> ## HSL-LTS
> ## ALCOA Light Tester
> ## Pneumatic Reject Control (Steel Can)

The Systems Engineering HSL-LTS Light Tester Pneumatic Reject Control package replaces the existing odd/even mechanical reject mechanism on Alcoa Light Testers testing steel cans with a reject blow-off solenoid mounted on the tester discharge magnetic conveyor providing the following benefits:

◊ **Increased Production:** By eliminating the mechanical reject, and thus the limitations of speed imposed by the response time of the mechanical reject mechanism, significant increases in speed can be achieved.

◊ **Reduced Downtime:** Eliminating the mechanical reject eliminates can jams caused by intermittent or poorly operating reject mechanisms thus reducing scrap and downtime to clear can jams in the machine.

◊ **Reduced Maintenance:** Removing the mechanical reject eliminates maintenance issues relating to the mechanisms such as worn or sticking actuators, worn air cylinders, etc.. Cost of maintaining and time involved in trouble-shooting these mechanical issues is eliminated as well.

◊ **Quick Pay-off:** With the potential increase in speed that can be realized, the HSL-LTS typically pays for itself in just a few months.
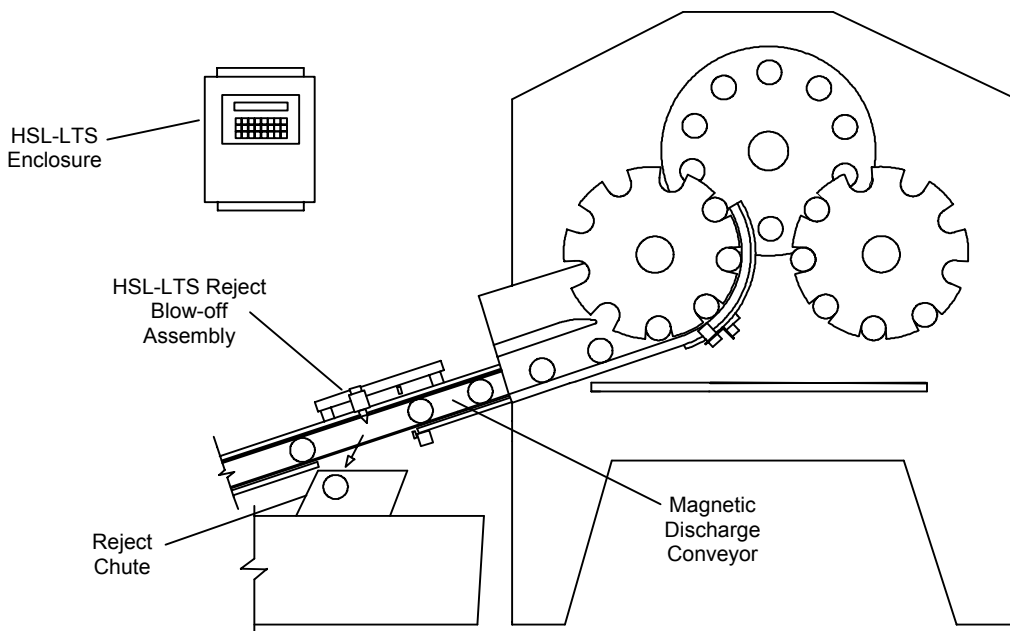
Features

- Replaces existing odd/even mechanical reject mechanism with a reject blow-off solenoid assembly mounted on the discharge magnetic conveyor of the tester to reject leak steel cans. Proprietary logic tracks cans from the leak detection array receiver to the blow-off location on the conveyor and accurately rejects leak cans at all speeds.

- Performs high-speed control functions of Alcoa Light Tester to speeds in excess of 3,000 Cans Per Minute (machine mechanically permitting). This includes detection of leaker cans (interfaces with existing Leak detector arrays), rejection of leaker cans, alarm detection as well as data acquisition.

- Optionally excepts reject input from vision inspection systems to incorporate rejection of inspected cans with leaker reject blow-off solenoid.

- Upgrade package which interfaces with existing control system which includes: 14" X 12" X 8" control enclosure with Reject Control Module, Reject blow-off assembly (to be mounted on the discharge conveyor of the tester), Can Presence sensor and Resolver (to replace existing encoder for timing).

- Performs the following control functions:

  - Interfaces with existing leak detector arrays to detect leak cans.
  - Tracks cans from leak detector to discharge mounted blow-off assembly to reject leak cans.
  - Optionally interfaces with vision inspection systems to reject visually defective cans.
  - Alarm detection: leak detection array fault, tester discharge can jam/back-up, timing signal failure, can presence sensor fail, photo eye lenses dirty fault, and missed reject detection (option).
  - Data Acquisition: Total number of good cans tested, total number of leaker rejects, total number of vision rejects, rejects per pocket, etc. (for both current and last shift).

General Description

The HSL-LTS Alcoa Light Tester pneumatic reject control package is an electronic upgrade for the Alcoa Light Tester which replaces the existing mechanical odd/even reject mechanism with a reject blow-off solenoid mounted on the tester discharge magnetic conveyor thus allowing significant increases in speed. The package interfaces to the existing leak detection array receiver, tracks detected leak cans from the receiver to the blow-off location on the tester discharge conveyor, and accurately rejects the leak cans regardless of machine speed.

The control package is not a dedicated "black box", but instead is implemented using the high performance Systems M4503 PLC/PLS module which allows easy customization by either SEA or the end user. The module is programmed using the optional "SYSdev" (DOS based) software programming package which allows programming in any combination of Ladder Logic or high-level (subset of "C"), as well as perform on-line monitoring and trouble-shooting. The module incorporates a built-in PLS which interfaces directly with the machine-mounted resolver and provides all machine timing, eliminating the need for an external PLS.

Leaker Reject Blow-off System

The package incorporates a reject blow-off assembly which is mounted on the tester discharge conveyor to reject detected leak cans. This replaces the existing mechanical odd/even reject mechanism thus allowing significant increases in speed. By eliminating the existing mechanical reject, limitations of machine speed relating to the response time of the mechanical reject are eliminated. The blow-off reject system is capable of accurately rejecting cans at speeds in excess of 3,000 Cans Per Minute. Maintenance issues relating to the mechanical reject system (i.e. worn or sticking mechanical mechanisms, worn air cylinders, etc.) which result in missed rejects or intermittent can jams are eliminated as well. Light weighting of the discharge starwheel is achieved by removal of the mechanical reject, thus aiding in the potential increase in speed.

The reject blow-off assembly consists of a bracket equipped with a high-speed blow-off solenoid and a fiber optic photo eye which is mounted on the tester discharge conveyor. In conjunction with a machine mounted Can Presence sensor and resolver, leak cans are tracked from the leak detector to the reject blow-off assembly where the cans are rejected.

Vision Inspection System Reject

The package can optionally except a reject signal from a vision inspection system and reject these cans at the same discharge mounted reject blow-off solenoid. The vision system reject signal must occur between the infeed load location on the tester and the discharge of the tester. The vision reject signal must also be synchronized with the machine.

Alarm Detection

The package detects the following alarms: *Leak Detection Array Fault, Tester Discharge Can Jam/Back-up, Timing Signal Fail, Can Presence Sensor Fail*, *Photo Eye Lenses Dirty Fault* and *Missed Reject Detection (option)*. The *Leak Detection Array Fault* occurs when a fault in a leak detector array head occurs. The *Tester Discharge Jam/Back-up* is generated if either a jam or back-up occurs at the discharge of the tester or if the Reject Photo Eye fails.

The *Timing Signal Fail* occurs when any of the timing signals generated in the PLS section fails to change state periodically while the machine is running. *Can Presence Sensor Fail* occurs when the sensor fails to detect cans while cans are flowing through the machine. The *Photo Eye Lenses Dirty Fault* indicates that the lenses of the photo eye mounted on the Reject Blow-off assembly are contaminated and need to be cleaned or are damaged and need to be repaired. The *Missed Reject Detection* occurs when a can is not detected as being rejected when the reject blow-off is activated. This alarm is implemented using the optional HSL-LTRV reject verification sensors which are mounted in the reject chute.

"HSMLT" Setup Program

The "HSMLT" setup program allows the user to easily view the HSL-LTS data or alter the HSL-LTS setup variables using an IBM PC or compatible. These variables include: Can Presence to discharge number of shifts, leak detector to discharge number of shifts, vision reject to discharge number of shifts, Can neck size, Reject pulse time, and the machine timing set-points. In addition to setting the variables, "HSMLT" can be used to view the current and last shift data, view the rejects per pocket, download the HSL-LTS application program to the M4503 as well as download and upload the setup data to the M4503.

Data Collection

The following data is collected for both the current shift and the previous (last) shift: Total number of good cans tested, total number of leak cans rejected, total number of vision rejects, and the total rejects per pocket. This data is viewed on the display of the HSL-LTS. The information is updated ("current" shift transferred to "last" shift) based on the change of state of a discrete input.

In addition to the shift data collection, a separate buffer is available to collect rejects per pocket counts as a diagnostics aid to the operator for trouble-shooting a light seal problem on a specific pocket. Unlike the shift data, these counts can be reset manually by the operator at will. This allows the operator to note an abnormally high count on a specific pocket, attempt to correct the problem, reset the counts and then check the counts at a later time to determine if the problem is corrected.

HSL-LTS Keypad / Display

The HSL-LTS package is based on the M4503 PLC/PLS/Display module. The keypad of the M4503 contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the M4503 is a 2 line by 40 character back-lit LCD display which displays the selected data and setup menus. The keypad/display can be used by the operator to view the current and last shift data as well as the rejects per pocket diagnostic data. In addition, the keypad/display is used to activate the Reject Blow-off Solenoid test feature and can be used by authorized personnel (passcode or key switch protected) to adjust the timing and all setup parameters.

Tester Requirements

The reject blow-off assembly is mounted at the immediate exit of the tester. The can is rejected down off a magnetic conveyor located at the discharge of the tester. If the tester does not already have a magnetic conveyor at the immediate tester exit (such as a gravity track instead), one will have to be added. The reject blow-off assembly is mounted on this magnetic conveyor and blows the can down, either into a reject chute or bucket. The magnetic conveyor and reject chute are not provided as part of the HSL-LTS package.

Specifications

Power Requirements:
Voltage: 100-240VAC, 50/60HZ
Current: 0.5 Amps @ 115VAC
          0.25 Amps @ 230VAC

Voltage: +24VDC
Current: 2.0 Amps

Compressed Air: 90-110psi @ 0.25 SCFM

Temperature Ranges:
Operating: 0 to 55°C
Storage: 0 to 70°C

Resolver Interface:
Resolver Type: Systems Electronics Group RSV34-MS1
Resolver Cable: Systems Electronics Group RSV-RSCBLE-XX

Control Inputs:
Voltage Range: 10-30VDC
Input "On" Voltage (min):   10.0 volts
Input "On" Voltage (max):   30.0 volts
Input "Off" Voltage (max):   5.0 volts
Input Current (max): 15 milliamps @ Vin=30V
Optical Isolation: 1500 Vrms

Outputs:
Voltage Range: 10-30VDC
Output "On" Voltage (min): VCC-2.00 volts
Output "On" Voltage (max): VCC-0.25 volts
Output "Off" Voltage (max): 1.5 volts
Output "On" Current (max-cont): 0.5 Amps DC
Output "On" Current (100msec): 3.0 Amps DC
Optical Isolation: 1500 Vrms

Ordering Information

The HSL-LTS package includes a 14" X 12" X 8" NEMA 12 enclosure which should be mounted in close proximity to the tester. An addition, a reject blow-off assembly is provided which is mounted on the discharge conveyor of the tester. The order number for the HSL-LTS is as follows:

Part Number	*Description*
HSL-LTS	Alcoa Light Tester Pneumatic Reject Control package (for steel can) including the following:

1ea.	HSL-LTA/LTS Enclosure (14" X 12" X 8") with M4503 Reject Control Module.
1ea.	BRK-LTB-SOL Reject Blow-off Assembly with blow-off solenoid and Fiber Optic Photo Eye.
1ea.	BRK-LTB-HD Hardware Kit including mounting brackets.
1ea.	BRK-LTB-PRX Can Presence Sensor
1ea.	RSV34-MS1 Resolver
1ea.	RSV-RSCBLE-100 Resolver Cable
1ea.	HSL-LTA/LTS User's Manual
1ea.	HSL-LTA/LTS Program Disk
1ea.	M4500 User's Manual

HSL-LTS Options *(purchased separately)*

Part Number	*Description*
HSL-LTRV	Reject Verification Sensors (to be mounted in reject chute)