

AJ-08: Perform Broaching

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Observe machine safety when operating machines.

EQUIPMENT

- TR System
- basic Toolmaker measuring devices (caliper)

RESOURCES

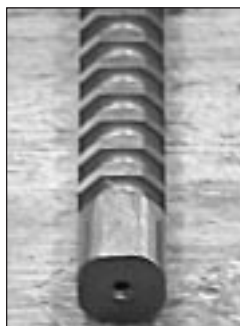
- print/sketch
- repair ticket

Perform Broaching of a Shaped Hole

1. Determine the work requirements.

- Read the repair ticket.

2. Select the broach bar according to the size and shape specified on the repair ticket or print.



Hex

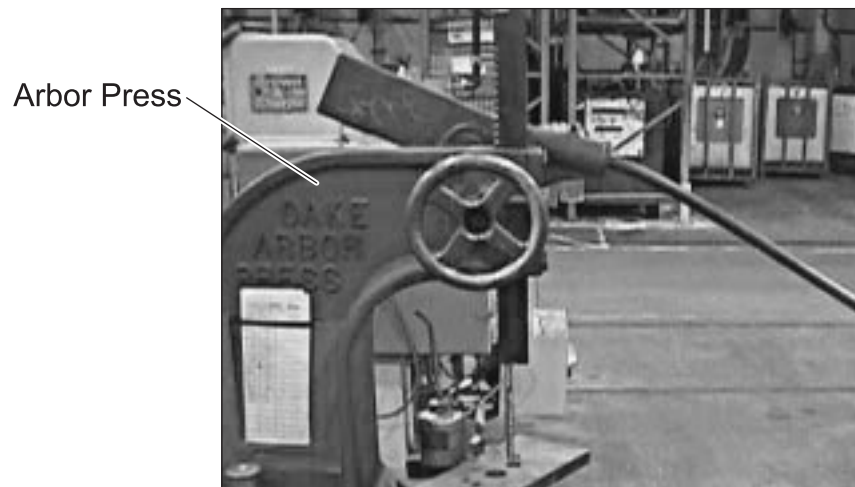


Square

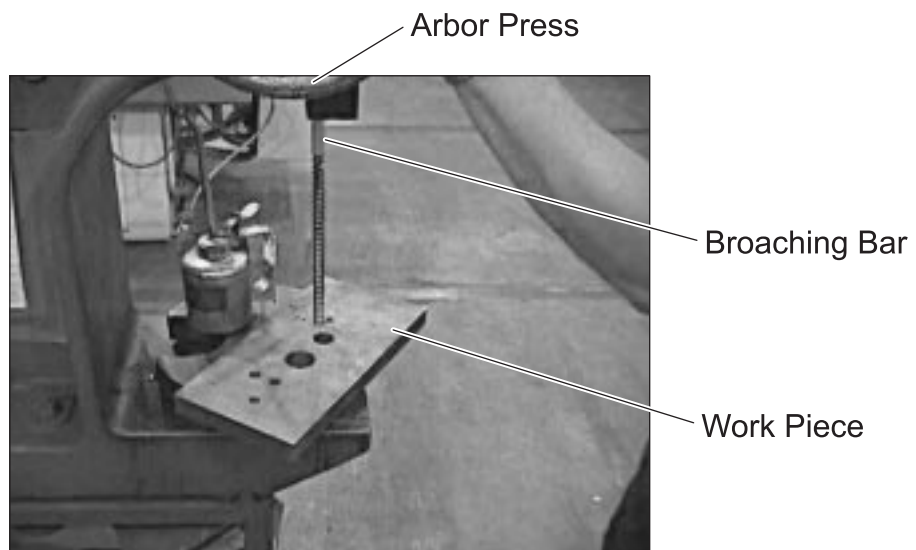
Example Broach Bars

3. Drill the pilot hole.

- Determine the pilot hole size from the broach bar.
- Drill the hole according to Toolmaker procedures.

4. Set up the part on the arbor press (or hydraulic press).

- Slide the broach bar into the pilot hole.
- Oil the broach bar.
- Verify that the broach bar is square with the piece and the press.

**Squared Components****5. Press the broach bar through the pilot hole.**

- Press slowly at first to guarantee you are not binding the broach bar.

- Check to make sure the broach bar is still square with the piece and the press as you push the broach bar through.
- Reach under the press and grab the broach bar as it slides through the piece. Catch the broach bar before it drops to the floor, to avoid damaging the teeth.

6. Inspect the hole.

- Verify the hole size and shape.

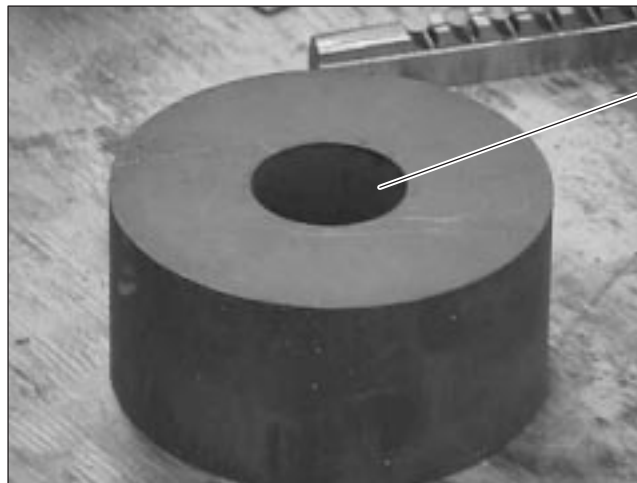
Broach a Keyway

1. Determine the work requirements.

- Read the repair ticket or print.

2. Select the keyway broach bar and pilot bushing according to the size specified on the repair ticket or print.

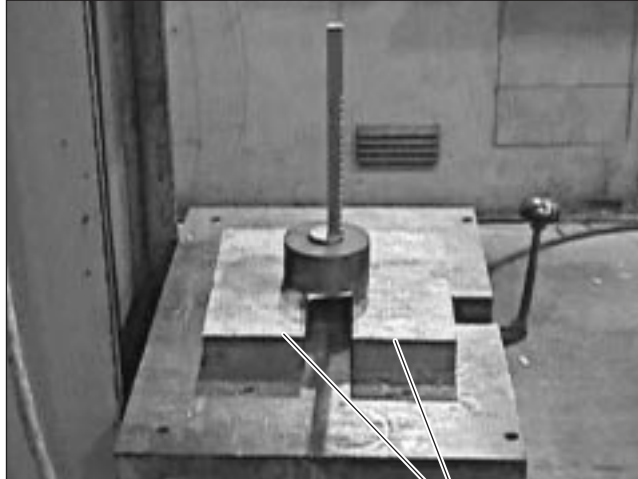
3. Bore a hole in the piece according to the repair ticket or print requirements.



Hole Bored to Specification

4. Set up the piece on the hydraulic press (or arbor press).

- Use parallels to raise the piece, as necessary.



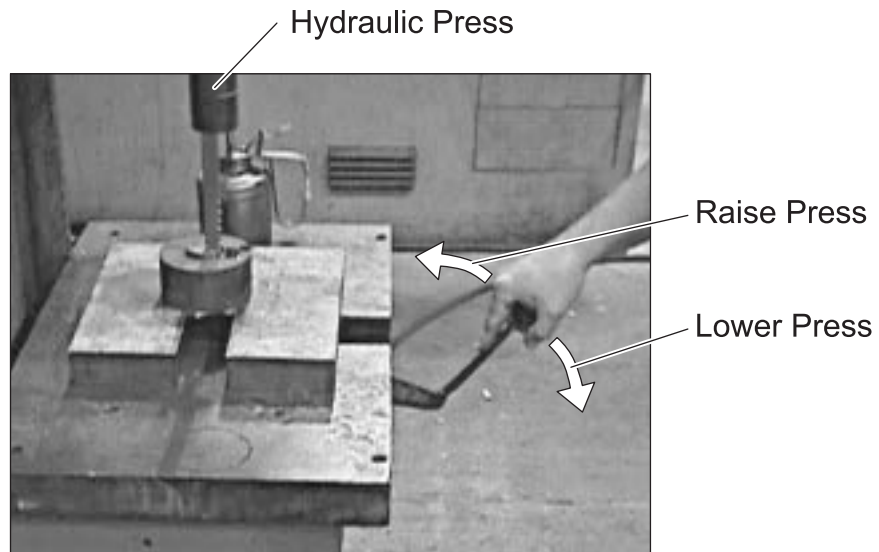
Parallels (Used to Raise the Work Piece)

- Place the pilot bushing in the hole.
- Slide the keyway broach bar into the pilot bushing.
- Position the keyway broach bar in the center of the ram.
- Oil the teeth on the keyway broach.

5. Slowly lower the ram to the keyway broach.

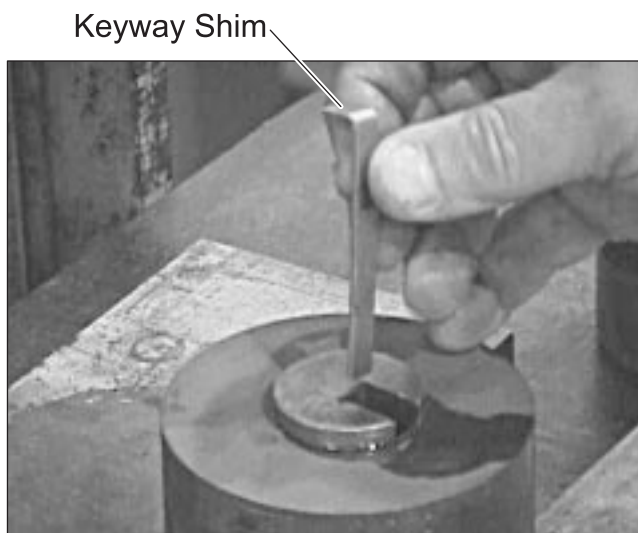
- Verify the keyway broach is square with the hole and centered with the ram.

- Release the pressure on the keyway broach to verify it is not bound up.

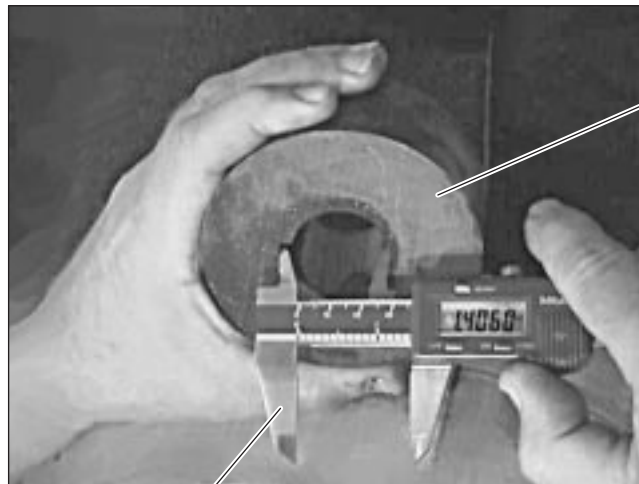


Hydraulic Pressure Control

6. **Continue applying pressure and releasing until the keyway broach bar is almost all the way through the hole.**
 - Grab the keyway broach bar as it exits the piece, to prevent the bar from falling to the floor.
7. **Add shims to the keyway, as required.**



8. Repeat steps 4 through 7 until the keyway is the desired size.
9. Inspect the keyway with a caliper.
 - Verify the keyway with the required size from the repair ticket or print.



Work Piece

Caliper

Keyway Inspection