

## Integration of storage unit into the production line at ZF Lemförder

### ZF Lemförder

- ▶ ZF Lemförder is a market leader in the development and manufacturing of automotive components.
- ▶ Product Range: Differentials, steering systems, axles and chassis components.

### ZF Lemförder South Africa

- ▶ Primarily concerned with the manufacture and supply of differentials for BMW South Africa in the manufacture of the 3-series.
- ▶ Upgraded facilities in 2004 in preparation of the launch of the new 3-series

### Previous storage and operational situation / Disadvantages

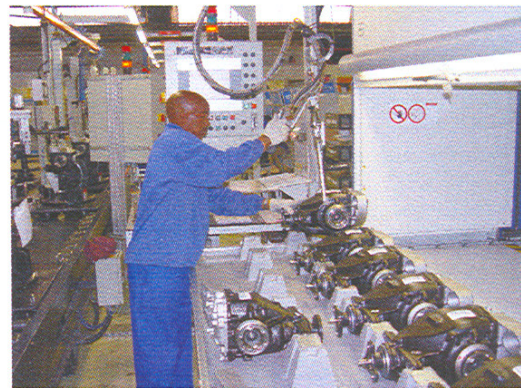
Some of the chassis components of the BMW 3-series are manufactured and pre-assembled at ZF, among them the differential gears. The pre-assembled differentials have to be put into buffer storage with other chassis components before final assembly. Previously, standard racking systems outside the production lines were used for this purpose.

Standard racking system was utilized:

- ▶ Manual storage and retrieval of parts
- ▶ Poor floor space utilization
- ▶ Low inventory control
- ▶ No inventory system (such as FIFO)
- ▶ Walking off production line to store or retrieve parts

### Solution

A Lean-Lift 2060-825/281/238/90/400/ 40 is now used at the end of the gear production line for temporary storage of the differentials. Chassis assembly begins at the rear of the lift. The gear systems can be retrieved from there when needed through a 2nd access point. Each pre-assembled differential is assigned to a specific work order.



The Lean-Lift is 15m high and holds 90 trays (containers). Each container can carry 12 differentials, resulting in a storage capacity of 1080 differentials.

The consultation and installation were carried out by our South African representative Storage Management Systems (Pty) Ltd.



## Design Considerations

### ► Roof Height

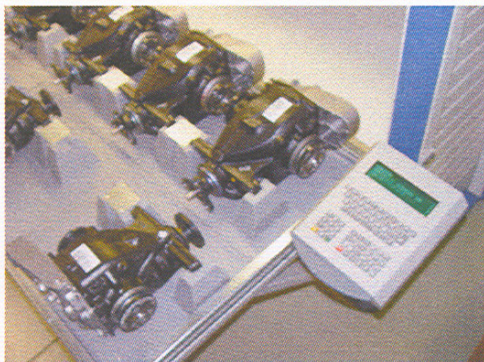
The 15m high machine could not fit into the single storey building. Special modifications had to be made to the existing roof structure.



A roof extension was added to accommodate the lean lift.

### Tray Layout

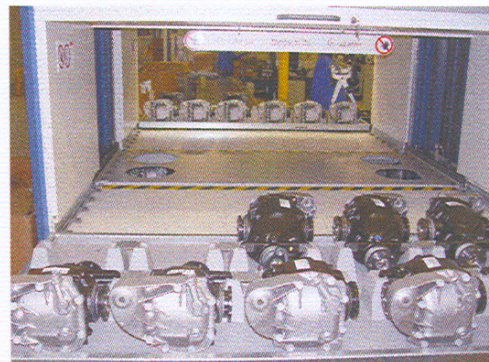
ZF Lemförder further improved on the storage process by creating storage moulds, to ensure that the differentials are fit securely on the tray and can not roll around.



## Advantages obtained

Operational:

- Faster storage and retrieval times
- Convenient ergonomic storage of parts
- On-the-production-line storage, doubling as a buffer storage system
- Parts are stored from one side of the machine and retrieved from the other side, integrating with the production line



## Storage

- Increased inventory accuracy
- FIFO inventory management system employed
- Increased storage capacity
- Optimal floor space utilization