

Cleveland Industrial Training Center Inc

CNC Swiss Machine Operations

80 hours (5 weeks)

WEEK ONE:

Day 1

1. Similarities and differences between Conventional lathes and Swiss lathes.
→ Types and sizes of tooling used, collet and guide bushing size and type.

Day 2

1. Bar feeder Power Point. Description of bar feed operation and breakdown of the components.
→ Pusher assembly sequence and the location of critical components.

Day 3

1. Removal and replacement of normal components during a set-up or "changeover".
→ "i.e." pusher replacement, guiding channel R&R, machining data entry into controller, removal, replacement of spindle liner, and adjustment of outboard supports.

Day 4

1. Overview of the week. Step-by-step procedure in ORDER, on proper set up sequence of bar feeder, leading into the next steps of setting up the Swiss lathe.

WEEK TWO:

Day 1

1. Swiss machine controller orientation. Description of Manual operation, Program Select, Edit, Preparation Page, Offset Page, Alarm History Page, Tool Set, etc.
2. Overview of manual movement of machine. "i.e." gang tool slide and Z1, Z2, X1, X2, and Y1 axis.
3. Explanation of Main Collet assembly and proper adjustment to material.
4. Explanation of the guide bushing and the importance of its proper adjustment.

Day 2

1. Explanation of the Zero Plane on Gang Tool Slide.
2. Proper use of the Preparation Page and diameter settings of tools on Gang Tool Slide.
3. How to watch for and see clearance issues when inserting tooling.
4. Setting of gang tool slide tools, both fixed and live.
5. Proper setting of core (center) and diameter of tools. (Geometry) Gang Tools.

Day 3

1. Setting of Front END working tools. (Front I.D. Tooling)
2. Proper selection and adjustment of sub-spindle collet and the proper selection and adjustment of the ejection knockout pin.
3. Setting of Rear END working tools. (Rear, or sub, or back working, I.D. tools)

Day 4

1. Running of machine and the manufacture of product from set up.
2. Proper use of inspection equipment to properly check product dimensions against the product blue print.
3. Proper use of the offset page in the "dialing in" of print dimensions.

WEEK THREE:

Day 1

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Detailed description of 1 cycle, continuous (automatic) operation.
4. Description of "Last Part" soft key feature.

Day 2

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Proper setting of work counter to aid oneself in maintaining an acceptable level of quality.
4. Explanation of the Operators soft key page. How to select APF (Auto Power Failure) in the use of "lights out" product manufacture to minimize problems or machine damage.
5. Explanation of a "two pan" product collection system to eliminate out of tolerance product from getting mixed into actual GOOD checked product.

Day 3

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Explanation of good housekeeping practices.
4. Explanation of when to remove turnings (chips) from the lower chip collection area.
5. Explanation and instruction into how to check cutting oil level, as well as when and how to fill oil tank.
6. Actual removal of chip collection pan from machine to remove pass through chips that are clogging oil return passage ways.

Day 4

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Addressing of maintenance issues that will arise.
4. When to check for loose guide bushing.
5. How to clean and readjust properly.
6. Proper procedure for removing, cleaning and readjusting dimensions against actual product measurements.

WEEK FOUR:

Day 1

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Explanation of the most common machine alarms and how to reset machine afterwards. (lathe)
4. Explanation of the most common machine alarms and how to reset machine afterwards. (bar feeder)
5. Overview of the alarm history page. (lathe)
6. Maintenance overview for the "WAY" lubrication system.

Day 2

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Description of the Cool Blaster high pressure oil system.
4. How to open filter reservoir, change filter, and bleed unwanted air from the system.
5. How to add the programming codes for Cool Blaster pumps to a current program or remove them.

Day 3

1. Introduction to programming.
2. Description of program format and how the machine needs to see a program.
3. In-depth description of Safe Start Codes and what they do.
4. Current program analysis. Line-by-line description of code and WHY it's there.

Day 4

1. Proper use of "Special G Codes" and their respective cycles.
2. Proper use of "wait" commands. (queuing codes)
3. Class participation writing of a basic program from scratch.
4. The above to include front ID (drilling), face off, turning, grooving, live tool use in milling, cutoff process and back working (rear drilling).

WEEK FIVE:

Day 1

1. Checking of current running production. Checking print dimensions against actual product measurements.
2. Making of offsets, if needed, and changing of tooling when it is required.
3. Overview of the previous week's programming details.
4. Open forum on any of the previous weeks' information.

Day 2

1. Review of all information given including description of machine manufacturers programming, maintenance, and operators' manuals and how to use them.
2. Review of machine software manuals and how to look up programming alarms.
3. Final pretest review.

Day 3

1. Final exam.

Day 4

1. Final review. Individual student/teacher review of exam grade and any area of improvement he/she may need.
2. Explanation of ability for student to receive future refreshing/tutoring at any time.
3. Graduation.