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ISO 9001:2008 CERTIFIED

Car Seat Assembly Workflow System

Introduction

Any automobile manufacturing industry has to have a seat manufacturing & assembling unit that caters to the **custom building of the car seats** as per the **model and variant types**. Seat building looks as a simple part of the car assembling, but the process by itself has a defined workflow with stringent quality checks at various points of the assembling line.
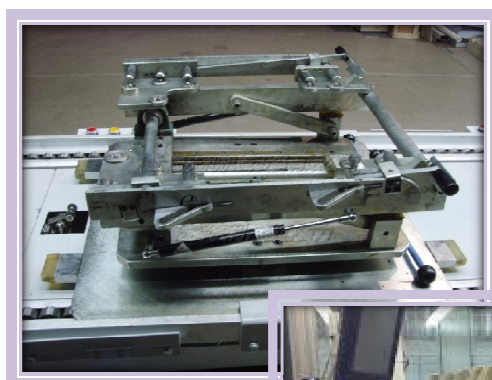
Access has thoroughly carried studied and provided an end to end solution to a reputed seat manufacturing & assembling unit. This document gives a overview of the system.

System Details

The assembling unit has a **main assembling line** with **sub lines** depending on the number of seats required per vehicle and location of placement of these seats in the vehicle.

The assembling line usually is an **automated conveyer line controlled by a PLC.** The conveyer has pallets for placing seat building parts from scratch.

The pallets move through each station where addition of seat parts are done till the final seat is built and quality tested before dispatch.
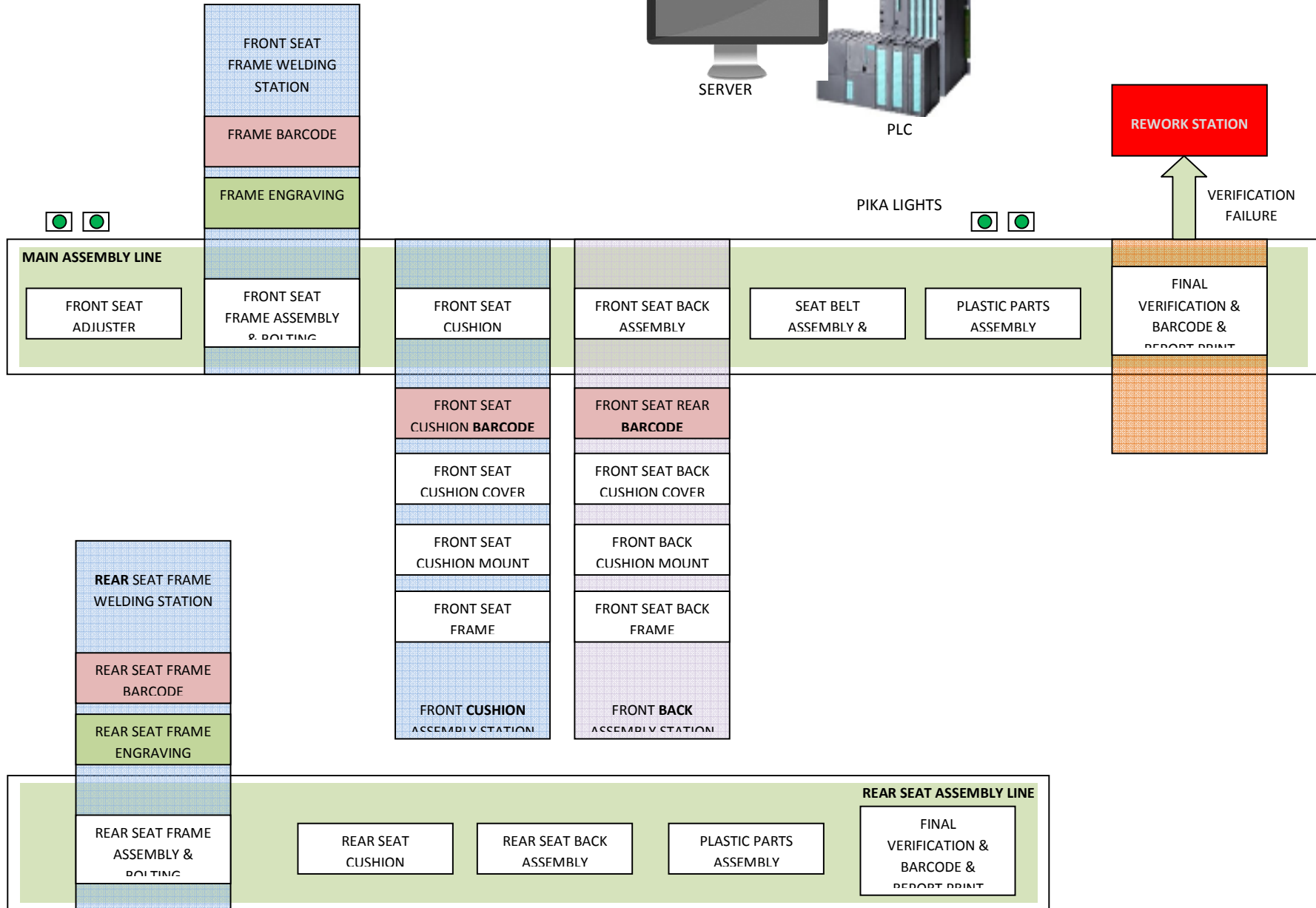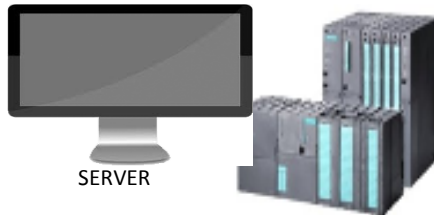

STATION PALLETE

CONVEYER LINE

FINAL PRODUCT

DATASHEET
www.aaplweb.com

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SERVER

PLC

REWORK STATION

VERIFICATION
FAILURE

PIKA LIGHTS

FRONT SEAT
FRAME WELDING
STATION

FRAME BARCODE

FRAME ENGRAVING

MAIN ASSEMBLY LINE

| FRONT SEAT ADJUSTER | FRONT SEAT FRAME ASSEMBLY & BOLTING | FRONT SEAT CUSHION | FRONT SEAT BACK ASSEMBLY | SEAT BELT ASSEMBLY & | PLASTIC PARTS ASSEMBLY | FINAL VERIFICATION & BARCODE & REPORT PRINT |

FRONT SEAT
CUSHION **BARCODE**

FRONT SEAT REAR
BARCODE

FRONT SEAT
CUSHION COVER

FRONT SEAT BACK
CUSHION COVER

FRONT SEAT
CUSHION MOUNT

FRONT BACK
CUSHION MOUNT

FRONT SEAT
FRAME

FRONT SEAT BACK
FRAME

FRONT **CUSHION**
ASSEMBLY STATION

FRONT **BACK**
ASSEMBLY STATION

REAR SEAT FRAME
WELDING STATION

REAR SEAT FRAME
BARCODE

REAR SEAT FRAME
ENGRAVING

REAR SEAT ASSEMBLY LINE

| REAR SEAT FRAME ASSEMBLY & BOLTING | REAR SEAT CUSHION | REAR SEAT BACK ASSEMBLY | PLASTIC PARTS ASSEMBLY | FINAL VERIFICATION & BARCODE & REPORT PRINT |

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Conveyer Line

Automatically movement controlled by PLC. The conveyer line has multiple pallets placed for simultaneous assembling of seat.

Along with automatic control, each station on the line has a manual emergency stop and release buttons.

Proximity sensors are available at each station to detect the presence & absence of Pallets in the station.

Each station is equipped with a Barcode scanner to scan the item barcode before assembling, monitors to show the user the activity that need to be done by the operator at the respective station.

Pika Lights

Pika lights are the new addition to the assembling line. Pika lights are mapped to a items that is required to be assembled. The items vary depending on the model and variant that is being assembled on the line. The respective item lights get lit up automatically when the sensor detects the presence of a palette in a station.

The Pika lights help the operator to pick the right item for assembly. On picking the item, the operator press on the light to confirm the pick.

Advantages

- Increases production efficiency
- Multiple parallel assembly possible
- Guides operators in assembling
- Guides operators to pick the right item and quantity
- Easy to monitor throughput and operator efficiency
- Automatic workflow management
- Sensors automatically detect presence /absence of the palette and communicate with the software

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Workflow Automation

The workflow management software is the heart of the entire system.
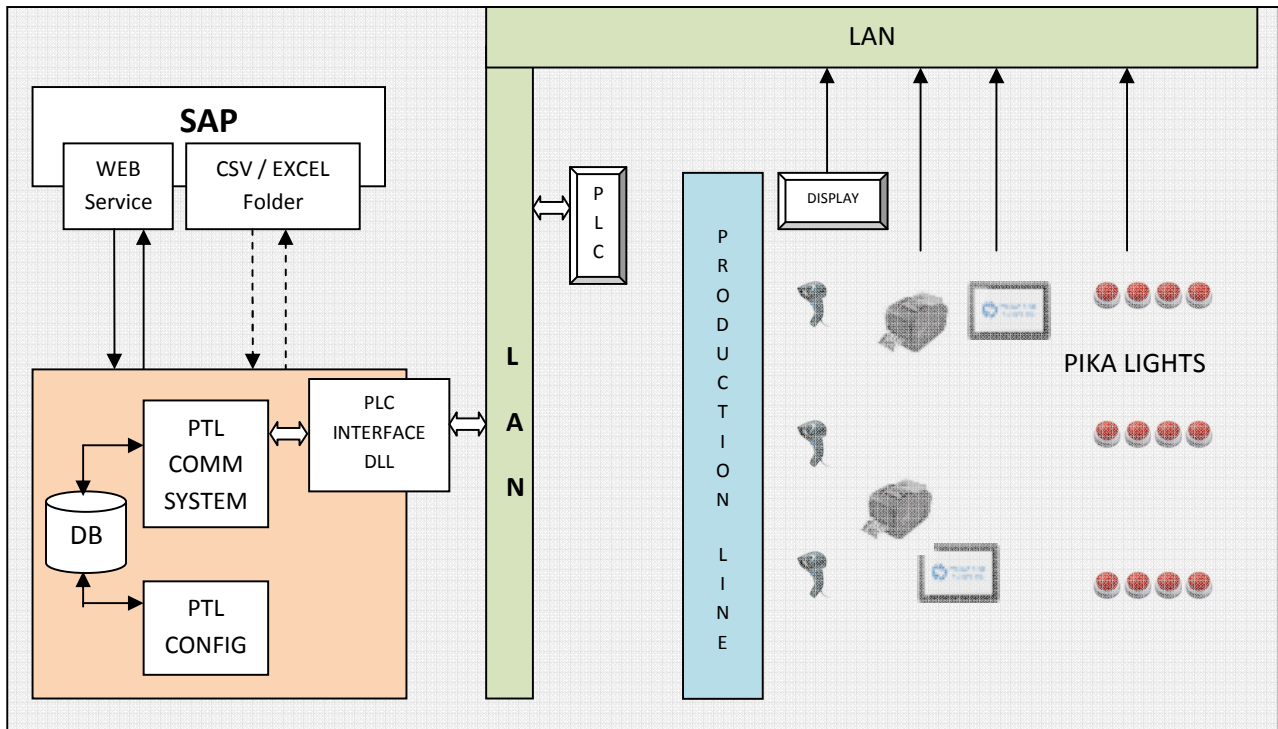
The main system is continuously running on the server. The COMM system is a multi-threaded application with each thread focusing on respective activity.

ERP Connectivity

Latest production data will be available on ERP. COMM System ERP thread continuously checks for new updates via a ERP Web Service.

The latest data is picked to the Production Database for the workflow.

The COMM application reads the production database and whenever a palette is detected in the first station, process is initiated and further flow activities are handled by the respective station modules that are available on station computers.

The basic flow of the system from the initiation till the acceptance of a seat is as follows:

- Fixing of the seat adjuster(movable base)
- Fixing of the Frame
- Bolting the frame to the adjuster [Uses DC Tool]
- Mounting the cushion on the frame
- Mounting the Recliner cushion with frame
- Bolting the Cushion and the recliner frames[Uses DC Tool]
- Mounting the seat plastic parts
- Fixing the seat belt
- Physical verification of the final product
- Generate barcode and detailed report
- Redirect to re-work if verification fails

DC Tool

DC Tool is a power driven bolting tool to bolt seats to frame. The Tool is a part of the Digital device that monitors the number of bolts per seat and displays the Torque value and angle. The value and angle standards are pre-defined in the device and always checks with the permissible values. In case of deviation it indicates failure to the user.