and wipe off excess residue*
	tram milling heads	*remove table covers; blow chips out of vise and out of table; wipe off table; very carefully install the precision ground EZ-tram ring on the mill table; use an indicol and miniature dial indicator to check the perpedicularity of the spindle axis with the X/Y plane formed on*

Lathe	oil ways	*put on nitrile gloves, remove chips or debris from the X & Z ways, apply a light but complete coating of way oil (green top bottle) to X & Z ways*
	oil lead screws	*put on nitrile gloves and rub way oil (green top bottle) on X & Z axis lead screws; X-axis requires opening feedscrew cover for access; apply a light but complete coating (i.e. not so much oil as to cause it to drip on the floor)*
	inspect inserts / organize tools	*blow out tool cabinet drawers; organize drawer liners and tools; inspect tools for large chips or built up edge (if unsure, perform a test cut with the tool and check surface finish); note damaged tools on the shop's damaged tool list and give to Mike for replacement*
	clean & wax painted surfaces	*clean the chips and residue off the machine as normal; apply a thorough coat of Meguire's liquid wax (maroon bottle) to all painted surfaces, let wax set for 30min and wipe off excess residue*
	tram chuck and tail stock	*clean the vise jaws thorough; clamp a precision round artifact gently in the chuck jaws (use the shank of a damaged endmill from the top left damaged endmill drawer in the endmill storage cabinet); carefully setup a precision dial indicator and test stand on the lathe to measure runout of endmill shank; barely loosen 3 or 6 bolts clamping the chuck body to the backplate; use radial jacking screws to adjust total indicator reading to < 0.001"; retorque backplate clamping screws* *to check tail stock tram, gently clamp dial indicator in chuck so it can rotate; remove the drill chuck from the tailstock quill and clean the quill well; adjust indicator so you can sweep the inside of the tailstock quill to check its alignment with the spindle centerline in the horizontal plane (not the vertical plane)*

	grease chuck jaws	*put on nitrile gloves; place small piece of plywood under chuck; clean outside surface of chuck and jaws with a rag and scotchbrite pad; open vise jaws until they fall free from the chuck scroll; apply a liberal coating of grease to the chuck scroll using a cue-tip; clean old grease off chuck jaws (use old rag in waste rag recycle bin); apply new coating of grease to jaw teeth and sliding surface on jaw sides; reinstall jaws, ensuring each goes back into its marked position ("1", "2", "3") and make sure jaw 1 is the first to re-engage the scroll for proper vise jaw timing*
Drill Press	organize clamps and work area	*place clamps securely on clamp rack under mill table so they can't fall off; blow off table; sweep the area; place dust pan and duster on hook*
	wax machine table	*remove any surface rust with scotchbrite; apply a thorough coat of Johnson's hardwood wax (yellow can) to top surface of table, let wax set for 30min and wipe off excess residue*
	clean and oil vises	*remove any surface rust with scotchbrite; clean with Simple Green; apply a light coat of oil to vise screw and guideways to ensure smooth operation*
DoAll Bandsaw	check blade condition	*gently cut a piece of (approx.) 1/8" aluminum scrap to check for missing teeth or a twisted bandsaw blade; if damaged, inform Mike and replace blade*
	check blade tension	*raise the blade guide approx. 6" off the table; applying 10 lbs of lateral force should result in approx. 1/4" of blade deflection; the goal is to apply just enough tension to make the blade track straight and remain on the drive wheels*
	wax blade	*apply a light coat of blade wax to all teeth on the blade*
	wax table	*remove any surface rust with scotchbrite; apply a thorough coat of Johnson's hardwood wax (yellow can) to top surface of table, let wax set for 30min and wipe off excess residue*
	empty swarf bin	*slide swaft bin out of machine and dump in trash can; this is also a good time to open the blade covers and clean and inspect the drive and idler wheels*

Roll-In Bandsaw	check blade condition	*gently cut a piece of (approx.) 1/8" aluminum scrap to check for missing teeth or a twisted bandsaw blade; if damaged, inform Mike and replace blade*
	check blade tension	*raise the blade guide approx. 6" off the table; applying 10 lbs of lateral force should result in approx. 1/4" of blade deflection; the goal is to apply just enough tension to make the blade track straight and remain on the drive wheels*
	wax blade	*apply a light coat of blade wax to all teeth on the blade*
	wax table	*remove any surface rust with scotchbrite; apply a thorough coat of Johnson's hardwood wax (yellow can) to top surface of table, let wax set for 30min and wipe off excess residue*

Sander/Grinder	check grinding wheels	*touch wheel(s) with a piece of material to ensure all motion has ceased; clean grinder with compressed air and/or vacuum cleaner; rotate each wheel and inspect for cracks, chips or other anomalies and bring concerns to Mike's attention*
	check sanding disk	*clean sander with compressed air and/or vacuum cleaner; inspect disc for tears, delamination and excessive wear (i.e. the disc no longer deburs, but just polishes a test piece, and bring concerns to Mike's attention*
	check sander table squareness	*use a carpenter's square to ensure the table is perpendular to the sanding disc and adjust as necessary*
	adjust support pedestals	*adjust grinding wheel support pedestals and upper wheel tongue guards so they are within 1/8" of the grinding wheels*

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