www.vestdavit.no

Safe boat handling
for life

VESTDAVIT

Vestdavit
Specialised Solutions

Features and options for Vestdavit systems which improve safe boat handling

Vestdavit
The World Leading Provider
of Efficient and Innovative
Boat handling Systems

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Davit performance and sea state

The ultimate performance criteria for any davit system is the sea state in which it can safely launch and recover a boat. There are a lot of different ways of measuring sea state and also significant wave height. However the most used and best recognised is the scale used by the World Meteorological Organization (WMO).

WMO Sea State Code	Wave Height (meters)	Characteristics
0	0	**Calm (glassy)**
1	0 to 0.1	**Calm (rippled)**
2	0.1 to 0.5	**Smooth (wavelets)**
3	0.5 to 1.25	**Slight**
4	1.25 to 2.5	**Moderate**
5	2.5 to 4	**Rough**
6	4 to 6	**Very rough**
7	6 to 9	**High**
8	9 to 14	**Very high**
9	Over 14	**Phenomenal**

Vestdavit systems always refer to the WMO sea state when specifying the conditions under which they are designed to launch and recover, assuming an experienced crew. E.g. If the davit specifies it can work in sea state 6 then it can safely launch and recover in a seaway with waves between 4 and 6 metres height.

Davit winch speed requirements

Hoist Activity	SOLAS (No Sea State provided)	Offshore Rules (No Sea State provided)	Ro-Ro SOLAS FRC rules. (No Sea State provided	NORSOK R-002 Group A6 Bottom fixed installation	NORSOK R-002 Group A6 Semi Sub-mersible installation	NORSOK R-002 Group A6 Monohull installation (FPSO)
Lowering Speed (m/min)	36	50	50	83	95	120
Hoisting Speed (m/min)	18	50	50	83	95	120
Constant Tension Speed (m/min)	No demand	No speed given. No demand if shock absorber employed.	120	120	120	No demand

Vestdavit systems have minimum 36m/min lowering and 36m/min hoisting speed as standard for boats with SWL less than 10t.

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Constant Tensioning System / Wave Compensation

What's the problem?
Naval vessels, coastguards, seismic survey operators, pilot authorities and offshore operators need to be able to operate small boats safely from larger vessels in heavy seas. In heavy seas the boat can rise and fall several metres relative to the mother vessel. During hooking on and release this will cause either loose wire and potential tangles when slack or shock loads when the boat falls away on the wave.

Vestdavit tailored solution
The Constant Tensioning System is a hydraulic system which is linked to the winch motor which enables the boat to follow the heave movements caused by the waves while maintaining a constant tension in the wire.

Benefits of fitting Vestdavit Constant Tensioning System:

Davit always operates safely in heavy seas.

Boat can be launched and retrieved in sea states up to 6.

Secure safety for crew.

Avoids sudden shock loading on the hoist wire.

Avoids slack in the hoist wire.

How does it work?
The Constant Tensioning System is used when the boat is connected to the wire and still buoyant in the sea. As the heave motion of the boat changes with wave height, the Constant Tensioning System automatically compensates for change in the wire rope length, maintaining wire rope tension.

As the boat falls away from the ship, moving downwards towards the trough of a wave, wire is reeled off the winch drum. Here the winch is passive and the load induced in the wire by the descending boat acts to reel wire off the winch drum. As the boat heaves up again, moving upwards towards the wave peak, the winch reels wire onto the drum and maintains wire tension.

Constant tension mode is manually activated when the boat is waterborne. System controls are configured for safety such that when the davit is being used to raise or lower the boat clear of the water the Constant Tensioning System cannot be activated.

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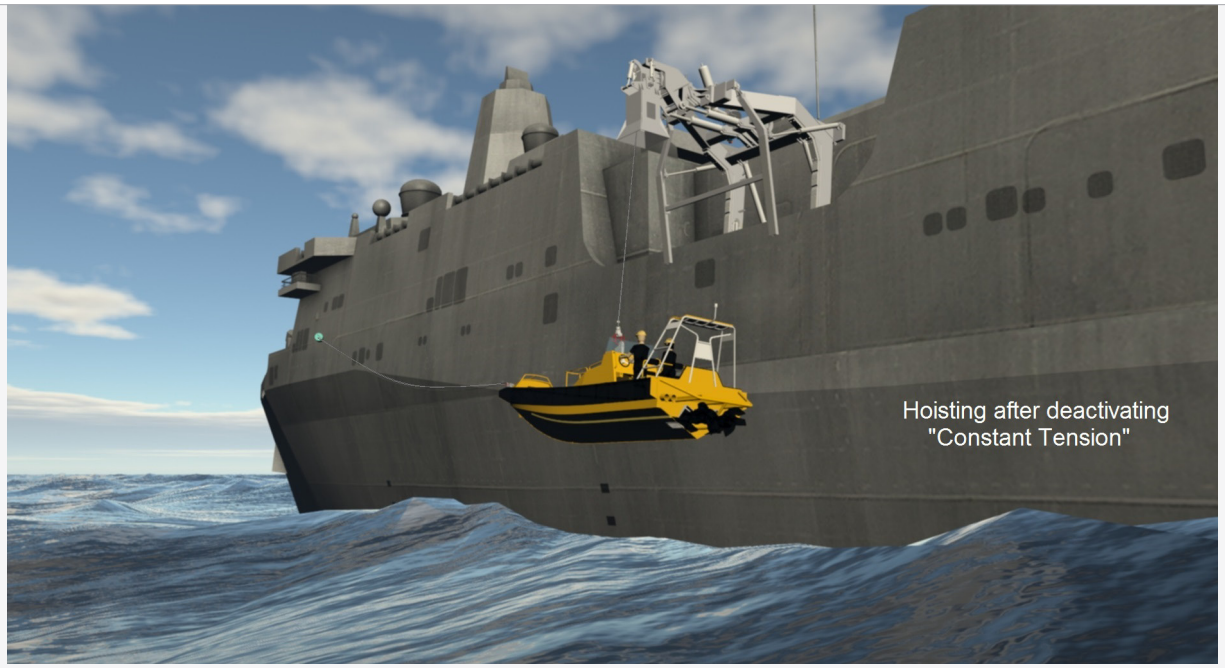
Vestdavit Constant Tensioning System is based on a sole hydraulic operated system without use of any sensors, which gives the system unique and reliable operation.



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Anti Pendulation device / Docking Head

What's the problem?
Naval vessels, coastguards, seismic survey operators, pilot authorities and offshore operators need to be able to operate small boats safely from larger vessels in heavy seas. When moving the boat and davit from the stowed position to the ready position at the ship's side the boat can move around, damaging itself or structure or hurting the crew. Steadying the boat requires extra hands and increases workload.

Vestdavit tailored solution
A docking head which is linked to a cone in the boat. It keeps the boat steady during all operations with the davit when the boat is at its upper position in the davit.

Benefits of fitting a Vestdavit Docking Head:

The davit can always be moved safely in heavy seas without unexpected movement of the boat.

Ensures safety for davit operator and crew.

Keeps boat stable and correctly orientated during operation between stowed position and ship side.

No need for extra crew to steady the boat during deployment and recovery.

How does it work?
A docking head fixed to the davit is triaxially operated via three hydraulic cylinders and fits directly onto a cone in the boat. The boat is then locked to the davit but can still maintain the correct orientation via the docking head system. The three cylinders ensure that the boat is stable in all davit positions even in rough sea conditions.

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Illustration of the docking head

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Hydraulic Boat Guiding System

What's the problem?
Naval vessels, coastguards, seismic survey operators, pilot authorities and offshore operators need to be able to operate small boats safely from larger vessels in heavy seas. That can lead to dangerous situations for crew and boat structure. The boat can swing around and be hard to handle when moving the davit and boat from the stowed position to the ship's side.

Vestdavit tailored solution
Vestdavit's unique Boat Guiding System is a safety device which provides safe movement of the boat when operating the davit from the stowed position to ship's side and vice versa. The system keeps the boat stable in its position relative to the davit preventing damage and dangerous situations.

Benefits of fitting Vestdavit Hydraulic Boat Guiding System:

Davit always operates safely in heavy seas.

Boat can be launched and retrieved in higher sea states.

Ensures safety for crew.

Keeps boat stable during operation between stowed position and ship's side.

Reduces likelihood of boat damage during heavy weather operation.

How does it work?
Guide arms are pressed against the side of the boat in order to keep the boat stable in all positions prior to launching and after hoisting, and follow the boat all the way from the stowed position to the ship's side. The guide arms can be hydraulically operated with two cylinders. They are operated with a separate handle on the control station. On some PLR-types the guide arms are passive and move with the davit.

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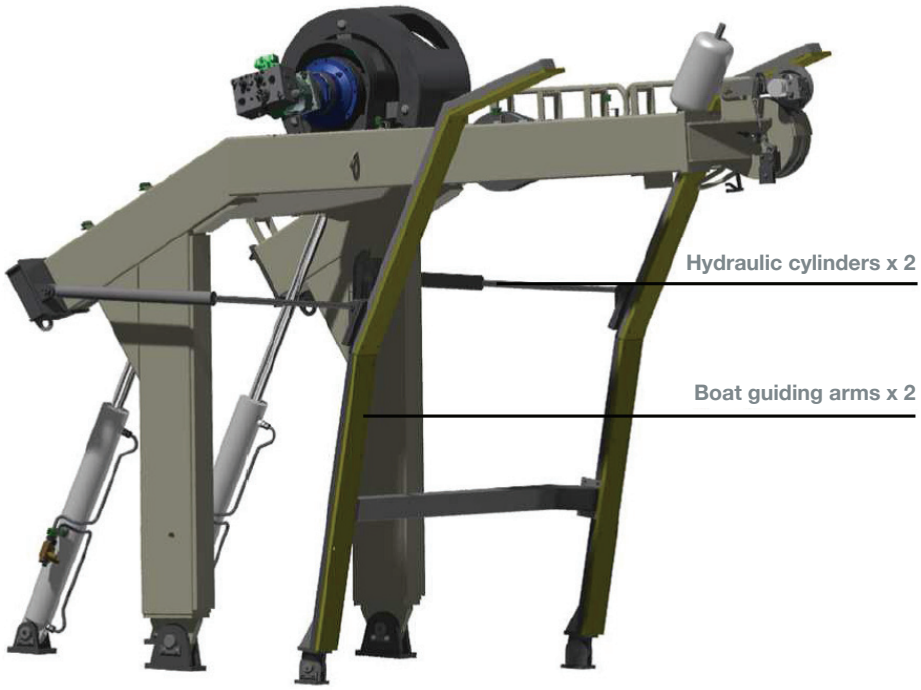

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Hydraulic Limit Switch

What's the problem?
Operating a davit requires strong focus and precision. The operation is often affected by the weather and sea conditions, and it can be difficult to stay focused on the lifting process. This can cause to over hoisting of the boat which can lead to damage of the wire sheave and lifting ring.

Vestdavit tailored solution
Vestdavit Limit Switch is a mechanical arm which is linked to a hydraulic valve which again stops the winch for further spooling.

Benefits of fitting a Vestdavit Limit Switch:

Avoids over hoisting.

Reduce chances of an accident from break of wire sheave or lifting ring.

Increased safety for davit operator and boat crew.

How does it work?
The limit switch consists of one mechanical arm which activates a hydraulic valve when boat is at its upper position. A wire clamp lifts the arm upwards which again activates the hydraulic valve. The hydraulic valve is linked to the winch motor and stops the winch when the valve is activated.

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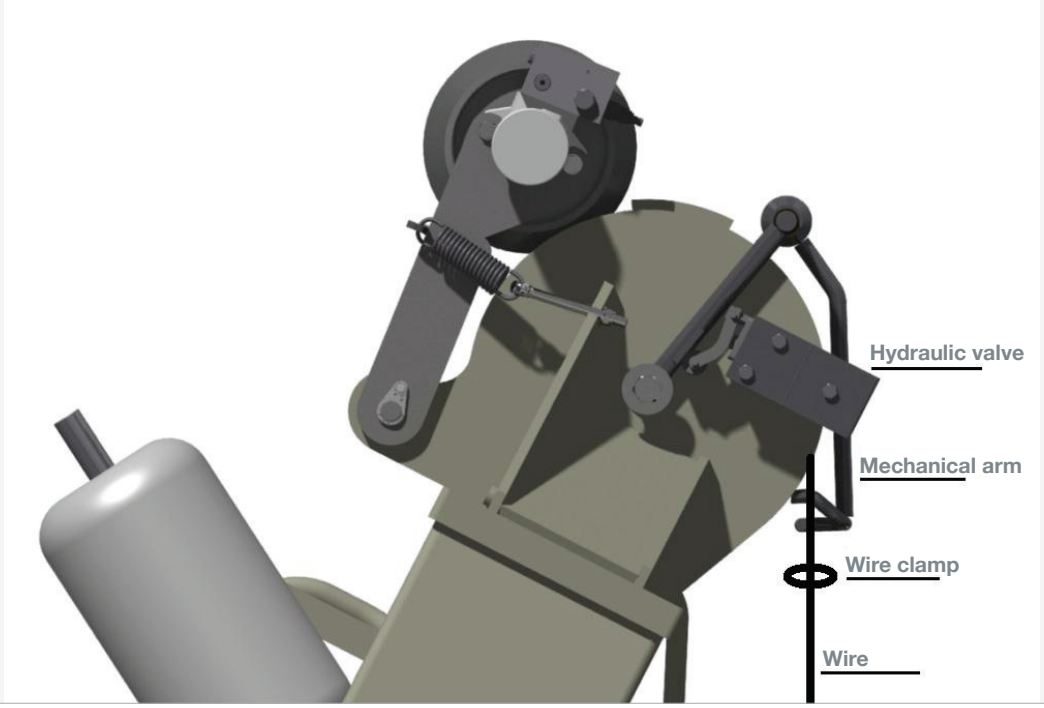
Illustration of the end-stop arrangement



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Dynamic Shock Absorber System

What`s the problem?
When lowering a boat, massive dynamic forces occur. These forces can lead to massive stress on deck, hinges and bolts, as well as on the davit structure.

Vestdavit tailored solution
Vestdavit Shock Absorber system is an oil filled hydraulic cylinder with a nitrogen filled accumulator, which absorb sudden acceleration during vertical hoist/lowering.

Benefits of fitting a Vestdavit Dynamic Shock Absorber System:

Reduce the G-forces by up to 80%.

Ensure safety and comfort for boat crew.

Limit dynamic loads during accelerations.

Prevent the davit and deck from being exposed to stress.

How does it work?
The shock absorber consists of one oil filled hydraulic cylinder and one Nitrogen filled accumulator. The wire is guided through the cylinder via a wire sheave. The Nitrogen pressure inside the accumulator acts as a spring and prevents the hydraulic cylinder from moving under load. The principle is the same as suspension on a car.

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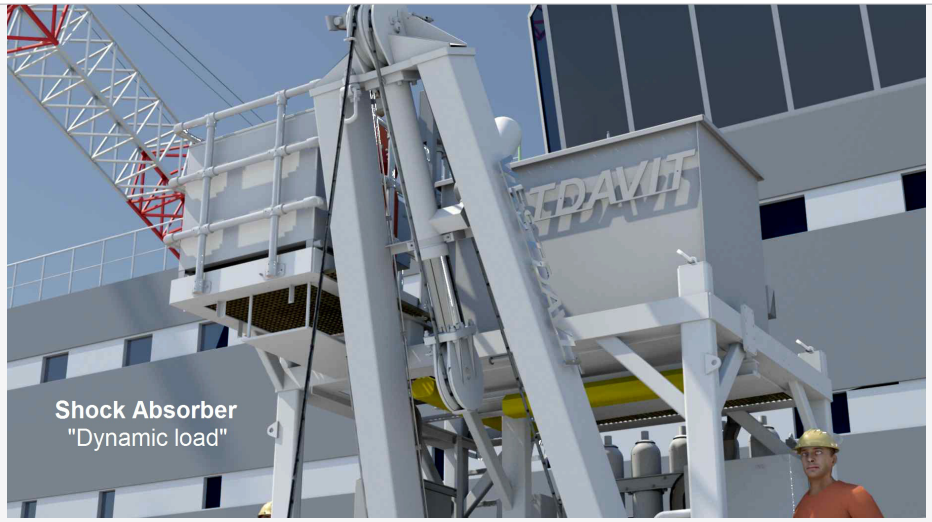
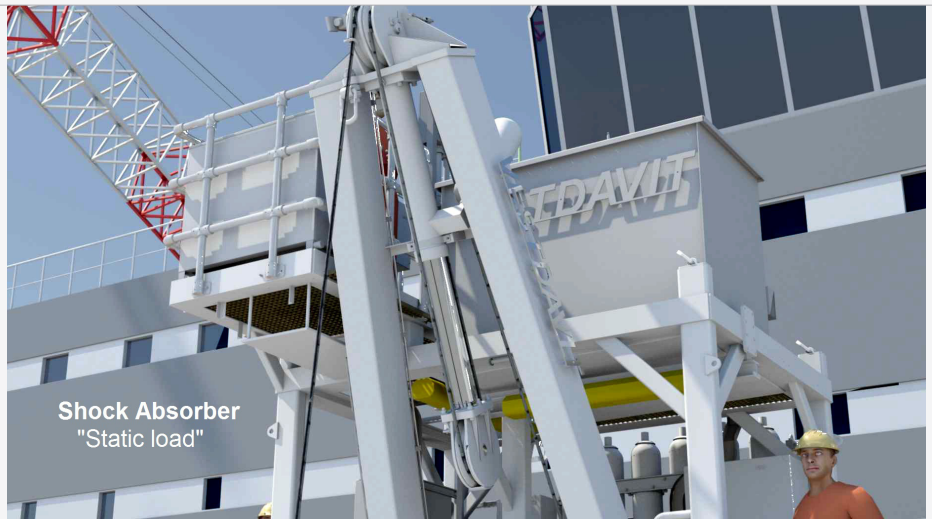
Illustration of shock absorber





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Hydraulic Wire Puller

What's the problem?
Modern high speed davits pay out the wire very fast to enable the boat to hook on in heavy seas. That can lead to loose turns and birds` nests on the drum. That may cause excess wear or wire breaks when heaving in under load.

Vestdavit tailored solution
Hydraulic Wire Puller is a hydraulic system which is linked to the winch motor and which pulls the wire off the drum with a constant tension.

Benefits of fitting a Vestdavit hydraulic wire puller:

Davit always operates safely at highest speeds,
which means you can handle boats safely in bigger seas.

Avoids time lost manually sorting out loose turns.

Reduces chance of an accident from wire break.

Reduces wire wear and prolongs lifting wire life.

How does it work?
A rubber wheel is pressed against the lifting wire by two springs. A hydraulic motor drives the wheel to pay out the wire with a constant load.

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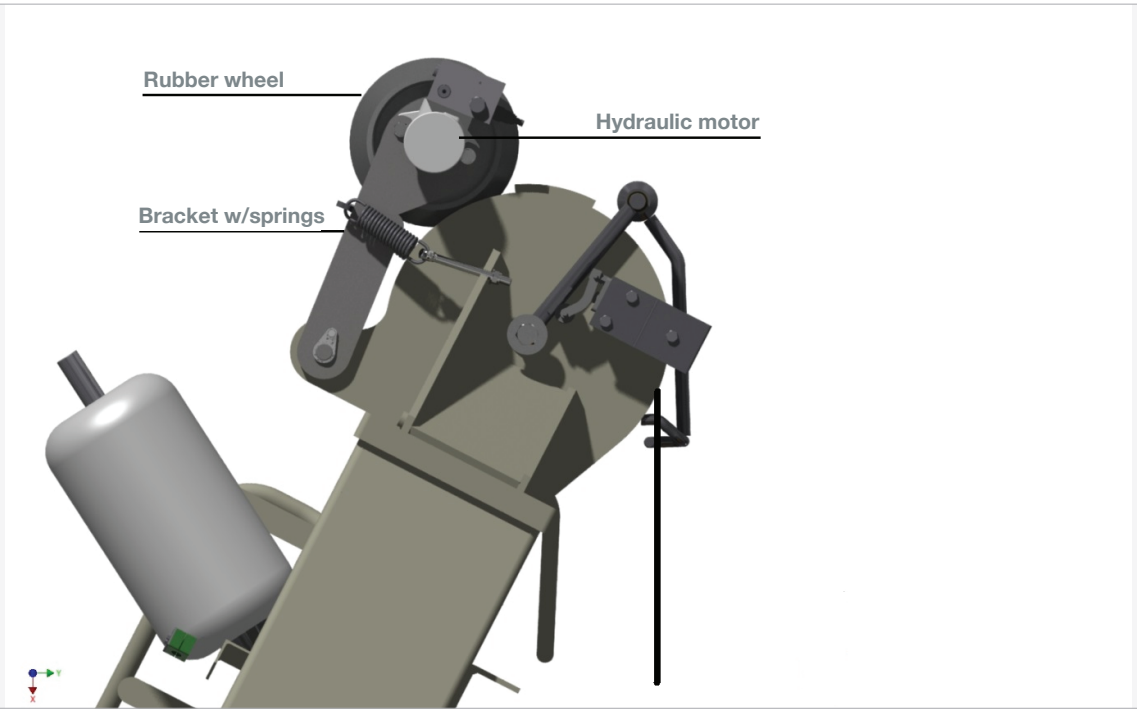
Illustration of Hydraulic Wire Puller



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Vestdavit Hydraulic Power Unit

What's the problem?
Hoisting and lowering heavy boats safely in a seaway requires a large amount of power which has to be very controllable and quick reacting to avoid shock loads on the wire and to enable fast pay out and recovery of the wire in heavy seas. Power systems for davits also need to be reliable, easy to maintain and compact to minimize the use of deck space.

Vestdavit tailored solution
A specially configured and robust Hydraulic Power Unit (HPU). There are two main types of Vestdavit Hydraulic Power Units: motor on top of reservoir or with motor submerged in the oil reservoir. The HPU consists of a motor, an oil reservoir, a hydraulic pump and associated valves.

Benefits of fitting a Vestdavit Hydraulic Power Unit:

Smooth, stepless delivery of the power needed.

Proven reliability.

Simple maintenance – no complex electronics.

HPU with top mounted motor allows easy access for maintenance and service where installation is in a protected area.

HPU with submerged motor is designed for outdoor installation giving increased protection to the working parts and flexibility with respect to installation area.

Easy customisation for specific environments including cooling, heating and noise insulation.

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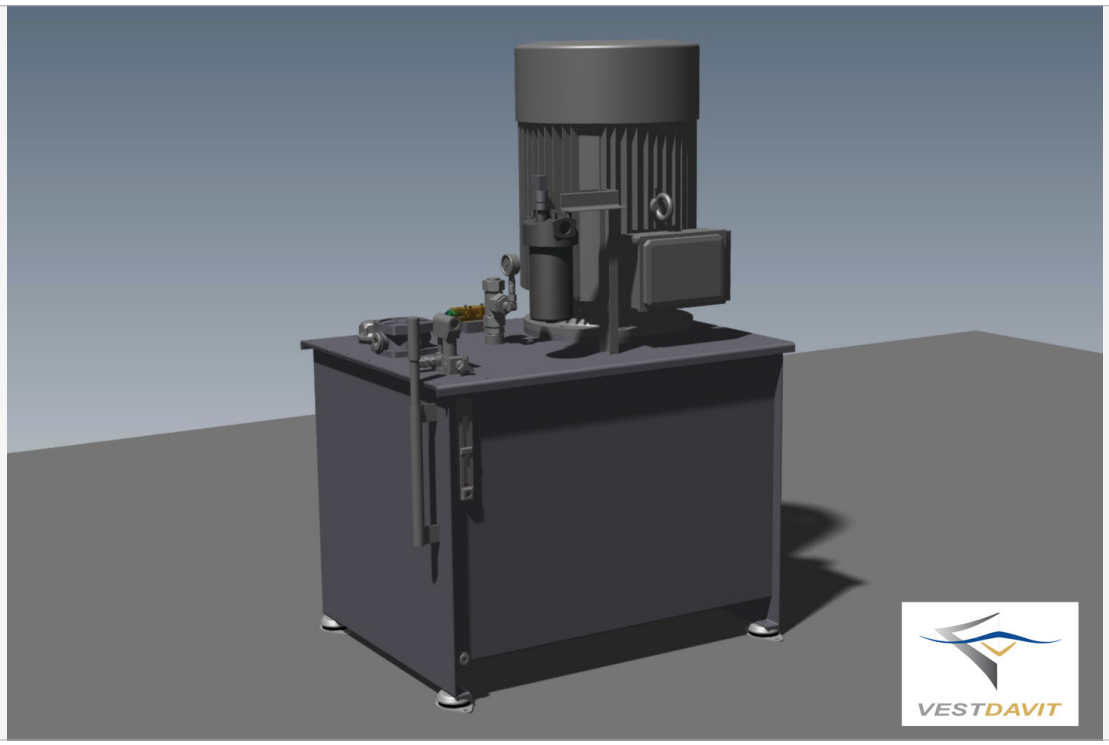
HPU with top mounted motor



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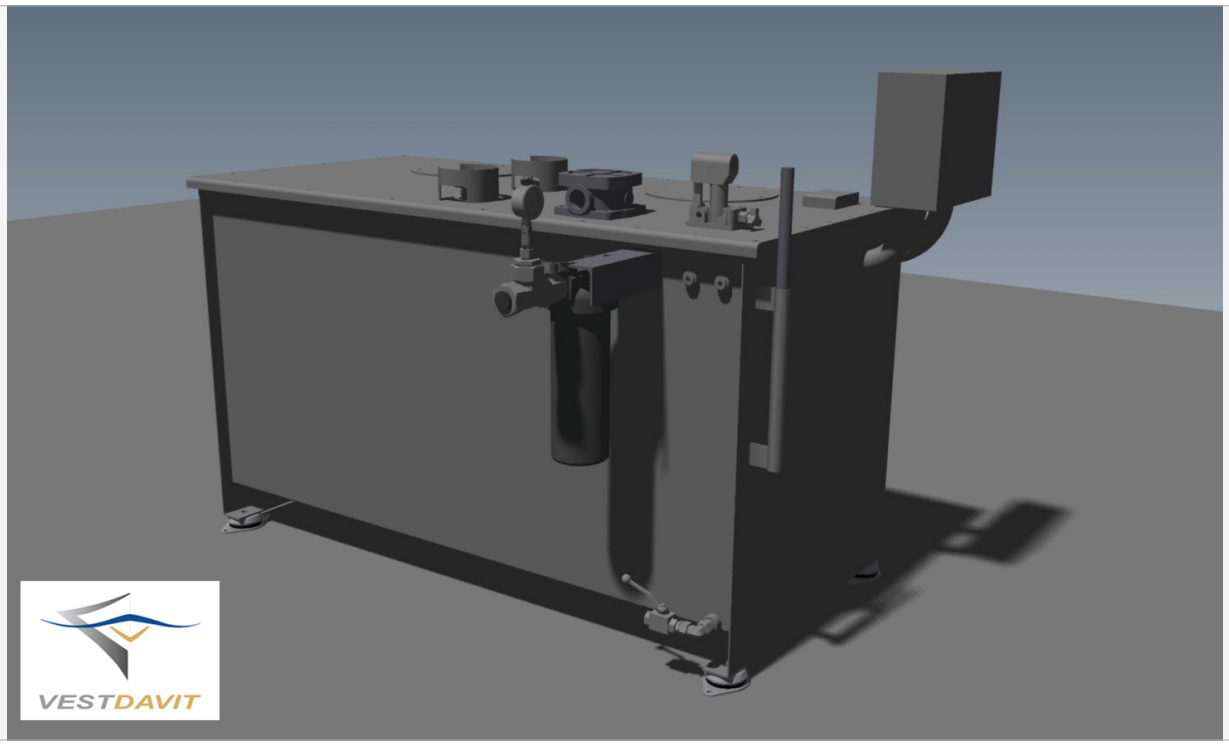
HPU with submerged motor (motor inside tank)



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