

High Speed Notcher

July 24, 2008

Issues / Problems / Challenges

- Competitive forces require higher throughput targets, shortened settling time is crucial.
- Variable loads up to 18:1 inertia mismatch
- Operator safety is important
- Competition was gearmotor from SANKYO with DeltaTau commanding motion in torque mode

Solution

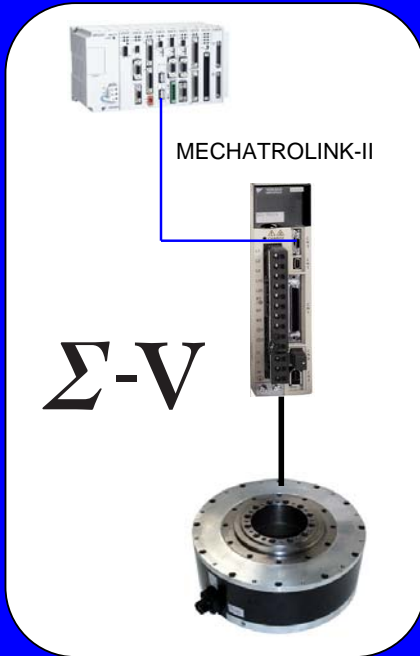
Controller: MP2200
Controller Software: MotionWorks v6
Servo: Sigma-5 (Direct Drive)
Power Level: 3.0 kw
Voltage Level: 230 VAC, 1 Ph.

Performance Achieved

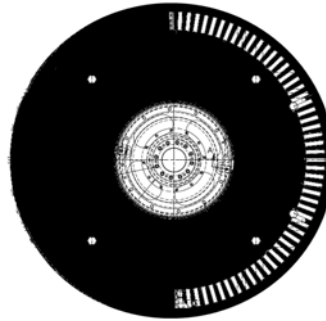
Throughput: 300 - 1200 Strokes Per Minute
Move Distance: 2 to 22 degrees Index
Inertia Mismatch: range: 2:1 to 18:1
Part Diameter: 15" to 50"
Accuracy: +/- 0.001"
Settling Time: 10 msec

Customer Information

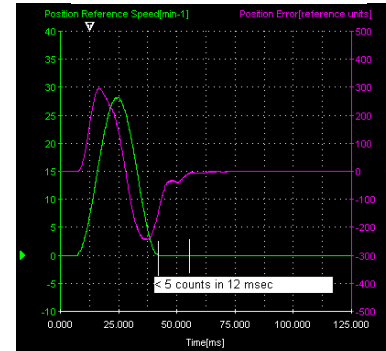
Industry: Metal Stamping
Application: Dial Table Notcher



End Product



1200 spm test graph



Machine Cycle:

- Index distance
- In-Position window signals stamp operation
- Repeat Index
- > Different part sizes usually mean different gains, but with Sigma-5, only change one parameter at recipe download.

Application Description

This OEM is entering into the market of High Speed Notchers. They decided to use a Yaskawa Direct Drive motor because of the published accuracy of +/- 15 arc-secs. An MP2200 is used to scan logic at 0.5 msec with a MECHATROLINK-II network update rate of 0.5 msec. The Axis is camed off the press encoder with speeds up to 1200 stokes per minute. Inertia ratios at slower press speeds can reach mismatches of up to 18:1. The OEM is tuning for settling into commanded position within 5 encoder counts in a time better than 10 msec. Another servo amplifier was tested with the system prior to using the Sigma-5. The integrator spent multiple days tuning for best performance. Although the system performed well enough to meet most written specifications, further improvement in settling time was still desired. It took less than 30 minutes of tuning for the Sigma-5 servopack to perform noticeably better than the previous system.

Differentiating Solution Features

- Seamless Digital Interface
- Vibration Suppression, Spd & Acc Feed-Fwd
- High Performance Auto-Tuning

Resulting Solution Benefits

- Clean wiring, consistent results
- Higher dynamic response with minimal tuning
- Quick setup & tuning of the Axis with the best possible performance
- Sigma-5 took only 30 minutes to setup
- Change only one parameter when load changes