Lear Assembly Plant Drives Integrated Systems & Quality Assurance

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Lear Corporation’s 94,000-square-foot, four assembly line seating plant in Montgomery, AL is one of the most modern and efficient facilities of its kind. At peak production, Lear builds approximately 1,000 seat sets per day or 73 sets per hour in 56 distinct combinations of colors and options for the Hyundai Sonata sedan and Santa Fe SUV built at Hyundai’s Alabama plant. The assembly lines use a non-synchronous looping conveyor system, with an automated, timed release at each workstation that can be overridden by the operator when necessary.

The focus is on just-in-time delivery. The Lear plant receives an estimate each day of which seat models will need to be built for Hyundai’s scheduled production. About two hours before the seats need to be installed into the cars, Lear receives a live broadcast of the exact production sequence and seat model requirements from Hyundai.

The entire assembly process is managed by an Integrated Systems Design (ISD) PC-based quality assurance system that improves overall seat quality by monitoring the seat assembly and sequencing process. The quality assurance system is interlocked to the ISD conveyor system, to prevent seat movement before each assembly and inspection step is properly completed at a particular workstation.

Read-only RFID tags index the conveyor system’s product tracking. RFID antennas located at each quality assurance station read RFID chips embedded in the seat build fixtures. The quality assurance system electronically displays instructions at critical workstations working in conjunction with the RFID system to provide positive

seat identification and data tracking. Once a “work complete” message appears on the workstation display screen, operators can release the part they’re working on and allow it to move to the next process.

The system allows Lear operators to simultaneously assemble several different types of seats on the same production line. Build sequence numbers and specific work instructions for each seat are displayed at the assembly line workstations. Critical data, such as torque and angle, are recorded and associated with each seat build sequence number and maintained for years, along with each seat’s build record/birth certificate.

As the seats move down the assembly conveyors, the quality assurance system receives various tool, equipment, and operator inputs and determines whether a seat assembly or component is a “pass” or “fail.” This information is used to route defective seats to a repair station, provide notification of defects found at inspection to the operation that caused the defect, and provide a means for tracking internal defects. The quality assurance system automatically sends information to Lear’s ERP system at several points in the assembly process. That information is used to trigger other events in the system and transfer data associated with each seat.

After a set of seats is assembled and placed on a shipping pallet at the Lear plant, they’re wrapped in a plastic bag and bar code labeled. The seats are then transferred to the shipping area and prepared for delivery to the customer. An Integrated Systems Design (ISD) UltraStore mid-load automated storage and retrieval system (ASRS) determines where to store the seats based on the bar code. The system also selects and retrieves seats in the order they’re to be shipped, based upon the live broadcast from the Hyundai plant.

Because the seats are moved exclusively by an automated system from Hyundai’s receiving dock to the assembly line, Lear software directs the ASRS to sequence each truck load of seat sets in reverse broadcast order prior to loading. This ensures that they’ll be delivered in the correct sequence to the assembly line precisely when the appropriate vehicle reaches the seat install locations.

Lear prides itself on achieving 100 percent on-time delivery to the Hyundai plant. The Integrated Systems Design (ISD) material handling equipment and quality assurance system are an integral part of ensuring they maintain their record.

For more information, visit the ISD web site at www.ISDDD.com *[2].*

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