Servo Motor Troubleshooting

Step 1) Did you check?

- Power on button has been pressed?
- Breakers are not tripped?
- E-Stop button is released?
- All three amplifiers have lights on?
- All physical connections are tight and intact at amp and at motors?
- Fuses in +15/-15 circuit are good?
  (Note About Fuses: Do not check for continuity, only check fuses under load.)

Servo Motor Troubleshooting Log

Step 2) Print this sheet and use the check list to confirm each component is working properly, to isolate the problem area.

<table>
<thead>
<tr>
<th>Works?</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#1 Amplifier</td>
</tr>
<tr>
<td></td>
<td>#2 Amplifier</td>
</tr>
<tr>
<td></td>
<td>#3 Amplifier</td>
</tr>
<tr>
<td></td>
<td>#1 Power Cable</td>
</tr>
<tr>
<td></td>
<td>#1 Resolver (Feed Back) Cable</td>
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<tr>
<td></td>
<td>#2 Power Cable</td>
</tr>
<tr>
<td></td>
<td>#2 Resolver (Feed Back) Cable</td>
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<tr>
<td></td>
<td>#3 Power Cable</td>
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<tr>
<td></td>
<td>#3 Resolver (Feed Back) Cable</td>
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<tr>
<td></td>
<td>#1 Motor</td>
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<tr>
<td></td>
<td>#2 Motor</td>
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<tr>
<td></td>
<td>#3 Motor</td>
</tr>
<tr>
<td></td>
<td>#1 PMAC Control</td>
</tr>
<tr>
<td></td>
<td>#2 PMAC Control</td>
</tr>
<tr>
<td></td>
<td>#3 PMAC Control</td>
</tr>
</tbody>
</table>
Check Motor Command from Jog Ribbon

Step 3) Open PWIN32 and test each motor has command by sending a command through the jog ribbon. See Illustration Below.

Step 4) Mark the infeed roller with a marker so you can confirm it rotates one full revolution. Clear counts on the #1 by typing #1HMZ into the terminal window and press "Enter". In the jog axis, set the motor to 1, and type 40960 cts and click "Jog To" to jog to position and confirm the #1 Infeed Motor makes one full revolution.

If the roller moves one full revolution, you can confirm you have command and encoder counts. This motor works, mark progress sheet #1 pmac, #1 amplifier, #1 motor, #1 power cable and #1 resolver cable as good. If the motor does not work, continue checking other motors.

Step 5) Mark the outfeed roller with a marker so you can confirm it rotates one full revolution. Clear counts on the #2 by typing #2HMZ into the terminal window and press "Enter". In the jog axis, set the motor to 2, and type 40960 cts and click "Jog To" to jog to position and confirm the #2 Outfeed Motor makes one full revolution.

If the roller moves one full revolution, you can confirm you have command and encoder counts. This motor works, mark progress sheet #2 pmac, #2 amplifier, #2 motor, #2 power cable and #2 resolver cable as good. If the motor does not work, continue checking other motors.

Step 6) Home saw head. If saw head homes: This motor works, mark progress sheet #3 pmac, #3 amplifier, #3 motor, #3 power cable and #3 resolver cable as good. If saw head does not home, proceed to PAGE 3

Check Motor Feedback at Jog Ribbon

Step 7) If the #1 Infeed Motor turned by command, skip this step. Clear counts on the #1 by typing #1HMZ into the terminal window and press "Enter". Turn the #1 infeed roller by hand one complete revolution. Servo #1 Position should read 40,960 (+/-) counts.

If it DOES read counts, you have no command but do have encoder counts. Mark progress sheet #1 Feedback Cable as good. Proceed to Page 4 "Check #1 Infeed Motor"

Step 8) If the #2 Outfeed Motor turned by command, skip this step. Clear counts on the #2 by typing #2HMZ into the terminal window and press "Enter". Turn the #2 outfeed roller by hand one complete revolution. Servo #2 Position should read 40,960 (+/-) counts.

If it DOES read counts, you have no command but do have encoder counts. Mark progress sheet #2 Feedback Cable as good. Proceed to Page 5 "Check #2 Outfeed Motor"

Step 9) If the #3 Pivot Motor turned by command, skip this step: Remove the pivot motor from the gear box. Note When Removing #3 Servo: Secure motor to prevent falling and further damage. Note When Reinstalling #3 Servo: Confirm the key is properly places in the shaft. Clear counts on the #3 by typing #3HMZ into the terminal window and press "Enter". Turn the #3 outfeed motor shaft by hand one complete revolution. Servo #3 Position should read 4096 (+/-) counts (note this is 10% of the feed roller value)

If it DOES read counts, you have no command but do have encoder counts. Mark progress sheet #3 Feedback Cable as good.
Check #1 Infeed Motor

Step 10) Test the #1 Servo Motor by switching SERVO MOTOR Cables from SD1 and SD2.
  **Note:** Only swap cables between a working and non-working Servo.
  If none of the servos are operational: Skip this page.

Step 11) Open PWIN32 and test motor has command by sending a command through the jog ribbon.
  Clear counts on the #1 by typing #1HMZ into the terminal window and press "Enter"
  In the jog axis, set the motor to 1, and type 40960 cts and click "Jog To" to jog to position and
  confirm the OUTFEED motor (because the cables are switched) makes one full revolution.

If the #2 Outfeed motor **DOES NOT** move, proceed **Step 12**

If the #2 Outfeed motor **DOES** move: Your #1 Cables or #1 Motor are bad.
  Mark progress sheet #1 Amplifier & PMAC as **good**
  Return SERVO MOTOR cables to original positions on SD1 and SD2.

  Swap #1 Infeed Motor and #2 Outfeed Motor.
  Clear counts on the #1 Servo by typing #1HMZ into the terminal window and hit "OK"
  In the jog axis, set the motor to 1, and type 40960 cts and click "Jog To" to jog to position and
  confirm INFEED motor (because the cables are in the original position) makes one full revolution.

  If the #1 Infeed motor **DOES NOT** move, Your #1 Power Cable is bad.
  If the #1 Infeed motor **DOES** move: Your #1 Motor is bad.

Step 12) Confirm the #1 Servo jog ribbon still reads 0.
  Turn the #2 Outfeed Roller by hand one complete revolution.
  Servo #1 Position should read 40,960 (+/-) counts.
  If the #1 Servo **DOES NOT** show any counts: **CALL FOR ASSISTANCE**
  If the #1 Servo **DOES** show counts: Your #1 Resolver Cable is bad.

Step 13) Return SERVO MOTOR cables to original positions on SD1 and SD2.

Step 14) Test the communication to PMAC by switching PMAC Cables from SD1 and SD2.
  Clear counts on the #1 Servo by typing #1HMZ into the terminal window and hit "OK"
  In the jog axis, set the motor to 1, and type 40960 cts and click "Jog To" to jog to position and
  confirm INFEED motor makes one full revolution.

  If the #1 Infeed motor **DOES NOT** move, **CALL FOR ASSISTANCE WITH THIS INFO**
  If the #1 Infeed motor **DOES** move: **CALL FOR ASSISTANCE WITH THIS INFO**
Check #2 Outfeed Motor

Step 15) Test the #2 Servo Motor by switching SERVO MOTOR Cables from SD2 and SD1.

Note: Only swap cables between a working and non-working Servo. If none of the servos are operational: Skip this page.

Step 16) Open PWIN32 and test motor has command by sending a command through the jog ribbon.

Clear counts on the #2 by typing #2HMZ into the terminal window and press "Enter"
In the jog axis, set the motor to 2, and type 40960 cts and click "Jog To" to jog to position and confirm the INFEED motor (because the cables are switched) makes one full revolution.

If the #1 Infeed motor DOES NOT move, proceed Step #17

If the #1 Infeed motor DOES move: Your #2 Cables or #2 Motor are bad.
Mark progress sheet #2 Amplifier & PMAC as good
Return SERVO MOTOR cables to original positions on SD2 and SD1.
Swap #2 Outfeed Motor and #1 Infeed Motor.
Clear counts on the #2 Servo by typing #2HMZ into the terminal window and hit "OK"
In the jog axis, set the motor to 2, and type 40960 cts and click "Jog To" to jog to position and confirm OUTFEED motor (because the cables are in the original position) makes one full revolution.

If the #2 Outfeed motor DOES NOT move, Your #2 Power Cable is bad.
If the #2 Outfeed motor DOES move: Your #2 Motor is bad.

Step 17) Confirm the #2 Servo jog ribbon still reads 0.

Turn the #1 Infeed Roller by hand one complete revolution.
Servo #2 Position should read 40,960 (+/-) counts.

If the #2 Servo DOES NOT show any counts: CALL FOR ASSISTANCE
If the #2 Servo DOES show counts: Your #1 Resolver Cable is bad.

Step 18) Return SERVO MOTOR cables to original positions on SD2 and SD1.

Step 19) Test the communication to PMAC by switching PMAC Cables from SD2 and SD1.
Clear counts on the #2 Servo by typing #2HMZ into the terminal window and hit "OK"
In the jog axis, set the motor to 2, and type 40960 cts and click "Jog To" to jog to position and confirm OUTFEED motor makes one full revolution.

If the #2 Outfeed motor DOES NOT move, CALL FOR ASSISTANCE WITH THIS INFO
If the #2 Outfeed motor DOES move: CALL FOR ASSISTANCE WITH THIS INFO

Check #3 Pivot Motor

Note About A-Axis: Top 3 Reasons for A-Axis Not Homing
1. Saw Head Carriage is Stuck Against the Hard Stop - Confirm the Head is Free
2. Amplifier is Dead - Check for Any Display Lights
3. Broken Motor Cable - Check all Connections, Including Twisting Fatigue

If the above steps have been confirmed: CALL FOR ASSISTANCE WITH THIS INFO