Omni*turn*
Phone 541/332 7004 Fax 541/332 1018

Installing the G4 control on a Yaskawa C-axis

Shut off all power to the machine. Make sure that the markings on all the cables connected to the original control are legible. If any of the cables are not clearly marked, label them with masking tape or some other convenient method. Remove the upper piece of sheet metal on the right end of the machine (as viewed from the front). Unplug the cables from the control. Remove the control, along with its wedge-shaped mount, from the top of the machine by removing the 4 cap screws that hold the mount to the top of the machine. Transfer the mount to the new control and mount the new control to the top of the machine. Cut any cable ties that prevent the control cables from being pulled down through the top sheet metal and pull the cables down. Attach the short adapter cable provided to the C AXIS connector on the new control. The C AXIS and MISC cable will also need to be pulled down through the hopper to make room for the new cables that will need to be run through the same holes. Connect the provided CPULSE and OP STA cables to the corresponding connectors on the new control and drop them down through the top sheet metal and the hopper. The CPULSE cable has a large flexible grommet attached. This grommet will need to be pushed through the holes in both the top sheet metal and the hopper. Once the CPULSE and OP STA cables have been dropped through the sheet metal into the area next to the coolant tank, the C AXIS and MISC cable can be pushed back up and connected to the new control. Connect the X and Z axis cables as well. The original Spindle encoder cable is no longer used. The encoder itself can be removed and kept as a spare for another machine. The original RS232 cable is no longer required. Run the new cables back along the rear frame rail to the main electrical box. Secure the new cables to the existing cables on the frame rail with cable ties. Unplug the remote operator's station from the OP STA connector on the main electrical box. Remove the 4 screws surrounding this connector and push the connector inside the electrical box. Connect the remote operator's station to the new OP STA cable and feed the new CPULSE cable into the main electrical box through the hole vacated by the old OP STA connector. Use the grommet on the CPULSE cable to seal the hole. Reinstall the screws that held the old OP STA connector to the box, using the nuts provided to secure them. Unplug the MISC cable from the MISC connector on the main electrical box.

Inside the electrical box, unplug the connector from CN1 on the Yaskawa servo amplifier. This connector has locking tabs which are released by squeezing the release levers in the finger-grip areas on the connector shell. Connect the new YASRETRO circuit board to CN1 and connect the cable that was removed from CN1 to the CN2 connector on the YASRETRO board. Connect the CPULSE cable which you previously routed into the box to the CN3 connector on the YASRETRO board. The connector on the CPULSE cable also has a yellow wire and a black-white pair with female pins attached connected to it. The yellow wire needs to be inserted to pin 4 in the MISC connector, which is located on the back wall of the box, above the spindle panel. The pins

are arranged in the connector as shown below (as viewed from the inside of the electrical box):

```
 1  2  3
 4  5  6  7
 8  9 10 11
12 13 14
```

The white wire from the black-white pair goes to pin 10 in the MISC connector, and the black wire goes to 11.

Install the longer red jumper wire provided between TB1 terminal 13 and TB1-4. TB1 is the long terminal strip that goes down the left side of the electrical panel.

Install the shorter jumper from TB1-30 to the mounting screw just below it.

Plug the MISC cable back in to the MISC connector on the electrical box.

This completes the physical installation. Leave the sheet metal panel off the right end of the machine until the machine is up and running. Power the machine up.

Re-programming the Yaskawa Servo Amplifier

First, you will need to restore the amp to its factory settings. Pressing the MODE/SET button below the digital display steps the amp through its various display modes. Press the MODE/SET button and the display will show *Fn000*. When *Fn000* is displayed, press the ^ button until the display reads *Fn005*. When *Fn005* is displayed, press and hold the DATA/< key until the display reads *P.InIt*. Then press the MODE/SET key and *P.InIt* will flash for a while, then briefly display *donE*. Press and hold DATA/< for a second and the display will return to *Fn005*. The parameters are now returned to factory defaults.

To set the parameters to the new values, you will need to follow this general procedure:

Press the MODE/SET key to get to the parameter display: *Pn000*

Press the DATA/< key to select the digit to be changed

Press the ^ or v key to change the value of the selected (flashing) digit.

Pressing and holding the DATA/< key will change from displaying the parameter number to displaying the value of that parameter, or vice versa. After the parameters have been changed, turn the main power off for at least 10 seconds, then back on to make the changes effective.

Yaskawa Parameter settings:

Drive mode selection
 Pn000=0070 (switch between velocity/position servo modes via P-CON signal)

Servo/speed loop settings
Pn100=100 (speed loop gain)
Pn101=1140 (time constant)
Pn102=90   (pos. loop gain)
Pn103=50(inertia ratio)

Position control settings
Pn200=0000 (selects pulse/direction format)
Pn201=1000 (sets feedback as 1000 line encoder)
Pn202=32768 (electronic gearing numerator)
Pn203=9000 (electronic gearing denominator)

Speed control settings
Pn305,306=1000 (accel/decel)
Pn300=625 (speed command scaling)

General
Pn600=25 (brake resistor setting)
Pn110=12 (auto-tuning disabled)

Power drive down and back up after setting parameters

Yaskawa Parameter Settings:

3000 RPM Motor, 16C Spindle

Drive mode selection
Pn000=0070 (switch between velocity/position servo modes via P-CON signal)

Encoder Setup
Pn002=0100 (uses absolute encoder as incremental)

Servo/speed loop settings
Pn100=100 (speed loop gain)
Pn101=1140 (time constant)
Pn102=20 (pos. loop gain)
Pn103=370(inertia ratio)

Position control settings
Pn200=0000 (selects pulse/direction format)
Pn201=1000 (sets feedback as 1000 line encoder)
Pn202=32768 (electronic gearing numerator)
Pn203=9000 (electronic gearing denominator)

Speed control settings
Pn305,306=2000 (accel/decel)
Pn300=830 (speed command scaling)

General
Pn600=25 (brake resistor setting)
Pn110=12 (auto-tuning disabled)

Power drive down and back up after setting parameters