



ENGINEERING DOCUMENT

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757-4002-096

REV: B

CAD# D8477

**SUBJECT: Servo Dynamics DC Servo Drive Set-up Procedure with MAX3
ISA Control**

Responsible		Reviewed	
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Originator	Date	Mgr. Controls and Integration	Date

Rev.	ECN	Rev. Description	Rev. By	Date	Appd By	Date
A	13749	Release				
B	13933	1) Page 3, step III-B was "Cut off W1 and W2 (zero ohm resistors). 2) Page 3, RMS Pot measurement was U3-pin 5 to TP1. 3) Page 3, Added step III-G	DEO	12/20/96		

- I. INTENT
To provide a Standardized procedure for the system set-up and configuration of the Servo Dynamics DC servo drive.
- II. APPLICABILITY
Applies to Hawk 5/SSM knee mill and BMC 30/SSM machining center with Ultimex 3 ISA control.
- III. PRE POWER-UP
 - A. Remove the x-axis servo card from the drive chassis.
 - B. ^{B1} Remove shunt jumper assembly from center area of board located at reference designator “*NC LIM*”.
 - C. Verify A/B jumper is in the “B” position for differential input mode.
 - D. Preset the pots as follows:

Pots	Measurement	Hawk 5/SSM	BMC 30/SSM
Aux. Pot	TP2 to TP1	fully CCW (0-2Ω)	fully CCW (0-2Ω)
Sig. Pot	TP3 to TP1	mid-range (approx. 10 KΩ)	5 KΩ
Tach Pot	TP4 to TP1	7 KΩ	x-axis: 4.55KΩ y-axis: 4.61KΩ z-axis: 4.95KΩ
CMP Pot	TP5 to TP1	fully CCW, then 10 turns CW (approx. 1 KΩ)	fully CCW, then 10 turns CW (approx. 1 KΩ)
CL Pot	J3-1 to J3-3	fully CCW, then 11 turns CW (X/Y) or 7 turns CW (Z)	fully CW (approx. 2.3KΩ)
RMS Pot (R65) ^{B2}		fully CW	fully CW
Bal. Pot		do not adjust at this time	do not adjust at this time

- E. Replace the servo card in the servo drive chassis.
- F. Repeat steps A thru E for the y-axis and z-axis servo cards.
- G. ^{B3} Install shunt regulator assembly to amplifier chassis just above power capacitor. Connect power lead wires across power capacitor terminals (BLK wire to BLK, RED wire to RED).

IV. POWER UP

- A. UltiMAX3 Control Parameter Verification

Load parameters from Engineering Document 757-4002-048 per machine type.

1. In Manual mode, select the <CHANGE TOOL OR DIAGNOSTICS> softkey followed by the <ATC & MACHINE DIAGNOSTICS> softkey.
2. Select each axis softkey to load the Axis Tuning Parameters.
3. If an Axis Tuning Parameter needs to be changed, then enter the correct value per the Engineering Document 757-4002-048.
4. After completing all changes for an axis, select the <BEGIN TUNE> softkey followed by the <STORE PARAMETERS> softkey.
5. Press the <EXIT> softkey to return to the ATC & Machine Diagnostics screen.
6. Press the Auxiliary mode Key.
7. Select the <SYSTEM CONFIGURATION> softkey.
8. Insert the Machine Configuration diskette into the floppy drive.
9. Select the <BACKUP MACHINE CONFIGURATION> softkey.
10. When complete, remove the diskette from the floppy drive and store in a safe location.

B. Servo Drive Configuration

1. Select POWER ON and CYCLE START pushbuttons.
2. Select the X-axis and jog to the approximate mid-travel position.
3. Balance and DAC adjustments:

Do not adjust the VR pots on the MX4 board. Leave them at their calibrated factory settings. The range of adjustment available within the Servo Dynamics drive is sufficient to balance axis offsets.

- a. In manual mode, select the <CHANGE TOOL OR DIAGNOSTICS> softkey followed by the <ATC & MACHINE DIAGNOSTICS> softkey.
- b. Press <ENTER><101><ENTER> to display the spindle/servo diagnostics setup screen.
- c. Select the <TOGGLE FOLLOWING ERROR DISPLAY> softkey, then the <AXIS BALANCE ADJUST> softkey.
- d. Select the appropriate softkey to choose the axis to be balanced.

- e. At the prompt, press the START button followed immediately by the MOTION HOLD button to provide 0V from the DAC.
 - f. Adjust the BAL pot on the servo card until the encoder counts on the CRT stop.
4. Release MOTION HOLD and select the <EXIT> softkey.
 5. In MANUAL MODE, select the x-axis.
 6. Adjust the CMP pot until the axis oscillates. Turn CCW until oscillation stops. Continue CCW 1-1/2 more turns.
 7. In the control cabinet, connect a volt meter between J1-1 and J1-2 (DAC input) on the servo card.
 8. In MANUAL MODE, select <CHANGE TOOL OR DIAGNOSTICS> softkey.
 9. Set rapid detent to 10% of the maximum rapid traverse for the axis being configured (i.e. if max rapid is 500ipm, then set rapid detent to $500 * 0.10 = 50\text{ipm}$). Turn axis feed rate pot to detent position.
 10. While jogging the axis back and forth. Adjust the SIG pot for a maximum absolute value of 0.95V.
 12. Readjust BAL pot if necessary.
- Note: It may be necessary to alternately readjust the signal and balance pots to achieve proper balance and DAC settings.**
11. Disconnect the volt meter.
 13. Repeat steps 1 thru 12 for the y-axis and z-axis.