
2.8 POWER UP HSL-WISVCUP

With the wiring to the HSL-WISVCUP complete, apply power and verify the following:

- 1) Green "PWR" and "RUN" LEDs on M4510 main processor are "on" and red "FLT" LED is "off".
- 2) Green "PWR" and "RUN" LEDs on S4520-RDC in M4510 slot 01 are both "on". Green "AMP ENB" LED is "off".
- 3) LED on B25A20 servo amplifier is "RED" (this is normal when the amplifier is disabled which it is until the cupfeed motor is actually running).
- 4) If the above is not as described, verify that power is applied to both the M4510 module and the B25A20 amplifier. Also verify all cables are connected properly to the respective modules.
- 5) Using the set-up program, verify that the M4510 main processor is loaded with the "HSLSCUP" application program and that the S4520 in slot 01 is loaded with the "SRVCUPR" application program. See section 4 or 5 for details on using the setup program to verify these programs are loaded.

SECTION 2 INSTALLATION

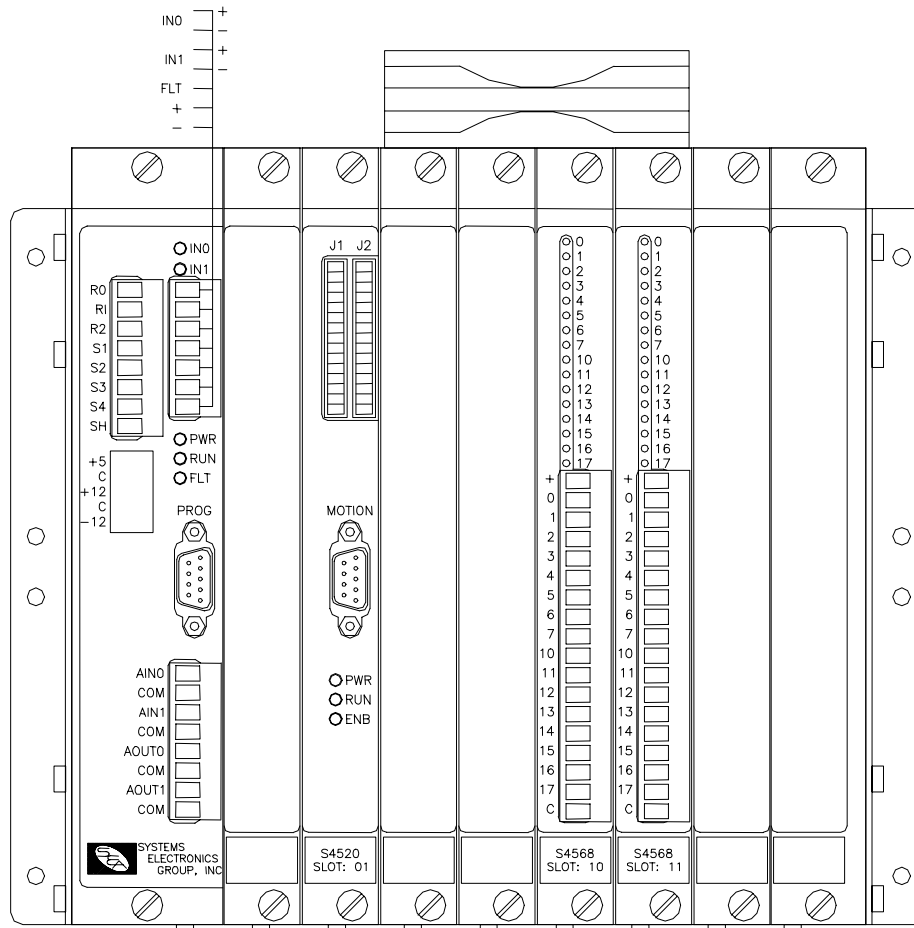


Figure 2 - M4510 Configuration

2.9 HSL-WISVCUP SET-UP

The HSL-WISVCUP is shipped from the factory with the PLC program "HSLSCUP" loaded in the main processor of the M4510 module (PLC section) and the PLS channel set-point file "TMGSCUP" loaded in the PLS section of the M4510 module. Program "SRVCUPR" is loaded in the S4520 motion controller located in slot 01 of the M4510. These are the standard programs used to implement the standard HSL-WISVCUP servo cupfeed algorithm.

In some cases, the following user variables and timing channels may have to be altered to tune the HSL-WISVCUP to the actual bodymaker it is controlling.

Once the HSL-WISVCUP is installed and the control system is powered back up, perform the following to set-up and tune the HSL-WISVCUP. The set-up is performed using a PC running the set-up program. See section 4 or 5 for a description of the menus and variables and how to use the setup program.

2.9.1 DEFAULT SET-UP VARIABLES

As shipped, the set-up variables for the S4520-RDC motion control processor in slot 01 are set to the following defaults:

Cupfeed Stop Position at Short Can: _____: 1950

Synchronization Error Limits:

Max Error for "Out of Sync" Disable: _____: 100

Max Error for Enable Cupfeed Synchronization: _____: 500

Max Error for "Following Error" Alarm: _____: 050

Cupfeed Servo PID Gains:

Proportional Gain (P): _____: 15.0

Integral Gain (I): _____: 100

Derivative Gain (D): _____: 25

The above default set-up variables are stored in the data file for Bodymaker 00.

SECTION 2 INSTALLATION

2.9.2 VERIFY SERVO CUPFEED SET-UP PARAMETERS

Using the set-up program, verify that the user variables of the S4520-RDC in slot 01 of the M4510 are set to the defaults as out-lined in section 2.9.1. If they are not, download the default set-up parameters for bodymaker #00. These may be changed once the servo cupfeed is run, but should be set to the defaults to start out. Refer to section 4 or 5 for details on observing these variables and downloading these variables using the setup program.

2.9.3 VERIFY MAIN CRANK RESOLVER

From the "Cupfeed Cam Time/Position Diagnostics" menu of the setup program, observe the actual main crank position. Verify that the main crank resolver direction is correct and is linear by barring or inching the machine forward. The position should increment linearly through the range of 0 to 4095. If the direction is backwards, reverse the S1 and S3 leads of the resolver where they connect to the M4510 module. If the position is not linear (increments up then down or does not increment through full range), verify that the resolver leads are all connected correctly.

2.9.4 SET MAIN CRANK ZERO

Inch the main crank of the bodymaker to back dead center (BDC) and set the M4510 offset by pressing the "Zero Main Crank" push-button inside the HSL-WISVCUP enclosure.

2.9.5 VERIFY CUPFEED CAM RESOLVER

From the "Cupfeed Cam Time/Position Diagnostics" menu of the setup program, observe the actual cupfeed cam position. Verify that the cupfeed resolver direction is correct and is linear by pulling the cupfeed cam forward by hand. The position should increment linearly through the range of 0 to 4095. If the direction is backwards, verify the resolver is wired per the schematic at the back of this manual. If the position is not linear (increments up then down or does not increment through full range), verify that the resolver leads are all connected correctly.

2.9.6 TIME CUPFEED CAM TO MAIN CRANK

Prior to timing the cupfeed cam with respect to the main crank, pull the cam forward through at least one complete revolution with the target on the cam passing the timing sensor.

Perform the following to time the cupfeed cam with respect to the main crank:

- 1) Inch or bar the ram to the position where the punch has just opened to the point where the cup could first be loaded (this is when the ram is on the back stroke). See figure 3.

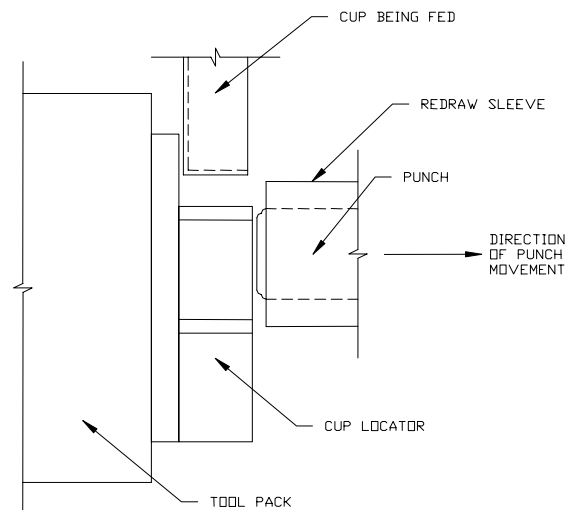


Figure 3 - Location of Ram at "Cupfeed Time" Position

SECTION 2 INSTALLATION

- 2) Using the "Manual Cupfeed" push-button, feed one cup into the cupfeed cam and rotate the cam by hand until the cup is fully loaded into the cam. Rotate the cupfeed cam (with the cup loaded) into the position where the cup would first be loaded into the cup locator (see figure 4).
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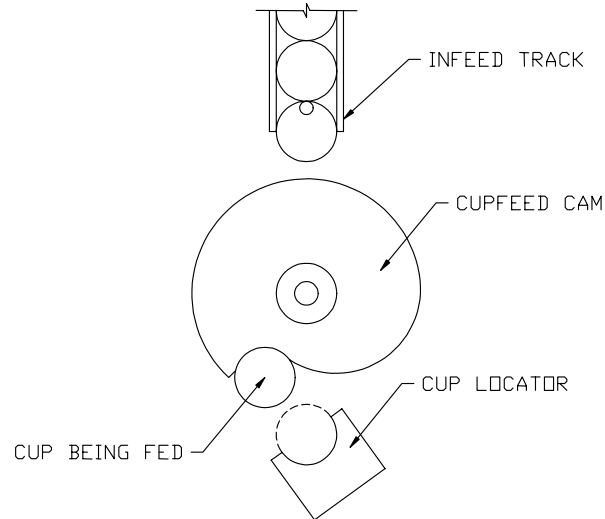


Figure 4 - Location of Cupfeed Cam at "Cupfeed Time" Position

- 3) With the cupfeed cam located as described above, press the "Home Cupfeed Cam" push-button inside the HSL-WISVCUP enclosure. Make sure the cupfeed cam does not slip from the "cupfeed time" position when performing this step.
- 4) At this point in time, the cupfeed cam is timed with respect to the main crank such that when the machine is running the cupfeed cam will be in sync with the main crank and load the cup when the ram has just opened up.
- 5) The previous steps will automatically set the "Cupfeed Cam Home Position" by calculating the cupfeed cam offset relative to the main crank position.

2.9.7 VERIFY CUPFEED TRACKING

By inching the machine, verify that the cupfeed does track (follow) the main crank. Verify that the cupfeed is correctly in time with crank in all crank positions.

If the cupfeed oscillates wildly or does not follow the crank, verify that the PID gains are set correctly (see section 2.9.1 – Default Set-up Variables). If the gains are set correctly, verify that the motor stator wiring and feedback wiring are correct (see schematic at the back of this manual). If they are correct, verify that the analog command reference from the S4520-RDC to the B25A20 is not swapped (see schematic at the back of this manual).

2.9.8 VERIFY MACHINE OPERATION

Run the machine in normal production (both at low and high speeds where practical) and verify that the cupfeed cam does track the main crank in both inch and continuous modes.

Note: After power-up, the cupfeed cam will automatically time itself when the machine is first run (in inch or continuous). The cupfeed cam will rotate at a slow speed until it passes the timing sensor and then will start tracking the main crank.

Verify that the cupfeed cam does stop immediately at the detection of a short can or tear off (no longer in sync with the ram). The position the cupfeed will stop at is set by the "Cupfeed Stop Position at Short Can" parameter (see section 4.6.1 – Windows Setup Program Reference or section 5.3 – DOS Setup Program Reference).

Verify that the cupfeed solenoid feeds cups properly.

Note: The positive cupfeed sequence is different than that of the standard cupfeed. With the positive cupfeed, the first can is punched on the second stroke after the cupfeed is opened. Two additional strokes will have to be made (with air strip and die protect enabled) after the cupfeed is turned "off" to process the cups in the cam. Modify the existing PLC die protect and cupfeed logic as necessary to achieve this. The HSL-WI6 high speed logic option performs the cupfeed logic as outlined in the preceding sequence.

SECTION 2 INSTALLATION

Verify that the Cupfeed Cam is disabled in BAR mode. Activate the clutch in Bar mode and verify that the C1 contactor for the servo amplifier is not activated. This makes sure that the Cupfeed servo motor is disabled while activating the clutch in Bar mode.

The Machine Is Now Set-Up And Ready To Run!