

Model engine: Crank soft jaw process plan

Learning objectives

After completing this module, you'll be able to:

- Describe the need and components of a process plan for CNC machining
- List the steps required to machine the part
- Define the order of operations for each Setup
- Define the part orientation and Work Coordinate System (WCS) for each Setup
- List the tools recommended to machine the part

What is a process plan?

Creating a machining process plan is **critical to ensure cost, time and quality parameters of manufacturing operations.**

Process plans contain the operations to be performed, the standard processes used to perform these operations, the sequence in which they must be done, the parts related to the operation, and the physical and human resources required to complete the operation.

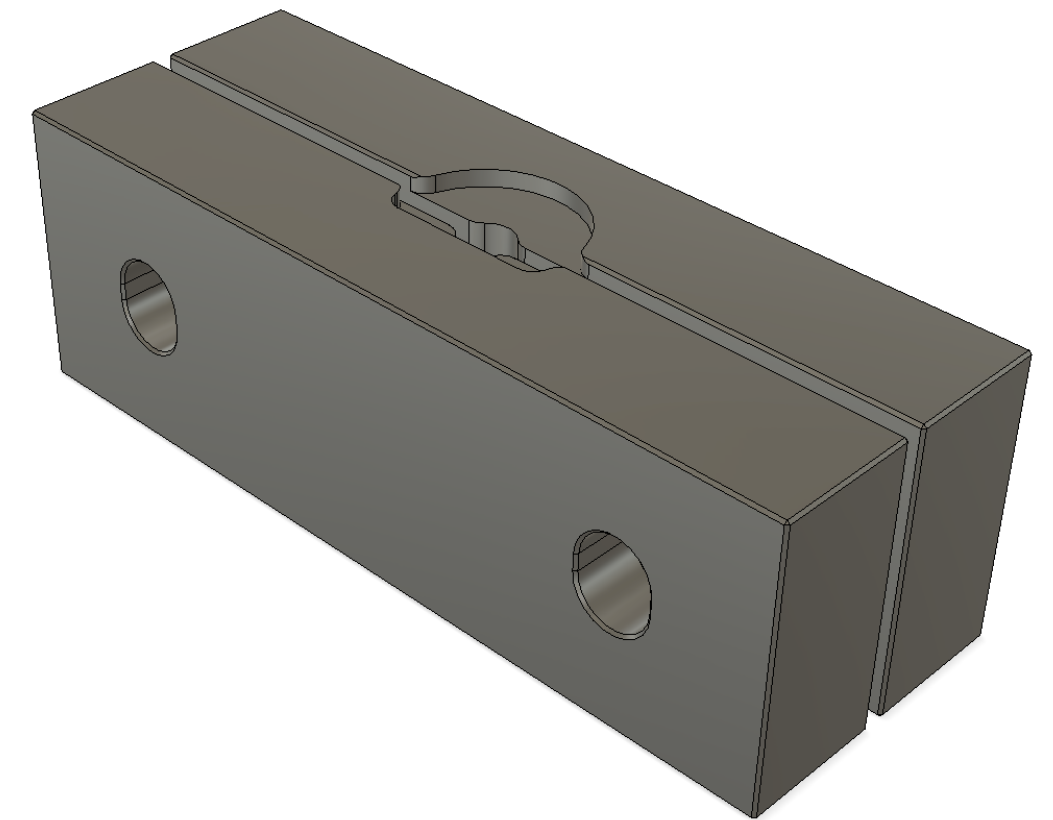
Process plan outline

- To create a process plan, you identify the following items before beginning the project:
 - What are you making?
 - What is the part material?
 - What is the order of operations?
 - How is the part held?
 - Where is the part reference (WCS)?
 - What tools are required?

What you are making?

The crank soft jaw to hold the engine crank secondary operation.

- After review of the supplied blueprint, you find that the design must be machined from a single orientation in order to finish all the required details.
- The Setup is planned to machine details required to accurately hold the part and reference a work coordinate system based on the blueprint datums.



What is the part material?

- This project will be using standard soft jaws made from Aluminum 6061.
- This material has good machinability properties and works well for this application with or without heat treatment.
- Post process anodizing of the part will be acceptable however paint or powder coat should be avoided on all mating surfaces.

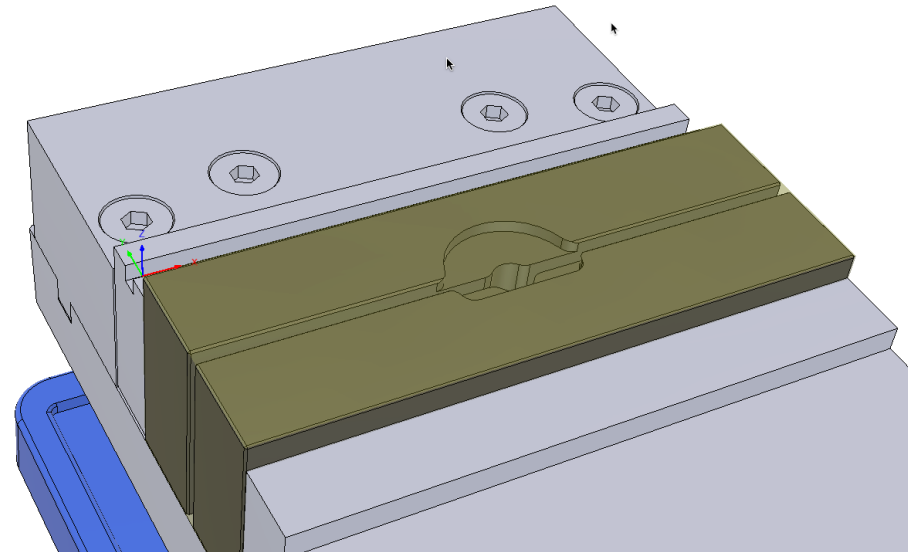
Note: Tool RPM and cutting feed rates are not universal. They will vary based on the specific tool, material, fixturing method as well as the machine tool capability.



Process plan

The crank soft jaw requires one operation. The process plan is a sort of road map for how you plan to orient and machine the part, which tools you should use, and any notes required.

- OP1 – 6” soft jaws mounted to a standard vise

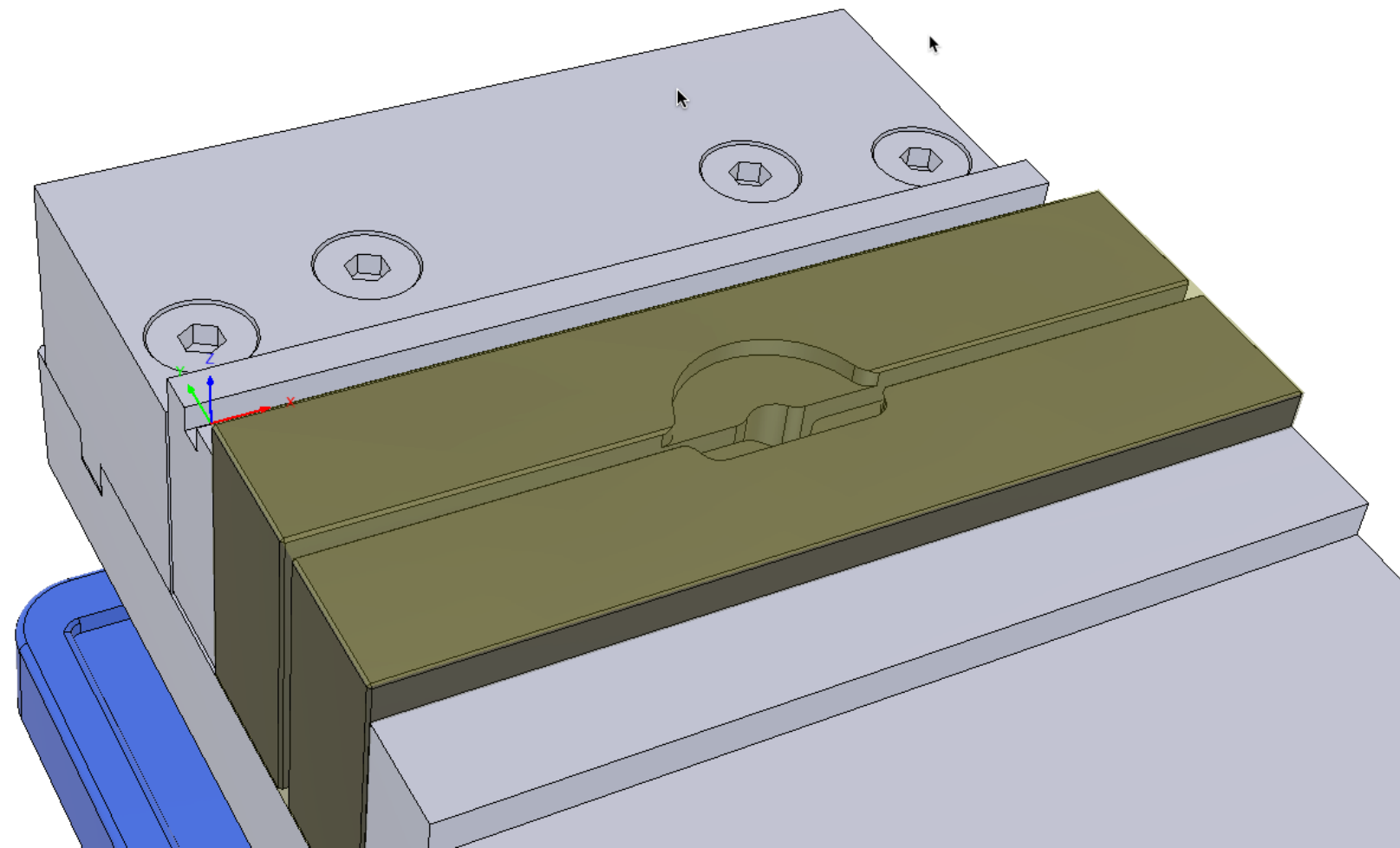


What is the order of operations?

- The crank soft jaw is a single part that consists of 1 Setup.
 - Setup 1(OP1)
 - Machine the cavity to hold the engine crank

Where is the part reference WCS?

- Setup 1(OP1)
 - Standard 6" vise with soft jaws
 - Top left corner of soft jaws



What tools are recommended?

- The following tools are used to complete the part on the vertical CNC mill.
- T1 – 1/4" 3 Flute Flat Carbide Endmill .75" Flute Length

