

Product presentation

Date: 230401

TOYOTA

MATERIAL HANDLING

TRACTO

S Series TSE



Content

- Product Range Overview
 - Design principles & Main specifications
- Product Features & Benefits
 - Productivity
 - Driveability
 - Safety
 - Durability



Product range overview

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MATERIAL HANDLING

TSE300 and TSE500

- Electric Towing Tractors
- The range contains two tonnange. A 3.0t tractor and a 5.0t tractor
- 24V
- Built at the factory in Mjölby



Product range overview

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MATERIAL HANDLING

TSE300 and TSE500

stand-on model

- High performance tractor, suited for horizontal transport and picking operations
- Especially suited for operations where the goods are moved frequently, for example just-in-time manufacturing
- Typical market segments are industrial and logistic companies. Some examples are car industries and third party logistics.



Product range overview

TSE					
Model	Voltage	Load capacity (kg)	Rated drawbar pull (N)	Width (mm)	Length (mm)
TSE300	24V	3000	1000	799	1571
TSE500	24V	5000	1150	799	1571

Main Specifications

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MATERIAL HANDLING

TSE			
Model		TSE300	TSE500
CHARACTERISTICS			
Load capacity / rated load	Kg	3000	5000
Rated drawbar pull	N	1000	1150
Wheelbase	mm	1319	1319
Wheels - number front/rear (x = drive wheel)	-	1x/2	1x/2
DIMENSIONS			
Overall length	mm	1571	1571
Chassis width	mm	799	799
Turning radius	mm	1508	1508
Stand height	mm	130	130
Coupling Height, towing pin	mm	188/283/378/473	188/283/378/473
MOTOR AND PERFORMANCE			
Travel speed laden/unladen	Km/h	9,0/12,0	6,0/11,0
Maximum gradeability laden/unladen	%	6/13	3/13
Drive motor	kW	2,8	2,8

Product Features & Benefits

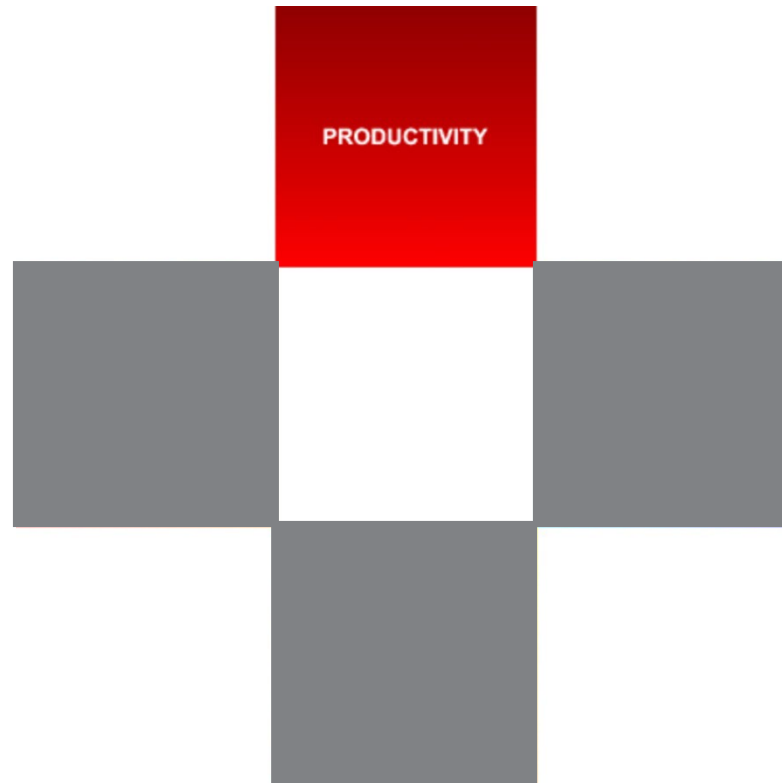
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MATERIAL HANDLING

TRACTO

S Series TSE300 and TSE500

is designed around 4 core values that customers can benefit from:



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Capacity

Features

- Towing up to 5t

Benefits

- High towing performance results in a capability of using numerous of load carriers. More efficient order picking due to less number of transports



High towing performance = more loads per cycle = less number of cycles for the same amount of load = high productivity = decreased handling cost

PRODUCTIVITY

RELIABILITY

SAFETY

ENVIRONMENTAL

Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

High performance

Features

- High performance tractor

Benefits

- High speed means more efficient towing cycles due to less transport time
- High acceleration reduces time in between stops



High towing performance = the driver is more effective in his work = more effective towing cycles = increased productivity = increase in towed loads per hour = decreased handling cost

PRODUCTIVITY

DRIVEABILITY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

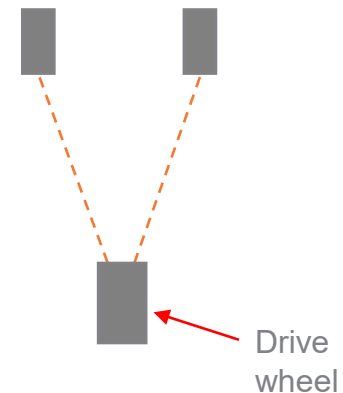
3 wheel design

Features

- 3 wheel design to suit the need for high drive wheel pressure

Benefits

- Better performance due to high drive wheel pressure
- No castor wheel adjustment
- Same turning radius for left and right cornering



3 wheel design = higher performance when driving = More effective cycles = increased productivity = decreased handling cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Chassis design

Features

- Narrow chassis design

Benefits

- Smaller distance between picking aisles is required
- Easier to work with other tractors in the same aisle



Narrow chassis = narrower aisles = more loads in the same area = reduced handling cost

PRODUCTIVITY

DRIVEABILITY

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ENVIRONMENTALITY

Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Storage

Features

- Many storage compartments for small or large items as standard. Integrated shrink film holder as standard

Benefits

- Easy access to carry-on items saves time



Ergonomic storage design supporting the driver = increased organization for frequently used equipment = saves time = increased productivity = decreased handling cost

PRODUCTIVITY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Battery

Features

- Different battery sizes, 465Ah & 620Ah.
- Optional sideways battery change

Benefits

- Optimized for each customer
- Quick and easy battery replacement



More options in battery sizes = customer get the most optimal battery size for its cycle = the battery gets price effective = decreased handling cost

PRODUCTIVITY

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Product Features & Benefits

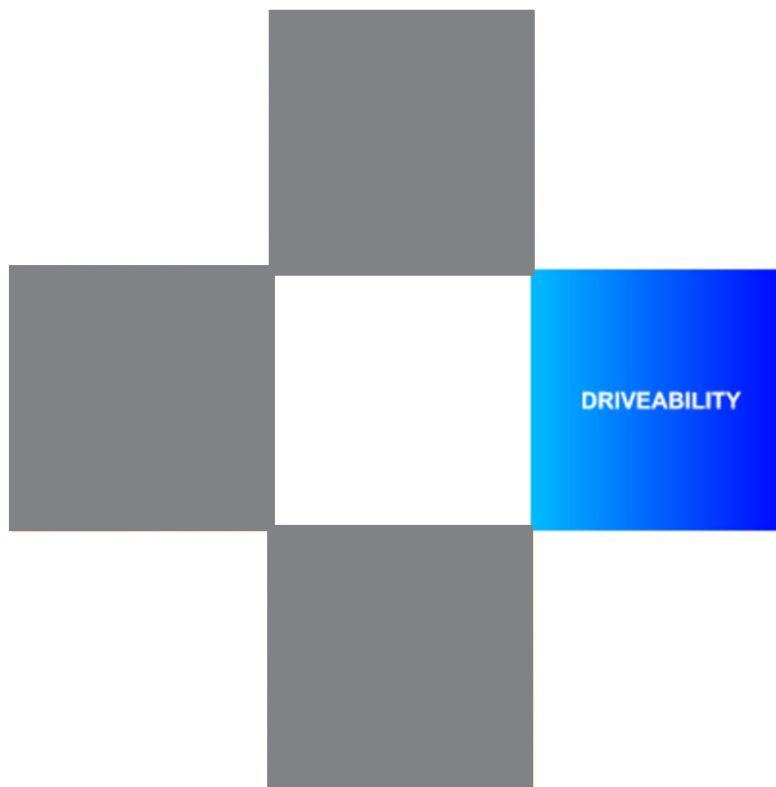
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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Controls, E-man steering system

Features

- A steering and controls system called E-man



Benefits

- Easy to use controls. It is easy to learn and understand the controls for tractor movements and steering
- Easy and ergonomic operation in all directions. You can use left, right or both hands for the operation
- Drive wheel automatically straightens up when alighting. This means you always know that the drive wheel is straight

Easy to operate = increased drivability = higher productivity
= reduced handling cost per towed load = decreased
handling cost

PRODUCTIVITY

DRIVEABILITY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Controls, E-man steering system

Benefits, continue

- No part of the operators body need to be outside the tractors profile during operation
- Automatic speed reduction in cornering helps to ensure that people, infrastructure and load are safe
- Walking alongside the tractor available. No need to jump on the tractor for every truck movement which gives higher productivity
- To keep a high safety level and avoid foot injures it is possibly to program speed between 0-4 km/h when walking with the tractor. More than 30 degree turning of the E-man when walking along the tractor stops the tractor



Easy to operate = increased drivability = higher productivity
= reduced handling cost per towed load = decreased
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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Operators parameters

Features

- The BT Movit tractor is highly maneuverable and offer individual setting of performance parameter for the operators. The parameters can be re-programmed by the operator. Some of the parameters that are available to adjust are high speed, acceleration, automatic braking, speed when walking next to tractor, and braking when operator jumps off while tractor is moving.

Benefits

- The availability to set the drivers personal parameters makes the driver experience more comfortable, more productive and more safe

Individual parameter setting = supports the driver in daily work = increased drivability = increased productivity = decreased handling cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Electrical servo steering, E-man steering system

Features

- Electrical servo steering
- Geared steering angle, 60° rotation of the E-man control unit moves the steered wheel 100°.

Benefits

- Less stress on the operator's shoulders and arms
- Helps the operator to always be inside the tractors profile
- Easy to steer at low speed

E-man steering = relaxed and safe driving supporting the driver = increased drivability = higher productivity = decreased handling cost

At full steering lock, the handle is turned 60°



At full steering lock the drive wheel is turned 100°

PRODUCTIVITY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Brakes

Features

- Reversing brake. The motor brake is easily applied when the operator moves the speed control past the neutral position to reverse the tractor
- Neutral brake. The motor brake is engaged when the operator releases the speed control in the centre position
- Alighting during driving. If the operator jumps off the tractor while it is moving, the motor brake is automatically applied and when after a while even the mechanical brake is activated
- Braking with the handle. The mechanical brake is engaged by pushing up the steering handle to its top position. Please note this is the only position in which the brake is applied, it is not applied if the lever is pressed down

Tractor with several brakes supporting the driver =
increased drivability and safety = decreased number of
accidents = higher productivity = decreased handling cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Brakes

Benefits

- Reversing brake means controlled slowing down of the tractor and regenerative braking (regeneration of energy back to the battery)
- The neutral brake power can be adjusted using the operator's tractor parameters. This means controlled slowing down of the tractor and regenerative braking
- Parking brake is always applied automatically when alighting during driving. This means also controlled slowing down of the tractor and regenerative braking
- Braking with the handle is easy to use in an emergency situation to come to a quick stop.

Tractor with several brakes supporting the driver =
increased drivability and safety = decreased number of
accidents = higher productivity = decreased handling cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Instep

Features

- Low instep height

Benefits

- Easy and safe stepping on & off
- Less tiring work



Easy access = less tiring work and less accidents =
increased drivability = increased productivity = decreased
handling cost

PRODUCTIVITY

DRIVEABILITY

SAFETY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Backrest

Features

- Ergonomic designed backrest

Benefits

- Easy on/off the truck
- Fits all sizes of operator



Backrest supporting the driver = more relaxed driving =
increased drivability = higher productivity = decreased
handling cost



Product Features & Benefits

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

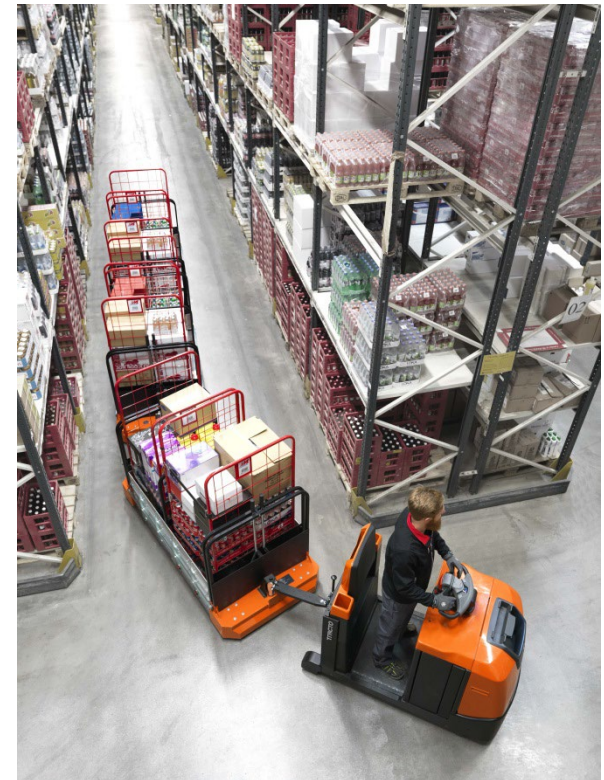
OTP – Optimized Truck Performance

Features

- Reduced speed when drive wheel angle exceeds 25°

Benefits

- The tractor slows down when cornering which decreases the risk of accidents



OTP = always supporting the driver when driving in curves =
less accidents = increased productivity = decreased
handling cost

PRODUCTIVITY

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Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Access

Features

- Keyless access by PIN codes
- 10 different driver profiles and 100 different PIN codes possible

Benefits

- Prevents unauthorised use of the tractor
- The performance of the tractor can be programmed to suit individual drivers
- No key is needed for start of the tractor



Safe access to tractor = correct driver = less accidents =
decreased handling cost



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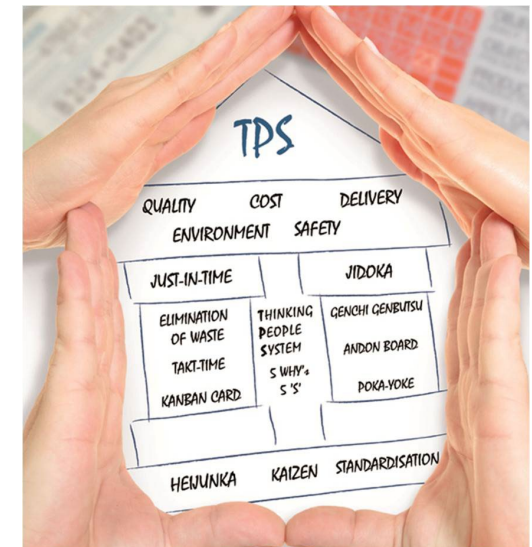
Toyota Quality – TPS and components selection

Features

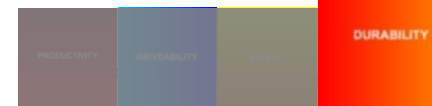
- Manufacturing according Toyota Production System (TPS)
- Components selection and extensive testing
- Toyota in-house checks:
 - At delivery of parts
 - At assembly of parts
 - Final check before delivery

Benefits

- Quality from design stage to manufacturing stage for long term reliability and durability



Guarantee of high quality components and final product =
increased life time of components (durability) = fewer
replacements = reduced overall service cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

Durable motor package

Features

- The AC drive motor is permanently mounted, and the motor does not move when the drive wheel turns.
- Easy access for maintenance
- Minimum amount of components
- Robust and reliable CAN-bus technology

Benefits

- Permanently mounted motor means no moving cables and enables a very compact machine
- Easy access means easy and quick maintenance
- AC Drive motor means no carbon brushes, no wear
- CAN-bus means less components and extended lifetime

Reducing need of maintenance = high durability = high productivity = decreased handling cost



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

BT Powerdrive system

Features

- The BT Powerdrive system on the Tracto. T-series is a unique combination of contactless controls, CAN bus communication (CAN = Controller Area Network) and AC drive motor.
- Available to program the operator truck parameters.
- Fast acceleration and braking.
- Regeneration of energy back to the battery. The regenerative braking is automatically activated whenever the operator releases the speed control or alights from the truck.

BT Powerdrive system = reduced number of moving parts
and wear points = higher durability = higher productivity =
decreased handling cost



Product Features & Benefits

TOYOTA

MATERIAL HANDLING

[TSE300/TSE500]

BT Powerdrive system

Benefits

- Contactless controls means high reliability and reduced downtime thanks to the reduced number of moving parts and wear points.
- CAN bus provides quick, reliable information with few cables.
- The truck can be adapted to the operator's level of experience and preferences in terms of speed, acceleration and motor braking. Resulting in improved safety and increased productivity.
- Fast acceleration and braking means maximum control of truck travels because the truck instantly reacts to operator commands.
- Up to 5-10% of the energy can be returned back to the battery when using the motor braking with reduced stress and wear on the drive wheel.



Product Features & Benefits

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MATERIAL HANDLING

[TSE300/TSE500]

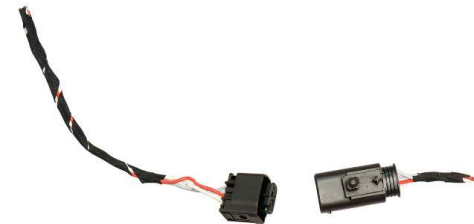
MQS

Features

- Use of MQS (Micro Quadlok System) contact in the electrical system.

Benefits

- It is smaller and uses less space.
- It has high quality mechanical connection ability
- It has high quality electrical connection ability.



Reducing need of maintenance = reducing time that
the tractor stand still = higher productivity = reduced
handling cost per towed load = decreased handling cost



END OF MODULE

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MATERIAL HANDLING