ASCOM BHT 80T

1. MAIN TECHNICAL CHARACTERISTICS

Overall Lifting Capacity		metric ton	80	
Dock Span	A)	mm	8.000	
Inside clear height	E)	mm	7.500	
Max. negative stroke	N)	mm	1.500	
Dead-weight		ton	30,8	approx.
Travelling speed at full load; stepless		Km/h	0 ÷ 2.70	± 5%
Travelling speed unloaded; stepless		Km/h	option	± 5%
Hoisting speed at full load; stepless		m/1’	0 ÷ 2.30	± 5%
Hoisting speed unloaded; stepless		m/1’	option	± 5%
Max gradeability at full load		%	4	
Ground Pressure (Tire Air Inflate Pressure)		Kg/cm²	10	

Brand-new OTR tyres 18.00 - 25 / high abrasion resistance	N°	4	
Traction Wheels	N°	2	
Idle wheels	N°	2	
Steering wheels by electronics	N°	4	all
Fixed Lifting Points		2	
Adjustable Lifting Points		**2**	**2**
Winches independent and synchronized	N°	4	
Hoisting speed control		**included**	
Number of polyester slings in single piece	**N°**	**4**	
Slings length	m	11	TBA
Wireless Remote radio control		**standard**	
Emergency levers on the hydr. oil distributors		standard	
Weighing system with display		standard	
Supervision and diagnosis system		**included**	
Steel structure		S355JR	
Hydraulic tubing		painted cold-galvanized steel	
Extended rear cross beam, U-shaped		**included**	
Operating temperature	°C	-5° / +35°	

2. STRUCTURE

Equipment design fully complies with Regulations "**FEM Fédération Européenne de la Manutention n° 1001 Cahier 1, 2, 3 et 4**", which are at the moment considered the strictest design standards for lifting equipment worldwide. All structural components of our machines, especially the steel structure, are analyzed with software programs of finite element calculation.

The structure is divided into countless small pieces, in order to analyze the stresses in all its parts; in this way, it is possible to know the points of the structure with the maximum values of moment and shear, the maximum stress and maximum strain and the structure is dimensioned accordingly. This solution allows to realize structures that are shaped by following the trend of the moments and forces (dynamic loads applied); also allow the use of greater thickness where it is needed and smaller thicknesses where the material is less stressed, moreover this type of construction, plans to enter the internal baffles to increase the rigidity of the structure in particular in the way the points of application of the load.

The quality of steel used for each specific machine, is selected by our engineering department following **UNI EN 10025 standards**.
The steel plates are supplied by first-class steelworks plants, accompanied by the related foundry certificates.
The frame has a single cross-member at rear and this "U" shape allows a wide variety of crafts to be accommodated.
Box-welded sections are internally reinforced with diaphragms, in order to guarantee mechanical resistance, stiffness and side stability.

All joints are flanged with high resistance nuts and bolts; mutual position fixed with pins. Specific sealing that is applied during assembly phases prevent from water penetration.

2.1 Extended rear cross beam

A special extended rear cross beam, "U"-shaped and mounted behind the vertical axis of the rear piers, is included in this scope of supply.
It provides additional clearance without the need for removing or adjusting the vessel's rigging.

2.2 Anti-corrosion protection

Every single part is disassembled and then assembled again, in order to receive full and complete protection.

At first, all frame parts are sandblasted according with Sweden Standards SIS 055900 – grade SA2,5 and, at the end of this process, all the members are carefully cleaned with compressed air in order to eliminate any kind of residue that could affect the proper application of subsequent treatments. Then, to prevent from rust, obtain a better corrosion resistance and a better appearance, we apply a special anti-corrosion treatment, consisting of:

- At least 2 (two) coats of epoxy-polyamidic primer resins.
- At least 2 (two) coats of polyurethane enamel.

The total thickness of the dry film will be 220 µ.
Final color (RAL code): to be agreed with the customer. Winches and rims are painted black RAL 9005.

3. TRAVELLING

Bonfiglioli

As a standard, our Boat Hoists have one travel speed and the operator can vary it ranging from zero up to the maximum selected speed, via remote control.

A **hydrostatic transmission circuit**, via a variable displacement axial pistons pump operating in closed circuit, controlled by a proportional electrohydraulic valve, feed the hydraulic motors that are responsible for the transmission of the motion.
We supply large diameter steel bearings, roller type, providing free rotation minimizing vibrations.

Traction takes place through No. 4 wheels, of which No. 2 are driven / motorized.
No. 2 planetary gearboxes with rotating self-supporting casing, which enclose ground gears keyed on roller bearings, transmit motion to the wheels.
Wheel guards are located on the back and the front side of each wheel set.

M.M.V.P. ASCOM ABI TRAILERS BALDI TECNOMETALLI

Hydraulic braking is smooth and progressive; when oil pressure is off, brakes are applied to the Boat Hoist (negative brakes).

3.1 Steering system

The proposed Boat Hoist features **mechanical/hydraulic steering (Ackermann System) on all 4 wheels**, which represent the most reliable system in the market.
Piston rods are made of NIKROM 350, which represents the optimum choice for critical applications such as marine environment:

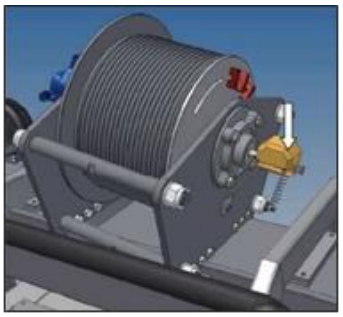
Certified corrosion resistance

	ISO 9227 NSS ASTM B117 Neutral salt spray	ISO 9227 AASS ASTM B287 Acetic acid salt spray
Duration	>1000 hours	>350 hours
Rating according to ISO 10289	10 (no corrosion)	10 (no corrosion)

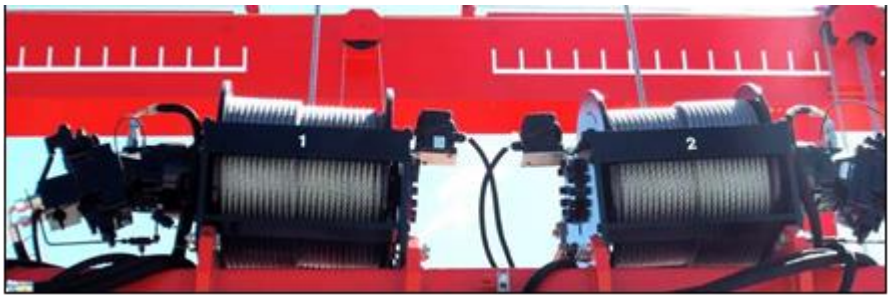
A quick and simply operated manual wheel-alignment control is also fitted, though seldom required. Mechanical linkages incorporate steel pins with bimetal self-lubricating sleeves and spacers, though periodical lubrication is recommended to reduce wear.

4. LIFTING

4.1 Winches



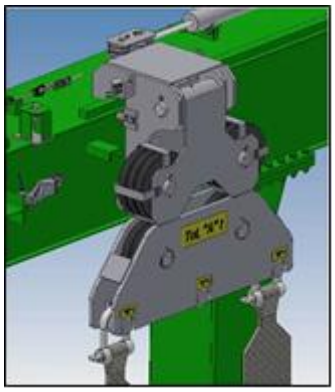
N.4 independent winches, n.2 per side, can operate simultaneously or separately, permitting the levelling in any positions (transverse or longitudinal).
A variable displacement axial pistons pump operating in an open circuit, controlled by a proportional electrohydraulic valve with Load Sensing technology, feed the hydraulic motors acting on the speed reducers driving each winch.
Wire rope drums are grooved as to ensure proper winding.



Each winch features an **integrated electronic control system**, that thanks to the constant control of the piloting of each section of the distributor, ensures that all the winches operate at the same speed. This system guarantees an extremely safe and reliable levelling of boats.

An **automatic overload system** prevents winches from lifting not admissible loads.
The dynamic braking of the load during descent is obtained fully automatically by the hydraulic braking valve, which also automatically controls the opening of the negative brake interposed between the hydraulic motor and the reducer inside the drum.
Negative hydraulic brakes with multiple disks guarantee the stability of the load in any position even with the engine off with no time limit.

4.2 Sling blocks



In order to get easier wrapping manoeuvres with slings, and avoid any contact with delicate shaped keel appendixes, helix axle, stabilizers and so on, the machine is supplied with **4 lifting points, 2 fixed and 2 adjustable hydraulically**.
Hoist rope pulleys are **modular cast iron / reinforced polyamide**, turning on paired ball bearings that are pre-packed with grease and sealed for corrosion-free and maintenance-free service.
Ropes are calculated with a safety factor > 5
Clamps are CROSBY-LAUGHLIN wedge types.

4.3 Slings

The machine will be equipped with 4 slings, fabricated in polyester 2-ply, resistant to UVA rays and abrasions / scraping.
They are compliant with the standards PR-EN 1492 and have a capacity of no less than 19 tons when in the “U” shape – safety factor > 7:1.

5. POWER UNIT

Inside a water-tight, sound-proof (basic version) engine compartment, there are:

- Diesel Engine:
  - Type: industrial; off road;

  - Brand: KOHLER / IVECO
  - Cylinders: 4 in-line
  - Emission compliance: EPA tier 4F
  - Power: 80 kW
- Coupler
- Hydraulic pumps
- Hydraulic components
- Battery

The fuel tank (120 l capacity) is located outside for immediate access. It will ensure continuous operation of the crane for at least 12 hours without refuelling.
The hydraulic oil temperature is controlled by a heat exchanger.
The water engine temperature is cooled by an oversized fan.

6. ELECTRICAL INSTALLATION AND CONTROL SYSYTEM

6.1 Main switchboard

The control panel is made of **AISI 316 stainless steel**. It contains all the electromagnetic devices for command and maneuver, control and protection, of the Boat Hoist functions, and in particular:

- Enabling commands for switching on the machine and accessories (e.g., lights, radio control, etc.).
- PLC and hydraulic control electronics.
- Load limiter with lifting residual life recording.
- Touch screen panel dedicated to Siemens PLC:
  - Diagnostic lights,
  - Counts hours of operation,
  - Check operation of the diesel engine,
  - Alarm displays,
  - Indication of load lifted at bow, stern and total.
- Emergency stop mushroom pushbutton.
- Radio control receiving unit.

6.2 Proportional radio remote radio control

The radio control system allows the operator to check directly, walking around the lifting equipment, any manoeuvre in advance having the best view angle.
Main functions are:

- Start
- Engine Acceleration
- Travel
- Steering
- Lifting, with independent winches or synchronized
- Adjustment of mobile lifting points

- Speed Selections
- Emergency Stop

The transmitter is free from radio disturbance or interference.
The control unit has a dynamic research of the free frequency, so that other radio control devices can be operated in the same area without the risk of false command.
We supply a free battery (Ni-Cd) charger unit and one spare battery.
Each battery, with full charge, provides 10 hours continuous use of the remote handset. The battery charger switches itself off once the battery is fully charged.

Recharging takes around five hours.
The radio control is shockproof and waterproof, and it features a **display for boat weight reading** (bow, stern, overall).
Typical working range: 100 m [330 ft.] in a straight line.

6.3 Electronic load detection system

The machine is equipped with an electronic load limiter with dynamometric pins in stainless steel, located on the lifting pulleys.
This device measures the stern and bow load applied to the machine and transmits the detected data to the PLC, which sends them to the digital display of both the radio control and the control panel, allowing the operator to read the weight (stern/bow/total) of each boat with instantaneous survey.

The operator, by reading the displays, can evaluate the position of the boat's center of gravity and, if necessary, modify the placement of the slings along the vessel to better balance it.
The electronic load limiter is also equipped with no.5 thresholds for limiting movements:

- 5% threshold for blocking movements of the bow lifting points.
- 5% threshold for blocking movements of the stern lifting points.
- 30% threshold for blocking fast lifting and translation.
- 100% alarm threshold for reaching the nominal load.
- 110% threshold for blocking lifting. Max SWL reached.

On the radio control display, when a threshold is exceeded, a LED alarm activates.
When the 100% threshold is exceeded, an audible warning activates intermittently at 1Hz.
When the 110% threshold is exceeded, an audible warning activates intermittently at 5Hz.
The load limiter also acts as memory of the lifts carried out and therefore of the residual lifting hours, referred to the Boat Hoist class, according to the “UNI 4301-1: / 2016 classification of lifting equipment service” standard.

6.4 Supervision and diagnosis

The proposed Machine features a display which allows the operator to check the machine status and visualize the alarms (by means of error codes and diagnosis messages).
On the same interface, it is possible to set and adjust some functions of the machine. For some operations, a safety password is required.
Hereafter is a list of some of the possible operations and monitoring:

- Real-time control of the speed of each individual winch
- Control of travelling parameters
- Control of steering parameters
- Control of lifting parameters
- Delayed switching off of engines / radio controls
- Display of PLC input / output status

Display of engine status and parameters, oil pressure, fuel low, high temperature water, etc.

Display load ad signal for nominal load and overload

6.7 Remote factory assistance

The Boat Hoist is provided with a **PARKER IQAN system**.
ASCOM installs AnyDesk, Iqan run and Iqan design software on customer's Windows 10 laptop.
By means of a RJ14 cable, we can connect the laptop to the machine: one end into the Ethernet port and the other end into the dedicated connector located on the bottom part of the Boat Hoist's general panel.
The Anydesk software allows ASCOM SERVICE team to work remotely on the customer's laptop as if they were present on site and to carry out a diagnosis of the control system with the assistance of the crane's operator, for a possible troubleshooting.

7. MAIN SAFETY DEVICES

The proposed machine has many safety devices. The most important are:

- Lower\Upper Lifting Electric Limit Switches
- Upper Lifting Mechanical Limit Switches
- Mechanical Limit Switches for Steering Manœuvres
- Max. Pressure Hydraulic Valves (Relief Valves)
- OverLoad Limiting Devices
- Travel warning alarm (beeper)
- Mechanical protections on all tires
- Emergency Stop at each corner of the machine
- Emergency Stop on the main electric cabinet
- Emergency Stop on each radio remote control
- Levers on the distributors
- In-line-pulleys in order that the sling block doesn't 'twist' towards the boat when in slings
- Grooved-type winches to avoid wire rope twisting
- Safety signage and capacity marking by rule
- Electronic digital encoders on each winch to detect and adjust the hoisting speed and movement.

8. VENDOR LIST

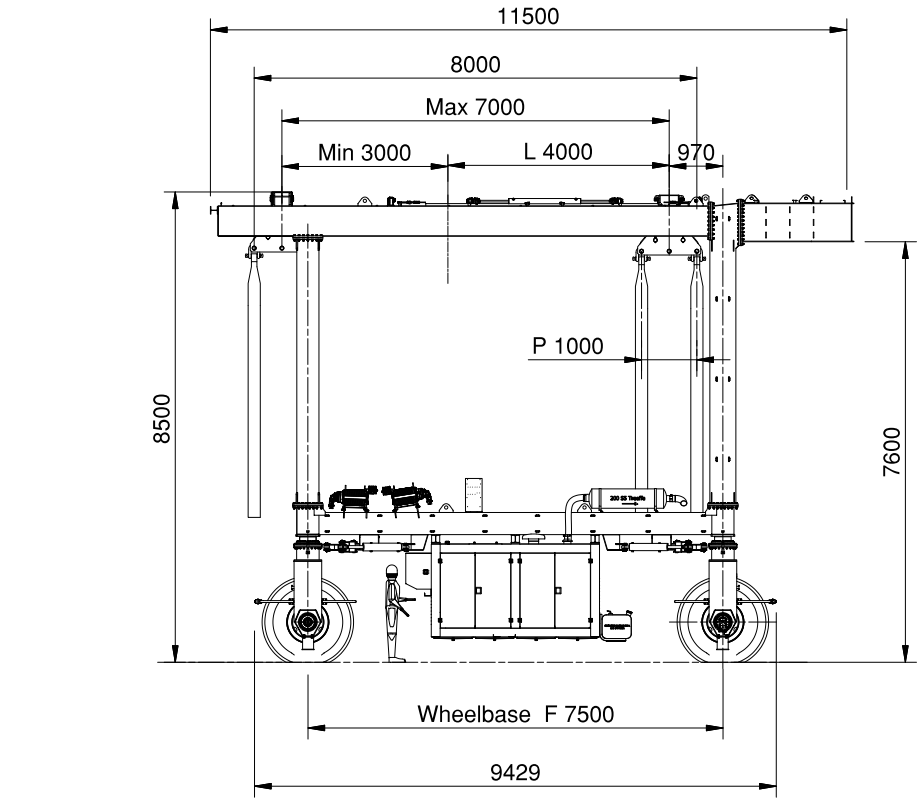
ASCOM machines feature first quality components supplied by very well worldwide known brands such as:

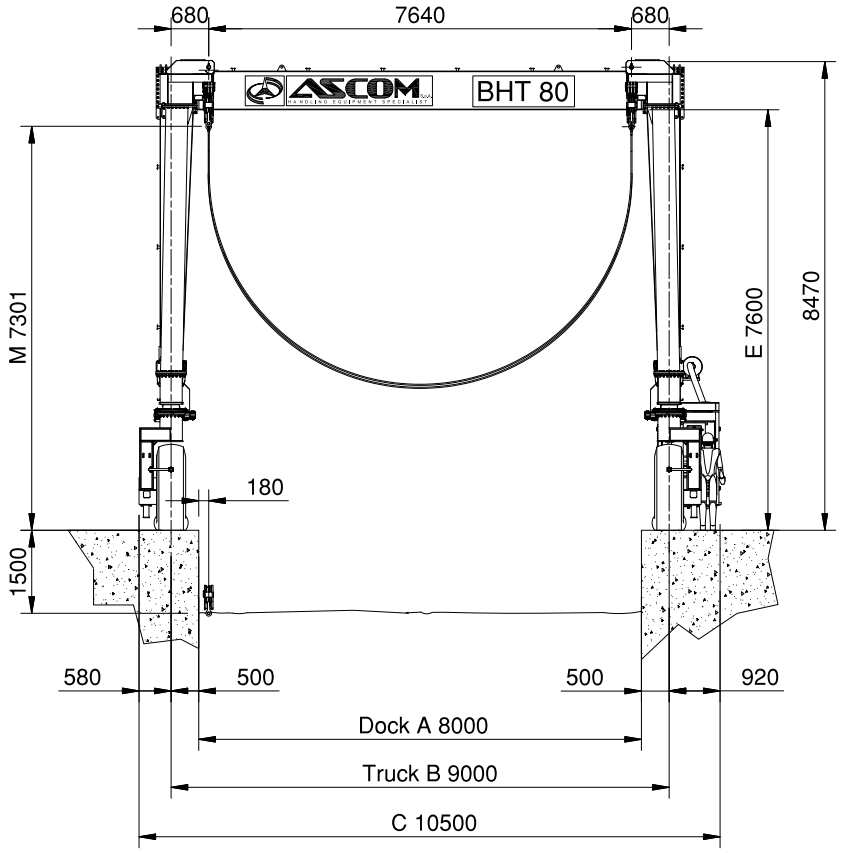
COMPONENT	BRAND
Diesel Engine	KOHLER (USA)
Drive Pumps	TWIN DISC TECHNODRIVE (Italy)
Hydraulic Pumps	PARKER (USA) DANFOSS (Denmark) LINDE (Germany)
Wheelgroups (Gearboxes)	BONFIGLIOLI TRASMITAL (Italy) DANA INCORPORATED (USA)
Hydraulic Motors	PARKER (USA) LINDE (Germany)

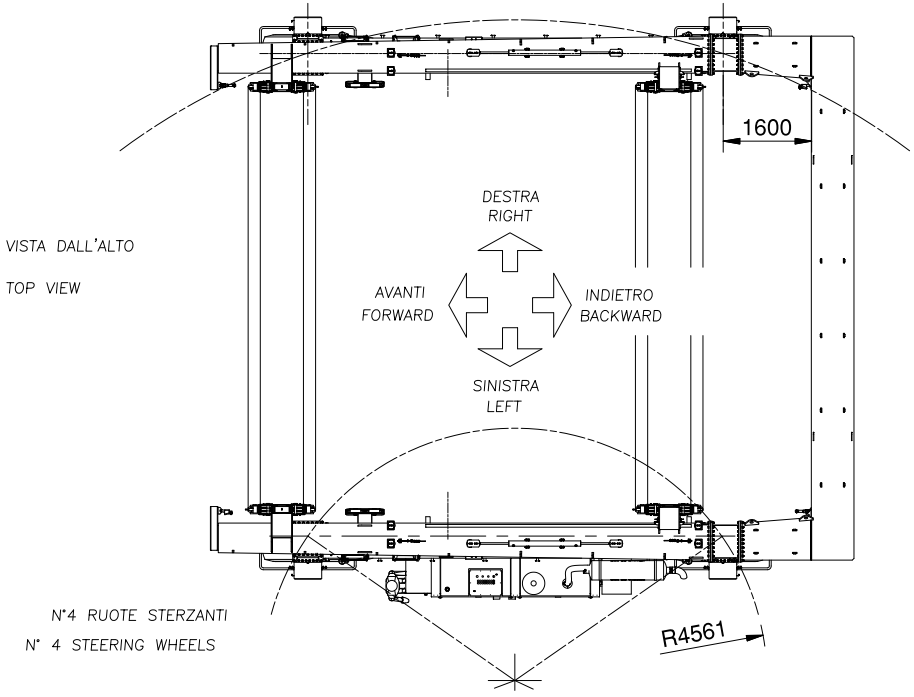
	DANFOSS (Denmark)
Winches	ASCOM (Italy) DINAMIC OIL (Italy)
Ropes	TREFIL EUROPE (France) SIRTEF (Italy)
Slings	SPANSET (Germany)
Electric \ Electronic Devices	TELEMECANIQUE (France) SCHNEIDER (France) SIEMENS (Germany)
Radio remote control	AUTEC (Italy)

Boat Hoist model BHT 80, having a configuration as follows:

- 8,0 m inside clear width (non standard) √
- Steering wheels (by hydraulics) 4 (ALL)
- Driving wheels 2
- Adjustable sling blocks 2
- Fixed sling blocks 2
- Independent and synchronized winches 4
- U Shaped forward beam for sailing boats √
- Double hoisting speed (loaded / unloaded) √
- Polyester slings in single piece 4
- Electronic hoisting speed sensors √
- Remote factory assistance √
- Remote + wired controls + emergency levers 1+1+1
- IVECO diesel engine √
- Electronic weighing system √







VISTA DALL'ALTO

TOP VIEW

N°4 RUOTE STERZANTI

N° 4 STEERING WHEELS

Pos.	Codice	Titolo	Q.ta'	Materiale	kg
N° REV.	DATA	NOTE			REVISIONE
DAMMA	DATA	COMMESSA N°	QUANTITA'	VISTO	PESO / DISEG.

ASCOM S.p.A. HANDLING EQUIPMENT SPECIALIST

BOAT-HOIST mod. BHT 80

DISEGNO N°

REVISIONE N°