

# BT reflex

1.4 – 2.5 tons  
Reach Trucks





E-series



N-series



R-series



F-series

# BT Reflex – the *complete* range of reach trucks

## *Productivity – Driveability – Safety – Durability*

Reach trucks are at the heart of many storage and distribution systems. TMHE has set the industry standard for reach truck design with the BT Reflex range through the combination of high productivity, exceptional driveability, and an unrivalled reputation for durability and reliability – with measured availability levels exceeding 99% – all with the intention to drive down costs in operations. At the same time safety is central to the design of the trucks, with a host of advanced features. All BT Reflex reach trucks can work effectively in chilled environments.

The BT Reflex **R-series** and **E-series** offer the highest acceleration, braking, and lifting performance, all of which is easy to program and control thanks to its intelligent man-machine interface. AC power brings low operating costs and long work cycles. A full range of truck chassis and mast configurations is available, with capacities up to 2500 kilograms. For high-lift applications, the E-series features the unique tilting cab system, which reduces neck and shoulder strain and allows faster and more accurate fork positioning.

For longer distances the Productivity+ formula allows a top speed of 14 km/h, and the Driveability+ formula adds automatic fork levelling and an armrest on to E-series models. If the focus is on safety, the Safety+ formula offers a range of enhanced safety features, including electronic performance control, to suit the handling situation.

Designed for the many applications in which a load capacity of 1.6 tons and lift height of 8.5 metres is more than enough, the **N-series** has a narrow chassis that makes it the ideal reach truck for potentially congested applications such as factories, and perfect for block stacking and drive-in racking.

For four-way handling, TMHE offers the BT Reflex **F-series**. This model is ideal for long load handling, as well as conventional pallet movement in confined spaces.

# BT Reflex N-series

## *designed to perform*

**All BT Reflex N-series models are fitted with high-performance AC drive units, with improved reliability and reduced maintenance requirements. Lift capacities of 1200, 1400, and 1600 kilograms are offered, with lift heights up to 8.5 metres.**

### **360° steering**

BT Reflex N-series' electronic, progressive 360° steering is perhaps the most significant contribution to the driving experience. Progressive means that fewer turns of the wheel are required when travelling at low speeds. This ensures that maximum manoeuvrability is possible without compromising high-speed safety. Its 360° nature means faster and smoother positioning within the aisle, and lower drive wheel wear – driving down costs.

### **Electronic braking**

Electronic braking adds to the N-series' driveability. In most cases braking is applied by the drive motor, and is regenerative. It applies when the brake pedal is depressed or the truck's direction is changed. Progressive auto-braking can also be programmed to apply whenever the accelerator is released. This means that the truck's speed can be effectively controlled by one pedal.

### **Electronic fork control**

Electronic fork control provides a cushioning effect during lifting, lowering, and reach movements, to allow high-speed but

smooth operation. Fingertip operation means smooth, precise, and strain-free control of all hydraulic functions.

### **Programmability**

Different aspects of the N-series' performance can be fully programmed, including acceleration rate, maximum speed, both steering and brake sensitivity, and the auto-braking function. This means that a truck can always be configured to suit its operator and operating conditions. BT Access Control automatically does this for each operator when his or her PIN-code is keyed in to start the truck.

### **E-bar**

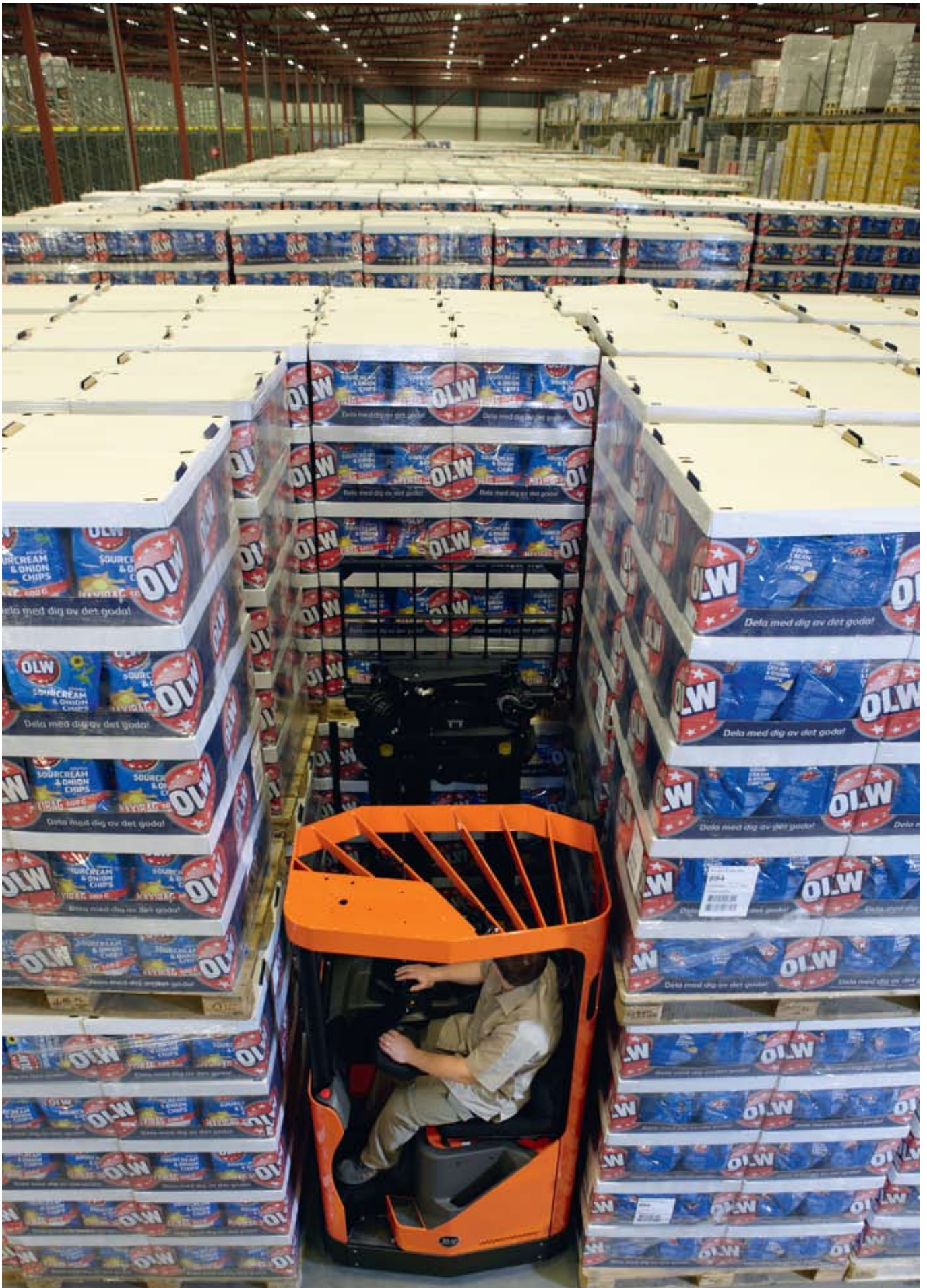
'E' stands for efficiency and effective integration with warehouse management systems. The E-bar is a universal mount for warehouse management devices such as on-board computers, radio data terminals, and barcode readers. It can be equipped with an integral 12 V or 24 V DC power supply, ensuring that Reflex M is ready to fit into any application.



*BT Reflex N-series' electronic, progressive 360° steering is perhaps the most significant contribution to the driving experience*



*Electronic braking adds to the N-series' driveability*



# BT Reflex N-series

## *built for safety...*

**A host of safety features – both passive and active – are built-in to the N-series to protect the load, the truck, the driver, and your business.**

### **BT Access Control**

BT Reflex N-series offers PIN-code entry as standard to ensure that the truck is only used by authorised personnel. This feature means that entry of a code will also configure the truck to that operator's specific performance settings. Up to ten different configurations can be stored under a maximum of 100 different codes.

### **Automatic parking brake**

On all Reflex N-series models the electromagnetic parking brake can be programmed to automatically apply in the following circumstances:

- when the driver steps off the truck
- when the truck is switched off
- when the brake pedal is applied after the truck comes to a stop

It automatically releases when drive direction is selected and the accelerator is applied. This way the driver need not think about applying and releasing the parking brake while working at height.

### **Panoramic vision**

The design of the cab not only provides panoramic vision for the

operator, but also provides excellent protection – the operator is fully contained within the profile of the cab. N-series' clear-view overhead guard provides full protection whilst maintaining excellent visibility. All Reflex M masts are also clear-view.

### **Adjustable seat and controls**

The BT Reflex N-series' cab will suit any size or shape of driver. The control console is adjustable in height, rake, and distance from the body. The seat and pedal positions are also adjustable, ensuring a perfectly comfortable driving position.

### **Lowest step-in height**

No other manufacturer's reach truck offers such a low step-in height. Typical reach truck applications require the driver to mount and dismount frequently, making step-in height significant for both ergonomics and productivity.

### **Pedals as in a car**

Pedals are laid out as in a car for maximum ease-of-use, and safety in emergencies. The left foot 'dead-man' pedal sounds a beeper when released, and may be programmed to apply auto-braking. This safety feature directly reduces the risk of left foot injury.



*Unique to BT, Reflex M offers PIN-code entry as standard to ensure that the truck is only used by authorised personnel*



*The design of the cab not only provides panoramic vision for the operator, but also provides excellent protection – the operator is fully contained within the profile of the cab*

## ... and maximum durability

**A combination of world-class design, build quality, and TMHE-standard service support ensures that the BT Reflex N-series is always there when you need it. And, with TMHE's 'Guaranteed Availability' offer, you can enjoy guaranteed availability of your N-series trucks on full service contracts or long-term rental.**

Because the BT Reflex N-series is built to TMHE standards it shares many components with other models in the BT Reflex family, giving the assurance of reliability through proven technology.

The absence of carbon brushes and power contacts in its AC drive motor reduces maintenance downtime. The latest 'CAN' technology also keeps parts to a minimum.

### Options

The BT Reflex N-series is fully configurable to suit each application:

#### Height indication

Electronic height indication (standard equipment from 6.3 metres) allows fast and accurate positioning of the forks.\*

#### Height pre-selection

Electronic height pre-selection improves productivity by making it easy to get the forks at the right height for both put-away and retrieval, reducing damage and neck strain.\*

#### Integrated sideshift

Lateral fork adjustment without restriction of the operator's view

of the load is available on the RRE140N and RRE160N. 'Hook-on' sideshift is available on the RRE120N.

#### Sideways battery change

To enable fast battery changes in multi-shift applications, BT's sideways battery change system uses a built-in rollerbed to facilitate battery removal and replacement.

#### Coldstore specification

Coldstore BT Reflex N-series models are able to operate effectively in temperatures down to  $-35^{\circ}\text{C}$ . Full protection is built into the hydraulic and electrical systems, and stressed fabrications within the chassis are specially prepared. Cold store versions have non-slip surfaces.

\* Not available on RRE120N



*The absence of carbon brushes and power contacts in its AC drive motor reduces maintenance downtime*



*The latest 'CAN' technology also keeps parts to a minimum*



# BT Reflex R-series

## *productivity is key*

**Most reach trucks form part of a complete logistics system where, alongside safety, assured levels of productivity are essential. The BT Reflex R-series has been designed to deliver the highest levels of throughput – thanks to class-leading driveability. In addition the unique Transitional Lift Control system gives shock-free lifting and lowering which means that high-speed movements are fully realisable without risk of load damage. All of this combines to drive down costs.**

### **Fast work cycles**

Productivity is all about work cycle rate and, while the travel distances and lift heights may vary between applications, work cycles for reach trucks will always depend upon speed of operation for both horizontal travel and vertical fork movements.

Acceleration is a key factor, with trucks often making frequent transits over relatively short distances. BT Reflex R-series offers exceptional acceleration rates and, if longer travel distances are required, the Productivity+ formula allows a top speed of 14 km/h (see below).

The advanced 360° steering system on all BT Reflex trucks allows exceptional manoeuvrability. It also means that the direction of travel can be changed in one smooth and continuous movement, thereby maintaining the highest work rate. The steering is electronic and progressive, which means that it is effortless for the driver.

### **Transitional Lift Control**

It is equally important to have high vertical performance levels, and this is where the BT Reflex R-series range really makes a

difference. These new trucks not only offer very high lift and lower speeds but, importantly, these high speeds are realisable in operation. The advanced Transitional Lift Control (TLC) system means that even at maximum speed the lift and lower movements are completely smooth – protecting the load and assuring safety in operation.

Similarly the reach movement is damped to ensure fast yet smooth operation, and the simultaneous hydraulic control system allows, for example, lift and reach movements to be combined, once again improving work cycle rates.

### **Energy efficiency**

BT Reflex trucks are powered by AC motors, which ensure maximum energy efficiency. Consumption rates are low on all BT Reflex models, with the added benefit of energy being recycled on deceleration and braking. For multi-shift operations these trucks can interface with battery change systems and the battery can be quickly and easily power-released while the driver is seated in the cab.



*The advanced 360° steering system on all BT Reflex trucks allows exceptional manoeuvrability*



*The optional E-bar is designed to carry ancillary equipment, offering standard interfaces and a built-in power supply*

### **BT Reflex+ Productivity**

For applications that demand the highest levels of productivity BT Reflex has the option of the Productivity+ formula. This gives the greatest travel speed and ensures that BT Reflex R-series fits into your application.

### **High top speed**

The Productivity+ formula allows travel speeds up to 14 km/h – particularly suited to longer travel distances, with safety assured through support wheel braking systems.

### **Horizontal E-bar with power supply and PC mounting kit**

This formula incorporates a horizontal E-bar, including 12 V power supply, which allows easy connection of an on-board computer and other ancillary equipment. This enhances productivity through full integration into the most sophisticated operations.

# BT Reflex R-series

## *driveability supports productivity...*

**The driving experience on BT Reflex sets unique standards in reach truck design. To achieve maximum productivity and consequently drive down costs it is essential to have man and machine working in perfect harmony.**

### **Perfectly driver-adapted**

Drivers come in all shapes and sizes. BT Reflex is designed to adapt perfectly. The seating position is fully adjustable, as are the split controls. The steering console can be adjusted for height, lateral distance and incline, and the control console is also adjustable to create the perfect driving position for each operator.

There is a choice of hydraulic control units. The standard mini-levers allow fingertip control of each fork movement. Alternatively the optional multifunction control unit can be selected, depending on the preference and experience of your drivers. These units are interchangeable, for maximum flexibility.

All controls on the BT Reflex range are effortless to use. The electronic steering system uses a small spinner-style steering wheel. Steering is progressive, meaning minimum turns of the wheel are required when fine positioning.

### **More comfort – less fatigue**

Comfort is essential to get the best from your operators, and the full work cycle needs to be considered. This includes mounting and dismounting the cab. The BT Reflex has a very low step-in height, which, combined with the easy-grip overhead guard post, means minimum effort is required, reducing strain over full working shifts. Also, the steering console folds forward to make life even easier.

### **Clear, concise information**

The BT Reflex range provides complete information to the driver via an intuitive information display, including:

- battery discharge indicator
- steering wheel direction indicator
- main drive direction indicator
- parking brake indicator
- service and maintenance indicator
- calendar and clock

The multifunction display is also used to set performance parameters and to allow fault diagnosis. In the event of a detected fault during operation the display will immediately alert the driver.

### **Height pre-selection, with height and weight indication**

This option allows frequently accessed lift heights to be pre-programmed for fast and accurate stacking. The pre-selection system differentiates between placement and retrieval cycles, accurately controlling fork movements throughout the process. Information is displayed on the load information display, which also shows lift height and load weight.



*Standard mini-levers allow fingertip control of each fork movement*



*An optional multifunction control unit can be selected, depending on the preference and experience of your drivers*

## ... and safety

**Reach trucks work in the most demanding situations, often in congested and narrow aisles, potentially handling loads up to 2.5 tons and with lift heights in excess of 12 metres. It is therefore not surprising that, when talking to reach truck users, they place a strong focus on safety – and safety is central to the design of BT Reflex trucks.**

### Safety in the cab

Keeping the driver safe is a key priority. The cab is designed to ensure that the driver is safely seated well within the profile of the truck, and that the overhead guard gives real protection from above. Sensors ensure that the driver is correctly seated and that the left foot is positioned within the profile of the cab.

The driver needs a PIN-code to activate the truck, which ensures use only by authorised personnel. The truck can be programmed so that the PIN-code determines the performance characteristics of the truck, according to the experience of the driver. Sensible logic also contributes to the design of BT Reflex R-series. For example the pedals are laid out as in a car for maximum familiarity, and every time the truck is stationary the electronic parking brake is automatically applied – and automatically released when the accelerator is pressed. A direction indicator continuously displays the current direction of travel, to ensure safety when starting out.

### Totalview concept

Having a clear, unobstructed view throughout the handling process is essential for maintaining maximum safety standards. BT Reflex has carefully considered all aspects of visibility. We call it 'BT Totalview'.

### Visibility for driving

When driving in the cab direction, the R-series gives a panoramic view for the driver. The overhead guard support is oval in design, and the rear support features a visibility window.

### Visibility for manoeuvring

The driver's view around and through the mast is maximised to allow safe positioning of the truck and the load.

### Upward visibility

The design of the overhead guard has been carefully considered to not only provide protection but also to allow a clear view upwards when placing and retrieving loads.

### Forward visibility

The driver console is low and slopes away from the driver. This gives maximum forward visibility from the cab when manoeuvring in congested areas.



*BT carefully considered all aspects of visibility during the design process*

### BT Reflex+ Safety

For even higher levels of safety in operation BT Reflex R-series offers a Safety+ formula that provides a number of enhanced features:

#### Automatic speed control

The Safety+ formula allows different aspects of the truck's performance to be adapted to suit the handling situation:

- optimised acceleration with lifted load
- optimised speed and acceleration with reached-out mast
- optimised speed when cornering
- lift height limited when speed exceeds 6 km/h
- reach speed adapted to suit lift height and load weight

### Height indicator

This provides accurate eye-level load information to enable the driver to quickly and accurately raise or lower the forks to the required height.

### Load weight indicator

*This enables the driver to check that loads are within the rated capacity for the truck. It also allows loads weights to be verified as part of the handling process.*





# BT Reflex R-series

## *durability means uptime*

**Reach trucks invariably work as part of an integrated process, in which having all machines available for work is essential – hence today's focus on 'uptime'. BT Reflex R-series trucks have been designed and are built to ensure the highest standards of durability, quality and reliability.**

### **Quality and strength**

BT Reflex trucks have been developed over successive generations with quality and strength as key components. Today's trucks are built to Toyota Production System standards, further improving the focus on quality. The latest generation of trucks feature heavy-duty drive units and gearboxes, and the entire construction of a BT Reflex truck is intended for the most demanding applications.

### **Designed for reliability**

BT Reflex trucks have been developed through a continuous process of improvement. As a result, reliability standards are exceptional. This is partly achieved by reducing the overall number of components. It is also achieved by designing-in reliability with, for example, sealed electrical units, brushless

motors and leak-free hydraulic connectors. Attention to detail ensures reliability in operation – which in turn delivers maximum uptime.

### **Reduced time for servicing**

Routine servicing and safety checks are of course essential. It is also important to keep time lost to servicing to the absolute minimum. The latest generation of BT Reflex reach trucks has extended service intervals due to the use of long-life or maintenance-free components. On-board diagnostics can quickly pinpoint any faults as they occur and ensure that remedial action is fast and effective. This is further supported by exceptionally easy service access to all areas of the truck.



*BT Reflex R-series has durability designed-in with its sealed electrical units, brushless motors and leak-free connectors*



*All BT Reflex models can be specified for cold store use*

# BT Reflex E-series

## *setting even higher standards*

**The BT Reflex range has consistently set the highest standards when it comes to driveability – providing the best driving characteristics and therefore achieving the highest performance from the operator. The BT Reflex E-series takes the R-series to new heights of productivity with BT’s unique tilting cab, further supporting TMHE’s efforts to drive down costs in handling operations.**

### **Tilting cab**

The tilting cab system – unique to BT – is designed for applications demanding repetitive high-level work. The tilting cab allows a clear view of the fork tips without requiring additional head movements, increasing handling accuracy and efficiency and reducing the risk of strain for the driver. The advanced tilting cab system achieves this by automatically tilting the driver back as the forks are raised. The tilting action can be programmed to suit the application.

---

### **BT Reflex+ Driveability**

To further enhance the driver experience with BT Reflex E-series an optional Driveability+ formula provides additional features.

### **Automatic fork levelling**

Another valuable feature that forms part of the Driveability+ formula is an automatic fork-levelling facility, which enables the driver to level the forks at the touch of a button.

### **Armrest**

The Driveability+ formula also provides additional comfort for the driver with an ergonomically designed armrest.





# BT Reflex F-series

## *four-way handling*

**For long load handling TMHE offers the BT Reflex F-series reach truck, which features a front-facing driving position and a hydraulic fork spreader as standard equipment. The FRE270 can also handle conventional pallets with ease.**

The BT Reflex F-series is based on the class-leading R-series and shares many features such as AC power, clear-view masts, electronic mini-levers, 360° steering with direction indicator, automatic parking brake, and sideways battery exchange with built-in rollerbed.

Unique to the F-series, the driver faces in the same direction as the forks, giving the best view of the long loads that the F-series is designed to handle. The truck can drive in any direction,

which, combined with its hydraulic fork spreading, makes the F-series a very versatile truck for horizontal and vertical handling.

Maximum lift height is 8 m, load capacity 2700 kg.



*The BT Reflex F-series can spread its forks over a range of 0.54 m to 2.22 m*



*The cabin is spacious and comfortable, and the controls offer fingertip operation, for precise and effort-free load handling*



# Materials handling for Europe

**Toyota Material Handling Europe (TMHE) has a strong European presence with its Toyota and BT brands, establishing close geographic links with its customers in order to better respond to their needs. TMHE has operations in more than 30 countries, and production centres in Ancenis (France), Bologna (Italy) and Mjölby (Sweden).**

## **Toyota Production System**

The Toyota Production System (TPS) empowers team members to optimize quality by constantly improving processes and eliminating unnecessary waste of resources. TPS includes a common set of knowledge, values and procedures, entrusts employees with well-defined responsibilities in each production step, and encourages each staff member to strive for overall improvement. Today, TPS is the acknowledged reference among automotive manufacturers and related industries. Our methods enable businesses to achieve sustained gains in productivity while satisfying customer expectations for quality and reliability.

## **Research & Development**

Toyota Material Handling Europe benefits from Toyota's vast experience in the automotive industry, especially in engine development. By taking full advantage of the group's massive R&D facilities and engineering expertise, Toyota has developed a number of world-class technologies. Intelligent use of electronic and computer controlled devices has also made a significant contribution to creating more ergonomic and user-friendly operator environments, contributing to safety in the workplace.

## **Empowering your business**

Our services and solutions are designed to provide different levels

and types of support in response to individual customer's needs. This approach gives our customers the power to focus on their core business.

## **Our commitment to the environment**

TMHE believes that getting the job done should never be at the expense of our environment. Our long-term commitment is to develop and deliver environmentally friendly and economically viable materials handling solutions that respect present and future energy needs. TMHE strives to reduce environmental impact throughout the product life cycle, from design, manufacturing and operation through to recycling at end-of-life. TMHE's production centres are all ISO 14001 certified. A declaration of the emissions and waste during the manufacturing process and typical life cycle is available on request.

With its emphasis on eliminating waste, TPS also helps to reduce the environmental impact of our manufacturing activities. CO<sub>2</sub> emissions, water consumption, waste-water generation and landfill quantities have all been reduced, while recycling levels for packaging, water and scrap have been raised. Hazardous substances and air pollutants have also been reduced. Moving towards the creation of a recycling-oriented society, TMHE seeks to continuously improve the recyclability levels of its products.

# Choose the features that suit your needs

● standard ○ option

	BT Reflex N-series	BT Reflex R-series / E-series	BT Reflex F-series
<b>Truck features</b>			
Adjustable width over forks	●	●	●
Choice of cab widths	○	○	
Choice of chassis widths		○	
Driver facing forks			●
Fork spreader	○	○	●
Four-wheel design			●
Heavy-duty models		○	
High-capacity battery models		○	
High performance models		○	
Sideshift	○	○	
Integrated sideshift	○	○	○
Tilting forks	●	●	●
Tilting mast	●		
<b>Driving features</b>			
360° progressive steering	●	●	●
Automatic deceleration	●	●	●
Electronic braking system	●	●	●
Electronic regenerative brakes (motor)	●	●	●
Electronic speed control	●	●	●
<b>Controls and instruments</b>			
Adjustable BT Control console	●	●	●
Creep speed function	●	●	
Drive motor temperature warning	●	●	●
Electronic controller temperature warning	●	●	●
Electronic height indicator	○	○	○
Electronic fingertip controls	●	●	●
Height pre-selector	○	○	○
Hour meter (working hours)	●	●	●
Information display	●	●	●
Lift motor temperature warning	●	●	●
Load information display	○	○	○
Mini-joystick electronic controls	●	●	●
Multifunction control	○	○	○
Power/Electronic steering	●	●	●
Split control panel		●	
Steering direction indicator	●	●	●
Camera/monitor system		○	
Twin direction controls			●
Weight indicator		○	●
<b>Safety features</b>			
Automatic parking brake	●	●	●
BT Access Control (PIN codes)	●	●	
Smart Access (electronic cards/fobs)	○	○	
Clear-view mast	●	●	●
Clear-view overhead guard	●	●	●
Driver detection system	●	●	●
Electronic support arm brakes (standard on RRE180–250)		○	
Emergency cut-off	●	●	●
Load support	○	○	
Parking brake	●	●	●
Pedals as in a car	●	●	●
Programmable performance	●	●	●
Warning beacon	○	○	○
Working lights	○	○	○
<b>Operator features</b>			
Adjustable backrest	●	●	
Adjustable pedals	●		●
Adjustable seat with safety belt	○	○	●
Adjustable seat	●	●	●
Adjustable steering wheel	●	●	●
E-bar	●	●	
Enclosed cab	○	○	
Heated seat	○	○	○
Low step-in	●	●	●
On-board data terminal mount		○	
Storage compartments	●	●	●
Tilting cab (* standard on E-series)	○	○*	
Writing table	○	○	○
<b>Maintenance features</b>			
Easy access for maintenance	●	●	●
Fault diagnosis facility	●	●	●
Historic fault log	●	●	●
<b>Battery management features</b>			
Battery change facility	○	○	○
Battery status indicator	●	●	●
Battery discharge prevention system	●	●	●
Heavy-duty battery compartments		●	
Sideways battery change	○	○	●
<b>Special applications</b>			
Coldstore version	○	○	
EEx version (ATEX)		○	



**TOYOTA**

MATERIAL HANDLING

stronger together

TOYOTA MATERIAL HANDLING EUROPE, MANAGING THE TOYOTA AND BT MATERIALS HANDLING BRANDS IN EUROPE