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Pin Insertion & Spring Test Unit

This unit was manufactured for a major European automotive sub-supplier. The task is to feed and insert two aluminum cylinder pins into automotive door-locks for Opel (division of GM) and to simultaneously verify, that springs are present in the door-lock. There are right- and left door-locks, as well as locks for front- and rear doors.

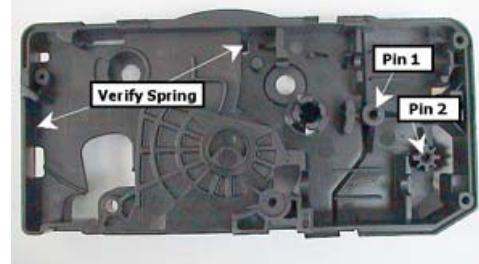
The cycle time for one completed part is approximately 5 seconds.

The palletized door-lock arrives at the first Test station (part identification/verification). The door lock is identified as right/left door-lock and front/rear door lock. The station also verifies that one or two springs are present in the door-lock. The front door-lock requires one spring and the rear door-lock requires two springs.

Once the verification process is completed, the door-lock is transported to a buffer stop position. A buffer stop was required to maintain a sufficient quantity of door-locks in the queue and to help reduce the overall cycle time.

Next the door-lock pallet is stopped at a lift/locate-station and precisely positioned below the press-insertion devices.

Simultaneously, a vibratory feeder presents two identical aluminum press pins via a horizontal vibratory linear track to a Pick & Rotate device, which orients and holds the pin(s) in a vertical position ready for insertion. This operation takes place as one pallet leaves the station and the next pallet is in transport. The complete pin feeding and orientation process has a cycle time of 2.5-seconds. The feed system is equipped with a belt-driven refill-hopper and a fill-level indicator.



Spring Verification System



Pin Feeder with dual linear track



Press-Insertion Station 1



Press-Insertion Station 2

Each individual press-insertion station is actuated when the door-lock pallet is in the lift/locate position. The part identification data collected from the "test" station is used to determine whether lock is a right or left, front or rear door lock. The pin-holding device is then indexed in the X-axis to align the pins in accordance with the part identification data. Thereafter, the pins are pushed through the pin-holding device into the product, using a pressure below 50 kg (110 lbs). The complete machine is controlled by a Siemens S7 controller, and equipped with OP-7 touch screen panel for operator interface.



Please click the movie icon to view a video clip!