nanni diesel

energy in blue

English

Base Kubota

N4.38

Reference : 970 313 243
Date : 10/2007
Version : A

This photograph does not necessarily represent the engine

Technical characteristics

Engine specifications

Cycle	4 strokes, Diesel
Number of cylinders / Arrangement	4 in line
Bore / Stroke	78 mm x 78,4 mm
Displacement	1,498 litres
Compression rate	22:1
Intake	Atmospheric
Direction of rotation (from flywheel)	Counter clockwise
Weight dry with gearbox	152 kg
Max. power*	27,6 kW (37,5 hp)
Rated rpm speed*	3000 rpm
Idle rpm speed	850 rpm
No load rpm speed	3220 rpm
Specific fuel consumption	190 g/kW/h at 3000 rpm

Fuel supply

Injection	Indirect (E-TVCS)
Injection order	1-3-4-2
Injection timing	19° before PMH
Injection pump	BOSCH MD Mini type
Injection pressure	140 bar

Lubrication

Engine oil	API CD-SAE 15W40 (temperate climat)
Engine oil capacity	4,5 to 5,5 litres depending on the inclination of the engine

Cooling

Cooling	Dual circuit sweet water / sea water with heat exchanger or by "keel cooling"
Seawater pump	Neoprene rotor type
Coolant for heat exchanger version	Around 5 liters, 50% water + 50% mixture of antifreeze and anti-corrosion agents

Electrical system

Alternator	12 V / 100 A
Alternator belt tension	Deflection 10 mm à 10 daN
Battery capacity (min.)	100 to 110 A/h

Connections

Exhaust	50 mm
Fuel (suction and return	8 mm
Seawater	25 mm
Max. mounting angle	15° (dynamic)

⚠ These specifications are for marine pleasure only.

* For more information concerning your transmission, refer to its specific manual.

The recommended cruise speed is 200 rpm below rated RPM speed.

*At engine flywheel, according to ISO 8665-1.

⚠ Refer to the maintenance and servicing section in the manual for information on the regular servicing checks and operations to be performed.

Operation : **I**nspect, **A**djust, **C**lean, **R**eplace

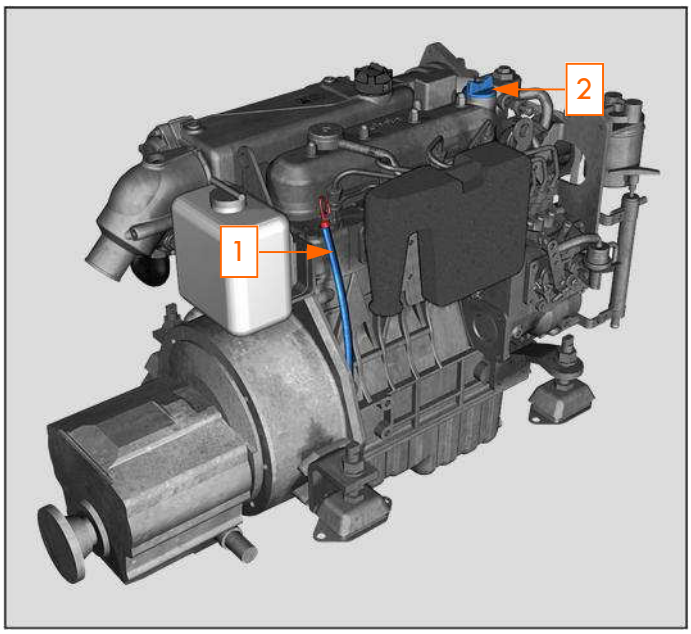
Information given in italics refers to equipment not necessarily forming part of your engine.

Gearbox (refer to specific manual for this component).

Subset	Component	Operation	Fréquence
Fuel supply	Fuel filter	**R**	A 20 heures puis toutes les 100 h ou tous les ans
Exhaust elbow	Zinc anode	**I / R**	
Engine block	Tension of belts	**R**	
	Tightening of attaching parts and clamps	**I / A**	
Control unit	Cables accelerator / reverse, Trolling, General lubrication	**I**	
Fuel supply	Air filter (cleaning kit)	**I / C / R**	Toutes les 200 heures ou tous les ans
Cooling	Seawater pump rotor	**R**	
Electrical system	Starter (attachment)	**I / A**	
	Alternator (attachment)	**I / A**	
Engine block	Cleaning and protection of engine	**I / A / C**	1 fois par an
Fuel supply	Fuel pre-filter (cartridge)	**R**	A 20 heures puis toutes les 200 h ou tous les ans
Engine block	Attachment of engine suspensions / alignment	**I / A**	
Electrical system	Battery	**I**	
Lubrication	Engine oil (change)	**R**	
	Engine oil filter	**I / A / R**	
Cooling	Cooling circuit (rinsing)	**C**	Tous les 2 ans
Fuel supply	Adjustment of valve clearance	**I / A**	Toutes les 400 heures ou tous les 2 ans
	Calibration of injectors	**I / A / R**	
Cooling	Coolant change	**R**	
	Exchanger manifold or keel cooling	**I / C**	
	Calibrated plug of temperature exchanger	**R**	
	Thermostat	**R**	

Inspection and adjustment of the levels

Oil level

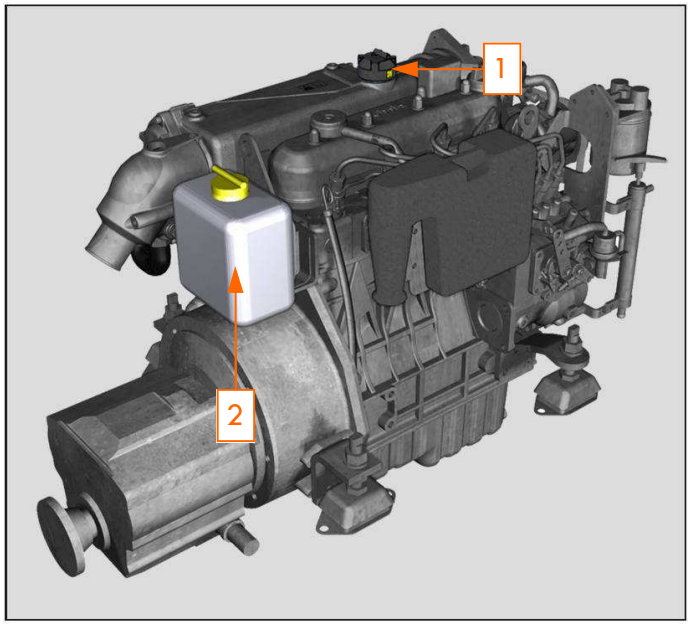


1 - Oil gauge
2 - Oil filler port

The oil checks must always be performed with the engine stopped and cold. Be careful, these fluids are flammable. Do not smoke in the vicinity of these fluids and do not allow for any sparks or flame in the vicinity.

Engine casing oil: remove the gauge, wipe off the gauge and reinstall it in the gauge tube.
Pull out the gauge again and check the oil level. It should be located between the min. and max. positions on the gauge.
If necessary, top up the oil level: open the air filler port, pour the recommended oil (see technical characteristics in appendices) to reach the max. level indicated on the gauge without exceeding the max. level. Close the oil filler port.

Coolant level

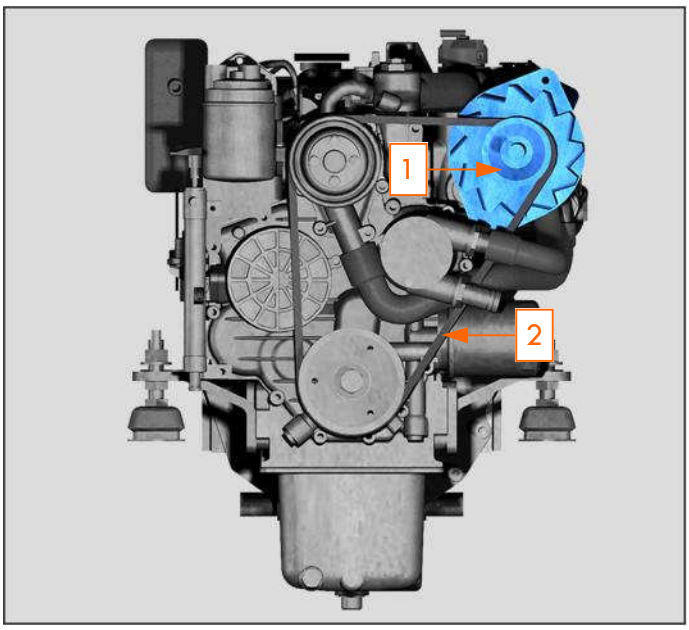


1 - Coolant plug
2 - Expansion tank

When filling the cooling system, the coolant level must be checked after 10 minutes of use since the system purges itself automatically. Top up if necessary.

Turn the filler plug up to its first stop to allow the pressure in the system to escape before removing the plug.
Inspect the fluid level. The level should be between the lower edge of the filler neck and the level pin (if equipped), respectively representing the minimum and maximum level in the expansion chamber.
Top up if necessary using a fluid comprising 50% water and 50% antifreeze.

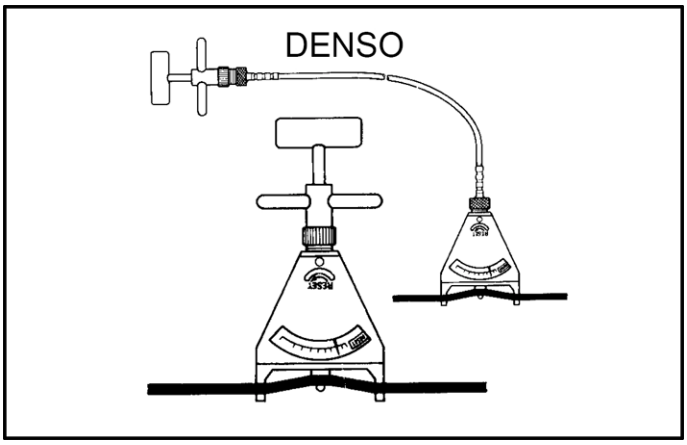
Alternator belt



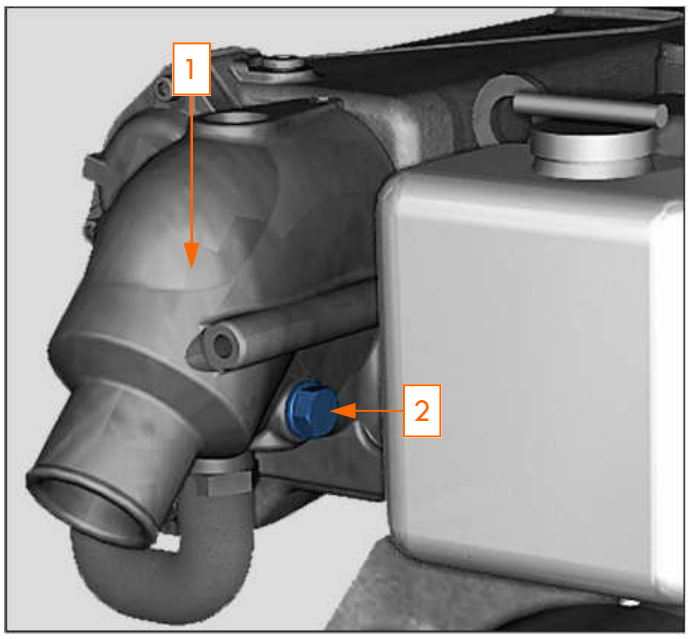
1 - Alternator
2 - Alternator belt

Perform this operation with the engine stopped.

Regularly check the tensions of the alternator belt. Tension the belt between the pulleys in accordance with the tension or deflection given in the technical characteristics (appendices pA-2) using a DENSO meter.



Zinc anode



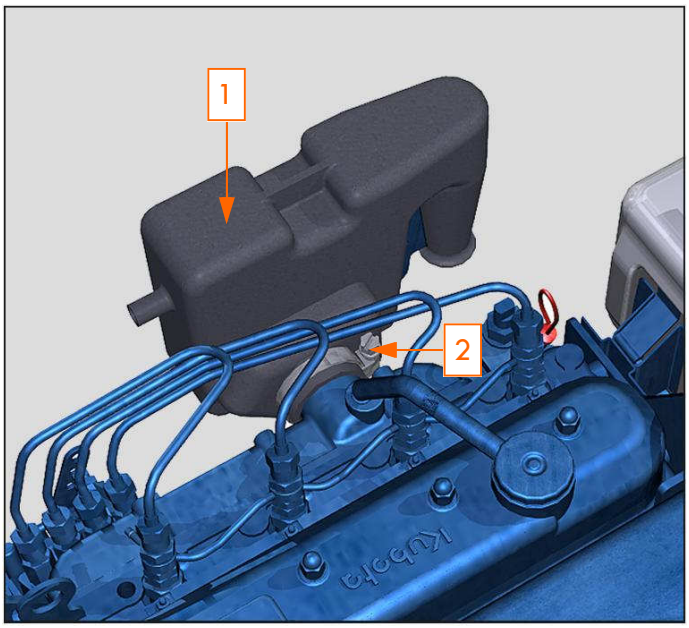
1 - Exhaust elbow
2 - Zinc Anode

Perform this operation with the engine stopped.

A zinc anode forms part of the exhaust elbow . It serves as an anticorrosion anode. The anode must be replaced when more than 50% of it has been consumed.
Diameter : 10 mm
Length : 16 mm

Non-binding photographs. The coupled equipment and accessories can vary according to your level of equipment.

Air filter

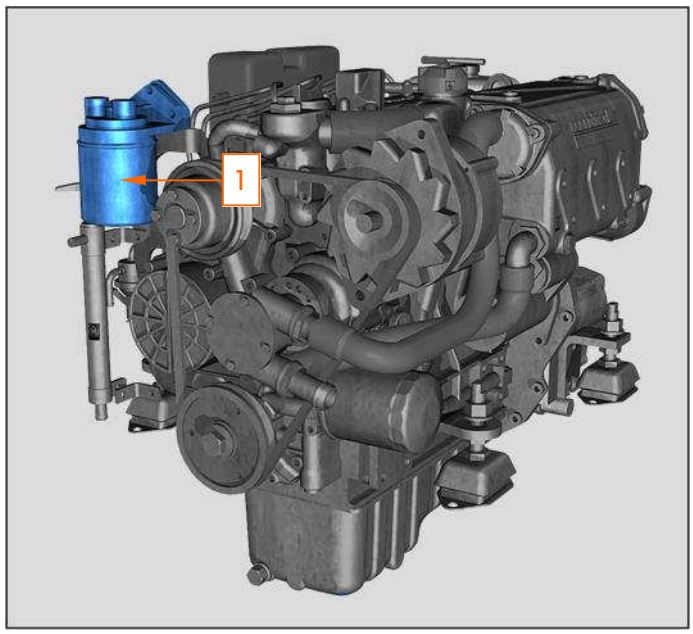


1 - Air filter
2 - Clamp

Be sure no impurities get into the engine.

Remove the clamp from the hose and remove the filter. Remove the spring inside the filter. If necessary, clean the filter by washing it with soapy water. Then, rinse the filter with clear water.
Press the filter to remove any water and to dry it.
NANNI DIESEL has designed a cleaning kit which is suited to certain models of the air filter.
Use of this kit is recommended on our engines to perform effective cleaning and ensure good engine « breathing ».

Fuel filter

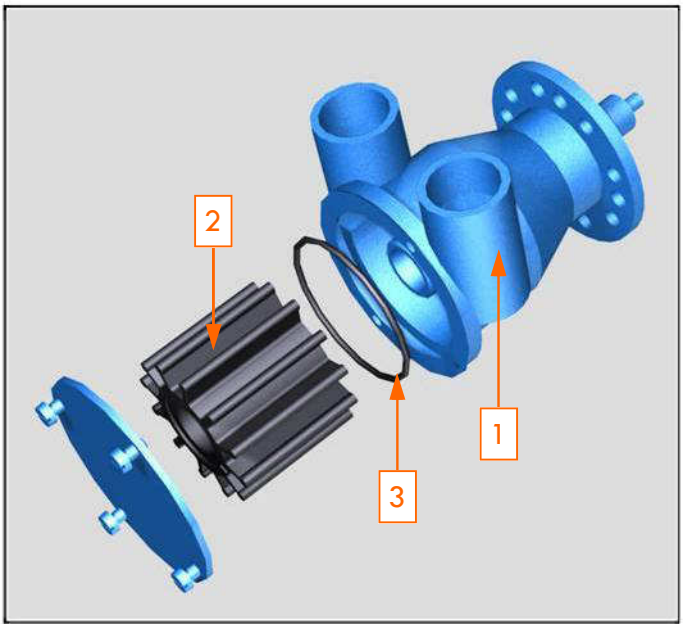


1 - Fuel filter cartridge

Always sponge up any fuel which may have spilled Observe the environment protection rules.

The fuel filter is a throw-away type filter. The fireguard envelope and the water probe must be preserved and reinstalled correctly (if equipped), The fire guard must not come into contact with the plastic purge screw.
- Close the fuel valve
- Unscrew the cartridge from the filter head
- Coat the seal of the new cartridge with clean oil
- Screw the new cartridge on the filter head, then tighten by hand by ¾ turn (do not use a tool).
- Reinstall the probe and the purge screw (if equipped). Check the seal
- Open the fuel valve
- Purge the circuit
- Start up the engine and check for any leaks

Sea-water pump

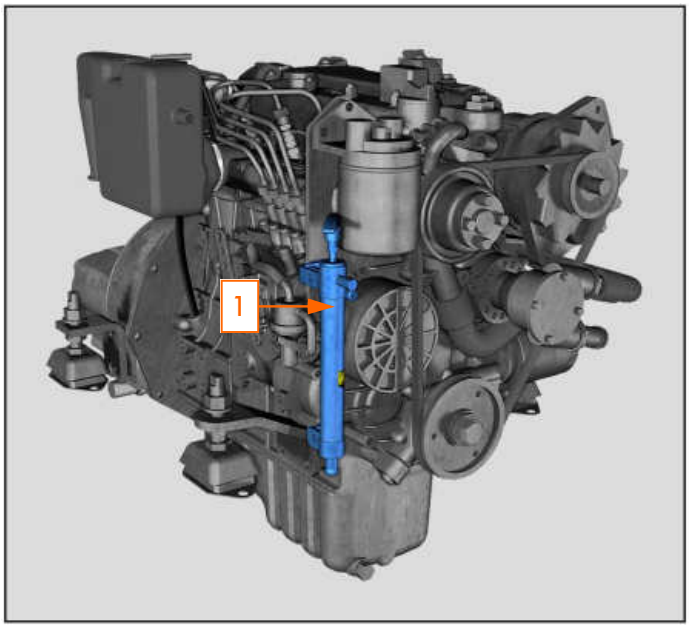


1 - Sea-water pump
2 - Impeller
3 - Sea-water pump gasket

Close the seawater intake valve as there is a risk of water penetrating into the engine.

- Close the seawater intake valve
- Close the seawater pump cover
- Using a channel lock pliers, remove the worn Impeller
- If the rotor shows any signs of cracks or defects, it should be replaced
- Clean the parts preserved
- Fit a new rotor by applying a clockwise rotary movement
- Install the seawater pump cover using a new seal
- Open the seawater intake valve
- Start-up the engine and check for any leaks in the circuit

Engine oil drain

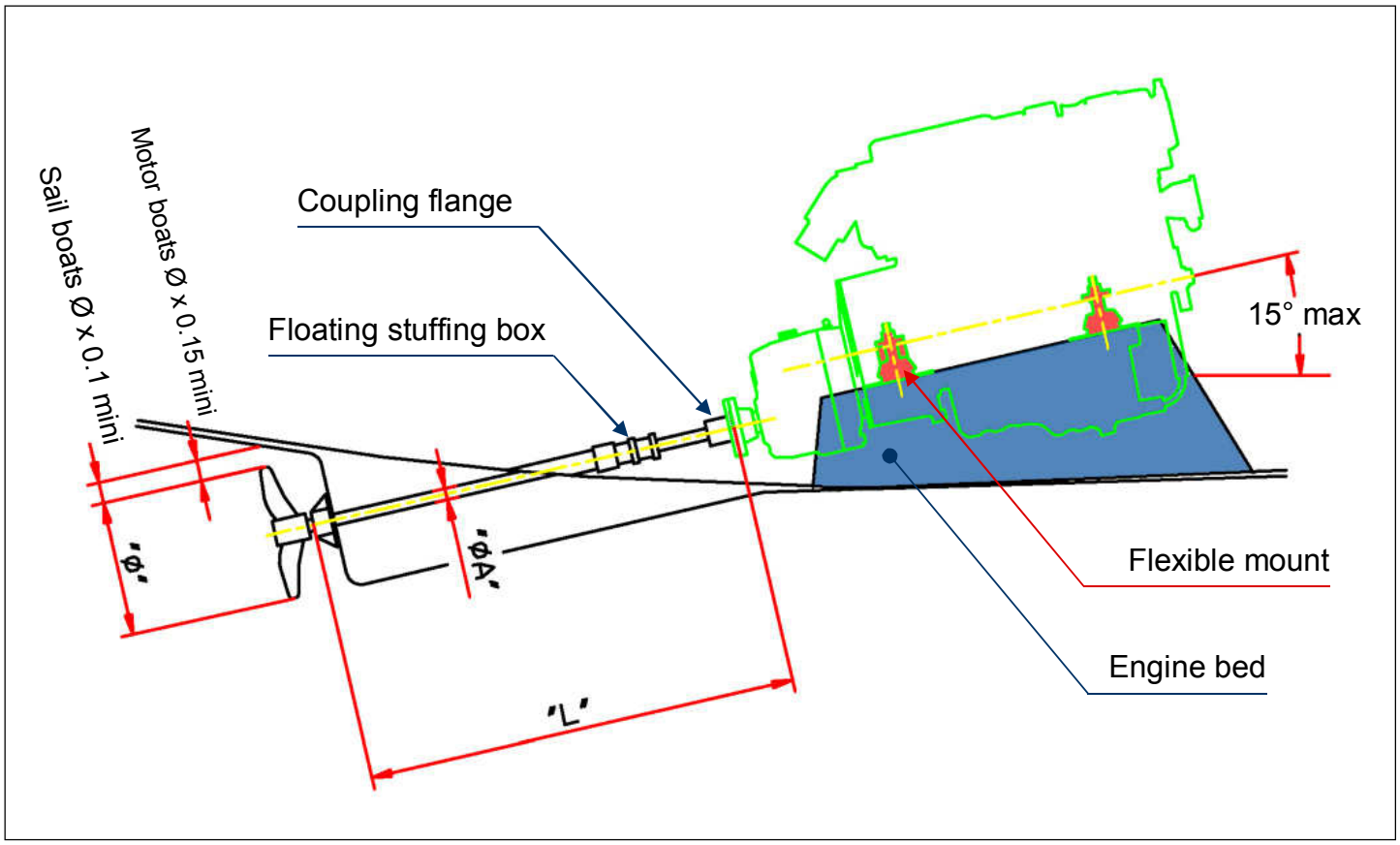


1 - Oil drain pump

Hot oil can burn. Avoid any contact with the skin. Observe the environment protection rules.

- The oil is removed using a drain pump, preferably: engine slightly warm,
- Fully pump out all the oil,
- Fill with new oil,
- Check the oil level using the gauge,
- Do not exceed the maximum level.

Non-binding photographs. The coupled equipment and accessories can vary according to your level of equipment.



Engine bed

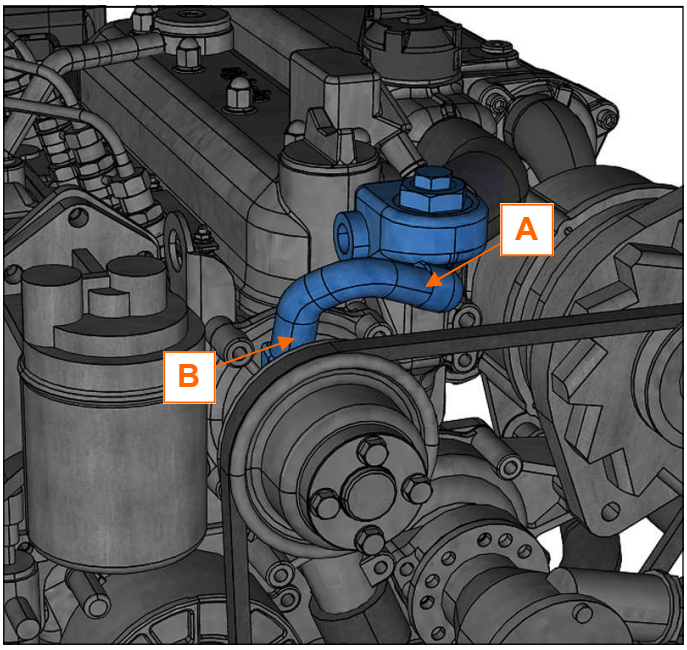
Rigid structure able to absorb all the dynamical stress, and the engine weight.
It must be linked to the hull with a surface as large as possible.

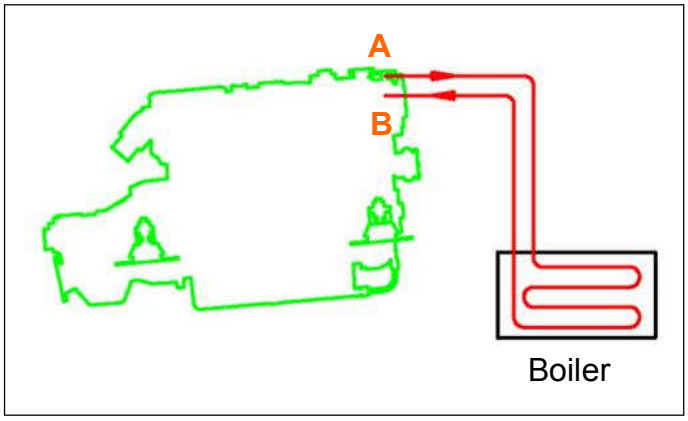
Engine	Reduction ratio	ØA (mm)	Ø * (inches)	L ** (meter)	Engine RPM		
					Idling	Maxi rated load	Maxi without load
N4.38	2	25	15	1.35	850	3000	3220
	3	30	19	1.80			

* For propeller calculation please fill in in the "propeller study" form

** Maximum value accepted

Boiler connections

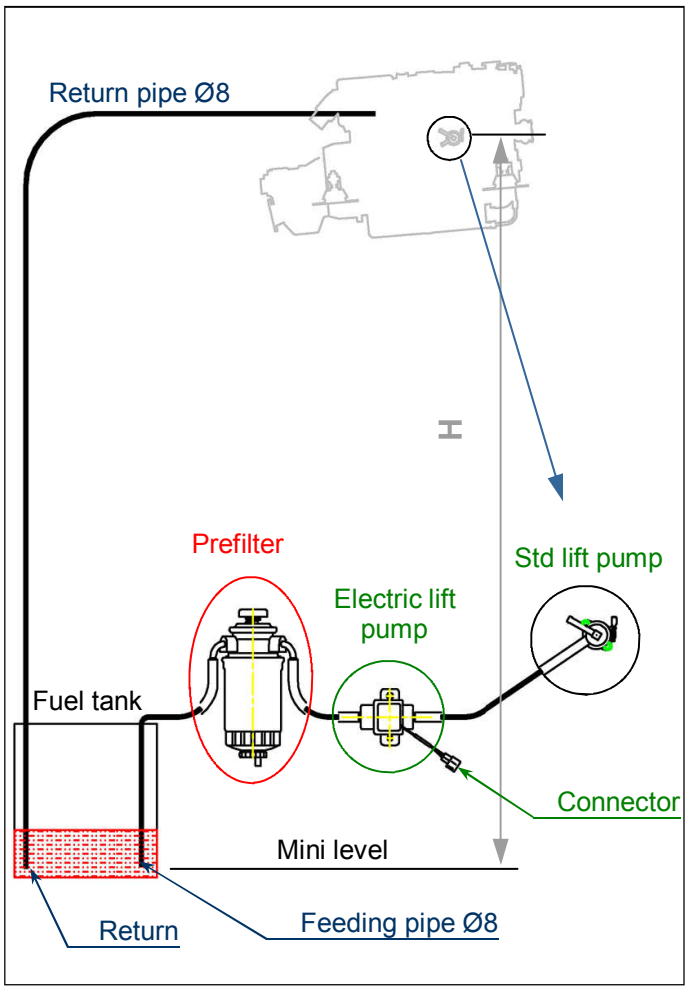




A - Inlet
B - Outlet

- Ø hose = 10 mm (maxi)
- Pipes must be as short as possible with a minimum bend,
- Pipe must be flexible (max temp hoses 100°c),
- The boiler must be located below the engine level (if not possible contact us).

Fuel connections

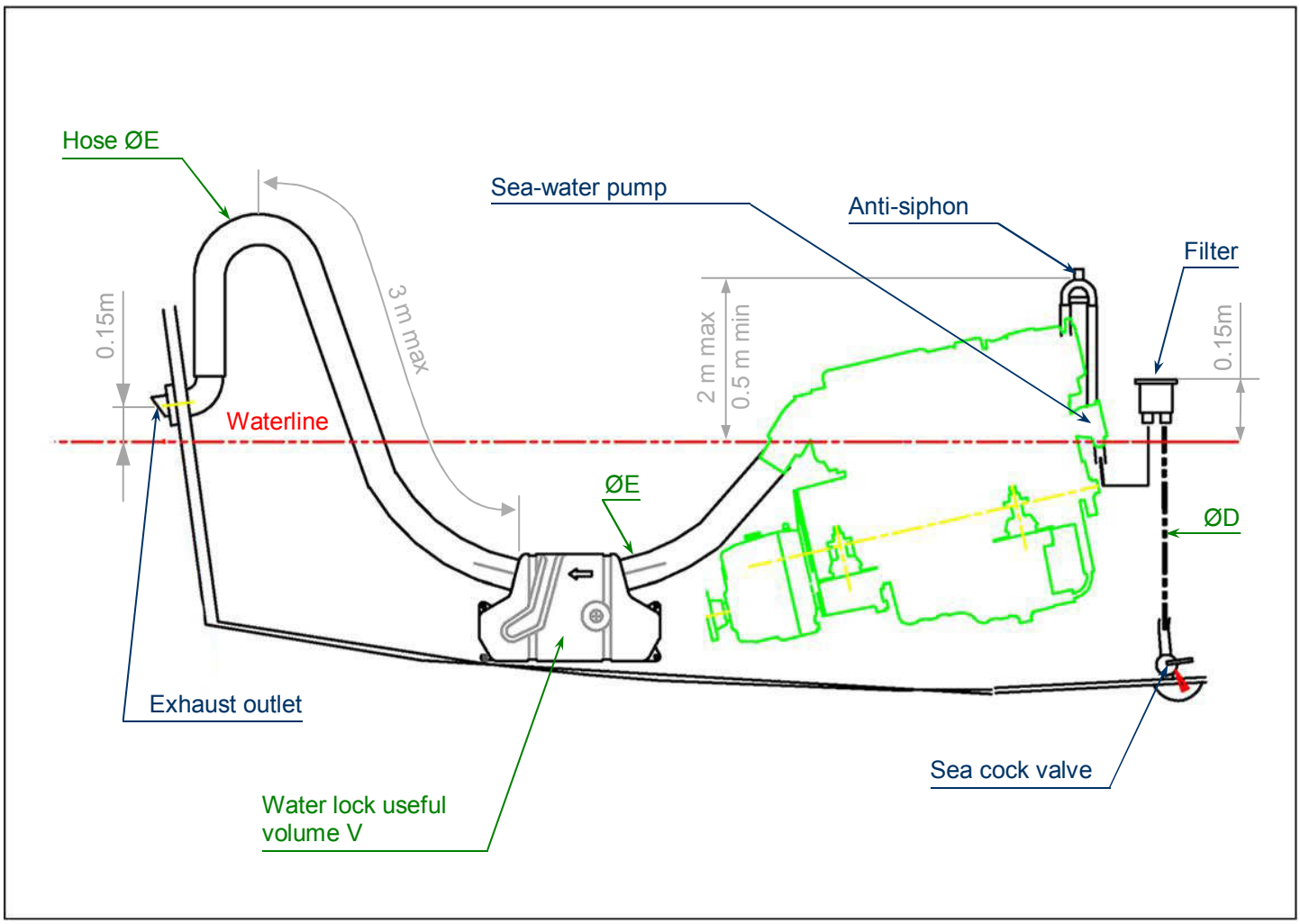


- Prefilter has to be as low as possible,
- The return to tank must be below the mini fuel level,
- The electric lift pump is optional. Connector : +12V to key switch P.15/54, protect with fuse 1.5A.

Pump	H maxi (meter)
Standard	0.5
Electrical	1.8

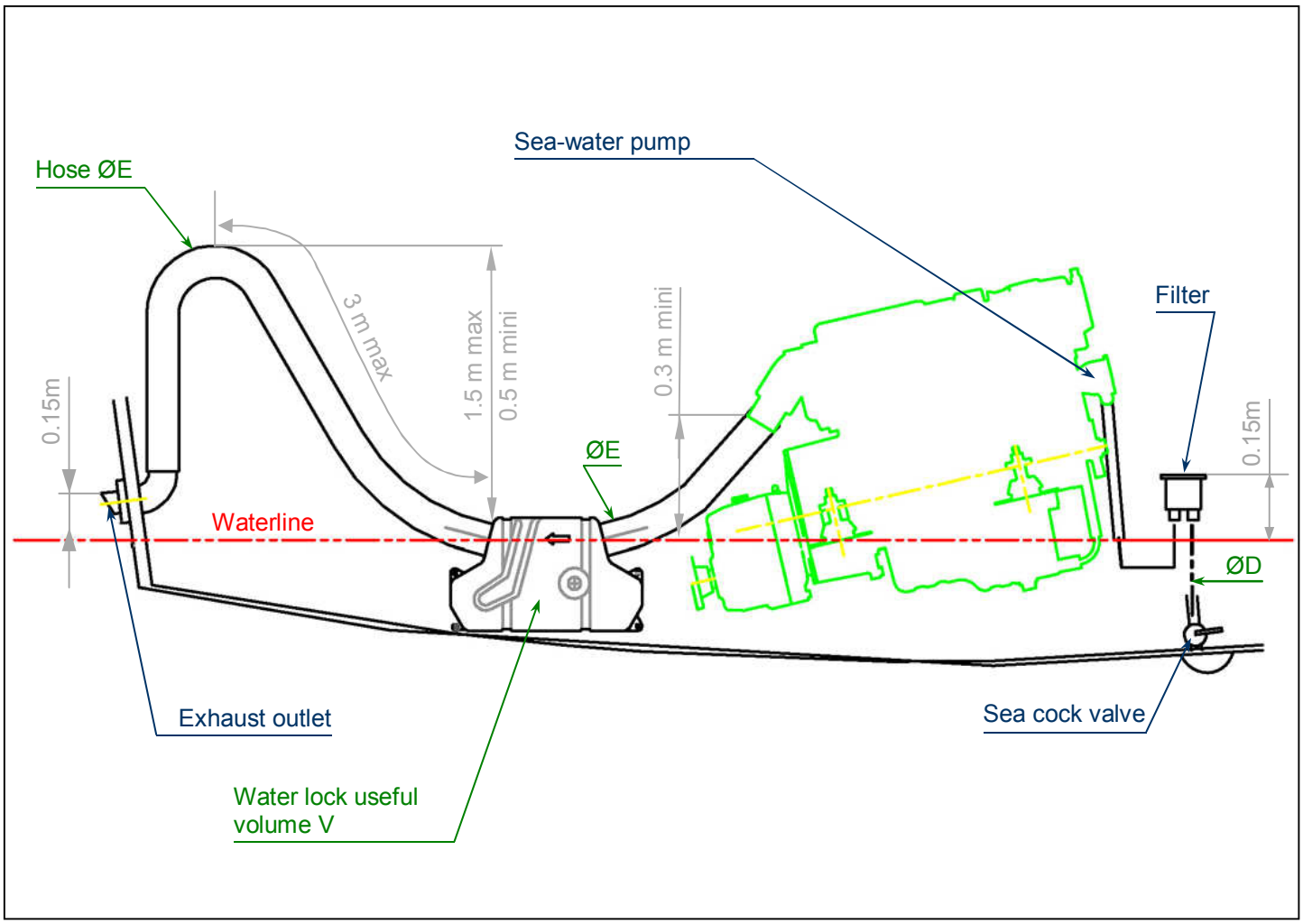
Sea water pick-up and exhaust lines

Engine under waterline



Engine	ØD (mm)	ØE (mm / inches)	Max back-pressure (kPa / PSI)	V mini (litre)
N4.38	25	50 / 1.97"	10.5 / 1.523	8

Engine under waterline



All sail boat

Anti siphon valve

Must be at the end of raw water piping before exhaust elbow inlet

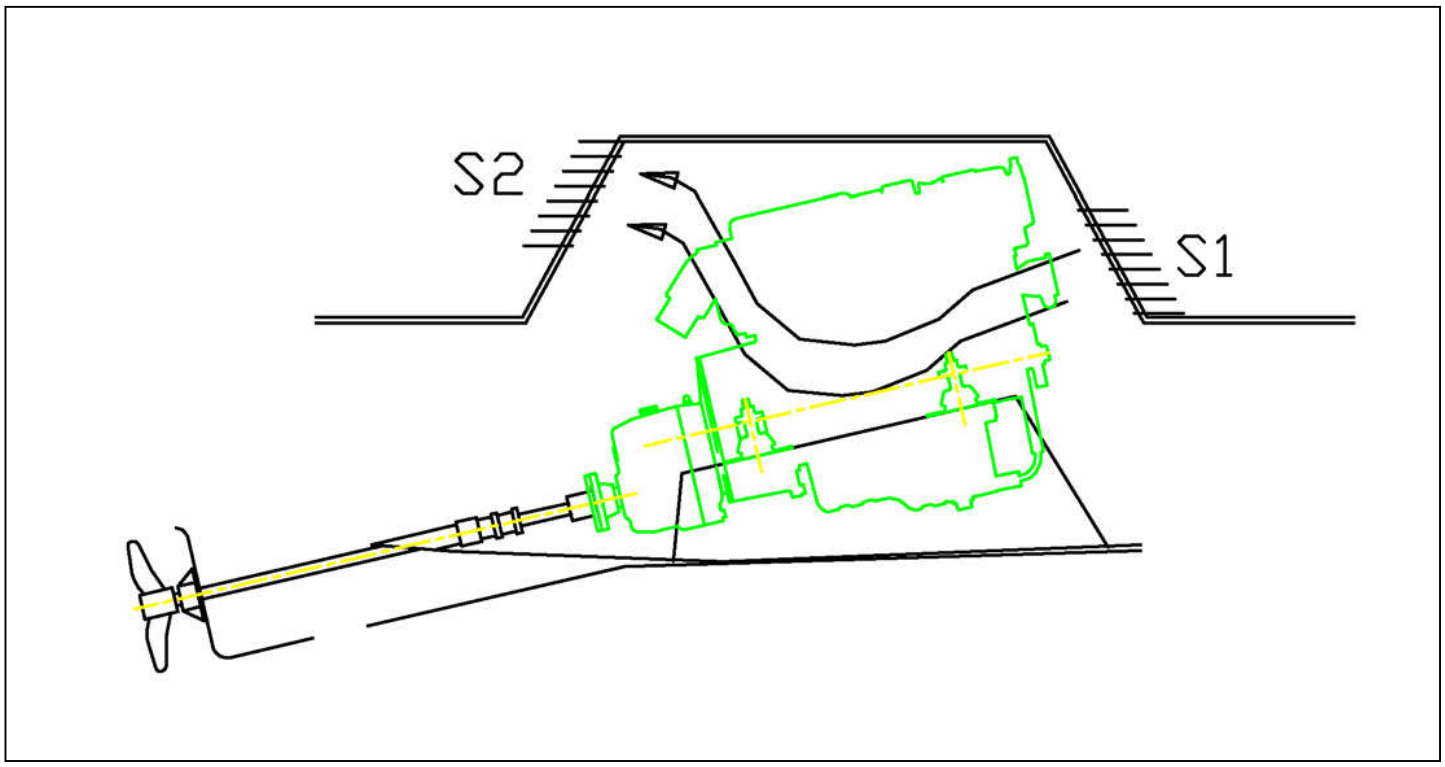
Water lock

Must be always lower and near the engine

Motor boats

Air requirement

Dynamical system



Engine	Engine air Consump. (m^3/min)	Inlet S1 (cm^2)	Outlet S2 (cm^2)
N4.38	1.9	280	180

Engine room temperature

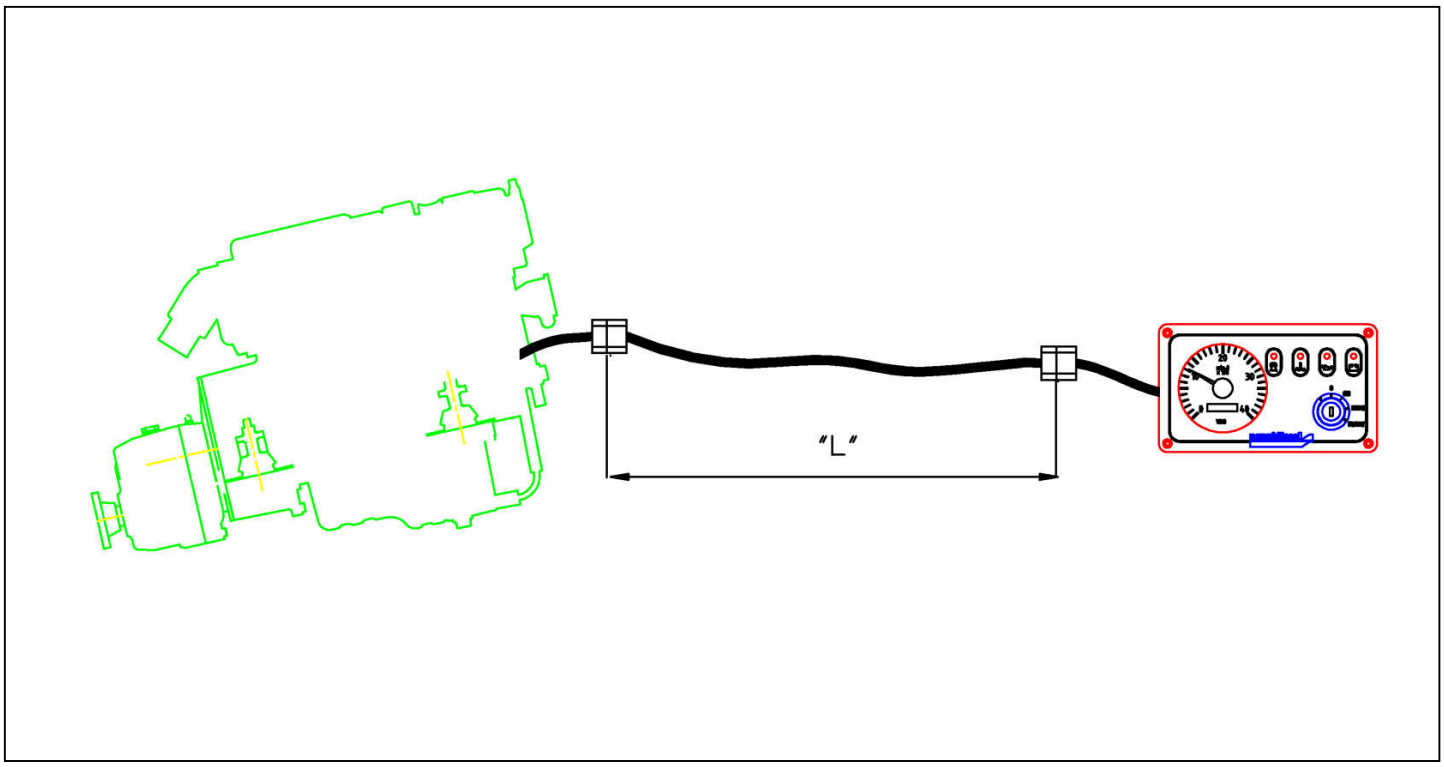
Nor more than 50°C with a difference of 15°C (20°C maxi) with ambient temperature.

Air flow

Fresh air inlet, on the front in the lower part of the engine room and warm air outlet on the back in the upper part.

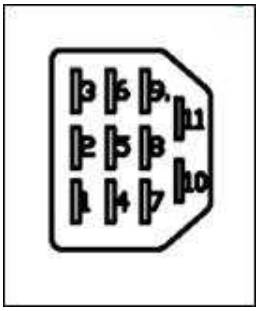
Avoid short-circuit between inlet and outlet in order to have a maximum air move.

A3 / B3 Panel



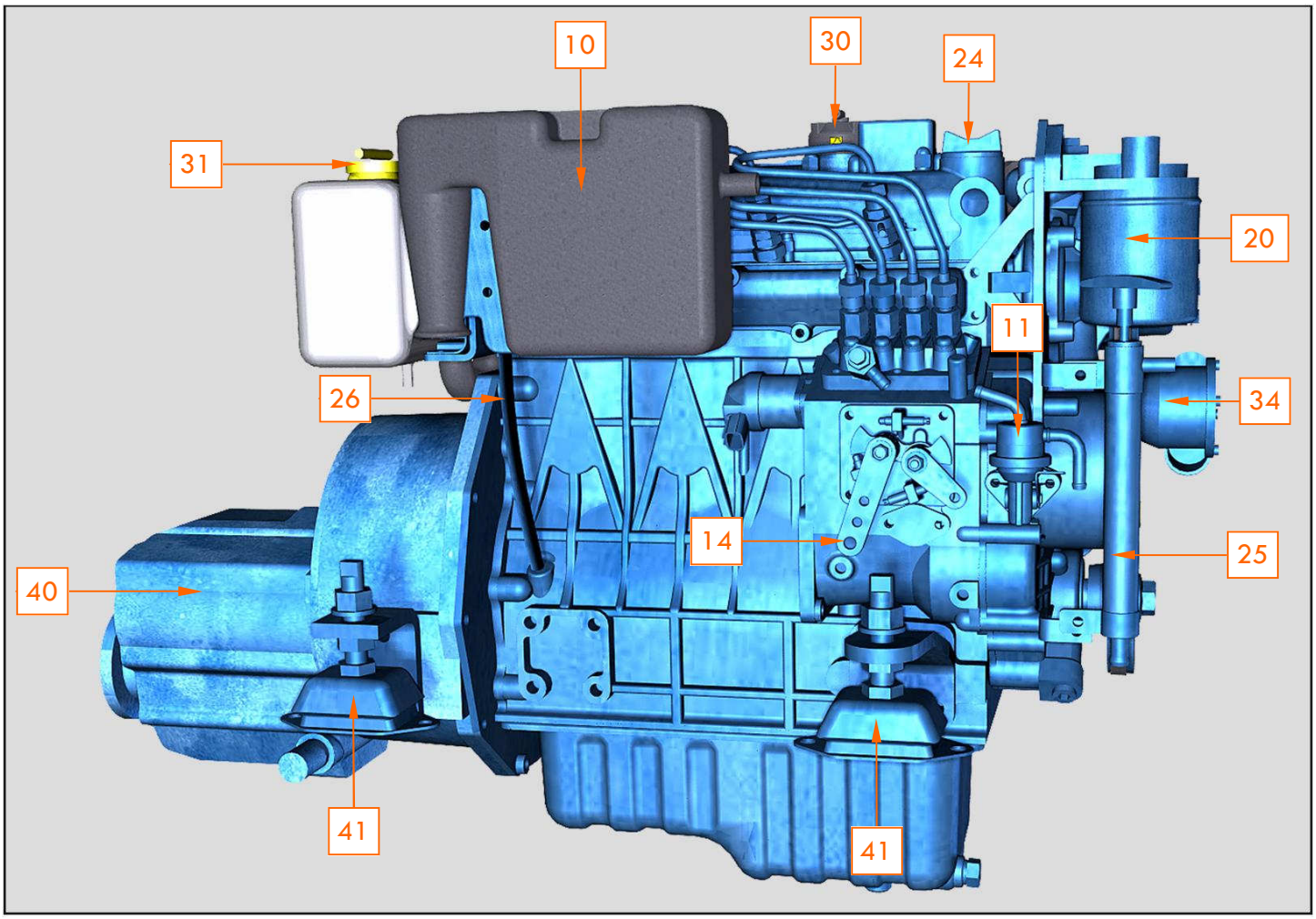
Connectors	
1	+
2	-
3	Starter
4	Preheating
5	Stop
6	Oil sender
7	D+
8	Oil switch
9	Water switch
10	Water sender
11	Revolution counter (tachometer)

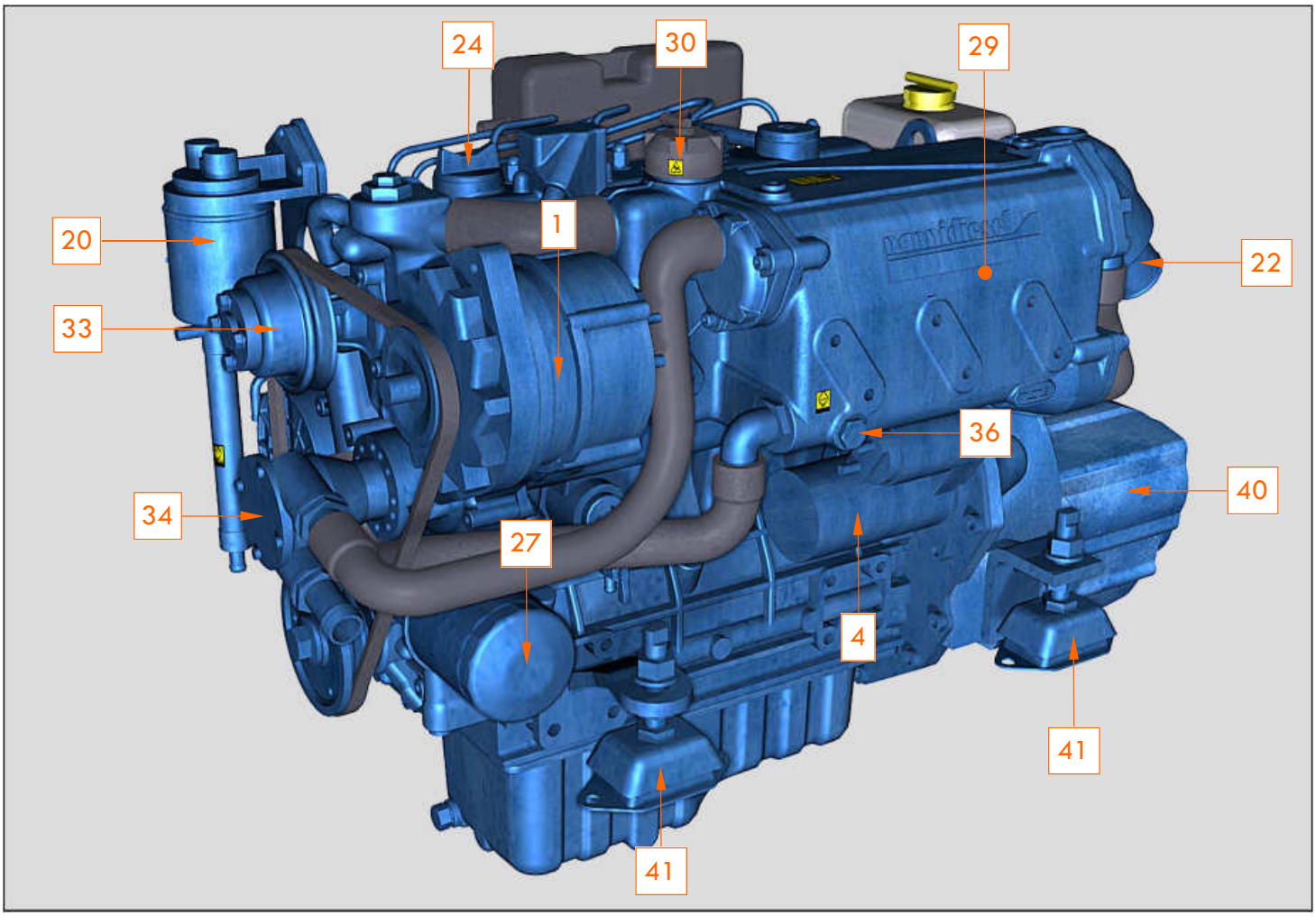
Extension references		
L =	2 meters	970 304 162
L =	4 meters	970 302 665
L =	8 meters	970 302 666



Main parts of the engine

Non-binding photographs. The coupled equipment and accessories can vary according to your level of equipment.





1 - Alternator

2 - Alternator belt

4 - Starter

10 - Air filter

11 - Injection pump

14 - Acceleration control

20 - Fuel filter

22 - Water injection exhaust elbow

24 - Oil filler port

25 - Oil pump

26 - Oil gauge

27 - Oil filter

29 - Heat exchanger

30 - Coolant filler port A

31 - Coolant filler port B

33 - Freshwater pump

34 - Sea-water pump

36 - Exchanger drain plug

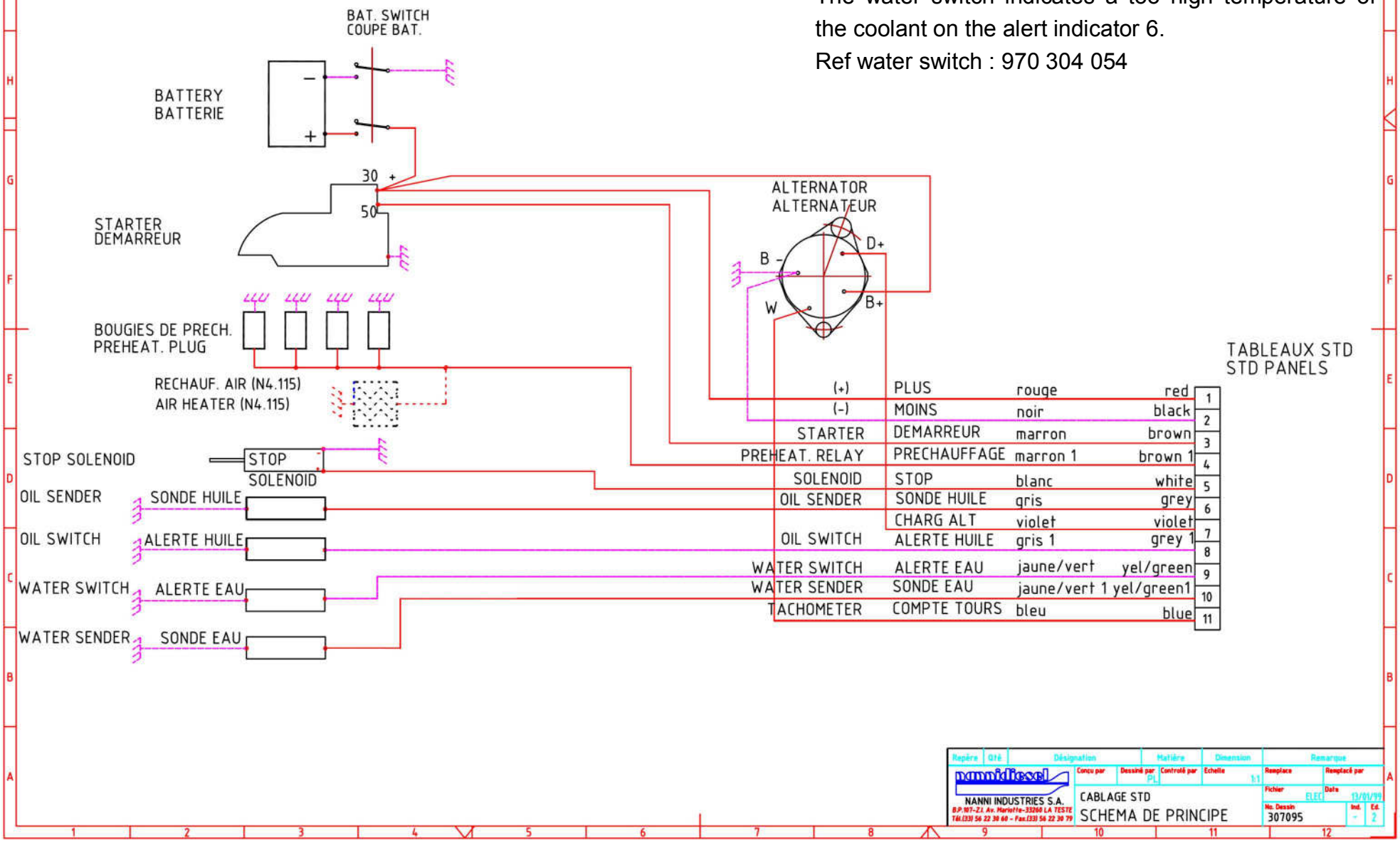
40 - Gearbox

41 - Flexible suspension

The components indicated in italics (water sensor and oil sensor) are optional equipment used with a more complete instrument panel.

The oil switch indicates a too low oil pressure in the engine on the alert indicator 5.
Ref oil switch : 48 201 143

The water switch indicates a too high temperature of the coolant on the alert indicator 6.
Ref water switch : 970 304 054

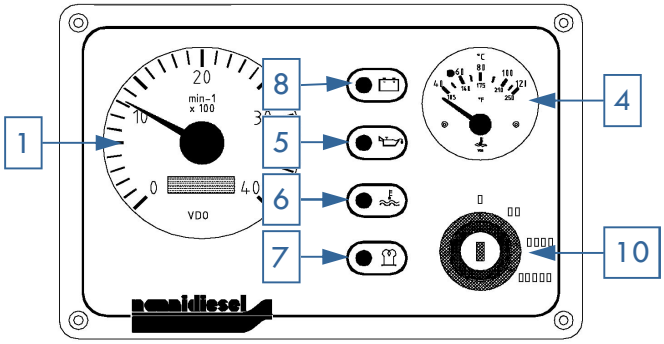


This section presents the various dashboards used to date with our marine engines. In the event of modification of the dashboards, we reserve ourselves the right to present new models in the appendices.

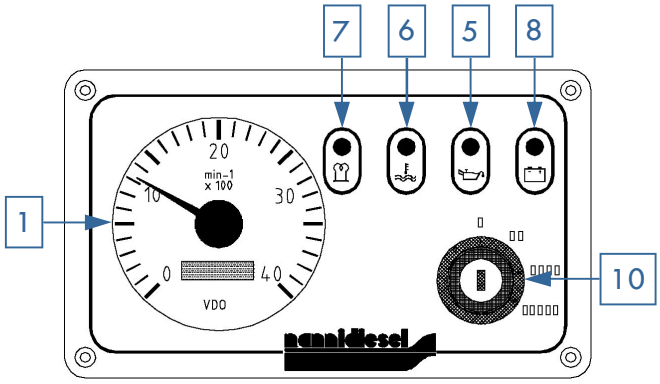
Some panels are not available with the whole range of engines.

⚠ The instruments shown often consist of safety indicator lights. Take the necessary time to become familiar with these instruments and check them regularly when operating the engine.

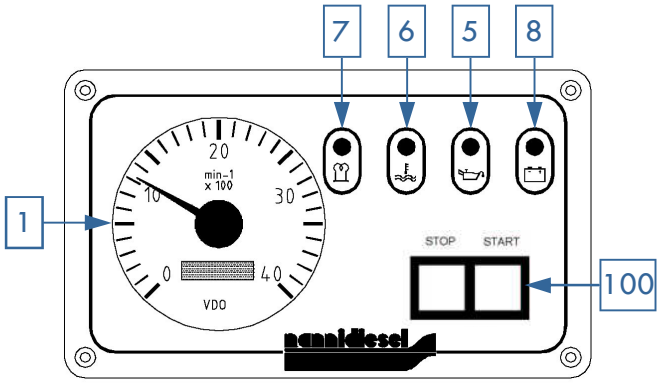
B3 panel
Dimensions 220 x 145 mm



A3 panel
Dimensions 205 x 120 mm



Fly Bridge panel



1 - Tachometer and hour meter
2 - Voltmeter
3 - Low engine oil pressure
4 - Coolant temperature
5 - Engine oil pressure
6 - Alarm too High coolant temperature
7 - Preheating
8 - Battery charge
10 - Switch on / off

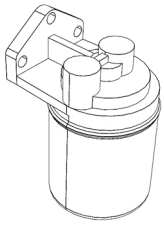
Recommended on-board kit

Concerning the checks to be performed on installation (see chapter 4 on installation), you can order the installation documentation from NANNI INDUSTRIES.

Alternator belt
Reference :
48 108 117

Engine oil filter
Reference :
970 302 742

Fuel filter
Reference :
970 622 350

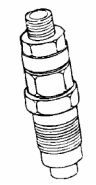


Sea-water pump kit
Reference :
970 604 591

Sea-water pump impeller
Reference :
970 604 530

Sea-water pump gasket
Reference :
970 604 529

Complete injector
Reference :
970 313 508

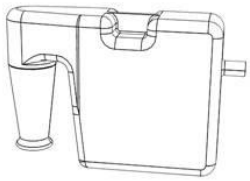


Injector seal
Reference :
970 142 109

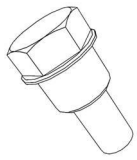
Injector seal (O-ring)
Reference :
970 307 388

Glow-plug
Reference :
970 307 591

Air filter
Reference :
970 302 624

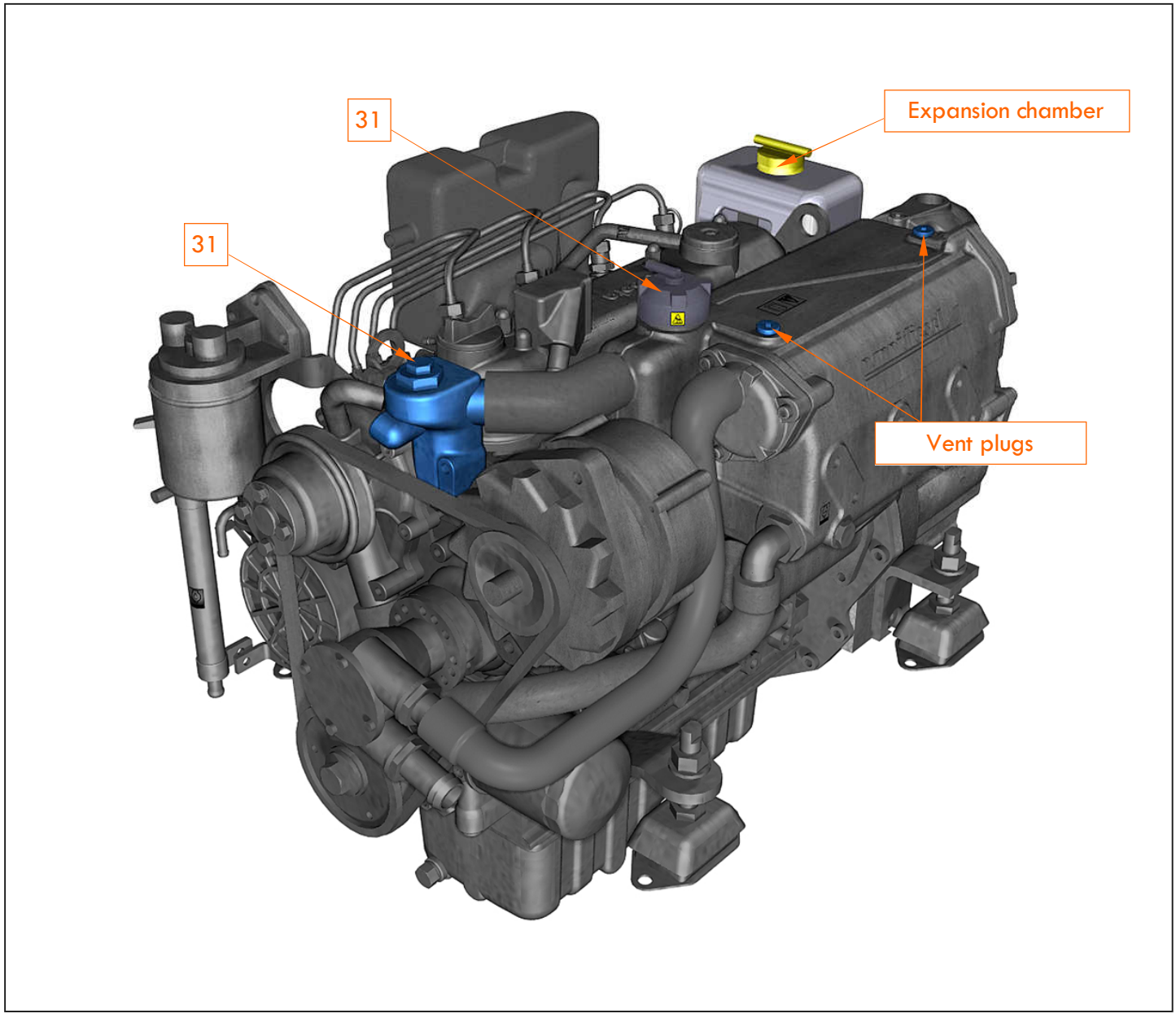


Zinc Anode
Reference :
970 494 635



Engine with exchanger :

- Open the main plug **30**
- Open the vents plugs above the exchanger
- Open the secondary plug **31** located on the water circuit
- Fill with the recommended liquid, by the filler orifice **30**
- Close the vent plugs when the liquid escape from it
- Finish the filling of the exchanger to the max level by the filler orifice **30**
- Close the main plug **30**
- Finish the filling by the orifice **31** the close it
- Fill half the expansion tank by its filling orifice if necessary



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