



United States
Office of Personnel Management

**FWS Job Grading Standard
for
Machine Tool Operator**

3431

TS-23, 5/73

Workforce Compensation and Performance Service
Classification Programs Division
June 1998, HRCD-5

WORK COVERED

This standard covers nonsupervisory work involved in the set up, adjustment, and operation of conventional machine tools to perform machining operations in the manufacture of castings, forgings, or parts from raw stock made of various metals, metal alloys, and other materials; or machining operations required in the repair of such items. Work assignments normally involve standard or repetitive operations that can be performed on one machine.

The work requires a knowledge of basic machining processes and skill in performing machining operations such as boring, drilling, planing, milling, and turning on milling machines, radial or multiple spindle drill presses, planers, lathes, or equivalent types of conventional machine tools.

WORK NOT COVERED

The following kinds of work are not covered by this standard:

- Operating power metal cutting saws such as metal cutting bandsaws or power hacksaws. (See [Trades Helper](#) or [Power Saw Operating Series, 3422](#).)
- Operating machines to make coil springs and other small metal items from wire, such as rings, buckle tongues, machine gun hooks, and similar items. (See the [Job Grading Standard for Metal Forming Machine Operating, 3869](#).)
- Operating machines and performing other duties in the manufacture of tension, compression, and torsion springs, including the blocks and mandrels used in forming and shaping. (See [Springmaking Series, 3818](#).)
- Manufacturing or repairing parts and items of equipment by using a variety of machine tools and performing such processes as the initial planning of the work, selecting the material, laying out the work to be machined, determining the machines to be used and proper machining sequences, setting up the work in the machine, performing necessary machining operations, and performing precision handwork to fit, finish, and assemble machined parts and equipment. (See the [Job Grading Standard for Machinist, 3414](#).)

TITLES

Jobs covered by this standard are to be titled *Machine Tool Operator*.

GRADE LEVELS

This standard does not describe all possible levels at which jobs might be established. If jobs differ substantially from skill, knowledge, and other requirements described in the grade levels of this standard, they may be graded above or below these grades based on the application of sound job grading methods.

3431-8**MACHINE TOOL OPERATOR, GRADE 8****3431-8**

General: Grade 8 Machine Tool Operators typically operate a machine tool to perform a specific machining operation in the machining of parts, castings, forgings, or raw stock of various metals and metal alloys and other machinable materials. Assignments are usually to the same type or closely related types of machine tools which have similar spindle and table movements; use comparable speed and feed controls; require the same type of cutting tools; or which perform essentially the same machining operation. The machine tools operated range from those which are manually controlled to those which are completely automatic.

The Machine Tool Operators, grade 8, usually operate machines of only one type to carry out production runs involving standard operations. New jobs are normally set up in the machine and detailed operating instructions are provided by a higher grade worker. The workers at the grade 8 level control the machine feeds and speeds, and change and use different cutting tools for successive operations on any one machine. They insure that dimensions meet those prescribed by blueprints, sketches, or other instructions through the use of various standard measuring instruments commonly used in the machine shop. They make minor changes in machine setup such as realigning for different sizes or changes in the shape of the work piece.

Skill and Knowledge: Grade 8 Machine Tool Operators are skilled in performing machining operations on conventional machine tools such as lathes, boring mills, shapers, planers, milling machines, grinding machines, or radial drills after the machine has been set up and checked for proper operation by a higher grade worker. Machines, such as numerically controlled machine tools, are normally operated only in the automatic mode by workers at this level, i.e., operation of the machine requires no manual input on the part of the Machine Tool Operators.

They follow detailed oral or written instructions concerning the location of needed dimensions on blueprints, sequence of machine operations, machine feeds and speeds, tools to be used, alignment processes, and predetermined machined dimensions.

They align parts in the machine according to set methods and given reference points, exercising care to keep material, holding fixtures, and machine stops clear of chips and particles.

They use a knowledge of machine operation to enable him to recognize defective tooling, improper coolant flow, the need for changing speeds or feeds, machine malfunctions, or obvious dimensional deviations and either corrects the problem by adjusting the machine, cutting tool, or fixture or obtaining assistance from the supervisor or a higher grade worker.

The Machine Tool Operators at this level uses measuring instruments such as scales, micrometers, and various standard or preset snap, plug, or ring gages to check the accuracy of dimensions or he maintains dimensions through the use of fixtures or preset machine stops, depending upon the dimensional tolerances allowed.

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Responsibility: Grade 8 Machine Tool Operators are responsible for following detailed oral or written instructions from the supervisor or higher grade worker that tell them the dimensions, machine to be used, machining sequence, proper feeds and speeds, and appropriate cutting tools for each operation. The workers at this level are responsible for insuring dimensional accuracy of machined parts in accordance with instructions provided and through the use of the machine setup provided by a higher grade worker.

The grade 8 operators are responsible for proper and safe operation of the machine tool. They are continually aware of whether tools are sharp, the coolant flow is adequate, dimensions are being held, or fixtures, holding devices, or the entire setup needs adjustment, and determine at what point the machine should be stopped and adjustments made.

The work may be checked during progress. A higher grade worker or supervisor is available for advice and assistance on any work problem encountered and checks to see that assignments are completed according to instructions provided.

Physical Effort: Grade 8 Machine Tool Operators' work requires standing, stooping, bending, and reaching. They frequently handle objects weighing up to 4.5 kilograms (10 pounds) and occasionally objects weighing up to 18.6 kilograms (40 pounds); however, hoists, hand trucks, lifts, and other workers are available to assist with heavier items.

Working Conditions: Grade 8 Machine Tool Operators work inside in areas that are usually noisy and dirty, and where there is a constant danger to the skin and eyes from flying metal chips, abrasive particles, and hot metal; skin irritation from contact with coolants, lubricants, and abrasive compounds; danger to the fingers, hands, and other parts of the body from cutting tools, grinding wheels, rotating work pieces, and moving parts of machines.

3431-9**MACHINE TOOL OPERATOR, GRADE 9****3431-9**

General: Grade 9 Machine Tool Operators operate one or more of the types of machine tools operated by workers at the grade 8 level to perform assigned machining operations which may require the use of various machine tool attachments. While the grade 8 operators receive assistance on machining problems and has the machine set up and checked before operating it, the grade 9 operators are expected to make their own set ups and independently resolve machining problems during the actual machining process.

The Grade 9 Machine Tool Operators receive work from the supervisory or higher grade worker in the form of work orders accompanied by blueprints and instructions for the machine and attachments to be used and the processes to be performed. From this information they obtain tools and materials, notes tolerances, set up machine, and perform machining operations according to instructions received. They consult with the supervisor or higher grade worker on unusual problems encountered and submits completed work for check for quality and whether it meets the specifications required.

Skill and Knowledge: The Grade 9 Machine Tool Operators are skilled at operating the same machine tools as workers at the Grade 8 level; however, they extend the scope of operations on these machine tools by applying additional skill in using various standard machine attachments such as rotary tables, magnetic chucks, gear changing boxes, angular drive heads, taper attachments, and universal milling attachments; and is skilled in performing precision work on parts that present complex configurations and close tolerances between interrelated surfaces.

They operate numerically controlled machine tools when the manual input required is limited to changes in coolant flow, increases or decreases in speeds or feeds, or stops are programmed for dimensional checks or minor adjustments.

While the Grade 8 Machine Tool Operators have most jobs set up in the machine for him, the Grade 9 Operators normally set up their own jobs in the machine to be operated. The Grade 9 Operators must be sufficiently familiar with blueprints to enable them to visualize the finished part in order to identify critical surfaces, dimensions, and tolerances; and determine the proper use of jigs and fixtures provided. From the blueprints and work order, they determine and obtain materials and cutting tools for the job.

The Grade 9 Machine Tool Operators use a knowledge of the metal or material to be machined, the characteristics of cutting tools, and surface finishes to enable them to select the proper cutting tools and correct machine feeds and speeds necessary to perform the job.

They achieve and maintain critical dimensions and tolerances during the machining process through their skill in using measuring instruments such as scales, micrometers, vernier calipers and height gages, and various types of snap, plug, and ring gages.

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Responsibility: The Grade 9 Machine Tool Operators receive work assignments from their supervisor or a higher grade worker in the form of word orders accompanied by blueprints and oral or written instructions for the machine or machines and attachments to be used, sequence of operations on each machine, and critical dimensions or unusual aspects of the job. From these, they are responsible for obtaining the prescribed fixtures, tools, and materials; setting up the job in the machine; and maintaining dimensions and tolerances to meet job specifications.

The Grade 9 Machine Tool Operators independently determine the proper machine speeds and feeds based on the accuracy desired and the type of material to be machined. They are responsible for making adjustments to the machine during operation in order to insure dimensional accuracy and type of finish required. They must determine the most proper and efficient method of setting up the job in the machine, and recognize the need for replacing or adjusting dull or chattering tools.

The supervisor or a higher grade worker is available for consultation or advice on any problems encountered and to check completed work to see that it meets accuracy and quality requirements of the job.

Physical Effort: The physical effort required at this level of work is the same as that required at the [Grade 8 level](#).

Working Conditions: The working conditions encountered at the Grade 9 level are the same as those encountered at the [Grade 8 level of work](#).