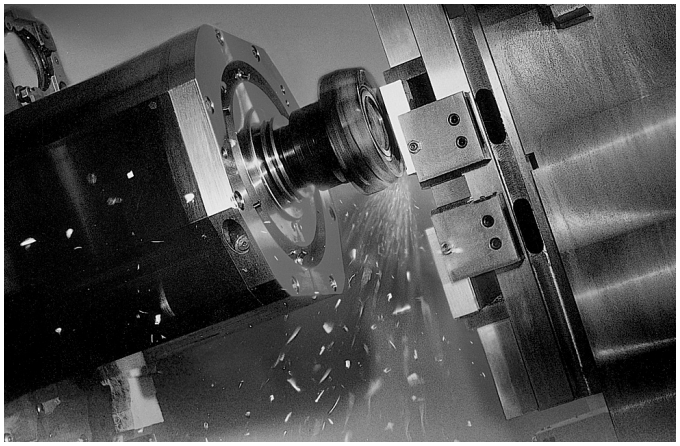


Chapter 16

Broaching Operations

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Describe the broaching operation.
- Explain the advantages of broaching.
- Set up and cut a keyway using a keyway broach and an arbor press.

INSTRUCTIONAL MATERIALS

Text: pages 281–284
Test Your Knowledge Questions, page 284
Workbook: pages 89–90
Instructor's Resource: pages 219–222
Guide for Lesson Planning
Research and Development Ideas
Reproducible Masters:
16-1 How a Broaching Tool Cuts
16-2 Test Your Knowledge Questions
Color Transparency (Binder/CD only)

GUIDE FOR LESSON PLANNING

Have students/trainees read and study the chapter. Review the assignment using Reproducible Master 16-1 as an overhead transparency and/or handout. Discuss the following:

- The broaching process.
- Types of broaching machines.
- How a broaching tool cuts.
- Advantages of broaching.
- Demonstrate how to broach a keyway.

Technical Terms

Review the terms introduced in the chapter. New terms can be assigned as a quiz, homework, or extra credit. The following list is also given at the beginning of the chapter.

broach
broaching
burnishing
finishing teeth
keyway
pot broaching
pull broach
roughing teeth
semifinishing teeth
slab broach

Review Questions

Assign *Test Your Knowledge* questions. Copy and distribute Reproducible Master 16-2 or have students use the questions on page 284 in the text and write their answers on a separate sheet of paper.

Workbook Assignment

Assign Chapter 16 of the ***Machining Fundamentals Workbook.***

Research and Development

Discuss the following topics in class or have students complete projects on their own.

1. Secure samples of work produced by broaching.
2. Research and prepare a short description of the following types of broaching machines:

a. Pot-broaching machine.
b. Continuous broaching machine.
c. Rotary broaching machine.

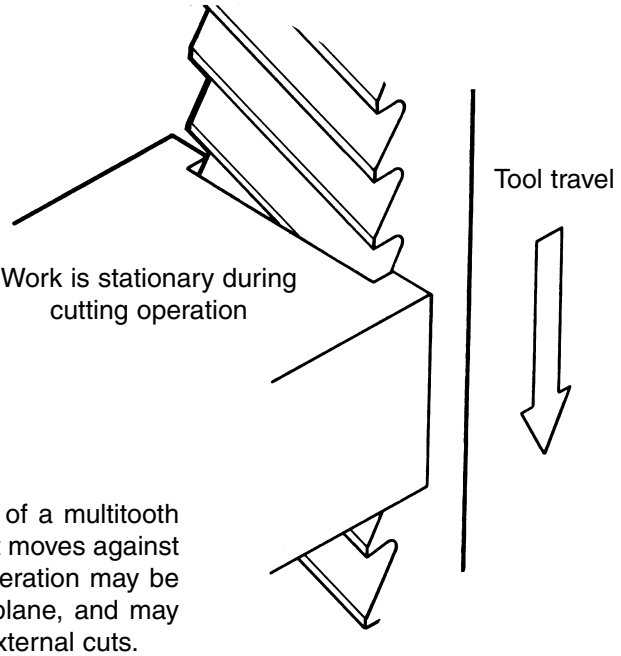
TEST YOUR KNOWLEDGE ANSWERS, Page 284

1. flat, round, contoured
2. It requires an opening to insert the broaching tool.
3. It is a multitoothed cutting tool. Each tooth removes only a small portion of the material being machined.
4. Any order: high productivity; can maintain close tolerances; produces good surface finishes; economical; long tool life; since equipment is automated, it can be operated by semiskilled workers.
5. burnishing (noncutting) elements

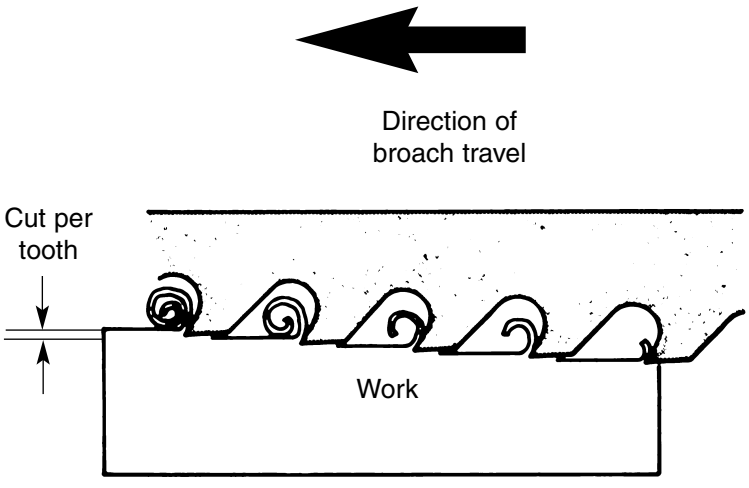
WORKBOOK ANSWERS, Pages 89–90

1. e. Both a and b.
2. Pull broach. Used for internal broaching.
   Slab broach. For external broaching.
   Pot broach. The tool is stationary and the work is moved against the tool.
3. pushed, pulled
4. A. Finishing teeth
   B. Semi-finishing teeth
   C. Roughing teeth
   D. Pilot guide
5. d. All of the above.
6. d. All of the above.
7. ram

How a Broaching Tool Cuts



Broaching involves the use of a multitooth cutting tool (the broach) that moves against the stationary work. The operation may be on a vertical or horizontal plane, and may involve making internal or external cuts.



Each tooth on a broaching tool removes only a small portion of the material being machined.

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Broaching Operations

Name: _____Date: _____ Score: _____

1. Broaching is a manufacturing process for machining _____ surfaces. 1. _____

2. What does internal broaching require that external broaching does not? _____

_____

_____

_____

_____

3. What is unique about the cutting tool used on a broaching machine? _____

_____

_____

_____

_____

4. List three advantages offered by broaching. _____

_____

_____

_____

_____

_____

5. With broaching, the machined surface can be further improved by adding _____ to the finishing end of the broach. 5. _____

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