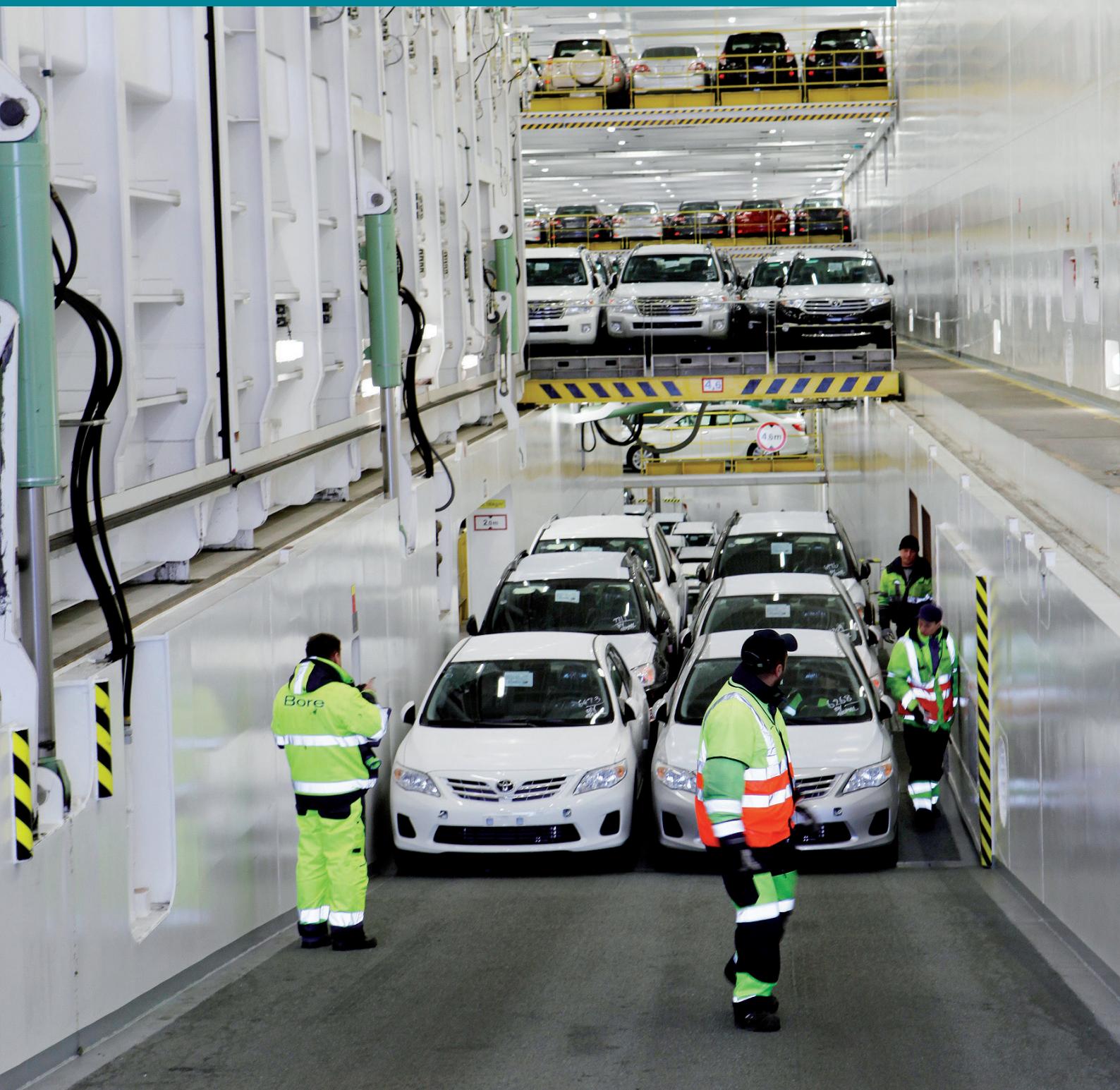


Access Equipment

RORO, ROPAX VESSELS AND CAR CARRIERS



TTS

A MacGregor Company

WORLD CLASS DESIGNED

Working closely with TTS during the early design phase ensures maximum flexibility in optimizing cargo access solutions and integration with the on-board systems as well as port facilities. Our activities primarily involve design, assembly, full installation and testing of equipment. Apart from the manufacture of certain key components, production is undertaken by a global network of subcontractors supervised by our quality control team.

Based on decades of experience and technological innovations, we offer handling solutions for a wide variety of vessel types in different marine segments. We work closely with leading shipyards and ship-owners and take pride in contributing to safer, more efficient and environmentally friendly operations – whether in shipyards, at sea or dockside.

To optimize the turnaround time of vessels we can simulate the effectiveness of cargo handling and conduct flow studies, based upon this we can customize an efficient solution for both onboard and harbor personnel.

TTS goal is to manufacture and develop environmentally friendly products such as electrically operated systems, the use of biodegradable hydraulic oil and noise reduction solutions, with all contribute towards minimizing the environmental impact of our products.



EXTERNAL ACCESS EQUIPMENT

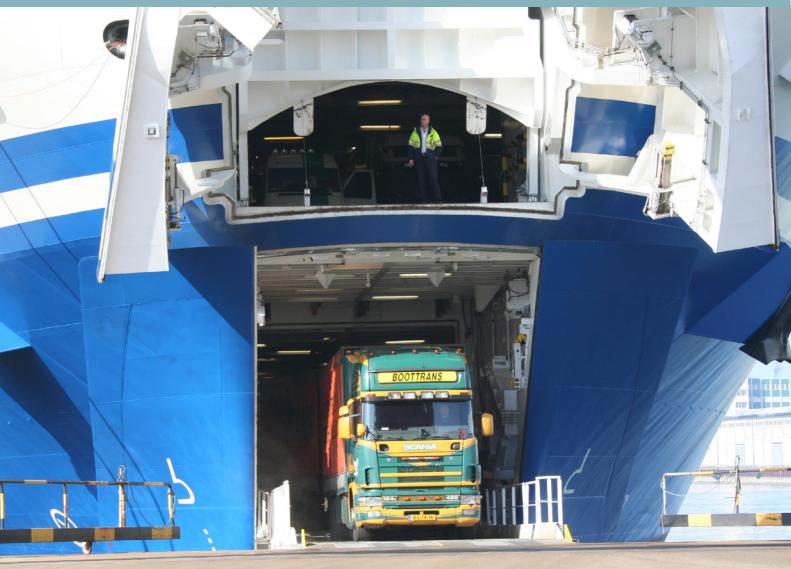
TTS offers a wide range of external access equipment for all types of RoRo vessels, everything from bunker doors to the unique TTS Folding Frame bow arrangement. For example, Pure Car Truck Carriers (PCTC's) quarter stern ramps are most commonly preferred so that the vessels can be loaded/unloaded in any port with the quay alongside the vessel. In contrast, passenger vessels have very specific demands for both cargo and passenger flow in

their assigned ports. To assist our customers in achieving the most efficient port solution we can provide cargo and passenger flow simulations and conduct harbor studies to get the optimum solution for the specific route. All external access equipment is supplied with either electric or hydraulic operation and are water or weather tight. For safety, open or closed/cleated status is shown on the local panel and on a remote panel on the bridge.

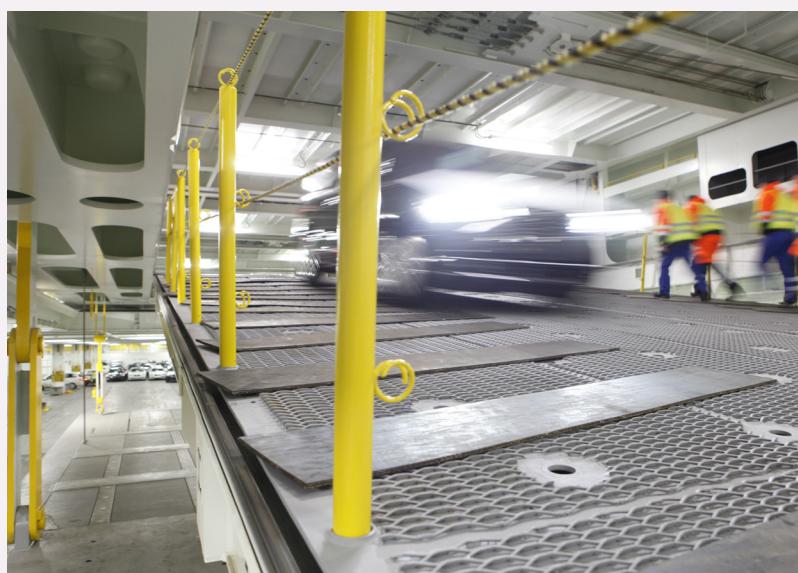


INTERNAL ACCESS EQUIPMENT

For internal access equipment, we offer all types of ramps, covers, car decks and doors. Our ramps can also be used as car decks in the level of the surrounding car deck panels or be stowed below the deck above. We offer hoistable, liftable and fixed car decks; all hoistable car decks are arranged with individually operated panels providing outstanding flexibility. Internal doors may be required for various reasons such as a water and gastight division of a newbuilding



or as flood prevention due to compulsory requirements imposed on an existing vessel. All internal access equipment is supplied with either electric or hydraulic operation and is water and/or gas tight. Fire proofing and insulation material can also be incorporated into the doors if required. For safety, open or closed/cleated status of internal access equipment is shown on the local panel and if required also on the bridge.





CARGO LIFTS & COVERS

Our cargo lifts provide a solution to transfer trailers between deck levels in areas of RoRo vessels where longitudinal space is limited. The lifts are available in a wide variety of configurations to suit individual applications. We have two types of ramp covers; side and end hinged, both of which can be made water or gas tight. The cargo lift and cover can be combined in the same installation.

OPERATION & CONTROL SYSTEMS

To increase safety and simplify handling of our equipment we supply a variety of easy to operate systems such as electrical indication equipment, hydraulic/electric manoeuvring systems and hydraulic power units. We have developed a unique end user interface for terminals with easy to understand touch displays. Our equipment is also prepared for remote connection via satellite, radio controlled operations and bus networks.

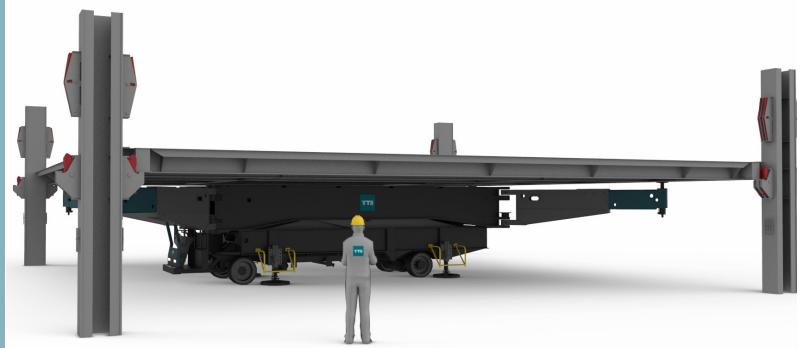


FLUSH STATION

With the patented IFS-70™ flush station unit you prolong the lifetime of your hydraulics, significantly reduce your maintenance costs and considerably shorten the installation time. With the IFS-70™ you get 3 units in one; flushing, pressure testing and hydraulic operation. The unit is portable and easy to use with a tenfold reduction in labor associated with a conventional system for flushing and pressure testing.

INTELLIGENT MOVABLE DECK LIFTER

A typical PCTC is about 200 meters long and has 4 hoistable car deck levels, each deck level consists of approximately 30 panels, divided into panel sections with a mean weight of about 20 tonnes. The patent pending TTS Intelligent Movable Deck Lifter™ raises efficiency by reducing waste volume and in some cases, even weight due to lifting being done in parallel with 4 contact points.





CONVERSIONS

TTS expertise in converting and upgrading vessels provides a fast and effective solution to maximize a vessel's efficiency or allow it to undertake new roles. Everything from the simple addition of doors or hatches to adding massive stern ramps can be undertaken with TTS assisting in cargo and vehicle flow studies, design solutions, equipment delivery, project planning and turnkey installation.

SPECIAL FEATURES

Our R&D team constantly develop our products to improve the function and handling, such as the TTS Load Monitor System (LMS), which automatically reduces the load on the quay as high and heavy vehicles pass the ramp. With the LMS the SWL capacity of the ramp increases by up to 50%. Another innovative solution is the TTS panel stopper system which requires only one rope per pillar, regardless of the number of panel stoppers. This greatly simplifies the handling for onboard personnel.

SEALING ARRANGEMENTS

When developing a rubber seal for a specific application, we always design in mechanical flexibility to provide optimum sealing capability. An example of this is the single lip seal whose flexibility enables it to take up both sideways movement as well as vertical compression, making it the ultimate seal for RoRo equipment and hatch covers.

SERVICE

PART OF TTS GROUP WITH A WORLDWIDE SERVICE NETWORK

With a worldwide network of strategically located offices and service stations, TTS commands global as well as local presence. We understand that mission critical assets cannot be allowed to stand idle, so we have built a global service network of highly qualified maintenance professionals that operates around the clock to support customers wherever they are located. Our services portfolio includes spare parts, technical support, inspections, surveys, maintenance, repairs, service agreements, modernization, conversions and training. Our expanding service network is focused on maximizing its availability to your fleet and tailored to meet the needs of vessels worldwide.



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