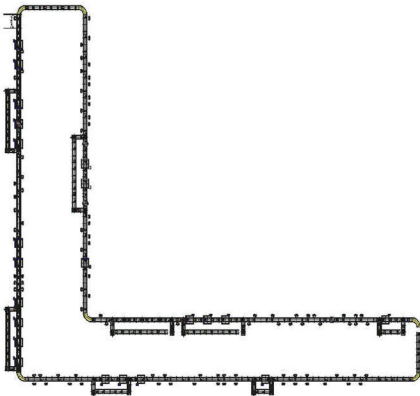


System profile

Engine



01

- 8.1L 2V V8 Engine
- 8.1L 2V V8 Engine
- 8.1L 2V V8 Engine

8.1L 2V V8 Engine

- Capacity: 200,000 / year
- Cycle time: 26 secs
- 365 Meters of ABB MS-7 Conveyor
- (19) Automatic Stations
- (76) Manual Stations
- (84) Operators
- (25) Engine Types
- Job 1: 2000

02

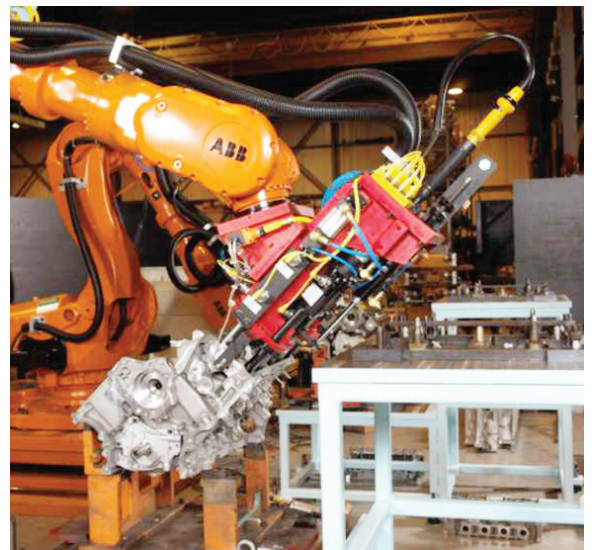


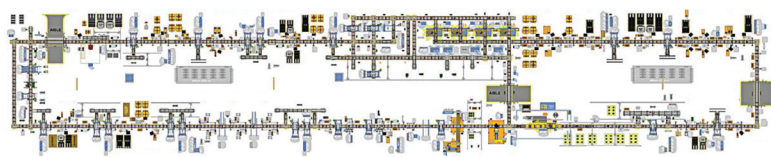
System Reference Engine Upgrade

ABB proved it's customer commitment with:

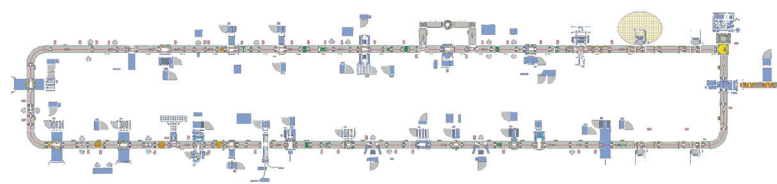
- Modifications done during normal shut-down periods with "0" production issues.
- 12 months ahead of PA timing. 16-month completion.
- Total of 260 stations impacted, 129 new material handling areas and tool packages, 579 linear feet of conveyor.
- Close team work and communication with the customer team. Executive Steering Committee meetings as needed.
- Equipment was pre-assembled and run-off prior to installation.
- Every Monday morning "Job 1"
- Reference: available upon request

03





01



02

- 01 3.5L 24V V6 Engine
- 02 2.7L 24V V6 Engine
- 03 3.5L 24V V6 Engine
- 04 2.7L 24V V6 Engine

3.5L 24V V6 Engine

- Capacity: 400,000 / year
- Cycle time: 28 secs
- 425 Meters of ABB MS-7 Conveyor
- 33 Automatic Stations
- 65 Manual Stations
- 3rd product addition
 - Retool in process
- Job 1: 2002

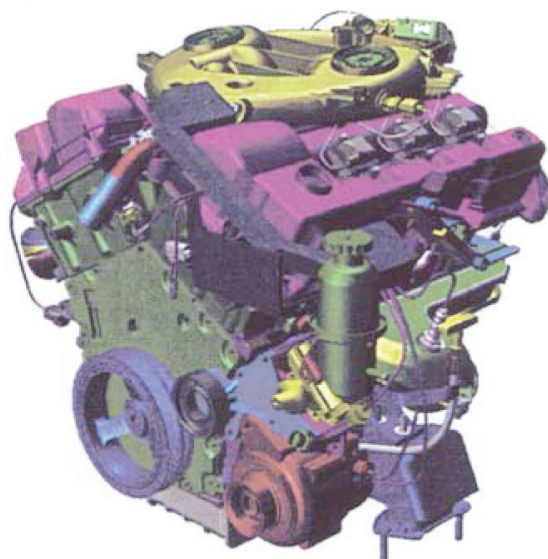
2.7L 24V V6 Engine

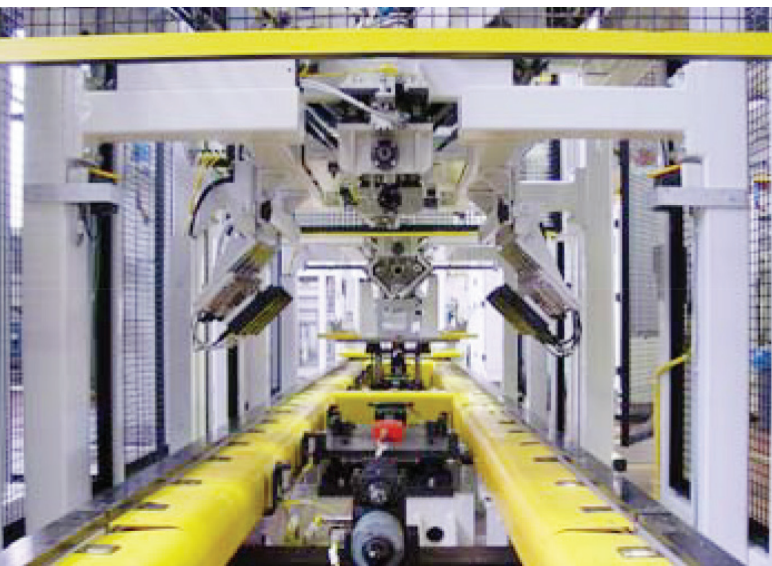
- Capacity/year: 400,000 /2-shift
- Cycle time: 28.8 seconds
- Length/width: 100 meters x 18 meters
- (22) Automatic stations
- (17) Manual stations
- Launched in 1998; Retooled in 2003, 2006

03



04





01



02

- 01 4.6L 4V V8 Engine
- 02 1.4L/2.4L I4 Engine
- 03 4.6L 4V V8 Engine
- 04 1.4L/2.4L I4 Engine

4.6L 4V V8 Engine

- Capacity: 240,000 / year
- 425 Meters of ABB MS-7 Conveyor
- 34 Automatic Stations
- 2 Semi-Automatic Stations
- 7 ABB Robots and Gantries
- 52 Manual Stations
- 59 Operators
- FWD and RWD variants
- Job 1: 2002
- Cycle time: 40 secs

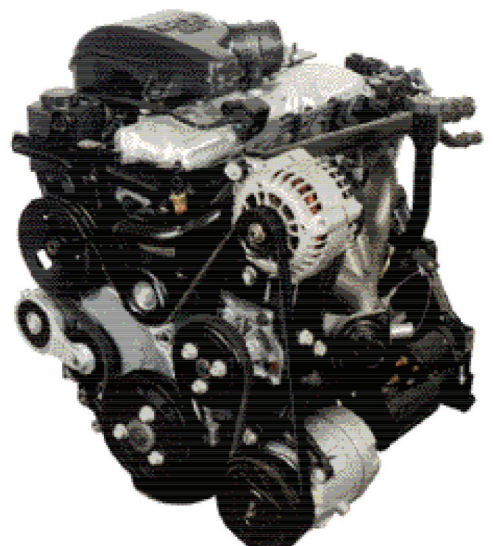
1.4L/2.4L I4 Engine

- Capacity: 125,000 / year
- Cycle time: 2.2 min
- 60 Meters ABB MS-7 Conveyor
- (1) Automatic Station
- (3) Semi Auto Stations
- (22) Manual Stations
- (22) Operators
- Job 1: 2001

03



04



Retool –Engine Assembly –2005/6

ABB provided a complete system solution

- Cycle Time 47 Sec @ 100 % Efficiency
- 250 Pallets
- 1800' Rework Conveyor
- 57 Technicians
- 24 Retooled Auto Stations
- 2 Robots (Gantry) with ABB controls

Components

- ABB Gantry Pallet Load
- Connecting Rod Run Down
- Drag torque and air bearing check
- ABB Spark Plug Gap Test
- Retooled Run Down Machines
- Ability to add Robotic Head Decking
- 3 Retooled Leak Test Machines
- Continuity Test