

## TB289 (REV1) – Software Travel Limits

Without software travel limits the machine can go maximum speed until a limit is tripped as shown in Figure 1. Often times, there is not enough time to decelerate the axis after the limit switch is tripped causing the machine to crash into the hard stop. **This collision may cause serious damage to both the mechanical and electrical system.**

Setting software travel limits will automatically decelerate the axis right before it reaches the limit switch, preventing possible damage to the machine as shown in Figure 2. Additionally, the CNC11 software will throw an error and stop the machine if a G code requests the machine to move past the software travel limit.

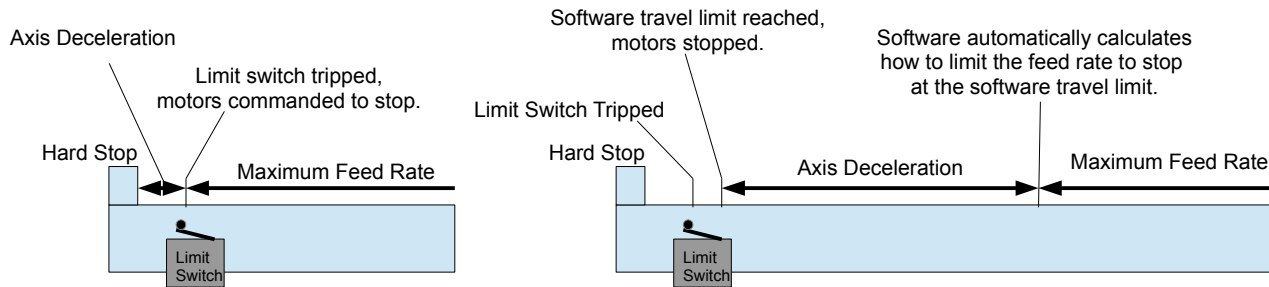


Figure 1  
Machine without software travel limits.

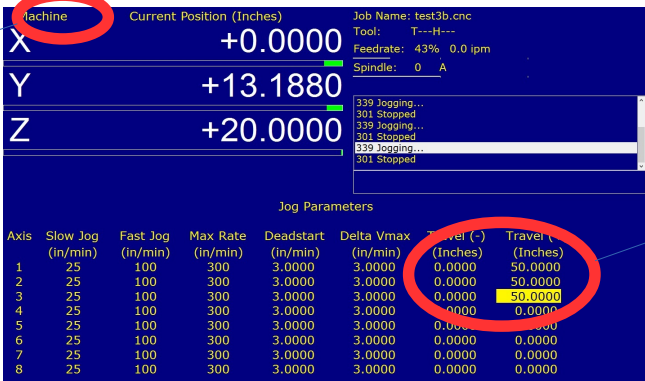
Figure 2  
Machine with software travel limits.

1. **Prerequisites:** Before starting machine revs per inch / mm (DRO) needs to be calibrated correctly, the limit switches need to be functioning, and the maximum feed rate and acceleration should be correctly set up. Restart the machine and home it before continuing with this procedure.
2. Make sure your looking at the machine position and not the part position. From any menu, press the **"alt"** key and **"D"** key simultaneously until **"machine"** is displayed in the top left corner of the DRO as shown in Figure 3.
3. Put the machine into **"Slow jog"** mode and turn the feed rate **down**. Slowly moves the axis away from home toward the limit switch on the opposite end of the axis until the limit switch trips. The status screen will display message such as **"407 ## limit (#50004) tripped"**.
4. Put the jog panel into **incremental mode**. Slowly increment to away from the limit switch until the limit switch is cleared. The status screen will display a message such as **"340 ## limit (#5003) cleared"**.
5. From the main menu, press **F3 MDI** and issue a command to move another 0.1 inches (2.5 millimeters) away from the limit switch. This DRO position will be our software travel limit.
6. From the main menu, press **F1 – Setup** → **F3 - config**. The password is **137**. Press **F2- Mach.** → **F1-Jog**. In the jog parameters menu. Enter the position for the software travel limit into the appropriate **"Travel (-)"** or **"Travel (+)"** box.
7.
  1. **NOTE:** When both the Travel(-) limit and the Travel(+) limit are set to zero, software travel limits are disabled. As soon as **one** of the two values change to a non-zero value, **both** limits are enabled. This can be seen in figure 3. Since everything is referenced to machine position, the side of each axis that you "home to" should be left at zero.
8. Repeat for each axis.

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- Test by manually jogging each axis toward the limit switch. Watch that the software automatically stops the axis at the software travel limit **before** the limit switch is tripped. Use the **F3 – MDI** menu to issue a G-code that asks the software to move just beyond the software travel limit, if set up correctly the CNC11 status window will throw an error such as **"907 # axis travel exceeded, 325 Limit: job canceled"**

"alt" + "D" to toggle the DRO mode to display the machine coordinates.



Set up software travel limits here.

Axis	Slow Jog (in/min)	Fast Jog (in/min)	Max Rate (in/min)	Deadstart (in/min)	Delta Vmax (in/min)	Travel (-) (Inches)	Travel (+) (Inches)
1	25	100	300	3.0000	3.0000	0.0000	50.0000
2	25	100	300	3.0000	3.0000	0.0000	50.0000
3	25	100	300	3.0000	3.0000	0.0000	50.0000
4	25	100	300	3.0000	3.0000	0.0000	50.0000
5	25	100	300	3.0000	3.0000	0.0000	0.0000
6	25	100	300	3.0000	3.0000	0.0000	0.0000
7	25	100	300	3.0000	3.0000	0.0000	0.0000
8	25	100	300	3.0000	3.0000	0.0000	0.0000

Figure 3  
Setting Software Travel Limits

### Document History

Rev1 Created on 2014-09-25 by #369