

## Reference

### OD or ID CHUCKING

1. If you have a key switch marked CHUCK OD/ID on the Operation Panel, use the proper key to select the setting you require. IF your machine has a key switch disregard steps 2 through 6.
2. If your machine does **not** have a key switch marked CHUCK OD/ID you must set a parameter. On the Operation Panel, select the PARAMETER mode of operation.
3. Select function key [F7] (ITEM down) or [F6] (ITEM up) until you see the \* CHUCK/ TAIL-STOCK \* screen..
4. Use the cursor arrow keys to move the cursor over the data position for CHUCK HOLD CHG.
5. Press function key [F1] (SET).
6. Select 0 for OD or 1 for ID chucking at the Extended Keypad.
7. Press the WRITE key.

Notice that under CHUCK HOLD CHG. you have a similar setting for CHUCK and C.WORK FOR activating the tailstock.

See Chapter 5 for more information on this subject.

## SPINDLE MANUAL

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1. On the Operation Panel, select the MDI mode of operation.
  2. Select function key [F1] (DATA INPUT).
  3. Enter the correct gear range at the Extended Keypad (M41 or M42).
  4. Enter the correct spindle RPM (this will be an S\_\_\_ word).
  5. Press the WRITE key.
  6. On the Operation Panel, press the CYCLE START button.
  7. On the Operation Panel, select the MANUAL mode of operation.
  8. On the Operation panel, rotate the SPINDLE OVERRIDE dial **fully counterclockwise**.
  9. On the Operation Panel, Activate the spindle by pressing one of the Spindle Manual Control keys
  10. On the Operation Panel, stop the spindle by pressing the Spindle Manual Control STOP key.

See Chapter 5 for more information on this subject.

## TOOLING GRAPHICS

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1. On the Operation Panel, select the TOOL DATA mode of operation.
2. Select function key [F7] (ITEM down).
3. Select function key [F3] (TOOL KIND).
4. Enter the number that represents the type of operation this tool will perform.
5. Press the WRITE key.
6. Enter the number that most closely represents the "form" or tool shape.
7. Press the WRITE key.
8. Various information blocks will appear depending on the specific type of tool you selected. For these entries you will need to also use function key [F1] (SET).

See Chapter 6 for more information on this subject.

## SLIDE JOG CONTROLS

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1. On the Operation Panel, select the Manual mode of operation.
2. On the Operation Panel, rotate the Feed Rate Override dial **fully counterclockwise!** This sets your turret movement at zero percent.
3. Select the Slide Jog Arrow key that matches the direction you want the turret to move (these arrow keys are only active when you are pressing them).
4. While holding the selected Slide Jog Arrow key, **slowly** rotate the Feed Rate Override in a clockwise direction. The turret speed will increase as you rotate the Feed Rate Override.
5. When the turret is in the desired position, release the Slide Jog Arrow key.

See Chapter 7 for more information on this subject.

## **PULSE HANDLE CONTROLS**

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1. On the Operation Panel, select the Manual mode of operation.
2. At this point, you will be able to use the Pulse Handle Controls to position the axes. Use the following procedures to safely perform this task.
3. Select the desired X or Z Pulse Handle Control key that matches the axis you want to move (these keys will remain active after you have selected them).
4. Select the Control Switch for the axis feed amount you desire (see page 2-9 for detailed explanation of these Control Switches).
5. Now you can use the Pulse Handle to position the turret at the feed rate selected in step three. If you are going to touch off a part, turn the spindle ON using the instructions listed on pages 5-5 through 5-9.

See Chapter 7 for more information on this subject.

## **X-AXIS ZERO SET**

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1. If you do not have a "true" diameter for the part, go to the Manual mode of operation and make a skim cut.
2. While still in the Manual mode of operation, just touch the tool to the diameter of the part. Don't forget that you **must** use the Pulse Handle Controls when touching a tool to a part.
3. After you have touched the part, move the turret off of the part by selecting the Z control Switch and rotating the Pulse Handle in the positive direction.
4. Now stop the spindle by using the Spindle Manual Control STOP key.

### **DO NOT MOVE THE TURRET AT THIS TIME!!!**

5. Measure the diameter of your part and record the size. **WRITE IT DOWN!** Don't count on your memory for this critical information.
6. On the Operation Panel, select the Zero Set mode of operation.
7. Use the Cursor Position keys to locate the cursor over the ZERO OFFSET data for the X-axis.
8. Press the function key [F3] (CAL).
9. At the Extended Keypad, enter the value that you recorded in step 5 for the X-axis diameter.
10. Press the WRITE key.

11. Return to the Operation Panel and select the Manual mode of operation,

Check the CRT readout in ACTUAL POSITION. The value here for the X-axis **SHOULD** be the same as what you entered in step 9.

See Chapter 8 for more information on this subject.

## Z-AXIS ZERO SET

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1. If you do not have a "true" face for the part, go to the Manual mode of operation and make a skim cut.
2. While still in the Manual mode of operation, just touch the tool to the face of the part. Don't forget that you **must** use the Pulse Handle Controls when touching a tool to a part.
3. After you have touched the part, move the turret off of the part by selecting the X control Switch and rotating the Pulse Handle in the positive direction.
4. Now stop the spindle by using the Spindle Manual Control STOP key.

### **DO NOT MOVE THE TURRET AT THIS TIME!!!**

5. Measure the diameter of your part and record the size. **WRITE IT DOWN!** Don't count on your memory for this critical information.
6. On the Operation Panel, select the Zero Set mode of operation.
7. Use the Cursor Position keys to locate the cursor over the ZERO OFFSET data for the Z-axis.
8. Press the function key [F3] (CAL).
9. At the Extended Keypad, enter the value that you recorded in step 5 for the Z-axis length.
10. Press the WRITE key.
11. Return to the Operation Panel and select the Manual mode of operation,



Check the CRT readout in ACTUAL POSITION. The value here for the Z-axis **SHOULD** be the same as what you entered in step 9.

See Chapter 8 for more information on this subject.

## **Z-AXIS ZERO ON THE PART FACE**

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1. If you do not have a "true" face for the part, go to the Manual mode and make a skim cut
2. While still in the Manual mode of operation, just touch the tool to the face of the part. Don't forget that you **must** use the Pulse Handle Controls when touching a tool to a part.
3. After you have touched the part, move the turret off of the part by selecting the X control Switch and rotating the Pulse Handle in the positive direction.
4. Now stop the spindle by using the Spindle Manual Control STOP key.

### **DO NOT MOVE THE TURRET AT THIS TIME!!!**

5. On the Operation Panel, select the Zero Set mode of operation.
6. Use the Cursor Position keys to locate the cursor over the ZERO OFFSET data for the Z-axis.
7. Press the function key [F3] (CAL).
8. At the Extended Keypad, enter zero .
9. Press the WRITE key.
10. Return to the Operation Panel and select the Manual mode of operation,

Check the CRT readout in ACTUAL POSITION. The value here for the Z-axis **SHOULD** be the same as what you entered in step 8.

See Chapter 8 for more information on this subject.

## SETTING TOOL DATA FOR THE ZERO TOOL

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1. Move the turret back to the tool index position.
2. On the Operation Panel, select the Tool Data mode of operation.

The TOOL DATA screen will be displayed.

3. Use the Cursor Arrow keys to locate the cursor on the X-axis TOOL OFFSET position number that **MATCHES** the tool turret position where the master zero tool has been installed.
4. Select function key [F8] (EXTEND) until you see function key [F1] (SET).
5. Select function key [F1] (SET).
6. At the Extended Keypad enter the value zero (0).
7. Press the WRITE key.
8. To set the zero tool value for the Z-axis offset, Use the Cursor Arrow keys to locate the cursor on the Z-axis TOOL OFFSET position number that **MATCHES** the tool turret position where the master zero tool has been installed.
9. Repeat steps 5 through 7 to set the Z-axis Tool Data for the master zero tool.

See Chapter 8 for more information on this subject.

## ESTABLISHING TOOL OFFSETS FOR THE X-AXIS

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1. If you do not have a "true" diameter for the part, go to the Manual mode of operation and make a skim cut.
2. While still in the Manual mode of operation, just touch the tool to the diameter of the part. Don't forget that you **must** use the Pulse Handle Controls when touching a tool to a part.
3. After you have touched the part, move the turret off of the part by selecting the Z control Switch and rotating the Pulse Handle in the positive direction.
4. Now stop the spindle by using the Spindle Manual Control STOP key.

### **DO NOT MOVE THE TURRET AT THIS TIME!!!**

5. Measure the diameter of your part and record the size. **WRITE IT DOWN!** Don't count on your memory for this critical information.
6. On the Operation Panel, select the Tool Data mode of operation.
7. Use the Cursor Arrow keys to locate the cursor on the X-axis TOOL OFFSET number that **matches** the tool number you used in step 1.
8. Select function key [F8] (EXTEND) as many times as is necessary until you see function key [F3] [CAL].

9. Select function key [F3] (CAL).
10. At the Extended Keypad, enter the number you wrote down in step 5.
11. Press the WRITE key.

See Chapter 9 for more information on this subject.

## ESTABLISHING TOOL OFFSETS FOR THE Z-AXIS

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1. If you do not have a "true" face for the part, go to the Manual mode of operation and make a skim cut.
2. While still in the Manual mode of operation, just touch the tool to the face of the part. Don't forget that you **must** use the Pulse Handle Controls when touching a tool to a part.
3. After you have touched the part, move the turret off of the part by selecting the X control Switch and rotating the Pulse Handle in the positive direction.
4. Now stop the spindle by using the Spindle Manual Control STOP key.

### **DO NOT MOVE THE TURRET AT THIS TIME!!!**

5. Measure the diameter of your part and record the size. **WRITE IT DOWN!** Don't count on your memory for this critical information.
6. On the Operation Panel, select the Tool Data mode of operation.
7. Use the Cursor Position keys to locate the cursor over the Z-axis TOOL OFFSET number that **matches** the tool number you used in step 1.
8. Select function key [F8] (EXTEND) as many times as is necessary until you see function key [F3] [CAL].

9. Select function key [F3] (CAL).
10. At the Extended Keypad, enter the number you wrote down in step 5.
11. Press the WRITE key.

See Chapter 9 for more information on this subject.

## **TNR SET-UP**

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1. On the Operation Panel, select the Tool Data mode of operation.
  2. Using the Cursor Arrow keys, move the cursor toward the right side of the screen. The guide will move to the left.
  3. Using the Cursor Arrow keys, position the cursor on the X-axis data for the tool you are setting.
  4. Select function key [F8] (EXTEND) as many times as is necessary you see function key [F1] (SET).
  5. Select function key [F1] (SET).
  6. At the Extended Keypad, enter the correct nose radius value for this tool.
  7. Press the WRITE key.
  8. Use the Cursor Arrow keys to position the cursor once to the right.
  9. Select function key [F1] (SET).
  10. At the Extended Keypad, enter the same value used for step 6.
  11. Press the WRITE key.
  12. Use the Cursor Arrow keys to position the cursor once to the right.



13. Select function key [F1] (SET).
14. At the Extended Keypad, enter the correct value for the P word (shown on the graphic of the tool).
15. Press the WRITE key.

See Chapter 9 for more information on this subject.

## **CREATING A NEW PROGRAM**

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1. On the Operation Panel, select the Edit mode of operation.
2. Select function key [F4] (EDIT).
3. Enter the program name at the keypad for this program.
4. After the program name has been entered select the WRITE key.
5. Use the keypad to enter your program
6. After all the information has been entered, and is correct, select function key [F7] (EDIT QUIT).

See Chapter 10 for more information on this subject.

## **EDITING AN EXISTING PROGRAM**

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1. On the Operation Panel, select the Edit mode of operation.
2. Select function key [F4] (EDIT).
3. Enter the name of the program you want to select from the keypad.
4. After the program name has been entered press the WRITE key.

See Chapter 10 for more information on this subject.

## **EDITING PROGRAMS USING MENU**

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1. On the Operation Panel, select the Edit Mode of operation.
2. Select the function key [F4] (EDIT).
3. For this example enter a \* at the Extended Keypad
4. Press the WRITE key.
5. Use the cursor Arrow keys to position the cursor over the program name that you desire to edit.
6. When the cursor is properly positioned, select the WRITE key.
7. Use the Cursor Arrow keys to position the cursor over the desired information for your edit.
8. After all the information is correct, select the function key [F7] (EDIT QUIT).

See Chapter 10 for more information on this subject.

## **PROGRAM SELECT**

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1. On the Operation Panel, select the Auto mode of operation.
  2. Select function key [F1] (PROGRAM SELECT).
  3. Enter the program name at the keypad for this program.
  4. After the program name has been entered select the WRITE key.

See Chapter 11 for more information on this subject.

## **PROGRAM SELECT USING MENU**

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1. On the Operation Panel, select the Auto Mode of operation.
2. Select function key [F1] (PROGRAM SELECT).
3. For this example enter a \* at the Extended Keypad
4. Press the WRITE key.
5. Use the cursor Arrow keys to position the cursor over the program name that you desire to select. If there are more programs stored in the bubble memory than can be displayed at one time, selecting one of the PAGE keys will show these additional listings.
6. When the cursor is properly positioned, select the WRITE key.

See Chapter 11 for more information on this subject.

## SETTING USER PARAMETERS

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1. On the Operation Panel, select the Manual mode of operation.
2. Use the Pulse Handle to position the turret to the desired location.
3. On the Operation Panel, select the Parameter mode of operation.
4. You should see the following screen. If you do not see this screen, press either function key [F6] or [F7] (ITEM) until this screen is displayed.

It is important for you to note that there are other pages that look similar. **Ensure that you are on the \* USER PARAMETER \* page!**

5. At the Extended Keypad, use the Cursor Arrow keys to position the cursor over the data for the **+VARIABLE LIMIT(PROG) X.**
6. Select function key [F3] (CAL).
7. Select the WRITE key.
8. At the Extended Keypad, use the Cursor Arrow keys to position the cursor over the data for the **+VARIABLE LIMIT(PROG) Z.**
9. Select function key [F3] (CAL).
10. Select the WRITE key.

See Chapter 12 for more information on this subject.

## OPENING USER PARAMETERS

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1. Use the information in Chapter 10 to enter programs OPENXA and OPENZA (also OPENXB and OPENXZ for a 4-axis machine) into the OSP bubble memory if they are not already there.
2. ON the Operation Panel, Select the AUTO mode of operation
3. Use the instruction for Loading Programs (see chapter 11) to P-Select OPENZA (or OPENZB).
4. On the Operation Panel, press the CYCLE START button.

The text should read "430 ALARM-B bad value for system variable". This alarm is telling you that the Z positive limit value is now as large as it can be.

5. On the Operation Panel, press the CONTROL ON/RESET button.
6. P-Select OPENXA (or OPENZB).
7. On the Operation Panel, press the CYCLE START button.

The text should read "430 ALARM-B bad value for system variable". This alarm is telling you that the X positive limit value is now as large as it can be.

8. On the Operation Panel, press the CONTROL ON/RESET button.

See Chapter 12 for more information on this subject.



## PROGRAM INTEGRITY

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1. Ensure that the MACHINE LOCK key is selected; the light in the corner of the key should be lit.
2. Ensure that the DRY RUN key is selected; the light in the corner of the key should be lit.

**NEVER PLACE THE MACHINE IN DRY RUN UNLESS THE MACHINE IS ALSO IN MACHINE LOCK!!! THE MACHINE WILL OPERATE AT THE RAPID FEEDS *DURING CUTTING FEEDS* IF YOU ARE ONLY IN DRY RUN.**

3. On the Operation Panel, select the Auto mode of operation.
4. Use the information in Chapter 10 to review the procedures for Program Select.
5. *Double check to ensure that both the DRY RUN and MACHINE LOCK keys have been selected!!!*
6. Press the CYCLE START button.

The program will cycle. Because you are in the MACHINE LOCK condition no axis positioning or spindle operation is possible. Because you are in the DRY RUN condition, all feeds will be processed at the rapid feed allowing a *quick* test of your program.

See Chapter 13 for more information on this subject.

## VIEWING GRAPHICS

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1. Ensure that the MACHINE LOCK key is selected; the light in the corner of the key should be lit.
2. On the Operation Panel, select the Auto mode of operation.
3. Use the instructions in Chapter 10 to select the program you want to run.
4. Select function key [F8] (EXTEND) as many times as is necessary until the following guide is displayed.
5. Select function key [F1] (STD GRAPHIC) and the following screen should be displayed.

### **!!! WARNING !!!**

**TAKE THIS TIME TO *INSURE* YOU ARE IN THE MACHINE LOCK CONDITION!!! FAILURE TO DO SO MAY RESULT IN SERIOUS DAMAGE TO THE MACHINE AND/OR PERSONAL INJURY.**

6. Press the CYCLE START BUTTON. The program will be graphically displayed on the screen.

### **!!! WARNING !!!**

**THIS TEST DOES NOT CHECK TOOL LENGTH OFFSETS!!!**

See Chapter 13 for more information on this subject.

## RUNNING A PROGRAM

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1. On the Operation Panel, select the Auto mode.
2. Use the instructions in Chapter 10 to select the program you want to run.
3. Ensure that the SINGLE BLOCK key is selected; the light in the corner of the key should be lit.
4. *Double check to ensure that both the DRY RUN and MACHINE LOCK keys have been deactivated; the light in the corner of each key should be OFF. The machine is now free to operate.*
5. Rotate the FEED RATE OVER- RIDE dial **fully counterclockwise** to zero. This sets the turret movements to zero percent.

### !!! WARNING !!!

**IF YOU HAVE FORGOTTEN TO PLACE THE MACHINE IN THE SINGLE BLOCK CONDITION, THE FEED RATE OVERRIDE DIAL HAS NO EFFECT ON THE RAPID (G00) MOVEMENTS!!!**

6. Press the CYCLE START button. No axis movement should occur.
7. Slowly rotate FEED RATE OVERRIDE clockwise.
8. After you have gone (or blocked) through your entire programmed to determine that **all** processes are correct, you are ready to take your machine out of SINGLE BLOCK and run the remainder of the parts necessary.

See Chapter 13 for more information on this subject.

## MID-AUTO MANUAL

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1. You should already be in the Auto mode of operation running a part program.
2. Press the SLIDE HOLD button.
3. Press the MID-AUTO MANUAL key; the light in the corner of the key will be lit..
4. At this point you have complete manual control over the machine. The axes can be moved, spindle stopped, tool changed, etc...
5. If you indexed the turret or stopped the spindle, you must return them to their previous condition.
6. Return the tool **near** the position where Slide hold was activated using manual controls.

### **!!! WARNING !!!**

**YOU  
MUST INSURE THERE IS A CLEAR PATH  
FROM THE TOOL BACK TO WHERE THE  
SLIDE HOLD CONDITION WAS ACTIVATED.**

7. Ensure that the SINGLE BLOCK condition is active; the light in the corner of the key should be lit.
8. Rotate the FEED RATE OVERRIDE dial to zero (fully counterclockwise).
9. Press the SEQ. RESTART key.
10. Gradually rotate the FEED RATE OVERRIDE dial clockwise.

11. Rotate the FEED RATE OVERRIDE dial back to zero (fully counterclockwise).
12. Press the CYCLE START button.
13. Gradually rotate the FEED RATE OVERRIDE dial clockwise until the machine has started the cut.
14. Ensure that the SINGLE BLOCK condition is **not** active; the light in the corner of the key should **not** be lit.

See Chapter 14 for more information on this subject.

## SEQUENCE RESTART ( 2-AXIS )

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1. If necessary, go to the Manual mode of operation and position the turret on a soft limit where a safe tool change can occur.
  2. On the Operation Panel, select the Auto mode of operation.
  3. Ensure that the SINGLE BLOCK condition is active; the light in the corner of the key should be lit.
  4. Select function key [F8] (EXTEND) as many times as necessary until function key [F2] (RESTART) is displayed.
  5. Select function key [F2] (RESTART).
  6. At the Extended Keypad enter the sequence number (or name) where the restart should begin.
  7. Press the WRITE key.
  8. Rotate the FEED RATE OVERRIDE dial fully counter clockwise.
  9. Press the SEQ. RESTART key.
  10. Press the CYCLE START button.
  11. Gradually rotate the FEED RATE OVERRIDE dial clockwise until the machine is stopped in the position for the desired cutting pass.
  12. Ensure that the SINGLE BLOCK condition is **not** active. The light in the corner of the key should **not** be lit.

See Chapter 14 for more information on this subject.

**SEQUENCE  
RESTART  
( 4-AXIS )**

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1. If necessary, go to the Manual Mode of operation and position both the "A" and "B" turrets on a soft limit where a safe tool change can occur.
  2. On the Operation Panel, select the Auto mode of operation.
  3. Ensure that the SINGLE BLOCK condition is active; the light in the corner of the key should be lit.
  4. Select function key [F8] (EXTEND) as many times as necessary until function key [F2] (RESTART) is displayed.
  5. Select function key [F2] (RESTART).
  6. Select the "A" Turret Control key
  7. At the Extended Keypad enter the sequence number (or name) where the restart should begin.
  8. Press the WRITE key.
  9. Select the "B" Turret Control key
  10. At the Extended Keypad enter the sequence number (or name) where the restart should begin.
  11. Press the WRITE key.
  12. Rotate the FEED RATE OVERRIDE dial fully counter clockwise.
  13. Press the SEQ. RESTART key.
  14. Press the CYCLE START button.

15. Gradually rotate the FEED RATE OVERRIDE dial clockwise until the machine is stopped in the position for the desired cutting pass.
16. Ensure that the SINGLE BLOCK condition is **not** active. The light in the corner of the key should **not** be lit.

See Chapter 14 for more information on this subject.