CNC Mill Code Continued

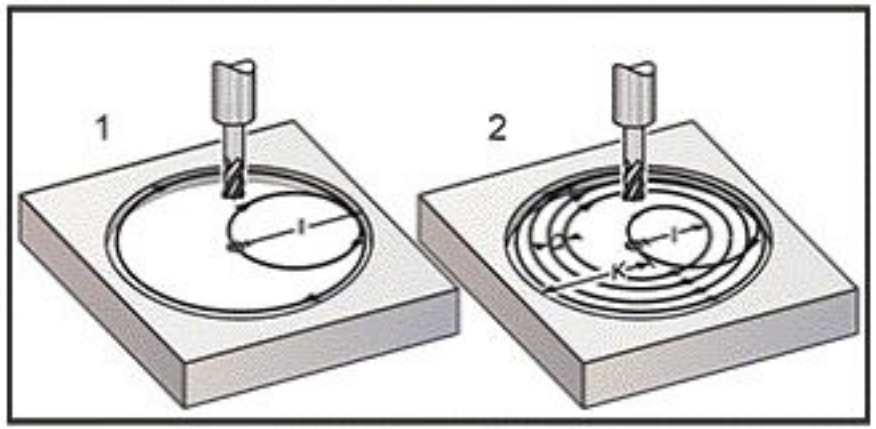
G12/G13 Circular Pocket Milling

G12 Circular Pocket Milling CW / G13 Circular Pocket Milling CCW (Group 00)

These G-codes mill circular shapes. They are different only in that *G12* uses a clockwise direction and *G13* uses a counterclockwise direction. Both G-codes use the default *XY* circular plane (*G17*) and imply the use of *G42* (cutter compensation) for *G12* and *G41* for *G13*. *G12* and *G13* are non-modal.

* **D** - Tool radius or diameter selection**
F - Feedrate
I - Radius of first circle (or finish if no *K*). *I* value must be greater than Tool Radius, but less than *K* value.
* **K** - Radius of finished circle (if specified)
* **L** - Loop count for repeating deeper cuts
* **Q** - Radius increment, or stepover (must be used with K)
Z - Depth of cut or increment
*indicates optional

Circular Pocket Milling, G12 Clockwise shown: [1] I only, [2] I, K and Q only.



G73/G81/G83 Drilling Cycles

G81 Drill Canned Cycle (Group 09)

* **E** - Chip-clean RPM (Spindle reverses to remove chips after each cycle)
F - Feedrate
* **L** - Number of holes to drill if *G91* (Incremental Mode) is used
* **R** - Position of the R plane (position above the part)
* **X** - X-Axis motion command
* **Y** - Y-Axis motion command
Z - Position of the Z Axis at the bottom of hole
* indicates optional

G73 and G83 will add “Qxxx” for peck depth.
G73 returns to the last “Q” depth between pecks while G83 returns to the R-plane or the Initial point based on G98/G99 used before G83 on the program line.

G84 Tapping Cycle

G84 Tapping Canned Cycle (Group 09)

* **E** - Chip-clean RPM (Spindle reverses to remove chips after each cycle)

F - Feedrate

* **J** - Retract Multiple (Example: *J2* retracts twice as fast as the cutting speed, also refer to Setting 130)
* **L** - Number of holes if *G91* (Incremental Mode) is used
* **R** - Position of the R plane (Position above the part)
* **X** - X-Axis location of hole
* **Y** - Y-Axis location of hole

Z - Position of the Z Axis at the bottom of hole

* **S** - Spindle speed

* indicates optional

G70/G71/G72

G70 Bolt Hole Circle (Group 00)

I - Radius

* **J** - Starting angle (0 to 360.0 degrees CCW from horizontal; or 3 o clock position)

L - Number of holes evenly spaced around the circle

*indicates optional

G71 Bolt Hole Arc (Group 00)

I - Radius

* **J** - Starting angle (degrees CCW from horizontal)

K - Angular spacing of holes (+ or --)

L - Number of holes

*indicates optional

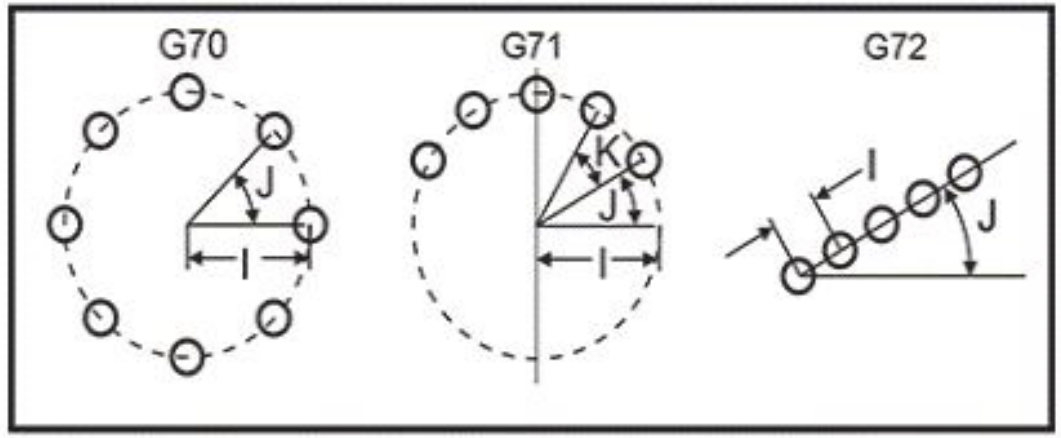
G72 Bolt Holes Along an Angle (Group 00)

I - Distance between holes

* **J** - Angle of line (degrees CCW from horizontal)

L - Number of holes

*indicates optional



*These are non-modal G codes that must be used with one of the canned cycles G73, G74, G76, G77, or G81-G89. A canned cycle must be active so that at each position, a drill or tap function is performed. See also G-code Canned Cycles section.

G70/G71/G72 Program Example

- O60701 (G70 Bolt Hole Circle).txt