

Tune Up - Eurotherm Drive

Tools Required	1
Procedure	1
Spindle	3
Traverse	4

NOTE: This procedure is for tuning up drives manufactured by Eurotherm only. For more information, see the Eurotherm Drive Manual. Manuals are available online at: www.ssddrives.com

Tools Required

- Digital Voltmeter
- AC Amp Clamp Meter

Procedure

1. Hold the JOG button and press the RESET button. Release the JOG button after the 8 L.E.D.'s flash. (You are now in the trouble-shooting mode.)
2. Measure the voltage across C1 on the W90B board's front panel. (C1 is near BLUE CPU connector.) Adjust power supply to +5.10 VDC. Wire 500 is power supply common.
3. Measure the voltage across C28 on the W90B board's front panel. (C28 is near GREEN connector.) Adjust power supply to +12.10 VDC.
4. Measure the voltage across C21 on the W90B board's front panel. (C21 is near GREEN connector.) Adjust power supply to -12.10 VDC.
5. If drives do not need adjustment skip to [step 9](#).
6. Remove top cover on drives. Set up both drives with the proper jumpers (JP1-JP6) and Voltage and Armature Calibrations. The Spindle and Traverse will have the same settings except for Armature Current Calibration.
 - a. Set the jumpers which are located in the lower left hand corner of the drive as follows:
 - JP1 and JP2 jumped between pins 1 & 2
 - JP3 and JP4 jumped between pins 2 & 3
 - JP5 and JP6 jumped between pins 2 & 3
 - b. Armature Voltage Calibration

- Set both drives for 180 Volt Armatures by setting dip switches (S1-S4) as shown below.

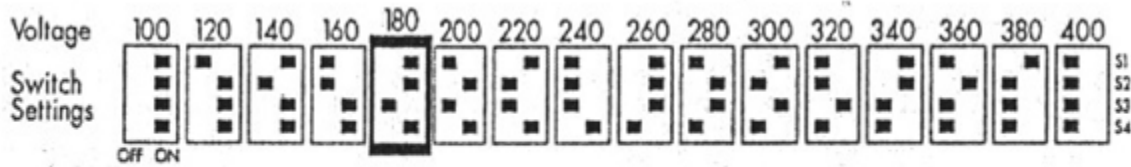
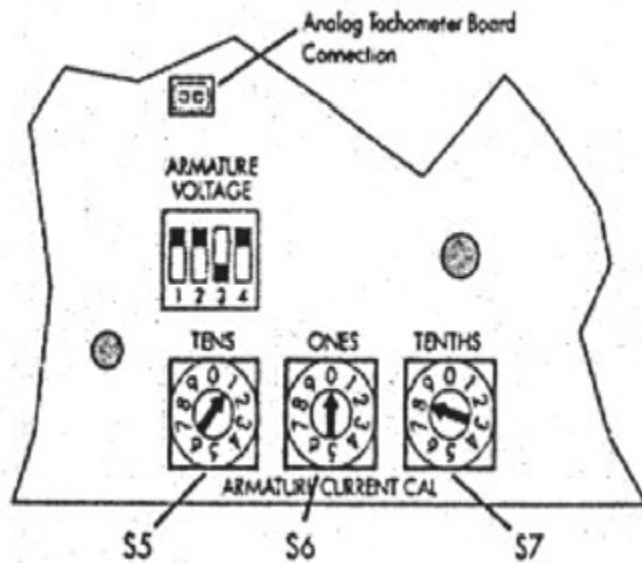


Figure 3.9 - Armature Voltage Calibration Switch Settings

c. Armature Current Calibration

- Set the armature current rotary switches S5, S6, & S7 to match the motor nameplate rating (25 amps for the spindle and 12 amps for the traverse). See example below.



NOTE. Calibration for 2 HP, 180 VDC armature motor shown (Ratings Source: 1990 NEC, Table 430-147).

7. Autotune

- Clamp the motor shaft so it will not turn. Any rotation of the motor during the AUTOTUNE procedure causes the AUTOTUNE to abort.
- Connect power to the drive. The display should read the following: 590SP DRIVE:MENU LEVEL
- Check the 6 indicator LEDs to the right of the LCD display: Run and Start should be off. All others should be on
- Make sure the Emergency Stop circuits on the drive are closed (coast stop and program stop should be at +24 VDC, and (C0) jumpered to (C1) – Thermistor) See drawing E1252.
- Make sure speed demand is zero (remove reference). Using the MMI (Man Machine Interface) check DIAGNOSTICS::SETPOINT SUM OUTPUT and SPEED SETPOINT. They should be zero.
- Set (using MMI) SETUP PARAMETERS::CURRENT LOOP::CURRENT LIMIT to: 100.00%.
- Make sure (A6) is jumpered to (B3) and (A5) is jumpered to (B4) for maximum current clamps.

- h. Turn AUTOTUNE on by setting SETUP PARAMETERS:: CURRENT LOOP::AUTOTUNE to ON
- i. Push the START button on the D-750. This will start the drive and enable the autotune. At this point the AUTOTUNE will set the following parameters:
 - SETUP PARAMETERS:: CURRENT LOOP::PROP.GAIN
 - SETUP PARAMETERS:: CURRENT LOOP::INT.GAIN
 - SETUP PARAMETERS:: CURRENT LOOP::DISCONTINUOUS
- j. When finished the main contactor will open automatically
- k. If there is a problem with the AUTOTUNE an AUTOTUNE failure will be indicated.
- l. Press the Emergency Stop button.
- m. SAVE Parameters
- n. Remove power.
- o. Remove clamps from shaft. The AUTOTUNE is now complete.

8. Set the following parameters that are different from factory settings:

Spindle

To change the SYSTEM::CONFIGURE I/O parameters first enable SYSTEM ::CONFIGURE I/O.

- SYSTEM::CONFIGURE I/O::BLOCK DIAGRAM::RAMP O/P DEST to 0
- SYSTEM::CONFIGURE I/O::BLOCK DIAGRAM::RAMP O/P DEST to 0

After the changes are made change the SYSTEM::CONFIGURE I/O parameter to disable.

- SETUP PARAMETERS::SPEED LOOP::PROP.GAIN to 50
- SETUP PARAMETERS::SPEED LOOP::INT. TIME CONST. To .5 seconds
- SETUP PARAMETERS::SPEED LOOP::INT. DEFEAT. to ON
- SETUP PARAMETERS::SPEED LOOP::SETPOINTS::RATIO 2 (A3) to .6 (fine tune below)

The following 3 parameters will change according to individual motor or drive.

- SETUP PARAMETERS::CURRENT LOOP::PROP.GAIN to autotune adjustment (21.36 example only)
- SETUP PARAMETERS::CURRENT LOOP::INT.GAIN to autotune adjustment (25.55 example only)
- SETUP PARAMETERS::CURRENT LOOP::DISCONTINUOUS to autotune adjustment (37.71 example only)

- SETUP PARAMETERS::STOP RATES::STOP TIME to .1 SEC.
- SETUP PARAMETERS::STOP RATES::STOP LIMIT to 0 SEC.
- SETUP PARAMETERS::STOP RATES::CONTACTOR DELAY 1.0 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP TIME .1 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP LIMIT 0 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP I LIMIT 100.00%

- SETUP PARAMETERS::STOP RATES::STOP ZERO SPEED 0.00%

Traverse

To change the SYSTEM::CONFIGURE I/O parameters first enable SYSTEM ::CONFIGURE I/O.

- SYSTEM::CONFIGURE I/O::BLOCK DIAGRAM::RAMP O/P DEST to 0
- SYSTEM::CONFIGURE I/O::BLOCK DIAGRAM::RAMP O/P DEST to 0

After the changes are made change the SYSTEM::CONFIGURE I/O parameter to disable.

- SETUP PARAMETERS::SPEED LOOP::PROP.GAIN to 3.5
- SETUP PARAMETERS::SPEED LOOP::INT. TIME CONST. To 5 seconds
- SETUP PARAMETERS::SPEED LOOP::INT. DEFEAT. to OFF
- SETUP PARAMETERS::SPEED LOOP::SETPOINTS::RATIO 2 (A3) to .8 (fine tune below)
- SETUP PARAMETERS::CURRENT LOOP::PROP.GAIN to (.35)
- SETUP PARAMETERS::CURRENT LOOP::INT.GAIN to (100.00)
- SETUP PARAMETERS::CURRENT LOOP::DISCONTINUOUS to (23.75)
- SETUP PARAMETERS::STOP RATES::STOP TIME to .1 SEC.
- SETUP PARAMETERS::STOP RATES::STOP LIMIT to 0 SEC.
- SETUP PARAMETERS::STOP RATES::CONTACTOR DELAY 1.0 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP TIME .1 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP LIMIT 0 SEC.
- SETUP PARAMETERS::STOP RATES::PROG STOP I LIMIT 100.00%
- SETUP PARAMETERS::STOP RATES::STOP ZERO SPEED 0.00%

9. Dial 004 into hole size. Put the FEET/METERS switch on METERS.
10. Press the JOG button momentarily. A number eight will appear in the thousands position of the readout. Dial 129 into hole size and then press the JOG button.
11. The Spindle drive is now enabled. It may rotate in one direction or another. Adjust SPNDA OFFSET (P3) on the W90B board's front panel to zero speed.
12. Press the Emergency Stop button and after 10 seconds, hold the JOG button and press the RESET button (troubleshooting). Dial 004 into hole size. Put FEET/METERS switch on METERS.
13. Press the JOG button momentarily. A number eight will appear in the thousands position of the readout. Dial 002 into hole-size and then press the JOG button.
14. The CAM drive is now enabled. It may creep in one direction or another. Adjust CAM OFFSET (P4) on W90B board's front panel for zero speed.
15. E-Stop then reset machine. Make sure RPM/Constant Line Speed switch is in the RPM mode. Turn Cam Gain on the W90B board all the way off (ccw). Set Upper Gain (Ratio) to zero.
16. Turn master speed switch to speed 10 (max). Adjust " P3 " on W801 board (master speed switch) for 8VDC (measure between wires 517A and 500 (common)).
17. Adjust maximum speed on spindle motor by doing the following.:
 - a. On the spindle drive using the MMI go to SETUP PARAMETERS::SPEED LOOP::SETPOINTS::RATIO 2 (A3).

- b. Make sure the spindle is set to .6 and the traverse is set to .8 as shown in the listings above.
- c. Start the D-750 machine.
- d. Turn master speed pot all the way up (cw).
- e. Use the up/down arrow to adjust the maximum speed of the drive.
- f. Measure between S1 and S2 encoder wires on the W600 board and adjust the up/down arrow on the MMI of the spindle drive for 45 KHz on your Multimeter.
- g. Do the same to adjust the traverse drive except use C1 and C2 on the W600 board as your measuring points. Max speed of the D-750 is 750 RPMs at the spindle shaft or 1125 RPMs at the spindle motor.

WARNING: This speed is not to be exceeded or else the bearings in the cam unit will be destroyed!

- 18. Stop the machine and save parameters.
- 19. Turn the Cam Gain pot on the W90B Board all the way up (cw).
- 20. To adjust the W128 board for a maximum line speed of 1500 feet per minute move the toggle switch to Constant Line Speed and adjust P1 for 100Hz between wires 500 (common) and 548 (signal from footage counter) while the machine is running.
- 21. Adjust ACCEL on W90B board, so accumulator does not crash with a full reel on the payoff when the REELEX machine goes to speed 10 from speed 1. (roughly 10 seconds)
- 22. Adjust DECEL on W90B board, so payoff can stop full reel when the REELEX machine goes from speed 10 to speed 1. (roughly 10 seconds)
- 23. Dial 5 into PRESET 1 and 10 into PRESET 2. Start machine without winding cable and turn footage counter until you see a number 6 or 7 in the readout. Adjust LOW on W90B board so the machine runs at a slow speed.
- 24. The machine is now tuned properly.