

# Company Profile

Material  
Handling





# Carraro Group

Carraro is a multinational Group and world leader in power transmission systems. Its core business consists in conceiving, designing, validating, manufacturing and marketing drive systems for construction equipment, agricultural tractors, material handling, light commercial vehicles, automobiles, renewable energies and stationary applications.

The Group, whose holding company Carraro Spa has been listed on the Italian Stock Exchange since 1995, is based in Campodarsego (Padua) and has manufacturing facilities in Italy, Argentina, India and China.

# The Group

## Areas



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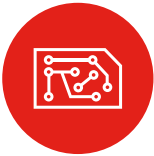
## Drivelines

Integrated solutions (axles, transmissions) for a wide range of applications: construction equipment, agricultural tractors, light commercial vehicles, material handling and stationary applications; cut steel gears for the automobile sector, agricultural applications and construction equipment, railway, industrial sector and wind power generators.

## Tractors

Design and manufacturing of light utility, vineyard & orchard tractors, from 60 to 100 HP; offering a wide range of engineering services, from simple consultancy to “turnkey” projects.

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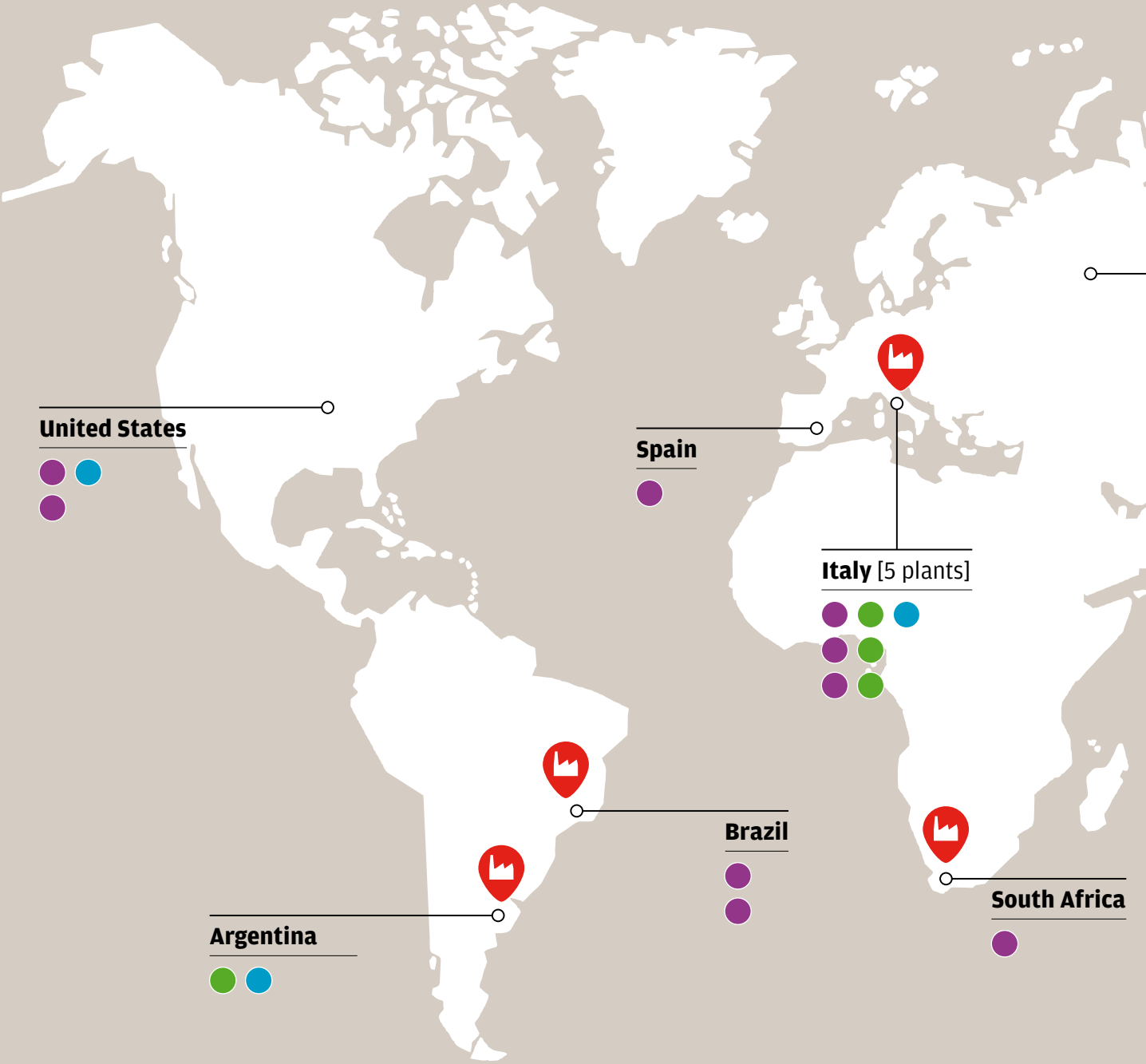
# Power Electronics

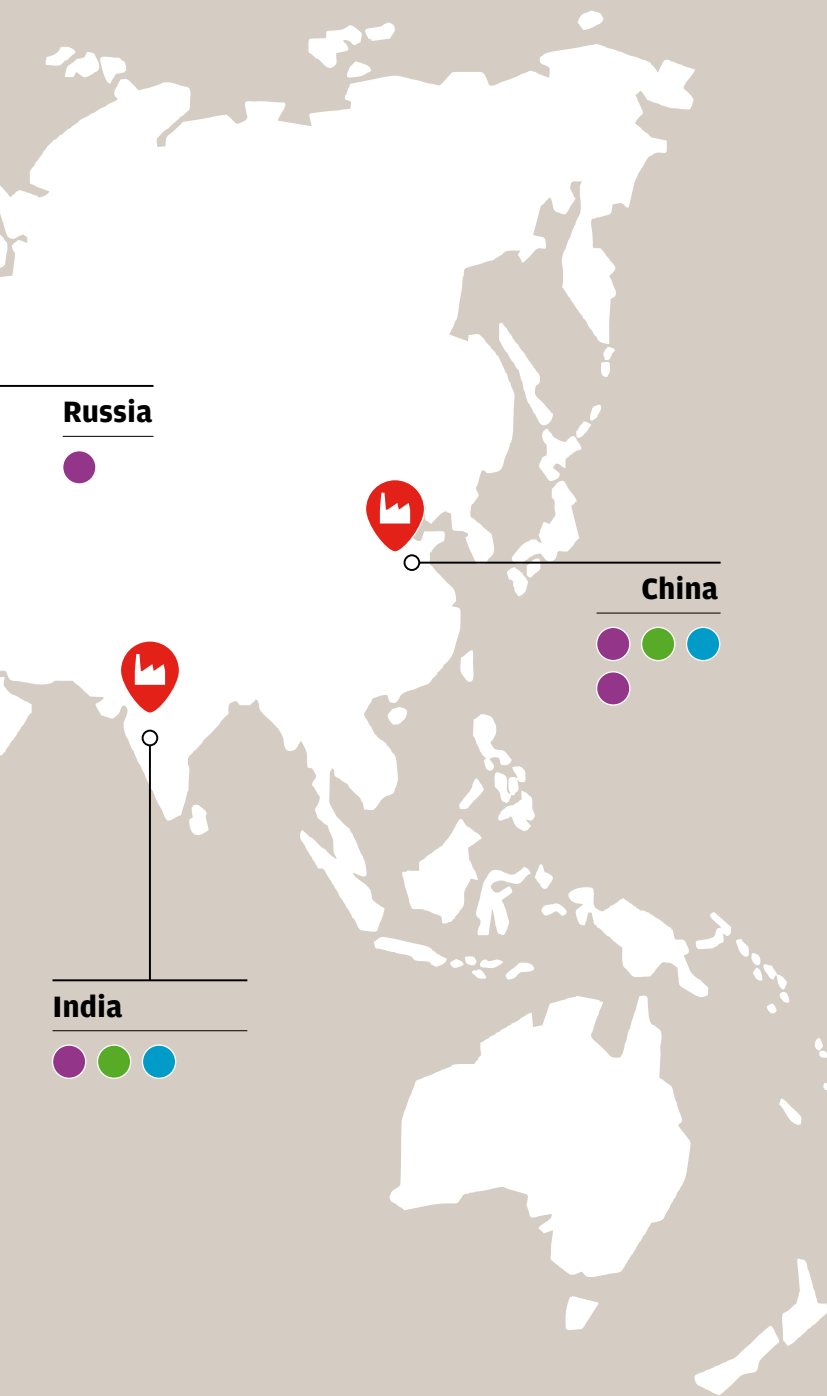
Inverters and power control systems for renewable energies production (solar & wind energy). Variable speed drives and soft starters for electric motors in industrial automation, water management, HVAC and refrigeration, cement, oil&gas plants. Hybrid and electric vehicle powertrains.

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# Global footprint

## Where we are





**Russia**



**China**



**India**



**Plants**

Italy  
 Argentina  
 Brazil  
 China  
 India  
 South Africa



**Branches**

Italy  
 Spain  
 Russia  
 USA  
 Brazil  
 China  
 India  
 South Africa



**Engineering Centres**

Italy  
 Argentina  
 China  
 India



**Spare Parts Centres**

Italy  
 USA  
 Argentina  
 China  
 India

# Drivelines Brands

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Carraro Drive Tech is the Carraro Group's core business: designing, manufacturing and marketing axles and transmissions, hydraulic drives and heavy duty gears.

SIAP is the centre of excellence of the Carraro Group for heavy-duty steel gears.

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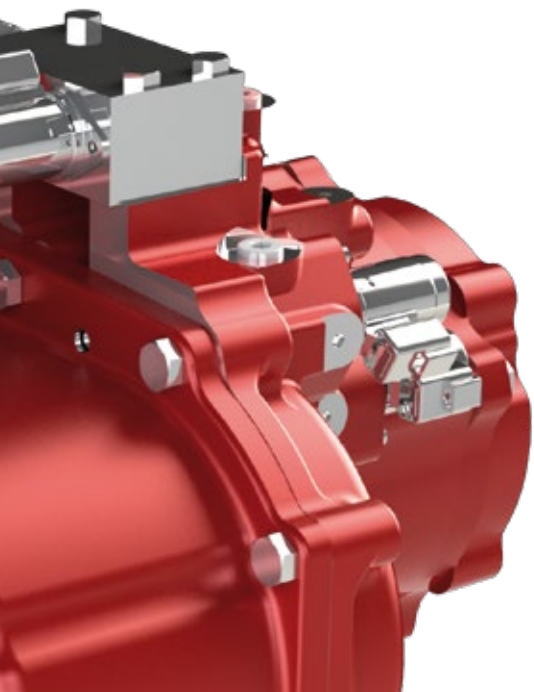


Wherever there is a need for integrated transmission systems for off- and on-road vehicles, Carraro Drive Tech has the solution, with a complete, diversified product range for agriculture, construction equipment, and material handling. Carraro drivelines have been optimised for the individual markets of application, to guarantee the very best efficiency and most practical vehicle layout.

All this is possible thanks to the wide range of combinations of rigid and steering axles and mechanical, automatic or semi-automatic transmissions. The Carraro systems have been designed for the optimal integration of mechanics and hydraulics, under the supervision of an advanced electronic control unit. This can best manage the whole driveline while monitoring and diagnosing the vehicle functions.

## SIAP

In its plants the company is able to manufacture state-of-the-art products, thanks to leading-edge technologies covering a huge range of machining operations, with Gleason and Oerlikon cutting systems and lapped or ground surface finishings. The high quality of SIAP gears is assured by advanced processes for control – on Zeiss and Klingelberg systems – and verification of meshing noise on testers. Optimisation of geometry and drive is ensured through the use of dedicated software programs.



# Carraro

## Solutions for Electric and Internal Combustion Vehicles

The consolidated expertise of Carraro in the design and development of integrated drive systems for Off-Highway vehicles, has been also widely leveraged in Material Handling applications.

Today Carraro Drive Tech is the global player in providing a wide range of traction systems for counterbalanced trucks with lifting capacity up to 9 tons, both Internal Combustion and with Electric Traction.

For electric counterbalanced trucks Carraro offers both the solution with the electric motor integrated in the axle, and with Front Dual Drives, complete with multiple option of brake system.

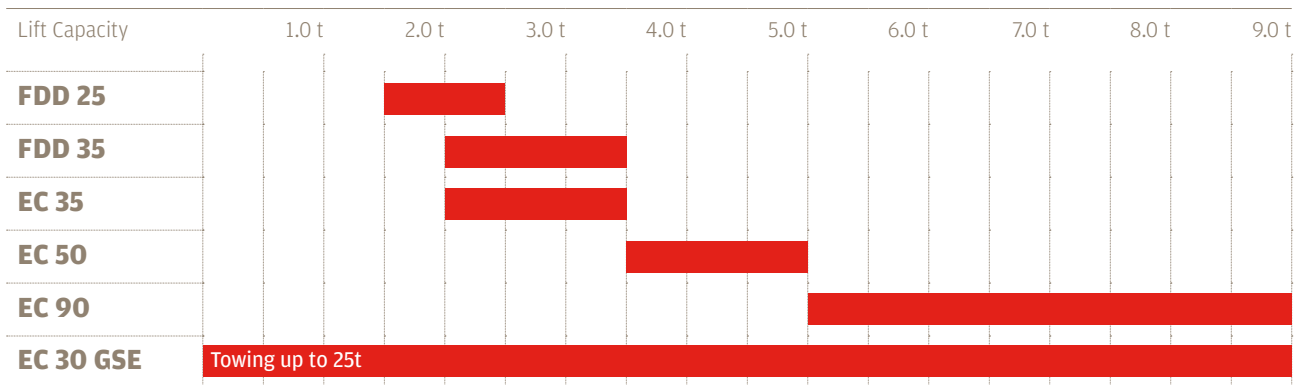
For internal combustion counterbalanced trucks, Carraro owns a range of transaxles with option of remote transmission mounting, able to efficiently fit every vehicle architecture.

All Carraro Drive Tech products are distinguished by high reliability & durability, thanks to advanced technological solutions such as wet oil Service and SAHR Parking brakes, coming from its off-highway long established know-how.

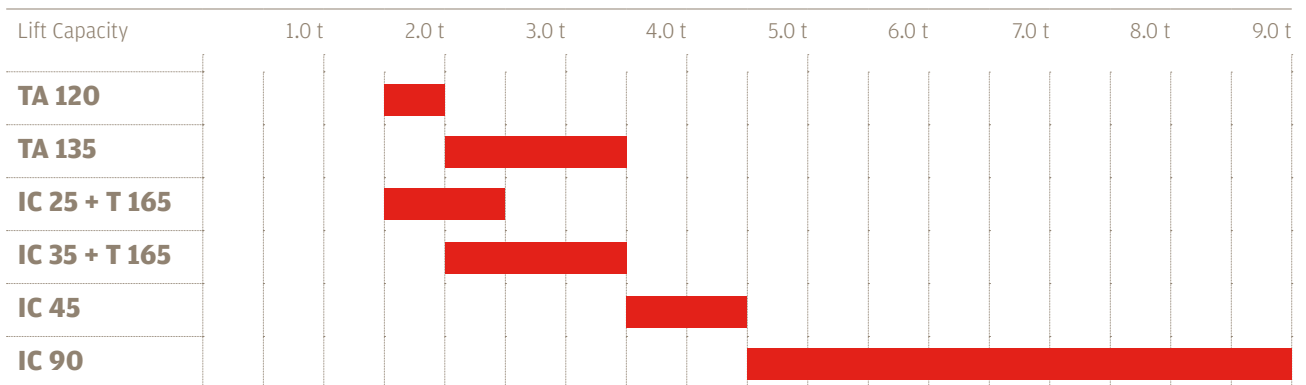
All coupled with lowest Power Losses, thus providing best in class vehicle battery range.

# Our Material Handling range

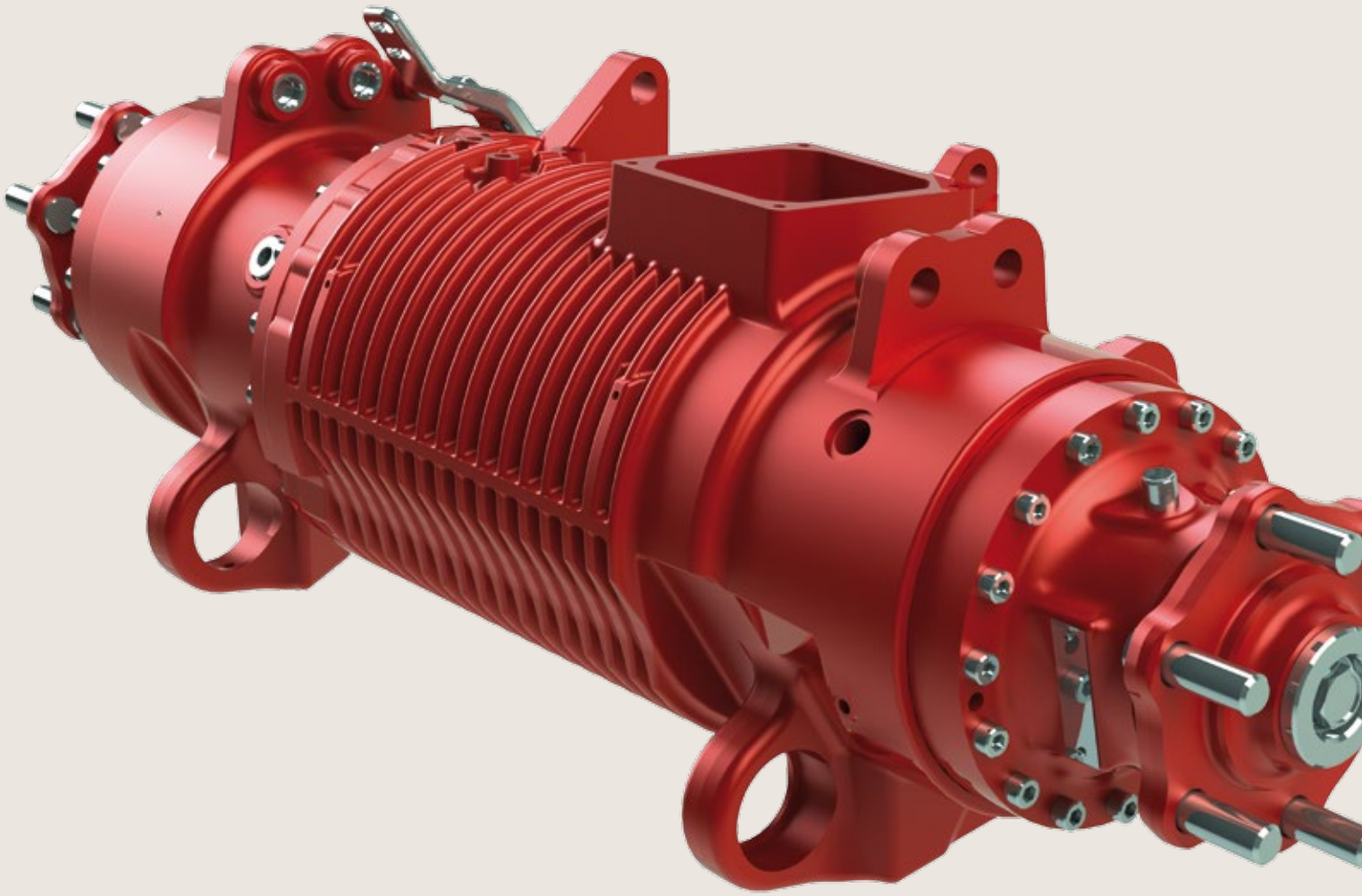
## Class I Axles and Drive Systems for Electric Counterbalance Lift Trucks



## Class IV & V Solutions for Internal Combustion Lift Trucks







# Axles

## for Electric Counterbalance Trucks and Ground Support Equipment

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### Applications

- › 4 wheel Electric CB Lift Trucks
- › Ground Support Equipment
- › Airport Tractors

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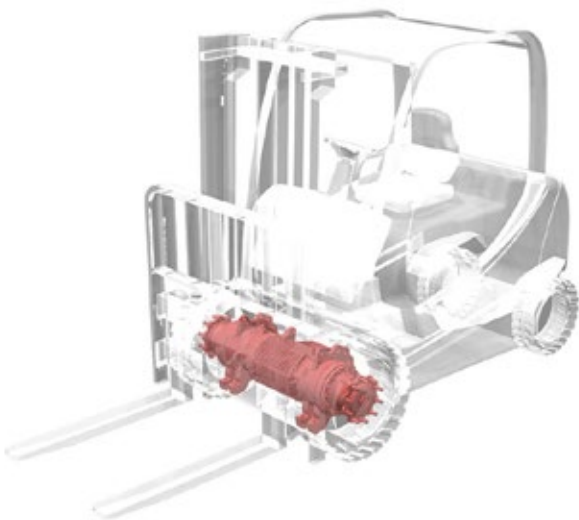
### Standard features

- › Dual planetary gear box
- › Wet Disc Brakes
- › Easy to service
- › Optimized installation envelope
- › Maintenance free
- › Optimized gears profile for noise reduction
- › Integrated mast support
- › Integrated AC traction motor

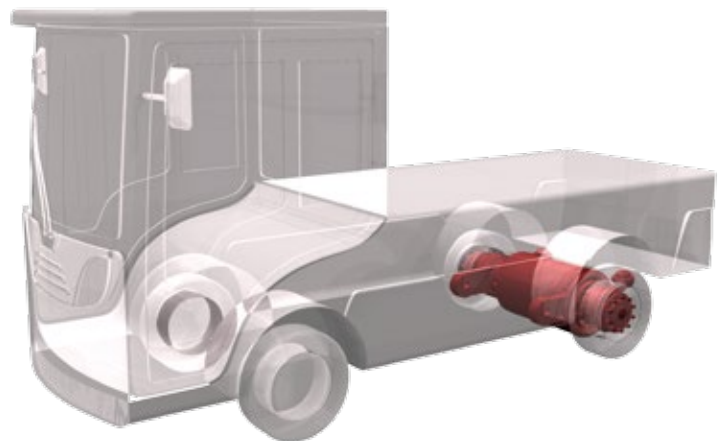
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### Optional features

- › Mechanical actuation by lever of service brake



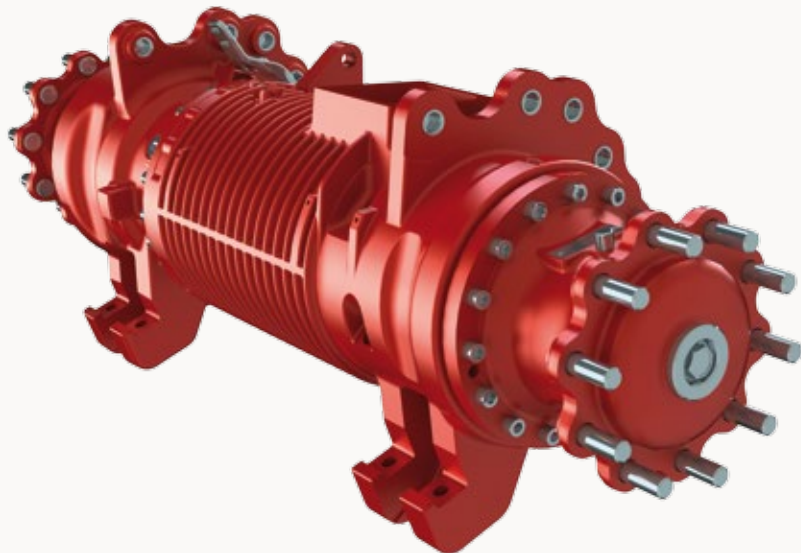
Class I



Class VI/Electric

**CLASS I – CLASS VI/E**

		<b>EC 30 GSE</b>	<b>EC 35</b>	<b>EC 50</b>
Applications		GSE	CB Forklifts	CB Forklifts
Trailer weight	<b>Kg</b>	25,000	-	-
Lift capacity	<b>Kg</b>	-	3,500	5,000
Wheels load	<b>Kg</b>	5,000	8,800	12,000
Torque at wheels	<b>Nm</b>	5,600	8,200	9,600
Ratios		14.5-20.2	14.5-29.2	18.2-29.2
AC motor power	<b>Kw</b>	5/20	15	15/18
Service and Parking Brakes		Wet Disc	Wet Disc	Wet Disc
Flange to flange distance	<b>mm</b>	1,075	1,085	1,155
Frame mounting	<b>mm</b>	610	640	640
Mast mounting	<b>mm</b>	-	570	650
Wheel stud PDC	<b>mm</b>	170	160	225



# Axles

## for Electric Counterbalance Trucks and Ground Support Equipment

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### Applications

- › 4 wheel Electric CB Lift Trucks

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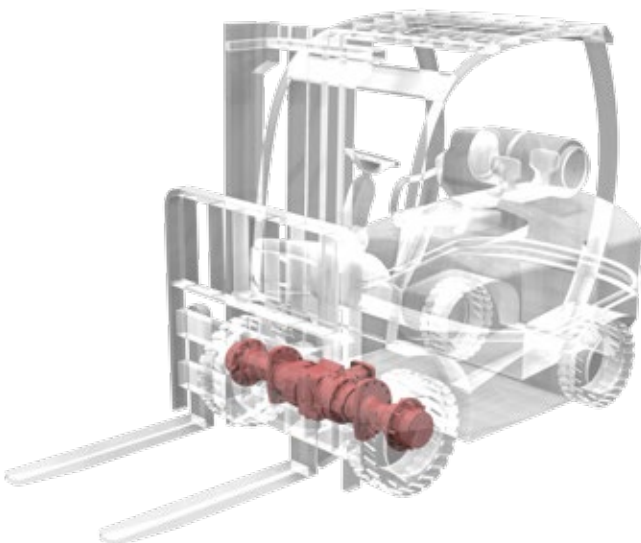
### Standard features

- › Bevel set gear concept
- › Wet Disc Brakes
- › Spring applied hydraulic release parking brake
- › Optimized installation envelope
- › Maintenance free
- › Optimized gears profile for noise reduction
- › Integrated mast support

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### Optional features

- › Wide range of reduction ratio available
- › Transfer box



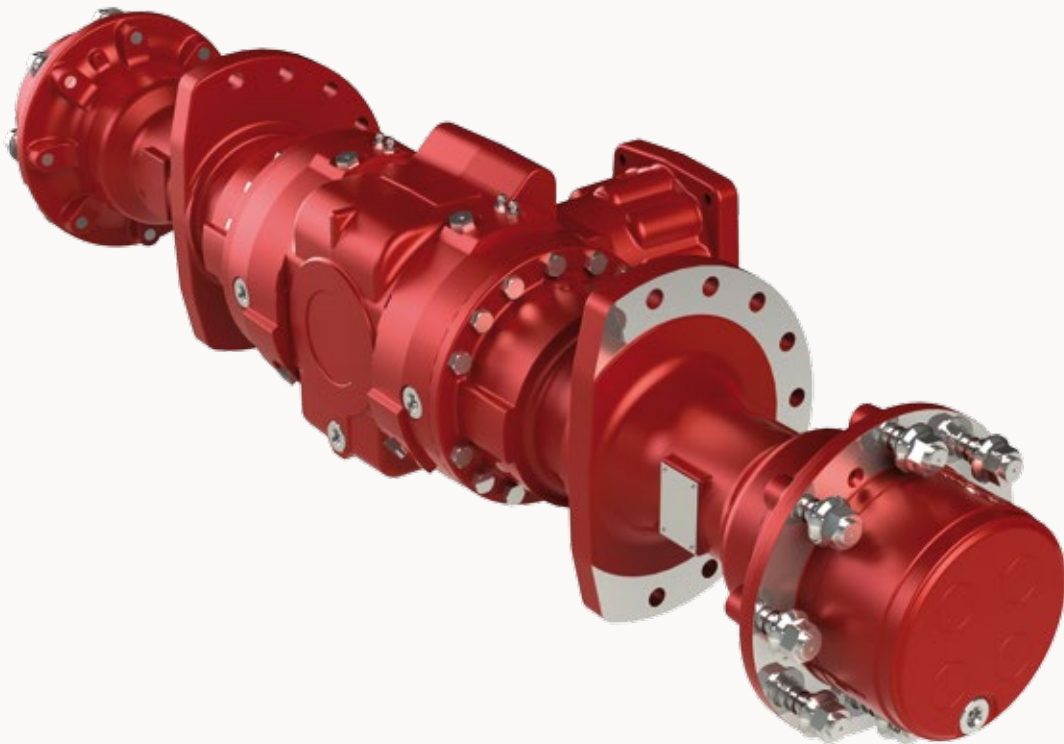
Class I



**CLASS I – CLASS VI/E**

**EC 90**

Lift capacity	<b>Kg</b>	9,000
Wheels load	<b>Kg</b>	136,000
Torque at wheels	<b>Nm</b>	25,000
Axle ratios		10.7-27.6
AC motor power	<b>kW</b>	27
Service and Parking brakes		Wet Disc
Transmission type		Carraro Transfer Box
Transmission ratio		1.2-3.2
Flange to flange distance	<b>mm</b>	1,250 1,450
Frame mounting	<b>mm</b>	Customized
Mast mounting	<b>mm</b>	Customized
Wheel stud PDC	<b>mm</b>	275



# Drive Systems for Electric Counterbalance Lift Trucks

## Applications

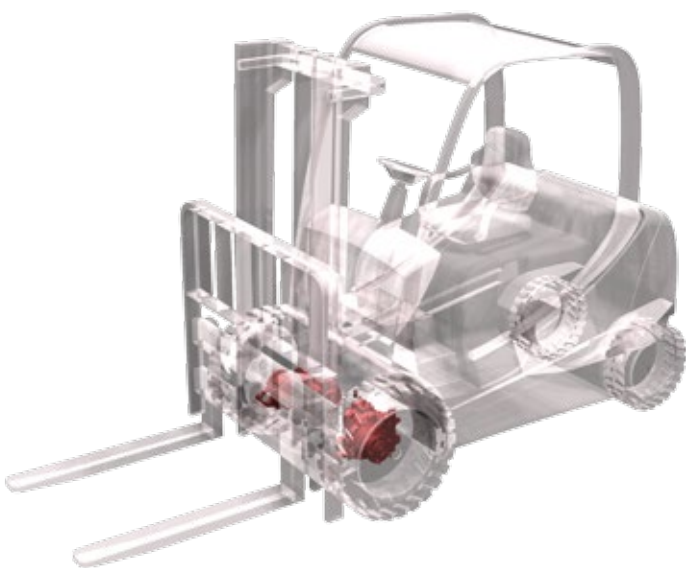
- › 3/4 wheel Electric CB Lift Trucks
- › Ground Support Equipment
- › Airport Tractors

## Standard features

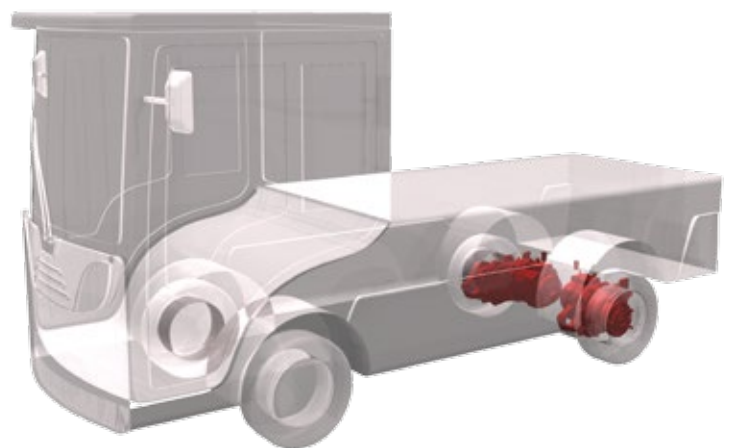
- › Compact and modular design
- › Wet Disc Brakes
- › Easy to service
- › Optimized installation envelope
- › Maintenance free
- › Optimized gears profile for noise reduction
- › Integrated AC traction motors

## Optional features

- › Integrated SAHR parking brake with low release pressure
- › External electromagnetic parking brake
- › Integrated must support



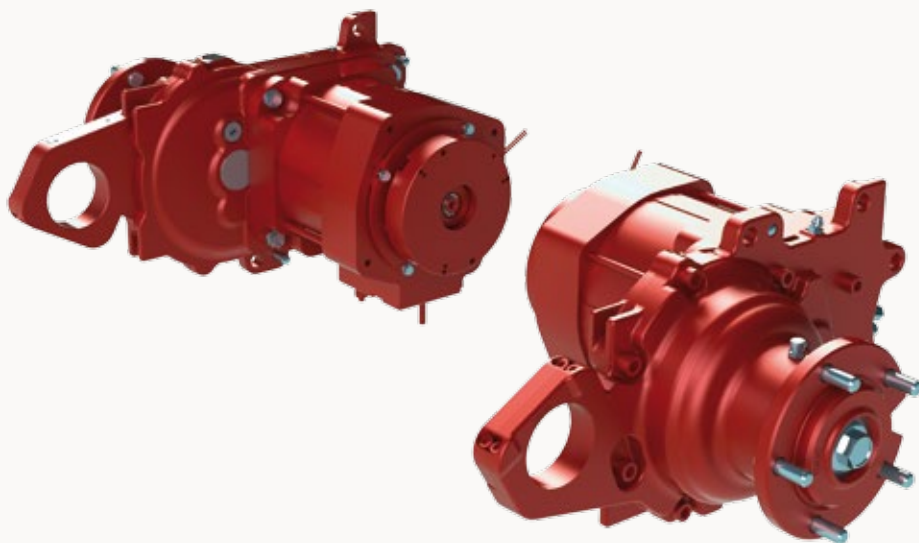
Class I



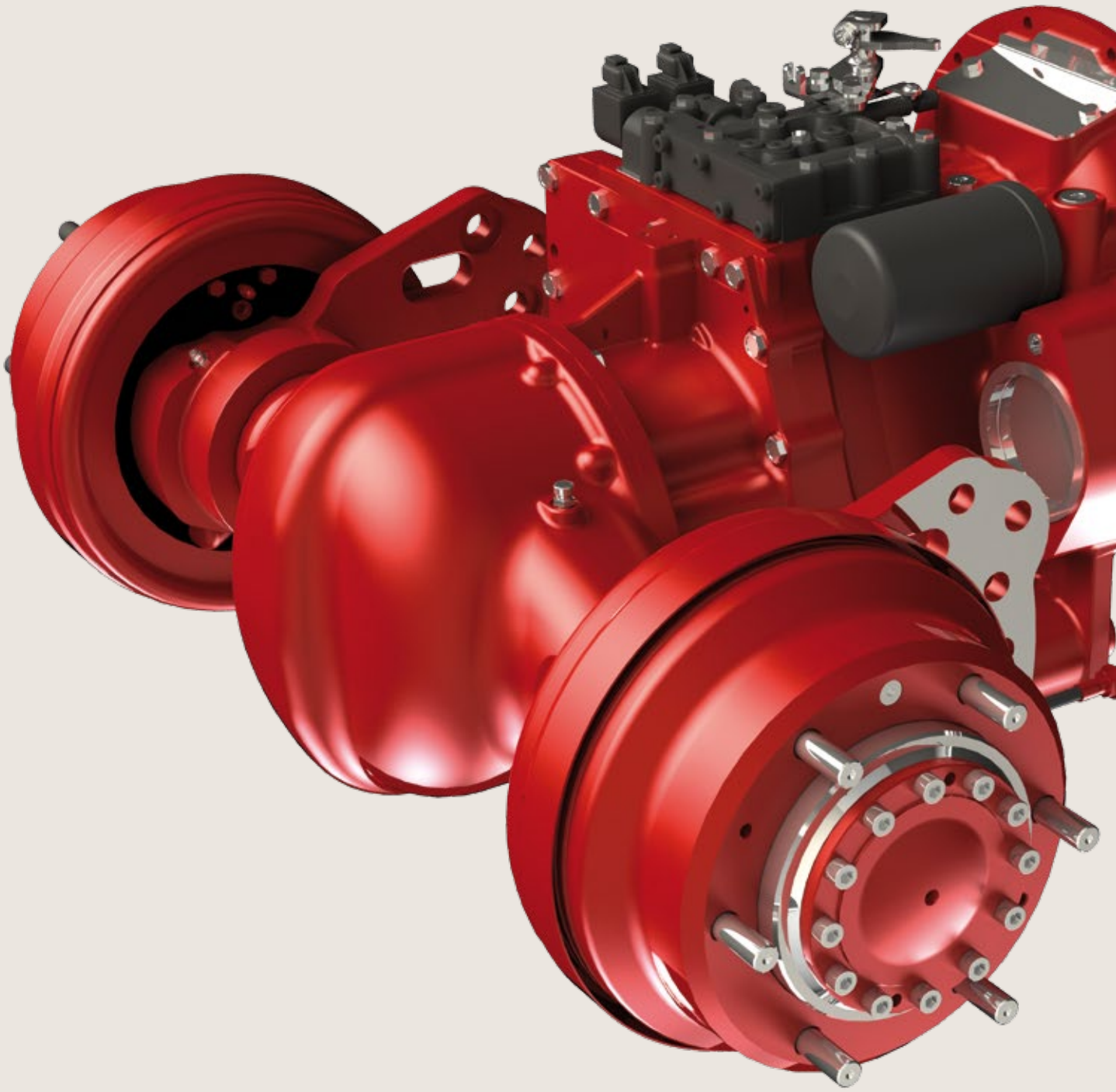
Class I / GSE

**CLASS I – CLASS VI/E**

		<b>FDD 25</b>	<b>FDD 35</b>
Lift capacity	<b>Kg</b>	2,500	3,500
Wheels load	<b>Kg</b>	6,400	8,800
Torque at wheels	<b>Nm</b>	3,000	8,200
Ratios		25.7	29.2
AC motor power		5 (X2)	7.5 (X2)
Service and Parking brakes		Wet Disc	Wet Disc
Flange to flange distance	<b>mm</b>	850	1,085
Frame mounting	<b>mm</b>	470	640
Mast mounting	<b>mm</b>	Customized	570
Wheel stud PDC	<b>mm</b>	145	160







# Transaxles for Internal Combustion Lift Trucks

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## Applications

- › IC Counterbalance Lift Trucks  
Cushion and Pneumatic

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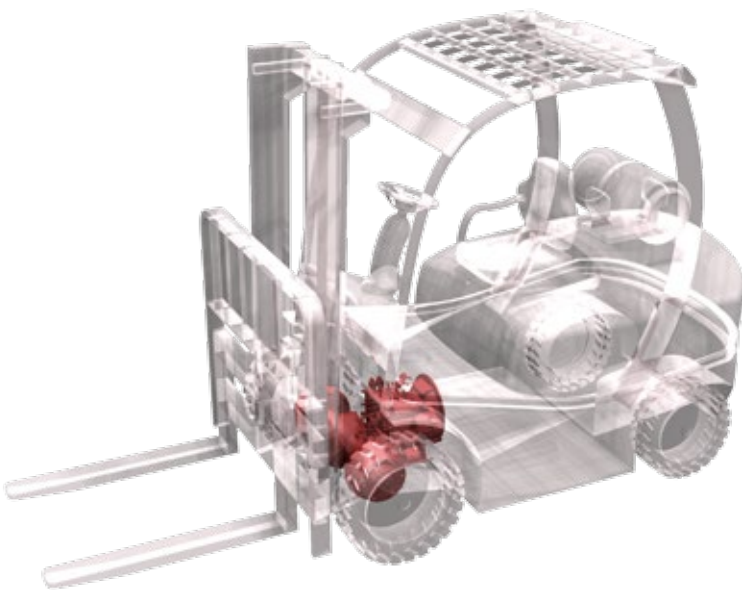
## Standard features

- › Compact and modular design
- › Powershift Transmission FWD/REV
- › PTO drive included
- › Mechanical inching
- › Drum brakes
- › Integrated mast support
- › Optimized gears profile for noise reduction

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## Optional features

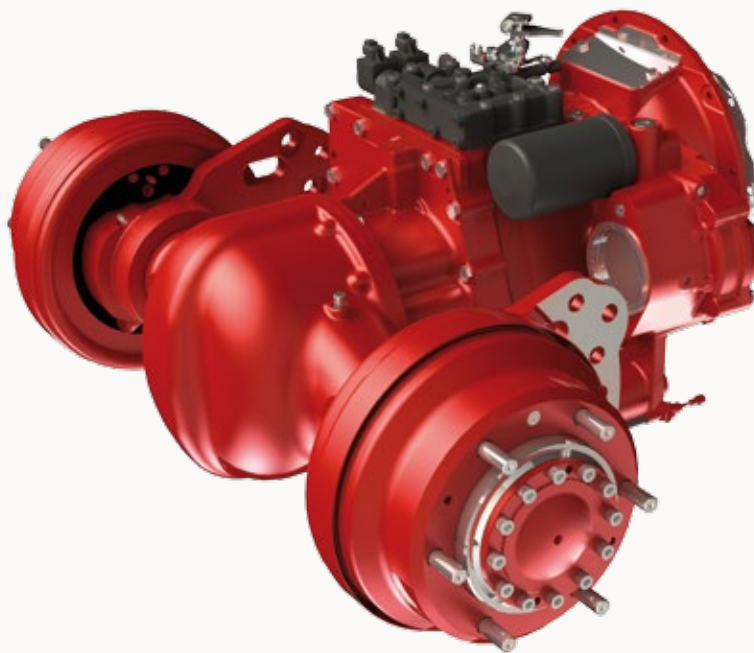
- › Hydraulic inching



Class IV & V

**CLASS IV & V**

		<b>TA 120</b>	<b>TA 135</b>
Lift capacity	<b>Kg</b>	2,000	3,500
Wheels Load	<b>Kg</b>	4,500	6,900
Torque at wheels	<b>Nm</b>	5,100	7,800
Transmission type		Single speed	Single speed
Range of ratios		13.46	16.17-17.76
Service and Parking Brake		Drum Brake	Drum Brake
PTO Drive		SAE A - 2 bolts	SAE B - 2 bolts
Input shaft to wheel shaft	<b>mm</b>	133	103
Flange to flange distance	<b>mm</b>	900	1,000
Wheel shaft to flywheel	<b>mm</b>	565	595
Mast mounting		Customized	Customized
Frame mounting		Customized	Customized
Wheel stud PCD	<b>mm</b>	156	235





# Split Solution for Internal Combustion Lift Trucks

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## Applications

- › IC Counterbalance Lift Trucks  
Cushion and Pneumatic

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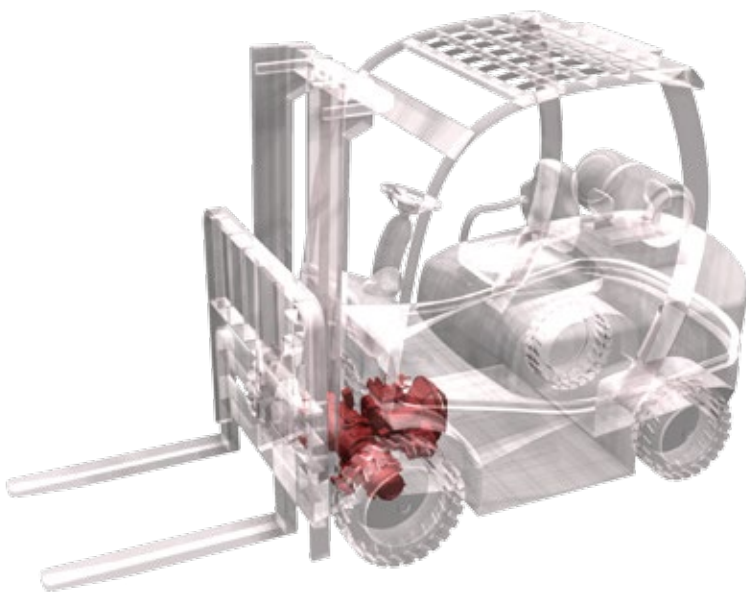
## Standard features

- › Compact and modular design
- › Powershift Transmission FWD/REV
- › PTO drive included
- › Integrated mast support
- › Mechanical inching
- › Wet Disc Brakes
- › Maintenance Free
- › Increased ergonomics
- › Optimized gears profile for noise reduction

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## Optional features

- › Hydraulic inching

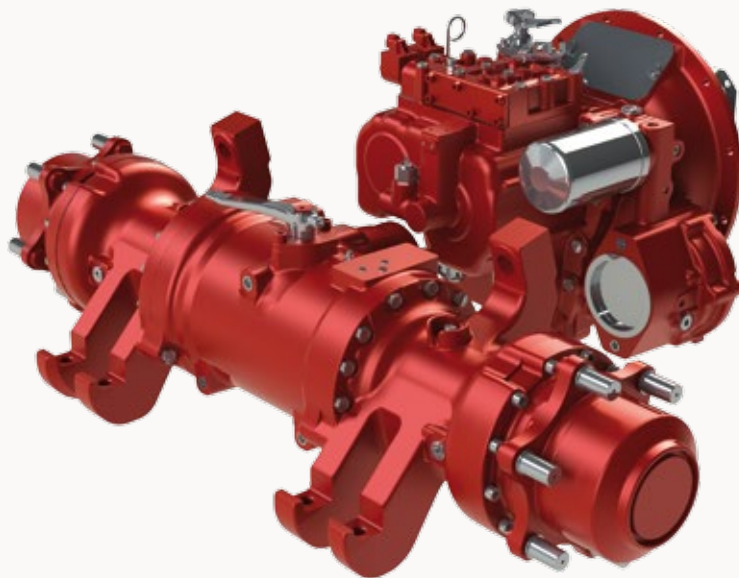


Class IV & V



**CLASS IV & V**

		<b>IC 25 + T165</b>	<b>IC 35 + T165</b>
Lift capacity	<b>Kg</b>	2,500	3,500
Wheels Load	<b>Kg</b>	5,500	7,500
Torque at wheels	<b>Nm</b>	5,500	9,400
Transmission type		Single speed	Single speed
Axle ratios		14.85	12.8-17.8
Transmission ratios		1,213	1,213
Service and Parking Brake		Wet Disc	Wet Disc
PTO Drive		SAE B - 2 bolts	SAE B - 2 bolts
Input shaft to wheel shaft	<b>mm</b>	101	101
Flange to flange distance	<b>mm</b>	950	950
Wheel shaft to flywheel	<b>mm</b>	660	660
Mast mounting		Customized	Customized
Frame mounting		Customized	Customized
Wheel stud PCD	<b>mm</b>	220	220



# Split Solution for Internal Combustion Lift Trucks

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## Applications

- › IC Counterbalance Lift Trucks

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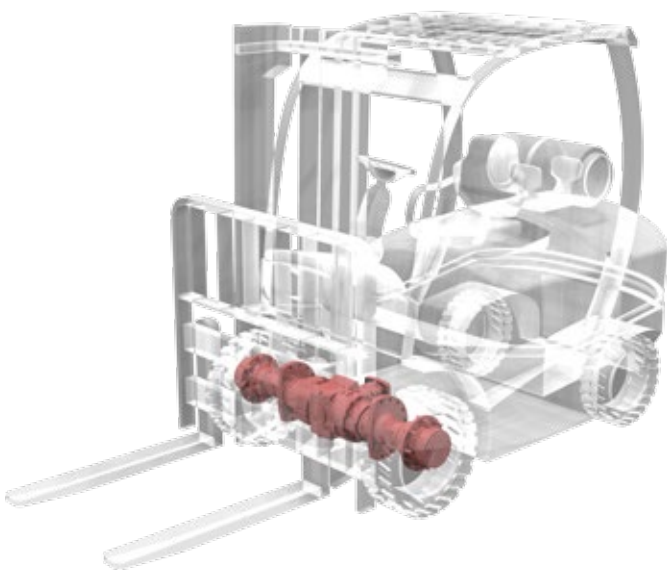
## Standard features

- › Compact and modular design
- › Integrated mast support
- › Optimized gears profile for noise reduction
- › Wet Disc Brakes
- › Maintenance free

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## Optional features

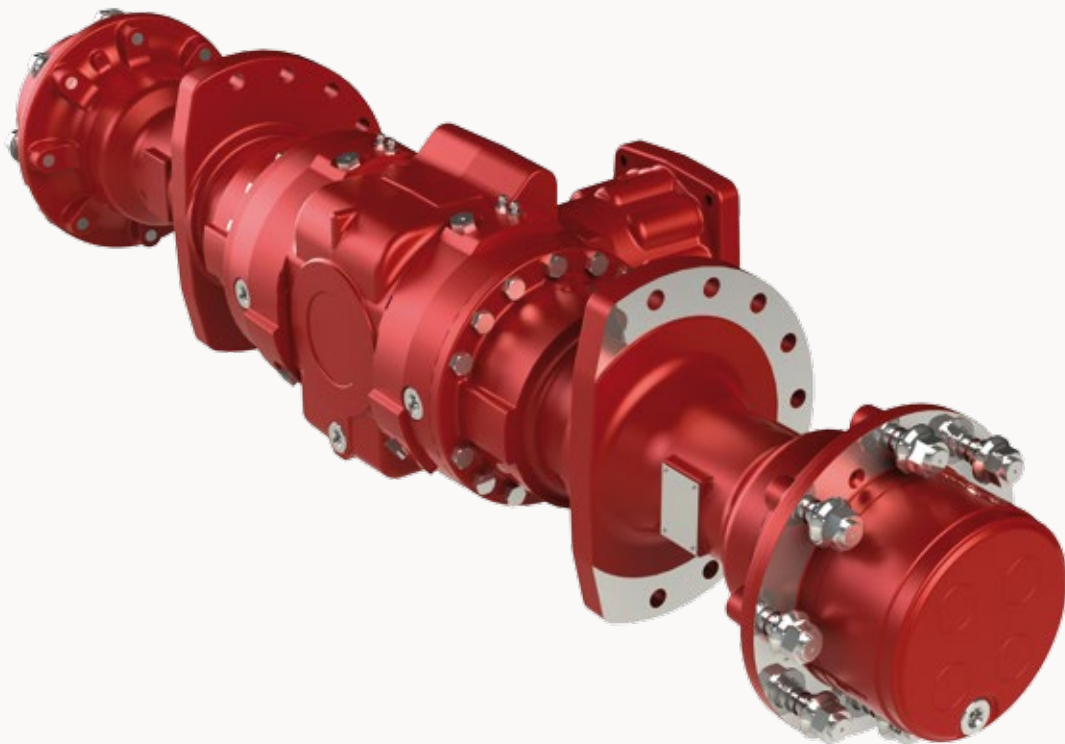
- › Transfer box
- › Wide range of reduction ratio available



Class IV & V

**CLASS IV & V**

		<b>IC 45</b>	<b>IC 90</b>
Lift capacity	<b>Kg</b>	4,500	9,000
Wheels load	<b>kg</b>	9,500	136,000
Torque at wheels	<b>Nm</b>	16,000	25,000
Axle ratios		9.66-25.8	10.7-27.6
Service and Parking brake		Wet Disc	Wet Disc
Transmission type		Carraro Transfer Box	Carraro Transfer Box
Transmission ratios		1.2-3.2	1.2-3.2
Flange to flange distance	<b>mm</b>	1,140-1,530	1,250-1,450
Frame mounting	<b>mm</b>	Customized	Customized
Mast mounting	<b>mm</b>	Customized	Customized
Wheel stud PCD	<b>mm</b>	205-275	275



The Power Transmission Excellence  
is our Passion



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Project related installation drawings  
can be made available on request as dimensions  
and technical data are subject to change  
due to continuous development.