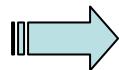


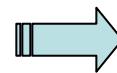
# T20 AP/SP PRESENTATION



## The New T20AP/SP Pallet Truck



- Current Situation
- Driving Position
- A new Tiller Design
- Secured driving area
- Traction control
- Steering control
- Lift control
- Active Castor-wheels
- CAN-BUS Architecture
- Battery locking device
- T20AP New Design



## A Simplified Maintenance

- A simplified Maintenance
- Service visit interval increased



# CURRENT SITUATION

Nowadays, all pallet trucks are delivered with stand-on platform. All of them propose a platform which can be folded.



- ⇒ Therefore, for current application, the “platform up” position is rarely used.
- ⇒ That is why a new concept appears without a foldable platform.

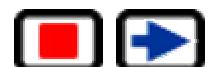
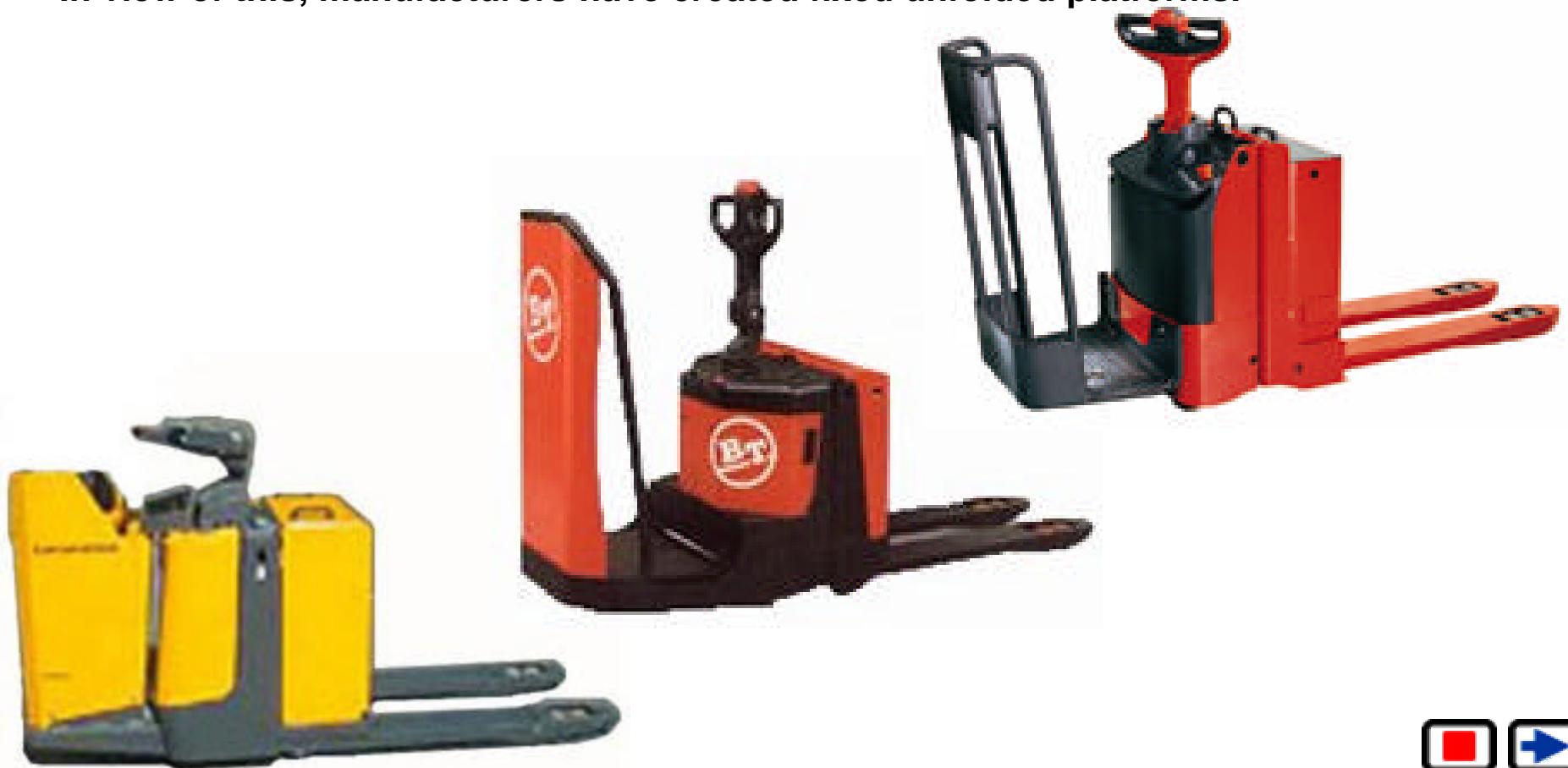


## CURRENT SITUATION

- All of them propose a platform which can be folded.

However, even for manoeuvring, the operator is still using the unfolded platform 97% of the time.

In view of this, manufacturers have created fixed unfolded platforms.



# CURRENT SITUATION DRIVING POSITION

Linde Material Handling



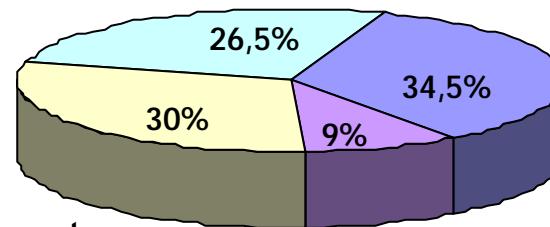
- During the loading / unloading application, the operator's driving positions can be shown as follows:



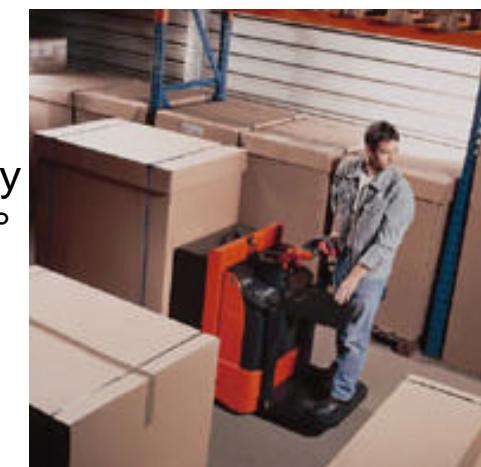
Movement  
and looking in  
forward  
direction



Movement  
with the head  
oriented 90°



Movement  
with the body  
oriented 90°

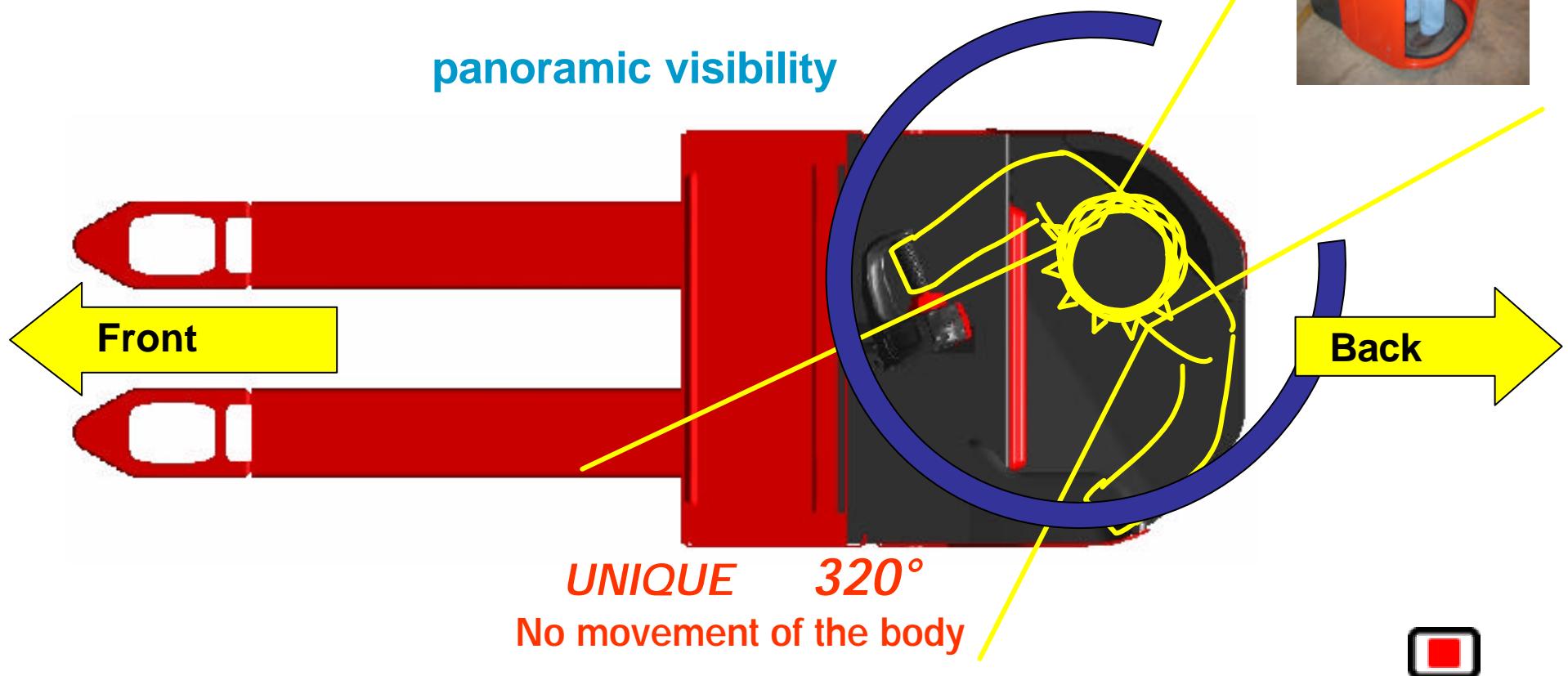




# DRIVING POSITION

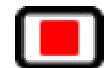
## □ An ideal driving position :

To deal with the 50 / 50 forward & backwards drive, the driving position at 45° is ideal



# A NEW TILLER DESIGN

- Easy access to the driver, it has been redesigned for the 45° driving position
- It can be handled with only one hand
- It still offers a good protection to the operator's hands



# SECURED DRIVING AREA

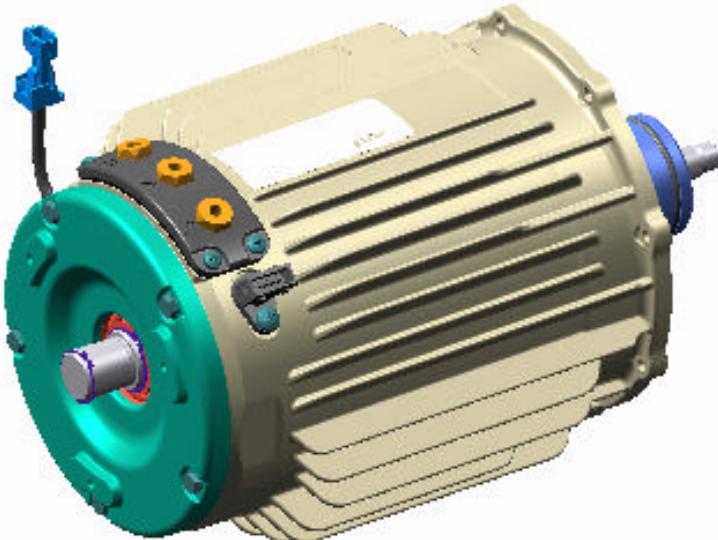
- The enveloping steel shield gives an efficient protection against rear and side impacts
- The low 6 mm steel safety-belt, protects the operator's feet & legs from any truck forks intrusion.
- A wide opening of 420mm offers a very good truck accessibility.
- Platform step is only 165mm above the floor which offers more comfort to the driver.



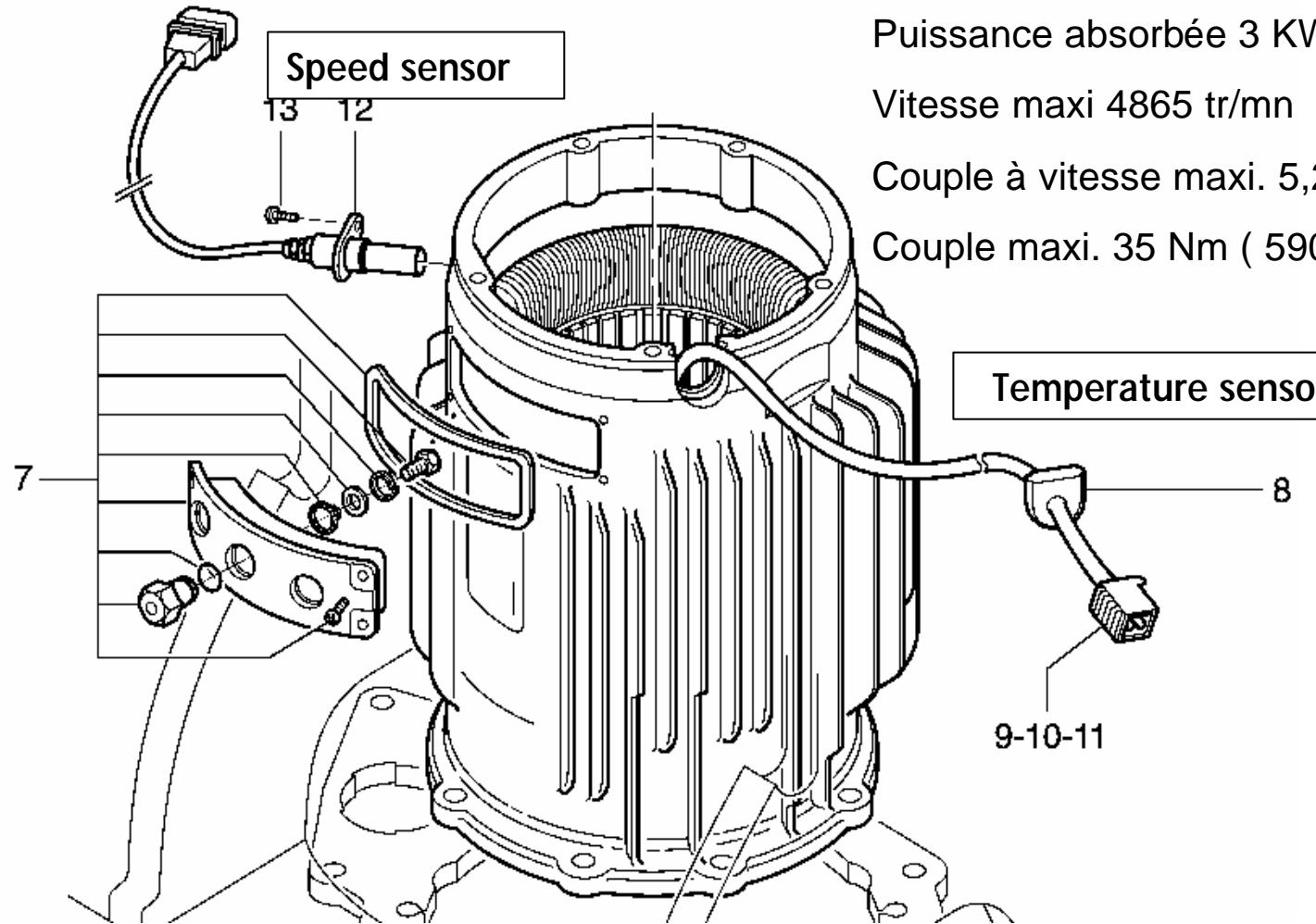
# AC TRACTION MOTOR

New Asynchronous 3kW JULY AC motor (50% more powerful than the 141)

- Continuous & strong motor coupling torque.
- Performance: climbing ability at 13% fully loaded
- Maximum speed of 10 km/h, truck loaded or unloaded
- A powerful acceleration for a maximum speed reached within less than 5 meters



# AC TRACTION MOTOR



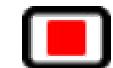
Moteur asynchrone (AC) 24 volts

Puissance absorbée 3 KW

Vitesse maxi 4865 tr/mn

Couple à vitesse maxi. 5,2Nm

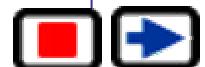
Couple maxi. 35 Nm ( 590 tr/mn )



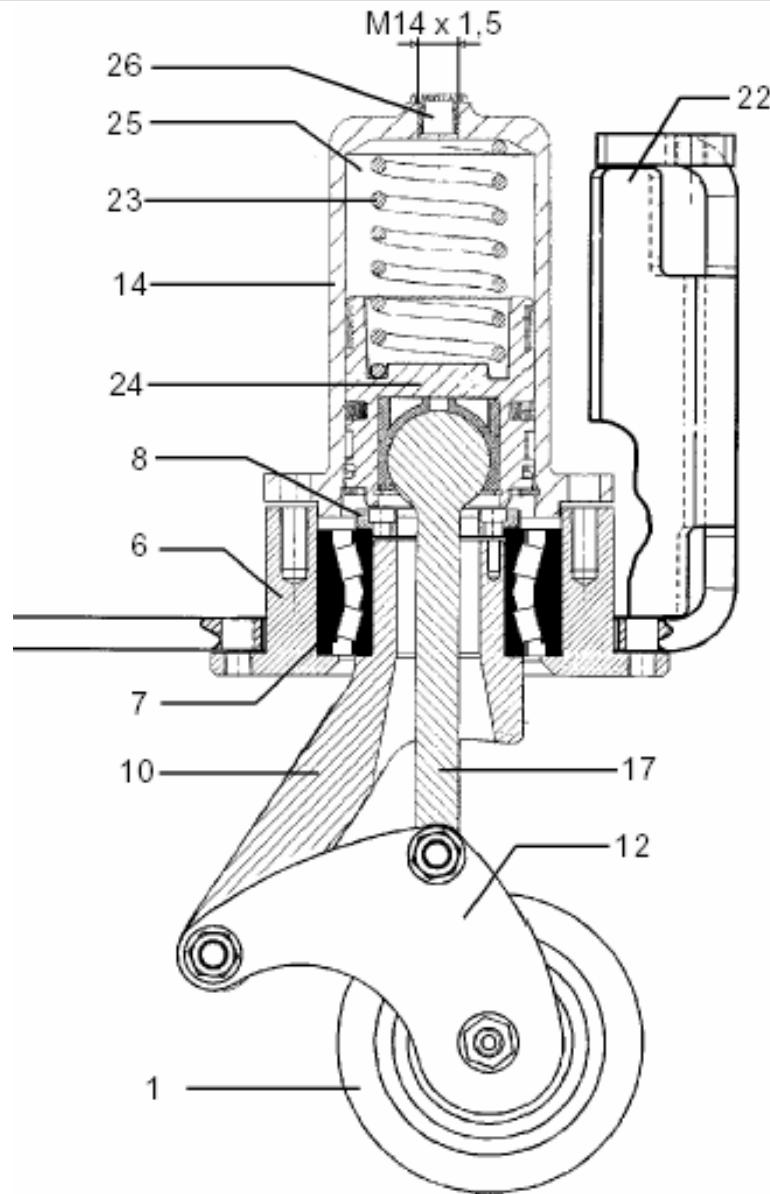
# ACTIVE CASTOR WHEELS



- The fixed drive wheel unit together with electronically controlled stabilizer wheels provide excellent traction & stability.

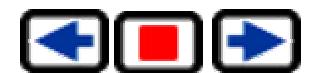
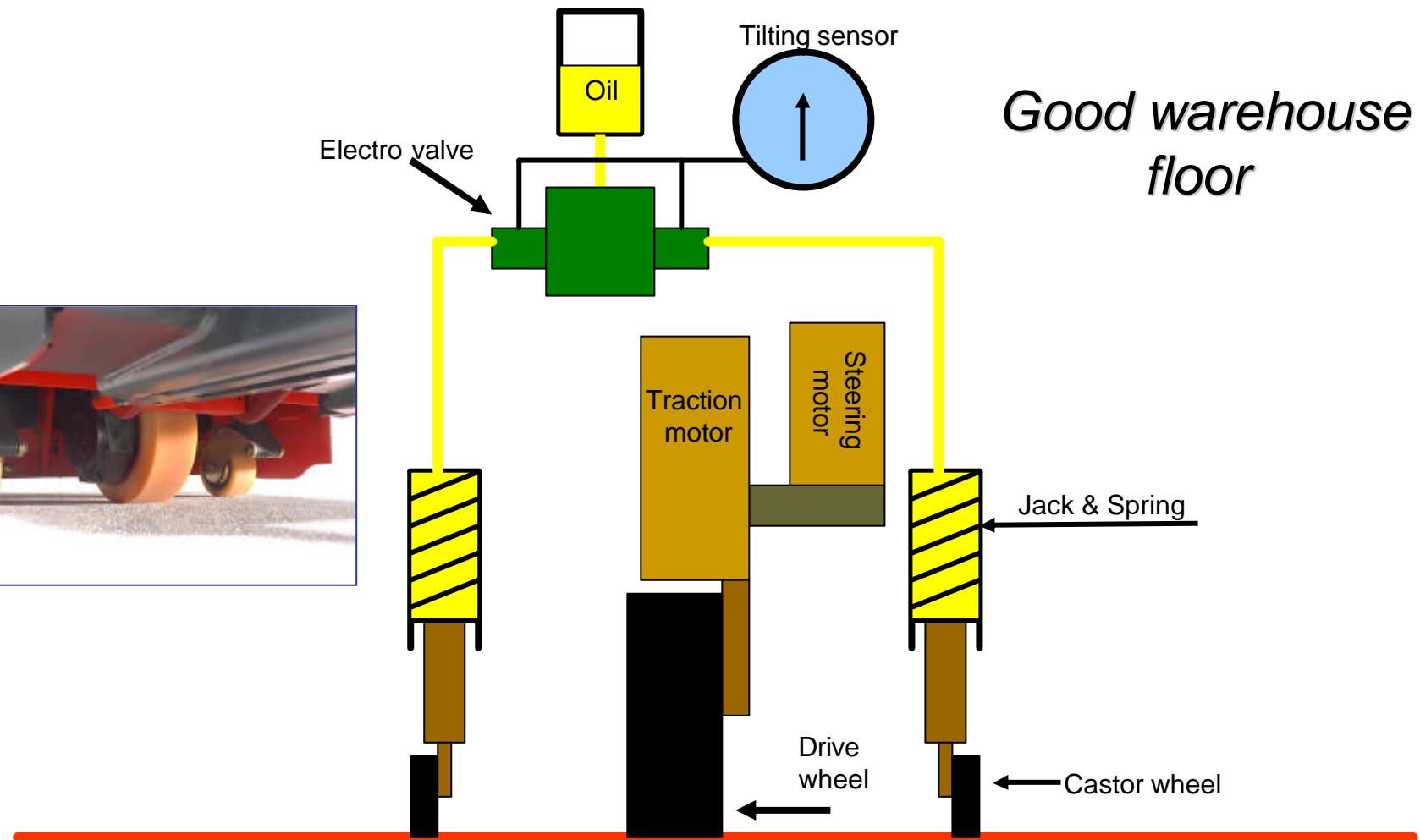


# ACTIVE CASTOR WHEELS

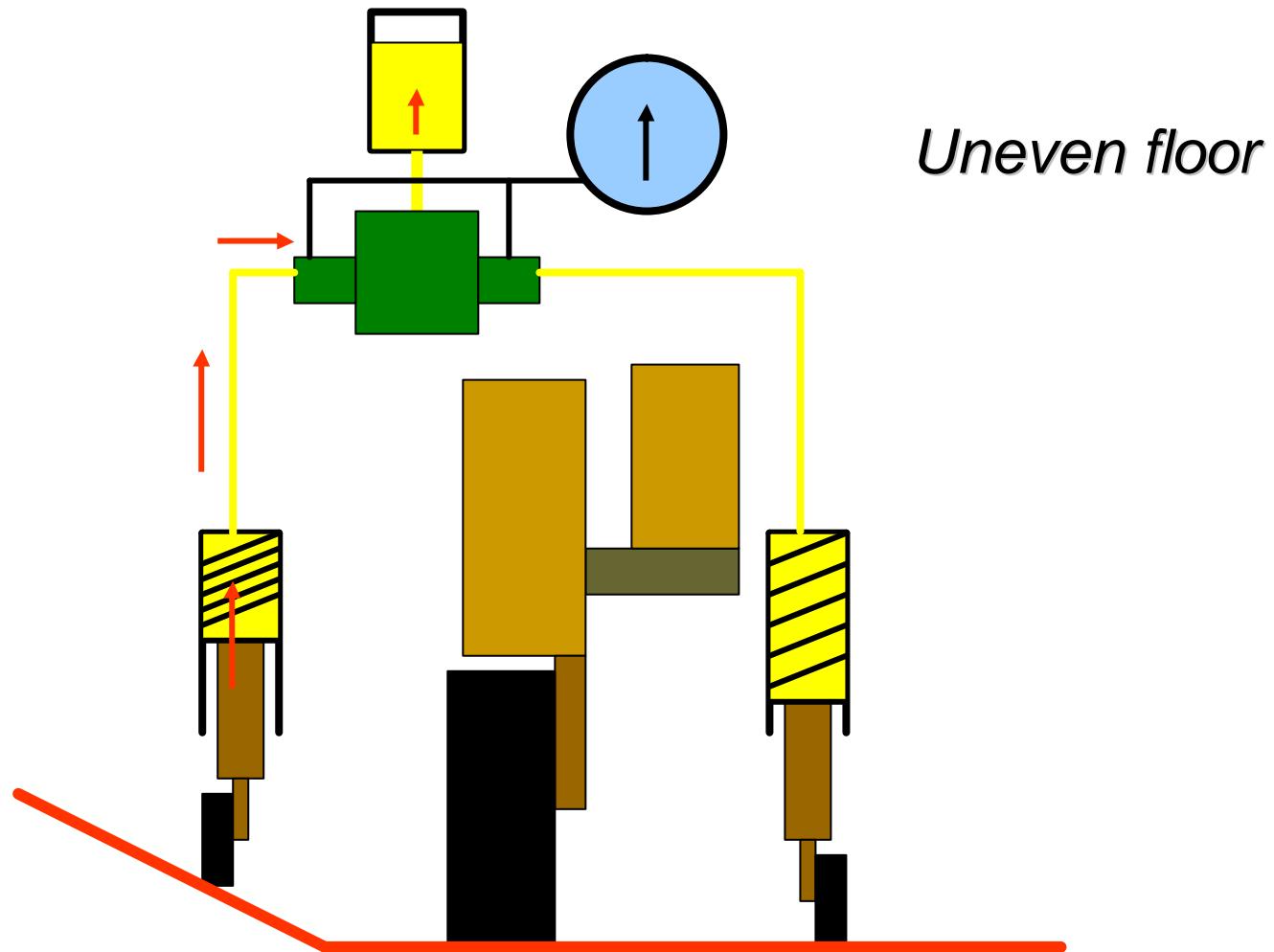


# ACTIVE CASTOR WHEELS

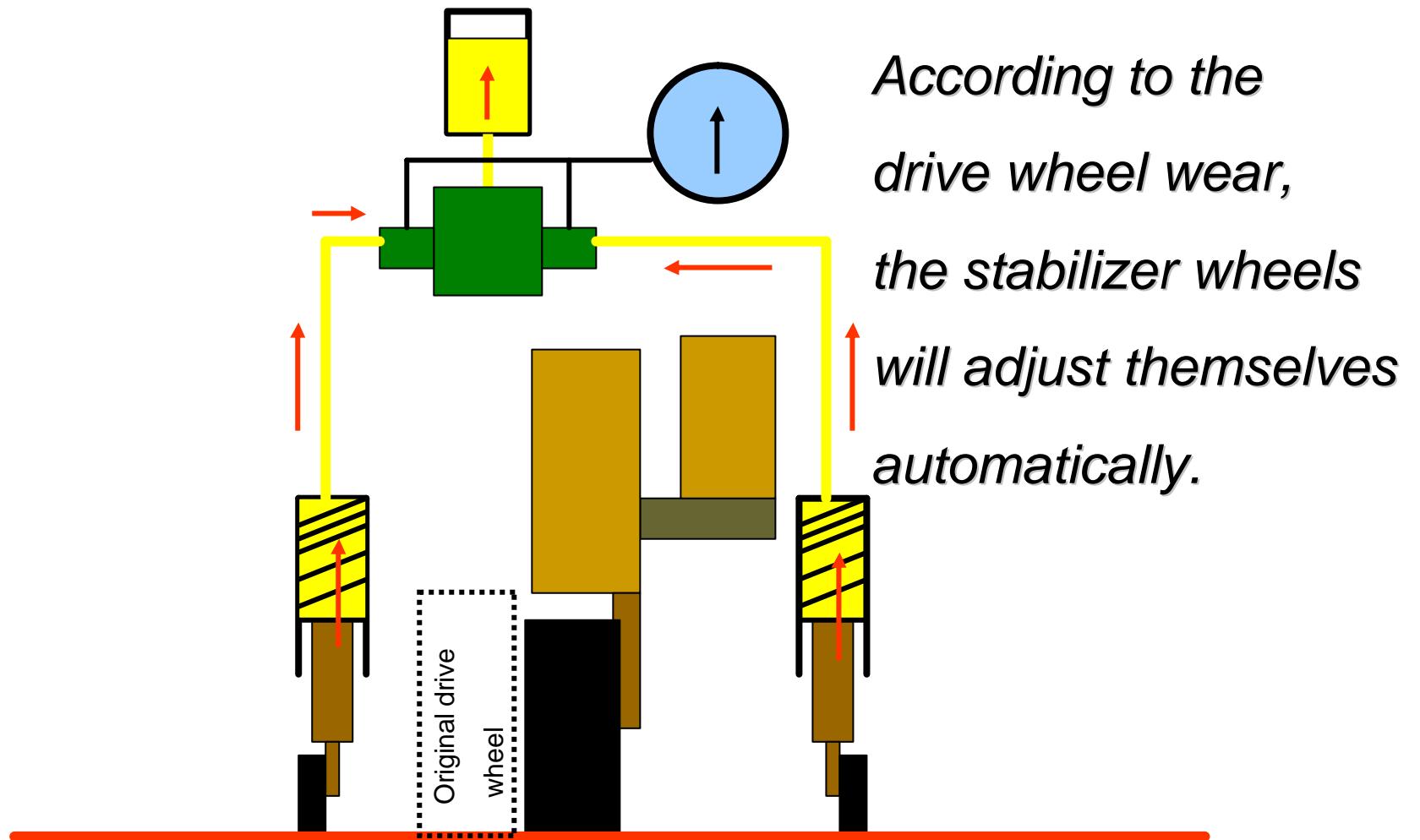
*Good warehouse  
floor*



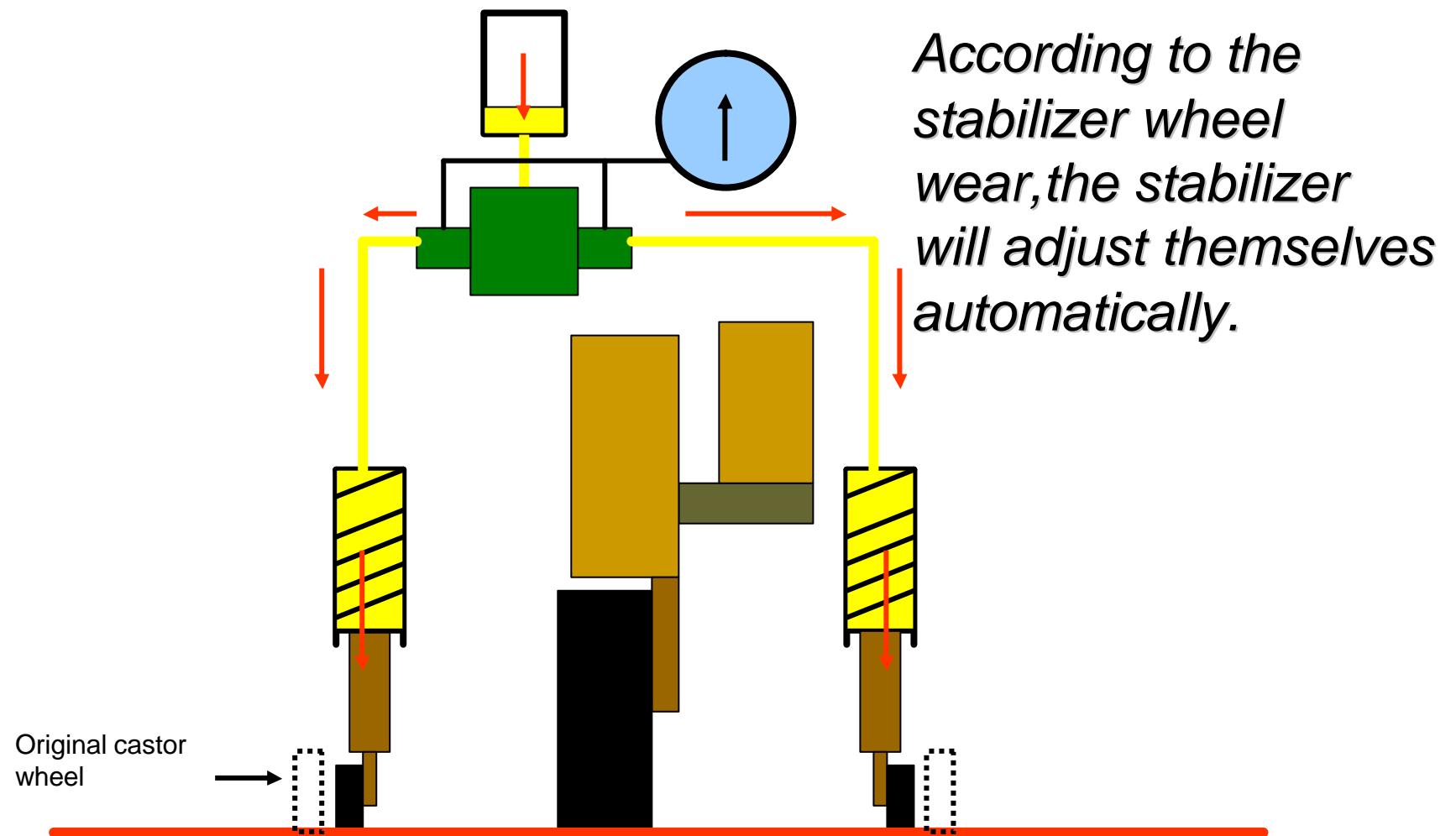
# ACTIVE CASTOR WHEELS



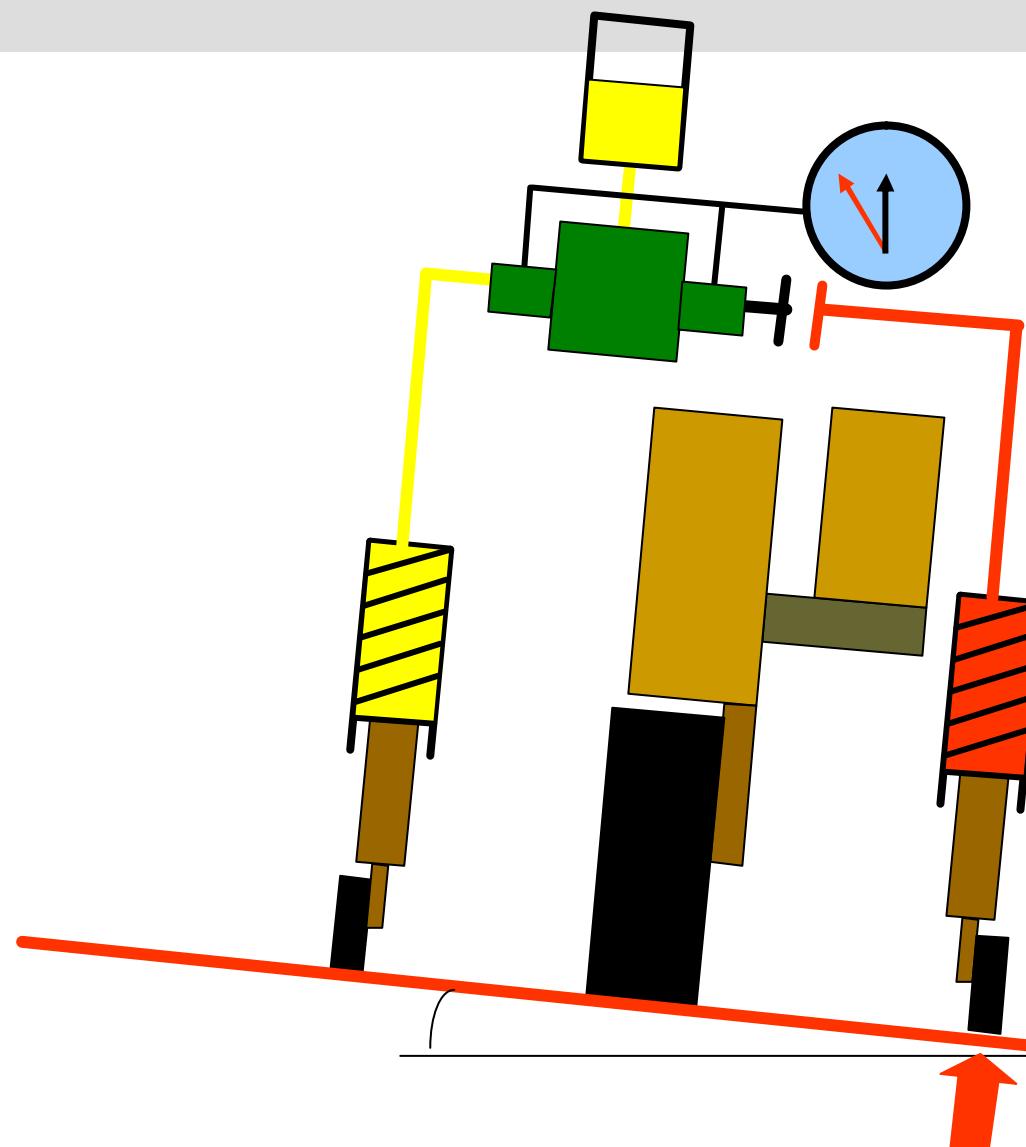
# ACTIVE CASTOR WHEELS



# ACTIVE CASTOR WHEELS



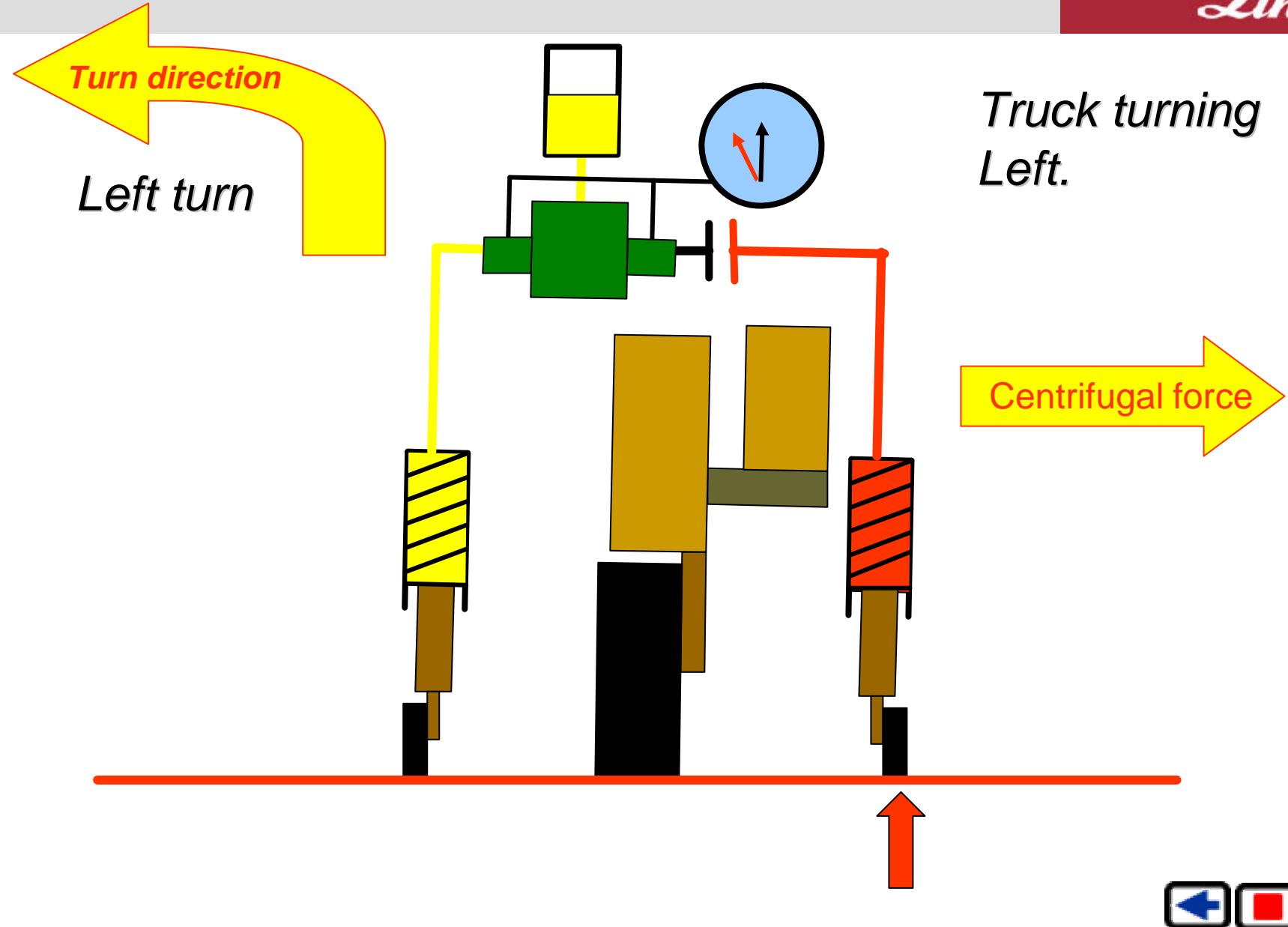
# ACTIVE CASTOR WHEELS



*Truck driving  
on a slope*



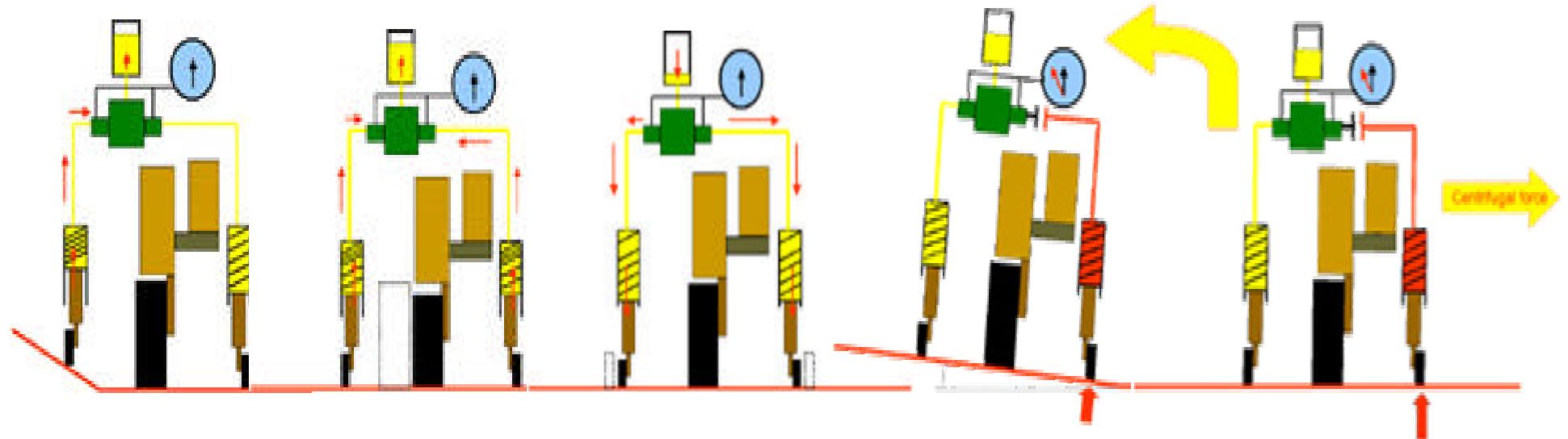
# ACTIVE CASTOR WHEELS



Truck turning  
Left.

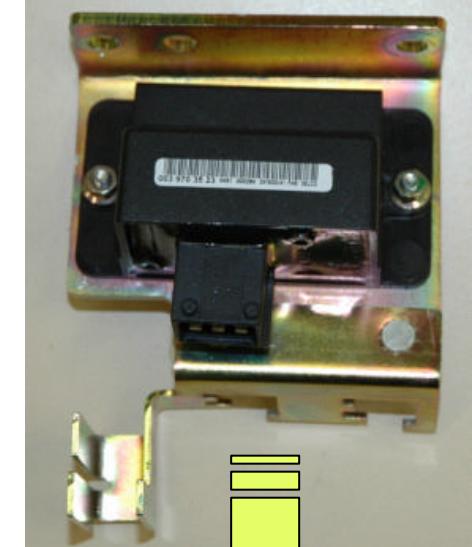


# ACTIVE CASTOR WHEELS

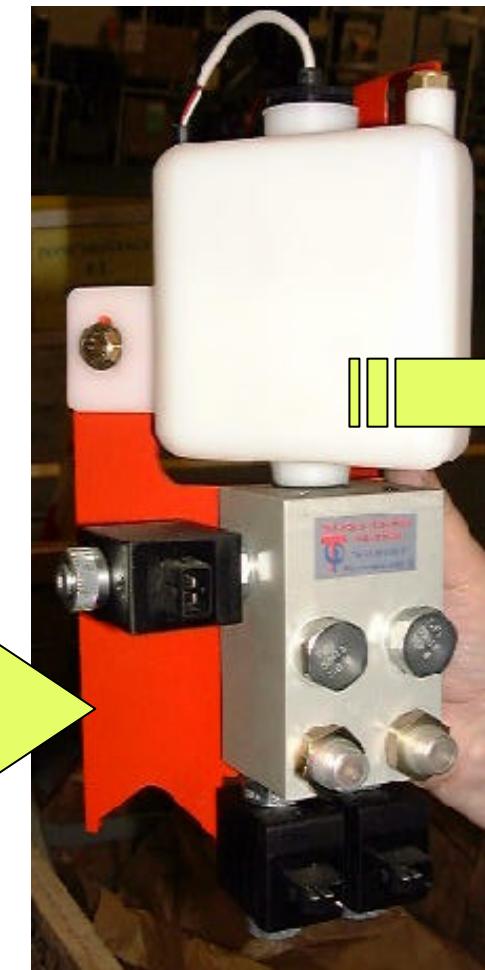


→ Continuously, this system is calculating the ideal ratio between stability & traction, whatever the situation is

# ACTIVE CASTOR WHEELS



Tilt sensor  
interface



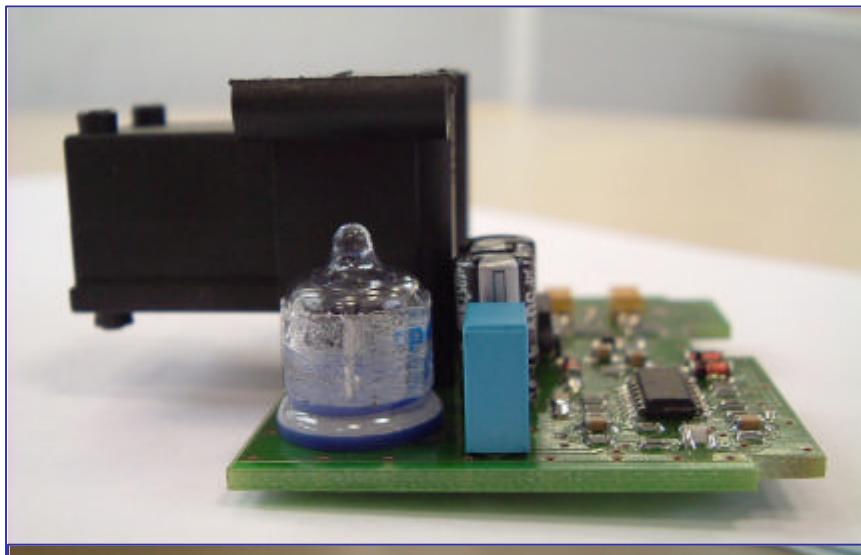
Hydraulic valves



Stabilizer  
wheel



# ACTIVE CASTOR WHEELS



Tilt sensor

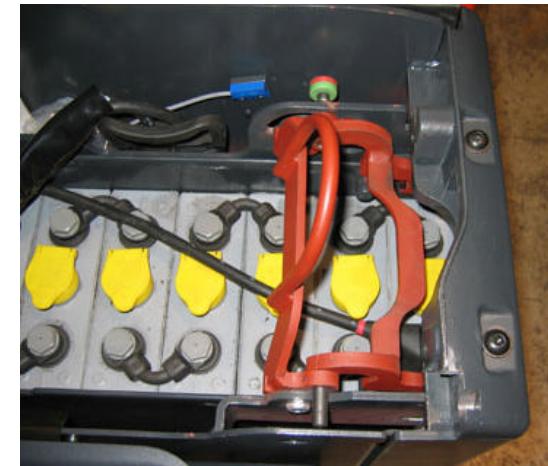


# BATTERY LOCKING DEVICE

- Two battery change configurations: Vertical or Battery side loading.

- When the battery is **unlocked**, the castor wheels are blocked, in order to keep the truck height unchanged.

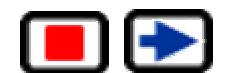
If the locking systeme is not locked properly, then when battery change is completed (the sliding hood can not be locked (battery can move), the Truck's speed is limited to 2km/h



# STEERING CONTROL

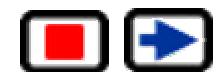
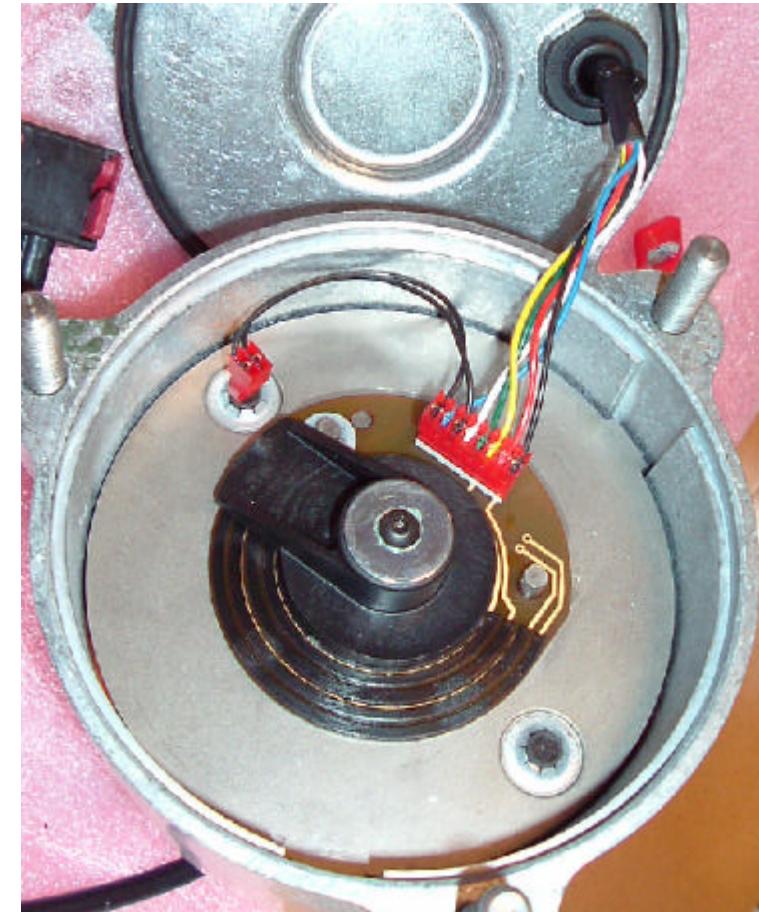


LES, Controller



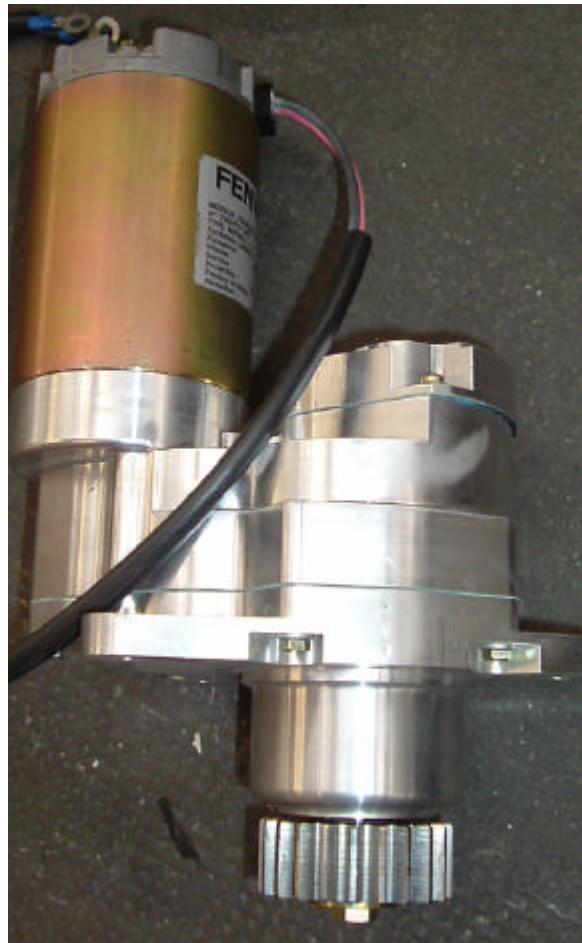
# STEERING CONTROL

Force Feed back control , Steering set point potentiometer

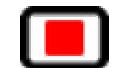


# STEERING CONTROL

## Actual wheel potentiometer



- Motor type: Permanent magnets
- Nominal torque (gearbox output shaft): 13.1 Nm
- Maximum torque (gearbox output shaft): 110 Nm
- Motor protection: IP42



# LIFT CONTROL

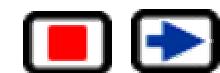
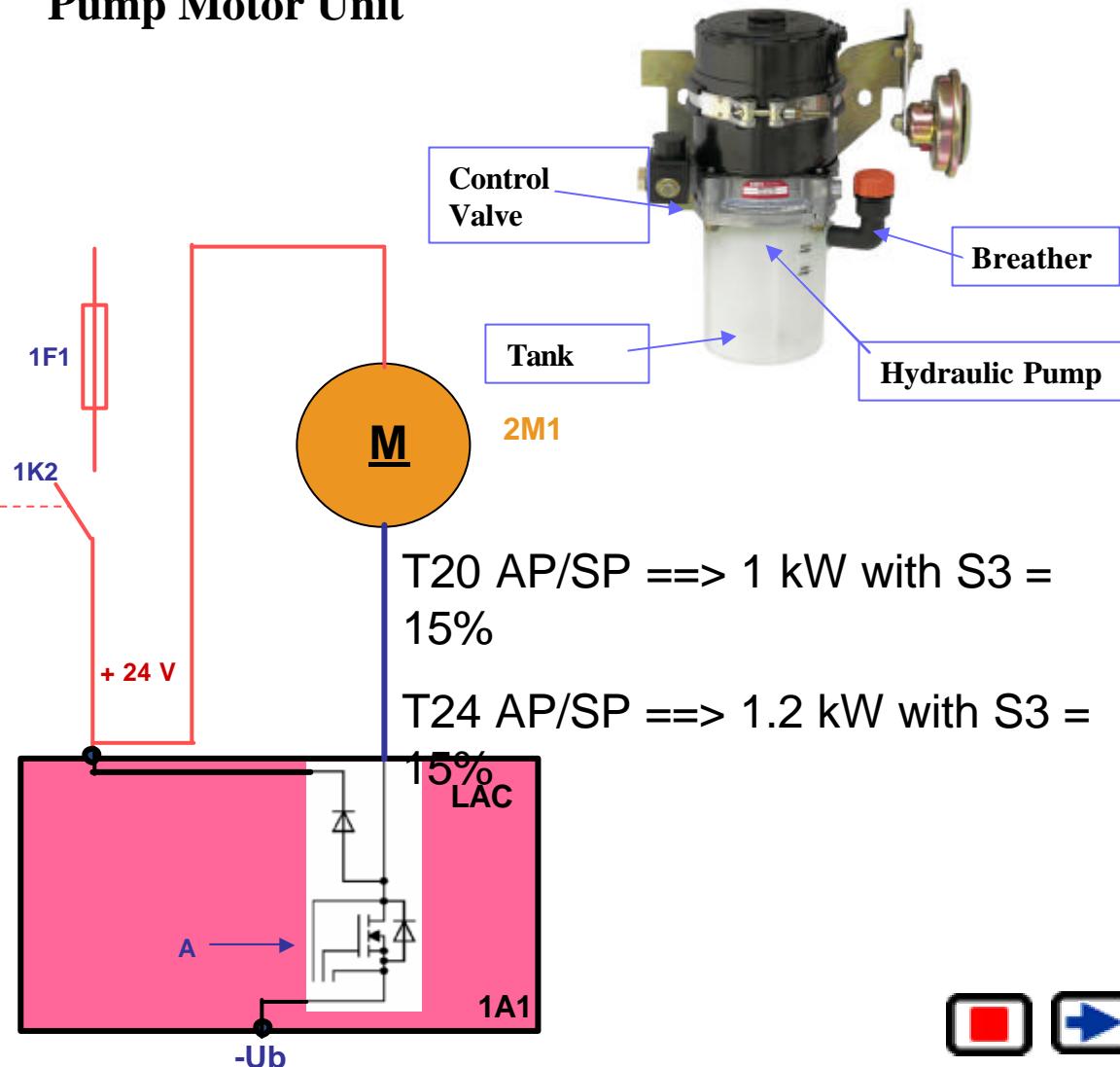
Linde Material Handling



*Linde*



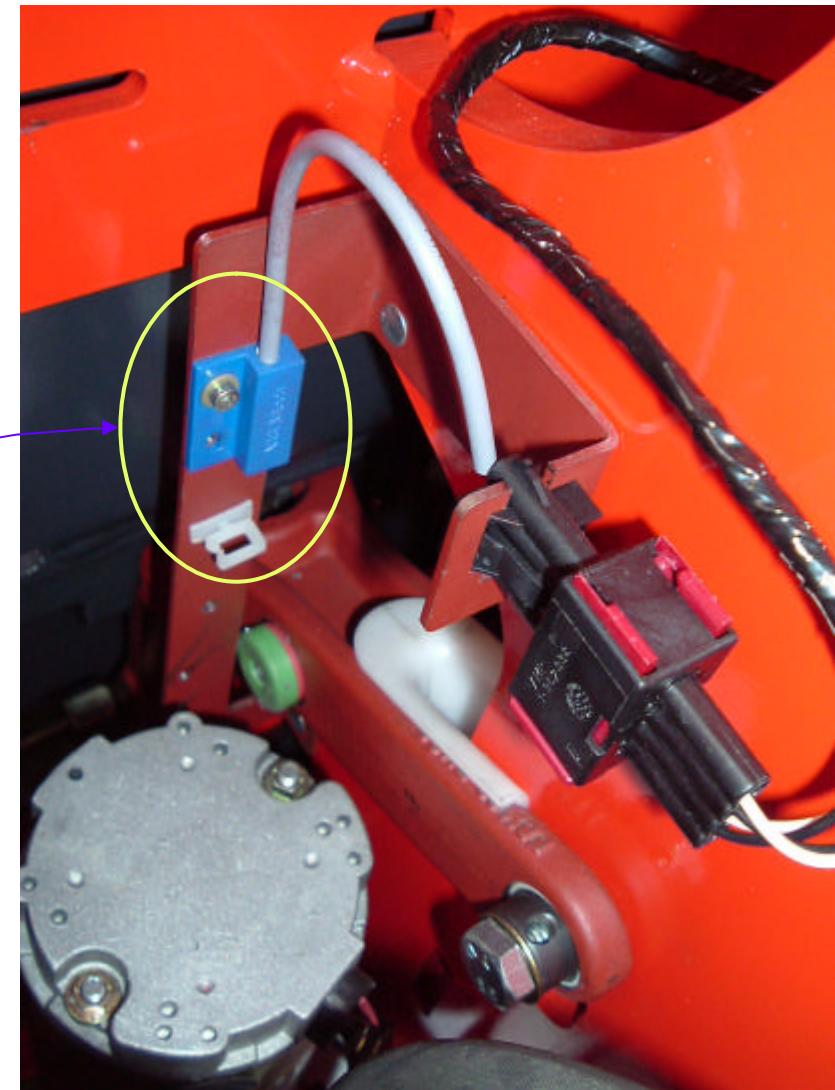
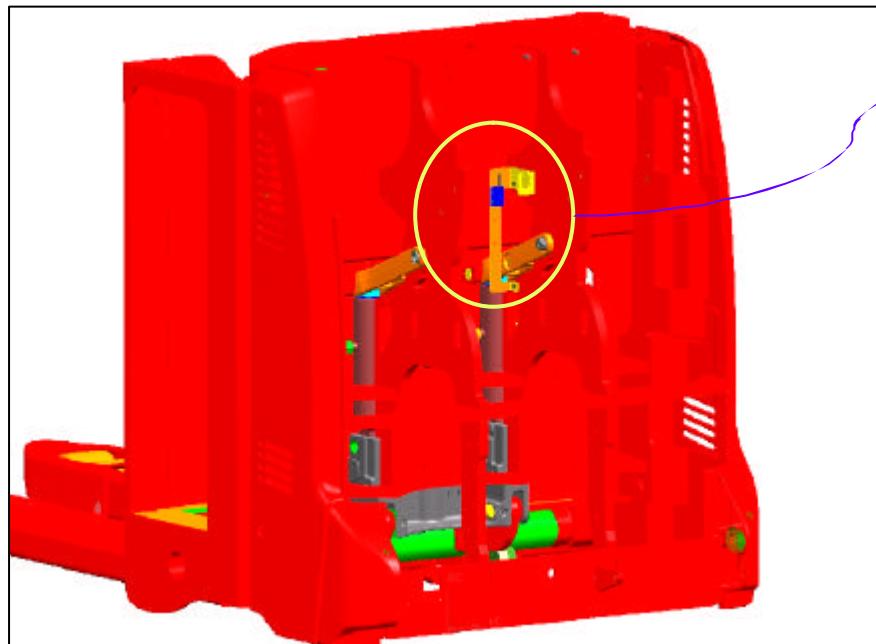
Pump Motor Unit





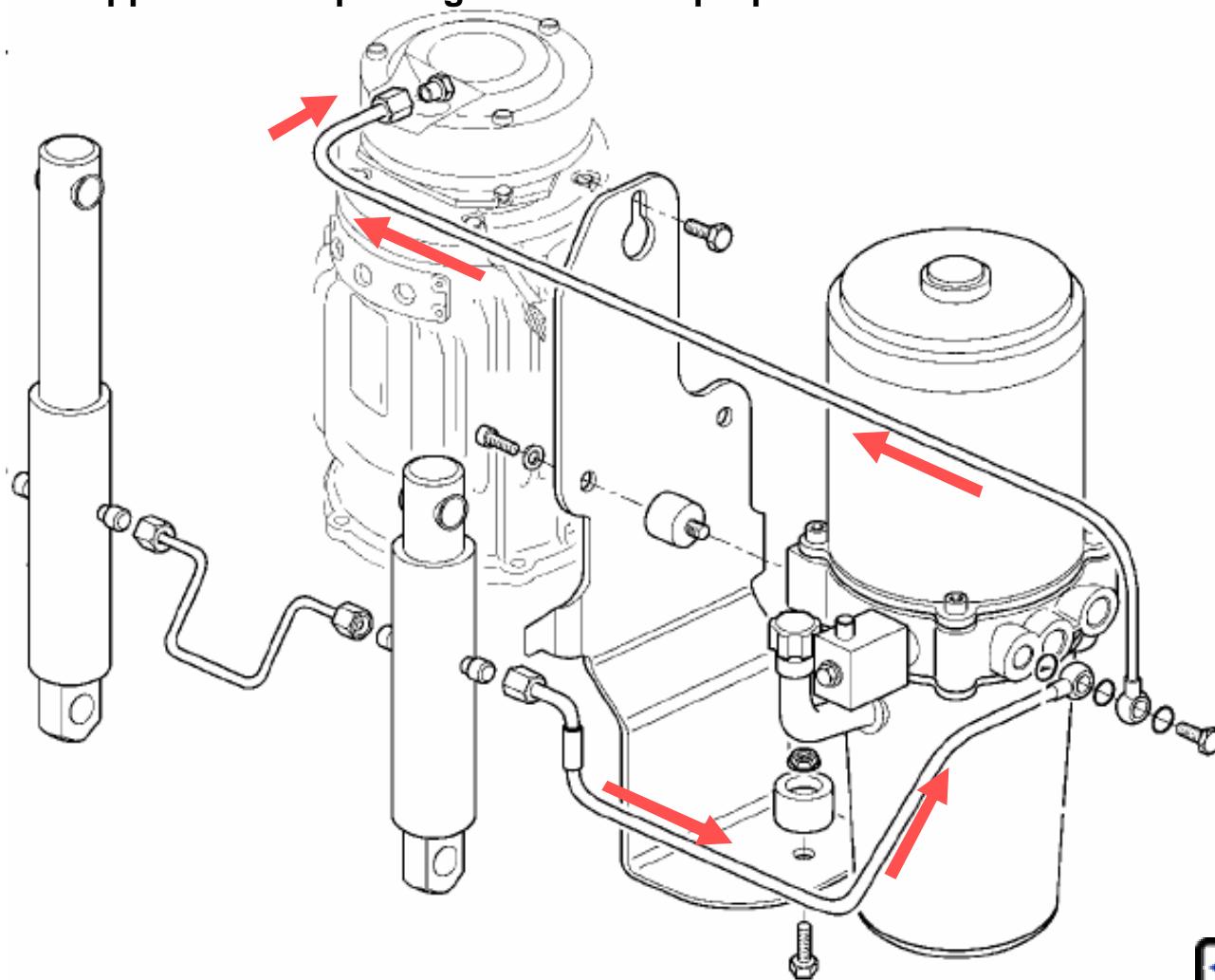
# LIFT CONTROL

- ✓ Lift limit Switch 1B4 cuts the lift before mechanical stop.
- ✓ This is to allow the best brake efficiency.
- ✓ With forks high, oil pressure will depend only of the load standing on the forks.



# PARKING BRAKE CONTROL

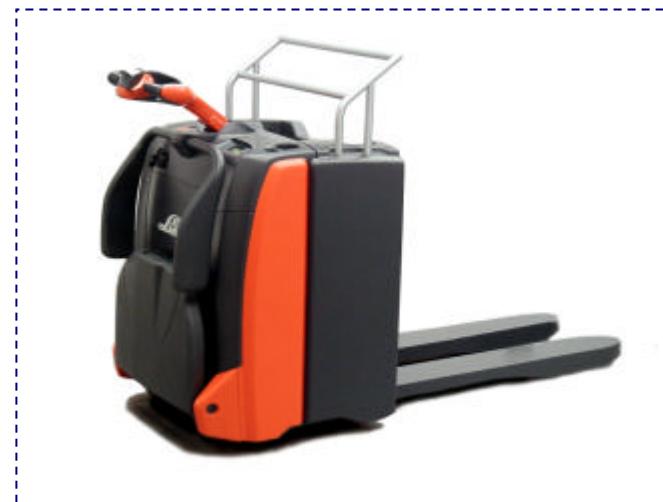
- ✓ Oil pressure will depend only of the load standing on the forks.
- ✓ The brake force applied on the parking brake will be proportional to the load on the forks.



# T20AP NEW DESIGN

- The T20 AP version has been completely redesigned:

- ✓ AC Motorisation
- ✓ Active castor-wheels
- ✓ A new battery locking device
- ✓ A new platform
- ✓ New Side arms
- ✓ New Lift control
- ✓ New Lift linkage



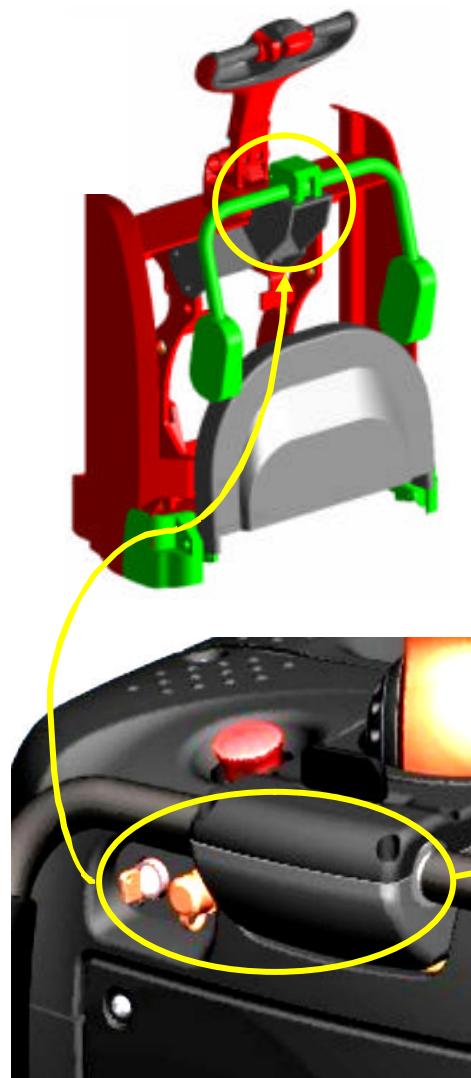
New side arms design

A new platform

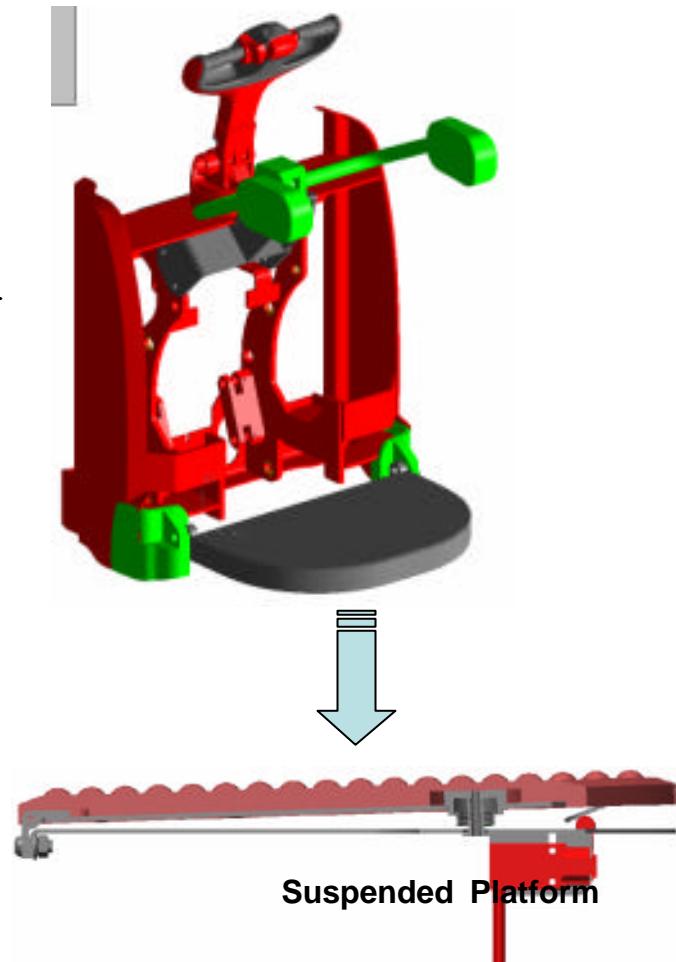


# T20AP NEW DESIGN

Side Arms IN



Side Arms OUT



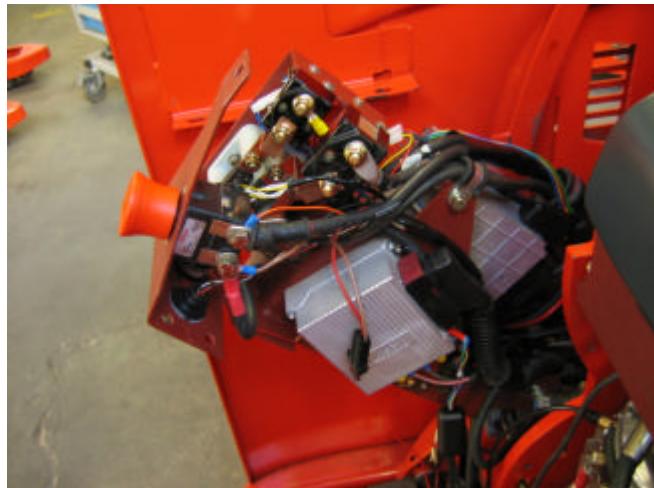
Reed sensor



# A SIMPLIFIED MAINTENANCE

- Access to components is possible by dismounting a single hood.
- An articulation allows easy access to the main controller and various electrical components
- Easy access to the stabilizer wheels through an aperture on the driver side.

→ Saves Service time

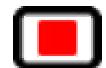


Main Controller module  
mounted on an articulation



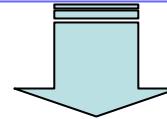
Pump Motor Unit

Drive Motor Unit

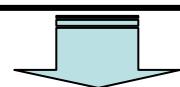


# A SIMPLIFIED MAINTENANCE

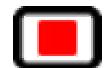
- Service visit interval increased.



AC MOTOR UNIT	CONTACTORS	Motor Pump Unit	Lift Linkage
<ul style="list-style-type: none"> <li>• No more motor brushes thanks to the AC technology</li> <li>• Water &amp; dustproof motor which does not require any kind of maintenance</li> <li>• Protection &amp; life time of motor are increased</li> </ul>	<ul style="list-style-type: none"> <li>• No more direction contactors.</li> <li>• Only one main contactor and one safety steering contactor.</li> </ul>	<ul style="list-style-type: none"> <li>• No more brushes on pump motor (standard truck).</li> <li>• Maintenance free (pump motor lifetime = 5000 hours).</li> <li>• No more pump contactor.</li> <li>• Direct control of the pump motor from the LAC controller</li> </ul>	<ul style="list-style-type: none"> <li>• Lifetime increased with Garmax .</li> <li>• Greasable version available.</li> </ul>
<b>ACTIVE CASTOR-WHEELS</b>		<ul style="list-style-type: none"> <li>• Motricity and truck stability significantly improved</li> <li>• Lifetime of the Wheels increased.</li> </ul>	



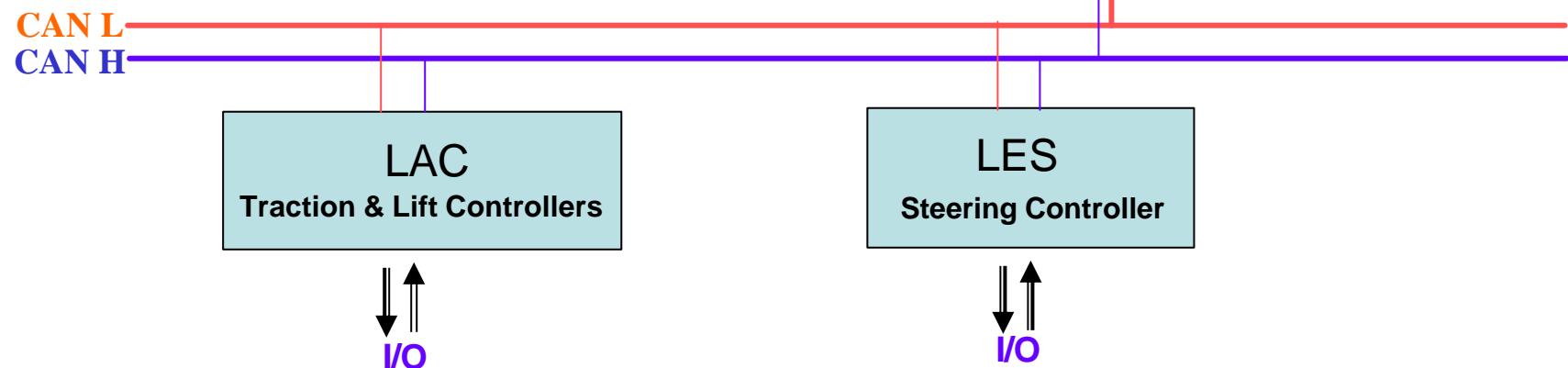
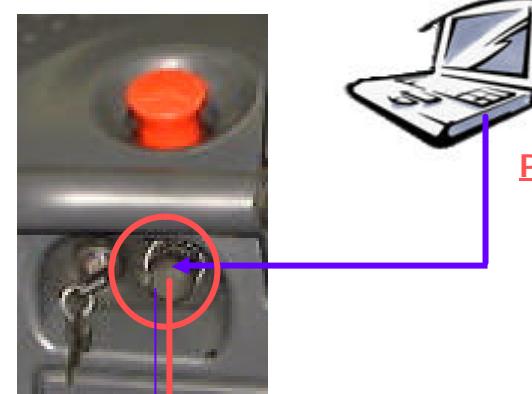
- One of the benefit of using the above new technology is to allow to increase the service intervals from 500 hours to 1000 hours



# A SIMPLIFIED MAINTENANCE

- New truck design with :
- Can-Bus Architecture using the Linde “Pathfinder” diagnostic software to set the truck parameters and with additional diagnostic help to the technician .
- Easy access to the diagnostic plug located on the truck front cover.

Diagnostic Plug



- In the future, some other components will be connected to the Can-Bus system (Dashboard controller, LUC controller).

