

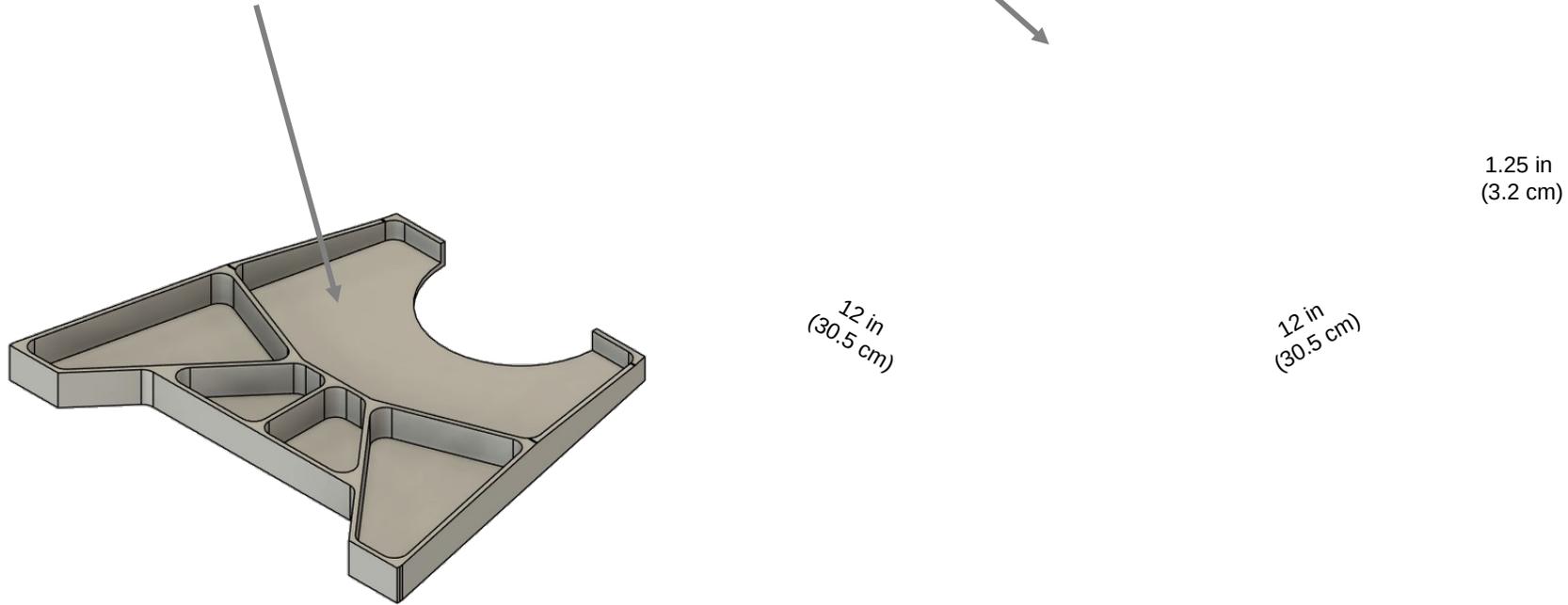
CAM example

Tony Schmitz and Ross Zamerowski

Part overview

Aerospace panel geometry

- complex geometry with thin-walled sections
- large volume of material to be removed in pocketed areas.



Stock volume	Part volume	Volume of material removed
180.0 in ³	12.4 in ³	167.6 in ³ (93%)
2949.7 cm ³	202.5 cm ³	2747.2 cm ³ (93%)

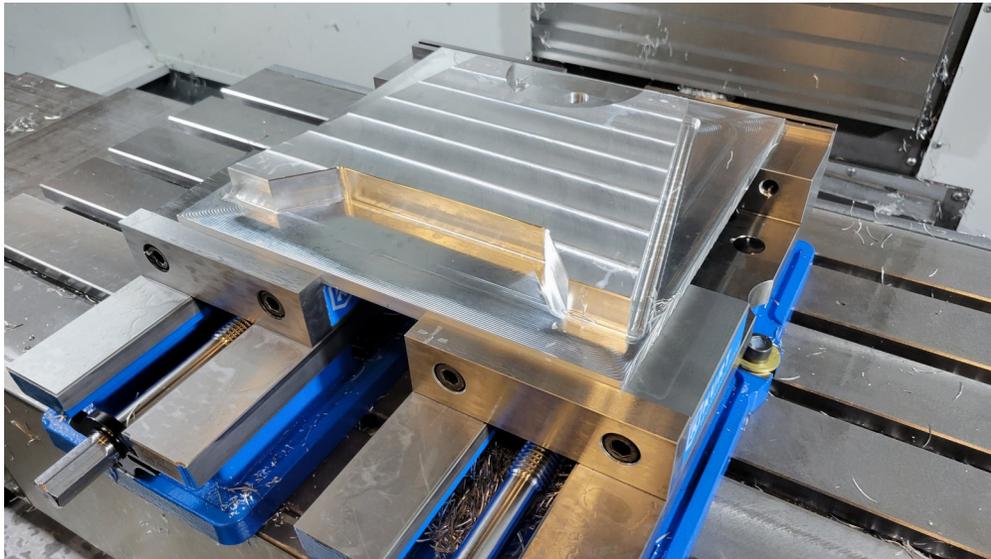
Setup sheets

The setup sheets summarize the machining process

- OP10 – machining the bottom of the panel
- OP20 – machining the top of the panel
- CAM software is Fusion.

Review the two setup sheets to see the work coordinate systems, tools, and operations.

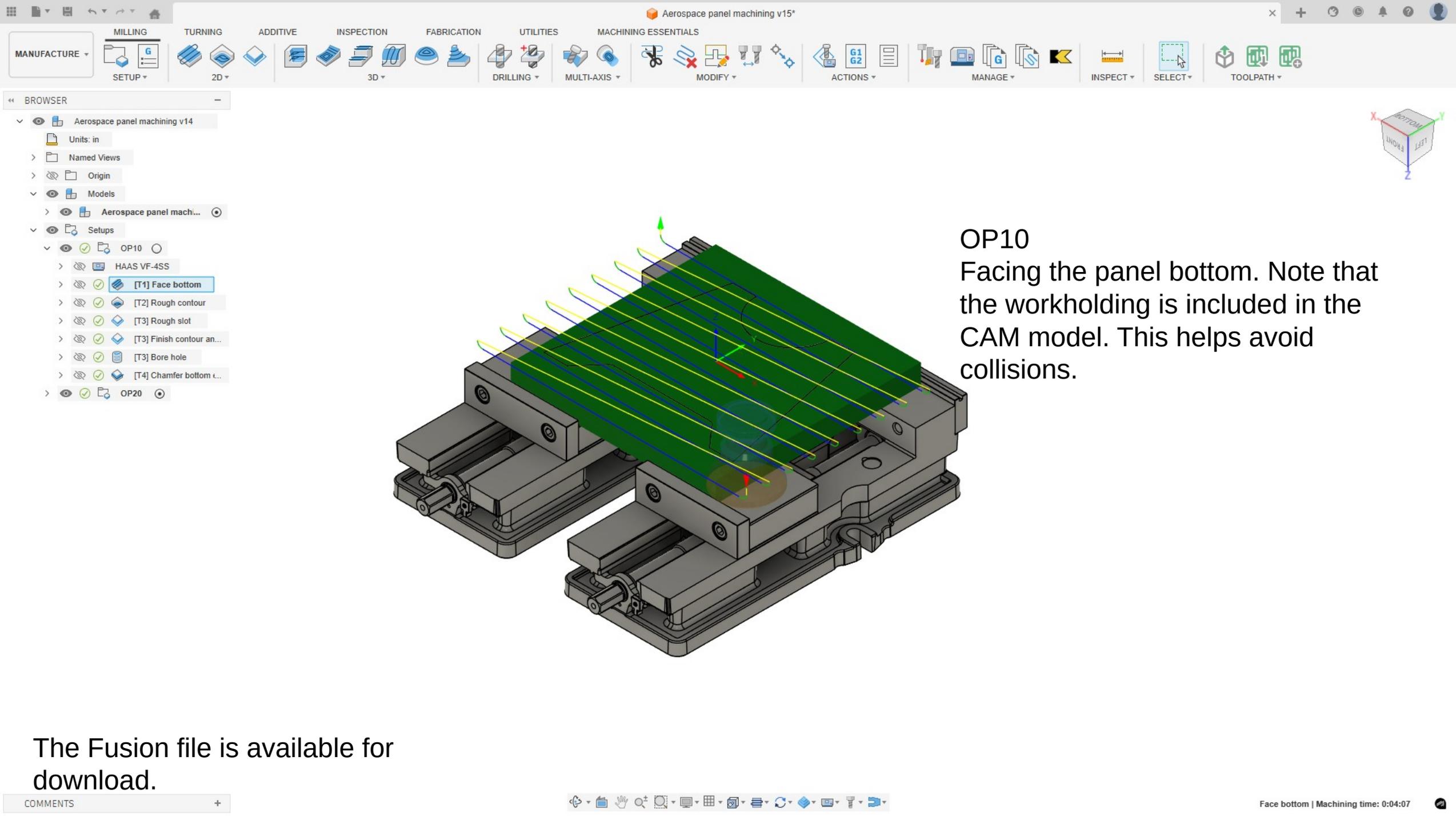
After OP10



After OP20

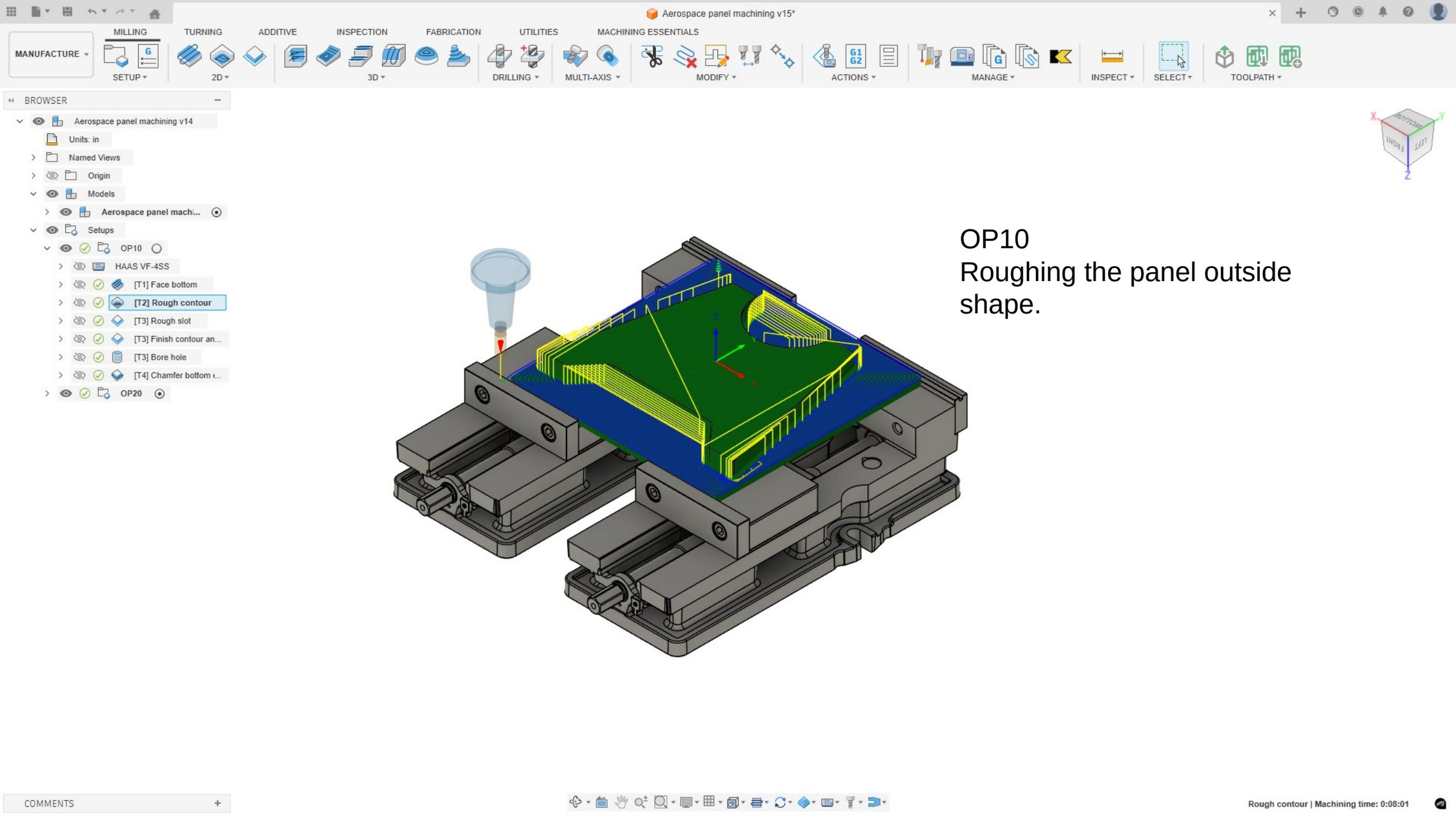


Workholding is completed using two vises for the wide stock and part.

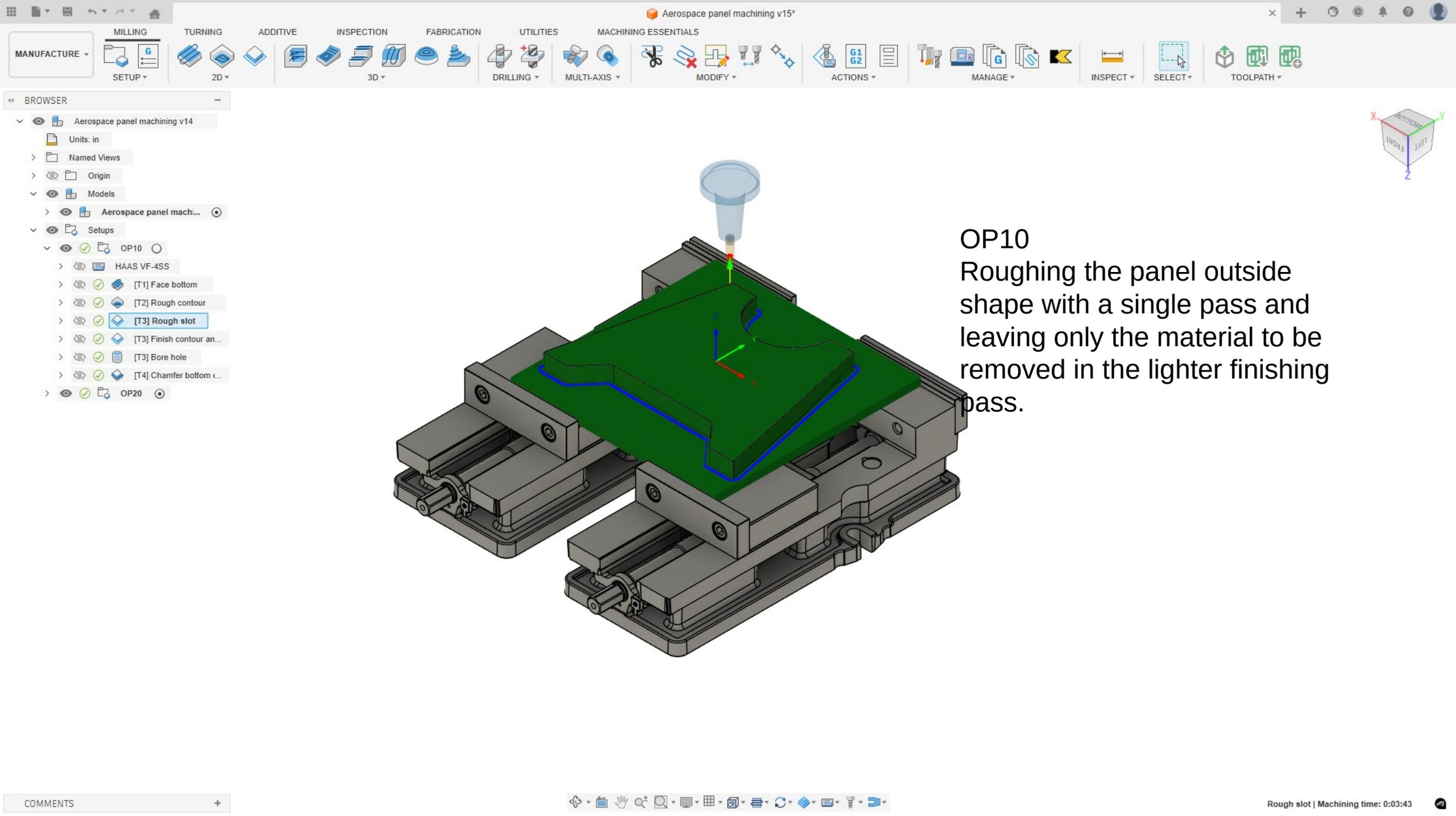


OP10
Facing the panel bottom. Note that the workholding is included in the CAM model. This helps avoid collisions.

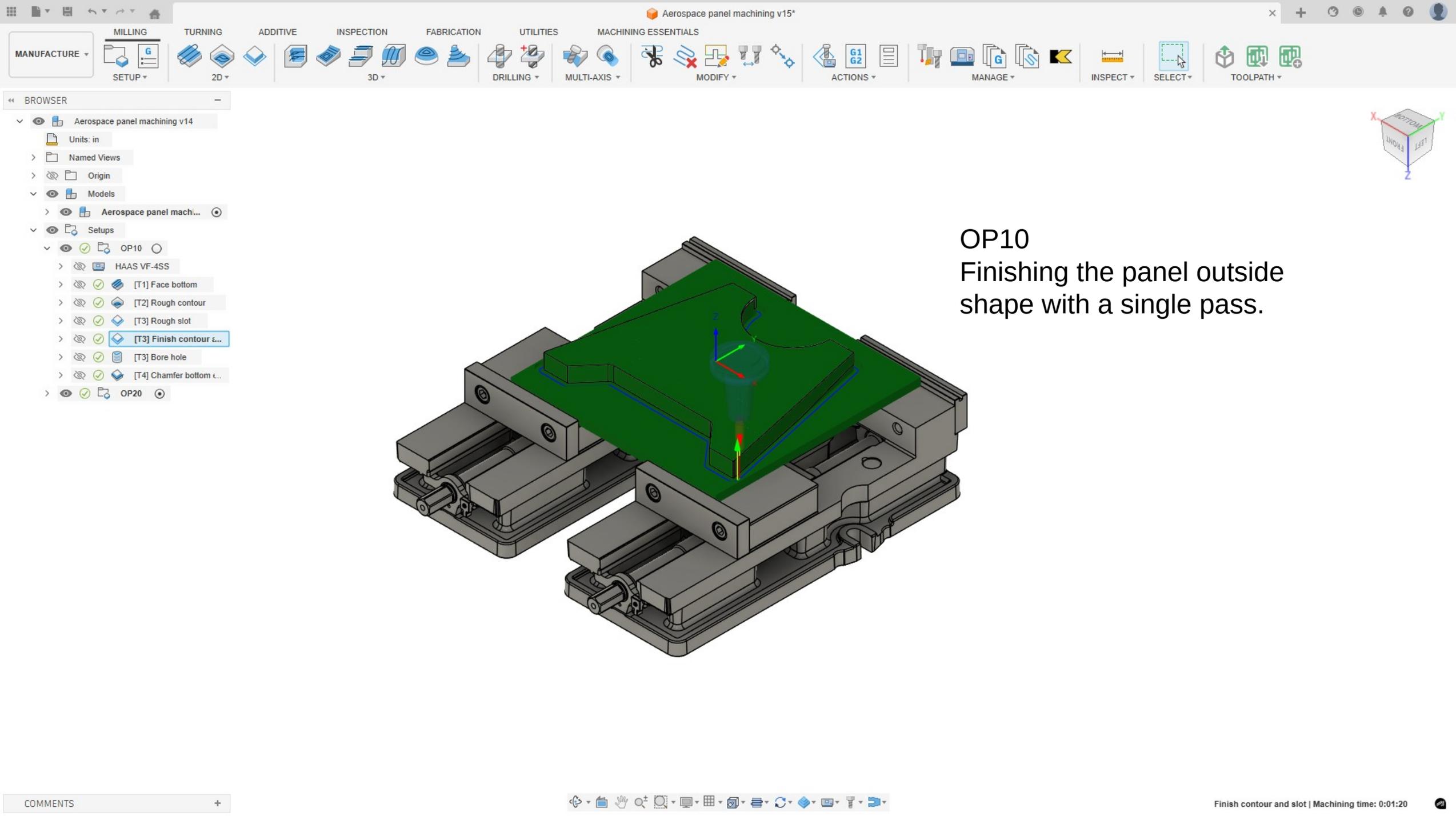
The Fusion file is available for download.



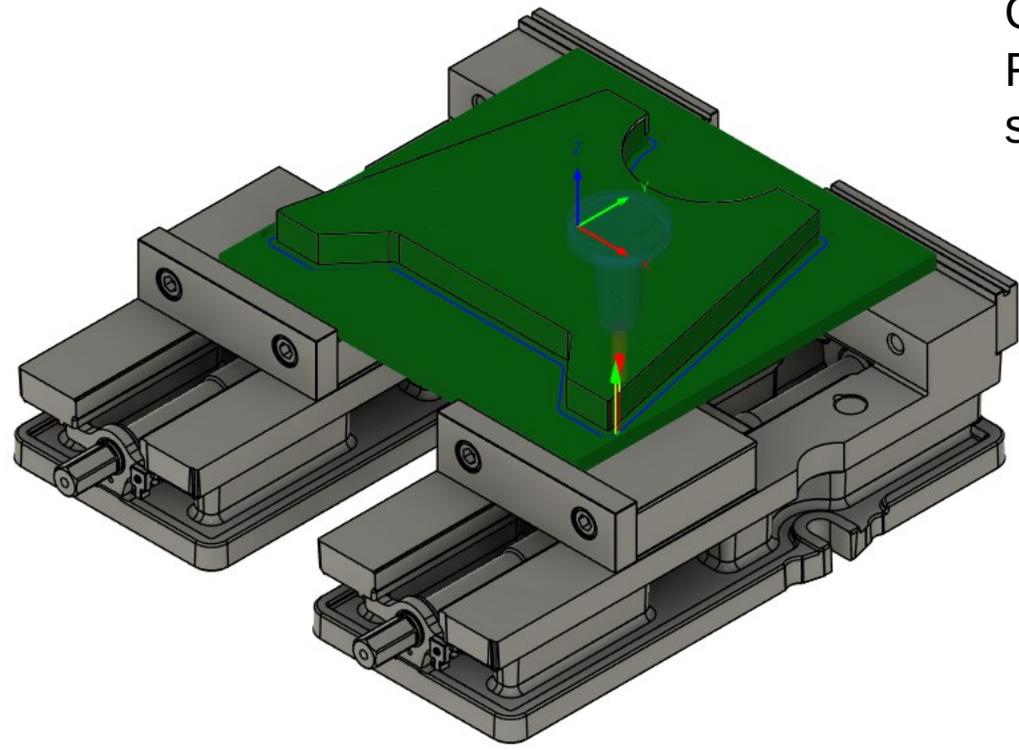
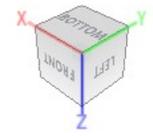
OP10
Roughing the panel outside shape.



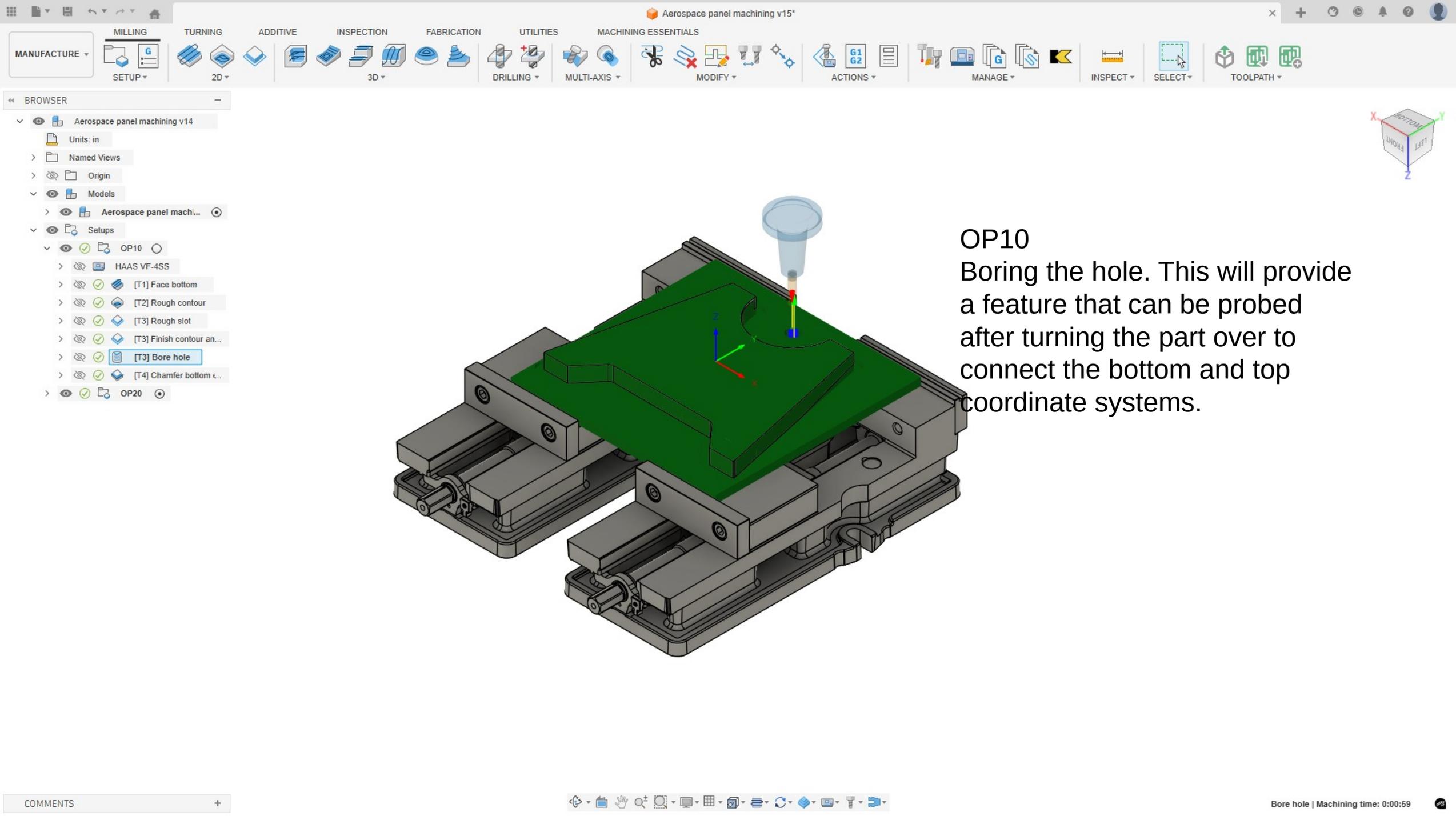
OP10
Roughing the panel outside shape with a single pass and leaving only the material to be removed in the lighter finishing pass.



- ▼ Aerospace panel machining v14
 - Units: in
 - Named Views
 - Origin
 - Models
 - Aerospace panel machi...
 - Setups
 - OP10 ○
 - HAAS VF-4SS
 - [T1] Face bottom
 - [T2] Rough contour
 - [T3] Rough slot
 - [T3] Finish contour ε...
 - [T3] Bore hole
 - [T4] Chamfer bottom ε...
 - OP20 ○

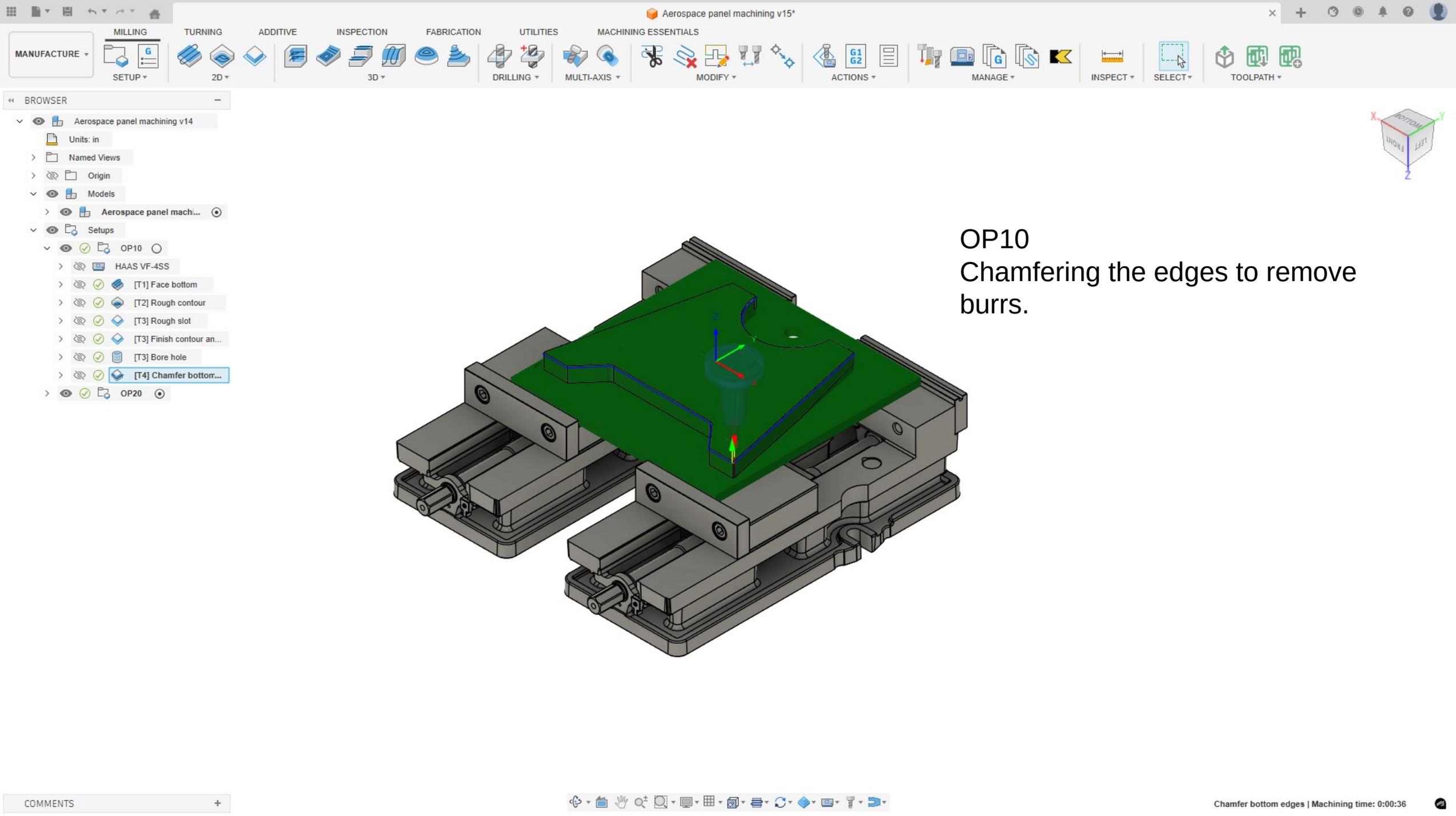


OP10
Finishing the panel outside
shape with a single pass.

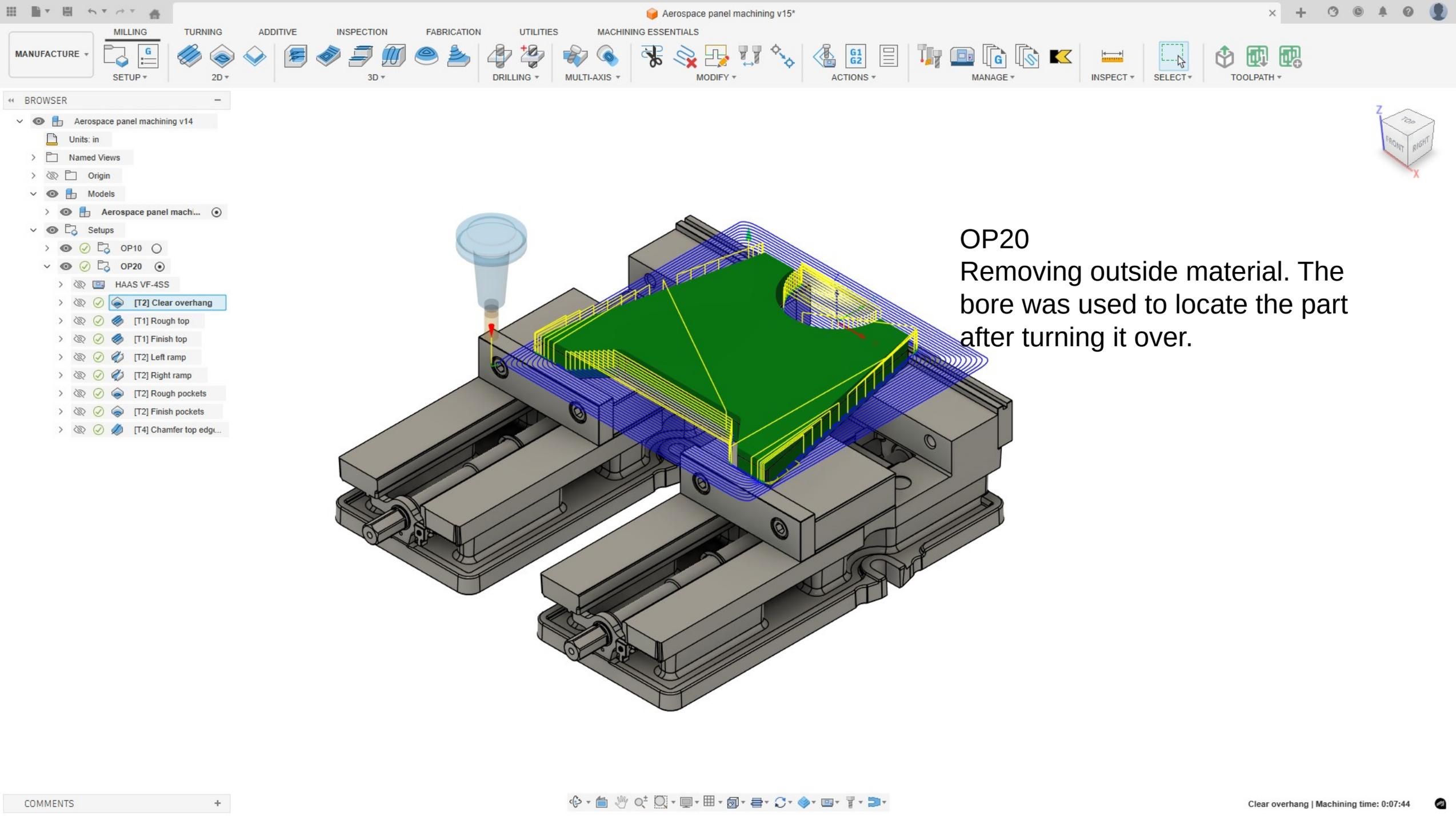


OP10

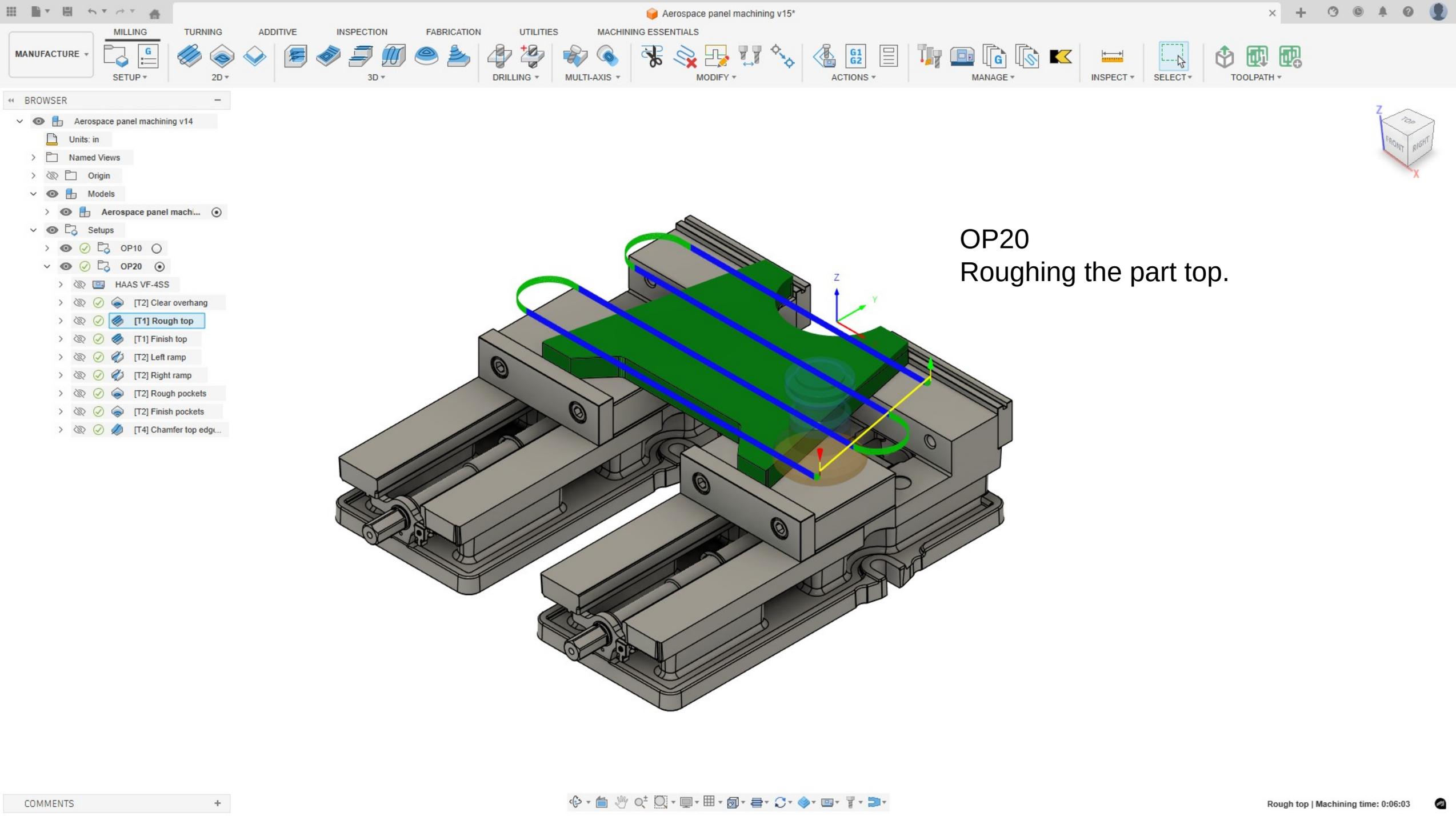
Boring the hole. This will provide a feature that can be probed after turning the part over to connect the bottom and top coordinate systems.



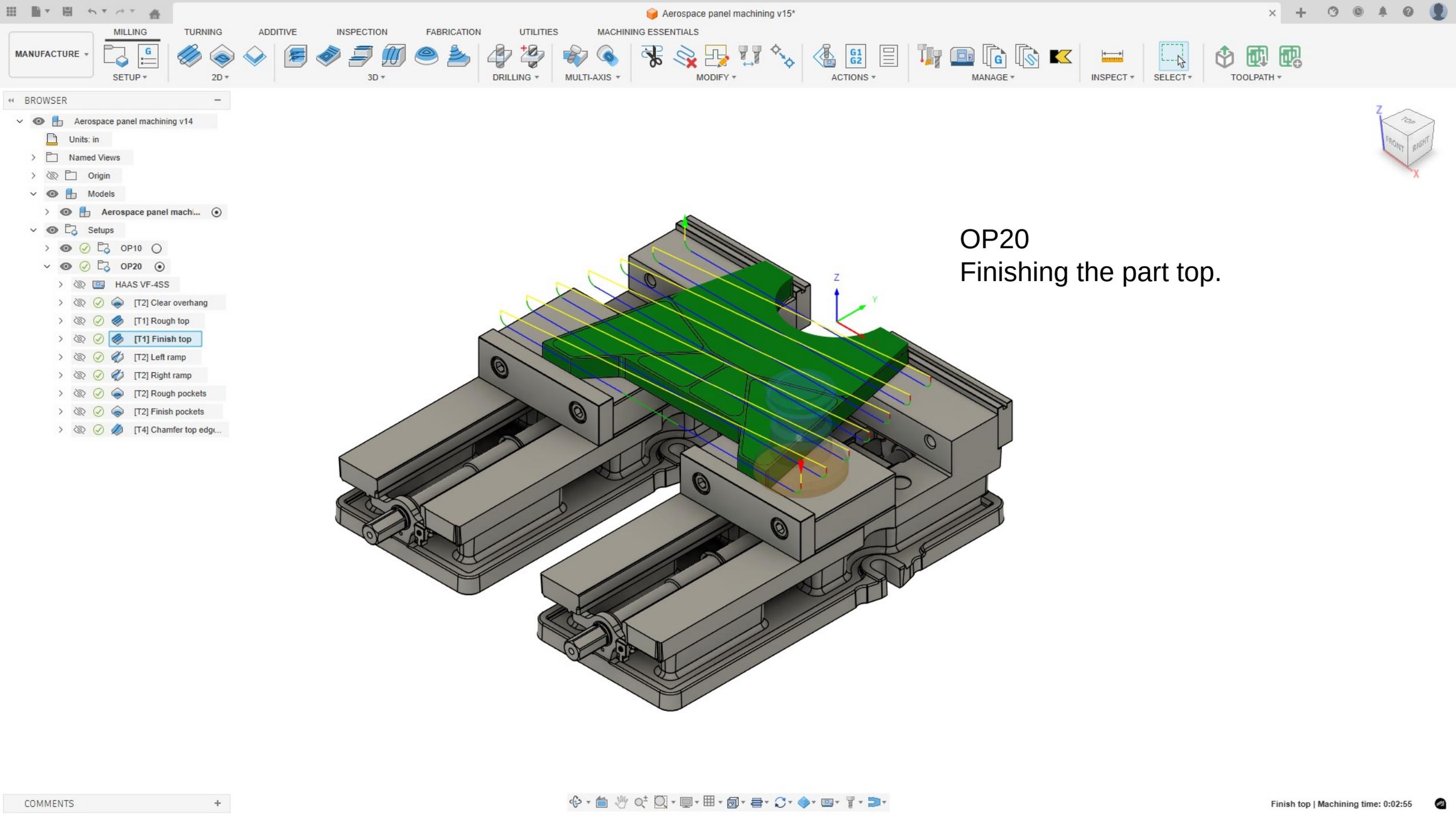
OP10
Chamfering the edges to remove burrs.



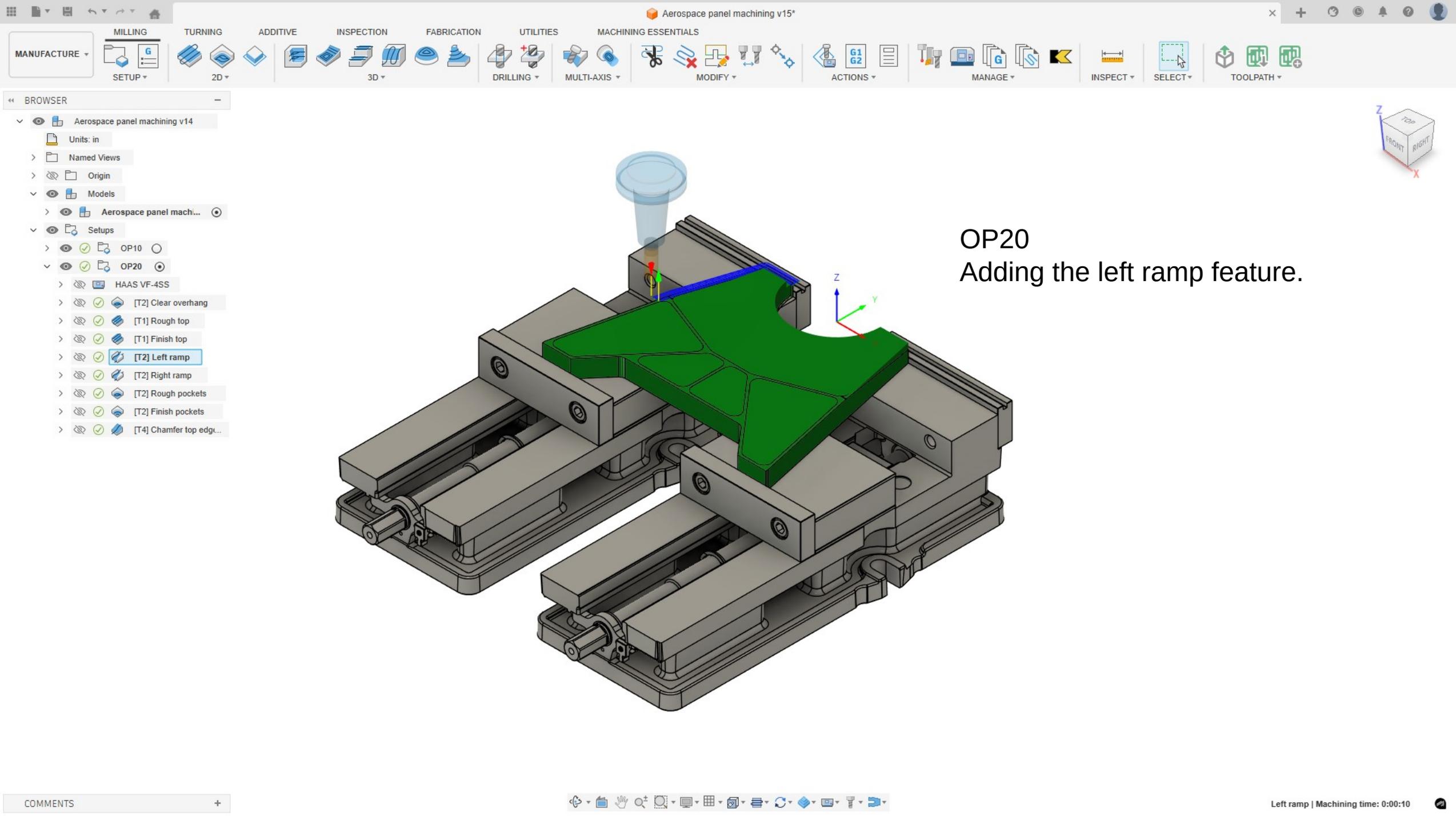
OP20
Removing outside material. The bore was used to locate the part after turning it over.



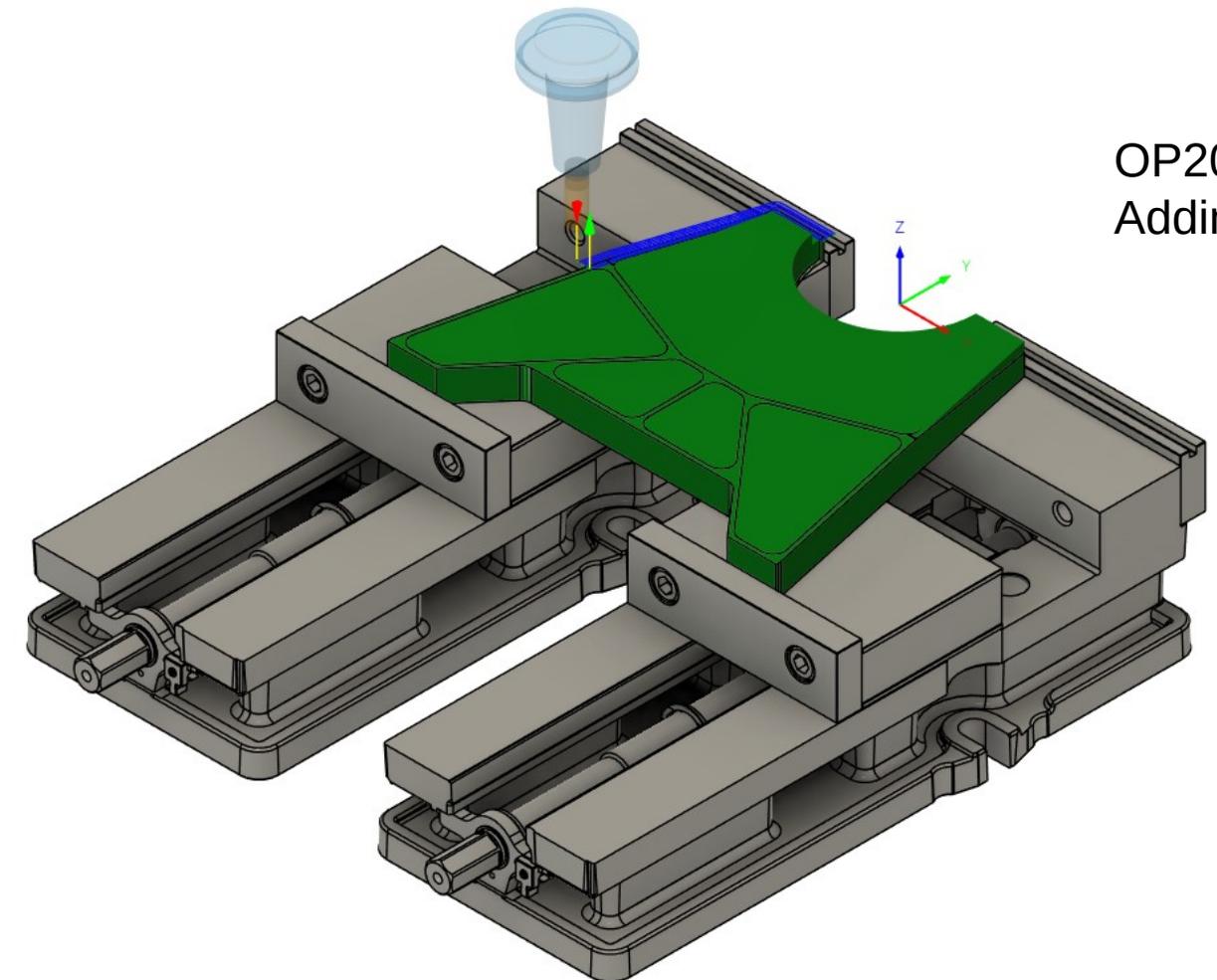
OP20
Roughing the part top.



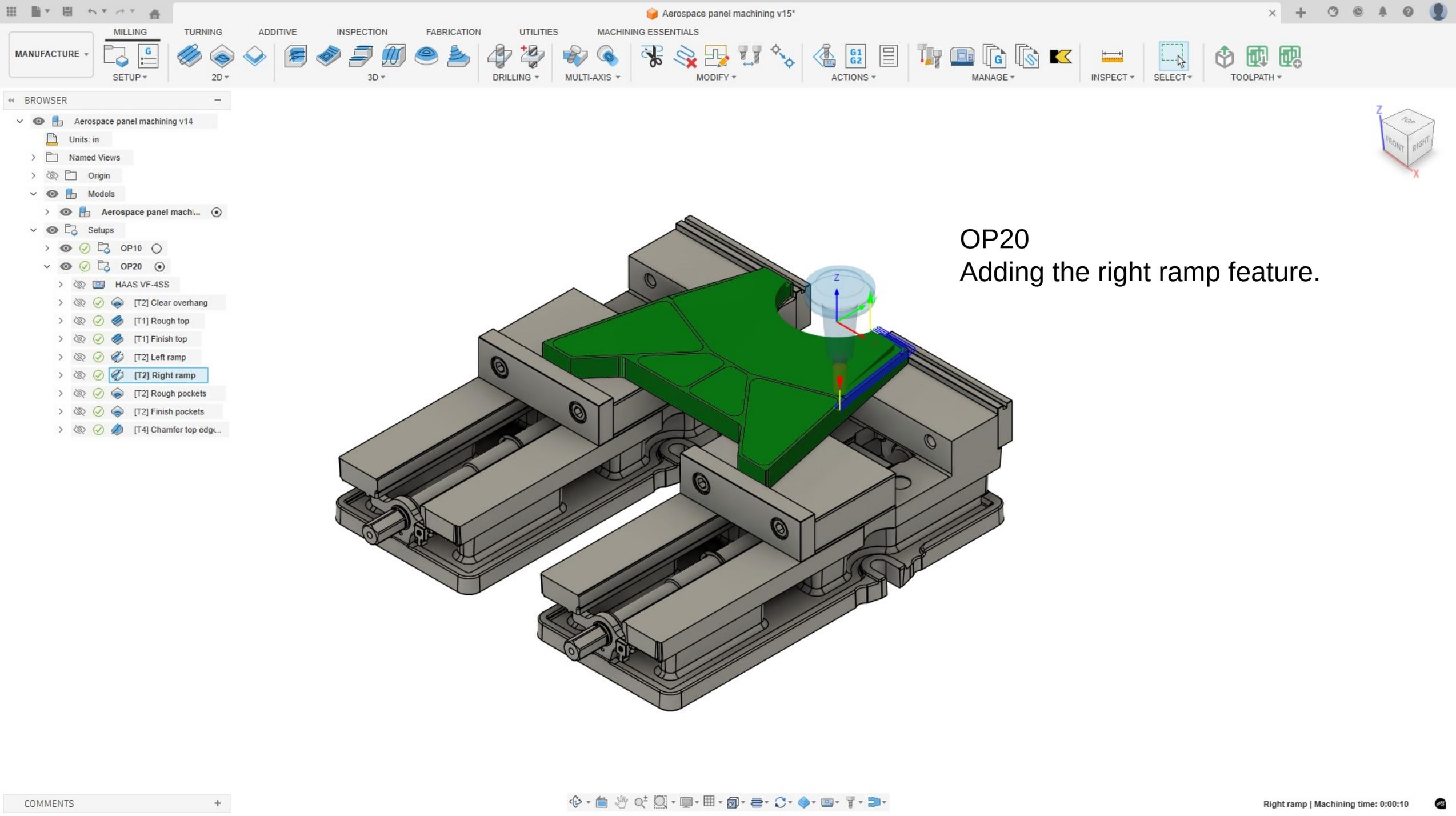
OP20
Finishing the part top.



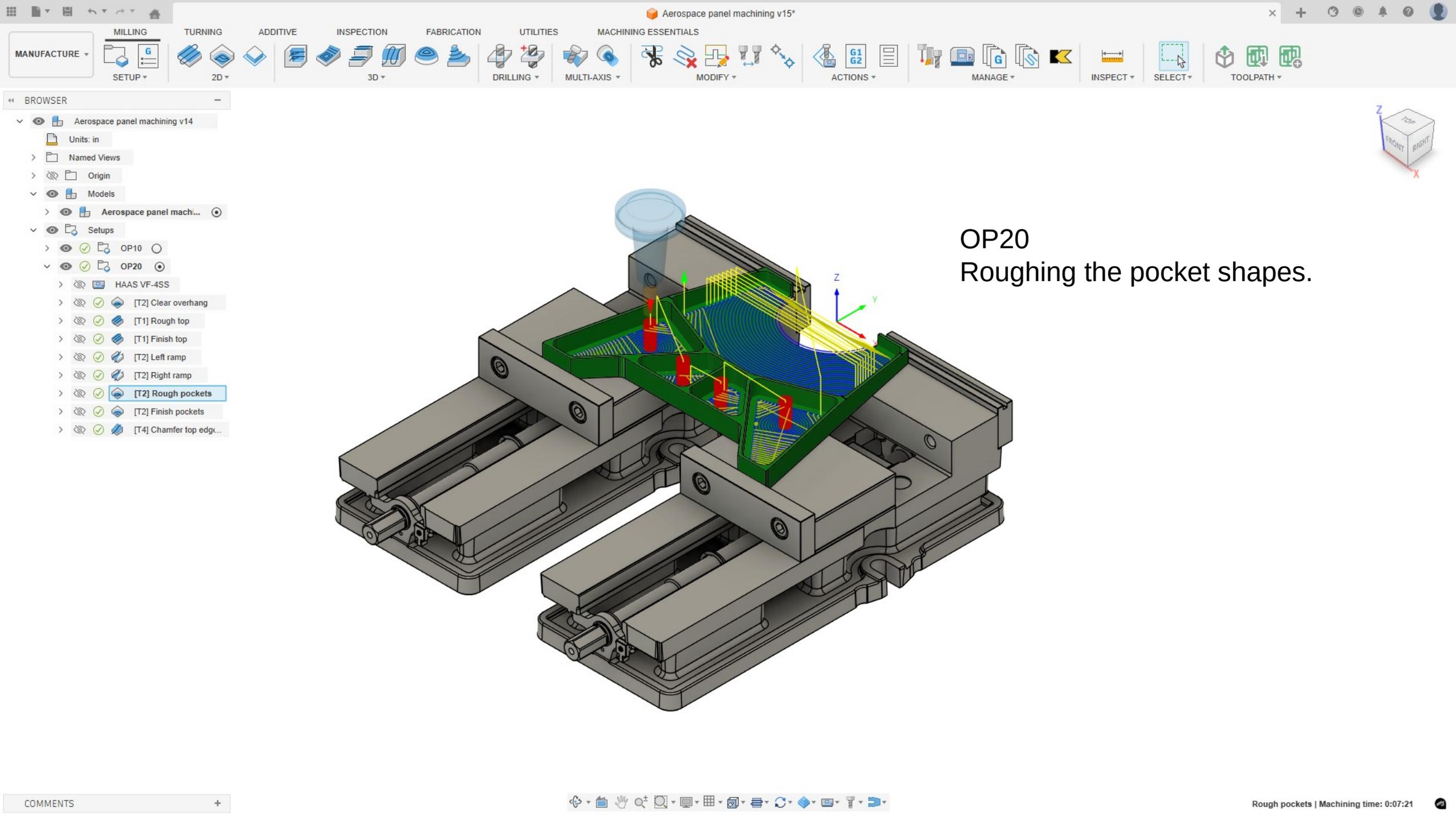
- BROWSER
- Aerospace panel machining v14
 - Units: in
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 - Models
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 - Setups
 - OP10
 - OP20
 - HAAS VF-4SS
 - [T2] Clear overhang
 - [T1] Rough top
 - [T1] Finish top
 - [T2] Left ramp
 - [T2] Right ramp
 - [T2] Rough pockets
 - [T2] Finish pockets
 - [T4] Chamfer top edgk...



OP20
Adding the left ramp feature.



OP20
Adding the right ramp feature.



MANUFACTURE

MILLING

TURNING

ADDITIVE

INSPECTION

FABRICATION

UTILITIES

MACHINING ESSENTIALS

ACTIONS

MANAGE

INSPECT

SELECT

TOOLPATH

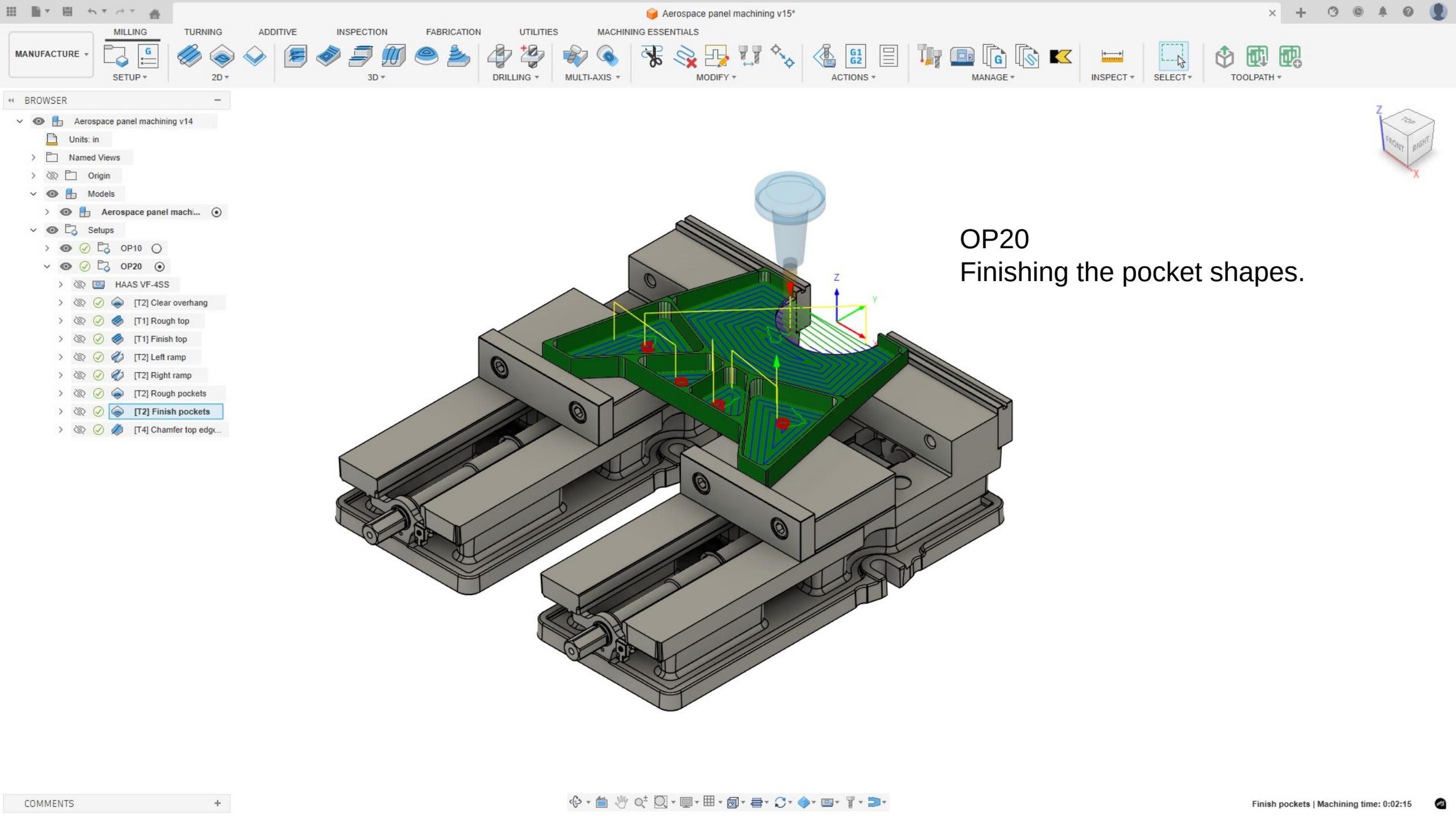
BROWSER

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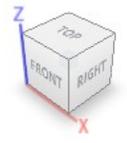
OP20
Roughing the pocket shapes.

COMMENTS

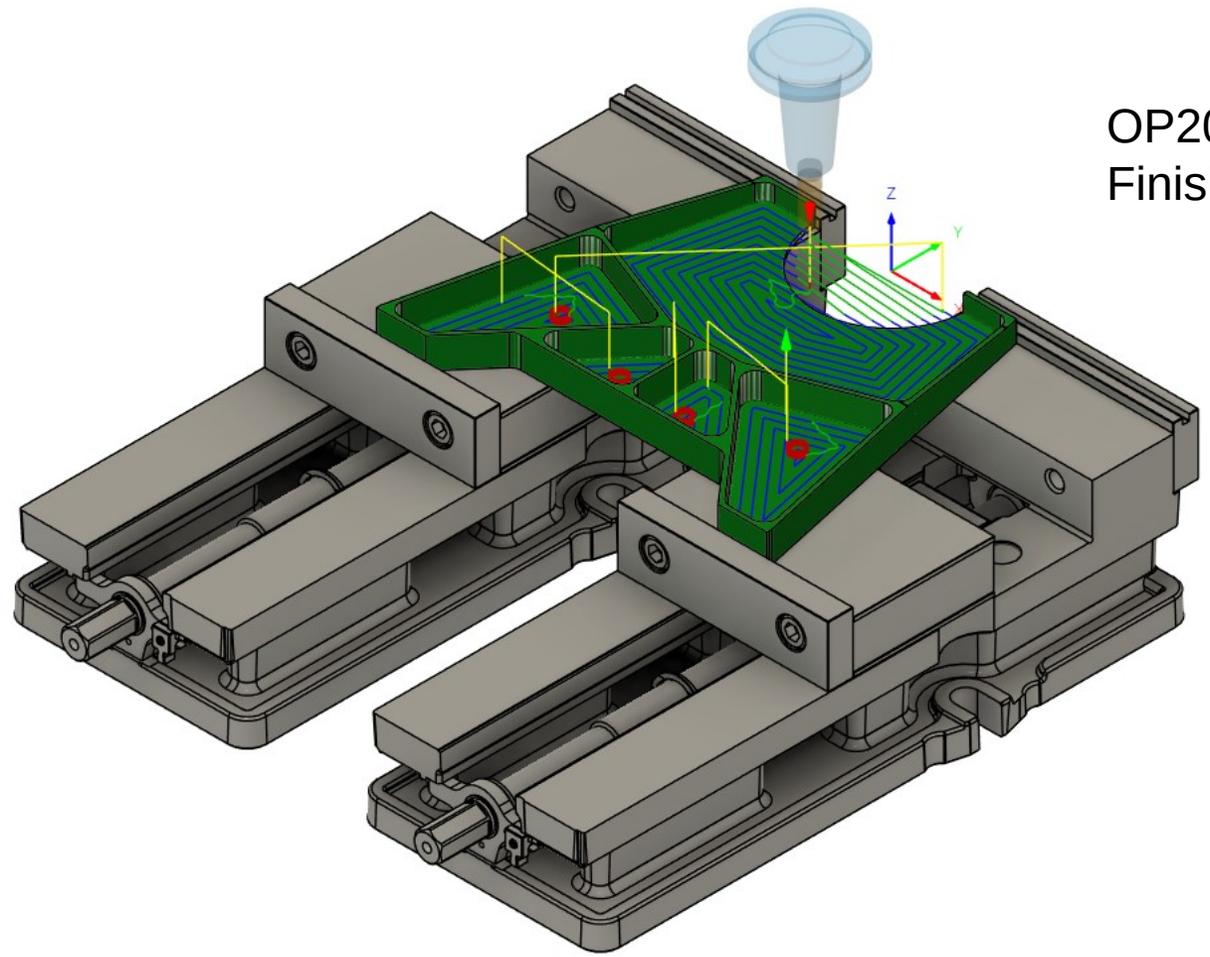


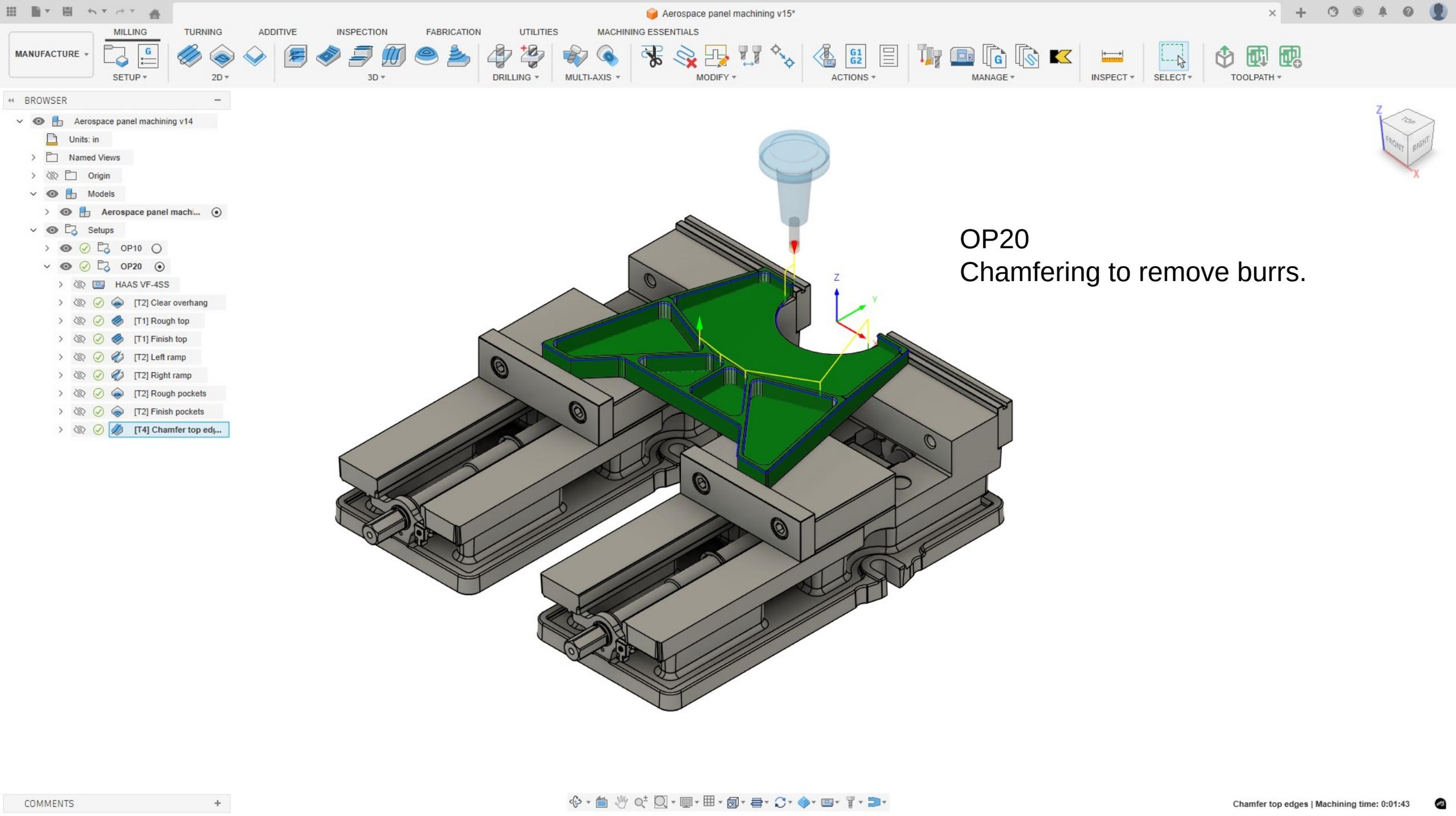


- ▼ Aerospace panel machining v14
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 - [T4] Chamfer top edg...



OP20
Finishing the pocket shapes.





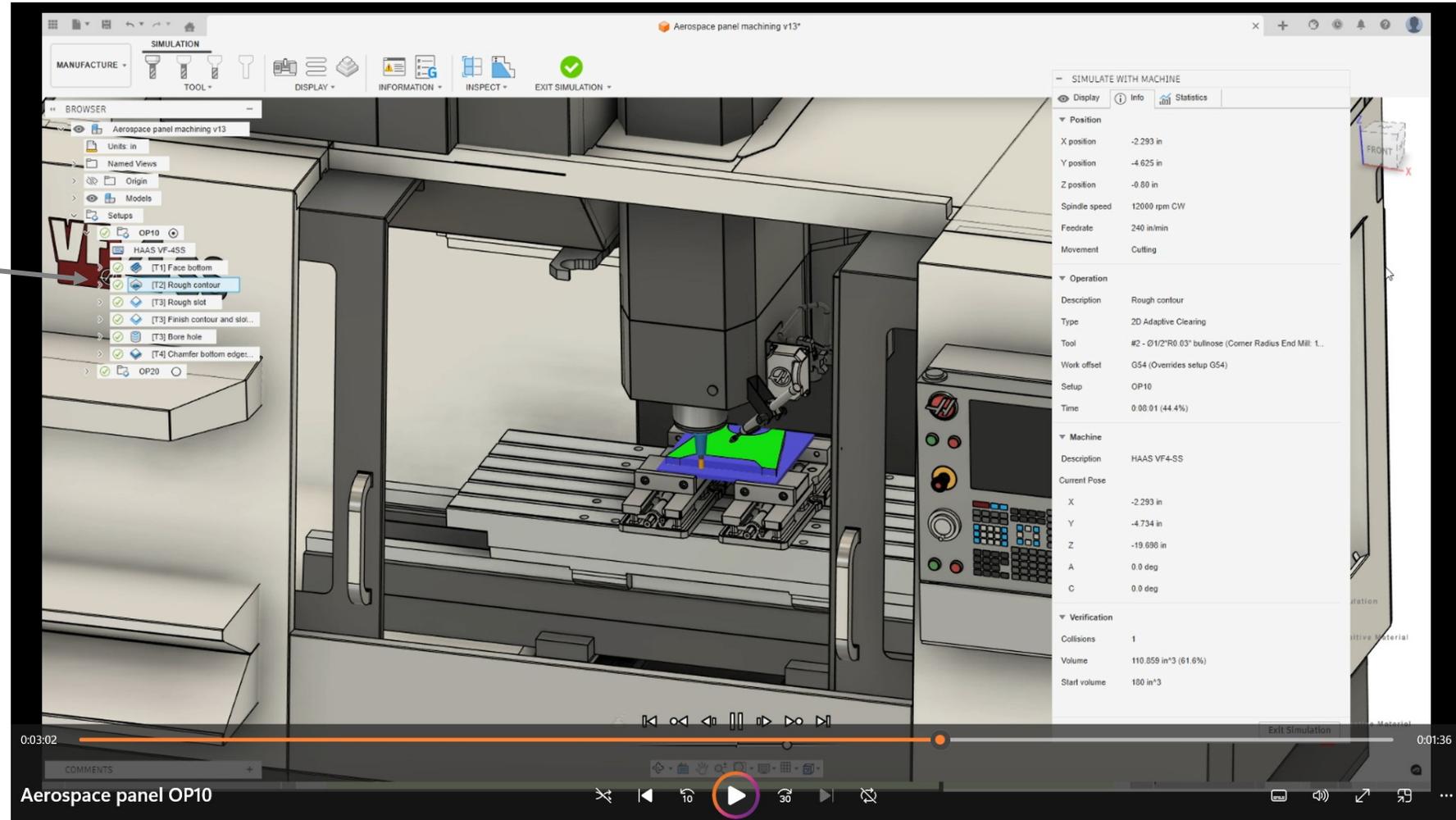
OP20
Chamfering to remove burrs.

Simulations

Watch the CAM simulation videos to see all operations

- OP10 – machining the bottom of the panel
- OP20 – machining the top of the panel
- CAM software is Fusion.

The operations are identified in the left-hand panel of the simulation videos. They are highlighted as they occur.



Machining video

Watch the machining video to see the part being machining using the CAM toolpaths.

