

ED 134735

Surface Grinder Operator

INSTRUCTOR'S GUIDE

Part of
SINGLE-TOOL SKILLS PROGRAM
MACHINE INDUSTRIES OCCUPATIONS



U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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MACHINE INDUSTRIES OCCUPATIONS
 SINGLE-TOOL SKILLS PROGRAM
 SURFACE GRINDER OPERATOR COURSE

SHOP PROJECTS

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Unit No. Operator's job title: Surface Grinder Operator
 Project X Project Name: 1-2-3 Blocks
 Job No. 1 Job name: 1-2-3 Blocks D.O.T. No. 603,280
 Drawing No. 45 Time: 8 hours

Objectives:
 Using the equipment, materials, and operations listed here, the student will be able to produce the piece shown on the drawing in accordance with the time and accuracy requirements specified.

Operations:
 1. Wheel dressing
 2. Grinding parallel
 3. Grinding square
 4. Precision inspecting

Equipment:
 Surface grinder Surface gage
 Grinding wheel Diamond wheel dresser
 Indicator Parallel clamps
 Angle plate 1", 2", and 3" micrometer calipers
 Grinding vise Gage blocks
 Surface plate Precision square

Materials:
 Case hardened steel,
 2 pieces 1.020" x 2.020"
 x 3.020" from milling,
 drilling, and heat treat operations

Selected references:
 Krar & Oswald, *Grinding Technology*
 McCarthy & Smith, *Machine Tool Technology*; 3d edition

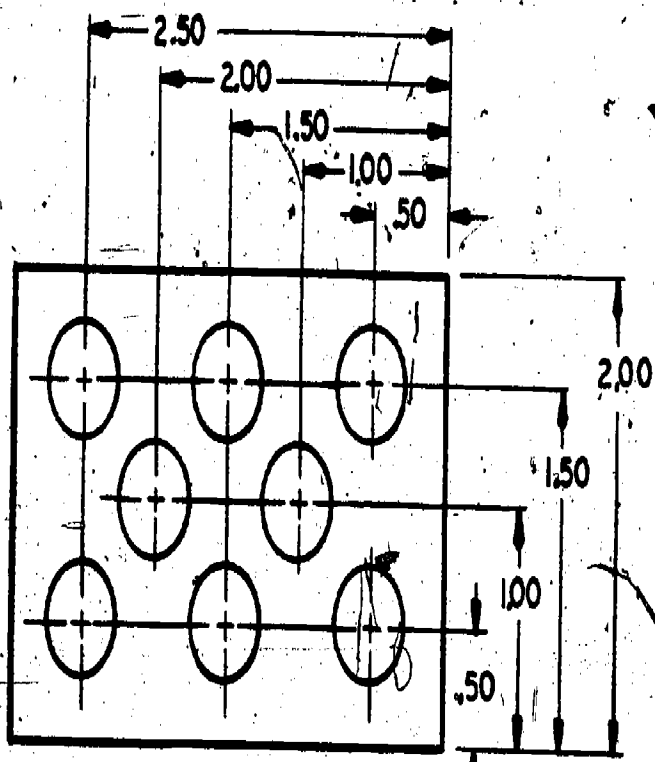
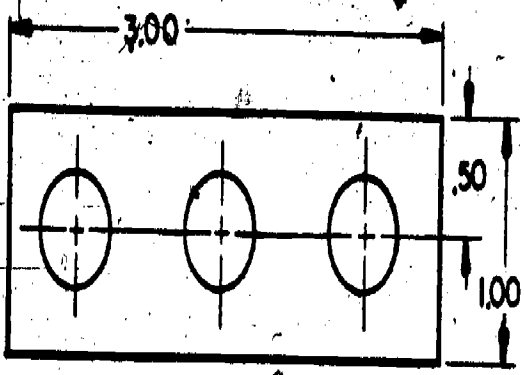
PROCEDURE

TECHNIQUES AND RELATED INFO.

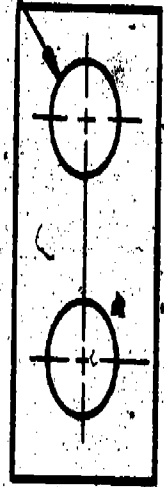
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|---|---|
| <ol style="list-style-type: none"> 1. Obtain two blocks and remove all burrs with an oilstone. 2. Dress grinding wheel sharp and true. 3. Locate first block in a grinding vise with the 2" x 3" face above the vise jaws, and level the surface for grinding. 4. Mount vise on magnetic chuck and grind first surface to clean up. 5. Repeat operations 3 and 4 with second block. 6. Place both blocks with their ground surfaces on the magnetic chuck and grind the opposite sides parallel. Check size and leave .002" oversize. 7. Locate first block on a precision angle plate with the 1" x 3" surface projecting above the angle plate, and clamp securely. 8. Mount angle plate on magnetic chuck and grind surface to clean up. | <ol style="list-style-type: none"> 1. Use parts from milling, drilling, and heat treat. 2. No. 32A46-J8VBE is recommended. 3. Check for levelness with the indicator and the vise on a surface plate. Ends must be leveled to the same reading. Check vise for good holding power. 4. Clean chuck and vise base when setting up. Contact highest point with grinding wheel and use .001" cuts. 6. These blocks must be a matching pair. 7. Check and level the surface with an indicator on the surface plate. 8. Contact highest point with wheel and use .001" depth of cut. |
|---|---|

PROCEDURE**TECHNIQUES AND RELATED INFO.**

9. Repeat operations 7 and 8 on second block.
 10. Locate both blocks on the magnetic chuck with the 1" x 3" ground surface on the chuck. Grind parallel to 2.002" dimension.
 11. Lay the precision angle plate on its side. Clamp the first block with the 1" x 2" surface projecting above the top of the angle plate.
 12. Mount angle plate on the magnetic chuck in upright position and grind the 1" x 2" surface to clean up.
 13. Repeat operations 11 and 12 on second block.
 14. Locate both blocks on the magnetic chuck with the 1" x 2" ground surface on the chuck, and grind parallel to 3.002" dimension.
 15. Remove all sharp edges with an oilstone. Check sizes and squareness on the surface plate with gage blocks, an indicator, and a precision square.
 16. Dress grinding wheel carefully, and thoroughly clean the magnetic chuck.
 17. Locate both blocks on 2" x 3" surface and finish grind to 1.0002".
 18. Locate both blocks on 1" x 3" surface and finish grind to 2.0002".
 19. Locate both blocks on 1" x 2" surface and finish grind to 3.0002".
 20. Remove all sharp edges with an oilstone and submit for inspection and grade.
10. Inspect parts for squareness and parallelism on the surface plate. Remove all sharp edges with an oilstone.
 11. Use parallels if needed and check the alinement of the ground edge with an indicator. Adjust until level within .0001".
 14. Block the pieces for support with parallels.
 16. Check for burrs and remove with oilstone if necessary.
 17. Use .0005" or less for depth of cut. The .0002" oversize is left for lapping.
 19. Block pieces for safety.



$\frac{31}{64}$ DR. $\frac{1}{2}$ REAM THROUGH
 $\frac{1}{32}$ CSINK 13 HOLES



NOTES:
 MATL. SAE 1020
 CASE HARDEN.
 BREAK ALL SHARP CORNERS.
 2 REQD.

TOLERANCES:
 (UNLESS OTHERWISE SPECIFIED)
 $\pm .005$ DECIMAL
 $\pm \frac{1}{64}$ FRACTIONAL
 $\pm \frac{1}{2}^\circ$ ANGULAR

DRAWN BY: E.F.S.

SCALE: —

1-2-3 BLOCK

DWG. NO. 45

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