

USING CSS IN MACH 3 TURN

CSS is not covered in the Mach 3 manual and can be a little hard to understand. Here are a few tips to help you get started and understand how it works. For some reason the commands G96 to start CSS and G 97 to stop are not covered in Mach 3, but they do work.

Follow the simple rules below and you will have no problem setting CSS on your lathe.

1. The G96 (Activate CSS) command MUST be in the following format:

G96 S50 M3 (The M3 (or M4) Spindle On command MUST accompany the G96 with a specified surface speed, in this case 50m/min). The M3 or M4 command must be applied regardless of whether it was called previously.

2. The G97 (Deactivate CSS) command does not have to have the accompanying Spindle On M3 or M4. For example:

G97 S1000 (Deactivate CSS and set the spindle speed to 1000RPM) works fine.

Why the G96 needs an accompanying M3 or M4 and the cancelling G97 does not; appears to be an idiosyncrasy.

3. When using G52 temporary offsets (as with a gang tool setup), it is best to select G96 mode at the beginning of each cutting action requiring CSS, and to deactivate CSS with G97 at the end, before cancelling the G52 offset. For each G52 offset tool position, activate CSS or simple RPM as applicable. For example:

G52 X242.7 Z-4.5 (Select Temporary Parting Tool Fixture Offset)

G96 S95 M3 (CSS Mode 95m/min) G95 (Set Feed/Rev Mode)
G00 Z0.5 (Go to Groove 1

Position) G00 X-39

4. Each G52 Offset Tool Position must have a cancelling **G52 X0 Z0** at the end of each turning operation as shown in the above example.

There is one thing that is unexplainable, sometimes when a program is run for the first time in a day and CSS is called, the spindle speed drops to a very low speed and it is necessary to abort the program and rewind. However, it always seems to work correctly the second time the program is run and will continue to run correctly until the machine is shut down. Therefore it is a good idea to “cut air” on the first startup program to avoid wasted time or wasted parts.

(Groove 1 Cut)

G01 X-25.1 F0.05 (Feed @

0.05mm/rev) G01 Z1 (Move away

from face of last cut) G00 X-39

(Withdraw to Safe X Position) G00 Z-

1.5 (Go to Groove 2 Position)

G00 X-38.5

Continue Action until finished

then: (Groove 6 Cut)

G01 X-25.1 F0.05 (Feed @ 0.05mm/rev)

G01 X-25 Z-7.5 (Move away from face of

last cut) G00 X-39 Z20 (Rapid out to Safe XZ

Position)

G97 S900 (Cancel CSS and set Spindle to 900RPM)

G52 X0 Z0 (Cancel Temporary Tool Offset)

G00 X42 Z20 (Safe XZ Position before moving to Finish Tool

Position) (OD Finish Cut)

G00 Z-20.5 X42.

X40.

G96 S95 M3 (CSS Mode

95m/min) Continue Finish Cut,

then:

G97 S900 (Cancel CSS and set Spindle to 900RPM)

Perform subsequent actions at each G52 gang tool offset, following the above format.