

Improved Reject for APM Light Testers

As demands for increased productivity and efficiency for can lines increases, the requirement for higher light tester speeds and reduced downtime grows. Being the final machine in the line prior to palletizing, the light tester must be able to outrun the rest of the line. So if a line is rated at 2,000CPM, the light tester must be able to hit top speeds of 2,400CPM or more. This is required in order to clear out the line after a back up. An increase in average line speed of just 100CPM can increase the productivity of the line by: 100 cans per minute X 1,440 minutes per day X 340 days per year X \$.055 per can = \$2,692,800 per year. Over \$2.5 million for just a 100CPM increase.

The APM light tester (formerly Borden's) uses a mechanical reject mechanism to reject defective cans. Air cylinders driven by solenoids activate cam followers which cam odd and even reject fingers into a "reject" position. At high speeds these must be activated as quickly as possible in order to successfully reject defective cans. So dampers or other devices that



HSL-LTA Light Tester Reject Package

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Stopping Cuppers and Bodymakers Accurately

On cupping presses it is desired to have the press stop at Top Dead Center (TDC) during normal stops (e.g. line standby etc). This is true for bodymakers as well where the press should stop at Back Dead Center (BDC) during a non-emergency type stop. For cuppers, this allows the machine to develop enough momentum when the machine is restarted to punch the cups on the first stroke. If the punches are too close to the die set when restarted, the press can stall and jam in the tool set. This creates downtime to un-jam the press which can be significant if the press has to be barred backwards out of the tooling.

The same is true for Standun and CMB bodymakers which punch a can on the first stroke. For these machines the press is normally stopped slightly before Back Dead Center (BDC), usually between 300 to 330 degrees. This allows the machine to have enough momentum to punch the first can when it is restarted. With a clutch that inconsistently stops, a simply (and relatively often) stand-by stop can result in additional lost production. A machine that jams at restart from a standby stop, requires

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the operator to manually clear the machine and then restart it. This results in increased downtime, lost production, and work load for the operator.

In general, it is also preferable to have the press stop at TDC or BDC so that the operator has access to the tooling. Additional downtime is created if the operator has to inch the machine to TDC or BDC to access the tooling. This simply because the machine does not consistently stop where needed.

Stopping the press at TDC or BDC is generally achieved using a timing signal from a crank mounted timing unit. The signal is manually set to "time" when the clutch is disengaged when a stop command is issued. As the brake wears, the stopping position becomes longer, requiring the timing signal to be periodically re-programmed by an electrician. In many cases, periodic maintenance needed to maintain the timing for correct TDC and BDC stopping is not performed. This results in the presses simply tending to jam more often, causing increased downtime and less efficiency.

Brake Wear Compensation...

The Systems Engineering high speed logic (HSL) packages for cupping presses and bodymakers in-

corporate a brake wear compensation feature to address this issue. Brake wear compensation automatically adjusts the TDC or BDC timing as needed to achieve consistent stopping at TDC or BDC. The feature is essentially an automatic TDC/BDC timing function that determines the stopping response of the press in degrees. It then automatically reprograms the timing signal such that on the next stop the press stops at the desired stopping location.

The electronic tech simply enters the desired location, in degrees, that the press should be stopped at. Trial stopping runs are then performed in which the system automatically programs the timing signal, homing in on the desired stop point. As the stopping response changes due to brake wear, the timing is automatically adjusted to compensate for the increased response. The system can be set to flag an alarm if the response becomes too long, indicating service to the brake is required.

The brake wear compensation works with variable speed machines such as cuppers by providing multiple compensated timing signals for multiple speed zones. By incorporating brake wear compensation, periodic maintenance for tuning each press manually for correct TDC or BDC stopping is eliminated. This feature is available on all our APM (Ragsdale), Standun, and CMB Bodymaker as well as all our cupping press HSL packages.

For more information circle 2 on the Fax replay form.

New Website www.sea-seg.com now on-line

Our new website is now online at www.sea-seg.com. This site was designed to be a comprehensive resource to obtain general information, data sheets, user's manuals, and the latest set-up programs for all our products.

Product Overviews and Documentation...

The Product section of our website provides information on all our products including: Upgrade packages (HSL/HSM), complete control systems, high performance controllers (the M4500), signal conditioner modules (M200) and more. Brief outlines of each of these are available as well as complete downloadable data sheets in PDF format.

The latest versions of all our user's manuals in

PDF format for each product can also be downloaded from the website. As a matter of fact, www.sea-seg.com is the best source to obtain the most current version of our product documentation as any updates to documentation are immediately uploaded to the site.

New Windows Based Set-up Programs...

We now have Windows based set-up programs for virtually all our HSL/HSM products. These can be downloaded directly from www.sea-seg.com and installed on your laptop to interface with an HSL/HSM package. These set-up programs are compatible with virtually all Windows operating systems

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limit the impact of activation cannot be used. This results in a system that is prone to wear and possible failure.

The reaction time of this mechanical system also imposes an ultimate speed limitation on the tester. If the tester is run beyond the speed that cans can be rejected, bad cans may be sent down the line. Significant discharge jams can also occur resulting in corresponding downtime to clear the jams. Attempts to light weight the reject mechanism are costly and only marginally increase speed while adding no benefit with regards to maintenance.

To compound the problem, the integration of vision inspection systems into the light tester dramatically increases the number of rejects. An increase of a magnitude or more is not uncommon as the proportion of visual defects is much higher than leakers. Maintenance and unexpected failures are now much more of an issue.

If the mechanical reject mechanism could be replaced with a higher performance system, the door would be open to greater line speeds. A significant reduction in maintenance and downtime could also be attained. The HSL-LTA and HSL-LTS packages are Pneumatic Reject packages, which can achieve this very result.

Description of Operation...

The Pneumatic Reject package replaces the mechanical odd/even reject mechanism with a reject blow-off manifold mounted in the tester discharge track-work. Two packages are available: the HSL-LTA and HSL-LTS. The HSL-LTA is used to reject aluminum cans up out of air tunnel or gravity discharge track-work. The HSL-LTS is used to reject steel cans down off an existing discharge magnetic conveyor. These packages can be used on any of the APM LT-8, LT-10, LT-12, or LT-16 Light Testers.

The package interfaces to the existing leak detection array receiver and tracks detected leak cans to the new blow-off location in the tester track-work. Here the defective cans are accurately rejected regardless of machine speed. For light testers equipped with an integrated vision system, visually defective cans are also tracked and blown-off at the same blow-off location. Production counts for both the current and last shift are collected as well. These include: total number of cans tested, total number of

leaker rejects, total number of vision rejects, and the total rejects per pocket.

Advantages...

The primary advantages of the Pneumatic Reject package are an increase in machine speed and reduction in downtime and maintenance. The Pneumatic Reject is rated in an excess of 3000 CPM. Thus the ultimate top speed of the tester is no longer limited by the reject mechanism. This opens the door for 100, 200, or even 300CPM top speed increases. Top speed now depends on the remaining mechanical limitations such as track-work, tester main motor and gearbox, main cam, etc.

With the Pneumatic Reject, the only moving parts are two solenoid spools that move .050". The balance of the mechanical reject moving parts, along with the corresponding maintenance to keep these parts operational, is eliminated. Moving parts removed include the cam followers, air cylinders, and reject fingers. This reduces the cost to maintain the tester as well as unexpected downtime to repair a failed reject mechanism.

New Features...

Some of the new features introduced on our latest Pneumatic Reject packages include: an optional *Rejected Can Verification* feature. This verifies that when a defective can is told to reject that it does indeed go down the reject chute. This consists of two thru-beam photo-eyes located in the reject chute, which "see" defective cans as they pass through the chute. This verifies the reject system is fully operational and that no bad cans are passed down the line.

The optional *Leaker versus Diverter* solenoid physically separates rejected leaker cans detected from the array heads from visually defective cans rejected by the vision system. This diverter is mounted in a split reject chute equipped with a leaker channel and vision reject channel. When a can is rejected, it is diverted to either the leaker channel or vision channel based on the reject source. If a can is detected both as a leaker and vision reject, it is diverted to the vision reject chute. This allows cans to be inspected based on what type of reject they were.

The *Communications Option* allows the shift counts to be read by either a host Allen-Bradley, Modicon, or Siemens TI PLC. This information can then be passed on to higher-level plant monitoring systems for production analysis.

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including Windows 95, 98, ME, 2000, and XP.

In addition to simply providing a windows environment to view and alter the set-up variables of a respective HSL/HSM package, the windows programs generally provide additional features the DOS set-up programs did not contain. These include: comprehensive help menus which actually walk you through the set-up process; enhanced production data display; additional alarm and status displays; general interface features such as module fault code read and program ident, checksum, and revision reads, etc.

To download one of the new windows based set-up program, click "Documentation" from the main navigation bar, then click "HSM/HSL Set-up Programs" then select the package you want to download the set-up program for and follow the directions on the "HSM/HSL Set-up Programs by part number" page to download and install the program

on your laptop.

General Information...

The website also provides links to the services we provide including: engineering, on-site installation and start-up, customer training, as well as our repair services. The current copy of the "Systems Solutions" newsletter (just like the one you are reading here) as well as archives of previous copies of the newsletter are also available. A "What's New" link will provide information on new products just released as well as improvements to existing products. A "Contact" link provides an easy way to send us an email if you can't find what you are looking for or are requesting price and delivery on one of our products. So please visit us on the world wide web at www.sea-seg.com.

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- 2** - *Stopping Cuppers and Bodymakers Accurately*
- 3** - *New Website www.sea-seg.com now on-line*

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or call Jenene Novotny at: (303) 421-0484

or email at: contact@sea-seg.com

Founded in 1965, Systems Engineering Associates, Inc. has been designing and developing control systems for the two-piece metal container industry from the industry's very inception. From the development of the very first machines to today's latest generation of equipment, Systems Engineering has been there to provide the highest degree of excellence in machine control.

"Systems" either has the solution or can develop the solution for your control system needs from supplying electronic sub-assemblies to complete control systems including start-up assistance, service, and customer training. Call us today for more information.

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