Verona / Global / Siena / ST Series Machines

Revised 12/13/06

Procedure to Reset C Axis Reference Position

If the control displays one or both of the following alarm messages, it is necessary to reset the C axis reference position.

300 APC ALARM : C1 AXIS NEED ZRN
300 APC ALARM : C2 AXIS NEED ZRN

These alarms can be caused by:

A low battery for the absolute encoder
A cable disconnection between the control and a C axis encoder
The setting or resetting of certain NC parameters

A Station Alignment Tool is required for this procedure.

The following is the procedure for resetting the C axis reference position.
Please be very careful.

It is absolutely essential, that each step be completed exactly as stated, and in the exact order specified in this procedure.

Read the entire procedure before doing anything.

NOTE: Keystrokes in this procedure are indicated as follows: [Brackets] indicate a soft key, (Parentheses) indicate input from MDI Panel, “Quotation Marks” indicate input from Operator Panel.

Visually verify that both the upper C Axis and the lower C Axis are in sync. Check to see upper and lower key positions are at same position. If both are in sync then continue with procedure below. If the upper and lower are not in sync then go to next procedure for reset of C Axis zero when out of sync.

PROCEDURE TO RESET C AXIS ZERO WITH UPPER AND LOWER IN SYNC

1. Turn control **OFF** and then back **ON**.

2. Place control in **“E-Stop”**.

3. Position an empty Auto Index Station under the Ram.

Note: The Turret will not move in jog mode because of the “C Axis Alarms”, you will be required to manually move the Turret to an Auto Index station under the ram by hand.
To rotate Turret by hand:

a) Remove the sheet metal cover from rear of the machine frame; this will expose the turret drive assembly.
b) Manually override the solenoid valve to pull the turret shot pins out. The solenoid valve stack is located on the side of the frame behind the far side tool door.
c) Manually rotate the jackshaft of the turret drive to position an auto index station centered under the ram.

d) With station in this position, manually override the solenoid to insert the turret shot pins. Put pins in and out a few times to center up the bushings.
e) Return the manual override on the solenoid valve to the center position.

4. Record the **P-Code Variables** for each Auto Index Station. (Verify match to the Data Listing of Machine).

Procedure to display **P-Code Variables**:
a) Press function key **(Offset Setting)** twice on the keypad of the MDI panel. The P-Code variable screen will be displayed.
b) Enter the P-Code variable number required (as #**510**) on the keypad of the MDI panel.
c) Press chapter selection soft key **[NO. SEL]**. This will move the cursor to the P-Code Variable number.
d) Record the P-Code variable value for **each** Auto Index Station.
e) Next enter a value of **"0"** (Zero) then press function key **(INPUT)** on the MDI panel for each Auto Index P-Code Variable.

5. Set "Parameter Write Enable" parameter to ONE.
Press function key for **(OFFSET SETTING)** on the keypad of the MDI panel.
Press soft key **[SETING]** for chapter selection, on the Display screen.
Enter "**1**" on the keypad, then press **(INPUT)** on the MDI panel.
Alarm P/S 100 "PARAMETER WRITE ENABLE" appears.
DO NOT press RESET to clear this Alarm

6. Setup CNC control for the reset of C Axis zero.
Set C Axis Grid Shift to "0" as follows: EVEN IF THE GRID SHIFT HAS A ZERO, ENTER A ZERO, AS THE CONTROL KNOWS THE DIFFERENCE.
a) Press **(SYSTEM)** push button on control keyboard. (May have to press SYSTEM twice to display the PARAM soft key)
b) Press **[PARAM]** soft key.
c) Type in **1850** on keyboard.
d) Then press soft key **[NO. SRH]** to select the GRID SHIFT parameters.
e) Move the cursor down to "**C**" (upper) number (value should be set at 0).
f) Type in **0 (zero)** and then press **(INPUT)** key on keyboard.
Screen may change to the "**ALARM MESSAGE"** screen, if it does, then press the **(SYSTEM)** key on the keyboard to continue.
g) Move the cursor down to the next "**C**" (lower) number (value should be set at 0).
h) Type in **0 (zero)** and then press **(INPUT)** key on keyboard.

7. Turn the control **OFF** and then back **ON**.

8. Release the **"E-Stop"**, then press the **"CLEAR"** button.

9. Check the Alarm messages, should only have the "APC Alarms" and "100 Parameter Write Enable"

Pay special attention to ALL the steps here.

10. Press and hold for 1 second the black **SERVICE** push button located in the electrical enclosure at the rear of machine on the operator side for Global / Siena / ST Machines (Note: on machines built in 2006 this is a Green push button); on the Verona / VT machine to enter **SERVICE** mode select MANUAL mode then press and hold PB7 located between T Jog buttons and PB13 ALL AXIS IN POSITION and PB15 LOAD POSITION - the "**MANUAL**" light on the operator's panel will blink indicating that the control is in SERVICE MODE. (Service mode allows tool door to open without being in tool load mode).

11. Verify that on the bottom of the CNC Display screen that the control is in **"JOG"** mode. DO NOT press the "Reset" push button. If the CNC Display screen shows "REF" mode, then E-Stop and restart again.

12. Press the blank push button located between the two turret jog push buttons. This will put the control in REFERENCE SETUP MODE. The blank button located between the two-turret jog buttons will blink indicating the control is in REFERENCE SETUP MODE. (Reference setup mode allows jogging of the C Axis motors).

13. Using the "turret jog joystick" (located near the turret load area) along with the "black safety push button" (located on the left side of joystick box), jog the C axis in both directions. Watch the lower die base at tool door to rotate through one complete revolution. Note: The Auto Index must rotate a full 360 degrees.

14. While observing the die base of the auto index station which is located under the ram, use the turret jog joystick along with the black safety push button, jog the C axis until the machined alignment marks on the moveable and stationary parts of the die base line up.

15. Press the **"E-Stop"** push button.

16. Enter Parameter 1815 bit #4 =1 (APZ). **Be sure to set both the upper C as well as the lower C at the same time** (a message / alarm will appear requiring the control to be turned off).

To enter a Parameter:

Select **"MDI"** Mode on the operator panel
Press function key for **(SYSTEM)** on the keypad of the MDI Panel. (May have to press SYSTEM twice to display the PARAM soft key)
Press soft key **[PARAM]** for chapter selection, on the Display screen.
Enter **"1815"** on the keyboard.
Press **[NO. SRH]** the display will now show Parameter "1815"
Use cursor key to select **"Bit #4 [APZ] for C Axis (Upper)**
Enter **"1"** then press **(INPUT)** (a message / alarm will appear requiring the control to be turned off, ignore this alarm).
Press function key for **(SYSTEM)** on the keypad of the MDI Panel, the display will return to Parameter **"1815"**.
Use cursor key to select **"Bit #4 [APZ] for C Axis (Lower).**
Enter **"1"** then press **(INPUT).**

17. Turn control **OFF**, then back **ON** and clear **"E-Stop"**.

18. Close the Tool Load Door if it is open.

19. Press the **(RESET)** push button to clear all alarms.

20. Press the **"Home"** push button to zero the axis.

21. After all the axis are zeroed, check for correct C Axis zero alignment marks with the Auto Index under the ram.

22. Use a Station Alignment fixture to setup the C Axis upper to lower mechanical alignment.

a) Use a good alignment tool into the upper and lower turret. Place a piece of material between the alignment punch and die to keep the tools from engaging. DO NOT rotate the turret if the alignment tools are locked together (engaged).
b) Rotate the turret to put the Auto Index under the ram.
c) For Long Style Tooling: Engage the line-up tool. If the tool does not engage, then loosen the bolts that hold the small key on the top of the Upper Auto Index bushing. Once

the bolts are loose, you can move this key left or right until the Auto Index line –up tool engages. Tighten down the bolts on the key at this position.
d) For Short Style Tooling: Engage the line-up tool. If the tool does not engage, then loosen the six bolts that hold the upper bushing in position. Once the bolts are loose, you can rotate the bushing left or right until the Auto Index line-up tool engages. Tighten down the six bolts on the bushing at this position.
e) Repeat mechanical alignment for each Auto Index station, with that station under the ram.

23. Reset the **P-Code Variable** to the values recorded for each Auto Index Station in step 4.

24. Run a test to verify each Auto Index Station is square to the X Axis as follows: (Any error in mechanical alignment (for square) can be adjusted with a software correction which is applied through the appropriate P-Code Variable. This Variable will turn the C Axis the corrected amount at the tool change cycle. This will ensure that the tool does not leave a saw tooth edge when punching a rectangular slot).

a) Load a rectangular punch and die with the appropriate clearance for the material being used into the Auto Index Station.
b) Rotate this Auto Index tool station to under the ram.
c) Place a test sheet of material in the clamps and MDI an X & Y coordinate to an area approximately 4 to 5 inches [or 100 mm to 125 mm] from the clamped edge of the sheet.
d) Press “Manual Punch”, to punch one hole.
e) Make an MDI command of G28, which will return the sheet to the reference position.
f) Measure the distance to the edge of the sheet from each side of the punched slot.
g) If the measurement requires adjustment from the values that are now entered in the P-Code for this particular station. Then adjust the P-Code for that Auto Index station per the instructions in Step 4.
h) Standard adjustment using a ¼” X 3.0” rectangle tool is 20 counts per 0.001” deviation, [or in metric mode use a 5mm X 75mm rectangle tool is 76 counts per 0.1mm deviation].
i) Rotate the turret from the Auto Index Station and back again to have the change in the P-Code take effect.
j) Repeat these steps until the tool punches parallel to the X Axis, then move to the next Auto Index station and repeat all these steps again.

25. After you complete the procedure, turn “Parameter Write Enable” back to ZERO. See step 5.

PROCEDURE TO RESET C AXIS ZERO WITH UPPER AND LOWER C AXIS OUT OF SYNC

If the control displays one of the following alarm messages, it is necessary to reset that C axis reference position.

300 APC ALARM : C1 AXIS NEED ZRN (This is the Upper C Axis)

300 APC ALARM : C2 AXIS NEED ZRN (This is the Lower C Axis)

From the alarm message DETERMINE which C Axis is in need of zero reset. With this fact known move onto the following steps.

1. Turn control **OFF** and then back **ON**.

2. Place control in **“E-Stop”**.

3. Position an empty Auto Index Station under the Ram.

Note: The Turret will not move in jog mode because of the “C Axis Alarms”, you will be required to manually move the Turret to an Auto Index station under the ram by hand. To rotate Turret by hand:

a) Remove the sheet metal cover from rear of the machine frame; this will expose the turret drive assembly.
b) Manually override the solenoid valve to pull the turret shot pins out. The solenoid valve stack is located on the side of the frame behind the far side tool door.
c) Manually rotate the jackshaft of the turret drive to position an auto index station centered under the ram.
d) With station in this position, manually override the solenoid to insert the turret shot pins. Put pins in and out a few times to center up the bushings.
e) Return the manual override on the solenoid valve to the center position.

4. Record the **P-Code Variables** for each Auto Index Station. (Verify match to the Data Listing of Machine).

Procedure to display **P-Code Variables**:
a) Press function key **(Offset Setting)** twice on the keypad of the MDI panel. The P-Code variable screen will be displayed.
b) Enter the P-Code variable number required (as #**510**) on the keypad of the MDI panel.
c) Press chapter selection soft key **[NO. SEL]**. This will move the cursor to the P-Code Variable number.
d) Record the P-Code variable value for **each** Auto Index Station.
e) Next enter a value of **“0”** (Zero) then press function key **(INPUT)** on the MDI panel for each Auto Index P-Code Variable.

5. Set “Parameter Write Enable” parameter to ONE.
Press function key for **(OFFSET SETTING)** on the keypad of the MDI panel.
Press soft key **[SETING]** for chapter selection, on the Display screen.
Enter “**1**” (Enable) in response to the prompt for parameter write (PWE).
Alarm P/S 100 “PARAMETER WRITE ENABLE” appears.
DO NOT press RESET to clear this Alarm.

6. Setup CNC control for the reset of C Axis zero. **NOTE: ONLY CHANGE THE BIT FOR THE C AXIS THAT REQUIRES RESET OF ZERO.**
Set C Axis Grid Shift to “0” as follows: EVEN IF THE GRID SHIFT HAS A ZERO, ENTER A ZERO, AS THE CONTROL KNOWS THE DIFFERENCE.
a) Press **(SYSTEM)** push button on control keyboard. (May have to press SYSTEM twice to display the PARAM soft key)
b) Press **[PARAM]** soft key.
c) Type in **1850** on keyboard.
d) Then press soft key **[NO. SRH]** to select GRID SHIFT parameters.
e) Move the cursor down to “**C**” (upper) number (value should be set at 0).
f) IF THIS IS C TO BE ZEROED Then, type in **0 (zero)** and then press **(INPUT)** key on keyboard.
Screen may change to the “**ALARM MESSAGE”** screen, if it does, then press the **(SYSTEM)** key on the keyboard to continue.
g) IF THIS IS C TO BE ZEROED Then, move the cursor down to the next “**C**” (lower) number (value should be set at 0).
h) Type in **0 (zero)** and then press **(INPUT)** key on keyboard.

7. Turn the control **OFF** and then back **ON**.

8. Release the “**E-STOP”**, then press the “**CLEAR**” button.

9. Check the Alarm messages, should only have the “APC Alarms” and “100 Parameter Write Enable”.

10. Press and hold for 1 second the black **SERVICE** push button located in the electrical enclosure at the rear of machine on the operator side for Global / Siena / ST Machines (Note: on machines built in 2006 this is a Green push button); on the Verona / VT machine to enter **SERVICE** mode select MANUAL mode then press and hold PB7 located between T Jog buttons and PB13 ALL AXIS IN POSITION and PB15 LOAD POSITION - the “**MANUAL**” light on the operator’s panel will blink indicating that the control is in SERVICE MODE. (Service mode allows tool door to open without being in tool load mode).

11. Verify that on the bottom of the CNC Display screen that the control is in **“JOG”** mode. DO NOT press the “Reset” push button. If the CNC Display screen shows “REF” mode, then E-Stop and restart again.

12. Press the blank push button located between the two turret jog push buttons. This will put the control in REFERENCE SETUP MODE. The blank button located between the two-turret jog buttons will blink indicating the control is in REFERENCE SETUP MODE. (Reference setup mode allows jogging of the C Axis motors).

13. Using the “turret jog joystick” (located near the turret load area) along with the “black safety push button” (located on the left side of joystick box), jog the C axis in both directions. Watch the lower die base at tool door to rotate through one complete revolution. Note: The Auto Index must rotate a full 360 degrees.

14. IF THE LOWER C IS THE AXIS REQUIRING ZERO then while observing the die base of the auto index station which is located under the ram, use the turret jog joystick along with the black safety push button, jog the C axis until the machined alignment marks on the moveable and stationary parts of the die base line up.
IF THE UPPER C IS THE AXIS REQUIRING ZERO then while observing the Key on the upper bushing of the auto index station which is located under the ram, use the turret jog joystick along with the black safety push button, jog the C axis until the Key on the upper bushing is located at the 12 o’clock position.

15. Press the **“E-Stop”** push button.

16. Enter Parameter 1815 bit #4 =1 (APZ). **ONLY FOR THE C AXIS THAT REQUIES RESET OF ZERO,** (a message / alarm will appear requiring the control to be turned off).

To enter a Parameter:

Press function key for **(SYSTEM)** on the keypad of the MDI Panel. (May have to press SYSTEM twice to display the PARAM soft key)
Press soft key **[PARAM]** for chapter selection, on the Display screen.
Enter **“1815”** on the keyboard.
Press **[NO. SRH]** the display will now show Parameter “1815”
Use cursor key to select **“Bit #4 [APZ] for C Axis (Upper) IF THIS IS THE C AXIS THAT REQUIRES RESET OF ZERO.**
Enter **“1”** then press **(INPUT)** (a message / alarm will appear requiring the control to be turned off, ignore this alarm).
Press function key for **(SYSTEM)** on the keypad of the MDI Panel, the display will return to Parameter **“1815”**.
Use cursor key to select **“Bit #4 [APZ] for C Axis (Lower). IF THIS IS THE C AXIS THAT REQUIRES RESET OF ZERO.**
Enter **“1”** then press **(INPUT).**

17. Turn control **OFF**, then back **ON** and clear **“E-Stop”**.

18. Close the Tool Load Door if it is open.

19. Press the **(RESET)** push button to clear all alarms.

20. Press the **"Home"** push button to zero the axis.

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