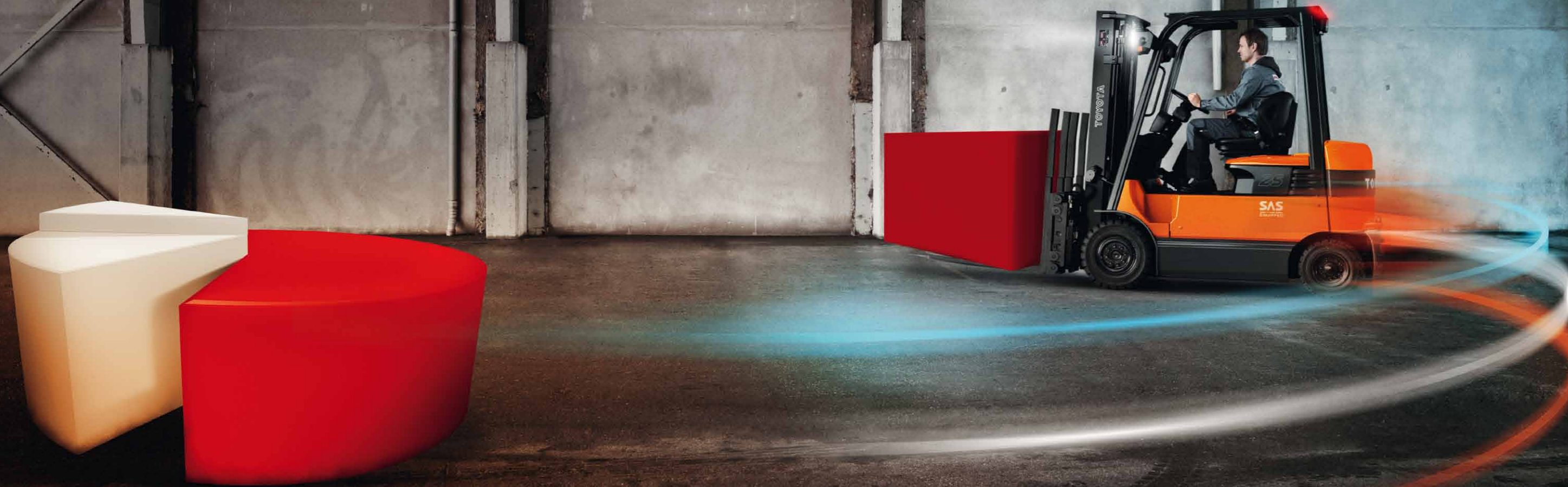


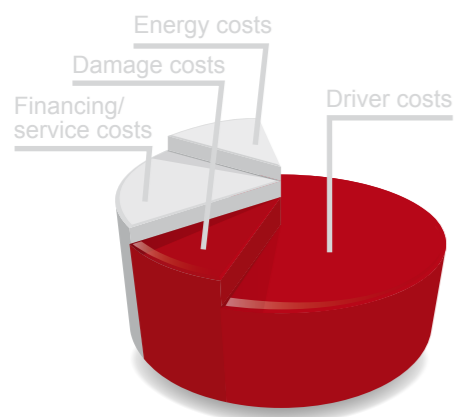
ONLY TOYOTA TRUCKS WITH SAS KNOW HOW



TO DRIVE DOWN COSTS



Toyota forklift trucks equipped with SAS use intelligent technologies to reduce your driver and damage costs. It all adds up to a significant reduction in your overall truck operating expenses. And because downtime is reduced and workflow is faster, your productivity increases as well. **Only Toyota trucks with SAS know how to move loads safely and drive down costs.**



Savings you can see

SAS addresses costs in two key areas: driver costs and damages costs. These areas can collectively account for more than 70% of your truck's life cycle cost. SAS can deliver immediate savings, protecting your drivers and your bottom line.



Six reasons why SAS delivers savings

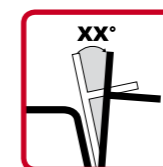
As the focus on workplace safety increases across Europe, SAS stands out as technology that actively reduces the risk of accidents. Unique to Toyota trucks, this patented dynamic system comprises 10 sensors, 3 actuators and a controller. SAS constantly monitors forklift operations and automatically takes corrective action when it senses factors that could lead to truck or load instability. Its six advanced functions work together to keep your driver and goods safely on the move – and your productivity on the up.



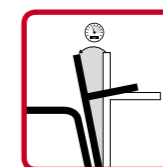
Swing Lock Cylinder



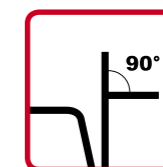
Speed reduction when cornering



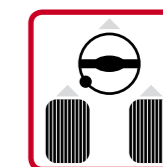
Mast Front Tilt Angle Control



Mast Rear Tilt Speed Control



Fork Levelling Control



Active Steering Synchroniser



ONLY TOYOTA TRUCKS WITH SAS KNOW HOW TO STEER CLEAR OF UNNECESSARY DAMAGES TO TRUCKS



SAS ACTS AUTOMATICALLY TO PREVENT SIDWAYS TIP-OVER – THE CAUSE OF OVER 30% OF SERIOUS FORKLIFT ACCIDENTS

Swing Lock Cylinder

SAS reduces risks during turning without compromising productivity. If the truck becomes unstable during a turn, the patented Swing Lock Cylinder automatically locks the rear axle to increase the truck's stability footprint – greatly reducing the risk of a sideways tip-over. Acting even faster than the most experienced driver, SAS provides excellent stability to help protect operators and keep trucks damage-free.

Speed reduction when cornering

If SAS senses the turning speed is too high, it overrides the driver's instructions and automatically slows the truck to keep the wheels and load in the proper position. Avoiding accidents keeps your drivers safe and your equipment in excellent working condition.

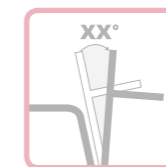
SAS functions help protect the condition of your truck. By preventing accidents and minimising unnecessary wear and tear, SAS keeps repair costs down.



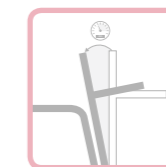
Swing Lock Cylinder



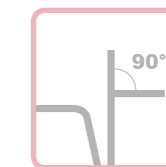
Speed reduction when cornering



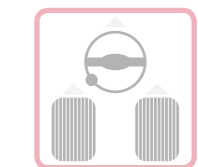
Mast Front Tilt Angle Control



Mast Rear Tilt Speed Control



Fork Levelling Control



Active Steering Synchroniser

Please note that Toyota forklift models are equipped with either the SAS Swing Lock Cylinder or SAS speed reduction when cornering. Consult the relevant product brochure for details specifications.



ONLY TOYOTA TRUCKS WITH SAS KNOW HOW TO DRIVE DOWN DAMAGES TO GOODS



SAS HELPS TO AVOID DAMAGES TO GOODS AND RELATED COSTS IN AN INDUSTRY WHERE ACCIDENTS ARE FAR TOO COMMON

Mast Front Tilt Angle Control

SAS prevents both the load and truck from tipping dangerously forward. Mast Front Tilt Angle Control monitors load height and mast position. If necessary, it automatically limits the mast angle to protect the driver and load. This reduces the risk of injury and property damage, supporting lower insurance costs.

Mast Rear Tilt Speed Control

When loads are tilted backwards too quickly, they can put the driver, goods and the truck at risk. Mast Rear Tilt Speed Control senses possible risk factors and reduces the mast speed accordingly. The load moves surely and steadily into the right position and work carries on.

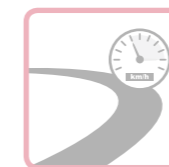
Fork Levelling Control

Adjusting the forks to a level horizontal position takes a little extra time – every time. With SAS Fork Levelling Control, the forks are levelled at the push of a button, making work easier for the driver, particularly when loads are at height. This saves time, which increases productivity and saves you money.

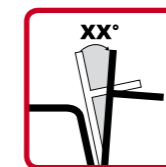
SAS is always active to protect your driver, truck and goods. By minimizing the chance of load loss or accidents, SAS can save you time and money otherwise spent on customer claims, insurance premiums, clean-up and lost productivity.



Swing Lock Cylinder



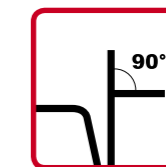
Speed reduction when cornering



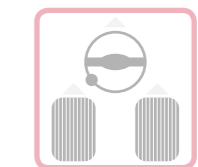
Mast Front Tilt Angle Control



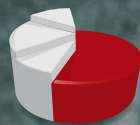
Mast Rear Tilt Speed Control



Fork Levelling Control



Active Steering Synchroniser



ONLY TOYOTA TRUCKS WITH SAS KNOW HOW TO DRIVE DOWN DRIVER COSTS



FROM NOVICE DRIVERS TO EXPERIENCED OPERATORS, SAS SUPPORTS BETTER PRODUCTIVITY AND EFFICIENCY

Active Steering Synchroniser

Eliminating hydraulic steering slippage helps operators work safely and more efficiently. The SAS Active Steering Synchroniser does this by automatically aligning the steering wheel with the rear wheels. Your drivers work ergonomically and always know which direction the truck will move for safe, productive operation.

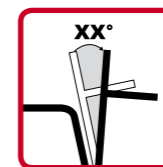
All SAS functions work together to enhance driver confidence and reduce the number of repetitive driver actions needed to handle each load. This makes handling operations simpler, safer and more efficient – helping you to optimise driver costs.



Swing Lock Cylinder



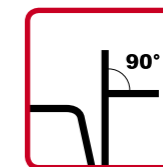
Speed reduction when cornering



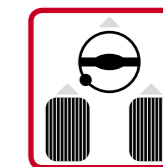
Mast Front Tilt Angle Control



Mast Rear Tilt Speed Control



Fork Levelling Control



Active Steering Synchroniser

ONLY TOYOTA TRUCKS WITH SAS HAVE THIS KIND OF KNOW HOW



Toyota SAS is the product of years of experience in engineering advanced automotive technology. An industry premiere and still unique in the business, patented Toyota SAS technology draws on Toyota's leadership in developing automotive safety systems. SAS dynamically manages lift truck stability for class-leading safety and productivity.

SAS now comes as standard in:

Engine powered forklifts 1.5 to 5.0 ton
Electric powered forklifts 1.0 to 8.5 ton

SAS SENSORS

(Placement indicated here on Toyota engine powered forklift)

- ① **FORK HEIGHT SWITCH** – senses whether the mast is higher than approx. 2 m.
- ② **TILT ANGLE SENSOR** – senses mast angle
- ③ **FRONT TILT LIMIT SWITCH** – senses when the operator tilts the forks forwards
- ④ **REAR TILT LIMIT SWITCH** – senses when the operator tilts the forks backwards
- ⑤ **LOAD SENSOR** – measures load weight using hydraulic pressure
- ⑥ **TILT KNOB SWITCH** – senses when the operator depresses the tilt switch
- ⑦ **VEHICLE SPEED SENSOR** – measures vehicle speed
- ⑧ **STEERING WHEEL ANGLE SENSOR** – measures position of steering wheel
- ⑨ **TIRE ANGLE SENSOR** – measures angle of rear wheels
- ⑩ **YAW RATE SENSOR** – measures truck lateral acceleration

SAS ACTUATORS

(Placement indicated here on Toyota engine powered forklift)

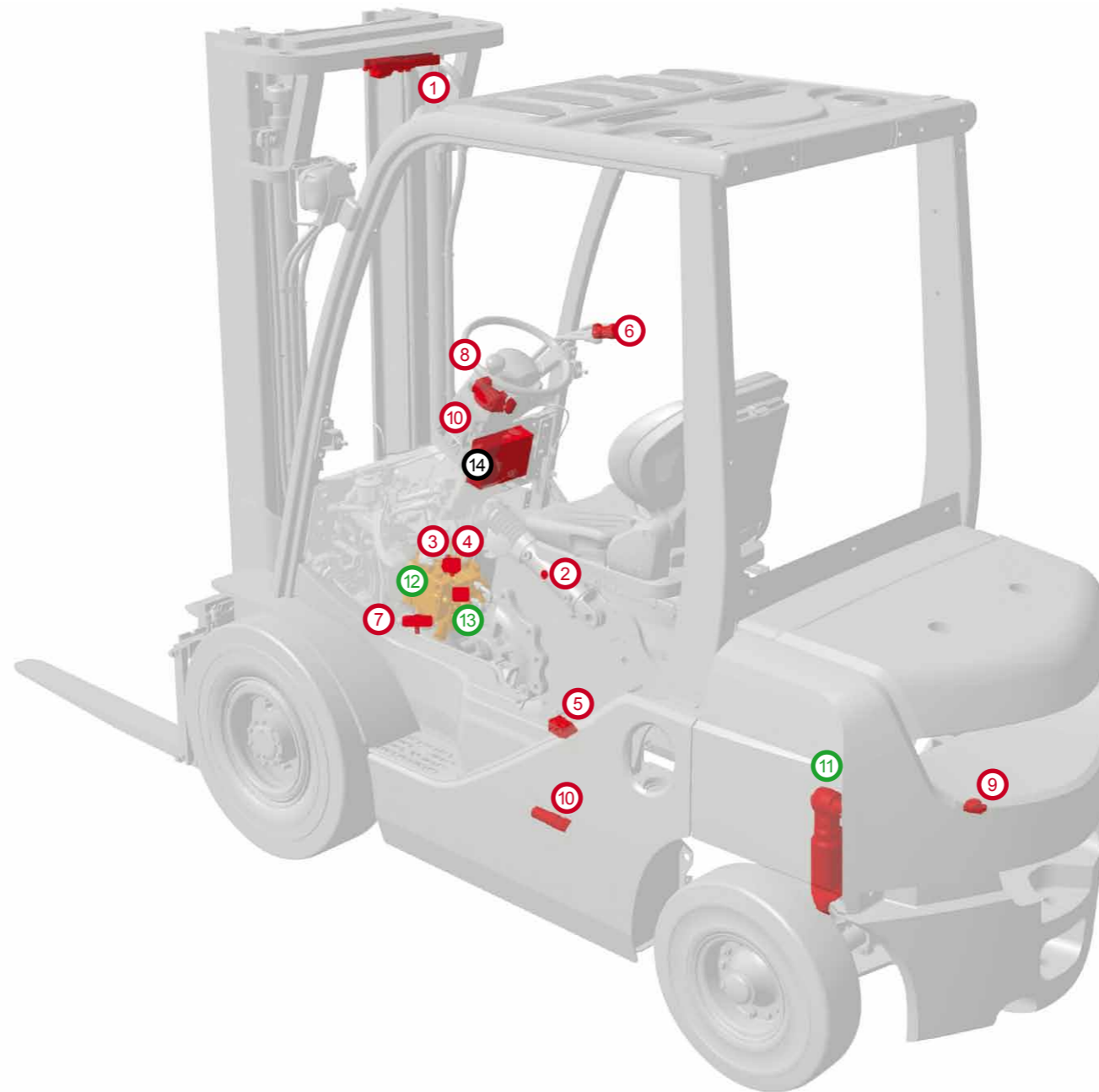
- ⑪ **SWING LOCK CYLINDER** – locks the rear axle
- ⑫ **HYDRAULIC OIL CONTROL VALVE** – regulates oil flow to tilt cylinders
- ⑬ **STEERING SYNCHRONISER SOLENOID** – regulates oil flow to steering cylinder to align steering knob position with rear wheels

THE SAS CONTROLLER

(Placement indicated here on Toyota engine powered forklift)

- ⑭ Toyota's SAS controller uses information from the SAS sensors to determine whether action is needed. When necessary the controller activates the SAS actuators to support excellent safety and productivity.

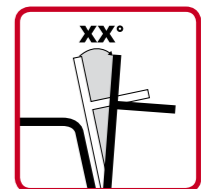
Even the best technology cannot guarantee accident-free operation. Proper training, the establishment of appropriate work rules, and enforcement of safety regulations will have the greatest impact on workplace safety.



Swing Lock Cylinder



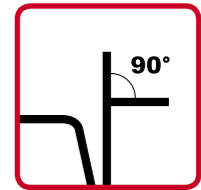
Speed reduction when cornering



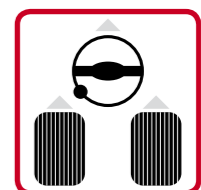
Mast Front Tilt Angle Control



Mast Rear Tilt Speed Control



Fork Levelling Control



Active Steering Synchroniser

- ①
- ⑤
- ⑦
- ⑩
- ⑪
- ⑭

- ①
- ②
- ③
- ④
- ⑤
- ⑥
- ⑫
- ⑭

- ⑧
- ⑨
- ⑬
- ⑭



The data in this brochure was determined based on our standard testing conditions. Operating performance may vary depending on the actual specification and condition of the truck as well as the condition of the operating area. Availability and specifications are determined regionally and are subject to change without notice. Please consult your authorised Toyota distributor for details. Due to photography and printing, colour of actual forklift may vary from this brochure. Some pictures have been computer enhanced.



TOYOTA
MATERIAL HANDLING
stronger together

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