

OmniTurn Programming Example

P Synchronization of axis motion and marker pulse on spindle encoder.

When a P is added to an axis move the start of movement will be delayed until the marker pulse on the spindle encoder is detected. This is very useful for a few applications:

- Peck tapping
- Non linear threading

The encoder on the spindle has a single marker pulse that is read separately from the rest of the pulses. This pulse is used to start the normal threading cycle. This makes sure that when the thread pass starts it is always in the same location with regards to the rotation of the spindle. This way all the passes of the thread cycle generate the same thread at the same starting point.

This feature can be used to write custom threading cycles or peck tapping cycles. You can even thread around arcs with this.

In the following example we are cutting a thread in 3 passes that uses the P feature. The thread changes its angle and its pitch in the middle of the part.

T7 (Threading tool)

X.25Z.2

G04F.5 *NOTE 1*

Z-.5G95F.03125**P** *NOTE 2*

X.27Z-.8

X.28Z-1f.028 *NOTE 3*

G00X.32

Z.2**D1** *NOTE 4*

G04F.5

Z-.5G95F.03125P

X.27Z-.8

X.28Z-1f.028

G00X.32

Z.2D2

G04F.5

Z-.5G95F.03125P

X.27Z-.8

X.28Z-1f.028

G00X.32

Z1

NOTE 1

NOTE 2

NOTE 3

NOTE 4



Note 1: A dwell is used to make sure that the slide is in location before the next pass is attempted. The dwell time can be shorter or longer depending on a few variables. Play with it as needed.

Note 2: The P is added to the first line of the threading pass. Once this line is started the rest of the lines stay in synch since they are all in the G95 mode.

Note 3: The feedrate can be changed thus yielding a new pitch for the thread. Don't ask me why this would be needed. I don't know. Maybe a bone screw?

Note 4: I am using the secondary offsets to shift the tool in for each pass. This makes programming a little easier. This way you can cut and paste each pass and then just change the D value. If you shift the Z a little each time you can also simulate the angle infeed effect (C) of the G33 command.

Make sure that the spindle speed stays constant while working with the P in a threading pass. If the spindle speed changes the location of the start of the thread will change.

Peck Tapping

Peck tapping can also be done with the P. Start a Z infeed move with the correct feed rate and the P. Don't use a releasing tap holder (Defeats the purpose). The come out and do it again.

M03S500

T9 (tap)

X0Z1

Z.2

G04F.5 *NOTE 1*

G95F.028 *NOTE 2*

Z-.2**P**

M04Z.2

M03

G04F1

Z-.4**P**

M04Z.2

M03

G04F1

Z-.6**P**

M04Z.2

M03

Note 1: A dwell is used to make sure that the slide is in location before the next pass is attempted. The dwell time can be shorter or longer depending on a few variables. Play with it as needed.

Note 2: The feed rate given in this example is for a 32 pitch thread. The rate is 10% less in the program so the tap is not given too much pressure.