

F-17: Cut Contour

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.

EQUIPMENT

- required holding device
- basic Toolmaker measuring devices
- piece

RESOURCES

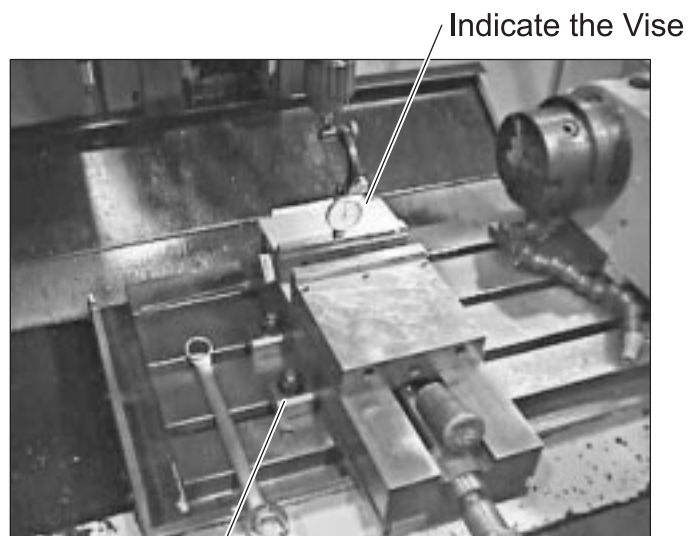
- job process sheet
- print
- manufacturer's programming/operating manual

Cut Contour

Note: Steps 1-3 are shown in the Toolmaker's procedures for setting up the machine.

1. Verify machine setup.

- Make sure the holding device is parallel with the machine.
- Make sure the holding device is secure to the table.



Indicate the Vise

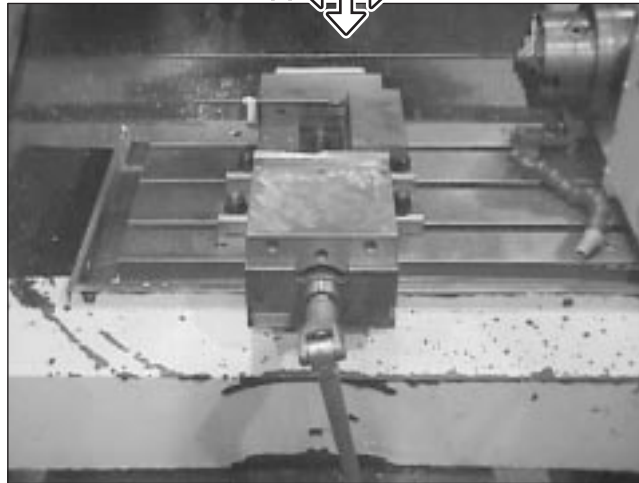
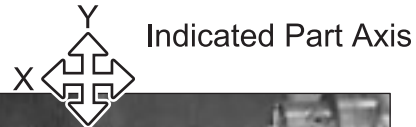
Secure the Indicated Vise

2. Verify tool setup and set the Z zero.

- Check the tool parameters and set the Z zero.

3. Verify the part setup.

- Locate the X and Y axes.

**Block: Program Contour**

- 1. Press the <F2> key to insert a block.**
- 2. Press the <F3> key for milling operations.**
- 3. Press the <F1> key for lines and arcs.**

Segment 0: General Parameters

- 1. Type the tool number required for the job, and press <Input>.**
- 2. Enter the cutter compensation, and press <Input>.**

Options include:

- 1) No
- 2) Left
- 3) Right
- 4) Profile Left
- 5) Profile Right

3. **Type the Finish tool number, and press <Enter>.**

Leave the value blank if no finish tool is required.

4. **Type the X start value, and press <Enter>.**

5. **Type the Y start value, and press <Enter>.**

6. **Type the Z start value, and press <Enter>.**

7. **Type the Z bottom, and press <Enter>.**

8. **Type the Plunge feed value, and press <Enter>.**

9. **Type the Speed (RPM), and press <Enter>.**

10. **Type the Peck Depth, and press <Enter>.**

Do not enter a value if one cut is expected; enter the depth of the peck.

11. **Verify the tool type and tool parameters.**

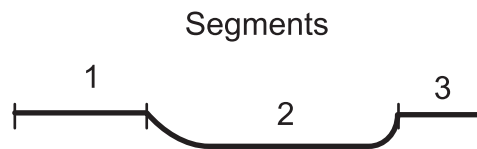


Tool Location

12. Press the advance key (right arrow) to start a new segment.

Block 1 – Segment 1 (Line)

Note: The following steps are an example of how to program the CNC mill to cut a contour. The drawing below is an example of what the shape looks like and the order the segments program the mill to cut the contour.



1. Press <F1> to select a Line.
2. Type the X end, and press <Enter>.
3. Type the Y end, and press <Enter>.
4. Type the Z end, and press <Enter>.
5. Verify the calculated value for XY length, if necessary.
6. Verify the calculated value for XY angle, if necessary.
7. Type the desired feed/minute value, and press <Enter>.
8. Press the advance key (right arrow) to start a new segment.

Block 1 – Segment 2 (Arc)

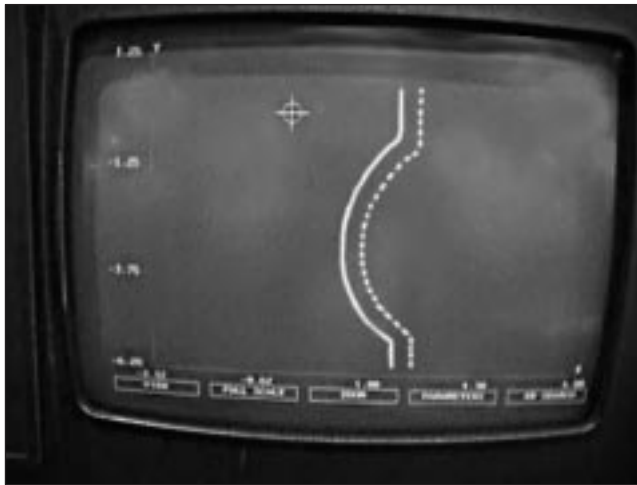
1. Press <F2> key to select an Arc.
2. Type the direction desired for cutting.
 - The options are Clockwise (CW) or Counterclockwise (CCW).
3. Type the X end and press <Enter>, if necessary.

4. Type the Y end and press <Enter>, if necessary.
5. Type the X center and press <Enter>, if known.
6. Type the Y center and press <Enter>, if known.
7. Type the Radius desired, and press <Enter>.
8. Verify that the Feed is correct.

Block 1 – Segment 3 (Line)

1. Press <F1> to select Line.
2. Verify or change the X end, and press <Enter>.
3. Verify or change the Y end, and press <Enter>.
4. Verify the Z end.
5. Verify the calculated value for XY length, if necessary.
6. Verify the calculated value for XY angle, if necessary.
7. Verify the feed/minute value.

8. Press the <Draw> key to view the proposed operation.



Drawn Contour

Verify the Program

1. Press the Machine Mode <Auto> key.
2. Press the <F4> key to check for errors.
 - Correct any errors.
 - Verify that the screen displays “No Errors” before proceeding.

Run the Program

1. Start the Coolant.

- For larger cutters, set the coolant level to Flood.

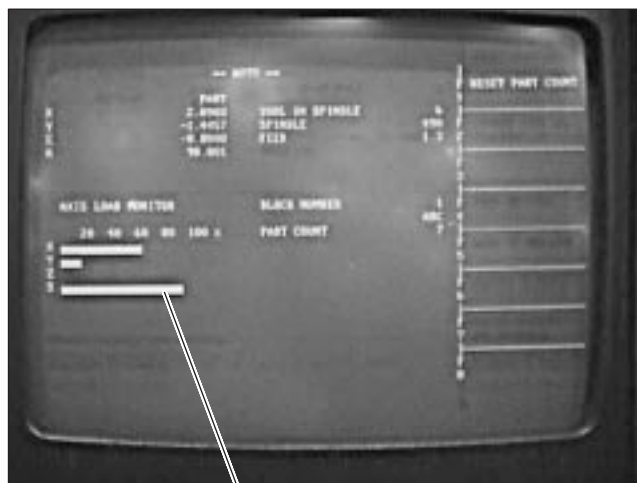


Turn On the Coolant



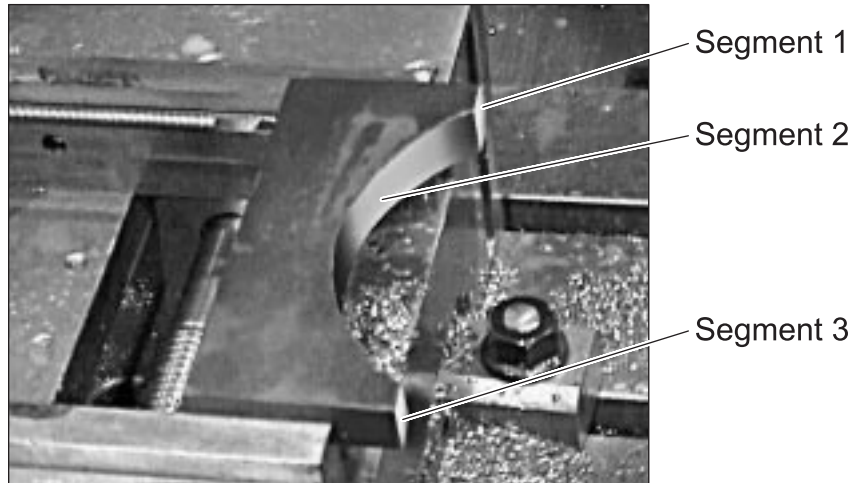
2. Press the <F8> key to run the program.

3. Watch the Axis Load Monitor.



Adjust the Mill if Loads Exceed Specifications

4. **Adjust the Speed and Feed on the Manual control to compensate for excessive loads as needed.**
5. **Inspect the piece when the program has finished.**
 - Verify print specifications.



6. **Clean up the work area.**