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ABSTRACT

This five-volume report details an effort undertaken by Ingersoll-Rand (IR) to restore a professional tool plant in Athens, Pennsylvania, as a viable asset to the IR corporation. Volume 1, the final report, presents a historical perspective of the Athens plant, discusses the major skill and knowledge issues facing the plant, and provides the strategic plan developed to address the issues. In addition, it describes the methodology used in the strategic needs assessment, provides the findings gathered from the self-assessment, and makes suggestions for post-assessment training and education programs. Volumes 2 and 3 contain the compilation of the machine and job classification task and knowledge inventories. Volume 2 matches tasks with jobs and jobs with departments; classifies machines by departments; associates tasks with each machine; and identifies procedural, technical, general, and systems knowledge associated with each machine. Volume 3 identifies general, systems, technical, and procedural knowledge associated with each task. Volume 4 provides sample database sorts from the database developed during the project. The sorts include jobs in various departments; tasks that jobs require; tasks that require specified general, systems, technical, and procedural knowledge; and machines that require specified general, systems, and procedural knowledge. Volume 5 contains the compilation of the self-assessment results and the instruments. (YLB)

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Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

Volumes 1-5

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August 1987

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Project Number Three

**Maintenance, Manufacturing Cell, and Industrial  
Engineering/Product Engineering Training Needs  
Assessment Project**

August 1987

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**Volume 1**

**Final Report**

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**The Pennsylvania State University**

Division of Counseling and Educational Psychology  
and Career Studies

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## INTRODUCTION

Historically, the management of heavy manufacturing industries have faced the dilemma of whether to alter or abandon their firm's manufacturing processes as they are confronted with technological advances and changes in demand for their product. The demise of the United States steel industry is a prime example of how profits can dwindle when customers are able to obtain a product at a lower cost from overseas competitors that employ modernized, cost-effective manufacturing processes. The abandoned steel mills are a omnipresent reminder of this harsh reality.

Not one to be sentenced to the "steel graveyard," Ingersoll-Rand (IR), a firm specializing in the manufacturing of professional compressor tools, has aggressively undertaken efforts to offset the devastating results of inefficient, costly production. Its 1985 annual report reminded stockholders that:

"The implementation of plans that improve productivity is a key management responsibility, one which we continue to stress. In this effort, our single most important asset is our 35,000 employees working together to maintain a strong, responsive organization, dedicated to quality products and profitable performance. Management's thrust is to find ways to help channel these employees' efforts without overly complicating how we operate."

Given this charge, IR focused on one of their professional tool manufacturing plants located in Athens, Pennsylvania. The remainder of this report will detail one part of the effort undertaken to restore this professional tool plant as a viable asset to the IR corporation. This part involved the Penn State University working with IR to carry out a needs assessment for training.

This report contains 5 major sections. First, a historical perspective of the Athens plant is presented. Second, the major skills and knowledge

issues facing the plant are discussed. Third, the strategic plan developed to address the issues is provided. Also included in this section is the rationale for involving expertise of the Penn State Team. Following this discussion, the fourth section provides the methodology employed to accomplish each phase of the strategic needs assessment. The fifth section contains the findings gathered from the self assessment as well as suggestions for post-assessment training and education programs.

### HISTORICAL PERSPECTIVE

In 1967, the IR-Athen's plant was the major employer (1,800 workers) in the community and, as a result, served as the hub of economic and social activity. Over the years, however, market conditions, internal business decisions and technological advances had served to reduce the work force by approximately 80% and place the plant in jeopardy of being completely shut down. Thus, IR saw the need to examine their Athen's plant processes and determine if the plant could be salvaged back to economic health. The resulting decision was to restructure the manufacturing process from its present linear model to one incorporating a cell model. It was reasoned that such a change would streamline production and allow IR to compete strategically in its professional tool market.

### ISSUES

Such a restructure extended beyond moving machines and equipment. IR planned to replace outdated machinery with state-of-the-art equipment that was designed to reduce the manufacturing time and degree of error. In addition, IR faced two major issues concerning their work force: 1) what new knowledge/skills/expertise would be required of the work force entering the new cells, and 2) what is the work force's current knowledge/

skills/expertise? By comparing what the IR workers presently can do with what they will be required to do, then IR could determine the degree of training needed to prepare their workers for the new cellular manufacturing technology.

### STRATEGIC PLAN

During the February of 1987, IR arranged, through Pennsylvania's Ben Franklin Job Partnership Program, to solicit the expertise of The Pennsylvania State University Vocational Industrial Educational Department. As a result, a team, comprising of Dr. Gary Geroy, Assistant Professor of Vocational Industrial Education and Director of the Institute for Research in Training and Development, and 4 graduate students, Sandra Dingle, George Ebert, N. Minx Olsen and Michael Erwin, was hired to investigate and address the training needs of the IR work force with respect to the new cell manufacturing process model. (In the remainder of this discussion, these individuals will be referred to as the Penn State Team).

This investigation necessitated a comprehensive needs assessment operation. This operation consisted of 8 assessment phases, followed by an analysis and synthesis of the findings. The following are the type of information which were essential to the assessment:

1. Basic skill competencies (mathematics, reading, writing) of the entire IR work force (this included laid off personnel).
2. Work tasks associated with each present job classification in the manufacturing process.
3. Supporting knowledge (procedural, technical, general, systems) associated with each task in #2.



4. Work tasks associated with the operation of each machine presently located in the shop.
5. Work tasks associated with the operation of the "future" machines which will be placed in the cells.
6. Supporting knowledge (procedural, technical, general and systems) associated with each task in #4 and #5.
7. The frequency which workers perform the tasks identified in #2 and #4 in their current jobs.
8. The competency with which the worker felt they could perform the items in #2, #4, and #5.

#### METHODOLOGY

The Penn State Team recognized that IR was not economically able to cease operations and production while the needs assessment activity was being conducted. As a result, the team was committed to work as unobtrusively as possible to avoid unnecessary work interruptions. Essential to achieving this end, was the support and assistance from the IR Human Resource Development (HRD) personnel. Permission and support was solicited from the IR HRD office by the Penn State Team for every phase of the needs assessment operation. As a result, the "united front" of the IR HRD group and the Penn State Team served to decrease the amount of worker skepticism and resistance that would normally confront external efforts.

Initially, 6 phases of the needs assessment operation were implemented simultaneously: the basic skills assessment, work tasks and associated knowledge for each job classification, and work tasks and associated knowledge for present and future machines. The following will describe the methodology involved with these phases.

## Basic Skills Assessment

### Overview

The assessment activity was conducted during a three day span (May 6 - 8, 1987). Employees were scheduled for assessment activities in approximately 10 minute increments. Initially, each employee met with a Penn State assessment team member for about five minutes to discuss the assessment activity. This was done to reduce any test anxiety the employee may have been experiencing, as well as to answer any questions that they had about the assessment. After this five minute interaction, the employees' word recognition level was evaluated. With this information, the assessment team member was able to compile an assessment package that was tailored to each individual's abilities. The employees then responded to the assessment material in a separate examination area.

### Instrumentation

The Wide Range Achievement Test (WRAT) was used to assess the employees' word recognition ability and math performance. The word recognition assessment was administered first so that evaluators could give the employees evaluation material that was commensurate with their abilities. The math segment of the WRAT was also administered to all the employees as per the WRAT instruction. Employees were given 10 minutes to complete this test.

The Adult Basic Level of Education Test (ABLE) was used to evaluate the employees' reading skills. The evaluators used the WRAT results to determine which one of the three levels of this instrument to administer. Level I indicated a reading ability from grades 0 to 4, Level II indicated reading skills from grades 5-8, and Level III indicated from grades 9-12.

Language was assessed using a language sub-test extracted from the Adult Proficiency Level (APL) test. Consisting of eight carefully selected

items, it measured the employees' ability to complete forms and lists. Because of their demonstrated inability to comprehend reading material beyond fourth grade level, persons achieving a Level I reading score were not given the language sub-test.

## **Results**

The results of the basic skill assessment activity are organized in the following manner. Initially, a global view of the basic skill performance of both current Ingersoll-Rand employees and furloughed workers is presented. In the subsequent section, the performance results for both groups are compared.

Numerical values that appear in the tables and charts on the following pages reflect the individual approach of this basic skill assessment. This is because not all employees completed an assessment instrument in each of the three academic areas. Consequently, the totals in these tables may differ from the overall number of employees evaluated.

### **Overall Performance**

Many of the Ingersoll-Rand employees performed well in the assessment activity. Over half of all the workers in the plant and those on lay-off have adequate skills in all areas and require no basic skill remediation should they elect to bid into a job in one of the new cells. Only 2% of Ingersoll-Rand's work force require extensive remediation.

The following table presents more detailed data regarding the performance results for all persons evaluated at the Ingersoll-Rand plant.

	Basic Skill Proficiency Level			Number of Persons	Percent
	Math	Reading	Language		
<b>Category 1</b> Adequate Skills in Math, Reading, and Language	3	3	3	194	50.5
<b>Category 2</b> Adequate Reading and Writing Skills but Limited Math Skills	1 or 2	3	3	128	33.3
<b>Category 3</b> Limited Reading and Math Skills	1 2 2	2 1 2	N/A* N/A* N/A*	44	11.5
<b>Category 4</b> Adequate Math Skills with Limited Reading and Language Skills	3	1 or 2	N/A*	11	2.9
<b>Category 5</b> No Functional Reading Skills and Very Limited Math Skills	1	1	N/A*	7	1.8

\*These values are not listed because language assessments were not administered to those persons below a fifth grade reading level (Level I).

In the following, a brief discussion is presented which outlines the results by academic area for all persons evaluated during the assessment.

#### Reading

The majority of the Ingersoll Rand work force have sufficient reading skills for the work place. They are reading at or above the ninth grade level. At that level, people can read and comprehend

most all manuals and written material they encounter on the job. Sixty-three employees were found to have either marginal or no functional reading skills. Fifty-four of these persons have reading abilities anywhere from fifth through eighth grade. These persons can read newspapers and simple manuals, but will have difficulty reading many of the complex manuals found in the plant. Nine persons were found to have no functional reading skills.

The following table illustrates the preceding information.

**Reading Level of Ingersoll Rand Employees**

<u>Reading Level</u>	<u>Approximate Grade Level</u>	<u>Number of Workers</u>
I	0-4	9
II	5-8	54
III	9-12	322

**Math**

The results of the math assessment were organized into three distinct levels with one of these levels branching off into a series of two performance levels. This was done to accurately contrast the needs of Ingersoll Rand with the skills of their employees. The following chart illustrates this breakdown.

<u>Level</u>	<u>Concepts Mastered</u>	<u>Number of Employees</u>	<u>% of Work Force</u>
I	Simple addition, subtraction, multiplication, and division	14	3.6%
II	Complex addition, subtraction, multiplication, division, simple fraction and decimals	166	43.3%
III	a. Complex addition, subtraction, multiplication, division, complex fractions and decimals, basics of algebra and geometry	184	47.9%
	b. Complex addition, subtraction, multiplication, division, complex fractions and decimals, algebra, geometry, and basics of trigonometry	20	5.2%

### Language

Based upon the results of the APL sub-test, virtually all employees who have at least moderate reading skills have demonstrated sufficient writing skills for the work place. As mentioned in the instrumentation discussion, those with no functional reading skills were not given this exam because of their inability to comprehend the items.

Employees with a skill level of two or higher have adequate skills for their jobs at Ingersoll Rand.

The following chart illustrates the results of the language assessment:

<u>Skill Level</u>	<u>Number of Workers</u>	<u>% of Work Force</u>
I (Little Skill)	1	.2
II (Moderate Skills)	81	22.8
III (Skilled)	273	77

#### **Results of Furloughed Employees and Current Employees**

There appears to be little difference in reading skill levels between those workers on lay-off and current employees. The following table illustrates this concept.

#### **Reading Skill Levels of Furloughed and Current Workers**

<u>Reading Skill Level</u>	<u>Furloughed Workers</u>		<u>Current Employees</u>	
	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>
1	0	0	8	2.4
2	7	17.9	46	13.9
3	32	82.1	277	83.7

Math skill levels are also very similar between these groups. The following table presents the results.

## Math Skill Levels of Furloughed and Current Employees

<u>Math Skill Level</u>	<u>Furloughed Workers</u>		<u>Current Employees</u>	
	Number	%	Number	%
1	1	2.6	13	4
2	14	35.9	147	44.5
3	24	61.5	170	51.5

Language performance levels are also very similar when examining the two groups. The following table presents this information.

### Language Skill Level of Furloughed and Current Employees

<u>Language Skill Level</u>	<u>Furloughed Workers</u>		<u>Current Employees</u>	
	Number	%	Number	%
1	0	0	1	.3
2	8	20.5	72	21.8
3	31	79.5	229	69.2

### Training Needs

#### Reading

Sixty-three employees were found to demonstrate a need for reading remediation. These individuals have reading levels anywhere from 0 to the 8th grade level. Nine of these persons were found to have no functional reading skills while the others had moderate reading ability.

To ensure the success of the training programs for Ingersoll Rand employees, the following specific guidelines for these programs should be followed:



1. Class size should be kept to a minimum (at the most 8-10 pupils/class).
2. Employees should take a diagnostic assessment at the onset of the training activity.
3. Individualized planned programs should be formulated for each trainee before instituting any coursework.
4. The trainees' length of stay in the training program should be mandated by degree of need. Workers must be permitted to remain in the training program only long enough to improve their skills to an acceptable level.

Based upon the training needs demonstrated by the Ingersoll Rand employees' performance on the basic skills assessment, the following is a recommended scope and content for the various levels of training programs:

1. At least one class should be organized for these persons with no functional reading ability (Level I readers). Approximately eight employees have been identified who require this programming. However, in all likelihood, many other workers who failed to participate in the assessment activity would also require this programming. Class size should be kept as small as possible. In addition, each employee should take a diagnostic test at the outset of the course and receive a subsequent planned course of study based on those results.
2. A number of classes should be offered to those workers who have moderate reading ability ranging from the 5th through 8th grade level (Level II). These workers need to improve their vocabulary, word identification skills, reading speed,

and (or) comprehension. Class size should be kept to a minimum and course content must conform to the individual needs of the worker.

### **Mathematics**

1. One program should be offered that focuses on complex addition, subtraction, multiplication, and division. Fourteen Ingersoll Rand employees tested require this programming (Level I).
2. A course should be offered that teaches concepts involving fractions, decimals, and basics of algebra and geometry (Level II).
3. A training program should be offered to employees that deals with advanced algebra and geometry. In addition, the basics of trigonometry should also be introduced. The content of this program will enable workers to perform the majority of tasks in the plant.
4. An advanced program in trigonometry should also be offered to Ingersoll Rand employees. This course would interest a select group of employees who require trigonometry skills in satisfying their job demands.

### **Language**

Based upon the results of the assessment, there is no need for language remediation programs at Ingersoll Rand. All workers who are literate possess acceptable skills.

### **Task and Knowledge Assessment**

#### **Overview**

The Penn State Team sought information from two plant perspectives in order to ensure a thorough comprehensiveness in needs assessment data. One

involved examining the work tasks and requisite knowledge associated with the particular job classification. The other involved looking at the work tasks and requisite knowledge from the perspective of operating the various shop machinery. Two Team members conducted the job classification assessment while another member was responsible for the machine-related data. Information from the two perspectives was gathered via report-questionnaires followed by interviews.

Once all involved personnel were interviewed, the Team verified their findings by conducting additional follow-up interviews with workers not contacted previously. Following this verification process, the data from the two perspectives were cross-correlated in a further attempt to validate the findings.

This painstaking checking and re-checking of these findings was critical to the remainder of the operation since the prescribed training (if any) would focus on the particular tasks (and knowledge) which were found to be deficient.

#### Machine Operation Perspective

In the case of the machine-oriented perspective, floor supervisors and machine operators were first requested to complete a machine task and knowledge inventory report. An example of this report is contained on the next page. This inventory required the itemization of each and every task a worker must complete in order to ensure a safe and effective operation of the machine. In addition, once the tasks were identified, the supervisor or machine operator assisted a Penn State Team member in determining the specific types of procedural, general, systems and technical knowledge that a worker required to complete each task.

For the purpose of this assessment operation, procedural knowledge was defined as the step-by-step procedures that a worker needed to follow to

# MACHINE TASK INVENTORY

FAMILY \_\_\_\_\_

MACHINE \_\_\_\_\_

OCCUPATIONAL CODES USING MACHINE: \_\_\_\_\_

ANALYST \_\_\_\_\_ Date \_\_\_\_\_

APPROVED BY \_\_\_\_\_ Date \_\_\_\_\_

Describe what the machine is designed to do. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Describe the relationship to other machines. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List the functional tasks the worker must carry out to set-up this machine

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List the functional tasks the workers must carry out to operate this machine.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

complete a particular task. Systems knowledge was described as the information a worker needed to diagnose malfunctions and perform adjustments to the machine in order to ensure proper operation. Technical knowledge was knowledge needed to understand the processes and functions being carried out while the task was being completed. Lastly, general knowledge was described as the types of general or basic skills a worker needed to successfully carry out the task.

Once the machine task inventory and required knowledge lists were compiled, the Penn State Team member reviewed the findings with a different supervisor or machine operator in order to ensure that the respective lists were complete.

#### Job Classification Perspective

The Penn State members initiated a discussion with supervisors or foremen by discussing the differences between IR's documented "job descriptions" and the true state of operations in the plant. It quickly became apparent that discrepancies existed between what tasks a worker actually performed and what the current job descriptions revealed. As a result, the IR supervisors and foremen agreed that a revision of the task inventory and job description was critical. The forms used to gather this information are contained in the following pages. As in the case with the machine perspective, the IR personnel also assisted in the identification of the procedural, systems, technical, general knowledge that were associated with each task. Again, the data was validated by soliciting input from other IR personnel not involved in the initial data gathering phase.

A data base was created to organize, manage and eventually sort this wealth of information upon request. Such inquiries as:

What jobs are in which department?

What tasks are required in which jobs?









**CURRENT JOB CLASSIFICATION**

page \_\_\_\_ of \_\_\_\_

TASK \_\_\_\_\_

JOB TITLE \_\_\_\_\_

OCCU. NO. \_\_\_\_\_

TECHNICAL KNOWLEDGE

GRADE \_\_\_\_\_

Analyst \_\_\_\_\_

Validated by \_\_\_\_\_

Date \_\_\_\_\_

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced



What procedural knowledge is associated with what job? What machine?

What general knowledge is associated with what job? What machine?

What systems knowledge is associated with what job? What machine?

What technical knowledge is associated with what job? What machine?

What machines are in each department?

What machines are used in which job?

could be addressed easily. Volumes 2 and 3 contain the compilations of the machine and job classification task and knowledge inventories.

In addition to these "housekeeping" duties, the data base served to provided the task and knowledge requirements of the jobs of the newly configured cells. Thus, no matter how IR decided to organize the job cells, the data base could identify the corresponding task and knowledge necessary for designing training for workers who were involved in the cell. Volume 4 of this report provides samples of output of this nature.

### Self Assessment

The final two phases of the needs assessment operation consisted of determining the frequency at which particular job tasks identified in the task inventory were performed by workers in their current jobs. In addition, the self assessment identified with what degree of competency workers felt they could do these tasks. Data for these two phases was gathered through the implementation of a "worker self assessment instrument." This instrument consisted of two identical lists of tasks and knowledge (generated from the previous assessment efforts) accompanied by questions addressing frequency and competency. Samples of these instruments can be found in Volume 5.

The Penn State Team and the IR HRD department concurred that the self assessment report was essential to completing the "whole picture" of the current state of the work or skills and abilities in the plant. The IR steering

committee served as a pilot group as the self assessment instrument was being finalized. The involvement of the IR steering committee served two purposes: one, to validate the terminology of the tasks and knowledge listed in the instrument. Second, and perhaps more importantly, by experiencing the nature of the self assessment activity, the IR steering committee was then able to describe the experience to their fellow workers who would be involved with the process at a later date. It was hoped that this strategy would decrease the worker's feelings of uncertainty and anxiety which may interfere with their responses.

All IR workers were provided the opportunity to complete the self assessment instrument on August 3 and 4, 1987. During the activity they were briefed with directions to complete the computerized answer form and given an opportunity to review the two parts and raise any questions they may have had. Following this briefing, the workers were given unlimited time to complete the instrument.

The results from this activity were then organized to enable the Penn State Team to analyze the job task or corresponding knowledge areas for frequency and degree of confidence. For example, if tasks were found to be frequently performed with a high degree of confidence, this was sufficient to suggest that training was not need for these particular tasks. Likewise if a task was found to be performed infrequently, then the critical need for training was not substantiated. A review of Volume 5 will enable training designers to focus on bona fide area of training needs. Volume 5 contains the compilation of the self assessment results, accompanied by interpretation procedures.

#### **Worker Self Assessment Findings and Recommendations for Training**

Included here are the observations concerning the overall IR work force and descriptions of specific areas in need of training.

## Observations

1. The analysis indicated a strong correlation between the frequency at which the workers applied basic math skills in their jobs, the high degree of confidence with which they used the math and the high levels of their performance on the Basic Skills Assessment.
2. The analysis indicated that in the various job task areas, there appears to be a larger resource of workers who report that they can do the task, than the number of workers currently responsible for these particular job tasks.
3. The analysis indicated that several machines and job operations are currently unique to the Tool Room. (These machines include the Cincinnati Monoset, Hobb Machine, Contour Saw, Jig Bore and Cam Grinder) As these machines are moved into the future cells, the number of qualified workers required to operate the machines may increase. The data indicates that only 4% of the current work force (CWF) report that they can operate the machines without assistance. Another 6% of the CWF indicate that they, if given assistance, could operate these machines. Additionally, 94% of the CWF indicated that they never operated these specialty machines.
4. Summary of worker's request for training:

Training Area	Machining Roster A		Non-Machining Roster B		Skilled Machining Roster C		Skilled Trades Roster D		Company Average	
	Responses									
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
1. Reading	30%	70%	31%	69%	33%	67%	27%	73%	30%	70%
2. Basic Math	50%	50%	50%	50%	30%	70%	38%	62%	42%	58%
3. Algebra	63%	37%	61%	39%	67%	33%	79%	21%	68%	32%

Training Area	Machining Roster A		Non-Machining Roster B		Skilled Machining Roster C		Skilled Trades Roster D		Company Average	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
4. Trigonometry and Advanced Math	44%	55%	44%	56%	70%	30%	77%	23%	59%	41%
5. Blue Print Reading	43%	57%	51%	49%	23%	77%	54%	46%	43%	57%
6. Blue Print Drawing	28%	72%	36%	64%	53%	47%	50%	50%	42%	58%
7. Conventional Machine Operations	55%	45%	43%	57%	33%	67%	50%	50%	45%	55%
8. CNC Machine Operations	72%	28%	50%	50%	77%	23%	54%	46%	63%	37%
9. Machine Shop Practices	56%	44%	43%	57%	47%	53%	46%	54%	48%	52%
10. Quality Control Procedures	52%	48%	52%	48%	50%	50%	46%	54%	50%	50%

### Training Areas

#### 1. Reading WIP Forms

Data:

37% of the CWF reported to read the WIP form regularly in their jobs.

30% of the CWF reported to be able to read the WIP without assistance.

22% of the CWF indicated that they could read the WIP if given assistance.

Comment:

There appeared to be fewer workers who reported that they could read the WIP without assistance than the current number who are required to read and use the WIP form. In addition, 30% of the workers across all rosters expressed a need for assistance in overall reading.

#### 2. Trigonometry

Data:

10% of the CWF report that they use trigonometry in their jobs.

14% of the CWF report that they can use trigonometry without assistance.

11% of the CWF report that they have not done this but could if given assistance.

**Comment:**

The lower numbers of workers who reported that they are able to use trigonometry suggest a need for training. This is also supported by the 59% of the CWF that reported they would want training in trigonometry and advanced mathematics.

**3. Read Complicated Drawings**

**Data:**

44% of CWF report that they read complicated drawings regularly in their job.

41% of CWF reported that they could do this without assistance.

22% of CWF indicated they could do this if given assistance.

**Comment:**

There are fewer workers who can perform this task without assistance than the number who are responsible for doing this task. Additionally, this correlates with the fact that 50% of the workers, across all rosters, express a desire for blue print reading instruction.

**4. Loading the Tape and Programming the CNC Machines**

**Data:**

20% of the CWF perform this task on a fairly regular basis.

28% of the CWF report that they can do this task without assistance.

12% of the CWF report that they can do this task if given assistance.

**Comment:**

Due to the next generation of technology which will become an integral part of the future cells, training in this area is anticipated to be critical.

## 5. Set Up and Operate Grinders

Data:

90% of the CWF report that they have never done this task.

Comment:

Although this task is currently described as low frequency (3% of CWF perform this), across all job classifications, it is anticipated that these tasks will be spread amongst all future manufacturing cells.

This suggests that there will be a need for a greater number of workers who can carry out this task. In addition, this is also correlated with the fact that 50% of workers across all rosters requested training in conventional machine operations.

### Additional Suggested Training Courses

The Penn State Team recommends that over the next 12 months, IR should develop the following courses with the suggested content:

#### 1. Individualized Reading Workshop

We suggest that this course be developed to help these people who need to build confidence in their reading skills. Each learner should work at his or her own pace on specific problem areas.

#### 2. Reading Effectiveness

We suggest that this course be developed to cover methods of increasing reading speed and comprehension.

#### 3. Math Refresher I

We suggest that this course be developed to help review for more advanced math courses. It should cover addition, subtraction, multiplication and division of whole numbers and decimals. The learners should be able to work at his or her own pace.



4. Math Refresher II

We suggested that this course be developed as a continuation of Math Refresher I. Whole numbers should be used again to review decimals, fractions and percents. The learner could take one or both of these courses (depending upon his or her needs). It should not be required that learners take Math Refresher I before this course.

5. Shop Math

We suggest that this course be developed to cover shop constants and math related to threads. A study should be made of speeds and feeds, square roots and math related to tapers.

6. Algebra

We suggest that this course be developed to teach the basic skills in algebra. It should cover the use of algebraic equations, inequalities, and linear equations. These skills should be applied to word problems.

7. Geometry

We suggest that this course be developed to introduce the basic skills of geometry. It should include methods of discovery and proof, angle relationships, lines and planes, and congruent triangles.

8. General Math

We suggest that this course be developed to take up where the Math Refresher courses left off. It should expand on fractions, decimals, percents, ratio proportion and measurements. Pre-algebra skills should also be introduced.

9. Trigonometry

We suggest that this course be developed to cover right triangles, trigonometric ratios, vectors, applied geometric problems, identities and interpolations, sine wave analysis, and complex numbers.

10. Blue Print Reading

We suggest that this course be developed to teach the interpretation of technical drawings. Topics which should be included are working drawings, hidden lines, angular surfaces, scales, circular feature, break lines and sectional views.

11. Machine Shop Practice

We suggest that this course be developed to cover milling, grinding, drilling, lathe and tool room measuring instruments. The learners should gain practical experience in feeds, speeds, and the use of various cutting tools.

12. Numeric Control

We suggest that this course be developed to cover the fundamentals of tape preparation and tape operation for machine shop equipment. This should also include the set up and operation of CNC equipment specific to IR.

13. Geometric Dimensions

We suggest that this course be developed to teach machine tool processing with an emphasis on controls imposed by geometric dimensioning. The course should include flatness, straightness, roundness, cylindricity, parallelism, perpendicularity, angularity, runout, profiles, concentricity, symmetry and true position.

14. Inspection and Gaging

We suggest that this course be developed to teach the use of mechanical inspection equipment. This should include calibration, micrometers, calipers, indicators, fixed-thread-ID and OD gauging, angular and optical measurement, surface plate and accessories, and coordinate measuring.

Project Number Three

**Maintenance, Manufacturing Cell, and Industrial  
Engineering/Product Engineering Training Needs  
Assessment Project**

August 1987

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**Volume 2**

**Section I - VII**

**Machines**

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**The Pennsylvania State University**

Division of Counseling and Educational Psychology  
and Career Studies

**SECTION I**  
**DEPARTMENTS AND JOBS**

**Which jobs are in each department?**

**Which tasks go with each job?**

File: DEPART JOB  
Report: GEROY

Dept: PRECISION MACHINING CENTER

Job: OPERATOR, LABOR GRADE: 4  
Operate Seiki Automatic Turret Lathe  
Operate Standard End Plate Finishing Lathe  
Operate Drill Press  
Operate Bridgeport Milling Machine

Dept: PRECISION MACHINING CENTER

Job: SET UP PERSONNEL, LABOR GRADE: 2  
Set up Seiki Automatic Turret Lathe  
Operate Seiki Automatic Turret Lathe  
Set up Standard End Plate Finishing Lathe  
Operate Standard End Plate Finishing Lathe  
Set Up Drill Press  
Operate Drill Press  
Set Up Bridgeport Milling Machine  
Operate Bridgeport Milling Machine

Dept: HONING MACHINES

Job: HONING MACHINE OPERATOR, LABOR GRADE: 6  
Set up Sunnen Horizontal Hone  
Operate Sunnen Horizontal Hone

Dept: TOOL ROOM

Job: CRIB KEEPER, LABOR GRADE: 6  
Maintain Crib service  
Maintain inventory of tools

File: DEPART JOB  
Report: GERDY

Dept: TOOL ROOM

Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4  
Operate Cincinnati Monoset Tool Grinder  
Operate KO Surface Grinder  
Operate Heald Tool Grinding Machine(s)  
Operate Norton Surface Grinder  
Operate Drill Grinder  
Operate Surface Grinder  
Operate Hobb Machine  
Operate Cutter and Tool Grinding Machine  
Operate Tap Grinder  
\*\*CONTINUED BELOW\*\*  
Dept: TOOL ROOM

Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4  
\*\*\*CONTINUED FROM ABOVE\*\*\*  
Operate Thread Chaser  
Operate Gleason Cutter-Shaper  
Operate Single-Point Carbide Grinder

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 3  
Operate Cincinnati Monosett Tool Grinder  
Operate KO Surface Grinder  
Operate Heald Tool Grinding Machine(s)  
Operate Norton Surface Grinder  
Operate Drill Grinder  
Operate Surface Grinder  
Operate Hobb Machine  
Operate Cutter and Tool Grinding Machine  
Operate Tap Grinder  
\*\*\*\*CONTINUED BELOW\*\*\*\*  
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 3  
\*\*\*CONTINUED FROM ABOVE\*\*\*  
Operate Thread Chaser  
Operate Broach Grinder  
Operate Gleason Cutter-Shaper  
Operate Single Point Carbide Grinder  
Operate Sunnen Precision Honing Machine

File: DEPART JOB  
Report: GEROY

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 4  
Operate Cincinnati Monosett Tool Grinder  
Operate KO Surface Grinder  
Operate Heald Tool Grinding Machine(s)  
Operate Norton Surface Grinder  
Operate Drill Grinder  
Operate Surface Grinder  
Operate Hobb Machine  
Operate Cutter and Tool Grinding Machine  
Operate Tap Grinder  
\*\*\*\*CONTINUED BELOW\*\*\*\*  
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 4  
\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*  
Operate Thread Chaser  
Operate Broach Grinder  
Operate Gleason Cutter Shaper  
Operate Single Point Carbide Grinder  
Operate Sunnen Precision Honing Machine

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 6  
Operate Cincinnati Monosett Tool Grinder  
Operate KO Surface Grinder  
Operate Heald Tool Grinding Machine(s)  
Operate Norton Surface Grinder  
Operate Drill Grinder  
Operate Surface Grinder  
Operate Hobb Machine  
Operate Cutter and Tool Grinding Machine  
Operate Tap Grinder  
\*\*\*\*CONTINUED BELOW\*\*\*\*  
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 6  
\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*  
Operate Thread Chaser  
Operate Broach Grinder  
Operate Gleason Cutter-Shaper  
Operate Single Point Carbide Grinder

File: DEPART JOB  
Report: GERDY

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 8  
Operate Cincinnati Monosett Tool Grinder  
Operate KO Surface Grinder  
Operate Heald Tool Grinding Machine(s)  
Operate Norton Surface Grinder  
Operate Drill Grinder  
Operate Surface Grinder  
Operate Hobb Machine  
Operate Cutter and Tool Grinding Machine  
Operate Tap Grinder  
\*\*\*\*CONTINUED BELOW\*\*\*\*  
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 8  
\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*  
Operate Thread Chaser  
Operate Broach Grinder  
Operate Gleason Cutter-Shaper

Dept: TOOL ROOM

Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5  
Operate Drill Press  
Operate Milling Machine(s)  
Operate Lathe  
Operate Jig Bore  
Operate Surface Grinder  
Operate Bench Grinders  
Operate Contour Saw

Dept: TOOL ROOM

Job: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6  
Operate Drill Press  
Operate Milling Machine(s)  
Operate Lathe  
Operate Jig Bore  
Operate Surface Grinder  
Operate Bench Grinder  
Operate Contour Saw



File: DEPART JOB  
Report: GEROY

Dept: TOOL ROOM

Job: TOOL AND DIE MAKER, LABOR GRADE: 3  
Operate Drill Press  
Operate Milling Machine(s)  
Operate Lathe  
Operate Vertical Shaper  
Operate Jig Bore  
Operate Surface Grinder  
Operate Cam Grinder  
Operate Jig Grinder

Dept: TOOL ROOM

Job: TOOL AND DIE MAKER, LABOR GRADE 1  
Operate Drill Press  
Operate Milling Machine(s)  
Operate Lathe  
Operate Jig Bore  
Operate Surface Grinder  
Operate Jig Grinder  
Operate Vertical Shaper  
Operate Cam Grinder

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4  
Set up Landis External Grinder  
Operate Landis External Grinder  
Set up Norton External Grinder  
Operate Norton External Grinder

Dept: GRINDING DEPARTMENT

Job: DOUBLE DISK GRINDER OPERATOR, LABOR GRADE: 4  
Set up Gardner Disk Grinder Horizontal  
Operate Gardner Disk Grinder Horizontal

File: DEPART JOB  
Report: GEROY

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR CENTERLESS, LABOR GRADE: 4  
Set up Cincinnati Thru Feed Grinder  
Operate Cincinnati Thru Feed Grinder  
Set up Landis Plunge Drive Grinder  
Operate Landis Plunge Drive Grinder

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR INTERNAL, LABOR GRADE: 4  
Set up Heald Model 271 Grinder  
Operate Heald Model 271 Grinder  
Set up Heald Model 272 Plain Grinder  
Operate Heald Model 272 Plain Grinder  
Set up Cincinnati Model 181 Grinder  
Operate Cincinnati Model 181 Grinder  
Set up Heald Model 272 Sizematic Grinder  
Operate Heald Model 272 Sizematic Grinder

Dept: GRINDING DEPARTMENT

Job: EXTERNAL GRINDER, LABOR GRADE: 4  
Set up External Stepmaster Grinder  
Operate External Stepmaster Grinder

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR SURFACE, LABOR GRADE: 6  
Set up Rotary Vertical Spindle  
Operate Rotary Vertical Spindle

File: DEPART JOB  
Report: GEROY

Dept: ASSEMBLY

Job: VOLUME ASSEMBLER, LABOR GRADE: 6  
Assemble components for tools

Dept: ASSEMBLY

Job: ASSEMBLER, LABOR GRADE: 4  
Assemble components for tools

Dept: ASSEMBLY

Job: INSPECTOR-TESTER VOLUME ASSEMBLY, LABOR GRADE: 2  
Operate Robot Test Cell

Dept: BENCHWORK

Job: BENCH HAND, LABOR GRADE: 7  
Stamp identification number on part  
Operate Roll Stamp  
Operate power press  
Assemble two or more parts

File: DEPART JOB  
Report: GEROY

Dept: BENCHWORK

Job: STAMPER HAND ROLL, LABOR GRADE: 8  
Stamp identification number on parts  
Operate Roll Stamp  
Operate Power Press

Dept: J & L DEPARTMENT

Job: PRECISION BORING MACHINE (222) OPERATOR, GRADE: 4  
Set up Standard Heald Borematic Machine  
Operate a Standard Heald Borematic Machine

Dept: J & L DEPARTMENT

Job: PRECISION BORING MACHINE (324-A) OPER., GRADE: 4  
Set up Heald Borematic Pin Machine  
Operate Heald Borematic Pin Machine

Dept: J & L DEPARTMENT

Job: TURRET LATHE OPERATOR, LABOR GRADE: 2  
Set up horizontal turret lathe(s)

File: DEPART JOB  
Report: GERDY

Dept: J & L DEPARTMENT

Job: TURRET LATHE OPERATOR. LABOR GRADE: 4  
Operate horizontal turret lathe(s)

Dept: TRANSFER LINE

Job: TRANSFER LINE OPERATOR, LABOR GRADE: 2  
Set up Transfer Machine  
Operate Transfer Machine  
Set up for J & L ATL  
Operate J & L ATL  
Set up MSO Machine  
Operate MSO Machine

Dept: HEAT TREAT

Job: FURNACE OPERATOR/LEADER, LABOR GRADE: 3  
Operate furnace

Dept: HEAT TREAT

Job: FURNACE OPERATOR, LABOR GRADE: 4  
Operate furnace

File: DEPART JOB  
Report: GEROY

Dept: HEAT TREAT

Job: FINISHER-CLASS 1, LABOR GRADE: 4  
Operate Wheel & Braden Shot-Blast Machine  
Operate Black Oxide Line  
Operate Straightening Press  
Operate Lapping Machine

Dept: HEAT TREAT

Job: BLACKSMITH, LABOR GRADE: 3  
Operate Forge Furnace  
Operate Upset Hammer  
Operate Richard's Bender

Dept: POTTER & JOHNSON

Job: OPERATOR, LABOR GRADE: 4  
Operate Seiki Model NE CNC Lathe  
Operate Seiki Model NEA CNC Lathe  
Operate Warner Swazy AC Lathes

Dept: POTTER & JOHNSON

Job: OPERATOR, LABOR GRADE: 6  
Set up Potter & Johnson Chucking Lathe(s)  
Operate Potter & Johnson Chucking Lathe(s)

File: DEPART JOB  
Report: GEROY

Dept: POTTER & JOHNSON

Job: SET UP PERSONNEL, LABOR GRADE: 2  
Set up Seiki Model NE CNC Lathe  
Operate Seiki Model NE CNC Lathe  
Set up Seiki Model NEA CNC Lathe  
Operate Seiki Model NEA CNC Lathe  
Set up Warner Swazy AC Lathe

Dept: DRILLING MACHINE

Job: DRILL PRESS OPERATOR-SENSITIVE/GANG DRILL, LG: 6  
Set up 4-6 Spindle Gang Drill  
Operate 4-6 Spindle Gang Drill  
Sharpen Drills

Dept: DRILLING MACHINE

Job: DRILLING MACHINE OPERATOR-HEAVY DUTY, LABOR GRADE: 5  
Set up Heavy Duty Vertical Drilling Machine  
Operate Heavy Duty Vertical Drilling Machine  
Set up and operate Radial Drill Press  
Set up NATCO Multi-Spindle Drill Press  
Operate NATCO Multi-Spindle Drill Press  
Set up and operate 24" Upright Single Spindle Drill Press

Dept: MILLING DEPARTMENT

Job: CNC MILLING MACHINE OPERATOR, LABOR GRADE 4  
Operate an Okata CNC Milling Machine  
Operate a Bridgeport CNC Milling Machine

File: DEPART JOB  
Report: GEROY

Dept: MILLING DEPARTMENT

Job: CNC OKATA/BRIDGEPORT SETUP MAN, LABOR GRADE: 2  
Set up CNC Okata Milling Machine  
Operate CNC Okata Milling Machine  
Set up CNC Bridgeport Milling Machine  
Operate CNC Bridgeport Milling Machine

Dept: MILLING DEPARTMENT

Job: MILLING MACHINE OPERATOR, LABOR GRADE: 4  
Set up Cincinnati Vertical Milling Machine  
Operate Cincinnati Vertical Milling Machine  
Set up Bridgeport Vertical Milling Machine  
Operate Bridgeport Vertical Milling Machine  
Set up Cincinnati Rise and Fall  
Operate Cincinnati Rise and Fall  
Set up Duplex-Twin Mill Machine

Dept: NC DEPARTMENT

Job: SET UP, LABOR GRADE: 2  
Operate Milwaukee Matic EB  
Operate J & L Align.  
Operate CNC Combi-Lathe  
Operate Kearny Treker 180 Indexes  
Operate Scimmx Indexes  
Operate Do All Saw  
Operate A Lines Lathe

Dept: NC DEPARTMENT

Job: OPERATOR, LABOR GRADE: 4  
Set Up Milwaukee Matic EB  
Operate Milwaukee Matic EB  
Set Up CNC Machine Lathe  
Operate CNC Machine Lathe  
Set Up Combi-Lathe  
Operate Combi-Lathe  
Set Up KT 180  
Operate KT 180  
Set Up Scimmx

\*\*\*\*CONTINUED BELOW\*\*\*



File: DEPART JOB  
Report: GEROY

Dept: NC DEPARTMENT

Job: OPERATOR, LABOR GRADE: 4  
\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*  
Operate Scimmx  
Set Up Do All Saw  
Operate Do All Saw  
Set Up A Lines Lathe  
Operate A Lines Lathe  
Set Up Seiki Lathe(s)  
Operate Seiki Lathe(s)

Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP & OPERATOR, LG: 2  
Set up Wagner Saw  
Operate Wagner Saw  
Set up Barber Coleman Hobb-Gear Making Machine  
Operate Barber Coleman Hobb-Gear Making Machine  
Set up Anvill Mill  
Operate Anvill Mill  
Set up Vertical Broaches  
Operate Vertical Broaches  
Set up MSO Machine  
\*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 2  
\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*  
Operate MSO Machine  
Set up Burke Twin Mill Machine  
Operate Burke Twin Mill Machine  
Set up Seiki Turning Machine  
Operate Vibro  
Operate Overveck Grinder

Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4  
Set up Wagner Saw  
Operate Wagner Saw  
Set up Barber Coleman Hobb-Gear Making Machine  
Operate Barber Coleman Hobb-Gear Making Machine  
Set up Anvill Mill  
Operate Anvill Mill  
Set up Vertical Broaches  
Operate Vertical Broaches  
Set up MSO Machine.  
\*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

File: DEPART JOB  
Report: GEROY

Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4

\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*

Operate MSO Machine  
Set up Burke Twin Mill Machine  
Operate Burke Twin Mill Machine  
Operate Vibro  
Operate Overbeck Grinder

Dept: SCREW MACHINE DEPARTMENT

Job: SET-UP MAN--GEAR SHAPER, LABOR GRADE: 2

Set up Gear Shaper  
Operate Gear Shaper

Dept: SCREW MACHINE DEPARTMENT

Job: OPERATOR-GEAR SHAPER, LABOR GRADE: 8

Operate Gear Shaper

Dept: SCREW MACHINE DEPARTMENT

Job: SCREW MACHINE SETUP, LABOR GRADE: 2

Set up Multiple Spindle Screw Machines  
Operate Multiple Spindle Screw Machines  
Set up Automatic Spindle Screw Machine  
Operate Automatic Spindle Screw Machine

File: DEPART JOB  
Report: GEROY

Dept: SCREW MACHINE DEPARTMENT

Job: SCREW MACHINE OPERATOR. LABOR GRADE: 6  
Operate Multiple Spindle Screw Machines  
Operate Automatic Screw Machines

Dept: SCREW MACHINE DEPARTMENT

Job: LATHE OPERATOR, LABOR GRADE: 6  
Set up Engine Lathes  
Operate Engine Lathes

Dept: POLISHING & POWDER COATING DEPARTMENT

Job: SPIN FINISH MACHINE OPERATOR, LABOR GRADE: 5  
Operate Vibro

Dept: POLISHING AND POWDER COATING DEPARTMENT

Job: POWDER COATING. LABOR GRADE: 5  
Operate Spray Guns  
Operate Powder Coating Room

File: DEPART JOB  
Report: GEROY

Dept: POLISHING AND POWDER COATING DEPARTMENT

Job: VIBRO OPERATOR, LABOR GRADE: 5

Operate Vibro

Operate SWECO

Operate Barrel Machine Tumbler

Operate Big Wash

Operate Derust Wash

Dept: POLISHING & POWDER COATING DEPARTMENT

Job: POLISHER/DEBURRER, LABOR GRADE: 5

Operate Buffing Lathe

Operate Die Grinder

Operate Disc Sander

Operate Belt Sander

**SECTION II**  
**MACHINES CLASSIFIED BY DEPARTMENT**

**What machines are in each department?**

File: DEPT.MACH  
Report: GEROY

DRILLING MACHINE

Heavy Duty Drilling Machine  
Radial Drill Press  
21" Upright Single Spindle Drill Press  
NATCO Multi-Spindle Drill Press  
Delta 6 Spindle Drill Press  
Deltoff 12, 18, 36" Gun Drill  
IR Gun Drill  
Sanvik Ejector Drill (not machine- but part)

TRANSFER LINE

Transfer Line  
Jones & Lamson  
MSO  
MSO 5 Station PTM

J & L DEPARTMENT

Standard Heald Borematic  
Heald Borematic Pin Machine  
Horizontal Turret Lathe  
Heald Borematic Model 321

POTTER & JOHNSON

Seiki CNC NE Lathe  
Seiki CNC NEA Lathe  
Warner Swazy AC Lathe  
Potter & Johnson Chucking Lathe

File: DEPT.MACH  
Report: GEROY

MILLING

Okata CNC Milling Machine  
Bridgeport CNC Milling Machine  
Cincinnati Horizontal Milling Machine  
Bridgeport Horizontal Milling Machine  
Cincinnati Rise & Fall  
Duplex Twin Mill Machine  
F & T Series E B Vertical w/NC Tape  
F & T 1804 Axis w/ NC Tape  
Cincinnati 720 3 Axis VMC w/NC Tape  
\*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

MILLING

\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*  
F & T 1436 A Duplex Mill  
Cincinnati 5 Horizontal Milling Machine  
Cincinnati 2 Horizontal Milling Machine  
Bridgeport Vertical Milling Machine  
Schaffner Rise & Fall Milling Machine  
Cincinnati 107/122 Rise & Fall Milling Machine  
Bridgeport 4 Axis VMC w/CNC  
Acroloc  
Okata

POLISHING AND POWDERCOATING

Spin Finish  
Vibro  
SWECCO  
Barrel Machine Tumble  
Big Wash  
Derust Wash  
Spray Guns (Paint Booth)  
Powder Coating Room  
Buffing Lathe  
\*\*\*CONTINUED BELOW\*\*\*

POLISHING AND POWDER COATING

\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*  
Die Grinder  
Disc Sander  
Beta Machine  
Float Sander  
Disc Grinder

File: DEPT.MACH  
Report: GERDY

GRIND

Cincinnati Monosett Tool Grinder  
KO Surface Grinder  
Drill Grinder  
Surface Grinder  
Tap Grinder  
Single Point Carbide Grinder  
Bench Grinder  
Cam Grinder  
Landis External Grinder  
\*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

GRIND

\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*  
Heald 271 Grinder  
Heald Plain 222 Grinder  
Heald Schematic 272 Grinder  
Cincinnati 181 Grinder  
External Step Master  
Overheck  
Die Grinder  
Norton External Grinder  
\*\*\*\*CONTINUED BELOW\*\*\*\*

GRIND

\*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*  
Gardner Disk Grinder  
Cincinnati Through Feed Grinder  
Landis Plunge Drive Grinder  
Norton Surface Grinder



**SECTION III**

**TASKS ASSOCIATED WITH EACH MACHINE**

**Which tasks are required by each machine?**

File: MACH.TASK  
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE  
Set Up  
Operate

RADIAL DRILL PRESS  
Set Up  
Operate

21" UPRIGHT SINGLE SPINDLE DRILL PRESS  
Set Up  
Operate

NATCO MULTI-SPINDLE DRILL PRESS  
Set Up  
Operate

TRANSFER LINE  
Set Up  
Operate

File: MACH.TASK  
Report: GERDY

JONES & LAMSON ATL  
Set Up  
Operate

MULTI-SECONDARY  
Set Up  
Operate

MSO 5 STATION RTM  
Set Up  
Operate

9 STATION IN-LINE TRANSFER MACHINE  
Set Up  
Operate

STANDARD HEALD BOREMATIC MILLING MACHINE (MODEL 222)  
Set Up  
Operate

File: MACH.TASK  
Report: GEROY

HEALD BOREMATIC PIN MACHINE (MODEL 324-A)  
Set Up  
Operate

HORIZONTAL TURK ATHE  
Set Up  
Operate

SEIKI CNC NE LATHE  
Set Up  
Operate

SEIKI CNC NEA LATHE  
Set Up  
Operate

WARNER SWAZY AC LATHE  
Set Up  
Operate

File: MACH.TASK  
Report: GERDY

POTTER & JOHNSON CHUCKING LATHE  
Set Up  
Operate

HEALD BOREMATIC MILLING MACHINE (MODEL 321-A)  
Set Up  
Operate

DELTA 6 SPINDLE DRILL PRESS  
Beval  
Drill  
Ream  
Bore  
Tap

DELTOFF 12, 18, 36 GUN DRILLS  
Sharpen drills

I.R. GUN DRILL  
Sharpen drill

File: MACH.TASK  
Report: GEROY

OKATA CNC MILLING MACHINE  
Operate  
Set up

BRIDGEPORT CNC MILLING MACHINE  
Operate  
Set up

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE  
Operate  
Set up

BRIDGEPORT VERTICAL MILLING MACHINE  
Operate  
Set up

CINCINNATI RISE & FALL  
Operate  
Set up

File: MACH.TASK  
Report: GERDY

DUPLEX TWIN MILL MACHINE  
Operate  
Set up

K & T SERIES E B VERTICAL W/ C TAPE  
Operate  
Set up

K & T 1804 AXIS W/ NC TAPE  
Operate  
Set up

CINCINNATI 720 3 AXIS VMC W/ NC TAPE  
Operate  
Set up

K & T 1436 A DUPLEX MILL  
Operate  
Set up

File: MACH.TASK  
Report: GERDY

CINCINNATI 5 HORIZONTAL MILLING MACHINE  
Operate  
Set up

CINCINNATI 2 HORIZONTAL MILLING MACHINE  
Operate  
Set up

BRIDGEPORT VERTICAL MILLING MACHINE  
Operate  
Set up

SCHAFFNER RISE & FALL MILLING MACHINE  
Operate  
Set up

CINCINNATI 107/122 RISE & FALL MILLING MACHINE  
Operate  
Set up



File: MACH.TASK  
Report: GERDY

BRIDGEPORT 4 AXIS VMC W/ CNC  
Operate  
Set up

ACROLOC 4 AXIS VMC W/CNC  
Operate  
Set up

OKATA VM 4 AXIS W/CNC  
Operate  
Set up

CINCINNATI MONOSETT TOOL GRINDER  
Operate  
Set up

KO SURFACE GRINDER  
Operate  
Set up

File: MACH.TASK  
Report: GERDY

NORTON SURFACE GRINDER  
Operate  
Set up

DRILL GRINDER  
Operate  
Set up

SURFACE GRINDER  
Operate  
Set up

TAP GRINDER  
Operate  
Set up

SINGLE POINT CARBIDE GRINDER  
Operate  
Set up

File: MACH.TASK  
Report: GEROY

BENCH GRINDER  
Operate  
Set up

CAM GRINDER  
Operate  
Set up

LANDIS EXTERNAL GRINDER  
Operate  
Set up

NORTON EXTERNAL GRINDER  
Operate  
Set up

GARDNER DISK GRINDER  
Operate  
Set up

File: MACH.TASK  
Report: GEROY

CINCINNATI THROUGH FEED GRINDER  
Operate  
Set up

LANDIS PLUNGE DRIVE GRINDER  
Operate  
Set up

HEALD 271 GRINDER  
Operate  
Set up

HEALD PLAIN 222 GRINDER  
Operate  
Set up

HEALD SIZEMATIC 272 GRINDER  
Operate  
Set up

File: MACH.TASK  
Report: GEROY

CINCINNATI 181 GRINDER  
Operate  
Set up

EXTERNAL STEP MASTER  
Operate  
Set up

OVERBECK  
Operate  
Set up

DIE GRINDER  
Operate  
Set up

SPIN FINISH  
Operate

File: MACH.TASK  
Report: GEROY

VIBRO  
Operate

SWECO  
Operate

BARREL MACHINE TUMBLER  
Operate

BIG WASH  
Operate

DERUST WASH  
Operate

File: MACH.TASK  
Report: GERDY

SPRAY GUNS (PAINT BOOTH)  
Operate

POWDER COATING ROOM  
Operate

BUFFING LATHE  
Operate

DIE GRINDER  
Operate

DISC SANDER  
Operate

File: MACH.TASK  
Report: GERDY

BETA MACHINE  
Operate

FLOAT SANDER  
Operate

DISC GRINDER  
Operate



**SECTION IV**  
**PROCEDURAL KNOWLEDGE ASSOCIATED**  
**WITH EACH MACHINE**

**What procedural knowledge is required  
by each machine?**

File: MACH.PROCD  
Report: GERDY

#### HEAVY DUTY VERTICAL DRILLING MACHINE

Locate & obtain fixture, prints, WIP, gages, & tooling  
Set up press  
Run  
Inspect  
Adjust  
Load/unload

#### RADIAL DRILL PRESS

Locate & obtain fixture, prints, WIP, gages, & tooling  
Set up press  
Run  
Inspect  
Adjust  
Load/unload  
Obtain drills  
Obtain reamers  
Set speeds  
Fix tools

#### 21" UPRIGHT SINGLE SPINDLE DRILL PRESS

Locate & obtain fixture, prints, WIP, gages, & tooling  
Set up press  
Run  
Inspect  
Adjust  
Load/unload  
Obtain drills  
Obtain reamers  
Set speeds  
Fix tools

#### NATCO MULTI-SPINDLE DRILL PRESS

Locate & obtain fixture, prints, WIP, gages, & tooling  
Set up press  
Run  
Inspect  
Adjust  
Load/unload  
Obtain drills  
Obtain reamers  
Set speeds  
Fix tools

File: MACH.PROCD

Report: GERDY

TRANSFER LINE

Select & Obtain WIP & tools

Select & obtain WIP set up sheets

Preset drills

Adjust heads

Preset mill ends

Change Jaws and Jobs

Adjust brackets

Sharpen tools

Inspect (check part to print)

Adjust machine

Load/unload and run

Set tools

JONES & LAMSON

Select & obtain WIP & tooling

Select & obtain WIP set up sheets

Inspect (check part to print)

Load/unload

Set tools

Run

MSD MACHINE

Select & obtain WIP & tooling

Select & obtain WIP set up sheets

Inspect (check part to print)

Load/unload

Set tools

Run

MSD 5 STATION RTM

Select & obtain WIP & tooling

Select & obtain WIP set up sheets

Inspect (check part to print)

Adjust machine

Set tools

Run

File: MACH.PROCD  
Report: GEROY

9 STATION IN-LINE TRANSFER MACHINE

Inspect (check part to print)  
Adjust machine  
Load/unload  
Set tools  
Run  
Perform simple maintenance  
Secure material in collet/fixture  
Select/change collet/fixture

HEALD BOREMATIC MILLING MACHINE MODEL 222

Select/obtain WIP, tooling, gages, collet fixtures  
Select/change index plate, drills, boring bars, reamers  
Select/set feeds and speeds  
Set stops/offsets  
Adjust milling heads  
Load/unload parts  
Inspect (check part to print)  
Adjust machine-- set switches  
Perform simple maintenance  
Select/change tool  
Secure material in furnace  
Grind/sharpen tools

HEALD BOREMATIC MILLING MACHINE MODEL 324-A

Select/obtain WIP, tooling, gages, collet fixtures  
Select/change index plate, drills, boring bars, reamers  
Select/set feeds and speeds  
Set stops/offsets  
Adjust milling heads  
Load/unload parts  
Inspect (check part to print)  
Adjust machine-- set switches  
Perform simple maintenance  
Select/change tool  
Secure material in furnace  
Grind/sharpen tools

HORIZONTAL TURRET LATHE

Place tooling in proper sequence

File: MACH.PROCD  
Report: GERDY

SEIKI CNC NE LATHE

Select/obtain WIP, tooling, & gages  
Select/obtain prints/set up sheets  
Select/obtain tape control  
Adjust/calibrate  
Install tape  
Load/unload parts  
Inspect (check part to print)  
Set tools  
Perform simple maintenance  
Secure material in fixture  
Select/change collet/fixture

SEIKI CNC NEA LATHE

Select/obtain WIP, tooling, & gages  
Select/obtain prints/set up sheets  
Select/obtain tape control  
Adjust/calibrate  
Install tape  
Load/unload parts  
Inspect (check part to print)  
Set tools  
Perform simple maintenance  
Secure material in fixture  
Select/change collet/fixture

WARNER SWAZY AC LATHE

Select/obtain WIP, tooling, & gages  
Select/obtain prints/set up sheets  
Select/obtain tape control  
Adjust/calibrate  
Install tape  
Load/unload parts  
Inspect (check part to print)  
Set tools  
Perform simple maintenance  
Secure material in fixture  
Select/change collet/fixture

POTTER & JOHNSON CHUCKING LATHE

Select/obtain WIP, tooling, & gages  
Select/obtain prints/set up sheets  
Select/obtain tape control  
Adjust/calibrate  
Install tape  
Load/unload parts  
Inspect (check part to print)  
Set tools  
Perform simple maintenance  
Secure material in fixture  
Select/change collet/fixture

File: MACH.PROCD  
Report: GERDY

HEALD BOREMATIC MILLING MACHINE MODEL 321-A

Select/obtain WIP, tooling, & gages  
Select/change collet/fixture  
Select/change index plate  
Select/change drills  
Select/set feeds  
Select/set speeds  
Set stops/offsets  
Load/unload parts  
Perform simple maintenance  
Grind/sharpen tools

DELTA 6 SPINDLE DRILL PRESS

Locate/obtain WIP, blueprints  
Locate/obtain tooling and gages  
Locate/obtain fixtures  
Fix tooling, gages, fixture  
Set stops  
Adjust  
Inspect

DELTOFF 12, 18, 36 GUN DRILLS

Locate/obtain WIP, blueprints  
Locate/obtain fixture  
Inspect  
Select/set speeds  
Select/set feeds  
Change/reset drills  
Change bushings

I.R. GUN DRILLS

Locate/obtain prints and WIP  
Locate/obtain fixture  
Inspect  
Select/set speeds  
Select/set feeds  
Change/reset drills  
Change bushings  
Load/unload parts

File: MACH.PROCD  
Report: GERDY

SANVIK EJECTOR DRILL PART  
Select/set speeds

OKATA CNC MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Load tape  
Perform simple maintenance  
Clear computer  
Secure material

BRIDGEPORT CNC MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Clear computer  
Load tape  
Indicate fixture  
Secure material  
Perform simple maintenance

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

File: MACH.PROCD  
Report: GEROY

BRIDGEPORT VERTICAL MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

CINCINNATI RISE & FALL

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

DUPLEX TWIN HEAD MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

K & T SERIES E B VERTICAL W/ NC TAPE

Perform simple maintenance  
Load tape  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds



File: MACH.PROCD  
Report: GEROY

K & T 1804 AXIS W/ NC TAPE

Perform simple maintenance  
Load tape  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

CINCINNATI 7200 3 AXIS VMC W/ NC TAPE

Load tape  
Perform simple maintenance  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

K & T 1436 A DUPLEX MILLING MACHINE

Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Secure materials  
Adjust  
Attach fixture/collet  
Select feeds/ speeds  
Set stops

CINCINNATI 5 HORIZONTAL MILLING MACHINE

Secure materials  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Set stops  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

File: MACH.PROCD  
Report: GERDY

CINCINNATI 2 HORIZONTAL MILLING MACHINE

Secure materials  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Set stops  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

BRIDGEPORT VERTICAL MILLING MACHINE

Secure material  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Set stops  
Adjust  
Attach fixture/collet  
Select feeds/ speeds

SCHAFFNER RISE & FALL MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds  
Indicate fixture  
Perform simple maintenance  
Set stops

CINCINNATI 107/122 RISE & FALL MILLING MACHINE

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds  
Set stops  
Perform simple maintenance  
Indicate fixture  
Secure material

File: MACH.PROCD  
Report: GER0Y

BRIDGEPORT 4 AXIX VMC W/ CNC

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Indicate fixture  
Load tape  
Perform simple maintenance  
Secure material

ACROLOC 4 AXIS VMC W/CNC

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds  
Load tape  
Secure material  
Set stops

OKATA VM 4 AXIS W/CNC

Load/unload  
Run (operate)  
Inspect (check part to print)  
Select/obtain WIP, tools, blueprints, tape  
Preset/set tooling  
Adjust  
Attach fixture/collet  
Select feeds/ speeds  
Load tape  
Secure material  
Set stops

CINCINNATI MONOSETT TOOL GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

File: MACH.PROCD  
Report: GERDY

KO SURFACE GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

DRILL GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

SURFACE GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

TAP GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

File: MACH.PROCD  
Report: GERDY

SINGLE POINT CARBIDE GRINDER

Select/obtain W  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

BENCH GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

CAM GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

LANDIS EXTERNAL GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

File: MACH.PROCD  
Report: GERDY

HEALD 271 GRINDER  
Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

HEALD PLAIN 222 GRINDER  
Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

HEALD SIZEMATIC 272 GRINDER  
Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

EXTERNAL STEP MASTER GRINDER  
Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

File: MACH.PROCD  
Report: GERDY

OVERBECK

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

DIE GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

NORTON EXTERNAL GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

GARDNER DISK GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

File: MACH.PROCD  
Report: GERDY

CINCINNATI THROUGH FEED GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center an. true stock  
Load/unload  
Set/adjust stops  
Adjust machine

LANDIS PLUNGE DRIVE GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

NORTON SURFACE GRINDER

Select/obtain WIP  
Secure materials  
Select/obtain prints  
Check part to print  
Select/obtain mount wheels  
Select speed/feeds  
Dress wheel  
Center and true stock  
Load/unload  
Set/adjust stops  
Adjust machine

SPIN FINISH

Locate fixture  
Load/unload parts  
Change/replace Head Bolts  
Replace tension spring  
Load media  
Run  
Set time levels  
Inspect  
Obtain WIP



File: MACH.PROCD  
Report: GER0Y

VIBRO

Load/unload parts  
Run  
Set time levels  
Inspect  
Set weights  
Adjust compounds  
Set water pressure  
Set compound flow  
Obtain WIP

SWECO

Load/unload parts  
Run  
Set time levels  
Inspect  
Set weights  
Adjust compounds  
Set water pressures  
Set compound flows  
Obtain WIP

BARREL WASH TUMBLE

Load/unload parts  
Run  
Set time levels  
Inspect  
Adjust compounds  
Set water pressures  
Rust protect  
Add water  
Obtain WIP

BIG WASH

Load/unload parts  
Load media  
Run  
Inspect  
Obtain WIP

File: MACH.PROCD  
Report: GERDY

DERUST WASH  
Load/unload parts  
Load media Run  
Inspect  
Obtain WIP

SPRAY GUNS (PAINT BOOTH)  
Load media  
Inspect  
Obtain WIP

POWDER COATING ROOM  
Load/unload parts  
Inspect  
Set water pressures  
Obtain WIP  
Adjust heat

BUFFING LATHE  
Load/unload parts  
Run  
Inspect  
Obtain WIP  
Select wheel  
Adjust wheel  
Select belt

File: MACH.PROCD  
Report: GERDY

DIE GRINDER  
Load/unload parts  
Inspect  
Obtain WIP  
Select wheel  
Adjust wheel  
Select belt

DISC SANDER  
Load/unload parts  
Inspect  
Obtain WIP  
Select/attach sandpaper

BETA MACHINE  
Load/unload parts  
Inspect  
Obtain WIP

FLOAT SANDER  
Load/unload parts  
Inspect  
Obtain WIP  
Select/attach sandpaper

File: MACH.PROCD  
Report: GER0Y

DISC GRINDER .  
Load/unload parts  
Obtain WIP  
Select wheel  
Adjust wheel

**SECTION V**  
**TECHNICAL KNOWLEDGE ASSOCIATED**  
**WITH EACH MACHINE**

**What technical knowledge is required**  
**by each machine?**

File: MACH.TECH  
Report: GERDY

HEAVY DUTY VERTICAL DRILLING MACHINE  
none

RADIAL DRILL PRESS  
none

21" UPRIGHT SINGLE SPINDLE DRILL PRESS  
none

NATCO MULTI-SPINDLE DRILL PRESS  
none

TRANSFER LINE  
none

JONES & LAMSON  
none

MSD MACHINE  
none

MSD 5 STATION RTM  
none

File: MACH.TECH  
Report: GERDY

9 STATION IN-LINE TRANSFER MACHINE  
none

HEALD BOREMATIC MILLING MACHINE MODEL 222  
none

HEALD BOREMATIC MILLING MACHINE MODEL 324-A  
none

HORIZONTAL TURRET LATHE  
none

SEIKI CNC NE LATHE  
none

SEIKI CNC NEA LATHE  
none

WARNER SWAZY AC LATHE  
none

POTTER & JOHNSON CHUCKING LATHE  
none

File: MACH.TECH  
Report: GERDY

HEALD BOREMATIC MILLING MACHINE 321-A  
none

ACROLOC 4 AXIS VMC W/CNC  
Principles of CNC Programming

OKATA VM 4 AXIS W/ CNC  
Principles of CNC Programming

CINCINNATI MONOSETT TOOL GRINDER  
Knowledge of cutting tools

KD SURFACE GRINDER  
Knowledge of cutting tools

DRILL GRINDER  
Knowledge of cutting tools

TAP GRINDER  
Knowledge of cutting tools

SURFACE GRINDER  
Knowledge of cutting tools



File: MACH.TECH  
Report: GERDY

SINGLE POINT CARBIDE GRINDER  
Knowledge of cutting tools

BENCH GRINDER  
Knowledge of cutting tools

CAM GRINDER  
Knowledge of cutting tools

LANDIS EXTERNAL GRINDER  
Knowledge of cutting tools

HEALD 271 GRINDER  
Knowledge of cutting tools

HEALD PLAIN 222 GRINDER  
Knowledge of cutting tools

HEALD SIZEMATIC 272 GRINDER  
Knowledge of cutting tools

CINCINNATI 181 GRINDER  
Knowledge of cutting tools

File: MACH.TECH  
Report: GEROY

EXTERNAL STEP MASTER  
Knowledge of cutting tools

OVERBECK  
Knowledge of cutting tools

DIE GRINDER  
Knowledge of cutting tools

NORTON EXTERNAL GRINDER  
Knowledge of cutting tools

GARDNER DISK GRINDER  
Knowledge of cutting tools

CINCINNATI THROUGH FEED GRINDER  
Knowledge of cutting tools

LAND'S PLUNGE DRIVE GRINDER  
Knowledge of cutting tools

NORTON SURFACE GRINDER  
Knowledge of cutting tools

**SECTION VI**

**GENERAL KNOWLEDGE ASSOCIATED WITH  
EACH MACHINE**

What general knowledge is required by  
each machine?

File: MACH.GEN

Report: geroy

#### HEAVY DUTY VERTICAL DRILLING MACHINE

Read WIP, blueprints

Read & use scales

Read & use Vernier Calipers

Read & use micrometer

Read, use & fix gages

Read & use Thread, Plug, Pipe, & DL gages

#### TRANSFER LINE

Basic math

Metric-to-English conversion

Read/use micrometer & gages

Read blueprints

Read & understand WIP forms

Read & understand panel gages

Read & understand Hex Center gages

Read & understand plug gages

Read & understand Vernier calipers

#### JONES & LAMSON

Basic math

Metric-to-English conversion

Read/use micrometer & gages

Read blueprints

Read & understand WIP forms

Read & understand panel gages

Read & understand Hex Center gages

Read & understand plug gages

Read & understand Vernier calipers

#### MSO MACHINE

Basic math

Metric-to-English conversion

Read/use micrometer & gages

Read blueprints

Read & understand WIP forms

Read & understand panel gages

Read & understand Hex Center gages

Read & understand plug gages

Read & understand Vernier calipers

#### MSO 5 STATION RTM

Basic math

Metric-to-English conversion

Read/use micrometer & gages

Read blueprints

Read & understand WIP forms

Read & understand panel gages

Read & understand Hex Center gages

Read & understand plug gages

Read & understand Vernier calipers

File: MACH.GEN  
Report: gerov

#### 9 STATION IN-LINE TRANSFER MACHINE

Read blueprints  
Read & understand WIP  
Read/use micrometer & gages  
Read blueprints  
Read & understand WIP forms  
Read & understand panel gages  
Read & understand Hex Center gages  
Read & understand plug gages  
Read & understand Vernier calipers

#### HEALD BOREMATIC MILLING MACHINE MODEL 222

Basic math and trigonometry  
Metric-to-English conversion  
Ability to measure up to .0001" and 1/64th"  
Use Clearance Plug, Concentricity & Tapered Plug Gages  
Read & understand WIP forms and blueprints  
Use Straight Plug  
Read/use gages

#### HEALD BOREMATIC MILLING MACHINE MODEL 324-A

Basic math and trigonometry  
Metric-to-English conversion  
Ability to measure up to .0001" and 1/64th"  
Use Clearance Plug, Concentricity & Tapered Plug gages  
Read & understand WIP forms and blueprints  
Use plug gages  
Use straight plug  
Read & use gages

#### HORIZONTAL TURRET LATHE

Basic math  
Use plug gage  
Read & understand WIP  
Read blueprints  
Complete quality audit  
Use micrometer  
Use Vernier calipers  
Use Dial Bar Gage  
Use Depth Gage

#### SEIKI CNC NE LATHE

Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use depth scales  
Read/use Vernier Calipers  
Read/use gages

File: MACH.GEN  
Report: geroy

SEIKI CNC NEA LATHE  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use depth scales  
Read/use Vernier Calipers  
Read/use gages

WARNER SWAZY AC LATHE  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use depth scales  
Read/use Vernier Calipers  
Read/use gages

POTTER & JOHNSON CHUCKING LATHE  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use depth scales  
Read/use Vernier Calipers  
Read/use gages

HEALD BOREMATIC MILLING MACHINE MODEL 321-A  
Basic math and Trigonometry  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use depth and bar gages  
Read/use Vernier Calipers  
Read blueprints  
Able to measure to .0001" and 1/64th"  
Use clearance plug, concentricity, tapered plug gages  
Use straight plug gage  
Complete quality audit form  
DELTA 6 SPINDLE DRILL PRESS  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use scales  
Measure to .0001" and 1/64th"

File: MACH.GEN.  
Report: genoy

DELTOFF 12, 18, 36 GUN DRILLS  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use scales  
Measure to .0001" and 1/64th"

IR GUN DRILL  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use scales  
Measure to .0001" and 1/64th"

SANVIK EJECTOR DRILL  
Basic math  
Metric-to-English conversion  
Read/understand WIP  
Read/use micrometer  
Read/use scales  
Measure to .0001" and 1/64th"

OKATA CNC MILLING MACHINE  
Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages

BRIDGEPORT CNC MILLING MACHINE  
Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages.

File: MAC .TEN  
Report: geroy

#### CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages

#### BRIDGEPORT VERTICAL MILL MACHINE

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages

#### CINCINNATI RISE & FALL MILLING MACHINE

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages

#### DUPLEX-TWIN HEAD MILLING MACHINE

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers  
Triangulation (trigonometry)  
Read/use radius gages

#### K & T SERIES E B VERTICAL MILLING MACHINE W/ NC TAPE

Read/use blueprints, WIP  
Read/use location gages, indicators  
Read/use scales, micrometers



File: MACH.GEN

Report: geroy

K & T 180 4 AXIS W/ NC TAPE

Read/use blueprints, WIP

Read/use location gages, indicators

Read/use scales, micrometers

CINCINNATI 720 3 AXIS VMC W/ NC TAPE

Read/use blueprints, WIP

Read/use location gages,

Read/use scales, indicators, micrometers

K & T 1436 A DUPLEX MILLING MACHINE

Read/use blueprints, WIP

Read/use location gages,

Read/use scales, depth gages, indicators, micrometers

CINCINNATI 5 HORIZONTAL MILLING MACHINE

Read/use blueprints, WIP

Read/use location gages, Vernier calipers,

Read/use scales, depth gages, indicators, micrometers

CINCINNATI 2 HORIZONTAL MILLING MACHINE

Read/use blueprints, WIP

Read/use location gages

Read/use scales, depth gages, indicators, micrometers

File: MACH.GEN  
Report: gerov

SCHAFFNER RISE & FALL MILLING MACHINE

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use scales  
Measure to .0001" and 1/64th"

CINCINNATI 107/122 RISE & FALL MILLING MACHINE

Basic math  
Metric-to-English conversion  
Read/use scales  
Measure to .0001" and 1/64th"

BRIDGEPORT 4 AXIS VMC W/ CNC

Basic math  
Metric-to-English conversion  
Read/use gages  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers

ACROLOC 4 AXIS VMC W/ CNC

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers

OKATA VM 4 AXIS W/CNC

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use location gages, Vernier calipers,  
Read/use scales, depth gages, indicators, micrometers  
Measure to .0001" and 1/64th"  
Read/use inside micrometers

File: MACH.GEN

Report: geroy

#### CINCINNATI MONOSETT TOOL GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### KO SURFACE GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### DRILL GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### SURFACE GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### TAP GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

File: MACH.GEN  
Report: geroy

#### SINGLE POINT CARBIDE GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### BENCH GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### CAM GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist s handbook

#### LANDIS EXTERNAL GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### HEALD 271 GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
/use micrometers  
trigonometry  
machinist's handbook

File: MACH.GEN  
Report: geroy

HEALD PLAIN 222 GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

HEALD SIZEMATIC 272 GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

CINCINNATI 181 GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

EXTERNAL STEP MASTER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

OVERBECK

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

File: MACH.GEN  
Report: geroy

#### DIE GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### NORTON EXTERNAL GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" - 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### GARDNER DISK GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### CINCINNATI THROUGH FEED GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

#### LANDIS PLUNGE DRIVE GRINDER

Basic math  
Metric-to-English conversion  
Read/use blueprints, WIP  
Read/use Vernier calipers  
Read/use scales, depth gages, indicators  
Measure to .0001" and 1/64th"  
Read/use micrometers  
Use trigonometry  
Read machinist's handbook

File: MACH.GEN

Report: geroy

#### NORTON SURFACE GRINDER

Basic math

Metric-to-English conversion

Read/use blueprints, WIP

Read/use Vernier calipers

Read/use scales, depth gages, indicators

Measure to .0001" and 1/64th"

Read/use micrometers

Use trigonometry

Read machinist's handbook

#### SPIN FINISH

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### VIBRO

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### SWECO

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### BAF.REL MACHINE TUMBLE

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

File: MACH.GEN

Report: geroy

#### BIG WASH

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### DERUST WASH

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### SPRAY GUNS

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### POWDER COATING ROOM

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools

#### BUFFING LATHE

Basic math

Properties of polishing steel

Read/use blueprints

Read/comprehend WIP

Read/use gages

Use hand tools

Use air tools



File: MACH.GEN  
Report: geroy

DIE GRINDER

Basic math  
Properties of polishing steel  
Read/use blueprints  
Read/comprehend WIP  
Read/use gages  
Use hand tools  
Use air tools

DISC SANDER

Basic math  
Properties of polishing steel  
Read/use blueprints  
Read/comprehend WIP  
Read/use gages  
Use hand tools  
Use air tools

BETA MACHINE

Basic math  
Properties of polishing steel  
Read/use blueprints  
Read/comprehend WIP  
Read/use gages  
Use hand tools  
Use air tools

FLOAT SANDER

Basic math  
Properties of polishing steel  
Read/use blueprints  
Read/comprehend WIP  
Read/use gages  
Use hand tools  
Use air tools

DISC GRINDER

Basic math  
Properties of polishing steel  
Read/use blueprints  
Read/comprehend WIP  
Read/use gages  
Use hand tools  
Use air tools

SECTION VII  
SYSTEMS KNOWLEDGE ASSOCIATED  
WITH EACH MACHINE

What systems knowledge is required  
by each machine?

File: MACH.SYS  
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE  
Identify malfunction in machine  
Obtain service  
Obtain WIP, tooling & prints  
Adjust speed

TRANSFER LINE

Locate prints, tooling, and WIP  
Identify malfunction on machine  
Obtain service for machine

JONES & LAMSON

Locate prints, tooling, and WIP  
Identify malfunction on machine  
Obtain service for machine

MSD MACHINE

Locate prints, tooling, and WIP  
Identify malfunction on machine  
Obtain service for machine

MSD 5 STATION RTM

Locate prints, tooling, and WIP  
Identify malfunction on machine  
Obtain service for machine

File: MACH.SYS

Report: GEROY

9 STATION IN-LINE TRANSFER MACHINE

Locate prints, tooling, and WIP

Identify malfunction on machine

Obtain service for machine

HEALD BOREMATIC MILLING MACHINE MODEL 222

Check hydraulic oil level

Identify malfunction on machine

Obtain service for machine

Monitor air pressure

Monitor hydraulic oil

HEALD BOREMATIC MILLING MACHINE MODEL 324-A

Check hydraulic oil level

Identify malfunction on machine

Obtain service for machine

Monitor air pressure

Monitor hydraulic oil

HORIZONTAL TURRET LATHE

Check hydraulic oil level

Identify malfunction on machine

Obtain service for machine

Monitor air pressure

SEIKI CNC NE LATHE

Locate prints and tape

Identify malfunction on machine

Obtain service for machine

File: MACH.SYS  
Report: GERDY

SEIKI CNC NEA LATHE  
Locate prints and tape  
Identify malfunction on machine  
Obtain service for machine

WARNER SWAZY AC LATHE  
Locate prints and tape  
Identify malfunction on machine  
Obtain service for machine

POTTER & JOHNSON CHUCKING LATHE  
Locate prints and tape  
Identify malfunction on machine  
Obtain service for machine

HEALD BOREMATIC MILLING MACHINE MODEL 321-A  
Check hydraulic oil level  
Identify malfunction on machine  
Obtain service for machine  
Monitor air pressure  
Monitor hydraulic oil

DELTA 6 SPINDLE DRILL PRESS  
Monitor oil pressure

File: MACH.SYS

Report: GERDY

DELTOFF 12, 18, 36 GUN DRILLS

Monitor oil pressure

I. R. GUN DRILL

Monitor oil pressure

SANVIK EJECTOR DRILL PART

Monitor oil pressure

OKATA CNC MILLING MACHINE

Identify malfunction in machine

Obtain service for machine

Locate tape, print, WIP

Check hydraulic oil

BRIDGEPORT CNC MILLING MACHINE

Identify malfunction in machine

Obtain service for machine

Locate tape, print, WIP

Check hydraulic oil levels

File: MACH.SYS  
Report: GEROY

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP  
Check hydraulic oil levels

BRIDGEPORT VERTICAL MILLING MACHINE

Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP  
Check hydraulic oil levels

CINCINNATI RISE & FALL

Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP  
Check hydraulic oil levels

DUPLEX TWIN HEAD MILLING MACHINE

Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP  
Check hydraulic oil levels

K & T SERIES E B VERTICAL MILLING MACHINE

Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

File: MACH.SYS  
Report: GER0Y

K & T 1804 AXIS W/ NC TAPE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

CINCINNATI 720 3 AXIS VMC W/ NC TAPE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

K & T 1436 A DUPLEX MILL  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

CINCINNATI 5 HORIZONTAL MILLING MACHINE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

CINCINNATI 2 HORIZONTAL MILLING MACHINE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP



File: MACH.SYS  
Report: GEROY

SCHAFFNER RISE & FALL MILLING MACHINE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

CINCINNATI 107/122 RISE & FALL MILLING MACHINE  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP

BRIDGEPORT 4 AXIS VMC W/ CNC  
Identify malfunction in machine  
Obtain service for machine  
Locate tape, print, WIP  
Check hydraulic oil levels

ACROLOC 4 AXIS VMC W/CNC  
Check hydraulic oil  
Identify malfunction in machine  
Locate tape, print, WIP  
Obtain service for malfunction

OKATA VM 4 AXIS W/CNC  
Check hydraulic oil  
Identify malfunction in machine  
Locate tape, print, WIP

File: MACH.SYS  
Report: GER0Y

CINCINNATI MONOSETT TOOL GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

KD SURFACE GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

DRILL GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

SURFACE GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

TAP GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

File: MACH.SYS  
Report: GERDY

SINGLE POINT CARBIDE GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

BENCH GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

CAM GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

LANDIS EXTERNAL GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

HEALD 271 GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

File: MACH.SYS  
Report: GEROY

HEALD PLAIN 222 GRINDER

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

HEALD SIZEMATIC 272 GRINDER

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

CINCINNATI 181 GRINDER

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

EXTERNAL STEP MASTER

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

OVERBECK

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

File: MACH.SYS  
Report: GEROY

DIE GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

NORTON EXTERNAL GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

GARDNER DISK GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

CINCINNATI THROUGH FEED GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

LANDIS PLUNGE DRIVE GRINDER  
Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

File: MACH.SYS  
Report: GER0Y

NORTON SURFACE GRINDER

Locate prints  
Identify malfunction  
Obtain service  
Routine machine maintenance

SPIN FINISH

Routine machine maintenance  
Obtain service  
Identify malfunction  
Simple Drive system

VIBRO

Routine machine maintenance  
Obtain service  
Identify malfunction  
Simple Drive System

SWECO

Routine machine maintenance  
Obtain service  
Identify malfunction  
Simple Drive System

BARREL MACHINE TUMBLER

Routine machine maintenance  
Obtain service

File: MACH.SYS  
Report: GEROY

BIG WASH  
Routine machine maintenance  
Obtain service

DERUST WASH  
Routine machine maintenance  
Obtain service

SPRAY GUNS (PAINT BOOTH)  
Routine machine maintenance  
Obtain service

POWDER COATING ROOM  
Routine machine maintenance  
Obtain service

BUFFING LATHE  
Routine machine maintenance  
Obtain service

File: MACH.SYS  
Report: GEROY

DIE GRINDER  
Routine machine maintenance  
Obtain service

DISC SANDER  
Routine machine maintenance  
Obtain service

BETA MACHINE  
Routine machine maintenance  
Obtain service

FLOAT SANDER  
Routine machine maintenance  
Obtain service

DISC GRINDER  
Routine machine maintenance  
Obtain service



Project Number Three

**Maintenance, Manufacturing Cell, and Industrial  
Engineering/Product Engineering Training Needs  
Assessment Project**

August 1987

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**Volume 3**

**Section VIII - XI**

**Tasks**

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**The Pennsylvania State University**

Division of Counseling and Educational Psychology  
and Career Studies

**SECTION VIII**  
**GENERAL KNOWLEDGE ASSOCIATED**  
**WITH EACH TASK**

What general knowledge is required  
for each task?

File: TASK GEN  
Report: GERDY

TASK: OPERATE STANDARD END PLATE FINISHING LATHE

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height and flatness gages  
Read concentricity gages  
Read plug gages  
Use length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: OPERATE DRILL PRESS

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height and flatness gages  
Read concentricity gages  
Read plug gages  
Use length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: OPERATE BRIDGEPORT MILLING MACHINE

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height and flatness gages  
Read concentricity gages  
Read plug gages  
Use length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

File: TASK GEN  
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: SET UP STANDARD END PLATE FINISHING LATHE

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: SET UP DRILL PRESS

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: SET UP BRIDGEPORT MILLING MACHINE

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

File: TASK GEN  
Report: GEROY

TASK: OPERATE BRIDGEPORT MILLING MACHINE

Read blueprints  
Read/comprehend routing forms  
Read setup sheets  
Read manuals  
Read micrometers  
Read height gages  
Read flatness gages  
Read concentricity gages  
Read plug and length gages  
Metric-to-English conversion  
Measure up to .001"  
Measure up to 1/64"

TASK: SET UP SUNNEN HORIZONTAL HONE

Basic math skills  
Read WIP forms  
Read job cards  
Read prints  
Use plug gages

TASK: OPERATE SUNNEN HORIZONTAL HONE

Basic math skills  
Read WIP forms  
Read job cards  
Read prints  
Use plug gages

TASK: MAINTAIN CRIB SERVICE

Be able to complete various forms  
Perform basic math operations

File: TASK GEN  
Report: GEROY

TASK: MAINTAIN INVENTORY OF TOOLS  
Be able to complete various forms

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE KO SURFACE GRINDER  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE HEALD TOOL GRINDING MACHINE  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

File: TASK GEN  
Report: GEROY

TASK: OPERATE NORTON SURFACE GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE DRILL GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE SURFACE GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE HOB MACHINE

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

File: TASK GEN  
Report: GEROY

**TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE TAP GRINDER**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE THREAD CHASER**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE GLEASON CUTTER-SHAPER**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings



File: TASK GEN  
Report: GERDY

**TASK: OPERATE SINGLE POINT CARBIDE GRINDER**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE SUNNEN PRECISION HONING MACHINE**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE DRILL PRESS**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE MILLING MACHINES**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

File: TASK GEN  
Report: GERDY

TASK: OPERATE LATHE(S)

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE JIG BORE

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE SURFACE GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE BENCH GRINDERS

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

File: TASK GEN  
Report: GERDY

**TASK: OPERATE CONTOUR SAW**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: OPERATE CAM GRINDER**

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use Micrometers  
Use Vanier Calipers  
Use Johansson blocks  
Use comparator  
Use measuring wires  
Use Machinist's Handbook to determine correct angles/dimensions  
Read complicated prints and drawings

**TASK: SET UP LANDIS EXTERNAL GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

**TASK: OPERATE LANDIS EXTERNAL GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

File: TASK GEN  
Report: GEROY

TASK: SET UP NORTON EXTERNAL GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE NORTON EXTERNAL GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

File: TASK GEN  
Report: GERDY

TASK: SET UP CINCINNATI THRU FEED GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE CINCINNATI THRU FEED GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

File: TASK GEN  
Report: GEROY

TASK: SET UP HEALD MODEL 271 GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE HEALD MODEL 271 GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: SET UP HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: OPERATE HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

File: TASK GEN  
Report: GERDY

**TASK: SET UP CINCINNATI MODEL 181 GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

**TASK: OPERATE CINCINNATI MODEL 181 GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

**TASK: SET UP EXTERNAL STEPMASER GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

**TASK: OPERATE EXTERNAL STEPMASER GRINDER**

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

File: TASK GEN  
Report: GERDY

TASK: SET UP ROTARY VERTICAL SPINDLE

Basic skills math  
Read prints and drawings  
Use scales  
Use micrometers  
Use depth gages  
Use shadow gages  
Use radius gages  
Use flatness gages  
Measure to .0001"

TASK: ASSEMBLE COMPONENTS FOR TOOLS

Read manuals  
Understand torque pressures  
Read prints  
Read assembly orders  
Read Vernier micrometers  
Read micrometers

TASK: OPERATE ROBOT TEST CELL

Basic mathematics  
Basic programming  
Read complex service manuals  
Enter information into a log  
Read Vernier calipers  
Read micrometers

TASK: STAMP IDENTIFICATION NUMBER ON PARTS

Read WIP Forms  
Read Blueprints  
Use Location Gages



File: TASK GEN  
Report: GERDY

TASK: OPERATE ROLL STAMP  
Read WIP Forms  
Read Blueprints  
Use Location Gages

TASK: OPERATE POWER PRESS  
Read WIP Forms  
Read Blueprints  
Use Location Gages

TASK: ASSEMBLE TWO OR MORE PARTS  
Read WIP Forms  
Read Blueprints  
Use Location Gages

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE  
Basic Math skills  
Trigonometry  
Ability to measure up to .0001"  
Ability to measure up to 1/64"  
Metric to English conversion  
Use clearance plug gages  
Use concentricity gages  
Use tapered plug gages  
Read and comprehend WIP forms  
Read blueprints  
Use straight plug

File: TASK GEN  
Report: GEROY

TASK: OPERATE STANDARD HEALD BOREMATIC MACHINE

Basic Math skills  
Trigonometry  
Ability to measure up to .0001"  
Ability to measure up to 1/64"  
Metric to English conversion  
Use clearance plug gages  
Use concentricity gages  
Use tapered plug gages  
Read and comprehend WIP forms  
Read blueprints  
Use straight plug

TASK: SET UP HEALD BOREMATIC PIN MACHINE

Basic Math skills  
Trigonometry  
Ability to measure up to .0001"  
Ability to measure up to 1/64"  
Metric to English conversion  
Use clearance plug gages  
Use concentricity gages  
Use tapered plug gages  
Read and comprehend WIP forms  
Read blueprints  
Use straight plug

TASK: OPERATE HEALD BOREMATIC PIN MACHINE

Basic Math skills  
Trigonometry  
Ability to measure up to .0001"  
Ability to measure up to 1/64"  
Metric to English conversion  
Use clearance plug gages  
Use concentricity gages  
Use tapered plug gages  
Read and comprehend WIP forms  
Read blueprints  
Use straight plug

TASK: SET UP TRANSFER MACHINE

Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

File: TASK GEN  
Report: GEROY

TASK: OPERATE TRANSFER MACHINE

Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

TASK: SET UP JONES AND LAMSON ATL

Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

TASK: OPERATE JONES AND LAMSON ATL

Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

TASK: SET UP MSO MACHINE

Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

File: TASK GEN  
Report: GERDY

TASK: OPERATE MSO MACHINE  
Basic Math  
Metric-to-English conversion  
Use micrometers  
Use and locate gages  
Read blueprints  
Read WIP forms  
Use panel gages  
Use Hex center gage  
Use plug gage  
Use Vernier calipers

TASK: OPERATE FURNACE  
Basic math  
Read blueprints  
Read circular chart  
Use Rockwell Hardness tester  
Read WIP forms  
Read Work Cards

TASK: OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE  
Basic math  
Read timers  
Set controls

TASK: OPERATE BLACK OXIDE LINE  
Basic math  
Read timers  
Set controls

File: TASK GEN  
Report: GERDY

TASK: OPERATE STRAIGHTENING PRESS  
Basic math  
Read timers  
Set controls

TASK: OPERATE LAPPING MACHINE  
Basic math  
Read timers  
Set controls

TASK: OPERATE FORGE FURNACE  
Basic math  
Read blueprints  
Use scales  
Use slip gages  
Read WIP forms  
Read Work Cards

TASK: OPERATE UPSET HAMMER  
Basic math  
Read blueprints  
Use scales  
Use slip gages  
Read WIP forms  
Read Work Cards

File: TASK GEN  
Report: GERDY

TASK: OPERATE RICHARD'S BENDER

Basic math  
Read blueprints  
Use scales  
Use slip gages  
Read WIP forms  
Read Work Cards

TASK: SET UP POTTER & JOHNSON AC

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: OPERATE POTTER & JOHNSON AC

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

File: TASK GEN  
Report: GERDY

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: OPERATE WARNER SWAZY AC LATHE

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE

Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

File: TASK GEN  
Report: GERDY

TASK: SET UP WARNER SWAZY AC LATHE  
Basic math  
Metric-to-English conversion  
Read WIP Routing forms  
Use micrometers  
Use depth scales  
Use Vernier calipers  
Use gages

TASK: SET UP 4-6 SPINDLE GANG DRILL  
Blueprint reading  
Use scales  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001"  
Read WIP cards

TASK: OPERATE 4-6 SPINDLE GANG DRILL  
Blueprint reading  
Use scales  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001"  
Read WIP cards

TASK: SHARPEN DRILLS  
Blueprint reading  
Use scales  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001"  
Read WIP cards  
Use scales  
Pipe gages



File: TASK GEN  
Report: GERDY

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: SET UP RADIAL DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: OPERATE RADIAL DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

File: TASK GEN  
Report: GEROY

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: SETUP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS

Blueprint reading  
Read WIP cards  
Use micrometer  
Fixed gages:Thread plugs  
Measurements to .001" and 1/64"  
Use Vernier calipers  
Use scales  
Pipe gages

File: TASK GEN  
Report: GEROY

TASK: OPERATE AN OKATA CNC MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: OPERATE A BRIDGEPORT CNC MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: SET UP AN OKATA CNC MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms  
Understanding of trigonometry

TASK: SET UP A BRIDGEPORT CNC MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms  
Understanding of trigonometry

File: TASK GEN  
Report: GERDY

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE

Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

File: TASK GEN  
Report: GERDY

TASK: SET UP CINCINNATI RISE AND FALL  
Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: OPERATE CINCINNATI RISE AND FALL  
Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: SET UP DUPLEX-TWIN MILL  
Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

TASK: OPERATE DUPLEX-TWIN MILL  
Basic math skills  
Ability to measure up to .0001" and 1/64"  
Metric-to-English conversions  
Use scales  
Use depth and radius gages  
Use indicators  
Use location gages  
Use micrometers and Vernier calipers  
Read blueprints  
Read and comprehend WIP routing forms

File: TASK GEN  
Report: GERDY

TASK: SET UP MILWAUKEE MATIC EB  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE MILWAUKEE MATIC EB  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: SET UP CNC MACHINE LATHE  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE CNC MACHINE LATHE  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

File: TASK GEN  
Report: GER0Y

TASK: SET UP CNC COMBI-LATHE

Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE CNC COMBI-LATHE

Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: SET UP K & T 180

Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE K & T 180

Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

File: TASK GEN  
Report: GEROY

TASK: SET UP SCIMMX  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE SCIMMX  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: SET UP DO ALL SAW  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE DO ALL SAW  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals



File: TASK GEN  
Report: GEROY

TASK: SET UP A LINES LATHE  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE A LINES LATHE  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: SET UP SEIKI LATHE(S)  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

TASK: OPERATE SEIKI LATHE(S)  
Basic math  
Measurement up to .0001"  
Read blueprints  
Read WIP Routing Form  
Read Machine Manuals

File: TASK GEN  
Report: GEROY

TASK: SET UP WAGNER SAW  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE WAGNER SAW  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: SET UP BARBER COLEMAN Hobb-GEAR MAKING MACHINE  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE BARBER COLEMAN Hobb-GEAR MAKING MACHINE  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

File: TASK GEN  
Report: GEROY

TASK: SET UP ANVILL MILL

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE ANVILL MILL

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: SET UP VERTICAL BROACHES

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE VERTICAL BROACHES

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

File: TASK GEN  
Report: GERDY

TASK:SET UP MSO MACHINE

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE MSO MACHINE

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: SET UP BURKE TWIN MILL

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE BURKE TWIN MILL

Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

File: TASK GEN  
Report: GERDY

TASK: OPERATE VIBRO  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: OPERATE OVERBECK GRINDER  
Basic math skills  
Use Co-Planer gages  
Use Center Line gages  
Use Micrometers  
Use Vernier Calipers  
Read WIP forms  
Read blueprints

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES  
Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES  
Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"

File: TASK GEN  
Report: GERDY

TASK: SET UP AUTOMATIC SCREW MACHINES

Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"

TASK: OPERATE AUTOMATIC SCREW MACHINES

Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"

TASK: SET UP GEAR SHAPER

Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"  
Read machinist's handbook for formulas  
Use ruler

TASK: OPERATE GEAR SHAPER

Basic math skills  
Use micrometers  
Read WIP forms  
Read blueprints  
Measure up to .001"  
Read Machinist's handbook for formulas  
Use ruler

File: TASK GEN  
Report: GERDY

TASK: OPERATE SWECO  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE A BARREL MACHINE TUMBLER  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE A BIG WASH  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE A DERUST WASH  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

File: TASK GEN  
Report: GERDY

TASK: OPERATE SPRAY GUNS  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE POWDER COATING ROOM  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE SPIN FINISH MACHINE  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE POLISHER LATHE  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms



File: TASK GEN  
Report: GERDY

TASK: OPERATE DIE GRINDER  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE DISC SANDER  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE BETA MACHINE  
Basic addition  
Percentages  
Decimals  
Read WIP routing forms

TASK: OPERATE FLOAT SANDER  
Basic addition  
Percentages  
Decimals  
Read WIF routing forms

**SECTION IX**  
**SYSTEMS KNOWLEDGE ASSOCIATED  
WITH EACH TASK**

**What systems knowledge is  
required for each task?**

File: TASK SYS  
Report: GERDY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: OPERATE STANDARD END PLATE FINISHING LATHE  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: OPERATE DRILL PRESS  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: OPERATE BRIDGEPORT MILLING MACHINE  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: SET UP SEIKI AUTOMATIC TURRET MACHINE(S)  
Locate prints  
Locate tape  
Identify problems with the machine  
Obtain service for the machine

File: TASK SYS  
Report: GERDY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: SET UP STANDARD END PLATE FINISHING LATHE  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: SET UP DRILL PRESS  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: OPERATE DRILL PRESS  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: SET UP BRIDGE/PORT MILLING MACHINE  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

File: TASK SY~  
Report: GEROY

TASK: OPERATE BRIDGEPORT MILLING MACHINE  
Identify malfunction system on the machine  
Obtain service for the machine  
Maintain proper oil levels  
Locate prints  
Locate WIP forms

TASK: SET UP SUNNEN HORIZONTAL HONE  
Identify problems with machine  
Know where to obtain plug gaging  
Obtain service for machine  
Know how to replace stone on machine

TASK: OPERATE SUNNEN HORIZONTAL HONE  
Identify problems with machine  
Know where to obtain plug gaging  
Obtain service for machine  
Know how to replace stone on machine

TASK: MAINTAIN CRIB SERVICE  
Locate tools in the plant  
Locate gages and scrap material in the plant  
Requisition tools

TASK: MAINTAIN INVENTORY OF TOOLS  
Know which forms are used for ordering tools

File: TASK SYS  
Report: GERDY

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE KO SURFACE GRINDER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE HEALD TOOL GRINDING MACHINE  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE NORTON SURFACE GRINDER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE DRILL GRINDER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

File: TASK SYS  
Report: GERDY

TASK: OPERATE SURFACE GRINDER

Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE HOB MACHINE

Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE

Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE TAP GRINDER

Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE THREAD CHASER

Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

File: TASK SYS  
Report: GERDY

TASK: OPERATE GLEASON CUTTER-SHAPER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE SINGLE POINT CARBIDE GRINDER  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE SUNNEN PRECISION HONING MACHINE  
Identify malfunctioning systems on the machine  
Obtain service for machine  
Locate prints  
Know the intended purpose of the workpiece

TASK: OPERATE DRILL PRESS  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE MILLING MACHINE  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece



File: TASK SYS  
Report: GERDY

TASK: OPERATE LATHE

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE VERTICAL SHAPER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE JIG BORE

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE JIG GRINDER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE SURFACE GRINDER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

File: TASK SYS  
Report: GERDY

TASK: OPERATE CAM GRINDER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE BENCH GRINDERS

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: OPERATE CONTOUR SAW

Identify malfunctioning systems of the machine  
Obtain service for machine  
Locate parts  
Know the intended purpose of the workpiece

TASK: SET UP LANDIS EXTERNAL GRINDER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE LANDIS EXTERNAL GRINDER

Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

File: TASK SYS  
Report: GERDY

TASK: SET UP NORTON EXTERNAL GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE NORTON EXTERNAL GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP CINCINNATI THRU FEEDER GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

File: TASK SYS  
Report: GERCY

TASK: OPERATE CINCINNATI THRU FEED GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP HEALD MODEL 271 GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE HEALD MODEL 271 GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

File: TASK SYS  
Report: GEROY

TASK: SET UP HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER  
Identify malfunctioning systems of the machine.  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP CINCINNATI MODEL 181 GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE CINCINNATI MODEL 181 GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP EXTERNAL STEPMASER GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

File: TASK SYS  
Report: GERDY

TASK: OPERATE EXTERNAL STEPMASER GRINDER  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: SET UP ROTARY VERTICAL SPINDLE  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: OPERATE ROTARY VERTICAL SPINDLE  
Identify malfunctioning systems of the machine  
Obtain service for machine  
Know when to replace grinding wheel  
Know how to replace grinding wheel

TASK: ASSEMBLE COMPONENTS FOR TOOLS  
Know where to obtain assembly orders  
Know where to send improper parts

TASK: OPERATE ROBOT TEST CELL  
Monitor equipment for proper settings  
Monitor equipment for proper operation  
Adjust equipment if necessary

File: TASK SYS  
Report: GERDY

TASK: STAMP IDENTIFICATION NUMBER ON PARTS  
None

TASK: OPERATE ROLL STAMP  
Identify problems with equipment  
Obtain service for equipment

TASK: OPERATE POWER PRESS  
Identify problems with equipment  
Obtain service for equipment

TASK: ASSEMBLE TWO OR MORE PARTS  
none

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE  
Check hydraulic oil level  
Identify malfunctioning system on machine  
Obtain service for machine  
Monitor air pressure on machine  
Monitor hydraulic oil pressures

File: TASK SYS  
Report: GERDY

TASK: OPERATE STANDARD HEALD BOREMATIC MACHINE

Check hydraulic oil level  
Identify malfunctioning system on machine  
Obtain service for machine  
Monitor air pressure on machine  
Monitor hydraulic oil pressures

TASK: SET UP HEALD BOREMATIC PIN MACHINE

Check hydraulic oil level  
Identify malfunctioning system on machine  
Obtain service for machine  
Monitor air pressure on machine  
Monitor hydraulic oil pressures

TASK: OPERATE HEALD BOREMATIC PIN MACHINE

Check hydraulic oil level  
Identify malfunctioning system on machine  
Obtain service for machine  
Monitor air pressure on machine  
Monitor hydraulic oil pressures

TASK: SET UP TRANSFER MACHINE

Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine

TASK: OPERATE TRANSFER MACHINE

Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine



File: TASK SYS  
Report: GERDY

TASK: SET UP JONES AND LAMSON ATL  
Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine

TASK: OPERATE JONES AND LAMSON ATL  
Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine

TASK: SET UP MSO MACHINE  
Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine

TASK: OPERATE MSO MACHINE  
Know where to obtain WIP, tooling and prints  
ID problems with machine  
Obtain service for machine

TASK: OPERATE FURNACE  
Know how to set computer controls  
Know how to set manual instruments  
Identif; problems with equipment  
Obtain service for equipment

File: TASK SYS  
Report: GERDY

TASK: OPERATE FORGE FURNACE  
Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

TASK: OPERATE UPSET HAMMER  
Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

TASK: OPERATE RICHARD'S BENDER  
Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

TASK: OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE  
Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

TASK: OPERATE BLACK OXIDE LINE  
Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

File: TASK SYS  
Report: GERDY

**TASK: OPERATE STRAIGHTENING PRESS**

Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

**TASK: OPERATE LAPPING MACHINE**

Identify problems with equipment  
Requisition service for equipment  
Know where to obtain WIP  
Know where to obtain job cards  
Know how to adjust equipment for proper temperatures

**TASK: SET UP POTTER & JOHNSON AC**

Locate prints  
Locate tape  
Identify problems with the machine  
Obtain service for the machine

**TASK: OPERATE POTTER & JOHNSON AC**

Locate prints  
Locate tape  
Identify problems with the machine  
Obtain service for the machine

**TASK: SET UP SEIKI MODEL 4 NE CNC LATHE**

Locate prints  
Locate tape  
Identify problems with the machine  
Obtain service for the machine

File: TASK SYS

Report: GEROY

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE

Locate prints

Locate tape

Identify problems with the machine

Obtain service for the machine

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE

Locate prints

Locate tape

Identify problems with the machine

Obtain service for the machine

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE

Locate prints

Locate tape

Identify problems with the machine

Obtain service for the machine

TASK: SET UP WARNER SWAZY AC LATHE

Locate prints

Locate tape

Identify problems with the machine

Obtain service for the machine

TASK: OPERATE WARNER SWAZY AC LATHE

Locate prints

Locate tape

Identify problems with the machine

Obtain service for the machine

File: TASK SYS  
Report: GERDY

**TASK: SET UP 4-6 SPINDLE GANG DRILL**

Identify problems with machines  
Obtain service for machine  
How to obtain WIP forms, tooling, prints  
How to adjust machine for correct speed

**TASK: OPERATE 4-6 SPINDLE GANG DRILL**

Identify problems with machines  
Obtain service for machines  
How to obtain blueprints, WIP, tooling  
How to adjust machines for correct speed

**TASK: SHARPEN DRILL**

Identify problems with machines  
Obtain service for machines  
How to obtain WIP forms, Tooling, and blueprints  
How to adjust machines for correct speed

**TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE**

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

**TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE**

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

File: TASK SYS  
Report: GEROY

TASK: SET UP RADIAL DRILL PRESS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

TASK: OPERATE RADIAL DRILL PRESS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

TASK: SET-UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

File: TASK SYS  
Report: GERDY

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
How to adjust machines for correct speeds

TASK: OPERATE A CNC OKATA MILLING MACHINE

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: OPERATE A CNC BRIDGEPORT MILLING MACHINE

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP A CNC OKATA MILLING MACHINE

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP A CNC BRIDGEPORT MILLING MACHINE

Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

File: TASK SYS  
Report: GEROY

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: OPERATE HORIZONTAL/VERTICAL MILLING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP CINCINNATI RISE AND FALL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil



File: TASK SYS  
Report: GERDY

TASK: OPERATE CINCINNATI RISE AND FALL-ROLLERS  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP DUPLEX-TWIN MILL MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: OPERATE DUPLEX-TWIN MILL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil

TASK: SET UP MILWAUKEE EB  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lube and oil machine

TASK: OPERATE MILWAUKEE MATIC EB  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

File: TASK SYS  
Report: GERDY

TASK: SET UP CNC MACHINE LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: OPERATE CNC MACHINE LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: SET UP CNC COMBI-LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: OPERATE CNC COMBI-LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: SET UP K & T 180  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

File: TASK SYS  
Report: GERDY

TASK: OPERATE K & T 180  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: SET UP SCIMMX  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: OPERATE SCIMMX  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: SET UP DO ALL SAW  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: OPERATE DO ALL SAW  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

File: TASK SYS  
Report: GERDY

TASK: SET UP A LINES LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: OPERATE A LINES LATHE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints  
Check hydraulic oil  
Locate gaging  
Monitor oil levels  
Lub and oil machine

TASK: SET UP WAGNER SAW  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE WAGNER SAW  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP BARBER COLEMAN HOB-GEAR MAKING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

File: TASK SYS  
Report: GERDY

TASK: OPERATE BARBER COLEMAN HOBBS-GEAR MAKING MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP ANVILL MILL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE ANVILL MILL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP VERTICAL BROACH  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE VERTICAL BROACH  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

File: TASK SYS  
Report: GERDY

TASK: SET UP MSO MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE MSO MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP BURKE TWIN MILL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE BURKE TWIN MILL  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE VIBRO  
Identify problems with machines  
Obtain service for machines

File: TASK SYS  
Report: GERDY

TASK: OPERATE OVERBECK GRINDER  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP GEAR SHAPER  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE GEAR SHAPER  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

File: TASK SYS  
Report: GERDY

TASK: SET UP AUTOMATIC SCREW MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE AUTOMATIC SCREW MACHINE  
Identify problems with machines  
Obtain service for machines  
How to obtain WIP, tooling, and blueprints

TASK: OPERATE A SWECO  
Know how to adjust weights, timing, roll, feed,  
Know how to adjust amplitude, compounds and water pressure  
Identify problems with machine

TASK: OPERATE A BARREL MACHINE TUMBLER  
Know how to adjust weights, timing, roll, feed,  
Know how to adjust amplitude, compounds and water pressure  
Identify problems with machine

TASK: OPERATE A BIG WASH  
Know how to adjust weights, timing, roll, feed,  
Know how to adjust amplitude, compounds and water pressure  
Identify problems with machine



File: TASK SYS  
Report: GERQY

**TASK: OPERATE A DERUST WASH**

Know how to adjust weights, timing, roll, feed,  
Know how to adjust amplitude, compounds and water pressure  
Identify problems with machine

**TASK: OPERATE A SPIN FINISH MACHINE**

Identify malfunctioning motor bearings, belts, and air pump in machine

**TASK: OPERATE PAINT BOOTH**

Know where to obtain powder coatings  
Know how to clean powder coating container  
Know how to clean spray gun

**TASK: OPERATE POWDER COATING ROOM**

Identify problems with the powder coating equipment  
Requisition service for the Powder Coating Room

**TASK: OPERATE BUFFING LATHE**

Know when to replace wheels  
Adjust belts  
Identify malfunctioning system on machine  
Requisition service for machine  
Identify type of wheel to use

File: TASK SYS  
Report: GERDY

TASK: OPERATE DIE GRINDER

Know when to replace wheels  
Adjust belts  
Identify malfunctioning system on machine  
Requisition service for machine  
Identify type of wheels to use

TASK: OPERATE DISC SANDER

Must know when to replace sandpaper  
Identify problems with machine  
Requisition service for machine

TASK: OPERATE BETA MACHINE

Obtain WIP form  
Select grinding wheel  
Attach grinding wheel  
Adjust machine  
Run

TASK: OPERATE FLOAT SANDER

Must know when to replace sandpaper  
Identify problems with the machine  
Requisition service for the machine

**SECTION X**  
**TECHNICAL KNOWLEDGE ASSOCIATED**  
**WITH EACH TASK**

**What technical knowledge is**  
**required by each task?**

File: TASK TECH  
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE  
None

TASK: OPERATE STANDARD ENDPLATE FINISHING LATHE  
None

TASK: OPERATE DRILL PRESS  
None

TASK: OPERATE BRIDGEPORT MILLING MACHINE  
None

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE  
None

File: TASK TECH  
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE  
None

TASK: SET UP DRILL PRESS  
None

TASK: OPERATE DRILL PRESS  
None

TASK: SET UP BRIDGEPORT MILLING MACHINE  
None

TASK: OPERATE BRIDGEPORT MILLING MACHINE  
None

File: TASK TECH  
Report: GEROY

TASK: SET UP SUNNEN HORIZONTAL HONE  
None

TASK: OPERATE SUNNEN HORIZONTAL HONE  
none

TASK: MAINTAIN CRIB SERVICE  
Must know which tools are used in various areas of the plant

TASK: MAINTAIN INVENTORY OF TOOLS  
none

TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER  
Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

File: TASK TECH  
Report: GEROY

**TASK: OPERATE KO SURFACE GRINDER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE HEALD TOOL GRINDING MACHINE**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE NORTON SURFACE GRINDER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE DRILL MACHINE**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE SURFACE GRINDER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

File: TASK TECH  
Report: GEROY

**TASK: OPERATE HOB MACHINE**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE TAP GRINDER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE THREAD CHASER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

**TASK: OPERATE GLEASON CUTTER-SHAPER**

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide



File: TASK TECH  
Report: GEROY

TASK: OPERATE SINGLE POINT CARBIDE GRINDER

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

TASK: OPERATE SUNNEN PRECISION HONING MACHINE

Understand the expansion/contracting properties of metals  
Understand the cutting qualities of various metals  
Understand the grinding qualities of steel and carbide  
Understand the polishing qualities of steel and carbide

TASK: OPERATE

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

TASK: OPERATE DRILL PRESS

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

TASK: OPERATE MILLING MACHINES

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

File: TASK TECH  
Report: GERDY

**TASK: OPERATE LATHE**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE JIG BORE**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE SURFACE GRINDER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE BENCH GRINDERS**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE CONTOUR SAW**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

File: TASK TECH  
Report: GEROY

**TASK: OPERATE VERTICAL SHAPER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE CAM GRINDER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: SET UP LANDIS EXTERNAL GRINDER**

Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

**TASK: OPERATE LANDIS EXTERNAL GRINDER**

Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

**TASK: SET UP NORTON EXTERNAL GRINDER**

Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GEROY

TASK: OPERATE NORTON EXTERNAL GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL.

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI THRU FEED GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI THRU FEED GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GEROY

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 271 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 271 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 272 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GERDY

TASK: OPERATE HEALD MODEL 272 GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI MODEL 181 GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI MODEL 181 GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP EXTERNAL STEPMASER GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE EXTERNAL STEPMASER GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GERDY

TASK: SET UP ROTARY VERTICAL SPINDLE  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE ROTARY VERTICAL SPINDLE  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: ASSEMBLE COMPONENTS FOR TOOLS  
None

TASK: OPERATE ROBOT TEST CELL  
Know how to service and maintain mechanical robot

TASK: STAMP IDENTIFICATION NUMBER ON PARTS  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE ROLL STAMP  
none

TASK: OPERATE POWER PRESS  
none

TASK: ASSEMBLE TWO OR MORE PARTS  
none

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE  
none

TASK: OPERATE A HEALD BORE MATIC MILLING MACHINE MODEL 222  
none



File: TASK TECH  
Report: GERDY

TASK: SET UP HEALD BOREMATIC PIN MACHINE  
none

TASK: OPERATE HEALD BOREMATIC PIN MACHINE  
none

TASK: SET UP HORIZONTAL TURRET LATHE  
none

TASK: OPERATE HORIZONTAL TURRET LATHE  
none

TASK: SET UP TRANSFER MACHINE  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE TRANSFER MACHINE  
none

TASK: SET UP JONES AND LAMSON ATL  
none

TASK: OPERATE JONES AND LAMSON ATL  
none

TASK: SET UP MSO  
none

TASK: OPERATE MSO  
none

File: TASK TECH  
Report: GEROY

TASK: OPERATE FURNACE  
none

TASK: OPERATE FORGE FURNACE  
Must understand the tempering properties of steel

TASK: OPERATE UPSET HAMMER  
Must understand the tempering properties of steel

TASK: OPERATE RICHARD'S BENDER  
Must understand the tempering properties of steel

TASK: OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE  
Must understand the tempering properties of steel

File: TASK TECH  
Report: GEROY

TASK: OPERATE BLACK OXIDE LINE  
Must understand the tempering properties of steel

TASK: OPERATE STRAIGHTENING PRESS  
Must understand the tempering properties of steel

TASK: OPERATE LAPPING MACHINE  
Must understand the tempering properties of steel

TASK: SET UP POTTER & JOHNSON AC  
none

TASK: OPERATE POTTER & JOHNSON AC  
none

File: TASK TECH  
Report: GERDY

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE  
none

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE  
none

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE  
none

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE  
none

TASK: SET UP WARNER SWAZY AC LATHE  
none

File: TASK TECH  
Report: GEROY

TASK: OPERATE WARNER SWAZY AC LATHE  
none

TASK: SET UP 4-6 SPINDLE GANG DRILL  
none

TASK: OPERATE 4-6 SPINDLE GANG DRILL  
none

TASK: SHARPEN TOOLS  
none

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE  
none

TASK: SET UP RADIAL DRILL PRESS  
none

TASK: OPERATE RADIAL DRILL PRESS  
none

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS  
none

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS  
none

File: TASK TECH  
Report: GERDY

TASK: SET UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS  
none

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS  
none

TASK: OPERATE CNC OKATA MILLING MACHINE  
none

TASK: OPERATE CNC BRIDGEPORT MILLING MACHINE  
none

TASK: SET UP CNC OKATA MILLING MACHINE  
Understand basic principals of CNC programming



File: TASK TECH  
Report: GERDY

TASK: SET UP CNC BRIDGEPORT MILLING MACHINE  
Understand basic principals of CNC programming

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE  
none

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE  
none

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE  
none

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE  
none

File: TASK TECH  
Report: GERDY

TASK: SET UP CINCINNATI RISE AND FALL  
none

TASK: OPERATE CINCINNATI RISE AND FALL  
none

TASK: SET UP DUPLEX-TWIN MILL  
none

TASK: OPERATE DUPLEX-TWIN MILL  
none

TASK: SET UP MILWAUKEE MATIC EB  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE MILWAUKEE MATIC EB  
none

TASK: SET UP CNC MACHINE LATHE  
none

TASK: OPERATE CNC MACHINE LATHE  
none

TASK: SET UP CNC COMBI-LATHE  
none

TASK: OPERATE CNC COMBI-LATHE  
none

File: TASK TECH  
Report: GEROY

TASK: SET UP K & T 180 INDEXES  
none

TASK: OPERATE K & T 180 INDEXES  
none

TASK: SET UP SCIMMX  
none

TASK: OPERATE SCIMMX  
none

TASK: SET UP DO ALL SAW  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE DO ALL SAW  
none

TASK: SET UP A LINES LATHE  
none

TASK: OPERATE A LINES LATHE  
none

TASK: SET UP WAGNER SAW  
none

TASK: OPERATE WAGNER SAW  
none

File: TASK TECH  
Report: GEROY

TASK: SET UP BARBER COLEMAN Hobb-GEAR MAKING MACHINE  
none

TASK: OPERATE BARBER COLEMAN Hobb-GEAR MAKING MACHINE  
none

TASK: SET UP ANVILL MILL  
none

TASK: OPERATE ANVILL MILL  
none

TASK: SET UP VERTICAL BROACHES  
none

File: TASK TECH  
Report: GEROY

TASK: OPERATE VERTICAL BROACHES  
none

TASK: SET UP MSO MACHINE  
none

TASK: OPERATE MSO MACHINE  
none

TASK: SET UP BURKE TWIN MILL  
none

TASK: OPERATE BURKE TWIN MILL  
none

File: TASK TECH  
Report: GEROY

TASK: OPERATE VIBRO  
none

TASK: OPERATE OVERBECK GRINDER  
none

TASK: SET UP GEAR SHAPER  
none

TASK: OPERATE GEAR SHAPER  
none

TASK: SET UP ENGINE LATHES  
none



File: TASK TECH  
Report: GERDY

TASK: OPERATE ENGINE LATHES  
none

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES  
none

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES  
none

TASK: SET UP AUTOMATIC SCREW MACHINE  
none

TASK: OPERATE AUTOMATIC SCREW MACHINE  
none

File: TASK TECH  
Report: GERDY

TASK: OPERATE BUFFING LATHE  
Understand the polishing properties of steel

TASK: OPERATE DIE GRINDER  
Understand the polishing properties of steel

TASK: OPERATE DISC SANDER  
Understand the polishing properties of steel

TASK: OPERATE BETA MACHINE  
Understand the polishing properties of steel

TASK: OPERATE FLOAT SANDER  
Understand the polishing properties of steel

File: TASK TECH  
Report: GERDY

TASK: OPERATE SPRAY GUNS  
Understand the polishing properties of steel

TASK: OPERATE POWDER COATING ROOM  
Understand the polishing properties of steel

TASK: OPERATE SPIN FINISH MACHINE  
Understand the polishing properties of steel  
Understand the various media used in the Spin machine

TASK: OPERATE SWECO  
Understand the polishing properties of steel

TASK: OPERATE A BARREL MACHINE TUMBLER  
Understand the polishing properties of steel

File: TASK TECH  
Report: GERDY

TASK: OPERATE A PARTS WASHER  
Understand the polishing properties of steel

TASK: OPERATE A DERUST WASH  
Understand the polishing properties of steel

TASK:

TASK: SET UP HEALD MODEL 272 SIZEMATIC GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 272 SIZEMATIC GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

**SECTION XI**  
**PROCEDURAL KNOWLEDGE ASSOCIATED**  
**WITH EACH TASK**

**What procedural knowledge is**  
**required by each task?**

File: TASK PROCDR  
Report: GER0Y

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE  
Run  
Unload  
Inspect  
Readjust

TASK: OPERATE STANDARD END PLATE FINISHING LATHE  
Run  
Unload  
Inspect  
Readjust, if necessary

TASK: OPERATE DRILL PRESS  
Run  
Unload  
Inspect  
Readjust, if necessary

TASK: OPERATE BRIDGEPORT MILLING MACHINE  
Run  
Unload  
Inspect  
Readjust, if necessary

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)  
Obtain tooling and prints  
Set-up sheets, gages and tape control  
Adjust and calibrate machine  
Install tape  
Run  
Inspect for quality

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)  
Run  
Unload  
Inspect  
Readjust (if necessary)

TASK: SET UP STANDARD END PLATE FINISHING LATHE  
Obtain tooling and prints  
Obtain setup sheets  
Obtain gages  
Adjust and calibrate  
Run a job  
Inspect for quality

TASK: OPERATE STANDARD END PLATE FINISHING LATHE  
Run  
Unload  
Inspect  
Readjust, if necessary

TASK: SET UP DRILL PRESS  
Obtain tooling and prints  
Obtain set up sheets  
Obtain gages  
Adjust and calibrate machine  
Run a job  
Inspect for quality

TASK: OPERATE DRILL PRESS  
Run  
Unload  
Inspect  
Readjust, if necessary

File: TASK PROCDR  
Report: GERDY

TASK: SET UP BRIDGEPORT MILLING MACHINE

Obtain tooling and prints  
Obtain gages  
Obtain set up sheets  
Adjust and calibrate machine  
Run a job  
Inspect for quality

TASK: OPERATE BRIDGEPORT MILLING MACHINE

Run  
Unload  
Inspect  
Readjust, if necessary

TASK: SET UP SUNNEN HORIZONTAL HONE

Obtain WIP forms  
Obtain gaging  
Select proper mandrel and honing stone  
Inspect stone  
Replace stone if necessary  
Run  
Inspect  
Readjust if necessary

TASK: OPERATE SUNNEN HORIZONTAL HONE

Load part  
Run  
Unload part  
Inspect for quality  
Readjust if necessary  
Replace stone, if necessary

TASK: MAINTAIN CRIB SERVICE

Dispense and monitor tool signout



File: TASK PROCDR  
Report: GERDY

TAF MAINTAIN INVENTORY OF TOOLS  
Identify which tools are needed  
Complete a requisition for required tools  
Submit a requisition

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE KO SURFACE GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE HEALD TOOL GRINDING MACHINE

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE NORTON SURFACE GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE DRILL GRINDER  
Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE SURFACE GRINDER  
Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE HOB MACHINE  
Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE  
Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE TAP GRINDER  
Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE THREAD CHASER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE GLEASON CUTTER-SHAPER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE SINGLE-POINT CARBIDE GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE SUNNEN PRECISION HONING MACHINE

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate machine  
Run  
Inspect

TASK: OPERATE DRILL PRESS

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE MILLING MACHINES

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

TASK: OPERATE JIG BORE

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

TASK: OPERATE SURFACE GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

TASK: OPERATE BENCH GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

TASK: OPERATE CONTOUR SAW

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE CAM GRINDER

Obtain prints  
Obtain tooling  
Obtain gaging  
Attach work  
Attach tooling  
Adjust and calibrate  
Run  
Inspect

TASK: SET UP LANDIS EXTERNAL GRINDER

Obtain WIP form and blueprints  
Attach tools  
Select feeds  
Attach fixture  
Load stock  
Set speeds and rate of traverse  
Balance and dress wheels  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE LANDIS EXTERNAL GRINDER

Load  
Unload  
Inspect for quality

TASK: SET UP NORTON EXTERNAL GRINDER

Obtain WIP form and blueprints  
Attach tools  
Select feeds  
Attach fixture  
Load stock  
Set speeds and rate of traverse  
Balance and dress wheels  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE NORTON EXTERNAL GRINDER

Load  
Unload  
Inspect for quality

File: TASK PROCDR  
Report: GERDY

TASK: SET UP GARDNER DISK GRINDER  
Obtain WIP form and blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL  
Load  
Unload  
Inspect for quality

TASK: SET UP CINCINNATI THRU FEED GRINDER  
Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE CINCINNATI THRU FEED GRINDER  
Load  
Unloads  
Inspect for quality

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER  
Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

File: TASK PROCDR  
Report: GERDY

TASK: SET UP HEALD MODEL 271 GRINDER

Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE HEALD MODEL 271 GRINDER

Load  
Unload  
Inspect for quality

TASK: SET UP HEALD MODEL 272 GRINDER

Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE HEALD MODEL 272 GRINDER

Load  
Unload  
Inspect for quality

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER

Load  
Unload  
Inspect for quality

File: TASK PROCDR  
Report: GERDY

TASK:SET UP CINCINNATI MODEL 181 GRINDER

Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE CINCINNATI MODEL 181 GRINDER

Load  
Unload  
Inspect for quality

TASK: SET UP EXTERNAL STEPMASER GRINDER

Obtain WIP form  
Obtain blueprints  
Write program for programmable control  
Attach tools  
Load stock  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE EXTERNAL STEPMASER GRINDER

Load  
Unload  
Inspect for quality

TASK: SET UP ROTARY VERTICAL SPINDLE

Obtain WIP form  
Obtain blueprints  
Attach tools  
Select feeds  
Attach fixture  
Load stock  
Set speeds and rate of traverse  
Balance and dress wheels  
Run  
Inspect quality and adjust if necessary



File: TASK PROCDR  
Report: GERDY

TASK: OPERATE ROTARY VERTICAL SPINDLE  
Load  
Unload  
Inspect for quality

TASK: ASSEMBLE COMPONENTS FOR TOOLS  
Obtain assembly order  
Obtain parts  
Assemble components

TASK: OPERATE ROBOT TEST CELL  
Set up for product  
Set up fixtures  
Program robot  
Make switch adjustments  
Make Gripper switch adjustments  
Maintain standards in the cell

TASK: STAMP IDENTIFICATION NUMBER ON PARTS  
Select dies  
Strike die with hammer

TASK: OPERATE ROLL STAMP  
Select proper fixture  
Select anchor  
Select stamps  
Set length of travel and pressure

File: TASK PROCDR  
Report: GEROY

TASK: OPERATE POWER PRESS

Load parts  
Run  
Unload

TASK: ASSEMBLE TWO OR MORE PARTS

Obtain parts  
Assemble

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE

Obtain WIP form, tooling and gages  
Change Collet and Index Plate  
Change Drills and Boring bars  
Change Reamers and Set Feeds  
Set Speeds and Stops  
Adjust Milling head  
Load parts/Run machine/Unload parts  
Inspect for quality  
Readjust machine if necessary

TASK: OPERATE A STANDARD HEALD BOREMATIC MACHINE

Load work  
Run  
Unload  
Inspect for quality

TASK: SET UP HEALD BOREMATIC PIN MACHINE

Obtain WIP, tooling and gages  
Change Collet and Index plate  
Change Drills and Boring bars  
Change Reamers and Set Feeds  
Set Speeds and Stops  
Adjust Milling Head  
Load parts/Run machine/Unload parts  
Inspect for quality  
Readjust if necessary

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE A HEALD BOREMATIC PIN MACHINE  
Load work  
Run  
Unload  
Inspect for quality

TASK: SET UP TRANSFER MACHINE  
Obtain blueprints  
Obtain set up sheets  
Preset drills  
Adjust heads  
Preset mill ends  
Change jaws and jobs  
Adjust brackets/Sharpen tools  
Run  
Inspect for quality  
Readjust if necessary

TASK: OPERATE TRANSFER MACHINE  
Load parts  
Unload parts  
Inspect

TASK: SET UP JONES AND LAMSON ATL  
Obtain WIP, blueprints, tooling  
Attach and Adjust Tools  
Load  
Run  
Unload  
Inspect parts for quality

TASK: OPERATE JONES AND LAMSON ATL  
Load work  
Run  
Unload  
Inspect

File: TASK PROCDR  
Report: GEROY

TASK: SET UP MSO  
Obtain WIP, blueprints, tooling  
Attach and Adjust tools  
Load  
Run  
Unload  
Inspect parts for quality

TASK: OPERATE MSO  
Load  
Run  
Unload  
Inspect

TASK: OPERATE FURNACE (LABOR GRADE 4)  
Blow off internal parts  
Burnout Heat-Treat generator  
Add quench oil  
Grease fitting  
Oil air line oilers  
Add make-gas  
Put gas in furnace  
Make up and unload loads  
Adjust and set computer  
Set manual instruments

TASK: OPERATE FURNACE (LABOR GRADE 3)  
Blow off internal parts  
Burnout Heat-Treat generator  
Add quench oil  
Grease fitting  
Oil air line oilers  
Add make-gas/ Put gas in furnace  
Make up and unload loads  
Adjust and set computer and manual instruments  
Troubleshoot problems in the system  
Assist the other furnace operators

TASK: OPERATE FORGE FURNACE  
Open valves (air & gas)  
Heat to proper temperatures  
Install proper plates  
Load  
Maintain proper settings  
Unload

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE UPSET HAMMER  
Select dies  
Set dies for proper dimensions  
Load  
Unload  
Inspect for quality  
Adjust dies if necessary

TASK: OPERATE RICHARD'S BENDER  
Set up dies  
Set up stops  
Bend parts to center radius  
Offset parts

TASK: OPERATE WHEEL & BRADEN SHOT-BLASTER MACHINE  
Load parts  
Set timer  
Blast parts  
Unload

TASK: OPERATE BLACK OXIDE LINE  
Load parts  
Load black and oil  
Unload parts  
Monitor tank temperature

TASK: OPERATE STRAIGHTENING PRESS  
Adjust pressures  
Select centers  
Set up centers  
Set up support block  
Load and Unload

File: TASK PROCDR  
Report: GEROY

TASK: OPERATE LAPPING MACHINE

Select mount wheels  
Select carbides  
Select centers  
Load  
Unload

TASK: SET UP POTTER & JOHNSON AC

Obtain tooling  
Obtain blueprints, Set-up sheets and gages  
Adjust and calibrate machine  
Attach tools  
Fix work  
Run  
Inspect  
Readjust, if necessary

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE

Obtain tooling  
Obtain blueprints, Set-up sheets and gages  
Adjust and calibrate machine  
Attach tools  
Fix work  
Run  
Inspect  
Readjust, if necessary

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE

Obtain tooling  
Obtain blueprints, Set-up sheets and gages  
Adjust and calibrate machine  
Attach tools  
Fix work  
Run  
Inspect  
Readjust, if necessary

TASK: SET UP WARNER SWAZY AC LATHE

Obtain tooling  
Obtain blueprints, Set-up sheets and gages  
Adjust and calibrate machine  
Attach tools  
Fix work  
Run  
Inspect  
Readjust, if necessary

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE POTTER & JOHNSON AC  
Load parts  
Run  
Unload parts  
Inspect for quality

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE  
Load parts  
Run  
Unload parts  
Inspect for quality

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE  
Load parts  
Run  
Unload parts  
Inspect for quality

TASK: OPERATE WARNER SWAZY AC LATHE  
Load parts  
Run  
Unload parts  
Inspect for quality

TASK: SET UP 4-6 SPINDLE GANG DRILL  
Obtain blueprints  
Obtain WIP  
Obtain drills  
Set Speeds  
Fix tools Adjust  
Obtain reamers

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE 4-6 SPINDLE GANG DRILL  
Run a piece  
Inspect for quality

TASK: SHARPEN DRILLS  
Fasten drill in holder  
Adjust grind angle  
Run

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE  
Locate fixtures, blueprints, and WIP  
Obtain gages and tooling  
Set-up drill press  
Run  
Inspect for quality

TASK: SET UP RADIAL DRILL PRESS  
Locate fixtures, blueprints, and WIP  
Obtain gages and tooling  
Set-up drill press  
Run  
Inspect for quality

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS  
Locate fixtures, blueprints, and WIP  
Obtain gages and tooling  
Set-up drill press  
Run  
Inspect for quality



File: TASK PROCDR  
Report: GERDY

TASK: SET UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS  
Locate fixtures, blueprints, and WIP  
Obtain gages and tooling  
Set-up drill press  
Run  
Inspect for quality

TASK: OPERATE RADIAL DRILL PRESS  
Load parts  
Run  
Unload parts  
Inspect for quality  
Adjust if necessary

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS  
Load parts  
Run  
Unload parts  
Inspect for quality  
Adjust if necessary

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS  
Load parts  
Run  
Unload parts  
Inspect for quality  
Adjust if necessary

TASK: OPERATE CNC OKATA MILLING MACHINE  
Load work  
Run  
Unload work  
Inspect for quality

File: TASK PROCDR  
Report: GER0Y

TASK: OPERATE CNC BRIDGEPORT MILLING MACHINE  
Load work  
Run  
Unload work  
Inspect for quality

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE  
Load work  
Run  
Unload work  
Inspect for quality

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE  
Load work  
Run  
Unload work  
Inspect for quality

TASK: OPERATE CINCINNATI RISE AND FALL  
Load work  
Run  
Unload work  
Inspect for quality

TASK: OPERATE DUPLEX-TWIN MILL  
Load work  
Run  
Unload work  
Inspect for quality

File: TASK PROCDR  
Report: GER0Y

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE

Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

TASK: SET UP CINCINNATI RISE AND FALL

Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

TASK: SET UP DUPLEX-TWIN MILL

Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

TASK: SET UP CNC OKATA MILLING MACHINE

Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

File: TASK PROCDR  
Report: GEROY

TASK: SET UP CNC BRIDGEPORT MILLING MACHINE  
Obtain WIP forms, blueprints, tape and tooling  
Fix tooling  
Attach fixture  
Adjust machine  
Select speeds and feeds  
Line-up  
Run  
Inspect for quality  
Readjust, if necessary

TASK: SET UP MILWAUKEE MATIC EB  
Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP CNC MACHINE LATHE  
Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP CNC COMBI-LATHE  
Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP K & T 180  
Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

File: TASK PROCDR  
Report: GERDY

TASK: SET UP SCIMMX

Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP DO ALL SAW

Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP A LINES LATHE

Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: SET UP SEIKI LATHE(S)

Obtain WIP forms, Blueprints, Tooling, and Gaging  
Attach fixtures  
Attach tools  
Mount work  
Adjust machine  
Load tape  
Run  
Inspect for quality  
Adjust, if necessary

TASK: OPERATE MILWAUKEE MATIC E3

Load  
Unload  
Inspect for quality  
Change tools

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE CNC MACHINE LATHE

Load  
Unload  
Inspect for quality  
Change tools

TASK: OPERATE COMBI-LATHE

Load  
Unload  
Inspect for quality  
Change tools

TASK: OPERATE K & T 180

Load  
Unload  
Inspect for quality  
Change tools

TASK: OPERATE SCIMMX

Load  
Unload  
Inspect for quality  
Change tools

TASK: OPERATE DO ALL SAW

Load  
Unload  
Inspect for quality  
Change tools

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE A LINES LATHE

Load  
Unload  
Inspect for quality  
Change tools

TASK: OPERATE SEIKI LATHE(S)

Load  
Unload  
Inspect for quality  
Change tools

TASK:SET UP WAGNER SAW

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

TASK: SET UP BARBER COLEMAN HOBBS-GEAR MAKING MACHINE

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

TASK: SET UP ANVILL MILL

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

File: TASK PROCDR  
Report: GEROY

TASK: SET UP VERTICAL BROACHES

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

TASK: SET UP MSO MACHINE

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

TASK: SET UP BURKE TWIN MILL

Obtain WIP form  
Obtain tooling, gaging, and blueprints  
Install tooling  
Install bore jaws  
Install tape  
Make offsets  
Inspect for quality  
Adjust, if necessary

TASK: OPERATE WAGNER SAW

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

TASK: OPERATE BARBER COLEMAN HOB-GEAR MAKING MACHINE

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary



File: TASK PROCDR  
Report: GEROY

TASK: OPERATE ANVILL MILL

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

TASK: OPERATE VERTICAL BROACHES

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

TASK: OPERATE MSO MACHINE

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

TASK: OPERATE BURKE TWIN MILL

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

TASK: OPERATE SEIKI LATHE(S)

Load  
Unload  
Inspect for quality  
Readjust machine, if necessary

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE VIBRO  
Select and Load Media  
Set pressures  
Load work  
Run  
Unload work

TASK: OPERATE OVERBECK GRINDER  
Select and mount stone  
Run

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES  
Obtain prints, tooling, gaging and WIP forms  
Fix tools  
Adjust and calibrate machine  
Run  
Inspect for quality

TASK: SET UP AUTOMATIC SCREW MACHINES  
Obtain prints, tooling, gaging and WIP forms  
Fix tools  
Adjust and calibrate machine  
Run  
Inspect for quality

TASK: SET UP GEAR SHAPER  
Obtain prints, tooling, gaging and WIP forms  
Fix tools  
Adjust and calibrate machine  
Run  
Inspect for quality

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE GEAR SHAPER  
Load  
Unload  
Inspect for quality  
Readjust machine if necessary

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES  
Load  
Unload  
Inspect for quality  
Readjust machine if necessary

TASK: OPERATE AUTOMATIC SCREW MACHINE  
Load  
Unload  
Inspect for quality  
Readjust machine if necessary

TASK: OPERATE SWECCO  
Set weights  
Set timing  
Adjust compounds  
Set water pressure  
Set compound flow  
Select media  
Load parts  
Unload parts  
Inspect

TASK: OPERATE A BARREL MACHINE TUMBLER  
Load  
Add compound  
Add water  
Set timer  
Unload  
Rust protect

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE A BIG WASH

Load  
Wash  
Rinse  
Blow out  
Restack  
Ship

TASK: OPERATE A DERUST WASH

Load  
Wash  
Rinse  
Blow out  
Restack  
Ship

TASK: OPERATE SPIN FINISH MACHINE

Loacte fixture  
Load parts  
Change head bolts  
Replace head bolts  
Replace tension springs  
Load media  
Set time levels  
Run  
Unload

TASK: OPERATE PAINT BOOTH

Obtain WIP forms  
Select proper powder  
Load powder  
Attach guns  
Operate

TASK: OPERATE POWDER COATING ROOM

Obtain WIP forms  
Turn on furnaces  
Turn on water  
Turn on heat  
Mask parts  
Load parts  
Operate spray equipment  
Change colors

File: TASK PROCDR  
Report: GERDY

TASK: OPERATE BUFFING LATHE  
Obtain WIP forms  
Select wheel  
Adjust wheel  
Select belts  
Run  
Clean work area

TASK: OPERATE DIE GRINDER  
Obtain WIP form  
Fasten tool  
Attach air supply  
Run

TASK: OPERATE DISC SANDER  
Obtain WIP form  
Select sandpaper  
Attach sandpaper  
Operate

TASK: OPERATE BETA MACHINE  
Obtain WIP form  
Select grinding wheel  
Attach grinding wheel  
Adjust machine  
Run

TASK: OPERATE FLOAT SANDER  
Obtain WIP form  
Select sandpaper  
Attach sandpaper  
Operate

File: TASK PROCDR  
Report: GERDY

TASK: SET UP HEALD SIZEMATIC GRINDER

Obtain WIP form  
Obtain blueprints  
Attach tools  
Attach fixture  
Load stock  
Set speeds  
Run Inspect for quality  
Readjust, if necessary

TASK: OPERATE HEALD SIZEMATIC GRINDER

Load  
Unload  
Inspect for quality

File: TASK SYS  
Report: GEROY

TASK: OPERATE DIE GRINDER

Know when to replace wheels  
Adjust belts  
Identify malfunctioning system on machine  
Requisition service for machine  
Identify type of wheels to use

TASK: OPERATE DISC SANDER

Must know when to replace sandpaper  
Identify problems with machine  
Requisition service for machine

TASK: OPERATE BETA MACHINE

Obtain WIP form  
Select grinding wheel  
Attach grinding wheel  
Adjust machine  
Run

TASK: OPERATE FLOAT SANDER

Must know when to replace sandpaper  
Identify problems with the machine  
Requisition service for the machine

Project Number Three

**Maintenance, Manufacturing Cell, and Industrial  
Engineering/Product Engineering Training Needs  
Assessment Project**

August 1987

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**Volume 4**

**Appendices A - I**

**Sample Data Base Sorts**

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**The Pennsylvania State University**

Division of Counseling and Educational Psychology  
and Career Studies



## **ANALYSIS PROFILES**

### **APPENDICES A-I**

The following printouts are designed to give an example of what type data that can be generated from the task and/or machine data bases.

These listings are by no means exhaustive since printing out every possible configuration would produce voluminous array of information.

Additional sorts and/or configurations are available upon request.

**APPENDIX A**

**JOBS: DEPARTMENT**

What jobs are in which department?

File: DEPART JOB

Report: DEPT.JOBS

Selection: Department begins with DEPT: SCREW MACHINE

Job Class./Grade

Department



Job: SET-UP MAN--GEAR SHAPER, LABOR GRADE: 2

Job: OPERATOR-GEAR SHAPER, LABOR GRADE: 8

Job: SCREW MACHINE SETUP, LABOR GRADE: 2

Job: SCREW MACHINE OPERATOR, LABOR GRADE: 6

Job: LATHE OPERATOR, LABOR GRADE: 6

←Jobs

File: DEPART JOB  
Report: DEPT.JOBS  
Selection: Department begins with DEPT: HEAT TREAT  
Job Class./Grade

---

Job: FURNACE OPERATOR/LEADER, LABOR GRADE: 3  
Job: FURNACE OPERATOR, LABOR GRADE: 4  
Job: FINISHER-CLASS 1, LABOR GRADE: 4  
Job: BLACKSMITH, LABOR GRADE: 3

File: DEPART JOB  
Report: DEPT.JOBS  
Selection: Department begins with DEPT: TOOL ROOM  
Job Cl. 7./Grade

---

Job: CRIB KEEPER, LABOR GRADE: 6  
Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4  
Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4  
Job: GRINDER-TOOL, LABOR GRADE: 3  
Job: GRINDER-TOOL, LABOR GRADE: 3  
Job: GRINDER-TOOL, LABOR GRADE: 4  
Job: GRINDER-TOOL, LABOR GRADE: 4  
Job: GRINDER-TOOL, LABOR GRADE: 6  
Job: GRINDER-TOOL, LABOR GRADE: 6  
Job: GRINDER-TOOL, LABOR GRADE: 8  
Job: GRINDER-TOOL, LABOR GRADE: 8  
Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5  
Job: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6  
Job: TOOL AND DIE MAKER, LABOR GRADE: 3  
Job: TOOL AND DIE MAKER, LABOR GRADE 1

File: DEPART JOB  
Report: DEPT.JOBS  
Selection: Department begins with DEPT: GRINDING  
Job Class./Grade

---

Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4  
Job: DOUBLE DISK GRINDER OPERATOR, LABOR GRADE: 4  
Job: GRINDER OPERATOR CENTERLESS, LABOR GRADE: 4  
Job: GRINDER OPERATOR INTERNAL, LABOR GRADE: 4  
Job: EXTERNAL GRINDER, LABOR GRADE: 4  
Job: GRINDER OPERATOR SURFACE, LABOR GRADE: 6

**APPENDIX B**

**JOBS: TASKS**

**Which jobs require this task?**

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

OPERATE DRILL PRESS

Task

Record 16 of 62

=====  
Department: Dept: TOOL ROOM

Dept. Code: -

Job Class./Grac ob: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6

Task (1): Operate Drill Press

Task (2): Operate Milling Machine(s)

Task (3): Operate Lathe

Task (4): Operate Jig Bore

Task (5): Operate Surface Grinder

Task (6): Operate Bench Grinder

Task (7): Operate Contour Saw

Task (8): -

Task (9): -

Task (10): -

Job which requires  
that task

-----  
Type entry or use @ commands

@-? for Help



Find all records that contain SET UP LANDIS EXTERNAL GRINDE  
Press @-F to change Find.

Record 19 of 62

=====  
Department: Dept: GRINDING DEPARTMENT

Dept. Code: -

Job Class./Grade: Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4

Task (1): Set up Landis External Grinder

Task (2): Operate Landis External Grinder

Task (3): Set up Norton External Grinder

Task (4): Operate Norton External Grinder

Task (5): -

Task (6): -

Task (7): -

Task (8): -

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET UP ANVILL MILL  
Press @-F to change Find.

Record 50 of 62

=====

Department: Dept: TURNING CENTER DEPARTMENT

Dept. Code: -

Job Class./Grade: Job: TURNING MACHINE CENTER SETUP & OPERATOR, LG: 2

Task (1): Set up Wagner Saw

Task (2): Operate Wagner Saw

Task (3): Set up Barber Coleman Hobb-Gear Making Machine

Task (4): Operate Barber Coleman Hobb-Gear Making Machine

Task (5): Set up Anvill Mill

Task (6): Operate Anvill Mill

Task (7): Set up Vertical Broaches

Task (8): Operate Vertical Broaches

Task (9): Set up MSD Machine

Task (10): \*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

-----

Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET UP ANVILL MILL  
Press @-F to change Find.

Record 52 of 62

=====  
Department: Dept: TURNING CENTER DEPARTMENT

Dept. Code: -

Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4

Task (1): Set up Wagner Saw

Task (2): Operate Wagner Saw

Task (3): Set up Barber Coleman Hobb-Gear Making Machine

Task (4): Operate Barber Coleman Hobb-Gear Making Machine

Task (5): Set up Anvill Mill

Task (6): Operate Anvill Mill

Task (7): Set up Vertical Broaches

Task (8): Operate Vertical Broaches

Task (9): Set up MSD Machine

Task (10): \*\*\*\*\*CONTINUED BELOW\*\*\*\*\*

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE MSO MACHINE  
Press @-F to change Find.

Record 34 of 62

=====  
Department: Dept: TRANSFER LINE

Dept. Code: -

Job Class./Grade: Job: TRANSFER LINE OPERATOR, LABOR GRADE: 2

Task (1): Set up Transfer Machine

Task (2): Operate Transfer Machine

Task (3): Set up for J & L ATL

Task (4): Operate J & L ATL

Task (5): Set up MSO Machine

Task (6): Operate MSO Machine

Task (7): -

Task (8): -

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE MSO MACHINE  
Press @-F to change Find.

Record 51 of 62

=====

Department: Dept: TURNING CENTER DEPARTMENT

Dept. Code: -

Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 2

Task (1): \*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*

Task (2): Operate MSO Machine

Task (3): Set up Burke Twin Mill Machine

Task (4): Operate Burke Twin Mill Machine

Task (5): Set up Seiki Turning Machine

Task (6): -

Task (7): Operate Vibro

Task (8): Operate Overveck Grinder

Task (9): -

Task (10): -

-----

Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE MSD MACHINE  
Press @-F to change Find.

Record 53 of 62

=====  
Department: Dept: TURNING CENTER DEPARTMENT

Dept. Code: -

Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4

Task (1): \*\*\*\*\*CONTINUED FROM ABOVE\*\*\*\*\*

Task (2): Operate MSD Machine

Task (3): Set up Burke Twin Mill Machine

Task (4): Operate Burke Twin Mill Machine

Task (5): Operate Vibro

Task (6): Operate Overbeck Grinder

Task (7): -

Task (8): -

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE JIG GRINDER  
Press @-F to change Find.

Record 17 of 62

-----  
Department: Dept: TOOL ROOM

Dept. Code: -

Job Class./Grade: Job: TOOL AND DIE MAKER, LABOR GRADE: 3

Task (1): Operate Drill Press

Task (2): Operate Milling Machine(s)

Task (3): Operate Lathe

Task (4): Operate Vertical Shaper

Task (5): Operate Jig Bore

Task (6): Operate Surface Grinder

Task (7): Operate Cam Grinder

Task (8): Operate Jig Grinder

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECCRDS

Escape: Review/Add/Change

Find all records that contain OPERATE JIG GRINDER  
Press @-F to change Find.

Record 18 of 62

=====  
Department: Dept: TOOL ROOM

Dept. Code: -

Job Class./Grade: Job: TOOL AND DIE MAKER, LABOR GRADE 1

Task (1): Operate Drill Press

Task (2): Operate Milling Machine(s)

Task (3): Operate Lathe

Task (4): Operate Jig Bore

Task (5): Operate Surface Grinder

Task (6): Operate Jig Grinder

Task (7): Operate Vertical Shaper

Task (8): Operate Cam Grinder

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help



File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS  
Press @-F to change Find.

Record 1 of 62

=====  
Department: Dept. PRECISION MACHINING CENTER

Dept. Code: -

Job Class./Grade: Job: OPERATOR, LABOR GRADE: 4

Task (1): Operate Seiki Automatic Turret Lathe

Task (2): Operate Standard End Plate Finishing Lathe

Task (3): Operate Drill Press

Task (4): Operate Bridgeport Milling Machine

Task (5): -

Task (6): -

Task (7): -

Task (8): -

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS  
Press @-F to change Find.

Record 2 of 62

=====  
Department: Dept: PRECISION MACHINING CENTER

Dept. Code: -

Job Class./Grade: Job: SET UP PERSONNEL, LABOR GRADE: 2

Task (1): Set up Seiki Automatic Turret Lathe

Task (2): Operate Seiki Automatic Turret Lathe

Task (3): Set up Standard End Plate Finishing Lathe

Task (4): Operate Standard End Plate Finishing Lathe

Task (5): Set Up Drill Press

Task (6): Operate Drill Press

Task (7): Set Up Bridgeport Milling Machine

Task (8): Operate Bridgeport Milling Machine

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

File: DEPART JOB

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS  
Press @-F to change Find.

Record 15 of 62

=====  
Department: Dept: TOOL ROOM

Dept. Code: -

Job Class./Grade: Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5

Task (1): Operate Drill Press

Task (2): Operate Milling Machine(s)

Task (3): Operate Lathe

Task (4): Operate Jig Bore

Task (5): Operate Surface Grinder

Task (6): Operate Bench Grinders

Task (7): Operate Contour Saw

Task (8): -

Task (9): -

Task (10): -

-----  
Type entry or use @ commands

@-? for Help

**APPENDIX C**

**GENERAL KNOWLEDGE: TASK**

**What tasks require this general knowledge?**

File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

USE MACHINIST'S HANDBOOK

← General  
knowledge

Record 31 of 156

=====  
Task: TASK: OPERATE SURFACE GRINDER ← Task

G (1): Utilize mathematical concepts up to, and including, trigonometry

G (2): Use all gages

G (3): Use Micrometers

G (4): Use Vanier Calipers

G (5): Use Johansson blocks

G (6): Use comparator

G (7): Use measuring wires

G (8): Use Machinist's Handbook to determine correct angles/dimensions

G (9): Read complicated prints and drawings

G (10): -

G (11): -

G (12): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK GEN

Report: GERDY

Selection: G (9) begins with

READ COMPLICATED PRI

← General  
knowledge

TASK: OPERATE CAM GRINDER ← Task

Utilize mathematical concepts up to, and including, trigonometry

Use all gages

Use Micrometers

Use Vanier Calipers

Use Johansson blocks

Use comparator

Use measuring wires

Use Machinist's Handbook to determine correct angles/dimensions

Read complicated prints and drawings

File: TASK GEN  
Report: GEROY  
Selection: G (9) begins with READ COMPLICATED PRI

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE KO SURFACE GRINDER  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE HEALD TOOL GRINDING MACHINE  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE NORTON SURFACE GRINDER  
Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

File: TASK GEN  
Report: GERDY  
Selection: G (9) begins with READ COMPLICATED PRI

TASK: OPERATE TAP GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE THREAD CHASER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE GLEASON CUTTER-SHAPER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

TASK: OPERATE SINGLE POINT CARBIDE GRINDER

Utilize mathematical concepts up to, and including, trigonometry  
Use all gages  
Use micrometers  
Use Vernier calipers  
Use Johansson Blocks  
Use comparator  
Use measuring wires  
Use machinist's handbook to determine correct angles/dimensions  
Read complicated prints and drawings

Find all records that contain USE COMPARATOR  
Press @-F to change Find.

Record 22 of 156

=====

Task: TASK: OPERATE TAP GRINDER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----

Type entry or use @ commands

@-? for Help



File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain USE COMPARATOR  
Press @-F to change Find.

Record 19 of 156

=====

Task: TASK: OPERATE SURFACE GRINDER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----

Type entry or use @ commands

@-? for Help

Find all records that contain USE COMPARATOR  
Press @-F to change Find.

Record 14 of 156

=====

Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----

Type entry or use @ commands

@-? for Help

File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS  
Press @-F to change Find.

Record 23 of 156

=====  
Task: TASK: OPERATE THREAD CHASER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS  
Press @-F to change Find.

Record 19 of 156

=====  
Task: TASK: OPERATE SURFACE GRINDER

G (1): Utilize mathematical concepts up to, and including, trigonometry

G (2): Use all gages

G (3): Use micrometers

G (4): Use Vernier calipers

G (5): Use Johansson Blocks

G (6): Use comparator

G (7): Use measuring wires

G (8): Use machinist's handbook to determine correct angles/dimensions

G (9): Read complicated prints and drawings

G (10): -

G (11): -

G (12): -

-----  
Type entry or use @ commands

@-? for help

File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS  
Press @-F to change Find.

Record 14 of 156

=====

Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

G (1): Utilize mathematical concepts up to, and including, trigonometry

G (2): Use all gages

G (3): Use micrometers

G (4): Use Vernier calipers

G (5): Use Johansson Blocks

G (6): Use comparator

G (7): Use measuring wires

G (8): Use machinist's handbook to determine correct angles/dimensions

G (9): Read complicated prints and drawings

G (10): -

G (11): -

G (12): -

-----

Type entry or use @ commands

@-? for Help

Find all records that contain USE MACHINIST'S HANDBOOK  
Press @-F to change Find.

Record 24 of 156

=====

Task: TASK: OPERATE GLEASON CUTTER-SHAPER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----

Type entry or use @ commands

@-? for Help

File: TASK GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain USE MACHINIST'S HANDBOOK  
Press @-F to change Find.

Record 18 of 156

=====

Task: TASK: OPERATE DRILL GRINDER

- G (1): Utilize mathematical concepts up to, and including, trigonometry
- G (2): Use all gages
- G (3): Use micrometers
- G (4): Use Vernier calipers
- G (5): Use Johansson Blocks
- G (6): Use comparator
- G (7): Use measuring wires
- G (8): Use machinist's handbook to determine correct angles/dimensions
- G (9): Read complicated prints and drawings
- G (10): -
- G (11): -
- G (12): -

-----

Type entry or use @ commands

@-? for Help

**APPENDIX D**

**SYSTEMS KNOWLEDGE: TASK**

**What tasks require this systems knowledge?**



File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

CHECK HYDRAULIC OIL

← Systems knowledge

Record 121 of 159

Task: TASK: OPERATE K & T 180

Task Code: -

- S (1): Identify problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): Locate gaging
- S (6): Monitor oil levels
- S (7): Lub and oil machine
- S (8): -
- S (9): -

← Task that requires  
that knowledge

-----  
Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL  
Press @-F to change Find.

Record 105 of 159

=====  
Task: TASK: SET UP A CNC BRIDGEPORT MILLING MACHINE

Task Code: -

- S (1): Identify problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): -
- S (6): -
- S (7): -
- S (8): -
- S (9): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL  
Press @-F to change Find.

Record 120 of 159

=====

Task: TASK: SET UP K & T 180

Task Code: -

- S (1): Identify problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): Locate gaging
- S (6): Monitor oil levels
- S (7): Lub and oil machine
- S (8): -
- S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL  
Press @-F to change Find.

Record 119 of 159

=====

Task: TASK: OPERATE CNC COMBI-LATHE

Task Code: -

- S (1): Identify problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): Locate gaging
- S (6): Monitor oil levels
- S (7): Lub and oil machine
- S (8): -
- S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING  
Press @-F to change Find.

Record 38 of 159

=====

Task: TASK: OPERATE CONTOUR SAW

Task Code: -

S (1): Identify malfunctioning systems of the machine

S (2): Obtain service for machine

S (3): Locate parts

S (4): Know the intended purpose of the workpiece

S (5): -

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING  
Press @-F to change Find.

Record 27 of 159

=====

Task: TASK: OPERATE SINGLE POINT CARBIDE GRINDER

Task Code: -

S (1): Identify malfunctioning systems on the machine

S (2): Obtain service for machine

S (3): Locate prints

S (4): Know the intended purpose of the workpiece

S (5): -

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Rev:ew/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING  
Press @-F to change Find.

Record 16 of 159

=====

Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

Task Code: -

S (1): Identify malfunctioning systems on the machine

S (2): Obtain service for machine

S (3): Locate prints

S (4): Know the intended purpose of the workpiece

S (5): -

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS  
Press @-F to change Find.

Record 16 of 159

=====

Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

Task Code: -

S (1): Identify malfunctioning systems on the machine

S (2): Obtain service for machine

S (3) Locate prints

S (4): Know the intended purpose of the workpiece

S (5): -

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help



File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS  
Press @-F to change Find.

Record 6 of 159

=====

Task: TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)

Task Code: -

S (1): Identify malfunction system on the machine

S (2): Obtain service for the machine

S (3): Maintain proper oil levels

S (4): Locate prints .

S (5): Locate WIP forms

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS  
Press @-F to change Find.

Record 5 of 159

=====

Task: TASK: SET UP SEIKI AUTOMATIC TURRET MACHINE(S)

Task Code: -

S (1): Locate prints

S (2): Locate tape

S (3): Identify problems with the machine

S (4): Obtain service for the machine

S (5): -

S (6): -

S (7): -

S (8): -

S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LUBE AND OIL MACHINE  
Press @-F to change Find.

Record 115 of 159

=====

Task: TASK: OPERATE MILWAUKEE MATIC EB

Task Code: -

- S (1): Identfy problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): Locate gaging
- S (6): Monitor oil levels
- S (7): Lube and oil machine
- S (8): -
- S (9): -

-----

Type entry or use @ commands

@-? for Help

File: TASK SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LUBE AND OIL MACHINE  
Press @-F to change Find.

Record 114 of 159

=====

Task: TASK: SET UP MILWAUKEE EB

Task Code: -

- S (1): Identify problems with machines
- S (2): Obtain service for machines
- S (3): How to obtain WIP, tooling, and blueprints
- S (4): Check hydraulic oil
- S (5): Locate gaging
- S (6): Monitor oil levels
- S (7): Lube and oil machine
- S (8): -
- S (9): -

-----

Type entry or use @ commands

@-? for Help

**APPENDIX E**

**TECHNICAL KNOWLEDGE: TASKS**

**What tasks require this technical knowledge?**

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain **UNDERSTAND THE EXPANSION/CONTR**  
Press @-F to change Find.

Technical  
knowledge

Record 37 of 165

Task: **TASK: OPERATE CAM GRINDER** ← Task

Task Code: -

- T (1): Understand the cutting qualities of various metals
- T (2): Understand the grinding qualities of various metals
- T (3): Understand the polishing qualities of various metals
- T (4): Understand the expansion/contracting properties of metals
- T (5): -
- T (6): -
- T (7): -
- T (8): -
- T (9): -
- T (10): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK TECH

Report: GERDY

Selection: T (1) begins with **MUST KNOW THE GRINDI**

Technical  
knowledge

**TASK: SET UP HEALD MODEL 272 SIZEMATIC GRINDER** ← Task

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GERDY  
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: SET UP LANDIS EXTERNAL GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS EXTERNAL GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP NORTON EXTERNAL GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE NORTON EXTERNAL GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GEROY  
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI THRU FEED GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI THRU FEED GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels



File: TASK TECH  
Report: GEROY  
Selection: T (1) begins with MUST KNOW THE GRINDI

346 2  
7/9

TASK: SET UP HEALD MODEL 271 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 271 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 272 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 272 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI MODEL 181 GRINDER  
Must know the grinding properties of steel  
Must know the grinding properties of various types of grinding wheels

File: TASK TECH

Report: GERDY

Page 4

Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: OPERATE CINCINNATI MODEL 181 GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP EXTERNAL STEPMASER GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE EXTERNAL STEPMASER GRINDER

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: SET UP ROTARY VERTICAL SPINDLE

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

TASK: OPERATE ROTARY VERTICAL SPINDLE

Must know the grinding properties of steel

Must know the grinding properties of various types of grinding wheels

File: TASK TECH  
Report: GERDY  
Selection: T (1) begins with UNDERSTAND THE CUTTI

102  
00 07

**TASK: OPERATE SURFACE GRINDER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE BENCH GRINDERS**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE CONTOUR SAW**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE VERTICAL SHAPER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

**TASK: OPERATE CAM GRINDER**

Understand the cutting qualities of various metals  
Understand the grinding qualities of various metals  
Understand the polishing qualities of various metals  
Understand the expansion/contracting properties of metals

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING  
Press @-F to change Find.

Record 15 of 165

=====  
Task: TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER

Task Code: -

T (1): Understand the expansion/contracting properties of metals

T (2): Understand the cutting qualities of various metals

T (3): Understand the grinding qualities of steel and carbide

T (4): Understand the polishing qualities of steel and carbide

T (5): -

T (6): -

T (7): -

T (8): -

T (9): -

T (10): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING  
Press @-F to change Find.

Record 17 of 165

=====

Task: TASK: OPERATE HEALD TOOL GRINDING MACHINE

Task Code: -

T (1): Understand the expansion/contracting properties of metals

T (2): Understand the cutting qualities of various metals

T (3): Understand the grinding qualities of steel and carbide

T (4): Understand the polishing qualities of steel and carbide

T (5): -

T (6): -

T (7): -

T (8): -

T (9): -

T (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING  
Press @-F to change Find.

Record 20 of 105

=====

Task: TASK: OPERATE SURFACE GRINDER

Task Code: -

T (1): Understand the expansion/contracting properties of metals

T (2): Understand the cutting qualities of various metals

T (3): Understand the grinding qualities of steel and carbide

T (4): Understand the polishing qualities of steel and carbide

T (5): -

T (6): -

T (7): -

T (8): -

T (9): -

T (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE EXPANSION/CONTR  
Press @-F to change Find.

Record 15 of 165

=====  
Task: TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER

Task Code: -

T (1): Understand the expansion/contracting properties of metals

T (2): Understand the cutting qualities of various metals

T (3): Understand the grinding qualities of steel and carbide

T (4): Understand the polishing qualities of steel and carbide

T (5): -

T (6): -

T (7): -

T (8): -

T (9): -

T (10): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE EXPANSION/CONTR  
Press @-F to change Find.

Record 37 of 165

=====  
Task: TASK: OPERATE CAM GRINDER

Task Code: -

T (1): Understand the cutting qualities of various metals

T (2): Understand the grinding qualities of various metals

T (3): Understand the polishing qualities of various metals

T (4): Understand the expansion/contracting properties of metals

T (5): -

T (6): -

T (7): -

T (8): -

T (9): -

T (10): -

-----  
Type entry or use @ commands

@-? for Help



File: MACH.TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain PRINCIPLES OF CNC  
Press @-F to change Find.

Record 18 of 40

=====

Machine: ACROLOC 4 AXIS VMC W/CNC

T: Principles of CNC Programming

T: -

T: -

T: -

T: -

T: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.TECH

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain PRINCIPLES OF CNC  
Press @-F to change Find.

Record 19 of 40

=====

Machine: DKATA VM 4 AXIS W/ CNC

T: Principles of CNC Programming

T: -

T: -

T: -

T: -

T: -

-----

Type entry or use @ commands

@-? for Help

**APPENDIX F**

**PROCEDURAL KNOWLEDGE: TASKS**

**What tasks require this procedural knowledge?**

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain **ADJUST AND CALIBRATE**  
Press @-F to change Find.

← Procedural  
knowledge

Record 5 of 162

=====  
Task: **TASK: SET UP SEIKI AUTOMATIC TURR** **ATHE(S)**

← Task

Task Code: -

- P (1): Obtain tooling and prints
- P (2): Set-up sheets, gages and tape control
- P (3): Adjust and calibrate machine
- P (4): Install tape
- P (5): Run
- P (6): Inspect for quality
- P (7): -
- P (8): -
- P (9): -
- P (10): -

-----  
Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE  
Press @-F to change Find.,

Record 17 of 162

=====

Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER

Task Code: -

- P (1): Obtain prints
- P (2): Obtain tooling
- P (3): Obtain gaging
- P (4): Attach work
- P (5): Attach tooling
- P (6): Adjust and calibrate machine
- P (7): Run
- P (8): Inspect
- P (9): -
- P (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE  
Press @-F to change Find.

Record 29 of 162

=====

Task: TASK: OPERATE SUNNEN PRECISION HONING MACHINE

Task Code: -

P (1): Obtain prints

P (2): Obtain tooling

P (3): Obtain gaging

P (4): Attach work

P (5): Attach tooling

P (6): Adjust and calibrate machine

P (7): Run

P (8): Inspect

P (9): -

P (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE  
Press @-F to change Find.

Record 22 of 162

=====

Task: TASK: OPERATE SURFACE GRINDER

Task Code: -

P (1): Obtain prints

P (2): Obtain tooling

P (3): Obtain gaging

P (4): Attach work

P (5): Attach tooling

P (6): Adjust and calibrate machine

F (7): Run

P (8): Inspect

P (9): -

P (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS.  
Press @-F to change Find.

Record 41 of 162

=====

Task: TASK: SET UP GARDNER DISK GRINDER

Task Code: -

- P (1): Obtain WIP form and blueprints
- P (2): Attach tools
- P (3): Attach fixture
- P (4): Load stock
- P (5): Set speeds
- P (6): Run
- P (7): Inspect for quality
- P (8): Readjust if necessary
- P (9): -
- P (10): -

-----

Type entry or use @ commands

@-? for Help



File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS  
Press @-F to change Find.

Record 43 of 162

=====

Task: TASK: SET UP CINCINNATI THRU FEED GRINDER

Task Code: -

P (1): Obtain WIP form

P (2): Obtain blueprints

P (3): Attach tools

P (4): Attach fixture

P (5): Load stock

P (6): Set speeds

P (7): Run

P (8): Inspect for quality

P (9): Readjust if necessary

P (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS  
Press @-F to change Find.

Record 37 of 162

=====  
Task: TASK: SET UP LANDIS EXTERNAL GRINDER

Task Code: -

- P (1): Obtain WIP form and blueprints
- P (2): Attach tools
- P (3): Select feeds
- P (4): Attach fixture
- P (5): Load stock
- P (6): Set speeds and rate of traverse
- P (7): Balance and dress wheels
- P (8): Run
- P (9): Inspect for quality
- P (10): Readjust if necessary

-----  
Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOAD TAPE  
Press Q-F to change Find.

Record 112 of 162

---

Task: TASK: SET UP MILWAUKEE MATIC EB

Task Code: -

P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging

P (2): Attach fixtures

P (3): Attach tools

P (4): Mount work

P (5): Adjust machine

P (6): Load tape

P (7): Run

P (8): Inspect for quality

P (9): Adjust, if necessary

P (10): -

---

Type entry or use Q commands

Q-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOAD TAPE  
Press @-F to change Find.

Record 119 of 162

---

Task: TASK: SET UP SEIKI LATHE(S)

Task Code: -

P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging

P (2): Attach fixtures

P (3): Attach tools

P (4): Mount work

P (5): Adjust machine

P (6): Load tape

P (7): Run

P (8): Inspect for quality

P (9): Adjust, if necessary

P (10): -

---

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain LOAD TAPE

Press @-F to change Find.

Record 117 of 162

---

Task: TASK: SET UP DO ALL SAW

Task Code: -

P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging

P (2): Attach fixtures

P (3): Attach tools

P (4): Mount work

P (5): Adjust machine

P (6): Load tape

P (7): Run

P (8): Inspect for quality

P (9): Adjust, if necessary

•P (10): -

---

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain INSPECT  
Press @-F to change Find.

Record 1 of 162

=====

Task: TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE

Task Code: -

P (1): Run

P (2): Unload

P (3): Inspect

P (4): Readjust

P (5): -

P (6): -

P (7): -

P (8): -

P (9): -

P (10): -

-----

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain INSPECT  
Press @-F to change Find.

Record 5 of 162

---

Task: TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)

Task Code: -

- P (1): Obtain tooling and prints
- P (2): Set-up sheets, gages and tape control
- P (3): Adjust and calibrate machine
- P (4): Install tape
- P (5): Run
- P (6): Inspect for quality
- P (7): -
- P (8): -
- P (9): -
- P (10): -

---

Type entry or use @ commands

@-? for Help

File: TASK PROCDR

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain INSPECT  
Press ?-F to change Find.

Record 7 of 162

---

Task: TASK: SET UP STANDARD END PLATE FINISHING LATHE

Task Code: -

P (1): Obtain tooling and prints

P (2): Obtain setup sheets

P (3): Obtain gages

P (4): Adjust and calibrate

P (5): Run a job

P (6): Inspect for quality

P (7): -

P (8): -

P (9): -

P (10): -

---

Type entry or use ? commands

?-? for Help



**APPENDIX G**

**GENERAL KNOWLEDGE: MACHINES**

**Which machines require this general knowledge?**

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

READ BLUEPRINTS

← General  
knowledge

Record 14 of 70

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

← Task

G: Basic math and Trigonometry

G: Metric-to-English conversion

G: Read/understand WIP

G: Read/use micrometer

G: Read/use depth and bar gages

G: Read/use Vernier Calipers

G: Read blueprints

G: Able to measure to .0001" and 1/64th"

G: Use clearance plug, concentricity, tapered plug gages

G: Use straight plug gage

G: Complete quality audit form

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/UNDERSTAND WIP  
Press @-F to change Find.

Record 11 of 70

=====

- Machine: SEIKI CNC NEA LATHE
- G: Basic math
- G: Metric-to-English conversion
- G: Read/understand WIP
- G: Read/use micrometer
- G: Read/use depth scales
- G: Read/use Vernier Calipers
- G: Read/use gages
- G: -
- G: -
- G: -
- G: -

-----  
Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/UNDERSTAND WIP  
Press @-F to change Find.

Record 14 of 70

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

G: Basic math and Trigonometry

G: Metric-to-English conversion

G: Read/understand WIP

G: Read/use micrometer

G: Read/use depth and bar gages

G: Read/use Vernier Calipers

G: Read blueprints

G: Able to measure to .0001" and 1/64th"

G: Use clearance plug, concentricity, tapered plug gages

G: Use straight plug gage

G: Complete quality audit form

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/UNDERSTAND WIP  
Press @-F to change Find.

Record 15 of 70

=====

Machine: DELTA 6 SPINDLE DRILL PRESS

G: Basic math

G: Metric-to-English conversion

G: Read/understand WIP

G: Read/use micrometer

G: Read/use scales

G: Measure to .0001" and 1/64th"

G: -

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"  
Press @-F to change Find.

Record 15 of 70

=====

Machine: DELTA 6 SPINDLE DRILL PRESS

G: Basic math

G: Metric-to-English conversion

G: Read/understand WIP

G: Read/use micrometer

G: Read/use scales

G: Measure to .0001" and 1/64th"

G: -

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"  
Press @-F to change Find.

Record 19 of 70

=====

Machine: OKATA CNC MILLING MACHINE

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use location gages, Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: Triangulation (trigonometry)

G: Read/use radius gages

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"  
Press @-F to change Find.

Record 33 of 70

=====

Machine: BRIDGEPORT 4 AXIS VMC W/ CNC

G: Basic math

G: Metric-to-English conversion

G: Read/use gages

G: Read/use location gages, Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help



File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER  
Press @-F to change Find.

Record 10 of 70

=====

Machine: SEIKI CNC NE LATHE

G: Basic math

G: Metric-to-English conversion

G: Read/understand WIP

G: Read/use micrometer

G: Read/use depth scales

G: Read/use Vernier Calipers

G: Read/use gages

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER  
Press @-F to change Find.

Record 34 of 70

=====

Machine: ACROLOC 4 AXIS VMC W/ CNC

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER  
Press @-F to change Find.

Record 14 of 70

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

G: Basic math and Trigonometry  
G: Metric-to-English conversion  
G: Read/understand WIP  
G: Read/use micrometer  
G: Read/use depth and bar gages  
G: Read/use Vernier Calipers  
G: Read blueprints  
G: Able to measure to .0001" and 1/64th"  
G: Use clearance plug, concentricity, tapered plug gages  
G: Use straight plug gage  
G: Complete quality audit form

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER  
Press @-F to change Find.

- Record 2 of 70

=====

Machine: TRANSFER LINE

G: Basic math

G: Metric-to-English conversion

G: Read/use micrometer & gages

G: Read blueprints

G: Read & understand WIP forms

G: Read & understand panel gages

G: Read & understand Hex Center gages

G: Read & understand plug gages

G: Read & understand Vernier calipers

G: -

G: -

-----

Type entry or use @. commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER  
Press @-F to change Find.

Record 3 of 70

=====

Machine: JONES & LAMSON

G: Basic math

G: Metric-to-English conversion

G: Read/use micrometer & gages

G: Read blueprints

G: Read & understand WIP forms

G: Read & understand panel gages

G: Read & understand Hex Center gages

G: Read & understand plug gages

G: Read & understand Vernier calipers

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER  
Press @-F to change Find.

Record 4 of 70

=====  
Machine: MSQ MACHINE  
G: Basic math  
G: Metric-to-English conversion  
G: Read/use micrometer & gages  
G: Read blueprints  
G: Read & understand WIP forms  
G: Read & understand panel gages  
G: Read & understand Hex Center gages  
G: Read & understand plug gages  
G: Read & understand Vernier calipers  
G: -  
G: -

-----  
Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain TRIANGULATION  
Press @-F to change Find.

Record 19 of 70

=====

Machine: OKATA CNC MILLING MACHINE

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use location gages, Vernier calipers.

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: Triangulation (trigonometry)

G: Read/use radius gages

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain TRIANGULATION  
Press @-F to change Find.

Record 20 of 70

=====

Machine: BRIDGEPORT CNC MILLING MACHINE

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use location gages. Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: Triangulation (trigonometry)

G: Read/use radius gages

G: -

G: -

-----

Type entry or use @ commands

@-? for Help



File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain TRIANGULATION  
Press @-F to change Find.

Record 21 of 70

=====

Machine: CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use location gages, Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: Triangulation (trigonometry)

G: Read/use radius gages

G: -

3: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS  
Press @-F to change Find.

Record 19 of 70

=====

Machine: OKATA CNC MILLING MACHINE

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use location gages, Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: Triangulation (trigonometry)

G: Read/use radius gages

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS  
Press @-F to change Find.

Record 33 of 70

=====

Machine: BRIDGEPORT 4 AXIS VMC W/ CNC

G: Basic math

G: Metric-to-English conversion

G: Read/use gages

G: Read/use location gages, Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.GEN

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS

Press @-F to change Find.

Record 34 of 70

=====

Machine: ACROLOC 4 AXIS VMC W/ CNC

G: Basic math

G: Metric-to-English conversion

G: Read/use blueprints, WIP

G: Read/use Vernier calipers,

G: Read/use scales, depth gages, indicators, micrometers

G: Measure to .0001" and 1/64th"

G: Read/use inside micrometers

G: -

G: -

G: -

G: -

-----

Type entry or use @ commands

@-? for Help

**APPENDIX H**

**SYSTEMS KNOWLEDGE: MACHINES**

**Which machines require this systems knowledge?**

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

IDENTIFY MALFUNCTION



Systems  
knowledge

Record 1 of 70

Machine: HEAVY DUTY VERTICAL DRILLING MACHINE



Task

S: Identify malfunction in machine

S: Obtain service

S: Obtain WIP, tooling & prints

S: Adjust speed

S: -

S: -

S: -

S: -

S: -

S: -

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION  
Press @-F to change Find.

Record 2 of 70

=====

Machine: TRANSFER LINE

S: Locate prints, tooling, and WIP

S: Identify malfunction on machine

S: Obtain service for machine

S: -

S: -

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION  
Press @-F to change Find.

Record 7 of 70

=====

Machine: HEALD STANDARD BOREMATIC MILLING MACHINE

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help



File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION  
Press @-F to change Find.

Record 13 of 70

=====

Machine: POTTER & JOHNSON CHUCKING LATHE

S: Locate prints and tape

S: Identify malfunction on machine

S: Obtain service for machine

S: -

S: -

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE  
Press @-F to change Find.

Record 7 of 70

=====

Machine: HEALD STANDARD BOREMATIC MILLING MACHINE

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE  
Press @-F to change Find.

Record 9 of 70

=====

Machine: HORIZONTAL TURRET LATHE  
S: Check hydraulic oil level  
S: Identify malfunction on machine  
S: Obtain service for machine  
S: Monitor air pressure

S: -  
S: -  
S: -  
S: -  
S: -  
S: -

-----  
Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE  
Press @-F to change Find.

Record 14 of 70

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Restore former entry

Find all records that contain MONITOR HYDRAULIC OIL  
Press @-F to change Find.

Record 7 of 70

=====

Machine: HEALD STANDARD BOREMATIC MILLING MACHINE

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----  
Type entry or use @ commands

47K Avail.

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MONITOR HYDRAULIC OIL  
Press @-F to change Find.

Record 8 of 70

=====

Machine: HEALD BOREMATIC PIN MACHINE

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.SYS

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain MONITOR HYDRAULIC OIL  
Press @-F to change Find.

Record 14 of 70

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

S: Check hydraulic oil level

S: Identify malfunction on machine

S: Obtain service for machine

S: Monitor air pressure

S: Monitor hydraulic oil

S: -

S: -

S: -

S: -

S: -

-----

Type entry or use @ commands

@-? for Help

**APPENDIX I**

**PROCEDURAL KNOWLEDGE: MACHINES**

**Which machines require this procedural knowledge?**



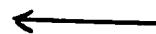
File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain  
Press @-F to change Find.

PERFORM SIMPLE MAINTENANCE



Procedural  
knowledge

Record 14 of 73

Machine: SEIKI CNC NEA LATHE



Task

- P: Select/obtain WIP, tooling, & gages
- P: Select/obtain prints/set up sheets
- P: Select/obtain tape control
- P: Adjust/calibrate
- P: Install tape
- P: Load/unload parts
- P: Inspect (check part to print)
- P: Set tools
- P: Perform simple maintenance
- P: Secure material in fixture
- P: Select/change collet/fixture
- P: -

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE  
Press @-F to change Find.

Record 10 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222

P: Select/obtain WIP, tooling, gages, collet fixtures

P: Select/change index plate, drills, boring bars. reamers

P: Select/set feeds and speeds

P: Set stops/offsets

P: Adjust milling heads

P: Load/unload parts

P: Inspect (check part to print)

P: Adjust machine-- set switches

P: Perform simple maintenance

P: Select/change tool

P: Secure material in furnace

P: Grind/sharpen tools

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE  
Press @-F to change Find.

Record 11 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A

P: Select/obtain WIP, tooling, gages, collet fixtures

P: Select/change index plate, drills, boring bars, reamers

P: Select/set feeds and speeds

P: Set stops/offsets

P: Adjust milling heads

P: Load/unload parts

P: Inspect (check part to print)

P: Adjust machine-- set switches

P: Perform simple maintenance

P: Select/change tool

? : Secure material in furnace

P: Grind/sharpen tools

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE  
Press @-F to change Find.

Record 13 of 73

=====

Machine: SEIKI CNC NE LATHE

- P: Select/obtain WIP, tooling, & gages
- P: Select/obtain prints/set up sheets
- P: Select/obtain tape control
- P: Adjust/calibrate
- P: Install tape
- P: Load/unload parts
- F: Inspect (check part to print)
- P: Set tools
- P: Perform simple maintenance
- P: Secure material in fixture
- P: Select/change collet/fixture
- P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET WATER PRESSURES  
Press @-F to change Find.

Record 62 of 73.

=====

Machine: SWECO

P: Load/unload parts

P: Run

P: Set time levels

P: Inspect

P: Set weights

P: Adjust compounds

P: Set water pressures

P: Set compound flows

P: Obtain WIP

P: -

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

Find all records that contain SET WATER PRESSURES  
Press @-F to change Find.

Record 63 of 73

=====

Machine: BARREL WASH TUMBLE

P: Load/unload parts

P: Run

P: Set time levels

P: Inspect

P: Adjust compounds

P: Set water pressures

P: Rust protect

P: Add water

P: Obtain WIP

P: -

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET WATER PRESSURES

Press @-F to change Find.

Record 67 of 73

=====

Machine: POWDER COATING ROOM

P: Load/unload parts

P: Inspect

P: Set water pressures

P: Obtain WIP

P: Adjust heat

P: -

P: -

P: -

P: -

P: -

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET SPEEDS  
Press @-F to change Find.

Record 4 of 73

=====

Machine: NATCO MULTI-SPINDLE DRILL PRESS

P: Locate & obtain fixture, prints, WIP, gages, & tooling

P: Set up press

P: Run

P: Inspect

P: Adjust

P: Load/unload

P: Obtain drills

P: Obtain reamers

P: Set speeds

P: Fix tools

P: -

P: -

-----

Type entry or use @ commands

@-? for Help



File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET SPEEDS  
Press @-F to change Find.

Record 19 of 73

=====

Machine: DELTOFF 12, 18. 36 GUN DRILLS

P: Locate/obtain WIP, blueprints

P: Locate/obtain fixture

P: Inspect

P: Select/set speeds

P: Select/set feeds

P: Change/reset drills

P: Change bushings

P: -

P: -

P: -

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET SPEEDS  
Press @-F to change Find.

Record 17 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

P: Select/obtain WIP, tooling, & gages

P: Select/change collet/fixture

P: Select/change index plate

P: Select/change drills

P: Select/set feeds

P: Select/set speeds

P: Set stops/offsets

P: Load/unload parts

P: Perform simple maintenance

P: Grind/sharpen tools

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS

Press @-F to change Find.

Record 5 of 73

Machine: TRANSFER LINE

P: Select & Obtain WIP & tools

P: Select & obtain WIP set up sheets

P: Preset drills

P: Adjust heads

P: Preset mill ends

P: Change Jaws and Jobs

P: Adjust brackets

P: Sharpen tools

P: Inspect (check part to print)

P: Adjust machine

P: Load/unload and run

P: Set tools

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS

Press @-F to change Find.

Record 10 of 73

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222

P: Select/obtain WIP, tooling, gages, collet fixtures

P: Select/change index plate, drills, boring bars, reamers

P: Select/set feeds and speeds

P: Set stops/offsets

P: Adjust milling heads

P: Load/unload parts

P: Inspect (check part to print)

P: Adjust machine-- set switches

P: Perform simple maintenance

P: Select/change tool

P: Secure material in furnace

P: Grind/sharpen tools

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS  
Press @-F to change Find.

Record 5 of '73

=====

Machine: TRANSFER LINE

P: Select & Obtain WIP & tools

P: Select & obtain WIP set up sheets

P: Preset drills

P: Adjust heads

P: Preset mill ends

P: Change Jaws and Jobs

P: Adjust brackets

P: Sharpen tools

P: Inspect (check part to print)

P: Adjust machine

P: Load/unload and run

P: Set tools

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

- Find all records that contain SHARPEN TOOLS
- Press @-F to change Find.

Record 10 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222

- P: Select/obtain WIP, tooling, gages, collet fixtures
- P: Select/change index plate, drills, boring bars, reamers
- P: Select/set feeds and speeds
- P: Set stops/offsets
- P: Adjust milling heads
- P: Load/unload parts
- P: Inspect (check part to print)
- P: Adjust machine-- set switches
- P: Perform simple maintenance
- P: Select/change tool
- P: Secure material in furnace
- P: Grind/sharpen tools

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS  
Press @-F to change Find.

Record 11 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A  
P: Select/obtain WIP, tooling, gages, collet fixtures  
P: Select/change index plate, drills, boring bars, reamers  
P: Select/set feeds and speeds  
P: Set stops/offsets  
P: Adjust milling heads  
P: Load/unload parts  
P: Inspect (check part to print)  
P: Adjust machine-- set switches  
P: Perform simple maintenance  
P: Select/change tool  
P: Secure material in furnace  
P: Grind/sharpen tools

-----  
Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS  
Press @-F to change Find.

Record 32 of 73

---

Machine: LININNATI 5 HORIZONTAL MILLING MACHINE

P: Secure materials

P: Run (operate)

P: Inspect (check part to print)

P: Select/obtain WIP, tools, blueprints, tape

P: Set stops

P: Adjust

P: Attach fixture/collet

P: Select feeds/ speeds

P: -

P: -

P: -

P: -

---

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS  
Press @-F to change Find.

Record 33 of 73

---

Machine: CINCINNATI 2 HORIZONTAL MILLING MACHINE

P: Secure materials

P: Run (operate)

P: Inspect (check part to print)

P: Select/obtain WIP, tools, blueprints, tape

P: Set stops

P: Adjust

P: Attach fixture/collet

P: Select feeds/ speeds

P: -

P: -

P: -

P: -

---

Type entry or use @ commands

@-? for Help



File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS  
Press @-F to change Find.

Record 40 of 73

-----  
Machine: CINCINNATI MONOSETT TOOL GRINDER

P: Select/obtain WIP

P: Secure materials

P: Select/obtain prints

P: Check part to print

P: Select/obtain mount wheels

P: Select speed/feeds

P: Dress wheel

P: Center and true stock

P: Load/unload

P: Set/adjust stops

P: Adjust machine

P: -

-----  
Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET FEEDS  
Press @-F to change Find.

Record 11 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A

- P: Select/obtain wIP, tooling, gages, collet fixtures
- P: Select/change index plate, drills, boring bars, reamers
- P: Select/set feeds and speeds
- P: Set stops/offsets
- P: Adjust milling heads
- P: Load/unload parts
- P: Inspect (check part to print)
- P: Adjust machine-- set switches
- P: Perform simple maintenance
- P: Select/charge tool
- P: Secure material in furnace
- P: Grind/sharpen tools

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET FEEDS  
Press @-F to change Find.

Record 17 of 73

=====

Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A

P: Select/obtain WIP, tooling, & gages

P: Select/change collet/fixture

P: Select/change index plate

P: Select/change drills

P: Select/set feeds

P: Select/set speeds

P: Set stops/cffsets

P: Load/unload parts

P: Perform simple maintenance

P: Grind/sharpen tools

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

File: MACH.PROCD

FIND RECORDS

Escape: Review/Add/Change

Find all records that contain SET FEEDS  
Press @-F to change Find.

Record 19 of 73

=====

Machine: DELTOFF 12, 18, 36 GUN DRILLS

P: Locate/obtain WIP, blueprints

P: Locate/obtain fixture

P: Inspect

P: Select/set speeds

P: Select/set feeds

P: Change/reset drills

P: Change bushings

P: -

P: -

P: -

P: -

P: -

-----

Type entry or use @ commands

@-? for Help

Project Number Three

**Maintenance, Manufacturing Cell, and Industrial  
Engineering/Product Engineering Training Needs  
Assessment Project**

August 1987

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**Volume 5**

**Worker Self Assessment**

**Part I - Frequency & Competencies  
Data**

**Part II - Self Assessment  
Instruments**

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**The Pennsylvania State University**

Division of Counseling and Educational Psychology  
and Career Studies

397

FOSTER A		SECTIONS 192		GEN		1		2		3		4		5		6		7		8	
MACHINING		QUESTION #		KNOWLEDGE		1/YR		MONTHLY		FEEDBACK		PAST		OBTAIN		HBL		SIMILAR		EEO	
PT 1	PT 2	task	f	a	f	a	f	a	f	a	f	a	f	a	f	a	f	a	f	a	%
146	150	read micrometers	5	5%	2	2%	1	1%	11	11%	8	8%	118	88%	2	2%	5	4%	1	1%	2%
152	155	use basic math	9	7%	5	4%	1	1%	118	81%	6	5%	118	81%	1	1%	1	1%	1	1%	1%
145	149	read blueprints	6	5%	7	7%	1	1%	114	71%	4	4%	1	1%	111	71%	1	1%	1	1%	1%
185	190	arrange for service	49	77%	8	6%	3	2%	5	4%	11	7%	77	78%	11	15%	15	11%	11	11%	11%
180	184	load in lathe machine	1	8%	1	1%	0	0%	111	87%	8	8%	11	8%	11	8%	1	1%	1	1%	1%
190	195	assist in troubleshooting	21	15%	3	3%	2	2%	87	65%	10	8%	1	1%	1	1%	1	1%	1	1%	6%
186	191	check part to print	10	8%	9	7%	1	1%	117	84%	1	1%	118	86%	5	5%	5	4%	4	4%	11%
155	159	use Vernier calipers	9	7%	5	5%	4	4%	11	76%	9	7%	1	1%	89	69%	3	3%	3	3%	1%
169	173	use depth gages	31	23%	4	4%	4	4%	86	61%	19	14%	91	68%	11	8%	11	10%	11	10%	6%
166	170	read WIP forms	31	25%	5	4%	1	1%	83	64%	9	7%	3	3%	8	6%	17	13%	1	1%	11%
191	196	obtain tooling	15	11%	6	5%	2	2%	110	75%	8	6%	1	1%	118	12%	9	7%	1	1%	1%
188	197	mount material	15	11%	0	0%	2	2%	97	71%	12	9%	112	77%	11	8%	9	7%	1	1%	6%
189	194	change fixture	22	17%	28	21%	4	3%	81	61%	15	11%	98	74%	1	1%	1	1%	1	1%	7%
158	162	use trigonometry	118	81%	10	8%	0	0%	6	5%	6	5%	11	1%	14	11%	11	8%	11	8%	61%
178	182	read Machinist handbk	47	72%	28	21%	7	5%	25	20%	27	20%	97	71%	15	11%	5	5%	11	8%	6%
156	160	use Johansson blocks	28	21%	10	8%	3	2%	82	62%	6	5%	111	79%	11	8%	1	1%	1	1%	6%
157	161	use Machinist handbk	50	38%	25	19%	4	3%	40	30%	12	9%	11	8%	15	11%	5	5%	1	1%	8%
159	163	read complicated draw	32	24%	15	11%	4	3%	69	52%	11	8%	1	1%	1	1%	1	1%	1	1%	14%
160	164	use depth gage	10	8%	11	8%	2	2%	94	72%	11	8%	1	1%	1	1%	1	1%	1	1%	4%
161	165	use shadow gage	40	72%	20	5%	1	1%	45	34%	21	15%	1	1%	88	17%	11	8%	1	1%	7%
162	166	use radius gage	20	15%	14	11%	2	2%	81	61%	17	13%	11	8%	11	8%	1	1%	1	1%	5%
149	153	measure to .0001"	11	4%	9	7%	3	2%	97	72%	9	7%	115	86%	3	3%	6	5%	1	1%	1%
183	188	assist w/ maintenance	25	19%	10	8%	1	1%	56	45%	10	8%	1	1%	1	1%	16	12%	1	1%	5%
150	154	measure to 1/64"	7	5%	2	2%	2	2%	107	80%	9	7%	1	1%	108	81%	3	2%	1	1%	1%
179	183	adjust machine	10	10%	2	2%	0	0%	110	80%	6	5%	117	87%	3	3%	1	1%	1	1%	1%
182	187	clean, oil, lubricate	11	8%	1	1%	3	2%	111	80%	5	4%	115	86%	8	6%	1	1%	1	1%	1%
78	82	oper. milling machines	65	49%	4	3%	4	3%	17	12%	15	11%	11	8%	14	10%	15	11%	4	3%	6%
111	115	oper. Bridgeport CNC mil	14	73%	3	2%	0	0%	4	2%	19	14%	11	8%	17	13%	8	6%	4	3%	16%
112	116	oper. Cincinnati horiz	36	65%	2	1%	2	2%	3	2%	11	8%	27	20%	1	1%	11	8%	11	8%	10%
113	117	oper. Cincinnati vert	20	71%	1	1%	3	2%	5	4%	15	11%	17	13%	11	8%	11	8%	11	8%	10%
70	74	oper. surface grinder	97	73%	8	6%	2	2%	7	5%	17	14%	17	13%	11	8%	11	8%	11	8%	10%
12	16	setup drill press	31	40%	5	4%	4	3%	14	11%	15	11%	40	30%	15	11%	11	8%	1	1%	17%
17	21	setup air thru feed	111	87%	4	3%	1	1%	3	2%	6	5%	9	7%	1	1%	1	1%	1	1%	4%
60	64	oper. drill press	44	33%	11	7%	1	1%	10	11%	12	9%	45	34%	11	8%	11	8%	11	8%	12%
147	151	read concentricity ga	10	10%	6	5%	1	1%	107	77%	1	1%	110	80%	3	3%	5	4%	1	1%	1%
184	189	load tape in NC	37	65%	6	5%	2	2%	22	17%	10	8%	25	19%	14	11%	11	8%	11	8%	19%
197	192	program machine	78	59%	7	5%	0	0%	15	16%	6	5%	48	36%	11	8%	11	8%	11	8%	10%
79	83	oper. lathe	63	47%	7	5%	2	2%	12	9%	47	35%	25	19%	17	13%	11	8%	11	8%	10%
13	17	setup Bridgeport mill	75	56%	6	5%	2	2%	11	8%	16	12%	11	8%	11	8%	11	8%	11	8%	10%
51	55	setup MSQ	114	86%	2	2%	3	2%	1	1%	11	8%	14	11%	10	8%	49	37%	58	44%	44%
61	65	oper. Bridgeport mill	62	47%	10	8%	4	3%	9	7%	46	35%	29	22%	21	16%	11	8%	11	8%	10%
66	70	oper. Cincinnati Monosett	112	34%	1	1%	1	1%	1	1%	7	5%	1	1%	1	1%	11	8%	11	8%	42%
67	71	oper. Heald tool grind	119	89%	1	1%	2	2%	2	2%	7	5%	6	5%	11	8%	11	8%	11	8%	47%
68	72	oper. Norton surface	105	79%	3	4%	2	2%	6	5%	12	9%	1	1%	20	15%	49	37%	49	37%	10%
69	73	oper. drill grinder	107	80%	4	3%	1	1%	1	1%	15	11%	10	8%	11	8%	48	36%	47	35%	10%
72	76	oper. cutter tool	119	89%	2	2%	0	0%	1	1%	10	8%	5	4%	11	8%	51	38%	56	42%	42%
73	77	oper. tap grind	123	92%	0	0%	0	0%	0	0%	6	5%	4	3%	15	11%	47	35%	65	49%	49%



ROSTER A		SECTIONS 192		1		2		3		4		5		6		7		8				
MACHINING				GEN'L		1/MO		MONTHLY		REGULARLY		PASS		CAP DO		W/SELF		SIMIL-R		NEED		
QUESTION #		KNLGE		NEVEF		f %		f %		f %		f %		f %		f %		f %		f %		
PT 1	PT 2	cast	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
74	78	oper.thread chaser	104	79%	3	2%	2	2%	6	5%	15	11%	14	11%	19	14%	42	32%	56	42%		
75	79	oper.Gleason cutter	124	93%	0	0%	2	2%	7	5%	2	2%	8	6%	11	8%	57	40%	59	44%		
129	137	oper. MSC machine	109	82%	2	2%	7	2%	4	3%	10	10%	17	12%	11	3%	54	41%	49	37%		
148	152	read plug gages	x 8	6%	5	4%	2	2%	4	7%	10	8%	15	86%	7	5%	5	4%	7	5%		
14	18	setup Sunnen	106	81%	6	5%	7	2%	5	4%	10	3%	16	12%	21	16%	46	35%	47	35%		
23	32	setup Potter&Johnson	100	75%	1	1%	1	1%	7	5%	12	17%	12	9%	15	11%	53	40%	49	37%		
44	48	setup Scimmx	121	91%	1	1%	1	1%	4	3%	4	3%	5	4%	7	5%	48	36%	70	53%		
65	69	oper.Sunnen horiz	104	78%	8	6%	2	2%	7	2%	17	10%	14	11%	23	17%	42	30%	51	38%		
76	80	oper.single point car	120	90%	1	1%	0	0%	1	1%	9	7%	7	2%	16	12%	54	41%	53	44%		
81	85	oper.surface grinder	92	69%	7	5%	2	2%	10	8%	21	15%	24	13%	25	19%	44	33%	35	27%		
122	126	oper. Scimmx	118	89%	2	2%	0	0%	5	4%	7	7%	9	7%	10	8%	49	37%	62	47%		
174	178	use slip gages	x 76	57%	2	7%	2	2%	25	20%	15	12%	18	25%	29	20%	10	25%	27	20%		
11	15	setup Standard endpla	105	79%	7	2%	1	1%	4	7%	13	14%	8	5%	27	15%	14	41%	45	37%		
25	29	setup Standard Heald	114	85%	3	2%	1	1%	4	3%	9	7%	8	5%	11	8%	45	34%	63	47%		
26	30	setup Horizontal turr	89	67%	5	4%	1	1%	4	3%	12	24%	19	14%	13	14%	47	35%	47	32%		
29	33	setup Warner SwazyAC	94	71%	5	4%	1	1%	5	5%	20	13%	17	14%	14	11%	48	36%	49	37%		
45	49	setup DoAll saw	95	71%	7	5%	3	2%	8	5%	19	14%	20	15%	15	10%	44	33%	42	32%		
46	50	setup Wagner saw	111	83%	3	2%	7	2%	5	5%	10	8%	5	10%	10	17%	47	35%	45	35%		
47	51	setup Barber-Coleman	118	89%	2	2%	1	1%	7	2%	5	5%	5	10%	10	5%	51	38%	59	44%		
48	52	setup Anvill Mill	109	82%	1	1%	1	1%	7	2%	17	13%	5	12%	13	14%	12	35%	51	40%		
49	53	setup vertical broach	109	82%	2	2%	2	2%	5	4%	14	11%	7	5%	26	20%	47	35%	51	35%		
52	56	setup Burke twin mill	122	92%	0	0%	2	2%	4	3%	7	2%	8	5%	17	10%	51	40%	54	42%		
54	58	setup multiple spindl	114	86%	0	0%	1	1%	9	7%	9	7%	2	5%	5	5%	57	40%	58	44%		
55	59	setup automatic screw	108	81%	2	2%	0	0%	11	5%	11	8%	15	12%	11	8%	47	35%	57	43%		
56	60	setup gear shaper	125	94%	2	2%	1	1%	1	1%	7	2%	5	4%	5	5%	55	42%	64	43%		
77	81	oper.Sunnen precision	109	82%	6	5%	2	2%	5	4%	9	7%	17	12%	23	17%	42	32%	53	40%		
98	102	oper.Heald borematic	109	82%	1	1%	1	1%	4	3%	15	11%	12	9%	11	3%	57	43%	51	38%		
123	127	oper.DoAll Saw	92	59%	5	4%	7	2%	6	5%	24	18%	23	17%	28	21%	41	31%	19	29%		
125	129	oper.Wagner saw	108	81%	5	4%	0	0%	6	5%	11	8%	15	12%	25	19%	46	35%	44	33%		
130	130	oper. BarberColeman	110	83%	1	1%	2	2%	5	5%	11	8%	17	12%	11	8%	49	37%	57	43%		
127	131	oper.Anvill Mill	93	70%	2	2%	7	2%	5	4%	26	20%	19	14%	19	14%	40	30%	44	33%		
128	132	oper.vertical broache	99	74%	3	2%	2	2%	5	5%	21	15%	15	11%	15	14%	52	39%	45	35%		
130	134	oper.Burke twin mill	110	83%	1	1%	2	2%	6	5%	11	8%	17	10%	11	8%	53	44%	48	36%		
132	136	oper.multiple spindle	112	84%	1	1%	0	0%	6	5%	12	9%	17	10%	18	14%	51	38%	53	33%		
133	137	oper.automatic screw	102	77%	0	0%	1	1%	5	7%	19	14%	15	14%	20	15%	52	35%	38	29%		
134	138	oper.gear shaper	119	89%	0	0%	1	1%	5	4%	5	5%	5	5%	18	14%	60	45%	44	33%		
168	172	use dial bar gages	x 46	35%	11	8%	6	5%	37	28%	31	23%	70	57%	24	13%	21	16%	16	12%		
9	12	setup Seike 3NE	102	77%	8	5%	0	0%	8	5%	10	8%	12	9%	25	20%	48	36%	45	34%		
9	13	setup Seike 4NE	104	78%	9	7%	0	0%	6	5%	10	8%	11	8%	24	18%	52	39%	44	33%		
10	14	setup Seike 4NEA	111	83%	6	5%	0	0%	5	5%	6	5%	11	8%	20	15%	54	41%	46	35%		
15	17	setup Landis external	107	80%	5	4%	3	2%	8	6%	8	5%	16	12%	11	9%	48	36%	36	42%		
16	20	setup Gardner disk	113	87%	4	3%	0	0%	4	3%	5	4%	5	5%	11	8%	57	43%	53	40%		
18	22	setup Landis plunge	115	86%	1	1%	2	2%	10	8%	7	2%	17	10%	9	6%	48	36%	62	47%		
19	23	setup Heald 271	113	85%	3	2%	4	3%	8	5%	7	2%	17	10%	9	7%	47	35%	52	47%		
20	24	setup Heald 272plain	111	83%	2	2%	7	5%	7	5%	4	3%	17	10%	9	7%	46	35%	62	47%		
21	25	setup Heald 272sizema	114	86%	2	2%	3	2%	8	6%	4	3%	11	8%	10	8%	48	36%	61	46%		
22	26	setup Cincinnati 181	118	89%	4	3%	2	2%	7	2%	4	3%	5	7%	9	7%	51	38%	52	47%		

ROSTER A		SECTIONS 1&2	1		2		3		4		5		1		2		3		4			
MACHINING			GEN L		1/MO		MONTHLY		REGULARLY		FAST		CAN DO		W/HELP		SIMILAR		NEED			
QUESTION #	task	INLGE	NEVER	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
PT 1	PT 2		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
23	27	setup external stepma	120	90%	3	2%	1	1%	3	2%	4	3%	7	5%	10	8%	50	38%	64	48%		
24	28	setup standard Heald	110	87%	1	1%	1	1%	6	5%	12	9%	9	8%	15	11%	43	32%	51	46%		
27	31	setup transfer machin	121	91%	1	1%	1	1%			7	5%	5	4%	9	7%	52	39%	63	47%		
30	34	setup 4-6 spindle	111	83%	2	2%	5	4%	2	2%	11	8%	17	10%	15	11%	49	37%	52	39%		
31	35	setup hvy duty vertic	91	68%	5	4%	0	0%	6	5%	27	22%	14	12%	22	17%	48	36%	47	32%		
32	36	setupradial drill	90	68%	4	3%	0	0%	7	5%	31	23%	17	17%	20	15%	50	38%	37	28%		
33	37	setup NATCO	108	81%	2	2%	2	2%	5	4%	14	11%	12	9%	17	17%	49	37%	52	39%		
34	38	setup 21'upright	90	68%	1	1%	3	2%	2	2%	29	22%	19	14%	18	14%	51	38%	42	32%		
35	39	setup CNC vertical	109	82%	2	2%	0	0%	5	4%	13	10%	5	4%	14	11%	50	38%	61	46%		
36	40	setup CNC horizontal	111	83%	3	2%	0	0%	3	2%	15	11%	5	4%	15	11%	50	38%	60	45%		
37	41	setup Bridgeport hori	92	69%	3	2%	1	1%	9	7%	27	20%	19	14%	20	15%	48	36%	47	32%		
38	42	setup Cincinnati&Fall	110	83%	1	1%	0	0%	4	3%	15	12%	10	8%	19	14%	49	37%	53	40%		
39	43	setup duplex twinhead	114	86%	2	2%	2	2%	6	5%	7	5%	11	8%	10	8%	50	38%	56	42%		
40	44	setup Milwaukee	109	82%	1	1%	2	2%	5	4%	17	10%	15	11%	12	9%	41	31%	52	47%		
41	45	setup J&L CNC chucker	113	85%	2	2%	1	1%	10	8%	6	5%	11	8%	5	4%	51	38%	59	44%		
42	46	setup J&L CNC combi	116	87%	2	2%	1	1%	6	5%	6	5%	9	7%	11	8%	51	38%	60	45%		
43	47	setup K&T 180	120	90%	3	2%	0	0%	5	4%	7	5%	5	5%	5	5%	45	35%	72	54%		
50	54	setup horiz broaches	112	84%	3	2%	0	0%	3	2%	13	10%	8	6%	21	16%	47	37%	53	40%		
53	57	setup engine lathe	89	67%	3	2%	4	3%	7	2%	33	25%	17	17%	21	16%	38	29%	48	36%		
57	61	setup TBI lathe	124	93%	0	0%	2	2%	2	2%	4	3%	6	5%	7	5%	52	39%	65	49%		
58	62	setup gun drill	94	71%	5	4%	2	2%	6	5%	25	19%	19	14%	17	17%	48	36%	47	35%		
59	63	oper. stand end plate	100	75%	3	2%	0	0%	8	6%	22	17%	17	13%	21	18%	49	37%	40	30%		
62	66	oper Seiki ONE	84	63%	6	5%	1	1%	24	18%	15	11%	12	24%	7	7%	39	29%	47	32%		
63	67	oper. Seiki 4NE	88	66%	5	4%	1	1%	20	15%	16	12%	27	22%	19	14%	29	29%	44	32%		
64	68	oper. Seiki 4NEA	99	74%	4	3%	1	1%	15	11%	11	8%	21	16%	20	15%	41	31%	49	37%		
71	75	oper Hobb machine	108	81%	4	3%	1	1%	10	8%	5	6%	16	12%	12	9%	43	32%	55	41%		
80	84	oper. Jig Bore	125	95%	0	0%	0	0%	0	0%	4	3%	5	4%	17	10%	52	39%	60	45%		
82	86	oper bench grinders	52	39%	6	5%	5	4%	25	19%	43	32%	47	35%	18	14%	11	23%	25	26%		
83	87	oper. contour saw	119	89%	1	1%	2	2%	1	1%	9	7%	9	7%	15	11%	53	40%	33	40%		
84	88	oper. cam grinder	124	93%	0	0%	0	0%	1	1%	5	4%	4	3%	7	5%	57	47%	63	47%		
85	89	oper. Landis external	108	81%	6	5%	1	1%	7	5%	9	7%	17	13%	12	9%	47	35%	35	41%		
86	90	oper Norton external	107	80%	5	4%	1	1%	8	6%	10	8%	17	13%	13	10%	45	34%	55	42%		
87	91	oper. Gardner disk	120	90%	2	2%	0	0%	4	3%	5	4%	10	8%	13	10%	37	40%	55	41%		
88	92	oper Cincinnati thru fee	113	95%	5	4%	1	1%	5	4%	6	5%	10	8%	12	9%	53	40%	56	42%		
89	93	oper. Landis plunge	116	87%	3	2%	1	1%	7	5%	4	3%	14	11%	10	8%	49	37%	57	47%		
90	94	oper. Heald 271	112	84%	2	2%	3	2%	7	5%	5	5%	17	10%	10	8%	47	35%	60	45%		
91	95	oper. Heald 272 plain	112	84%	2	2%	2	2%	7	5%	8	6%	14	11%	10	8%	47	35%	60	45%		
92	96	oper. Heald 272sizemat	114	86%	1	1%	3	2%	7	5%	6	5%	13	10%	10	8%	49	36%	60	45%		
93	97	oper. Cincinnati 191	117	88%	3	2%	1	1%	7	2%	6	5%	11	8%	12	9%	48	36%	60	45%		
94	98	oper. external stepmas	119	89%	2	2%	0	0%	5	4%	4	3%	7	5%	12	9%	54	41%	58	44%		
95	99	oper. roll stamp	85	65%	5	4%	3	2%	5	4%	22	24%	24	18%	27	20%	47	32%	26	27%		
96	100	oper. power press	90	68%	5	4%	1	1%	2	2%	34	26%	27	22%	23	17%	39	29%	39	29%		
97	101	oper. standard Heald	108	81%	0	0%	2	2%	5	4%	16	12%	10	9%	14	11%	55	41%	47	35%		
99	103	oper. transfer machine	119	99%	0	0%	0	0%	3	2%	10	8%	15	8%	15	11%	49	37%	54	41%		
100	104	oper. Jones&Lamsor ATL	109	82%	0	0%	2	2%	5	4%	16	12%	15	11%	12	9%	57	40%	49	37%		
101	105	oper. Wheel & Brader	117	89%	1	1%	0	0%	2	2%	10	9%	12	9%	11	8%	56	42%	48	36%		
102	106	oper. straightn press	94	71%	2	2%	1	1%	4	3%	30	27%	27	20%	26	20%	45	34%	12	24%		

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ROSTER A		SECTIONS 1&2	1		2		3		4		5		1		2		3		4		
MACHINING			GEN'L		1/MO		MONTHLY		REGULARLY		IN		DAY DO		W/HELP		SIMILAR		NEED		
QUESTION #		task	NEVER								FAST									TRNG	
PT 1	PT 2		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
103	107	oper. lapping machine	105	79%	1	1%	0	0%	4	3%	20	15%	21	16%	22	17%	45	74%	42	32%	
104	108	oper heat treat furna	120	90%	1	1%	1	1%	3	2%	5	4%	5	4%	12	9%	47	35%	66	50%	
105	109	oper.induction heat	121	91%	0	0%	0	0%	4	3%	3	2%	4	3%	12	9%	45	34%	69	52%	
106	110	oper.4-6spindle	107	80%	3	2%	2	2%	4	3%	14	11%	14	11%	17	13%	52	39%	46	35%	
107	111	oper.radial drill	88	66%	2	2%	2	2%	5	4%	14	11%	27	17%	30	23%	47	32%	35	26%	
108	112	oper.NATCO multi	109	82%	1	1%	3	2%	4	3%	14	11%	15	11%	21	16%	51	39%	44	33%	
109	113	oper.24'upright singl	93	70%	3	2%	1	1%	6	5%	27	20%	24	18%	25	19%	45	34%	37	28%	
110	114	oper.OKATA CNC	119	89%	0	0%	1	1%	4	3%	6	5%	9	7%	12	9%	52	39%	57	43%	
114	118	oper.Bridgeport verti	81	61%	6	5%	2	2%	6	5%	15	11%	26	20%	17	13%	32	29%	34	26%	
115	119	oper Cincin Rise&Fall	106	80%	2	2%	0	0%	3	2%	20	15%	13	10%	21	16%	54	41%	43	32%	
116	120	oper.duplex-twin	104	78%	2	2%	1	1%	6	5%	16	12%	14	11%	22	17%	46	35%	45	34%	
117	121	oper Milwaukee	107	80%	1	1%	1	1%	7	5%	15	11%	17	13%	19	14%	44	33%	49	37%	
118	122	oper. J&L CNC chucker	101	76%	4	3%	0	0%	11	8%	14	11%	19	14%	15	11%	47	35%	50	38%	
119	123	oper.J&L CNC combi	111	83%	4	3%	0	0%	6	5%	9	7%	13	10%	16	12%	51	38%	51	38%	
120	124	oper Shaffner	113	85%	1	1%	0	0%	11	8%	7	5%	12	9%	9	7%	55	41%	55	41%	
121	125	oper. oper K&T 180	118	89%	2	2%	0	0%	6	5%	4	3%	10	8%	11	8%	48	36%	62	47%	
124	128	oper.Marvel saw	109	82%	3	2%	0	0%	6	5%	12	9%	17	13%	26	20%	45	35%	46	35%	
131	135	oper. Vibro machine	99	74%	2	2%	1	1%	18	14%	10	8%	24	18%	21	16%	55	41%	30	23%	
135	139	oper.barrel machine	120	90%	0	0%	0	0%	3	2%	8	6%	6	5%	27	20%	37	28%	28	29%	
136	140	oper.big wash	109	81%	2	2%	1	1%	5	4%	15	11%	10	8%	25	19%	53	40%	23	18%	
137	141	oper.derust wash	112	84%	0	0%	1	1%	5	4%	14	11%	9	7%	26	20%	56	42%	20	15%	
138	142	oper.paint booth	113	85%	2	2%	0	0%	2	2%	15	11%	7	5%	25	19%	55	42%	33	25%	
139	143	oper.powder coating	119	89%	2	2%	1	1%	3	2%	8	6%	6	5%	29	22%	58	44%	37	28%	
140	144	oper.spin finish	121	91%	0	0%	0	0%	2	2%	8	6%	5	4%	31	23%	59	44%	36	27%	
141	145	oper.buffing lathe	113	85%	1	1%	1	1%	1	1%	17	13%	7	5%	24	18%	65	49%	32	24%	
142	146	oper. disc sander	87	65%	6	5%	2	2%	3	2%	33	25%	30	23%	26	20%	47	37%	25	19%	
143	147	oper.float sander	107	80%	2	2%	1	1%	2	2%	17	13%	17	13%	28	21%	56	42%	29	22%	
144	148	oper.belt sandner	57	43%	7	5%	2	2%	15	11%	48	36%	47	35%	29	22%	35	26%	19	14%	
151	155	read Height&flatness	x	16	12%	6	5%	5	4%	92	69%	12	9%	104	71%	15	11%	5	4%	6	5%
153	157	maintain crib service	x	79	59%	5	4%	0	0%	28	21%	17	13%	50	45%	25	26%	27	20%	10	8%
154	158	maintain tool invento	x	58	44%	10	8%	4	3%	34	26%	24	18%	64	48%	27	20%	27	20%	12	9%
163	167	asassemble components	x	65	49%	9	7%	5	4%	21	16%	31	23%	50	38%	35	26%	31	25%	14	11%
164	168	oper.robot cell	115	86%	0	0%	3	2%	4	3%	8	6%	11	10%	29	22%	41	31%	48	36%	
165	169	stamp ID on part	75	56%	5	4%	1	1%	10	8%	29	29%	54	41%	37	28%	27	17%	16	12%	
167	171	assemble 2 or more pa	49	37%	9	7%	0	0%	20	15%	57	40%	80	60%	26	20%	18	14%	6	5%	
170	174	oper. furnace	117	88%	2	2%	1	1%	3	2%	5	4%	8	6%	14	11%	57	40%	56	42%	
171	175	use Rockwell hardness	106	80%	4	3%	1	1%	3	2%	17	13%	14	11%	25	19%	51	38%	40	30%	
172	176	oper. black oxide	122	92%	0	0%	1	1%	2	2%	4	3%	7	5%	16	12%	57	43%	50	38%	
173	177	oper forge furnace	125	94%	1	1%	1	1%	0	0%	2	2%	3	2%	15	11%	56	42%	56	42%	
175	179	oper.upset hammer	125	94%	1	1%	0	0%	0	0%	3	2%	7	5%	15	11%	55	41%	52	39%	
176	180	oper. Richard's bende	123	92%	1	1%	0	0%	0	0%	5	4%	4	3%	19	14%	50	38%	55	41%	
177	181	sharpen drills	x	55	41%	10	8%	5	4%	28	21%	31	23%	57	43%	32	24%	20	15%	10	8%
191	196	assist w/repair	59	29%	16	12%	6	5%	56	42%	14	11%	51	38%	21	16%	5	4%	11	8%	
192	196	assist w/troubleshoot	10	10%	17	13%	4	3%	97	62%	2	9%	100	75%	16	12%	5	4%	7	5%	

ROSTER B		SECTIONS 3 & 4		3		4		3		4		5		1		2		3		4					
NON-MACHINING				GEN'L		KNLGE		NEVER		1/MO		MONTHLY		REGULARLY		PAST		CAN DO		W/HELP		SIMILAR		NEED	
QUESTION #	task	PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
146	150 read micrometers	X		28	22	10	8	9	7	40	32	15	28	67	55	16	17	14	12	24	20				
152	156 use basic math	X		31	25	5	4	2	2	59	47	26	21	62	58	10	8	12	10	17	14				
145	149 read blueprints	X		22	18	7	6	6	5	35	28	39	31	54	45	22	18	22	18	22	18				
185	190 arrange for service			75	60	2	2	0	0	20	16	25	20	44	36	25	21	21	17	28	23				
180	184 load/unload machine			56	45	1	1	1	1	29	23	34	27	57	47	14	12	18	15	30	25				
190	195 assist in troubleshoot			49	39	3	2	5	5	39	30	27	22	62	51	19	16	17	14	22	18				
186	191 check part to print	Y		44	35	6	5	5	4	33	26	36	29	67	55	17	14	13	11	33	29				
155	159 use Vernier calipers	X		55	44	5	4	6	5	32	26	26	21	60	50	17	11	19	15	29	24				
169	173 use depth gages	Y		65	52	6	5	0	0	23	18	30	24	44	36	16	13	22	18	37	31				
166	170 read NIP forms	X		59	55	8	6	1	1	24	19	21	17	42	35	14	12	25	21	34	28				
181	186 obtain tooling			45	36	0	0	1	1	47	34	35	28	74	61	18	15	14	12	14	12				
188	193 mount material			73	58	1	1	2	2	21	17	27	22	47	39	14	12	19	16	39	32				
189	194 change fixture			73	58	0	0	1	1	21	17	29	23	44	36	12	10	21	19	41	34				
158	162 use trigonometry	Y		112	90	1	1	1	1	0	0	9	7	3	2	6	5	24	20	87	71				
178	182 read Machinist handbk	X		59	55	7	6	1	1	14	11	32	26	54	45	14	12	15	15	32	26				
156	160 use Johansson blocks	X		79	62	3	2	1	1	27	19	19	15	42	35	15	12	21	17	40	33				
157	161 use Machinist handbk	X		74	59	9	7	1	1	15	12	25	20	41	34	27	19	20	17	37	31				
159	163 read complicated draw	X		65	52	6	5	4	3	21	17	27	22	21	17	27	22	31	25	43	36				
160	164 use depth gage	X		47	38	6	5	4	3	26	21	37	30	51	42	20	17	21	17	29	24				
161	165 use shadow gage	X		72	58	5	4	2	2	14	11	31	25	42	35	20	17	26	21	31	26				
162	166 use radius gage	X		62	57	4	3	2	2	20	16	32	26	48	40	16	13	27	19	31	26				
149	153 measure to .0001"	X		44	35	4	3	5	4	29	22	41	33	61	60	17	11	23	19	24	20				
183	188 assist w/ maintenance	X		66	53	3	2	0	0	34	19	31	25	50	41	28	27	21	17	19	16				
150	154 measure to 1/64"	X		42	34	4	3	3	2	35	28	38	30	62	51	12	10	20	17	25	21				
179	183 adjust machine			58	46	2	2	0	0	29	23	34	27	51	42	14	12	17	14	36	30				
182	187 clean, oil, lubricate			49	39	1	1	1	1	35	28	38	30	68	56	22	18	15	12	15	12				
78	82 oper. milling machines			99	79	1	1	1	1	6	5	16	17	7	6	18	15	33	27	63	52				
111	115 oper. Bridgeport CNC mil			115	92	0	0	0	0	2	2	6	5	5	4	6	5	33	27	77	64				
112	116 oper. Cincinnati horiz			104	83	0	0	0	0	4	3	14	11	9	7	10	8	30	25	72	60				
113	117 oper. Cincinnati verti			106	85	0	0	1	1	2	2	13	10	3	7	9	7	33	27	71	59				
70	74 oper. surface grinder			107	86	2	2	0	0	1	1	13	10	6	5	9	7	34	28	62	51				
12	16 setup drill press			71	57	6	5	4	4	5	4	37	30	29	24	27	22	32	26	33	27				
17	21 setup C in thru feed			117	94	0	0	1	1	0	0	5	4	1	1	3	2	37	31	80	66				
60	64 oper. drill press			65	52	4	3	4	3	6	5	43	34	23	19	28	23	31	26	38	31				
147	151 read concentricity ga	X		55	44	6	5	2	2	28	22	31	25	45	37	25	21	18	15	33	27				
184	189 load tape in NC			102	82	0	0	1	1	7	6	13	10	12	10	14	12	34	28	59	49				
187	192 program machine			106	85	0	0	1	1	10	8	7	6	17	14	11	9	27	22	54	53				
79	83 oper. lathe			90	72	3	2	1	1	6	5	24	19	8	7	20	17	35	29	58	48				
13	17 setup Bridgeport mill			96	77	4	3	2	2	5	4	17	14	15	12	11	9	34	28	61	50				
51	55 setup MSO			118	94	0	0	0	0	2	2	3	2	4	3	1	1	33	27	83	69				
61	65 oper. Bridgeport mill			96	77	2	2	3	2	5	4	17	14	15	12	14	12	29	24	57	47				
66	70 oper. Cincinnati Monosett			122	98	0	0	0	0	0	0	1	1	1	1	4	3	33	27	80	66				
67	71 oper. Heald tool grind			121	97	0	0	0	0	0	0	2	2	1	1	6	5	35	29	79	65				
68	72 oper. Norton surface			112	90	0	0	0	0	1	1	10	8	3	2	9	7	40	33	69	57				
69	73 oper. drill grinder			109	87	2	2	0	0	1	1	10	8	4	3	14	12	40	33	63	52				
72	76 oper. cutter & tool			120	96	1	1	0	0	0	0	2	2	0	0	6	5	37	31	78	64				
73	77 oper. tap grind			121	97	0	0	0	0	0	0	2	2	0	0	4	3	43	36	74	61				

ROSTER B		SECTIONS 3 & 4		3		4		3		4		5		1		2		3		4		
QUESTION #		task		NEVER		>1/MO		MONTHLY		REGULARLY		FAST		CAN DO		W/HELP		SIMILAR		NEED		
PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
74	78		116	93	2	2	0	0	0	0	0	5	4	2	2	8	7	36	30	75	62	
75	79		122	98	0	0	0	0	0	0	1	1	1	1	0	0	5	4	34	28	82	69
129	133		109	87	0	0	0	0	1	1	13	10	5	4	4	3	32	26	79	65		
148	152	X	40	32	7	6	3	2	21	25	41	33	60	50	16	13	20	17	25	21		
14	18		114	91	2	2	0	0	2	2	5	4	4	3	11	9	33	27	71	59		
23	32		111	89	2	2	0	0	1	1	9	7	5	4	5	5	37	31	72	60		
44	48		116	93	1	1	0	0	1	1	3	2	2	2	1	1	32	26	65	70		
65	69		114	91	1	1	2	2	1	1	5	4	5	2	9	7	36	30	72	60		
76	80		121	97	0	0	0	0	0	0	2	2	0	0	7	6	37	31	77	64		
81	85		107	86	2	2	0	0	2	2	12	10	4	3	9	7	40	36	65	54		
122	126		118	94	0	0	0	0	2	2	1	1	1	1	5	4	30	25	84	69		
174	178	X	98	78	2	2	2	2	10	8	11	9	19	16	7	14	34	28	49	40		
11	15		109	87	2	2	1	1	0	0	11	9	3	7	7	6	33	27	72	60		
25	29		115	92	1	1	0	0	1	1	6	5	3	2	4	3	32	26	82	68		
26	30		95	76	4	3	1	1	2	2	20	16	8	7	10	8	32	26	68	56		
29	33		112	92	2	2	0	0	0	0	9	7	3	2	7	6	36	30	75	62		
45	49		98	78	2	2	0	0	6	5	16	13	5	7	12	10	39	32	61	50		
46	50		113	90	1	1	0	0	3	2	7	6	1	1	11	9	43	35	65	54		
47	51		120	96	1	1	0	0	1	1	1	1	0	0	4	5	31	25	84	69		
48	52		112	90	1	1	0	0	2	2	8	6	1	1	8	7	30	25	81	67		
49	53		107	86	1	1	0	0	0	0	15	12	4	3	3	7	35	29	74	61		
52	56		120	96	0	0	0	0	0	0	3	2	0	0	5	4	32	26	84	69		
54	58		109	87	3	2	0	0	0	0	11	9	4	3	6	5	32	26	79	65		
55	59		108	86	2	2	0	0	1	1	12	10	6	5	7	6	32	26	76	63		
56	60		115	92	2	2	0	0	0	0	5	4	0	0	6	5	30	25	85	70		
77	81		118	94	1	1	0	0	1	1	3	2	5	4	7	6	36	30	72	60		
98	102		116	93	0	0	0	0	1	1	6	5	1	1	12	10	26	21	81	67		
123	127		102	82	1	1	1	1	3	2	15	12	10	8	15	12	40	33	56	46		
125	129		112	90	1	1	0	0	2	2	8	6	3	2	13	11	45	37	60	50		
127	131		121	97	0	0	0	0	0	0	2	2	4	3	6	5	34	28	77	64		
128	132		116	93	0	0	0	0	1	1	5	4	6	5	10	8	35	29	70	58		
130	130		116	93	0	0	0	0	2	2	4	3	1	1	5	4	32	26	83	69		
130	134		122	98	0	0	0	0	0	0	1	1	4	3	2	2	36	30	79	65		
132	136		113	90	0	0	0	0	0	0	10	8	3	2	9	7	35	29	74	61		
133	137		109	87	0	0	0	0	1	1	14	13	5	4	10	8	34	28	71	59		
134	138		117	94	0	0	0	0	0	0	5	4	2	2	6	5	34	28	78	64		
168	172	X	77	62	3	2	1	1	19	15	24	19	24	28	20	17	28	27	37	31		
8	12		115	92	0	0	0	0	2	2	4	3	3	2	7	6	37	31	74	61		
9	13		118	94	0	0	1	1	1	1	1	1	3	2	4	3	38	31	76	63		
10	14		116	93	1	1	1	1	1	1	1	1	3	2	3	2	39	32	76	63		
15	19		116	93	2	2	0	0	1	1	4	3	3	2	3	2	39	31	76	63		
16	20		116	93	1	1	0	0	2	2	4	3	2	2	3	2	37	31	79	65		
18	22		118	94	0	0	0	0	0	0	5	4	1	1	3	2	34	28	81	67		
19	23		119	95	0	0	0	0	0	0	4	3	1	1	4	3	32	26	82	68		
20	24		118	94	0	0	0	0	0	0	4	3	3	2	3	2	34	28	80	66		
21	25		118	94	1	1	0	0	0	0	4	3	3	2	4	3	33	27	81	67		
22	26		118	94	2	2	0	0	0	0	3	2	1	1	4	3	35	29	81	67		

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ROSTER B NON-MACH'		SECTIONS 3 & 4		3		4		3		4		5		2		3		4							
QUESTION #		task		GEN'L		KNLGE		NEVER		1/MO		MONTHLY		REGULARLY		PAST		CAN DO		w/HELP		SIMILAR		NEED	
PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
23	27	120	96	1	1	0	0	0	0	0	0	0	0	2	2	1	1	3	2	35	29	62	68		
24	28	115	92	0	0	0	0	1	1	7	6	2	2	7	6	2	2	7	6	29	24	87	67		
27	31	117	94	0	0	0	0	2	2	7	6	2	2	7	6	2	2	6	5	37	31	76	67		
30	34	100	80	3	2	0	0	2	2	19	16	14	12	6	5	14	12	6	5	37	27	65	56		
31	35	98	78	2	2	0	0	2	2	22	18	14	12	9	7	14	12	9	7	31	26	66	55		
32	36	97	78	3	2	0	0	2	2	22	18	13	11	1	1	14	12	9	7	34	28	60	52		
33	37	107	82	1	1	0	0	2	2	17	14	5	4	10	8	16	14	10	8	36	31	64	57		
34	38	91	77	2	2	0	0	3	2	27	22	15	12	11	9	16	14	11	9	38	31	57	47		
35	39	116	97	1	1	0	0	2	2	5	4	4	3	6	5	15	13	9	8	35	29	76	63		
36	40	115	92	1	1	1	1	3	2	7	6	7	6	6	5	14	12	9	8	34	28	73	64		
37	41	101	81	2	2	0	0	4	3	15	12	11	9	10	8	32	26	10	8	32	26	68	56		
38	42	110	88	0	0	0	0	2	2	11	9	5	4	7	6	12	10	10	8	32	26	70	65		
39	43	110	88	1	1	0	0	2	2	9	7	5	4	5	4	29	24	5	4	29	24	81	67		
40	44	109	87	1	1	0	0	3	2	6	5	6	5	7	6	31	25	7	6	31	25	82	69		
41	45	114	91	1	1	0	0	2	2	5	4	7	6	2	2	26	30	2	2	26	30	79	65		
42	46	115	92	2	2	1	1	0	0	5	4	0	0	4	3	27	31	0	0	27	31	79	65		
43	47	117	94	2	2	0	0	0	0	4	3	2	2	2	2	33	27	2	2	33	27	82	69		
50	54	109	87	1	1	0	0	1	1	12	10	4	3	8	7	33	27	7	6	33	27	75	62		
53	57	107	86	2	2	0	0	1	1	13	10	5	4	6	5	33	29	4	3	33	29	75	62		
57	61	112	90	2	2	0	0	1	1	9	6	2	2	9	7	29	24	2	2	29	24	81	67		
58	62	109	87	2	2	2	2	0	0	10	8	7	6	9	7	34	28	7	6	34	28	75	62		
59	63	109	87	1	1	1	1	0	0	12	10	6	5	10	8	33	27	6	5	33	27	68	56		
62	66	117	94	2	2	0	0	0	0	5	4	2	2	10	8	26	30	2	2	26	30	72	60		
63	67	118	94	1	1	0	0	2	2	2	2	0	0	11	9	26	30	0	0	26	30	77	60		
64	68	118	94	1	1	0	0	2	2	2	2	0	0	11	9	3	30	0	0	3	30	73	60		
71	75	120	96	0	0	0	0	0	0	3	2	0	0	7	6	35	29	0	0	35	29	79	65		
80	84	120	96	0	0	0	0	0	0	3	2	0	0	4	3	36	30	0	0	36	30	81	67		
82	86	72	58	5	4	4	3	12	10	20	16	24	20	19	15	27	22	24	20	27	22	52	43		
83	87	111	89	1	1	0	0	1	1	11	9	2	2	12	10	41	34	2	2	41	34	65	54		
84	88	122	98	0	0	0	0	0	0	1	1	1	1	4	3	34	28	1	1	34	28	82	68		
85	89	118	94	0	0	0	0	0	0	5	4	2	2	5	4	27	31	2	2	27	31	76	63		
86	90	117	94	0	0	0	0	0	0	6	5	2	2	5	4	38	31	2	2	38	31	76	67		
87	91	119	95	0	0	0	0	1	1	3	2	1	1	6	5	35	29	1	1	35	29	79	65		
88	92	119	95	0	0	0	0	0	0	4	3	0	0	6	5	34	28	0	0	34	28	81	67		
89	93	120	96	0	0	0	0	0	0	3	2	2	2	3	2	32	26	2	2	32	26	87	69		
90	94	119	95	0	0	0	0	0	0	3	2	1	1	6	5	32	27	1	1	32	27	81	67		
91	95	120	96	0	0	0	0	0	0	3	2	1	1	6	5	33	27	1	1	33	27	80	66		
92	96	120	96	0	0	0	0	0	0	3	2	2	2	5	4	33	27	2	2	33	27	80	66		
93	97	121	97	0	0	0	0	0	0	2	2	1	1	5	4	33	27	1	1	33	27	82	68		
94	98	120	96	0	0	1	1	0	0	2	2	1	1	3	2	33	27	1	1	33	27	83	69		
95	99	82	66	4	3	6	5	11	9	16	13	16	15	14	12	27	19	16	15	27	19	45	38		
96	100	78	62	8	6	3	2	17	14	19	14	20	17	17	12	26	21	20	17	27	22	40	33		
97	101	116	93	0	0	0	0	0	0	7	6	0	0	12	10	28	27	0	0	28	27	80	66		
99	103	117	94	1	1	0	0	1	1	4	3	1	1	8	7	32	26	1	1	32	26	73	64		
100	104	109	87	0	0	2	2	1	1	11	9	3	2	12	10	28	23	3	2	28	23	77	64		
101	105	111	89	0	0	0	0	2	2	10	8	6	5	11	9	37	31	6	5	37	31	65	54		
102	106	104	83	1	1	1	1	2	2	15	12	9	7	17	14	41	33	9	7	41	33	55	45		



ROSTER B		SECTIONS 3 & 4		3		4		3		4		5		1		2		3		4					
NON-MACH'				GEN'L		KNLGE		NEVER		1/MO		MONTHLY		REGULARLY		PAST		CAN DC		W/HELP		SIM LAR		NEED	
QUESTION #	task	PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
103	107 oper. lapping machine			113	90	0	0	0	0	1	1	9	7	5	4	16	17	34	29	66	55				
104	108 oper heat treat furna			114	91	0	0	0	0	2	2	6	5	1	1	9	7	32	26	90	66				
105	109 oper.induction heat			116	90	0	0	0	0	2	2	5	4	2	2	6	5	32	26	80	66				
106	110 oper.4-6spindle			99	79	0	0	0	0	1	1	24	19	11	9	10	8	37	31	57	52				
107	111 oper.radial drill			95	76	1	1	0	0	1	1	27	22	12	10	15	15	36	30	54	45				
108	112 oper.NATCO multi			104	83	1	1	0	0	0	0	18	14	10	8	12	10	25	25	64	53				
109	113 oper.24'upright singl			95	76	0	0	1	1	2	2	24	19	11	9	13	11	41	34	56	46				
110	114 oper.OKATA CNC			115	92	0	0	0	0	3	2	5	4	4	3	4	3	35	29	79	64				
114	118 oper.Bridgeport vert1			100	80	1	1	1	1	4	3	16	13	10	8	11	9	32	26	68	56				
115	119 oper Cincin Rise&Fall			110	88	0	0	0	0	2	2	10	8	5	4	10	8	29	24	77	64				
116	120 oper.duplex-twin			110	88	0	0	0	0	2	2	11	9	5	5	7	6	28	23	78	64				
117	121 oper Milwaukee			112	90	0	0	0	0	2	2	9	6	7	6	5	4	21	26	78	64				
118	122 oper. J&L CNC chucker			116	93	0	0	0	0	2	2	4	3	5	4	4	3	36	30	75	62				
119	123 oper.J&L CNC comb1			118	94	0	0	0	0	2	2	2	2	3	2	5	4	35	29	78	64				
120	124 oper Shaffner			116	93	0	0	0	0	2	2	4	3	2	2	6	5	32	26	81	67				
121	125 oper. oper K&T 180			115	92	0	0	0	0	2	2	4	3	3	2	4	3	20	25	35	67				
124	128 oper.Marvel saw			114	91	1	1	0	0	1	1	8	6	5	4	12	10	44	36	60	50				
131	135 oper. Vibro machine			106	85	2	2	1	1	2	2	12	10	7	7	17	14	40	33	55	45				
135	139 oper.barrel machine			113	90	0	0	0	0	1	1	8	6	4	3	16	17	47	35	57	47				
136	140 oper.big wash			103	82	0	0	0	0	4	3	16	17	15	12	28	23	43	35	34	28				
137	141 oper.derust wash			101	81	0	0	1	1	4	3	17	14	16	13	31	26	42	35	31	26				
138	142 oper.paint booth			95	76	1	1	3	2	5	4	20	16	17	14	35	29	37	31	31	26				
139	143 oper.powder coating			117	94	0	0	1	1	2	2	2	2	4	3	34	28	46	38	37	31				
140	144 oper.spin finish			118	94	0	0	0	0	0	0	5	4	3	2	24	20	47	39	47	39				
141	145 oper.buffing lathe			111	89	1	1	1	1	0	0	1	9	9	7	22	13	42	35	48	40				
142	146 oper. disc sander			92	74	2	2	2	2	5	5	21	17	18	15	28	23	35	29	40	32				
143	147 oper.float sander			111	89	0	0	1	1	2	2	9	7	9	7	30	25	36	30	46	38				
144	148 oper.belt sandner			67	54	4	3	2	2	12	10	37	30	26	21	28	23	35	29	31	26				
151	155 read Height&flatness	X		61	49	1	1	3	2	24	19	35	28	47	40	21	17	22	19	27	22				
153	157 maintain crib service	X		79	63	4	3	3	2	16	13	22	19	45	37	27	22	25	21	21	17				
154	158 maintain tool invento	X		71	57	4	3	3	2	19	15	27	22	45	37	29	24	26	21	20	17				
163	167 asassemble components	X		49	39	2	2	1	1	45	36	25	20	52	43	24	20	25	21	19	15				
164	168 oper.robot cell			106	85	0	0	2	2	5	4	9	7	12	10	29	23	36	30	44	36				
165	169 stamp ID on part			49	39	4	3	9	7	30	24	30	24	37	47	24	24	21	17	11	9				
167	171 assemble 2 or more pa			34	27	2	2	2	2	50	40	32	26	71	59	21	17	13	11	15	12				
170	174 oper. furnace			110	88	0	0	0	0	3	2	9	7	4	3	15	12	40	32	60	50				
171	175 use Rockwell hardness			98	78	2	2	0	0	3	6	15	12	20	17	15	12	35	29	50	41				
172	176 oper. black oxide			119	95	0	0	0	0	2	2	2	2	4	3	12	11	28	21	64	53				
173	177 oper forge furnace			120	96	1	1	0	0	1	1	1	1	2	2	11	9	40	33	66	55				
175	179 oper.upset hammer			120	96	1	1	0	0	0	0	2	2	2	2	9	7	41	34	67	55				
176	180 oper. Richard's bende			117	94	1	1	0	0	1	1	3	2	2	2	6	7	40	33	68	56				
177	181 sharpen drills	X		64	51	5	4	3	2	11	9	40	32	26	20	23	19	29	24	31	26				
191	196 assist w/repair			71	57	3	2	5	4	15	12	30	24	40	33	25	21	28	23	25	21				
192	196 assist w/troubleshoot			40	32	5	4	9	7	40	32	29	23	61	50	21	17	17	14	21	17				



ROSTER C		SECTIONS 5 & 6		5		6		3		4		5		1		2		3		4			
SKILLED MACHINE		QUESTION #		GEN'L		NEVER		>1/MO		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED TR'NG	
PT 1	PT 2	task	KNLGE	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
146	150	read micrometers	X	4	13	0	0	0	0	24	80	2	7	27	90	0	0	2	7	1	3	1	3
152	156	use basic math	X	3	10	1	3	0	0	25	83	1	3	28	93	0	0	1	3	1	3	1	3
145	149	read blueprints	X	4	13	0	0	0	0	24	80	2	7	24	80	3	10	1	3	2	7	2	7
185	190	arrange for service		9	30	5	17	0	0	13	43	3	10	19	63	4	13	5	17	2	7	2	7
180	184	load/unload machine		6	20	0	0	0	0	22	73	2	7	25	83	1	3	1	3	3	10	3	10
190	195	assist in troubleshoo		4	13	2	7	0	0	22	73	2	7	24	80	2	7	3	10	1	3	1	3
186	191	check part to print	X	4	13	1	3	0	0	21	70	4	13	24	80	2	7	2	7	2	7	2	7
155	159	use Vernier calipers	X	4	13	1	3	1	3	22	73	2	7	25	87	0	0	1	3	3	10	3	10
169	173	use depth gages	X	9	30	3	10	3	10	11	37	4	13	20	67	4	13	2	7	4	13	4	13
166	170	read WIP forms	X	20	67	2	7	1	3	2	7	5	17	9	30	9	30	7	23	5	17	5	17
181	186	obtain tooling		4	13	0	0	0	0	23	77	3	10	26	97	3	10	1	3	0	0	0	0
188	193	mount material		5	17	0	0	1	3	20	67	4	13	23	77	1	3	3	10	0	0	0	0
189	194	change fixture		5	17	0	0	0	0	20	67	5	17	24	80	1	3	2	7	3	10	3	10
158	162	use trigonometry	X	11	37	2	7	4	13	12	40	1	3	13	43	8	27	2	7	6	20	6	20
178	182	read Machinist handbk	X	5	17	6	20	4	13	8	27	7	23	25	93	1	3	2	7	2	7	2	7
156	160	use Johansson blocks	X	6	20	2	7	1	3	20	67	1	3	25	93	1	3	1	3	0	0	0	0
157	161	use Machinist handbk	X	5	17	5	17	2	7	12	40	6	20	20	77	0	0	0	0	0	0	0	0
159	163	read complicated draw	X	5	17	0	0	1	3	19	63	5	17	19	63	4	13	1	3	4	13	4	13
160	164	use depth gage	X	5	17	0	0	2	7	18	60	5	17	24	80	1	3	1	3	4	13	4	13
161	165	use shadow gage	X	11	37	4	13	1	3	9	30	5	17	20	67	3	10	1	3	4	13	4	13
162	166	use radius gage	X	6	20	1	3	3	10	16	53	4	13	24	80	2	7	2	7	2	7	2	7
149	153	measure to .0001"	X	5	17	0	0	0	0	21	70	2	7	26	87	0	0	1	3	0	0	0	0
183	188	assist w/ maintenance	X	6	20	1	3	1	3	18	60	4	13	20	77	0	0	2	7	2	7	2	7
150	154	measure to 1/64"	X	4	13	0	0	0	0	24	80	1	3	27	90	0	0	1	3	0	0	0	0
179	187	adjust machine		6	20	0	0	0	0	21	70	3	10	25	87	0	0	2	7	3	10	3	10
182	187	clean,oil,lubricate		5	17	0	0	0	0	22	73	3	10	26	97	1	3	1	3	2	7	2	7
78	82	oper.milling machines		8	27	0	0	1	3	12	40	9	30	19	63	3	10	4	13	4	13	4	13
111	115	oper.Bridgeport CNCm:		28	93	0	0	1	3	0	0	1	3	4	13	2	7	16	53	8	27	8	27
112	116	oper.Cincinnati horiz		8	27	0	0	1	3	12	40	9	30	18	60	0	0	5	17	4	13	4	13
113	117	oper.Cincinnati verta		8	27	3	10	1	3	8	27	10	33	17	57	4	13	5	17	4	13	4	13
70	74	oper.surface grinder		9	30	0	0	1	3	13	43	7	23	18	60	2	7	4	13	5	17	5	17
12	16	setup drill press		9	30	1	3	1	3	11	37	8	27	19	63	3	10	6	20	2	7	2	7
17	21	setup Cin thru feed		28	93	1	3	0	0	1	3	0	0	1	3	4	13	19	63	6	20	6	20
60	64	oper.drill press		8	27	0	0	1	3	13	43	8	27	20	67	2	7	6	20	2	7	2	7
147	151	read concentricity ga	X	5	17	1	3	2	7	18	60	4	13	26	87	0	0	1	3	3	10	3	10
184	189	load tape in NC		18	60	1	3	0	0	0	0	8	27	9	30	7	23	8	27	6	20	6	20
187	192	program machine		15	50	1	3	1	3	9	30	4	13	12	40	3	10	8	27	7	23	7	23
79	83	oper.lathe		7	23	1	3	2	7	12	40	8	27	19	63	3	10	4	13	4	13	4	13
13	17	setup Bridgeport mill		7	23	0	0	0	0	13	43	10	33	20	67	2	7	4	13	4	13	4	13
51	55	setup MSO		29	97	0	0	0	0	0	0	1	3	0	0	4	13	19	60	7	23	7	23
61	65	oper. Bridgeport mill		8	27	1	3	0	0	12	40	9	30	20	67	2	7	4	13	4	13	4	13
66	70	oper.Cincinnati Monsett		13	43	0	0	2	7	10	33	5	17	15	50	0	0	6	20	6	20	6	20
67	71	oper.Heald tool grind		17	57	1	3	0	0	7	23	5	17	12	40	4	13	7	23	7	23	7	23
68	72	oper. Norton surface		10	33	2	7	1	3	11	37	6	20	15	50	3	10	5	17	7	23	7	23
69	73	oper.drill grinder		12	40	0	0	3	10	7	23	8	27	17	57	3	10	3	10	7	23	7	23
72	76	oper.cutter & tool		11	37	3	10	2	7	7	23	7	23	14	47	2	7	7	23	7	23	7	23

ROSTER C		SECTIONS 5 & 6		5		6		3		4		5		1		2		3		4	
SKILLED MACHINE		task		f %		f %		f %		f %		f %		f %		f %		f %		f %	
QUESTION #	GEN'L	PT 1	PT 2	INLGE	NEVER	>1/MO	MONTHLY	REGULARLY	PAST	CAN DO	W/HELP	SIMILAR	TR NG								
					f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %	f %
73	77	oper.	tap grind		14 47	3 10	2 7	5 17	6 20	14 47	2 7	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
74	78	oper.	thread chaser		17 57	0 0	0 0	7 23	6 20	11 37	6 20	6 20	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
75	79	oper.	Gleason cutter		16 53	3 10	0 0	5 17	6 20	8 27	4 13	10 33	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27
129	133	oper.	MSC machine		29 97	0 0	1 3	0 0	0 0	0 0	6 20	17 57	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
148	152	read	plug gages	X	6 20	0 0	0 0	20 67	4 13	25 83	0 0	1 3	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13
14	18	setup	Sunnen		14 47	6 20	2 7	4 13	4 13	11 37	4 13	10 33	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17
28	32	setup	Potter&Johnson		24 80	2 7	0 0	0 0	4 13	0 0	3 10	21 70	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
44	48	setup	Scimmx		29 97	1 3	0 0	0 0	0 0	0 0	2 7	18 60	10 33	10 33	10 33	10 33	10 33	10 33	10 33	10 33	10 33
65	69	oper.	Sunnen horiz		18 60	2 7	1 3	6 20	3 10	11 37	3 10	10 33	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
76	80	oper.	single point car		14 47	1 3	2 7	6 20	7 23	15 50	1 3	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
81	85	oper.	surface grinder		9 30	0 0	1 3	14 47	6 20	18 60	3 10	7 23	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
122	126	oper.	Scimmx		29 97	0 0	1 3	0 0	0 0	1 3	2 7	19 63	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27
174	178	use	slip gages	X	20 67	1 3	1 3	5 17	3 10	11 37	6 20	9 30	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13
11	15	setup	Standard endpla		27 90	1 3	1 3	0 0	1 3	1 3	4 13	19 63	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
25	29	setup	Standard Heald		29 97	0 0	0 0	1 3	0 0	0 0	1 3	22 73	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
26	30	setup	Horizontal turr		18 60	3 10	2 7	1 3	6 20	7 23	7 23	15 50	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17
29	33	setup	Warner SwazyAC		26 87	1 3	1 3	0 0	2 7	0 0	3 10	20 67	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
45	49	setup	DoAll saw		11 37	2 7	1 3	11 37	5 17	16 53	4 13	7 23	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10
46	50	setup	Wagner saw		26 87	0 0	1 3	0 0	3 10	3 10	9 30	14 47	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13	4 13
47	51	setup	Barber-Coleman		26 87	1 3	1 3	0 0	2 7	7 23	4 13	16 53	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
48	52	setup	Anvill Mill		26 87	0 0	1 3	0 0	3 10	0 0	6 20	17 57	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
49	53	setup	vertical broach		26 87	1 3	1 3	0 0	2 7	3 10	5 17	16 53	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
52	56	setup	Burke twin mill		27 90	1 3	0 0	0 0	2 7	1 3	8 27	15 50	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
54	58	setup	multiple spindl		24 80	1 3	0 0	0 0	4 13	1 3	6 20	17 57	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
55	59	setup	automatic screw		24 80	1 3	0 0	1 3	3 10	2 7	3 10	19 63	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
56	60	setup	gear shaper		25 83	0 0	1 3	0 0	3 10	2 7	2 7	19 63	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
77	81	oper.	Sunnen precision		15 50	3 10	4 13	3 10	5 17	11 37	2 7	9 30	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
98	102	oper.	Heald borematic		29 97	0 0	0 0	1 3	0 0	0 0	3 10	19 63	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27
123	127	oper.	DoAll Saw		10 33	1 3	2 7	10 33	7 23	18 60	4 13	5 17	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10
125	129	oper.	Wagner saw		28 93	0 0	1 3	0 0	1 3	3 10	10 33	11 37	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
126	130	oper.	BarberColeman		25 83	0 0	2 7	0 0	3 10	3 10	1 3	18 60	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27	8 27
127	131	oper.	Anvill Mill		27 90	1 3	0 0	0 0	2 7	0 0	5 17	19 63	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
128	132	oper.	vertical broache		24 80	0 0	1 3	0 0	4 13	3 10	5 17	15 50	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
130	134	oper.	Burke twin mill		26 87	0 0	0 0	1 3	7 23	1 3	7 23	14 47	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
132	136	oper.	multiple spindle		27 90	0 0	2 7	0 0	0 0	0 0	5 17	19 63	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
133	137	oper.	automatic screw		24 80	1 3	1 3	1 3	3 10	1 3	6 20	17 57	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
134	138	oper.	gear shaper		26 87	1 3	1 3	0 0	2 7	1 3	4 13	20 67	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17
168	172	use	dial bar gages	X	8 27	3 10	0 0	11 37	8 27	15 50	9 30	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10
8	12	setup	Seike 3NE		28 93	1 3	0 0	0 0	1 3	0 0	1 3	22 73	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
9	13	setup	Seike 4NE		27 90	0 0	0 0	0 0	3 10	2 7	1 3	20 67	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
10	14	setup	Seike 4NEA		27 90	2 7	0 0	1 3	0 0	0 0	1 3	22 73	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23	7 23
15	19	setup	Landis external		19 63	1 3	1 3	6 20	3 10	6 20	8 27	11 37	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17	5 17
16	20	setup	Gardner disk		24 80	1 3	1 3	2 7	2 7	2 7	3 10	19 63	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
18	22	setup	Landis plunge		27 90	0 0	2 7	1 3	0 0	1 3	5 17	18 60	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
19	23	setup	Heald 271		24 80	1 3	2 7	2 7	1 3	2 7	3 10	19 63	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
20	24	setup	Heald 272plain		25 83	0 0	1 3	2 7	2 7	1 3	3 10	20 67	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20
21	25	setup	Heald 272sizema		27 90	0 0	0 0	2 7	1 3	1 3	3 10	20 67	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20	6 20

ROSTER C		SECTIONS 5 & 6		5		6		3		4		5		1		2		3		4	
SKILLED MACHINE		task		NEVER		1/MO		MONTHLY		REGULARLY		PAST		CAN DO		W/HELP		SIMILAR		NEED	
QUESTION #	GEN'L	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
PT 1	PT 2																				
22	26	setup Cincinnati 181	27	90	0	0	0	0	2	7	1	3	2	7	7	10	19	67	6	20	
23	27	setup external stepma	28	93	0	0	1	3	0	0	1	3	0	0	2	7	22	73	6	20	
24	28	setup standard Heald	29	97	0	0	1	3	0	0	0	0	0	0	2	7	21	70	3	23	
27	31	setup transfer machin	28	93	0	0	0	0	1	3	1	3	1	3	1	3	22	73	7	23	
30	34	setup 4-6 spindle	24	80	0	0	1	3	0	0	15	17	5	17	5	17	14	47	6	20	
31	35	setup hvy duty vertic	16	53	5	17	1	3	0	0	8	27	8	27	6	20	12	40	4	13	
32	36	setupradial drill	16	53	2	7	3	10	3	10	6	20	11	37	5	17	10	33	4	13	
33	37	setup NATCO	26	87	1	3	1	3	0	0	2	7	3	10	5	17	16	53	6	20	
34	38	setup 21'upright	12	40	0	0	1	3	8	27	9	30	17	43	6	20	6	20	5	17	
35	39	setup CNC vertical	25	83	0	0	3	10	1	3	1	3	2	7	0	0	21	70	7	23	
36	40	setup CNC horizontal	28	93	0	0	1	3	0	0	1	3	0	0	1	3	21	70	8	27	
37	41	setup Bridgeport hori	24	40	0	0	2	7	6	20	10	33	18	60	4	13	3	10	5	17	
38	42	setup CincinRise&Fall	25	83	0	0	1	3	0	0	4	13	2	7	4	13	18	60	6	20	
39	43	setup duplex twinhead	24	80	2	7	0	0	0	0	4	13	3	10	7	23	15	50	5	17	
40	44	setup Milwaukee	25	83	1	3	1	3	0	0	3	10	4	13	2	7	18	60	6	20	
41	45	setup J&L CNC chucker	26	87	2	7	0	0	1	3	1	3	1	3	1	3	20	67	9	27	
42	46	setup J&L CNC combi	28	93	1	3	1	3	0	0	0	0	0	0	2	7	20	67	8	27	
43	47	setup K&T 180	29	97	0	0	1	3	0	0	0	0	0	0	2	7	19	63	9	30	
50	54	setup horiz broaches	28	93	0	0	0	0	0	0	2	7	2	7	4	13	17	57	7	23	
53	57	setup engine lathe	8	27	2	7	0	0	11	37	9	30	18	60	4	13	4	13	4	13	
57	61	setup TBI lathe	28	93	1	3	0	0	0	0	0	0	2	7	0	0	22	73	6	20	
58	62	setup gun drill	27	90	0	0	1	3	0	0	1	3	2	7	5	17	17	57	6	20	
59	63	oper. stand end plate	26	87	1	3	0	0	0	0	2	7	3	10	4	13	17	57	6	20	
62	66	oper. Seiki 3NE	26	87	0	0	0	0	1	3	2	7	0	0	4	13	18	60	8	27	
63	67	oper. Seiki 4NE	24	80	1	3	1	3	0	0	3	10	2	7	3	10	17	57	8	27	
64	68	oper. Seiki 4NEA	26	87	2	7	0	0	0	0	1	3	0	0	4	13	18	60	8	27	
71	75	oper. Hobb machine	18	60	1	3	2	7	6	20	3	10	8	27	2	7	13	43	7	23	
80	84	oper. Jig Bore	14	47	1	3	0	0	5	17	10	33	13	43	5	17	5	17	7	23	
82	86	oper. bench grinders	10	33	0	0	1	3	15	50	4	13	17	57	2	7	8	27	3	10	
83	87	oper. contour saw	15	50	1	3	0	0	8	27	6	20	13	43	3	10	9	30	5	17	
84	88	oper. cam grinder	18	60	2	7	2	7	0	0	8	27	7	23	3	10	13	43	7	23	
85	89	oper. Landis external	18	60	1	3	1	3	4	13	4	13	8	27	6	20	9	30	7	23	
86	90	oper. Norton external	20	67	1	3	0	0	2	7	7	23	9	30	6	20	8	27	7	23	
87	91	oper. Gardner disk	25	83	0	0	0	0	2	7	3	10	4	13	2	7	16	53	8	27	
88	92	oper. Cincinn thru fee	28	93	0	0	0	0	2	7	0	0	2	7	4	13	16	53	8	27	
89	93	oper. Landis plunge	27	90	0	0	0	0	2	7	1	3	3	10	3	10	16	53	8	27	
90	94	oper. Heald 271	25	83	1	3	0	0	3	10	1	3	3	10	4	13	15	50	8	27	
91	95	oper. Heald 272 plain	26	87	0	0	1	3	3	10	0	0	2	7	4	13	15	53	8	27	
92	96	oper. Heald 272sizemat	28	93	0	0	0	0	2	7	0	0	2	7	3	10	17	57	8	27	
93	97	oper. Cincin181	27	90	0	0	0	0	3	10	0	0	2	7	4	13	6	57	8	27	
94	98	oper. external stepmas	28	93	0	0	0	0	1	3	1	3	1	3	1	3	20	67	8	27	
95	99	oper. roll stamp	21	70	1	3	0	0	1	3	7	23	7	23	6	20	14	47	3	10	
96	100	oper. power press	15	50	0	0	2	7	3	10	10	33	5	17	6	20	10	33	5	17	
97	101	oper. standard Heald	28	93	0	0	1	3	0	0	1	3	0	0	3	10	19	63	8	27	
99	103	oper. transfer machine	28	93	0	0	1	3	0	0	1	3	0	0	3	10	21	70	6	20	
100	104	oper. Jones&Lamson ATL	27	90	0	0	0	0	1	3	2	7	0	0	5	17	19	63	6	20	
101	105	oper. Wheel & Brader	25	83	1	3	1	3	0	0	3	10	2	7	6	20	15	50	7	23	





ROSTER C		SECTIONS 5 & 6		5		6		3		4		5		1		2		3		4		
SKILLED MACHINE		QUESTION #		GEN'L KNLGE		>1/MD		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED TR'NG		
PT 1	PT 2	task	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
102	106	oper.straightn press	14	47	6	20	3	10	2	7	5	17	12	40	2	7	11	37	5	17		
103	107	oper. lapping machine	17	57	4	13	3	10	2	7	4	13	11	37	2	7	12	40	5	17		
104	108	oper heat treat furna	28	93	0	0	0	0	1	3	0	0	1	3	2	7	18	60	9	30		
105	109	oper.induction heat	26	87	0	0	0	0	1	3	2	7	1	3	4	13	16	53	9	30		
106	110	oper.4-6spindle	23	77	0	0	1	3	0	0	5	20	7	23	2	7	14	47	6	20		
107	111	oper.radial drill	15	53	1	3	2	7	4	13	7	23	12	40	4	13	10	37	4	13		
108	112	oper.NATCO multi	25	83	1	3	0	0	0	0	4	13	5	17	3	10	14	47	5	17		
109	113	oper.24'upright singl	14	47	1	3	1	3	5	17	9	30	17	57	3	10	8	27	6	20		
110	114	oper.OKATA CNC	29	97	1	3	0	0	0	0	0	0	0	0	4	13	18	60	8	27		
114	118	oper.Bridgeport vert	8	27	1	3	0	0	12	40	9	30	20	67	3	10	3	10	4	13		
115	119	oper Cincin Rise&Fall	26	87	0	0	1	3	0	0	3	10	4	13	5	20	14	47	6	20		
116	120	oper.duplex-twin	24	80	1	3	1	3	0	0	4	13	4	13	7	23	12	43	5	17		
117	121	oper Milwaukee	25	83	2	7	0	0	0	0	3	10	2	7	3	10	18	60	6	20		
118	122	oper. J&L CNC chucker	27	90	1	3	1	3	1	3	0	0	1	3	3	10	17	57	9	30		
119	123	oper.J&L CNC combi	28	93	1	3	0	0	1	3	0	0	0	0	2	7	19	63	9	30		
120	124	oper Shaffner	28	93	0	0	1	3	0	0	1	3	1	3	5	17	17	57	7	23		
121	125	oper. oper K&T 180	29	97	0	0	0	0	1	3	0	0	0	0	3	10	19	63	18	27		
124	128	oper.Marvel saw	26	87	0	0	0	0	1	3	3	10	6	20	9	30	9	30	6	20		
131	135	oper. Vibro machine	29	97	0	0	1	3	0	0	0	0	0	0	9	30	14	47	6	20		
135	139	oper.barrel machine	7	23	1	3	0	0	0	0	0	0	1	3	7	23	17	57	5	17		
136	140	oper.big wash	29	97	1	3	0	0	0	0	0	0	2	7	5	17	18	60	5	17		
137	141	oper.derust wash	28	93	1	3	1	3	0	0	0	0	2	7	6	20	17	57	5	17		
138	142	oper.paint booth	25	83	1	3	0	0	1	3	3	10	3	10	8	27	14	47	5	17		
139	143	oper.powder coating	29	97	0	0	1	3	0	0	0	0	0	0	8	27	16	53	6	20		
140	144	oper.spin finish	28	93	1	3	0	0	0	0	1	3	1	3	5	17	17	57	7	23		
141	145	oper.buffing lathe	27	90	0	0	1	3	1	3	1	3	2	7	7	23	15	50	6	20		
142	146	oper. disc sander	19	63	1	3	2	7	0	0	8	27	9	30	6	20	9	30	6	20		
143	147	oper.float sander	26	87	0	0	0	0	1	3	3	10	3	10	9	30	11	37	7	23		
144	148	oper.belt sandner	9	30	1	3	1	3	12	40	7	23	18	60	4	13	4	13	4	13		
151	155	read Height&flatness	X	5	17	1	3	2	7	18	60	4	13	25	83	1	3	1	3	3	10	
153	157	maintain crib service	X	11	37	1	3	1	3	5	17	12	40	22	73	2	7	2	7	3	10	
154	158	maintain tool invento	X	12	40	3	10	2	7	5	17	8	27	20	67	4	13	4	13	2	7	
163	167	asassemble components	X	8	27	0	0	1	3	16	53	5	17	19	63	6	20	2	7	3	10	
164	168	oper.robot cell	26	87	0	0	1	3	1	3	1	3	4	13	8	27	14	47	4	13		
165	169	stamp ID on part	6	20	3	10	2	7	13	43	5	17	20	67	5	17	3	10	2	7		
167	171	assemble 2 or more pa	5	17	2	7	3	10	13	43	7	23	22	73	3	10	1	3	3	10		
170	174	oper. furnace	29	97	0	0	0	0	1	3	0	0	1	3	4	13	18	60	7	23		
171	175	use Rockwell hardness	21	70	1	3	1	3	0	0	7	23	4	13	10	33	10	33	6	20		
172	176	oper. black oxide	29	97	0	0	1	3	0	0	0	0	1	3	6	20	16	53	7	23		
173	177	oper forge furnace	29	97	0	0	0	0	1	3	0	0	1	3	3	10	19	63	7	23		
175	179	oper.upset hammer	27	90	1	3	0	0	1	3	1	3	1	3	7	23	16	53	6	20		
176	180	oper. Richard's bende	29	97	0	0	0	0	1	3	0	0	3	10	6	20	16	53	5	17		
177	181	sharpen drills	X	6	20	1	3	2	7	13	43	8	27	22	73	2	7	2	7	4	13	
191	196	assist w/repair	9	30	5	17	2	7	8	27	6	20	22	73	3	10	3	10	2	7		
192	197	assist w/troubleshoot	5	17	2	7	0	0	19	63	4	13	26	87	1	3	2	7	1	3		

ROSTER D		SECTIONS 7 & 8		7		8		3		4		5		1		2		3		4				
SKILLED TRADES		QUESTION #		GEN'L		NEVER		1/MO		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED		
PT 1	PT 2	task	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
146	150	read micrometers	X	4	15	3	12	3	12	14	54	1	4	19	73	2	8	1	4	3	12			
152	156	use basic math	X	1	4	2	8	0	0	20	77	2	8	22	85	3	12	1	4	0	0			
145	149	read blueprints	X	0	0	3	12	1	4	14	54	3	12	18	69	2	8	2	8	3	12			
185	190	arrange for service		14	54	3	12	0	0	9	35	0	0	19	73	1	4	2	8	3	12			
180	184	load/unload machine		13	50	1	4	0	0	11	42	1	4	16	62	5	19	1	4	4	15			
190	195	assist in troubleshoo		6	23	0	0	0	0	19	73	1	4	20	77	3	12	1	4	1	4			
186	191	check part to print		10	38	3	12	0	0	9	31	4	15	16	62	3	12	3	12	4	15			
155	159	use Vernier calipers	X	5	19	4	15	3	12	11	42	2	8	19	73	3	12	1	4	3	12			
169	173	use depth gages	X	14	54	4	15	0	0	6	23	1	4	14	54	5	19	3	12	4	15			
166	170	read wIP forms	X	18	69	0	0	0	0	3	12	4	15	7	27	3	12	6	23	5	19			
181	186	obtain tooling		8	31	2	8	0	0	15	58	1	4	19	73	4	15	2	8	1	4			
188	193	mount material		10	38	3	12	1	4	8	31	2	8	17	65	4	15	2	8	3	12			
189	194	change fixture		11	42	4	15	0	0	8	31	2	8	15	58	4	15	4	15	3	12			
158	162	use trigonometry	X	10	38	5	19	2	8	7	27	2	8	12	46	5	19	1	4	6	23			
178	182	read Machinist handbk	X	13	50	3	12	1	4	6	23	2	8	16	62	4	15	2	8	4	15			
156	160	use Johannson blocks	X	11	42	6	23	1	4	6	23	1	4	17	65	4	15	2	8	3	12			
157	161	use Machinist handbk	X	16	62	2	8	1	4	7	27	0	0	18	69	2	8	3	12	1	4			
159	163	read complicated draw	X	5	19	1	4	2	8	16	62	2	8	17	65	5	19	1	4	1	4			
160	164	use depth gage	X	8	31	4	15	1	4	10	38	1	4	15	58	2	8	3	12	1	4			
161	165	use shadow gage	X	13	50	5	19	1	4	4	15	2	8	17	65	3	12	1	4	1	4			
162	166	use radius gage	X	13	50	4	15	0	0	7	27	1	4	16	62	4	15	1	4	1	4			
149	153	measure to .0001"	X	6	23	5	19	2	8	12	46	1	4	19	73	3	12	1	4	3	12			
183	188	assist w/ maintenance	X	9	35	0	0	1	4	15	58	1	4	21	81	3	12	2	8	0	0			
150	154	measure to 1/64"	X	5	19	1	4	1	4	15	58	2	8	21	81	2	8	1	4	2	8			
179	183	adjust machine		12	46	0	0	0	0	13	50	1	4	15	58	6	23	2	8	3	12			
182	187	clean,oil,lubricate		9	35	0	0	0	0	14	54	3	12	22	85	2	8	1	4	1	4			
78	82	oper.milling machines		14	54	3	12	1	4	6	23	2	8	6	23	3	12	11	50	4	15			
111	115	oper.Bridgeport CNCm1		19	73	3	12	0	0	0	0	4	15	0	0	3	12	15	58	8	31			
112	116	oper.Cincinnati horiz		14	54	3	12	0	0	4	15	5	19	5	19	3	12	13	50	5	19			
113	117	oper.Cincinnati verti		15	58	3	12	0	0	4	15	4	15	5	19	3	12	13	50	5	19			
70	74	oper.surface grinder		14	54	3	12	2	8	5	19	2	8	5	19	5	19	11	42	5	19			
12	16	setup drill press		12	46	1	4	1	4	8	31	4	15	7	27	3	12	11	42	4	15			
17	21	setup Cn thru feed		26	100	0	0	0	0	0	0	0	0	0	0	4	15	13	50	9	35			
60	64	oper.drill press		6	23	0	0	4	15	11	42	4	15	12	46	3	12	8	31	3	12			
147	151	read concentricity ga	X	11	42	4	15	1	4	8	31	1	4	15	58	6	23	2	8	3	12			
184	189	load tape in NC		14	54	3	12	5	19	3	12	1	4	9	35	9	35	4	15	4	15			
187	192	program machine		12	46	4	15	1	4	5	19	2	8	9	35	6	23	7	27	3	12			
79	83	oper.lathe		13	50	3	12	1	4	6	23	3	12	10	38	1	4	11	42	4	15			
13	17	setup Bridgeport mill		17	65	1	4	0	0	6	23	2	8	5	19	5	19	12	47	4	15			
51	55	setup MSD		25	96	1	4	0	0	0	0	0	0	0	0	2	8	16	62	8	31			
61	65	oper. Bridgeport mill		12	46	3	12	2	8	5	19	4	15	7	27	2	8	12	46	5	19			
66	70	oper.Cincinnati Monosett		18	69	2	8	2	8	1	4	3	12	3	12	4	15	14	54	5	19			
67	71	oper.Heald tool grind		19	73	2	8	2	8	1	4	2	8	2	8	6	23	13	50	5	19			
68	72	oper. Norton surface		15	58	3	12	2	8	2	8	4	15	3	12	6	23	12	46	5	19			
69	73	oper.drill grinder		15	58	3	12	2	8	1	4	5	19	4	15	5	19	12	46	5	19			
72	76	oper.cutter & tool		16	62	2	8	1	4	1	4	6	23	4	15	4	15	13	50	5	19			
73	77	oper.tap grind		19	73	1	4	1	4	1	4	4	15	2	8	5	19	14	54	5	19			



ROSTER D		SECTIONS 7 & 8		7		8		3		4		5		1		2		3		4	
SKILLED TRADES		task		NEVER		>1/MO		MONTHLY		REGULARLY		PAST		CAN DO		W/HELP		SIMILAR		NEED	
QUESTION #	GEN'L	PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
74		78	oper.thread chaser	16	62	7	12	1	4	2	8	4	15	2	9	6	23	13	50	5	19
75		79	oper.Gleason cutter	19	73	1	4	1	4	1	4	4	15	1	4	3	12	14	54	8	31
129		133	oper. MSD machine	21	81	3	12	0	0	0	0	2	8	1	4	5	19	13	50	7	27
148	Y	152	read plug gages	10	38	8	31	0	0	7	27	1	4	18	69	4	15	1	4	7	27
14		18	setup Sunnen	23	88	2	8	0	0	0	0	1	4	1	4	4	15	13	50	8	31
28		32	setup Potter&Johnson	23	88	1	4	0	0	0	0	2	8	0	0	4	15	13	50	9	35
44		48	setup Scimmx	26	100	0	0	0	0	0	0	0	0	0	0	0	0	16	62	10	38
65		69	oper.Sunnen horiz	19	73	2	8	2	8	0	0	3	12	4	15	2	8	14	54	6	23
76		80	oper.single point car	19	73	0	0	2	8	1	4	4	15	2	8	4	15	14	54	5	19
81		85	oper.surface grinder	16	62	2	8	1	4	5	19	2	8	6	23	4	15	11	42	4	15
122		126	oper. Scimmx	23	88	2	8	0	0	0	0	1	4	0	0	2	8	13	50	10	38
174	X	178	useslip gages	23	88	1	4	0	0	0	0	1	4	5	19	5	19	12	46	4	15
11		15	setup Standard endpla	23	88	0	0	0	0	0	0	3	12	0	0	5	19	12	46	9	35
25		29	setup Standard Heald	26	100	0	0	0	0	0	0	0	0	0	0	0	0	13	50	10	38
26		30	setup Horizontal turr	23	88	1	4	0	0	0	0	2	8	1	4	3	12	13	50	8	31
29		33	setup Warner SwazyAC	23	88	1	4	0	0	0	0	1	4	1	4	3	12	13	50	9	35
45		49	setup DoAll saw	15	58	2	8	1	4	4	15	4	15	9	35	2	8	11	42	5	19
46		50	setup Wagner saw	22	85	1	4	0	0	1	4	2	8	2	8	5	19	13	50	6	23
47		51	setup Barber-Coleman	24	92	1	4	0	0	0	0	1	4	0	0	2	8	15	58	9	35
48		52	setup Anvill Mill	23	88	1	4	1	4	0	0	1	4	1	4	1	4	16	62	3	12
49		53	setup vertical broach	23	88	1	4	1	4	0	0	1	4	0	0	2	8	7	27	6	23
52		56	setup Burke twin mill	26	100	0	0	0	0	0	0	0	0	0	0	2	8	13	50	11	42
54		58	setup multiple spindl	25	96	0	0	0	0	0	0	1	4	0	0	2	8	16	62	7	27
55		59	setup automatic screw	24	92	1	4	0	0	0	0	0	0	0	0	3	12	16	62	7	27
56		60	setup gear shaper	25	96	0	0	0	0	0	0	1	4	0	0	3	12	15	58	8	31
77		81	oper.Sunnen precision	16	62	3	12	1	4	1	4	5	19	5	19	5	19	10	39	6	23
98		102	oper.Heald borematic	22	85	2	8	0	0	1	4	1	4	0	0	3	12	15	58	7	27
123		127	oper.DoAll Saw	9	35	6	23	0	0	6	23	5	19	10	39	6	23	7	27	3	12
125		129	oper.Wagner saw	16	62	3	12	0	0	1	4	5	19	2	8	7	27	13	50	4	15
126		130	oper. BarberColeman	21	81	2	8	0	0	0	0	3	12	0	0	4	15	15	58	7	27
127		131	oper.Anvill Mill	20	77	4	15	0	0	0	0	2	8	1	4	2	8	16	62	7	27
128		132	oper.vertical broache	20	77	3	12	0	0	0	0	3	12	1	4	3	12	7	27	5	19
130		134	oper.Burke twin mill	22	85	3	12	0	0	0	0	1	4	1	4	4	15	13	50	8	31
132		136	oper.multiple spindle	22	85	3	12	0	0	0	0	1	4	1	4	3	12	14	54	8	31
133		137	oper.automatic screw	21	81	2	8	0	0	0	0	3	12	1	4	4	15	14	54	7	27
134		138	oper.gear shaper	20	77	2	8	0	0	0	0	4	15	1	4	4	15	14	54	7	27
168	X	172	use dial bar gages	15	58	4	15	0	0	4	15	2	8	12	46	7	27	7	27	4	15
8		12	setup Seike 3NE	25	96	0	0	0	0	0	0	1	4	0	0	4	15	13	50	9	35
9		13	setup Seike 4NE	24	92	0	0	0	0	1	4	1	4	0	0	4	15	13	50	9	35
10		14	setup Seike 4NEA	24	92	0	0	0	0	0	0	2	8	0	0	5	19	13	50	8	31
15		19	setup Landis external	23	88	1	4	0	0	1	4	1	4	2	8	4	15	12	46	7	27
16		20	setup Gardner disk	24	92	1	4	0	0	1	4	0	0	0	0	3	12	17	65	9	35
18		22	setup Landis plunge	24	92	1	4	0	0	0	0	1	4	0	0	3	12	14	54	9	35
19		23	setup Heald 271	24	92	1	4	0	0	0	0	1	4	0	0	4	15	12	46	10	38
20		24	setup Heald 272plain	24	92	1	4	0	0	0	0	1	4	0	0	4	15	13	50	9	35
21		25	setup Heald 272sizema	24	92	1	4	0	0	0	0	1	4	0	0	4	15	17	65	9	35
22		26	setup Cincinnati 181	24	92	1	4	0	0	0	0	1	4	0	0	4	15	14	54	8	31



ROSTER D		SECTIONS 7 & 8		7		8		3		4		5		1		2		3		4			
SKILLED TRADES				GEN'L		GEN'L		MONTHLY		REGULARLY		IN		CAN DO		W/HELP		SIMILAR		NEED			
QUESTION #	task	NEVER	>1/MO	MONTHLY	REGULARLY	PAST	CAN DO	W/HELP	SIMILAR	TR'NG	f	%	f	%	f	%	f	%	f	%	f	%	
PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
23	27	25	96	1	4	0	0	0	0	0	0	0	0	0	0	0	12	14	54	9	35		
24	28	25	96	1	4	0	0	0	0	0	0	0	0	0	0	0	12	12	46	10	38		
27	31	24	92	1	4	0	0	0	0	1	4	0	0	4	15	13	50	9	35				
30	34	22	85	1	4	0	0	0	0	3	12	1	4	2	8	15	58	8	31				
31	35	22	85	1	4	0	0	0	0	3	12	2	8	2	8	16	62	6	23				
32	36	22	85	1	4	0	0	1	4	2	8	2	8	5	19	14	54	5	19				
33	37	22	85	1	4	0	0	0	0	2	8	1	4	3	12	16	62	6	23				
34	38	22	85	1	4	0	0	1	4	2	8	3	12	3	12	14	54	6	23				
35	39	24	92	0	0	0	0	0	0	2	8	0	0	3	12	13	50	10	38				
36	40	24	92	0	0	0	0	1	4	1	4	0	0	3	12	13	50	10	38				
37	41	20	77	2	8	0	0	0	0	4	15	5	19	2	8	13	50	6	23				
38	42	25	96	0	0	0	0	1	4	0	0	1	4	2	8	15	58	8	31				
39	43	25	96	0	0	0	0	0	0	1	4	0	0	1	4	17	65	8	31				
40	44	24	92	1	4	0	0	0	0	1	4	0	0	0	0	17	65	9	35				
41	45	24	92	1	4	0	0	0	0	1	4	0	0	1	4	16	62	9	35				
42	46	25	96	0	0	0	0	0	0	1	4	0	0	0	0	17	65	9	35				
43	47	26	100	0	0	0	0	0	0	0	0	0	0	0	0	16	62	10	38				
50	54	23	88	1	4	1	4	0	0	1	4	0	0	3	12	17	65	6	23				
53	57	19	73	1	4	0	0	3	12	3	12	7	27	1	4	11	42	7	27				
57	61	26	100	0	0	0	0	0	0	0	0	0	0	2	8	15	58	9	35				
58	62	25	96	0	0	0	0	0	0	1	4	0	0	2	8	17	65	7	27				
59	63	20	77	1	4	0	0	0	0	3	12	1	4	1	4	18	69	5	19				
62	66	20	77	2	8	2	8	0	0	2	8	0	0	2	8	16	62	8	31				
63	67	20	77	2	8	2	8	0	0	2	8	0	0	2	8	16	62	8	31				
64	68	19	73	2	8	2	8	0	0	3	12	0	0	2	8	16	62	8	31				
71	75	19	73	2	8	1	4	1	4	3	12	3	12	3	12	14	54	5	23				
80	84	19	73	1	4	1	4	0	0	12	48	1	4	4	15	2	8	16	62	4	15		
82	86	9	35	1	4	2	8	9	35	5	19	8	31	3	12	11	42	4	15				
83	87	17	65	2	8	1	4	0	0	12	48	3	12	4	15	4	15	17	65	5	19		
84	88	23	88	0	0	1	4	0	0	2	8	0	0	6	23	13	53	5	19				
85	89	20	77	2	8	1	4	1	4	2	8	3	12	3	12	14	54	6	23				
86	90	19	73	2	8	1	4	1	4	3	12	4	15	3	12	14	54	5	19				
87	91	22	85	1	4	1	4	1	4	1	4	1	4	4	15	14	54	7	27				
88	92	23	88	1	4	1	4	0	0	1	4	1	4	3	12	15	58	7	27				
89	93	23	88	1	4	1	4	0	0	1	4	1	4	3	12	15	58	7	27				
90	94	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31				
91	95	21	81	2	8	1	4	0	0	2	8	1	4	4	15	14	54	7	27				
92	96	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31				
93	97	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31				
94	98	22	85	2	8	1	4	0	0	1	4	0	0	3	12	16	62	7	27				
95	99	18	69	3	12	1	4	0	0	4	15	3	12	6	23	12	46	5	19				
96	100	15	58	2	8	1	4	2	8	5	19	5	19	5	19	11	42	4	15				
97	101	21	81	2	8	0	0	1	4	2	8	0	0	3	12	15	58	8	31				
99	103	21	81	2	8	0	0	0	0	3	12	0	0	2	8	15	58	9	35				
100	104	19	73	2	8	1	4	0	0	4	15	2	8	2	8	15	58	7	27				
101	105	19	73	2	8	1	4	0	0	4	15	3	12	2	8	16	62	5	19				
102	106	14	54	3	12	2	8	2	8	5	19	5	19	3	12	12	46	5	19				



ROSTER D		SECTIONS 7 & 8		7		8		9		10		11		12		13		14					
SKILLED TRADES		task		GEN'L		NEVER		1%/MO		MONTHLY		REGULARLY		FACT		CAN DO		W/HELP		SIMILAR		NEED	
QUESTION #	QUESTION #	PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
103	107	oper.	lapping machine	18	69	7	12	0	0	1	4	4	15	3	12	4	15	12	46	6	23		
104	108	oper.	heat treat furna	23	68	1	4	0	0	0	0	2	8	0	0	4	15	14	54	8	31		
105	109	oper.	induction heat	21	81	0	0	1	4	0	0	4	15	0	0	2	8	15	62	7	27		
106	110	oper.	4-6spindle	21	81	1	4	0	0	0	0	4	15	1	4	1	4	17	65	6	23		
107	111	oper.	radial drill	17	65	7	12	0	0	2	8	4	15	5	19	4	15	12	46	5	19		
108	112	oper.	NATCO multi	20	77	2	8	0	0	0	0	4	15	4	15	2	8	13	50	6	23		
109	113	oper.	24'upright singl	13	50	7	12	2	8	7	12	5	19	5	19	3	12	17	50	5	19		
110	114	oper.	OKATA CNC	20	77	3	12	0	0	0	0	3	12	0	0	3	12	13	58	8	31		
114	118	oper.	Bridgeport vert	14	54	4	15	0	0	5	19	3	12	5	19	4	15	12	46	5	19		
115	119	oper.	Cincin Rise&Fall	19	73	3	12	0	0	1	4	3	12	1	4	7	12	15	58	7	27		
116	120	oper.	duplex-twin	21	81	3	12	0	0	0	0	2	8	0	0	7	12	17	50	9	31		
117	121	oper.	Milwaukee	20	77	3	12	0	0	0	0	3	12	0	0	7	12	17	50	10	38		
118	122	oper.	J&L CNC chucker	20	77	3	12	0	0	0	0	7	12	0	0	7	12	14	54	8	31		
119	123	oper.	J&L CNC comb	21	81	7	12	0	0	0	0	2	8	0	0	2	8	14	54	9	35		
120	124	oper.	Shaffner	21	81	3	12	0	0	0	0	2	8	0	0	7	12	17	50	9	35		
121	125	oper.	oper K&T 180	21	81	3	12	0	0	0	0	2	8	0	0	2	8	13	50	10	38		
124	128	oper.	Marvel saw	17	65	4	15	0	0	1	4	2	12	2	8	7	27	13	50	4	15		
131	135	oper.	Vibro machine	18	69	4	15	0	0	0	0	4	15	2	8	7	27	11	42	6	23		
135	139	oper.	barrel machine	21	81	1	4	0	0	0	0	4	15	1	4	4	15	16	62	5	19		
136	140	oper.	big wash	20	77	1	4	0	0	0	0	5	19	2	8	4	15	15	58	5	19		
137	141	oper.	derust wash	19	73	2	8	0	0	0	0	5	19	2	8	4	15	16	62	4	15		
138	142	oper.	paint booth	18	69	3	13	0	0	0	0	5	19	7	12	7	12	15	58	5	19		
139	143	oper.	powder coating	21	81	2	8	0	0	0	0	3	12	1	4	5	19	14	54	6	23		
140	144	oper.	spin finish	18	69	2	8	0	0	0	0	5	19	1	4	5	19	15	58	5	19		
141	145	oper.	buffing lathe	21	81	1	4	0	0	0	0	4	15	2	8	7	27	12	46	5	19		
142	146	oper.	disc sander	14	54	4	15	0	0	1	4	7	27	7	27	3	12	12	46	4	15		
143	147	oper.	float sander	18	69	3	12	0	0	0	0	5	19	4	15	4	15	17	50	4	15		
144	148	oper.	belt sandner	8	31	4	15	1	4	6	23	7	27	10	38	4	15	9	35	3	12		
151	155	read	Height&flatness	X	11	42	5	19	0	0	8	31	1	4	17	65	4	15	2	8	3	12	
153	157	maintain	crib service	X	12	46	5	19	0	0	5	19	3	12	15	58	6	23	2	8	3	13	
154	158	maintain	tool invento	X	7	27	4	15	0	0	11	42	2	8	19	73	4	15	1	4	2	9	
163	167	asassemble	components	X	15	58	0	0	1	4	7	27	2	8	18	69	6	23	0	0	2	8	
164	168	oper.	robot cell		21	81	1	4	1	4	2	8	1	4	9	35	7	27	6	23	4	15	
165	169	stamp	ID on part		14	54	0	0	0	0	7	27	5	19	21	81	2	8	0	0	3	12	
167	171	assemble	2 or more pa		5	19	0	0	1	4	16	62	4	15	21	81	1	4	1	4	3	12	
170	174	oper.	furnace		19	73	1	4	0	0	1	4	4	15	2	8	6	23	11	42	7	27	
171	175	use	Rockwell hardness		16	62	3	12	0	0	2	8	4	15	2	8	11	42	7	27	6	23	
172	176	oper.	black oxide		23	88	0	0	0	0	0	0	2	8	2	8	4	15	14	54	6	23	
173	177	oper.	forge furnace		24	92	0	0	0	0	0	0	2	8	1	4	6	23	17	50	6	23	
175	179	oper.	upset hammer		24	92	0	0	0	0	0	0	1	4	1	4	4	15	15	58	6	23	
176	180	oper.	Richard's bende		21	81	2	8	0	0	0	0	2	8	1	4	4	15	15	58	6	23	
177	181	sharpen	drills	X	5	19	3	12	6	23	7	27	4	15	15	58	6	23	1	4	4	15	
191	196	assist	w/repair		4	15	1	4	0	0	19	73	2	8	21	81	7	12	1	4	1	4	
192	196	assist	w/troubleshoot		4	15	0	0	1	4	20	77	1	4	20	77	4	15	1	4	1	4	





ROSTER E		SECTIONS ALL	GEN'L		3		4		5		1		2		3		4				
SUMMARY			KNLGE		>1/10		MONTHLY		REGULARLY		PAST		CAN DO		SIMILAR		NEED				
QUESTION #	task		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%			
PT 1	PT 2																				
146	150	read micrometers	X	42	14%	15	5%	13	4%	192	62%	46	15%	231	75%	24	8%	22	7%	30	10%
152	156	use basic math	X	44	14%	13	4%	3	1%	212	69%	35	11%	248	81%	24	8%	17	6%	18	6%
145	149	read blueprints	X	32	12%	13	5%	8	3%	177	64%	48	17%	206	68%	42	14%	28	9%	29	10%
185	190	arrange for service		147	48%	18	5%	1	0%	102	33%	39	13%	159	53%	51	17%	43	14%	47	15%
180	184	load/unload machine		86	28%	2	1%	1	0%	173	56%	45	15%	213	70%	25	8%	21	7%	40	13%
190	195	assist in troubleshoot		79	26%	13	4%	9	3%	166	54%	40	13%	202	67%	41	14%	28	9%	32	11%
186	191	check part to print	X	68	22%	19	6%	6	2%	175	55%	48	15%	222	73%	28	9%	23	8%	33	11%
155	159	use Vernier calipers	X	73	24%	16	5%	14	5%	166	54%	39	13%	219	71%	24	8%	25	8%	39	13%
169	173	use depth gages	X	119	39%	17	6%	7	2%	106	35%	54	18%	169	56%	37	12%	40	13%	57	19%
166	170	read WIP forms	X	138	45%	15	5%	3	1%	114	37%	35	13%	56	30%	48	22%	50	22%	59	26%
181	186	obtain tooling		72	23%	8	3%	4	1%	181	58%	47	15%	228	75%	27	12%	22	7%	15	6%
188	193	mount material		103	33%	14	4%	6	2%	146	46%	45	14%	189	62%	31	10%	33	11%	51	17%
189	194	change fixture		111	35%	32	10%	5	2%	130	39%	54	16%	181	60%	27	9%	40	17%	56	18%
158	162	use trigonometry	X	241	78%	18	6%	7	2%	25	9%	18	6%	44	14%	33	11%	49	16%	180	59%
178	182	read Machinist handbk	X	130	42%	44	14%	13	4%	54	17%	68	22%	190	63%	35	12%	28	9%	49	16%
156	160	use Johansson blocks	X	123	40%	21	7%	6	2%	131	43%	27	9%	185	61%	33	11%	30	10%	56	18%
157	161	use Machinist handbk	X	145	47%	41	13%	8	3%	74	24%	43	14%	174	57%	44	14%	34	11%	53	17%
159	163	read complicated dra	X	107	34%	23	7%	11	4%	125	40%	45	14%	127	41%	59	22%	43	14%	58	22%
160	164	use depth gage	X	70	23%	21	7%	9	3%	150	49%	54	18%	201	66%	36	12%	28	9%	41	13%
161	165	use shadow gage	X	138	45%	34	11%	5	2%	72	23%	59	19%	166	55%	47	15%	34	11%	47	15%
162	166	use radius gage	X	105	34%	23	7%	8	3%	124	40%	50	16%	193	63%	24	11%	36	12%	42	14%
149	153	measure to .0001"	X	67	22%	18	6%	11	4%	158	51%	52	17%	221	72%	24	8%	31	10%	32	10%
183	188	assist w/ maintenance	X	106	34%	14	4%	3	1%	143	46%	46	15%	193	64%	50	17%	32	11%	27	9%
150	154	measure to 1/64"	X	58	19%	9	3%	7	2%	181	59%	50	16%	227	74%	19	6%	29	9%	31	10%
179	183	adjust machine		89	29%	4	1%	0	0%	173	56%	44	14%	204	67%	28	9%	25	8%	46	15%
182	187	clean, oil, lubricate		74	24%	2	1%	4	1%	182	59%	49	16%	231	76%	33	11%	21	7%	20	7%
78	82	oper. milling machines		186	60%	8	3%	7	2%	41	13%	66	21%	64	21%	59	19%	89	29%	96	31%
111	115	oper. Bridgeport CNCm1		266	86%	6	2%	1	0%	6	2%	30	10%	21	7%	28	9%	118	38%	141	46%
112	116	oper. Cincinnati horiz		212	69%	5	2%	3	1%	28	9%	60	19%	59	19%	37	11%	95	31%	121	39%
113	117	oper. Cincinnati verti		222	72%	9	3%	5	2%	19	6%	53	17%	57	19%	32	10%	100	32%	119	39%
70	74	oper. surface grinder		227	73%	11	4%	5	2%	26	8%	41	13%	46	15%	34	11%	101	34%	117	39%
12	16	setup drill press		145	47%	13	4%	10	3%	38	12%	104	34%	98	32%	72	23%	81	26%	56	18%
17	21	setup C in thru feed		287	92%	5	2%	2	1%	6	2%	11	4%	11	4%	21	7%	123	40%	153	50%
60	64	oper. drill press		123	40%	16	5%	10	3%	43	14%	117	38%	100	33%	73	24%	74	24%	59	19%
147	151	read concentricity ga	X	84	28%	17	6%	6	2%	156	51%	42	14%	196	64%	40	13%	27	9%	43	14%
184	189	load tape in NC		221	72%	10	3%	8	3%	35	11%	35	11%	65	22%	54	18%	76	25%	107	35%
187	192	program machine		211	69%	12	4%	3	1%	59	19%	21	7%	86	28%	36	12%	73	23%	110	36%
79	83	oper. lathe		173	56%	14	5%	6	2%	36	12%	32	10%	72	23%	51	17%	89	29%	96	31%
13	17	setup Bridgeport mill		195	63%	11	4%	5	2%	35	11%	65	21%	73	24%	48	16%	89	29%	96	31%
51	55	setup MSD		286	92%	3	1%	3	1%	3	1%	15	5%	18	6%	17	6%	116	33%	156	51%
61	65	oper. Bridgeport mill		178	57%	16	5%	9	3%	31	10%	76	25%	81	27%	46	15%	79	26%	92	31%
66	70	oper. Cincinnati Monosett		265	88%	3	1%	5	2%	11	4%	16	5%	20	7%	26	9%	108	36%	147	49%
67	71	oper. Heald tool grind		276	89%	4	1%	4	1%	10	3%	16	5%	21	7%	27	9%	107	35%	153	50%
68	72	oper. Norton surface		242	78%	10	3%	5	2%	20	6%	32	10%	34	11%	38	12%	106	34%	130	42%
69	73	oper. drill grinder		243	79%	9	3%	6	2%	12	4%	39	13%	35	11%	48	16%	107	33%	122	40%
72	76	oper. cutter & tool		266	86%	8	3%	3	1%	9	3%	25	8%	23	7%	31	10%	108	35%	146	47%
73	77	oper. tap grind		277	90%	4	1%	3	1%	6	2%	18	6%	20	6%	26	8%	111	36%	151	49%

ROSTER E		SECTIONS ALL	GEN'L		3		4		5		1		2		3		4			
SUMMARY			KNLGE		11/MO		MONTHLY		REGULARLY		PAST		CAN DO		W/HELP		SIMILAR		TR'ING	
QUESTION #	task		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
PT 1	PT 2																			
74	78	oper.thread chaser	253	82%	8	3%	3	1%	15	5%	30	10%	29	9%	29	10%	97	31%	147	45%
75	79	oper.Gleason cutter	281	91%	4	1%	3	1%	9	3%	13	4%	17	5%	27	7%	111	36%	157	51%
129	133	oper. MSD machine	268	85%	5	2%	4	1%	5	2%	25	9%	27	7%	26	9%	116	38%	147	46%
148	152	read plug gages	X 64	21%	20	7%	5	2%	162	53%	56	18%	219	71%	27	9%	27	9%	75	11%
14	18	setup Sunnen	257	87%	16	5%	5	2%	11	4%	20	6%	22	10%	40	13%	102	33%	131	40%
28	32	setup Potter&Johnson	258	83%	6	2%	1	0%	8	3%	37	12%	17	6%	28	9%	124	41%	176	45%
44	48	setup Scimmx	292	95%	3	1%	1	0%	5	2%	7	2%	7	2%	10	3%	114	37%	175	57%
65	69	oper.Sunnen horiz	255	83%	13	4%	7	2%	10	3%	24	9%	22	10%	27	12%	102	33%	175	44%
76	80	oper.single point car	274	88%	2	1%	4	1%	8	3%	22	7%	20	7%	28	9%	112	36%	147	43%
81	85	oper.surface grinder	224	72%	11	4%	4	1%	31	10%	41	13%	52	17%	41	13%	121	39%	111	35%
122	126	oper. Scimmx	288	94%	4	1%	1	0%	7	2%	6	2%	11	4%	19	6%	111	36%	164	54%
174	178	useslip gages	Y 217	71%	13	4%	5	2%	41	13%	31	10%	73	24%	57	19%	88	29%	84	28%
11	15	setup Standard endpla	264	85%	6	2%	3	1%	4	1%	33	11%	17	6%	36	12%	113	38%	176	44%
25	29	setup Standard Heald	234	92%	4	1%	1	0%	6	2%	15	5%	11	4%	18	6%	112	37%	162	50%
26	30	setup Horizontal turr	225	73%	13	4%	4	1%	7	2%	50	19%	31	10%	38	13%	107	36%	124	41%
29	33	setup Warner SwazyAC	255	84%	9	3%	2	1%	6	2%	32	11%	23	7%	27	9%	117	38%	140	46%
45	49	setup DoAll saw	219	71%	13	4%	5	2%	29	9%	43	14%	52	17%	41	14%	101	33%	111	36%
46	50	setup Wagner saw	272	87%	5	2%	4	1%	10	3%	22	7%	21	7%	48	15%	117	38%	121	39%
47	51	setup Barber-Coleman	288	93%	5	2%	2	1%	4	1%	12	4%	12	4%	24	8%	117	37%	159	52%
48	52	setup Anvill Mill	270	87%	3	1%	3	1%	5	2%	29	9%	6	2%	27	11%	115	38%	145	49%
49	53	setup vertical broach	265	85%	5	2%	4	1%	5	2%	32	10%	14	5%	42	14%	115	37%	177	44%
52	56	setup Burke twin mill	295	95%	1	0%	2	1%	4	1%	8	3%	9	3%	28	9%	117	37%	157	51%
54	58	setup multiple spindl	272	ERR0	4	ERR0	1	ERR0	1	ERR0	2	ERR0	17	6%	27	7%	118	39%	150	49%
55	59	setup automatic screw	264	85%	6	2%	0	0%	13	4%	27	9%	24	8%	24	8%	114	37%	146	47%
56	60	setup gear shaper	290	94%	4	1%	2	1%	1	0%	12	4%	7	2%	17	6%	120	39%	164	53%
77	81	oper.Sunnen precision	258	83%	13	4%	7	2%	10	3%	22	7%	34	11%	37	12%	97	32%	178	45%
98	102	oper.Heald borematic	276	89%	3	1%	1	0%	7	2%	32	7%	13	4%	28	9%	117	38%	143	48%
123	127	oper.DoAll Saw	213	69%	13	4%	6	2%	25	8%	51	17%	51	20%	53	17%	97	30%	101	33%
125	129	oper.Wagner saw	264	86%	9	3%	1	0%	9	3%	25	8%	24	8%	55	18%	115	37%	114	37%
127	131	oper.Anvill Mill	277	90%	3	1%	4	1%	6	2%	19	6%	20	7%	22	7%	116	38%	149	49%
128	132	oper.vertical broache	256	83%	7	2%	3	1%	6	2%	35	11%	26	8%	36	12%	117	38%	128	42%
130	130	oper. BarberColeman	259	84%	6	2%	1	0%	8	3%	32	10%	20	6%	32	10%	116	38%	140	45%
130	134	oper.Burke twin mill	280	91%	4	1%	0	0%	7	2%	16	5%	19	6%	23	8%	121	40%	142	47%
132	136	oper.multiple spindle	274	89%	4	1%	0	0%	6	2%	23	7%	17	6%	35	11%	118	38%	138	45%
133	137	oper.automatic screw	256	83%	3	1%	0	0%	11	4%	39	13%	26	9%	40	13%	117	38%	122	40%
134	138	oper.gear shaper	282	92%	3	1%	0	0%	5	2%	17	6%	19	6%	32	11%	128	42%	174	44%
168	172	use dial bar gages	X 146	48%	21	7%	0	0%	71	23%	65	21%	131	43%	60	20%	55	19%	60	20%
8	12	setup Seike 3NE	270	89%	9	3%	0	0%	10	3%	16	5%	15	5%	33	12%	120	39%	135	44%
9	13	setup Seike 4NE	272	90%	9	3%	0	0%	8	3%	15	5%	16	5%	33	11%	123	40%	136	44%
10	14	setup Seike 4NEA	278	91%	9	3%	0	0%	8	3%	9	3%	14	5%	29	9%	128	42%	137	44%
15	19	setup Landis external	265	87%	9	3%	0	0%	16	5%	16	5%	28	9%	26	8%	109	36%	144	47%
16	20	setup Gardner disk	282	91%	7	2%	0	0%	9	3%	11	4%	12	4%	20	7%	126	41%	145	49%
18	22	setup Landis plunge	284	93%	2	1%	0	0%	11	4%	9	3%	17	6%	19	6%	114	37%	158	51%
19	23	setup Heald 271	280	92%	5	2%	0	0%	10	3%	9	3%	18	6%	20	6%	110	35%	160	52%
20	24	setup Heald 272plain	278	92%	3	1%	0	0%	9	3%	11	4%	17	6%	19	6%	113	37%	157	51%
21	25	setup Heald 272sizema	293	92%	4	1%	0	0%	10	3%	10	3%	15	5%	21	7%	114	37%	157	51%
22	26	setup Cincinnati 181	287	97%	7	2%	0	0%	5	2%	9	3%	12	4%	20	6%	119	39%	157	51%

ROSTER E		SECTIONS ALL	GEN'L		3		4		5		1		2		3		4		
SUMMARY			*NLGE		MONTHLY		REGULARLY		FAST		CAN DO		W/HELP		SIMILAR		TRNG		
QUESTION #	task	NEVER	1/MO	MONTHLY	REGULARLY	FAST	CAN DO	W/HELP	SIMILAR	TRNG	f	%	f	%	f	%	f	%	
PT 1	PT 2	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
23	27 setup external stepma	293	95%	5	2%	0%	3	1%	7	2%	5	3%	19	6%	101	39%	161	52%	
24	28 setup standard Heald	279	91%	2	1%	0%	7	2%	19	6%	10	3%	27	9%	105	35%	157	53%	
27	31 setup transfer machin	290	94%	2	1%	0%	4	1%	12	4%	7	2%	20	7%	124	41%	155	51%	
30	34 setup 4-6 spindle	257	82%	6	2%	0%	4	1%	48	15%	20	11%	28	5%	111	37%	151	43%	
31	35 setup hvy duty vertic	227	73%	13	4%	0%	5	2%	60	20%	40	13%	39	12%	105	35%	119	39%	
32	36 setup radial drill	225	73%	10	3%	0%	13	4%	61	20%	47	15%	41	11%	108	35%	109	35%	
33	37 setup NATCO	259	85%	5	2%	0%	7	2%	35	11%	25	8%	25	8%	119	39%	123	40%	
34	38 setup 21'upright	215	71%	5	2%	0%	20	7%	67	22%	50	16%	28	12%	109	35%	110	35%	
35	39 setup CNC vertical	274	90%	2	1%	0%	5	2%	21	7%	11	4%	21	7%	109	35%	154	50%	
36	40 setup CNC horizontal	278	90%	4	1%	0%	7	2%	20	6%	3	1%	24	5%	118	39%	156	51%	
37	41 setup Bridgeport hori	237	74%	8	3%	0%	19	6%	55	17%	51	17%	35	12%	96	31%	122	41%	
38	42 setup Cincinnati Fall	270	87%	1	1%	0%	7	2%	31	10%	18	6%	30	10%	114	37%	145	47%	
39	43 setup duplex twinhead	273	89%	5	2%	0%	5	2%	21	7%	19	6%	25	8%	111	36%	150	49%	
40	44 setup Milwaukee	267	88%	4	1%	0%	8	3%	23	8%	25	8%	17	6%	106	35%	159	50%	
41	45 setup J&L CNC cutter	277	90%	6	2%	0%	13	4%	17	6%	15	5%	12	4%	127	41%	155	51%	
42	46 setup J&L CNC combi	284	93%	5	2%	0%	6	2%	12	4%	9	3%	17	6%	125	41%	156	51%	
43	47 setup K&T 180	292	94%	5	2%	0%	5	2%	7	2%	2	1%	11	3%	114	37%	173	57%	
50	54 setup horiz broaches	272	89%	5	2%	0%	4	1%	28	9%	14	5%	26	12%	116	38%	141	45%	
53	57 setup engine lathe	223	71%	8	3%	0%	18	6%	58	19%	53	17%	22	10%	89	29%	124	44%	
57	61 setup TBI lathe	290	94%	3	1%	0%	3	1%	12	4%	10	3%	18	6%	118	38%	161	52%	
58	62 setup gun drill	255	84%	7	2%	0%	6	2%	37	12%	24	8%	33	11%	116	38%	125	44%	
59	63 oper. stand end plate	255	83%	5	2%	0%	8	3%	39	13%	29	10%	29	10%	117	38%	119	39%	
62	66 oper. Seiki 3NE	247	81%	10	3%	0%	25	8%	24	8%	24	11%	23	11%	109	36%	131	43%	
63	67 oper. Seiki 4NE	250	82%	9	3%	0%	22	7%	23	8%	21	10%	25	11%	108	35%	137	43%	
64	68 oper. Seiki 4NEA	262	86%	9	3%	0%	17	6%	17	6%	21	8%	27	14%	78	26%	138	50%	
71	75 oper. Hobb machine	265	87%	7	2%	0%	17	6%	17	6%	27	9%	24	8%	105	35%	147	49%	
80	84 oper. Jig Bore	279	91%	2	1%	0%	8	3%	18	6%	22	7%	24	8%	109	36%	152	50%	
82	86 oper. bench grinders	143	48%	12	4%	0%	61	20%	80	28%	96	31%	41	13%	77	25%	94	31%	
83	87 oper. contour saw	262	85%	5	2%	0%	13	4%	29	9%	28	9%	34	11%	116	38%	128	42%	
84	88 oper. cam grinder	287	94%	2	1%	0%	1	0%	16	5%	12	4%	20	6%	119	39%	157	51%	
85	89 oper. Landis external	264	86%	9	3%	0%	12	4%	22	7%	30	10%	26	8%	107	35%	144	47%	
86	90 oper. Norton external	263	85%	8	3%	0%	11	4%	26	8%	32	10%	27	9%	105	34%	144	47%	
87	91 oper. Gardner disk	286	93%	2	1%	0%	8	3%	12	4%	16	5%	25	8%	118	38%	149	48%	
88	92 oper. Cincinnati thru fee	283	92%	6	2%	0%	7	2%	11	4%	13	4%	25	8%	118	38%	152	49%	
89	93 oper. Landis plunge	286	93%	4	1%	0%	9	3%	9	3%	21	7%	19	6%	112	36%	155	50%	
90	94 oper. Heald 271	277	91%	5	2%	0%	10	3%	12	4%	18	6%	24	8%	108	35%	157	51%	
91	95 oper. Heald 272 plain	279	91%	4	1%	0%	10	3%	13	4%	18	6%	24	8%	110	36%	155	50%	
92	96 oper. Heald 272sizemat	283	92%	3	1%	0%	9	3%	11	4%	18	6%	22	7%	111	36%	156	51%	
93	97 oper. Cincinnati 181	286	93%	5	2%	0%	6	2%	10	3%	14	5%	25	8%	100	34%	158	53%	
94	98 oper. external stepmas	288	94%	4	1%	0%	6	2%	8	3%	9	3%	19	6%	123	40%	156	51%	
95	99 oper. roll stamp	207	70%	13	4%	0%	17	6%	59	20%	50	17%	70	24%	92	30%	90	29%	
96	100 oper. power press	198	65%	15	5%	0%	24	8%	68	22%	72	23%	61	20%	56	23%	58	19%	
97	101 oper. standard Heald	273	89%	2	1%	0%	6	2%	26	8%	12	4%	32	11%	117	38%	143	47%	
99	103 oper. transfer machine	285	92%	3	1%	0%	4	1%	18	6%	11	4%	23	9%	117	39%	147	49%	
100	104 oper. Jones & Lamson ATL	264	86%	2	1%	0%	7	2%	33	11%	20	7%	21	10%	115	38%	129	46%	
101	105 oper. Wheel & Brader	272	89%	4	1%	0%	4	1%	27	9%	23	8%	30	10%	124	41%	125	41%	
102	106 oper. straightn press	226	75%	12	4%	0%	10	3%	55	18%	54	18%	43	16%	108	35%	97	32%	



ROSTER E SUMMARY		SECTIONS ALL	GEN L	3		4		5		1		2		3		4					
QUESTION #		task	KNLGE	NEVER		1/MO		MONTHLY		REGULARLY		FAST		CAN DO		W/HELP		SIMILAR		TRAINING	
PT 1	PT 2			f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
103	107	oper. lapping machine	257	83%	8	3%	0%	8	3%	37	12%	40	13%	44	14%	103	34%	119	39%		
104	108	oper heat treat furna	285	93%	2	1%	0%	6	2%	17	4%	7	2%	26	8%	111	36%	163	51%		
105	109	oper.induction heat	284	93%	0	0%	0%	7	2%	14	5%	5	3%	24	8%	109	36%	165	54%		
106	110	oper.4-6spindle	250	81%	4	1%	0%	5	2%	48	16%	34	11%	31	10%	120	39%	121	40%		
107	111	oper.radial drill	216	70%	7	2%	0%	12	4%	70	23%	52	17%	56	18%	101	32%	98	32%		
108	112	oper.NATCO multi	258	84%	5	2%	0%	4	1%	40	13%	34	11%	40	13%	110	37%	120	39%		
109	113	oper.24'upright singl	215	71%	7	2%	0%	17	6%	65	21%	57	17%	44	14%	107	35%	104	34%		
110	114	oper.OKATA CNC	280	92%	4	1%	0%	7	2%	12	4%	13	4%	27	7%	120	39%	151	49%		
114	118	oper.Bridgeport verti	203	67%	12	4%	0%	27	9%	67	23%	61	20%	75	11%	99	32%	111	36%		
115	119	oper Cincin Rise&Fall	261	85%	5	2%	0%	6	2%	35	12%	23	7%	40	13%	110	36%	133	43%		
116	120	oper.duplex-twin	259	85%	6	2%	0%	8	3%	33	11%	24	8%	39	13%	100	32%	126	40%		
117	121	oper Milwaukee	254	86%	6	2%	0%	9	3%	29	9%	27	9%	70	10%	108	35%	143	46%		
118	122	oper. J&L CNC chucker	264	86%	8	3%	0%	14	5%	21	7%	25	8%	25	8%	114	37%	142	46%		
119	123	oper.J&L CNC combi	278	90%	8	3%	0%	9	3%	13	4%	15	5%	25	8%	119	39%	147	48%		
120	124	oper Shaffner	276	91%	4	1%	0%	13	4%	10	3%	15	5%	27	7%	117	39%	152	50%		
121	125	oper. oper K&T 180	283	92%	5	2%	0%	9	3%	10	3%	17	4%	20	6%	110	35%	173	55%		
124	128	oper.Marvel saw	266	86%	9	3%	0%	9	3%	25	8%	26	9%	84	19%	112	36%	116	38%		
131	135	oper. Vibro machine	252	82%	8	3%	0%	20	7%	26	8%	25	11%	34	18%	120	39%	97	32%		
135	139	oper.barrel machine	283	92%	2	1%	0%	4	1%	20	6%	12	4%	34	18%	130	44%	105	35%		
136	140	oper.big wash	260	84%	4	1%	0%	9	3%	36	12%	29	10%	73	24%	123	40%	72	24%		
137	141	oper.derust wash	260	84%	3	1%	0%	9	3%	36	12%	29	9%	77	25%	131	43%	70	23%		
138	142	oper.paint booth	251	81%	7	2%	0%	8	3%	43	14%	30	10%	81	26%	122	40%	74	24%		
139	143	oper.powder coating	286	93%	4	1%	0%	5	2%	14	5%	11	4%	76	25%	134	44%	86	28%		
140	144	oper.spin finish	285	92%	3	1%	0%	2	1%	19	6%	10	3%	65	21%	137	45%	95	31%		
141	145	oper.buffing lathe	272	89%	3	1%	0%	2	1%	29	9%	20	7%	60	20%	124	44%	91	30%		
142	146	oper. disc sander	212	70%	13	4%	0%	10	3%	69	23%	64	21%	63	21%	105	34%	75	24%		
143	147	oper.float sander	262	86%	5	2%	0%	5	2%	34	11%	33	11%	71	23%	116	38%	86	29%		
144	148	oper.belt sandner	141	47%	16	5%	0%	45	15%	99	33%	101	33%	65	21%	83	27%	57	19%		
151	155	read Height&flatness	X	93	31%	13	4%	0%	142	47%	52	17%	195	64%	41	13%	71	10%	39	13%	
153	157	maintain crib service	X	181	60%	15	5%	0%	54	18%	54	18%	142	46%	70	23%	57	19%	27	10%	
154	158	maintain tool invento	X	148	49%	21	7%	0%	69	23%	61	20%	148	48%	64	21%	56	19%	36	12%	
163	167	asassemble components	X	137	46%	11	4%	0%	89	30%	57	19%	139	46%	71	23%	58	19%	37	12%	
164	168	oper.robot cell	268	89%	1	0%	0%	12	4%	19	6%	38	12%	72	23%	97	32%	100	33%		
165	169	stamp ID on part	144	49%	12	4%	0%	60	20%	79	27%	152	50%	73	24%	47	15%	32	11%		
167	171	assemble 2 or more pa	93	31%	13	4%	0%	99	33%	96	32%	194	64%	51	17%	73	11%	27	9%		
170	174	oper. furnace	275	90%	5	1%	0%	8	3%	18	6%	15	5%	39	13%	120	40%	130	42%		
171	175	use Rockwell hardness	241	78%	11	4%	0%	13	4%	43	14%	40	13%	61	20%	103	34%	102	33%		
172	176	oper. black oxide	293	96%	0	0%	0%	4	1%	9	3%	14	5%	39	13%	125	41%	127	42%		
173	177	oper forge furnace	298	97%	2	1%	0%	2	1%	5	2%	7	2%	75	11%	128	42%	135	44%		
175	179	oper.upset hammer	296	96%	3	1%	0%	1	0%	7	2%	11	4%	35	12%	127	42%	131	43%		
176	180	oper. Richard's bende	290	95%	4	1%	0%	2	1%	10	3%	10	3%	37	12%	21	40%	134	44%		
177	181	sharpen drills	X	130	45%	19	7%	0%	59	20%	83	29%	130	43%	60	21%	52	17%	59	19%	
191	196	assist w/repair	120	41%	25	8%	0%	98	33%	52	17%	164	54%	52	17%	47	16%	39	13%		
192	196	assist w/troubleshoot	62	21%	24	8%	0%	162	55%	45	15%	207	69%	42	14%	25	8%	30	10%		

I

# **WORKER SELF-ASSESSMENT**

**PART I**

**FOR INGERSOLL-RAND**

**AUGUST 3-4, 1987**

## Part I

This is a "Worker Self Assessment". It is designed to help us learn more about what you do on the job and to tell us how you feel about your abilities. This is NOT a test. There are no 'right' or 'wrong' answers. There is no time limit; you have as much time as you need to respond to the items presented.

Darken in the "0" on the RED answer sheet which corresponds to your response.

Make only ONE (1) response per item.

Use only a No.2 lead pencil.

Make no stray marks on your response sheet.

If you wish to change your response, erase your original response completely.

1. Number of years employed by Ingersoll-Rand
  - A. less than 5 years
  - B. 5 - 10 years
  - C. 11-15 years
  - D. 16 - 20 years
  - E. 21 - 25 years
  - F. over 25 years
  
2. Number of years within your present department
  - A. one or less
  - B. two
  - C. three
  - D. four
  - E. five or more
  
3. Have you ever been a supervisor/foreman for Ingersoll-Rand?
  - A. yes
  - B. no
  
4. Have you ever been a supervisor/foreman for another employer?
  - A. yes
  - B. no
  
5. Do you have any skills required by Ingersoll-Rand which you do not use during the normal course of your job?
  - A. yes
  - B. no
  
6. Have you held similar positions to the one which you have now prior to coming to work for Ingersoll-Rand?
  - A. yes
  - B. no
  
7. On which Master Roster are you currently working?
  - A. Machining
  - B. Non-machining
  - C. Skilled machining
  - D. Skilled trades

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST.

**Set-up:**

8. Seiki 3NE CNC lathe	1	2	3	4	5
9. Seike 4NE CNC lathe	1	2	3	4	5
10. Seike 4NEA CNC lathe	1	2	3	4	5
11. standard end plate finishing lathe	1	2	3	4	5
12. drill press	1	2	3	4	5
13. Bridgeport milling machine	1	2	3	4	5
14. Sunnen horizontal hone	1	2	3	4	5
15. Landis external grinder	1	2	3	4	5
16. Gardner disk grinder horizontal	1	2	3	4	5
17. Cincinnati thru feed grinder	1	2	3	4	5
18. Landis plunge drive grinder	1	2	3	4	5
19. Heald model 271 grinder	1	2	3	4	5
20. Heald model 272 plain grinder	1	2	3	4	5
21. Heald model 272 sizeromatic grinder	1	2	3	4	5
22. Cincinnati model 181 grinder	1	2	3	4	5
23. external stepmaster grinder	1	2	3	4	5

**Set-up:**

24. standard Heald borematic	1	2	3	4	5
25. Heald borematic pin machine	1	2	3	4	5
26. horizontal turret lathe	1	2	3	4	5
27. transfer machine	1	2	3	4	5
28. Potter & Johnson chucking lathe	1	2	3	4	5
29. Warner Swazy AC lathe	1	2	3	4	5
30. 4-6 spindle gang drill	1	2	3	4	5
31. heavy duty vertical drilling machine	1	2	3	4	5
32. radial drill press	1	2	3	4	5
33. NATCO multi-spindle drill press	1	2	3	4	5
34. 21" upright single spindle drill press	1	2	3	4	5
35. CNC vertical machining center	1	2	3	4	5
36. CNC horizontal machining center	1	2	3	4	5
37. Bridgeport horizontal milling machine	1	2	3	4	5
38. Cincinnati rise & fall	1	2	3	4	5

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS  
BUT I HAVE DONE THIS IN THE PAST.

**Set-up:**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 39. duplex-twin head milling machine        | 1 | 2 | 3 | 4 | 5 |
| 40. Milwaukee matic EB                      | 1 | 2 | 3 | 4 | 5 |
| 41. J & L CNC chucker, A line               | 1 | 2 | 3 | 4 | 5 |
| 42. J & L CNC combi-lathe                   | 1 | 2 | 3 | 4 | 5 |
| 43. KT 180                                  | 1 | 2 | 3 | 4 | 5 |
| 44. Scimmx                                  | 1 | 2 | 3 | 4 | 5 |
| 45. Do All saw                              | 1 | 2 | 3 | 4 | 5 |
| 46. Wagner saw                              | 1 | 2 | 3 | 4 | 5 |
| 47. Barber Coleman Hobb-gear making machine | 1 | 2 | 3 | 4 | 5 |
| 48. anvill mills                            | 1 | 2 | 3 | 4 | 5 |
| 49. vertical broaches                       | 1 | 2 | 3 | 4 | 5 |
| 50. horizontal broaches                     | 1 | 2 | 3 | 4 | 5 |
| 51. MSO machine                             | 1 | 2 | 3 | 4 | 5 |
| 52. Burke twin mill                         | 1 | 2 | 3 | 4 | 5 |
| 53. engine lathe                            | 1 | 2 | 3 | 4 | 5 |

**Set-up:**

- |                                    |   |   |   |   |   |
|------------------------------------|---|---|---|---|---|
| 54. multiple spindle screw machine | 1 | 2 | 3 | 4 | 5 |
| 55. automatic screw machines       | 1 | 2 | 3 | 4 | 5 |
| 56. gear shaper                    | 1 | 2 | 3 | 4 | 5 |
| 57. TBI lathe                      | 1 | 2 | 3 | 4 | 5 |
| 58. gun drill                      | 1 | 2 | 3 | 4 | 5 |

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IS IN THE PAST

**Operate:**

59. standard end plate finishing lathe	1	2	3	4	5
60. drill press	1	2	3	4	5
61. Bridgeport mill	1	2	3	4	5
62. Seiki 3NE automatic turret lathe	1	2	3	4	5
63. Seiki 4NE automatic turret lathe	1	2	3	4	5
64. Seiki 4NEA automatic turret lathe	1	2	3	4	5
65. Sunnen horizontal hone	1	2	3	4	5
66. Cincinnati monoset tool grinder	1	2	3	4	5
67. Heald tool grinding machine	1	2	3	4	5
68. Norton surface grinder	1	2	3	4	5
69. drill grinder	1	2	3	4	5
70. surface grinder	1	2	3	4	5
71. Hobb machine	1	2	3	4	5
72. cutter and tool grinding machine	1	2	3	4	5
73. tap grinder	1	2	3	4	5
74. thread chaser	1	2	3	4	5
75. Gleason cutter-shaper	1	2	3	4	5
76. single point carbide grinder	1	2	3	4	5
77. Sunnen precision honing machine	1	2	3	4	5
78. milling machines	1	2	3	4	5
79. lathe	1	2	3	4	5
80. jig bore	1	2	3	4	5
81. surface grinder	1	2	3	4	5

**Operate:**

82. bench grinders	1	2	3	4	5
83. contour saw	1	2	3	4	5
84. cam grinder	1	2	3	4	5
85. Landis external grinder	1	2	3	4	5
86. Norton external grinde	1	2	3	4	5
87. Gardner disk grinder horizontal	1	2	3	4	5
88. Cincinnati thru feed grinder	1	2	3	4	5
89. Landis plunge drive grinder	1	2	3	4	5
90. Heald model 271 grinder	1	2	3	4	5
91. Heald model 272 plain grinder	1	2	3	4	5
92. Heald model 272 sizeromatic grinder	1	2	3	4	5
93. Cincinnati model 181 grinder	1	2	3	4	5
94. external stepmaster grinder	1	2	3	4	5
95. roll stamp	1	2	3	4	5
96. power press	1	2	3	4	5
97. standard Heald borematic	1	2	3	4	5
98. Heald borematic pin machine	1	2	3	4	5
99. transfer machine	1	2	3	4	5
100. Jones & Lamson ATL	1	2	3	4	5
101. Wheel & Brader shot-blast machine	1	2	3	4	5
102. straightening press	1	2	3	4	5
103. lapping machine	1	2	3	4	5
104. heat treat furnaces	1	2	3	4	5
105. induction heat treat machine	1	2	3	4	5

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**Operate:**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 106. 4-6 spindle gang drill                 | 1 | 2 | 3 | 4 | 5 |
| 107. radial drill press                     | 1 | 2 | 3 | 4 | 5 |
| 108. NATCO multi-spindle drill press        | 1 | 2 | 3 | 4 | 5 |
| 109. 24" upright single spindle drill press | 1 | 2 | 3 | 4 | 5 |
| 110. Okata CNC milling machine              | 1 | 2 | 3 | 4 | 5 |
| 111. Bridgeport CNC milling machine         | 1 | 2 | 3 | 4 | 5 |
| 112. Cincinnati horizontal milling machine  | 1 | 2 | 3 | 4 | 5 |
| 113. Cincinnati vertical milling machine    | 1 | 2 | 3 | 4 | 5 |
| 114. Bridgeport Vertical milling machine    | 1 | 2 | 3 | 4 | 5 |
| 115. Cincinnati rise and fall               | 1 | 2 | 3 | 4 | 5 |
| 116. duplex-twin mill machine               | 1 | 2 | 3 | 4 | 5 |
| 117. Milwaukee-matic EB                     | 1 | 2 | 3 | 4 | 5 |
| 118. J & L CNC chucker , A line             | 1 | 2 | 3 | 4 | 5 |
| 119. J & L CNC combi lathe                  | 1 | 2 | 3 | 4 | 5 |
| 120. Shaffner rise & fall                   | 1 | 2 | 3 | 4 | 5 |
| 121. K & T 180                              | 1 | 2 | 3 | 4 | 5 |
| 122. Scimmx                                 | 1 | 2 | 3 | 4 | 5 |
| 123. Do All saw                             | 1 | 2 | 3 | 4 | 5 |
| 124. Marvel saw                             | 1 | 2 | 3 | 4 | 5 |
| 125. Wagner saw                             | 1 | 2 | 3 | 4 | 5 |

**Operate:**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 126. Barber Coleman hobb-gear making machine | 1 | 2 | 3 | 4 | 5 |
| 127. Anvill mill                             | 1 | 2 | 3 | 4 | 5 |
| 128. vertical broaches                       | 1 | 2 | 3 | 4 | 5 |
| 129. MSO machine                             | 1 | 2 | 3 | 4 | 5 |
| 130. Burke twin mill                         | 1 | 2 | 3 | 4 | 5 |
| 131. vibro machine                           | 1 | 2 | 3 | 4 | 5 |
| 132. multiple spindle screw machine          | 1 | 2 | 3 | 4 | 5 |
| 133. automatic screw machine                 | 1 | 2 | 3 | 4 | 5 |
| 134. gear shaper                             | 1 | 2 | 3 | 4 | 5 |
| 135. barrel machine tumbler                  | 1 | 2 | 3 | 4 | 5 |
| 136. big wash                                | 1 | 2 | 3 | 4 | 5 |
| 137. derust wash                             | 1 | 2 | 3 | 4 | 5 |
| 138. paint booth                             | 1 | 2 | 3 | 4 | 5 |
| 139. powder coating                          | 1 | 2 | 3 | 4 | 5 |
| 140. spin finish machine                     | 1 | 2 | 3 | 4 | 5 |
| 141. buffing lathe                           | 1 | 2 | 3 | 4 | 5 |
| 142. disc sander                             | 1 | 2 | 3 | 4 | 5 |
| 143. float sander                            | 1 | 2 | 3 | 4 | 5 |
| 144. belt sander                             | 1 | 2 | 3 | 4 | 5 |



1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST

I do the following:

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 145. read blue prints                     | 1 | 2 | 3 | 4 | 5 |
| 146. read micrometers                     | 1 | 2 | 3 | 4 | 5 |
| 147. read concentricity gages             | 1 | 2 | 3 | 4 | 5 |
| 148. read plug gages                      | 1 | 2 | 3 | 4 | 5 |
| 149. measure up to .0001"                 | 1 | 2 | 3 | 4 | 5 |
| 150. measure up to 1/64"                  | 1 | 2 | 3 | 4 | 5 |
| 151. read height and flatness gages       | 1 | 2 | 3 | 4 | 5 |
| 152. use basic math skills                | 1 | 2 | 3 | 4 | 5 |
| 153. maintain crib service                | 1 | 2 | 3 | 4 | 5 |
| 154. maintain inventory of tools          | 1 | 2 | 3 | 4 | 5 |
| 155. use Vernier calipers                 | 1 | 2 | 3 | 4 | 5 |
| 156. use Johansson blocks                 | 1 | 2 | 3 | 4 | 5 |
| 157. use Machinist Handbook               | 1 | 2 | 3 | 4 | 5 |
| 158. use trigonometry                     | 1 | 2 | 3 | 4 | 5 |
| 159. read complicated prints and drawings | 1 | 2 | 3 | 4 | 5 |
| 160. use depth gages                      | 1 | 2 | 3 | 4 | 5 |
| 161. use shadow gages                     | 1 | 2 | 3 | 4 | 5 |
| 162. use radius gages                     | 1 | 2 | 3 | 4 | 5 |
| 163. assemble components for tools        | 1 | 2 | 3 | 4 | 5 |
| 164. operate automated test cell          | 1 | 2 | 3 | 4 | 5 |
| 165. stamp identification number on parts | 1 | 2 | 3 | 4 | 5 |
| 166. read WIP forms                       | 1 | 2 | 3 | 4 | 5 |
| 167. assemble two or more parts           | 1 | 2 | 3 | 4 | 5 |

I do the following:

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 168. use dial bore gages                                      | 1 | 2 | 3 | 4 | 5 |
| 169. use dial depth gages                                     | 1 | 2 | 3 | 4 | 5 |
| 170. operate furnace  | 1 | 2 | 3 | 4 | 5 |
| 171. use Rockwell hardness tester                             | 1 | 2 | 3 | 4 | 5 |
| 172. operate black oxide line                                 | 1 | 2 | 3 | 4 | 5 |
| 173. operate forge furnace                                    | 1 | 2 | 3 | 4 | 5 |
| 174. use slip gages   | 1 | 2 | 3 | 4 | 5 |
| 175. operate upset hammer                                     | 1 | 2 | 3 | 4 | 5 |
| 176. operate Richard's bender                                 | 1 | 2 | 3 | 4 | 5 |
| 177. sharpen drills   | 1 | 2 | 3 | 4 | 5 |
| 178. read Machinist's handbook                                | 1 | 2 | 3 | 4 | 5 |
| 179. adjust the machine which I operate                       | 1 | 2 | 3 | 4 | 5 |
| 180. load/unload the machine which I operate                  | 1 | 2 | 3 | 4 | 5 |
| 181. obtain the tools/tooling for my job                      | 1 | 2 | 3 | 4 | 5 |
| 182. clean, oil, lubricate the machine(s) which I operate     | 1 | 2 | 3 | 4 | 5 |
| 183. assist with maintenance of the machine which I operate   | 1 | 2 | 3 | 4 | 5 |
| 184. load a tape in a NC machine                              | 1 | 2 | 3 | 4 | 5 |
| 185. arrange for the servicing of the machine which I operate | 1 | 2 | 3 | 4 | 5 |
| 186. check part to print                                      | 1 | 2 | 3 | 4 | 5 |

- |   |
|---|
| <p>1. NEVER</p> <p>2. LESS THAN ONCE A MONTH</p> <p>3. ONCE A MONTH</p> <p>4. REGULARLY</p> <p>5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST</p> |
|---|

**I do the following:**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 187. program the machine which I operate   | 1 | 2 | 3 | 4 | 5 |
| 188. mount material in fixture/collet  | 1 | 2 | 3 | 4 | 5 |
| 189. change fixture/collet   | 1 | 2 | 3 | 4 | 5 |
| 190. assist in trouble shooting or solving problems relating to my job/machine           | 1 | 2 | 3 | 4 | 5 |
| 191. assist with the repair of the machine(s) which I operate                            | 1 | 2 | 3 | 4 | 5 |
| 192. assist co-workers solve problems or trouble shoot problems relating to their job(s) | 1 | 2 | 3 | 4 | 5 |

# **WORKER SELF-ASSESSMENT**

**PART II**

**FOR INGERSOLL-RAND**

**AUGUST 3-4, 1987**

453

## Part II

This is a "Worker Self Assessment". It is designed to help us learn more about what you do on the job and to tell us how you feel about your abilities. This is NOT a test. There are no 'right' or 'wrong' answers. There is no time limit; you have as much time as you need to respond to the items presented.

Darken in the "0" on the BLUE answer sheet which corresponds to your response.

Make only ONE (1) response per item.

Use only a No.2 lead pencil.

Make no stray marks on your response sheet.

If you wish to change your response, erase your original response completely.

In which areas would you like more training:

- |                                    |        |       |
|------------------------------------|--------|-------|
| 1. reading                         | A. yes | B. no |
| 2. basic math                      | A. yes | B. no |
| 3. algebra                         | A. yes | B. no |
| 4. trig and advanced math          | A. yes | B. no |
| 5. blue print reading              | A. yes | B. no |
| 6. blue print drawing              | A. yes | B. no |
| 7. conventional machine operations | A. yes | B. no |
| 8. CNC machine operations          | A. yes | B. no |
| 9. machine shop practices          | A. yes | B. no |
| 10. quality control procedures     | A. yes | B. no |

11. On which Master Roster are you currently working?

- A. Machining
- B. Non-machining
- C. Skilled machining
- D. Skilled trades

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

**Set-up:**

- |   |   |   |   |   |
|---|---|---|---|---|
| 12. Seiki 3NE CNC lathe                 | 1 | 2 | 3 | 4 |
| 13. Seike 4NE CNC lathe                 | 1 | 2 | 3 | 4 |
| 14. Seike 4NEA CNC lathe                | 1 | 2 | 3 | 4 |
| 15. standard end plate finishing lathe  | 1 | 2 | 3 | 4 |
| 16. drill press                         | 1 | 2 | 3 | 4 |
| 17. Bridgeport milling machine          | 1 | 2 | 3 | 4 |
| 18. Sunnen horizontal hone              | 1 | 2 | 3 | 4 |
| 19. Landis external grinder             | 1 | 2 | 3 | 4 |
| 20. Gardner disk grinder horizontal     | 1 | 2 | 3 | 4 |
| 21. Cincinnati thru feed grinder        | 1 | 2 | 3 | 4 |
| 22. Landis plunge drive grinder         | 1 | 2 | 3 | 4 |
| 23. Heald model 271 grinder             | 1 | 2 | 3 | 4 |
| 24. Heald model 272 plain grinder       | 1 | 2 | 3 | 4 |
| 25. Heald model 272 sizeromatic grinder | 1 | 2 | 3 | 4 |
| 26. Cincinnati model 181 grinder        | 1 | 2 | 3 | 4 |
| 27. external stepmaster grinder         | 1 | 2 | 3 | 4 |

**Set-up:**

- |  |   |   |   |   |
|--|---|---|---|---|
| 28. standard Heald borematic               | 1 | 2 | 3 | 4 |
| 29. Heald borematic pin machine            | 1 | 2 | 3 | 4 |
| 30. horizontal turret lathe                | 1 | 2 | 3 | 4 |
| 31. transfer machine                       | 1 | 2 | 3 | 4 |
| 32. Potter & Johnson chucking lathe        | 1 | 2 | 3 | 4 |
| 33. Warner Swazy AC lathe                  | 1 | 2 | 3 | 4 |
| 34. 4-6 spindle gang drill                 | 1 | 2 | 3 | 4 |
| 35. heavy duty vertical drilling machine   | 1 | 2 | 3 | 4 |
| 36. radial drill press                     | 1 | 2 | 3 | 4 |
| 37. NATCO multi-spindle drill press        | 1 | 2 | 3 | 4 |
| 38. 21" upright single spindle drill press | 1 | 2 | 3 | 4 |
| 39. CNC vertical machining center          | 1 | 2 | 3 | 4 |
| 40. CNC horizontal machining center        | 1 | 2 | 3 | 4 |
| 41. Bridgeport horizontal milling machine  | 1 | 2 | 3 | 4 |
| 42. Cincinnati rise & fall                 | 1 | 2 | 3 | 4 |

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

**Set-up:**

- |   |         |
|---|---------|
| 43. duplex-twin head milling machine        | 1 2 3 4 |
| 44. Milwaukee-matic EB                      | 1 2 3 4 |
| 45. J & L CNC chucker, A line               | 1 2 3 4 |
| 46. J & L CNC combi-lathe                   | 1 2 3 4 |
| 47. KT 180                                  | 1 2 3 4 |
| 48. Scimmx                                  | 1 2 3 4 |
| 49. Do All saw                              | 1 2 3 4 |
| 50. Wagner saw                              | 1 2 3 4 |
| 51. Barber Coleman Hobb-gear making machine | 1 2 3 4 |
| 52. anvill mills                            | 1 2 3 4 |
| 53. vertical broaches                       | 1 2 3 4 |
| 54. horizontal broache                      | 1 2 3 4 |
| 55. MSO machine                             | 1 2 3 4 |
| 56. Burke twin mill                         | 1 2 3 4 |
| 57. engine lathe                            | 1 2 3 4 |

**Set-up:**

- |                                    |         |
|------------------------------------|---------|
| 58. multiple spindle screw machine | 1 2 3 4 |
| 59. automatic screw machines       | 1 2 3 4 |
| 60. gear shaper                    | 1 2 3 4 |
| 61. TBI lathe                      | 1 2 3 4 |
| 62. gun drill                      | 1 2 3 4 |

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

**Operate:**

63. standard end plate finishing lathe	1	2	3	4
64. drill press	1	2	3	4
65. Bridgeport mill	1	2	3	4
66. Seiki 3NE automatic turret lathe	1	2	3	4
67. Seiki 4NE automatic turret lathe	1	2	3	4
68. Seiki 4NEA automatic turret lathe	1	2	3	4
69. Sunnen horizontal hone	1	2	3	4
70. Cincinnati monosett tool grinder	1	2	3	4
71. Heald tool grinding machine	1	2	3	4
72. Norton surface grinder	1	2	3	4
73. drill grinder	1	2	3	4
74. surface grinder	1	2	3	4
75. Hobb machine	1	2	3	4
76. cutter and tool grinding machine	1	2	3	4
77. tap grinder	1	2	3	4
78. thread chaser	1	2	3	4
79. Gleason cutter-shaper	1	2	3	4
80. single point carbide grinder	1	2	3	4
81. Sunnen precision honing machine	1	2	3	4

**Operate:**

82. milling machines	1	2	3	4
83. lathe	1	2	3	4
84. jig bore	1	2	3	4
85. surface grinder	1	2	3	4
86. bench grinders	1	2	3	4
87. contour saw	1	2	3	4
88. cam grinder	1	2	3	4
89. Landis external grinder	1	2	3	4
90. Norton external grinder	1	2	3	4
91. Gardner disk grinder horizontal	1	2	3	4
92. Cincinnati thru feed grinder	1	2	3	4
93. Landis plunge drive grinder	1	2	3	4
94. Heald model 271 grinder	1	2	3	4
95. Heald model 272 plain grinder	1	2	3	4
96. Heald model 272 sizeromatic grinder	1	2	3	4
97. Cincinnati model 181 grinder	1	2	3	4
98. external stepmaster grinder	1	2	3	4
99. roll stamp	1	2	3	4
100. power press	1	2	3	4



1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

**Operate:**

101. standard Heald borematic	1	2	3	4
102. Heald borematic pin machine	1	2	3	4
103. transfer machine	1	2	3	4
104. Jones & Lamson ATL	1	2	3	4
105. Wheel & Brader shot-blast machine	1	2	3	4
106. straightening press	1	2	3	4
107. lapping machine	1	2	3	4
108. heat treat furnaces	1	2	3	4
109. induction heat treat machine	1	2	3	4
110. 4-6 spindle gang drill	1	2	3	4
111. radial drill press	1	2	3	4
112. NATCO multi-spindle drill press	1	2	3	4
113. 24" upright single spindle drill press	1	2	3	4
114. Okata CNC milling machine	1	2	3	4
115. Bridgeport CNC milling machine	1	2	3	4
116. Cincinnati horizontal milling machine	1	2	3	4
117. Cincinnati vertical milling machine	1	2	3	4
118. Bridgeport Vertical milling machine	1	2	3	4
119. Cincinnati rise and fall	1	2	3	4

**Operate:**

120. duplex-twin mill machine	1	2	3	4
121. Milwaukee-matic EB	1	2	3	4
122. J & L CNC chucker , A line	1	2	3	4
123. J & L CNC combi lathe	1	2	3	4
124. Shaffner rise & fall	1	2	3	4
125. K & T 180	1	2	3	4
126. Scimmx	1	2	3	4
127. Do All saw	1	2	3	4
128. Marvel saw	1	2	3	4
129. Wagner saw	1	2	3	4
130. Barber Coleman hobb-gear making machine	1	2	3	4
131. Anvill mill	1	2	3	4
132. vertical broaches	1	2	3	4
133. MSO machine	1	2	3	4
134. Burke twin mill	1	2	3	4
135. vibro machine	1	2	3	4
136. multiple spindle screw machine	1	2	3	4

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

### Operate

137. automatic screw machine	1	2	3	4
138. gear shaper	1	2	3	4
139. barrel machine tumbler	1	2	3	4
140. big wash	1	2	3	4
141. derust wash	1	2	3	4
142. paint booth	1	2	3	4
143. powder coating	1	2	3	4
144. spin finish machine	1	2	3	4
145. buffing lathe	1	2	3	4
146. disc sander	1	2	3	4
147. float sander	1	2	3	4
148. belt sander	1	2	3	4

187

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

149. read blue prints	1 2 3 4	169. stamp identification number on parts	1 2 3 4
150. read micrometers	1 2 3 4	170. read WIP forms	1 2 3 4
151. read concentricity gages	1 2 3 4	171. assemble two or more parts	1 2 3 4
152. read plug gages	1 2 3 4	172. use dial bar gages	1 2 3 4
153. measure up to .0001"	1 2 3 4	173. use dial depth gages	1 2 3 4
154. measure up to 1/64"	1 2 3 4	174. operate furnace	1 2 3 4
155. read height and flatness gages	1 2 3 4	175. use Rockwell hardness tester	1 2 3 4
156. use basic math skills	1 2 3 4	176. operate black oxide line	1 2 3 4
157. maintain crib service	1 2 3 4	177. operate forge furnace	1 2 3 4
158. maintain inventory of tools	1 2 3 4	178. use slip gages	1 2 3 4
159. use Vernier calipers	1 2 3 4	179. operate upset hammer	1 2 3 4
160. use Johansson blocks	1 2 3 4	180. operate Richard's bender	1 2 3 4
161. use Machinist Handbook	1 2 3 4	181. sharpen drills	1 2 3 4
162. use trigonometry	1 2 3 4	182. read Machinist's handbook	1 2 3 4
163. read complicated prints and drawings	1 2 3 4	183. adjust the machine which I operate	1 2 3 4
164. use depth gages	1 2 3 4	184. load/unload the machine which I operate	1 2 3 4
165. use shadow gages	1 2 3 4	185. read a print for the part I am working on	1 2 3 4
166. use radius gages	1 2 3 4		
167. assemble components for tools	1 2 3 4		
168. operate automated test cell	1 2 3 4		

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

- |   |         |
|---|---------|
| 186. obtain the tools/tooling for my job                    | 1 2 3 4 |
| 187. clean, oil, lubricate the machines which I operate     | 1 2 3 4 |
| 188. assist with maintenance of the machine which I operate | 1 2 3 4 |
| 189. load a tape in a NC machine                            | 1 2 3 4 |
| 190. arrange for the servicing of a machine                 | 1 2 3 4 |
| 191. check part to print                                    | 1 2 3 4 |
| 192. program the machine which I operate                    | 1 2 3 4 |
| 193. mount material in fixture/collet                       | 1 2 3 4 |
| 194. change fixture/collet                                  | 1 2 3 4 |

- |   |         |
|---|---------|
| 195. assist in trouble shooting or solving problems relating to my job/machine        | 1 2 3 4 |
| 196. assist with the repair of the machine(s) which I operate                         | 1 2 3 4 |
| 197. assist co-workers solve problems or trouble shoot problems relating their job(s) | 1 2 3 4 |