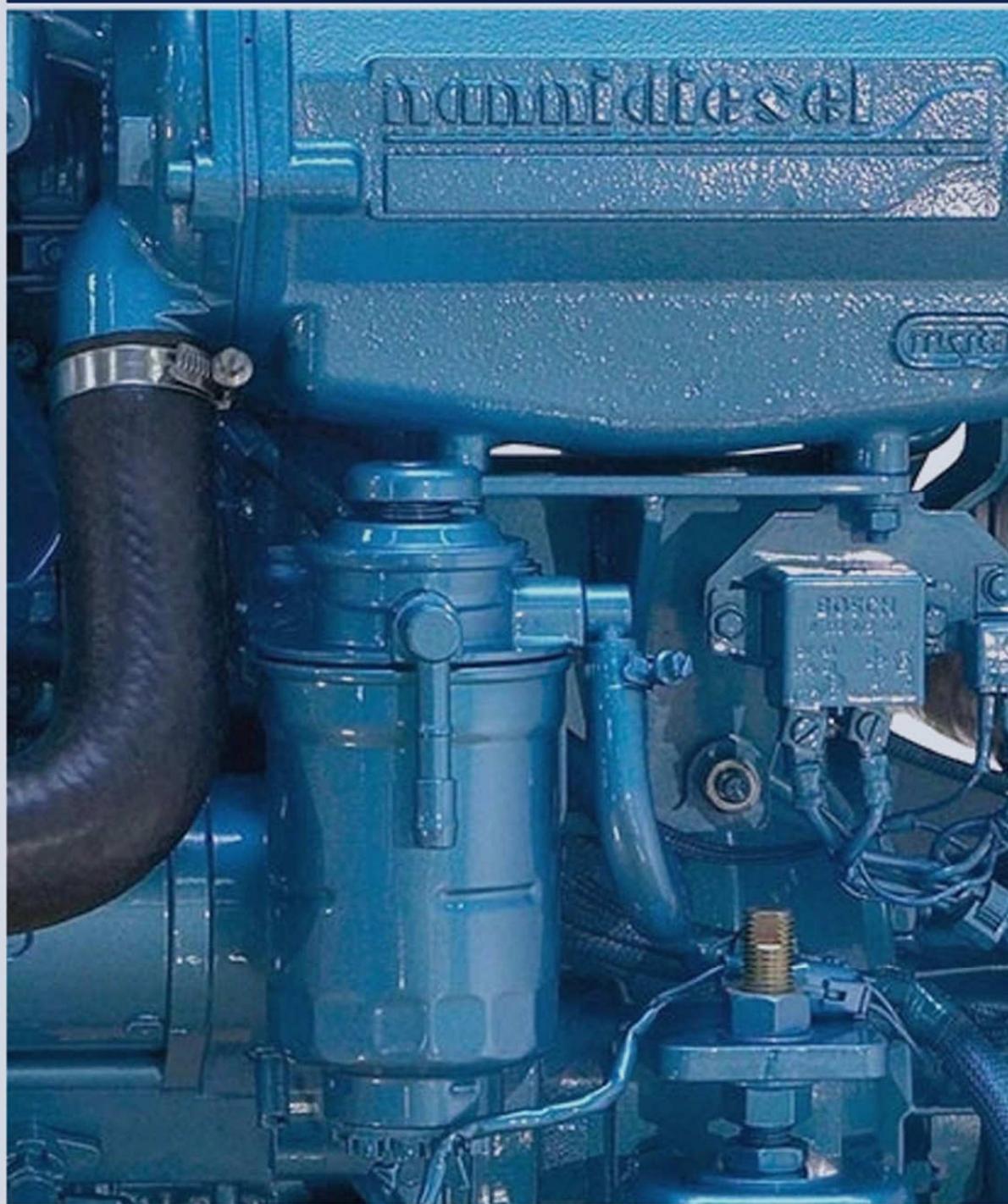


# mann diesel

energy in blue

English



Base  
**Kubota**

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i  
4  
N

Reference : 970 314 343

Date : 12/2007

Version : A

This photograph does not necessarily represent the engine

**Engine specifications**

Cycle	4 strokes, Diesel
Number of cylinders / Arrangement	4 in line
Bore / Stroke	94 mm x 110 mm
Displacement	3,053 litres
Compression rate	20/1
Aspiration	Turbo Intercooler
Direction of rotation (from flywheel)	Counter clockwise
Weight dry with gearbox	360 kg
Max. power*	73,6 kW (100 hp)
Rated rpm speed*	2800 rpm
Idle rpm speed	850 rpm
No load rpm speed	3020 rpm
Specific fuel consumption	237 g/kW/h at 2800 rpm

**Fuel supply**

Injection	Mechanic, Direct, 2 stages
Injection order	1-3-4-2
Fuel timing	9,5° +/- 1° before TDC
Injection pump	DENSO ND-PFR 4M
Injection pressure	18,63 MPa (1 <sup>st</sup> stage) 22,56 MPa (2 <sup>nd</sup> stage)

**Lubrication**

Engine oil	API CF 15W40 (temperate climate)
Engine oil capacity	8 to 10 litres depending inclination

**Cooling**

Cooling	Dual circuit sweet water / sea water with heat exchanger
Seawater pump	Neoprene rotor type
Coolant for heat exchanger version	Around 9,5 litres, 50% water + 50% mixture of antifreeze and anticorrosion agents

**Electrical system**

Alternator	12 V / 100 A
Alternator belt tension	Deflection 8 mm at 5 daN
Battery capacity (min.)	100 Ah

**Connections**

Exhaust	90 mm
Fuel (suction and return)	8 mm
Seawater	32 mm
Max. mounting angle	7°( 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.*

# Maintenance schedule

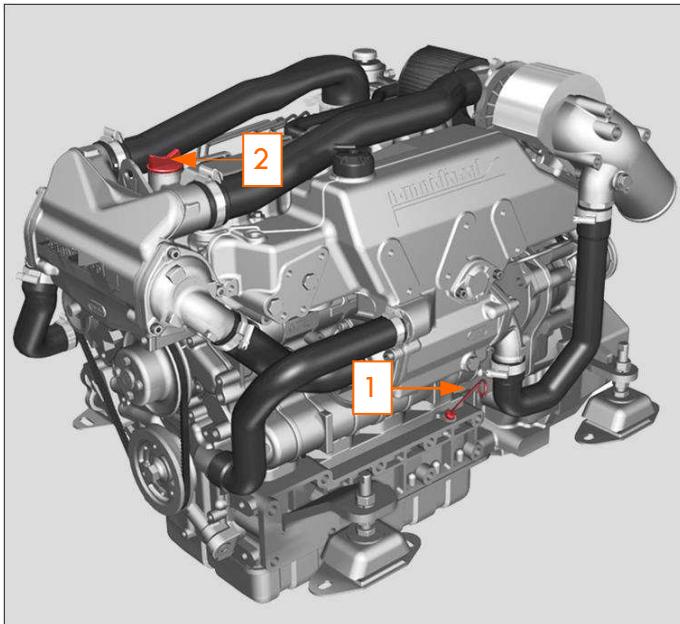
**⚠** Refer to the maintenance and servicing section in the manual for information on the regular servicing checks and operations to be performed.

Information given in *italics* refers to equipment not necessarily forming part of your engine.  
*Gearbox (refer to specific manual for this component).*

Operation : Inspect, Adjust, Clean, Replace

Subset	Component	Operation	Frequency
Fuel supply	Fuel filter	R	After 20 hours then every 100 hours or every year
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, <i>Trolling</i> , General lubrication	I	
Fuel supply	Air filter (cleaning kit)	I / C / R	Every 200 hours or every year
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	Every year
Fuel supply	Fuel pre-filter (cartridge)	R	After 20 hours then every 200 hours or every year
Engine block	Attachment of engine suspensions / alignment	I / A	
Electrical system	Battery	I	
	Engine oil (change)	R	
Lubrication	Engine oil filter	I / A / R	
	<i>Gearbox oil filter</i>	R	
Cooling	Cooling circuit (rinsing)	C	Every 2 years
Fuel supply	Adjustment of valve clearance	I / A	Every 400 hours or every 2 years
	Calibration of injectors	I / A / R	
	Turbo	I / C	
Cooling	Coolant change	R	
	Exchanger manifold or keel cooling	I / C	
	Gearbox oil cooler manifold	I / C	
	Calibrated plug of temperature exchanger	R	
	Thermostat	R	

## Oil level



1 - Oil gauge  
2 - Oil filler port

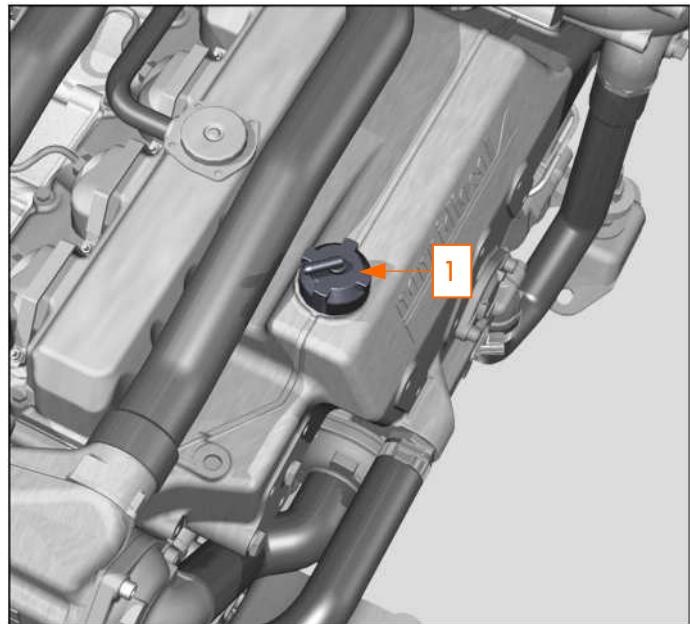
**⚠** *The oil checks must always be performed with the engine stopped and cold. Be careful, these fluids are flammable. Do not smoke in the vicinity of these fluids and do not allow for any sparks or flame in the vicinity.*

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

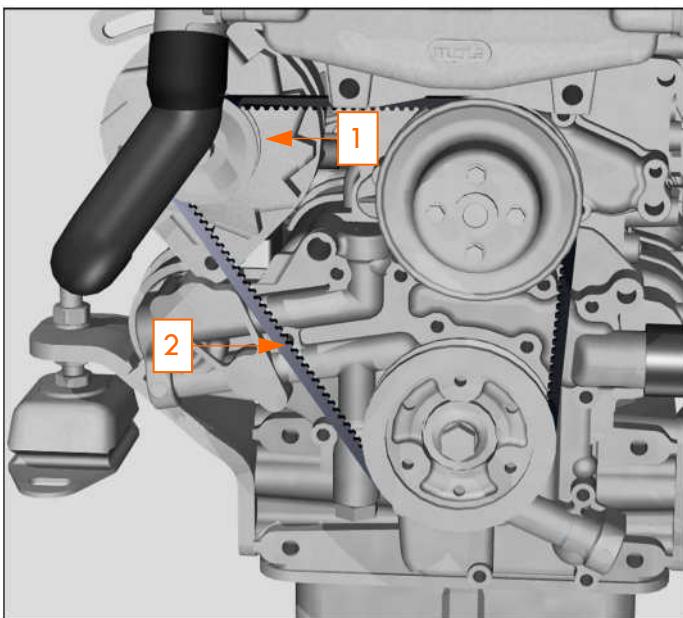
**⚠** *When filling the cooling system, the coolant level must be checked after 10 minutes of use since the system purges itself automatically. Top up if necessary.*

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.

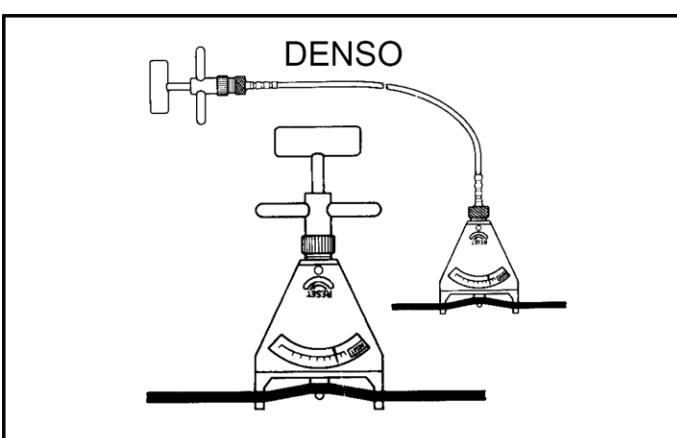
## Alternator belt



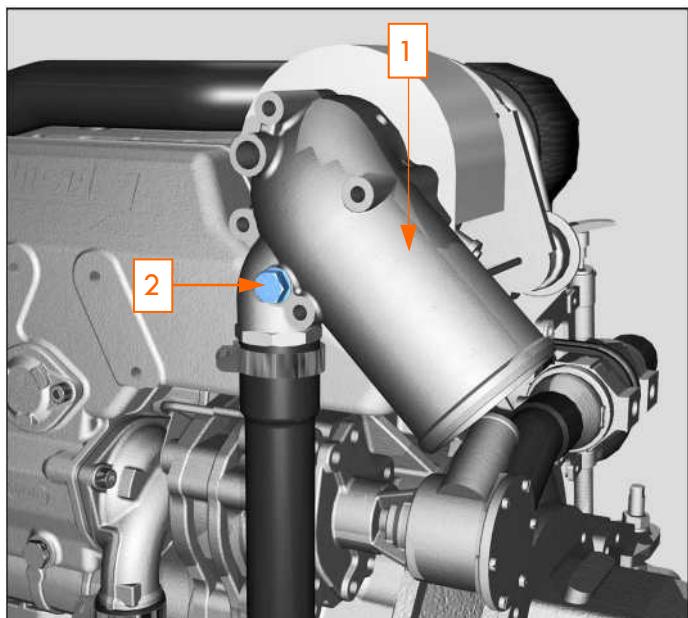
- 1 - Alternator
- 2 - Alternator belt

**⚠ 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.**

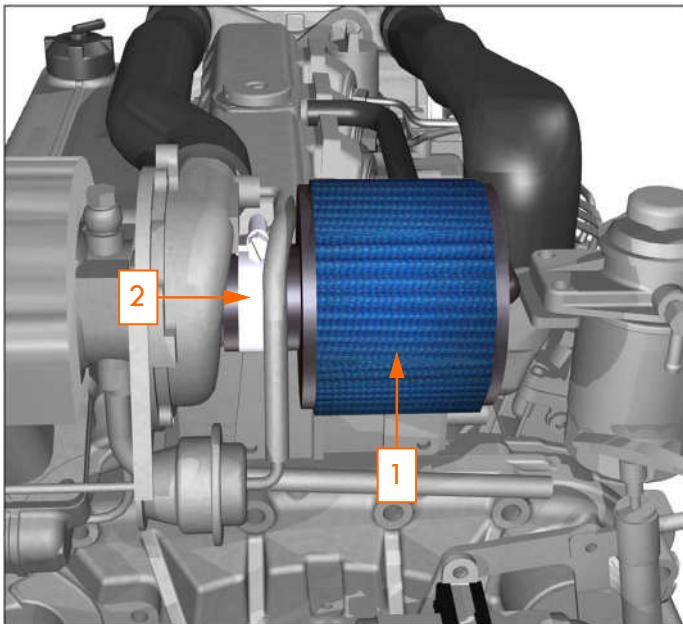
A zinc anode forms part of the exhaust elbow. It serves as an anticorrosion anode. The anode must be replaced when more than 50% of it has been consumed.

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.**

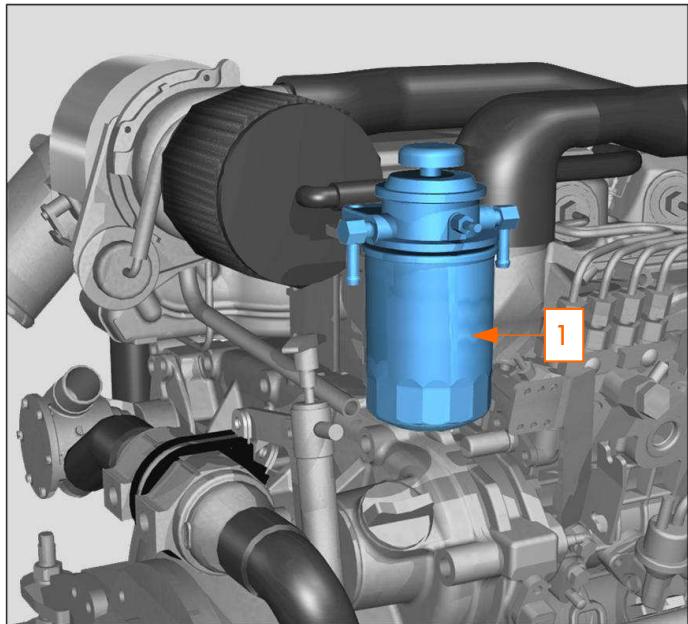
Remove the clamp from the hose and remove the filter. Remove the spring inside the filter. If necessary, clean the filter by washing it with soapy water. Then, rinse the filter with clear water.

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



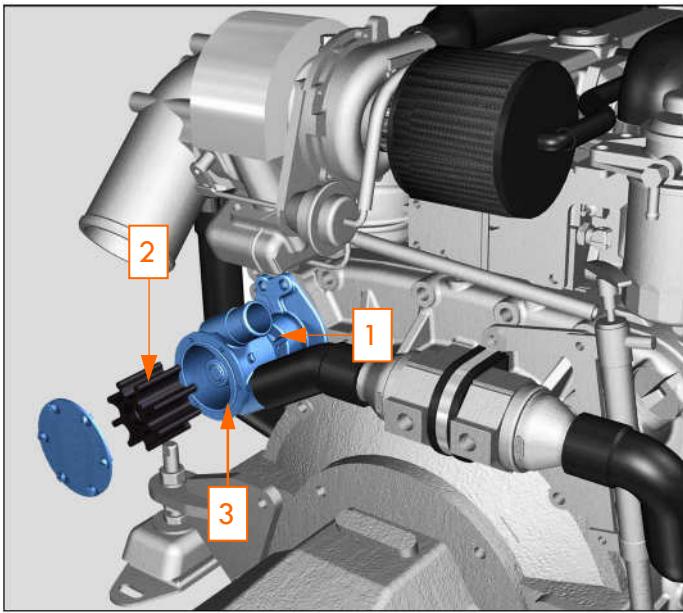
1 - Fuel filter cartridge

**⚠ 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  $\frac{3}{4}$  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

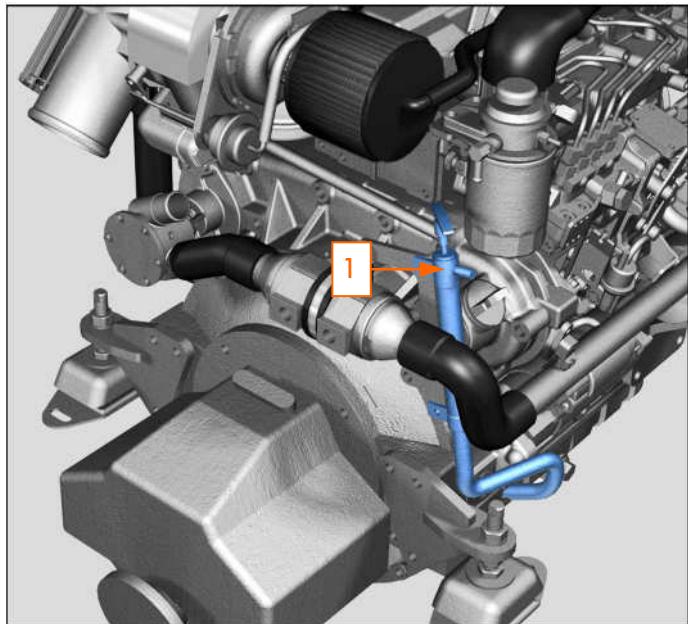
2 - Impeller

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

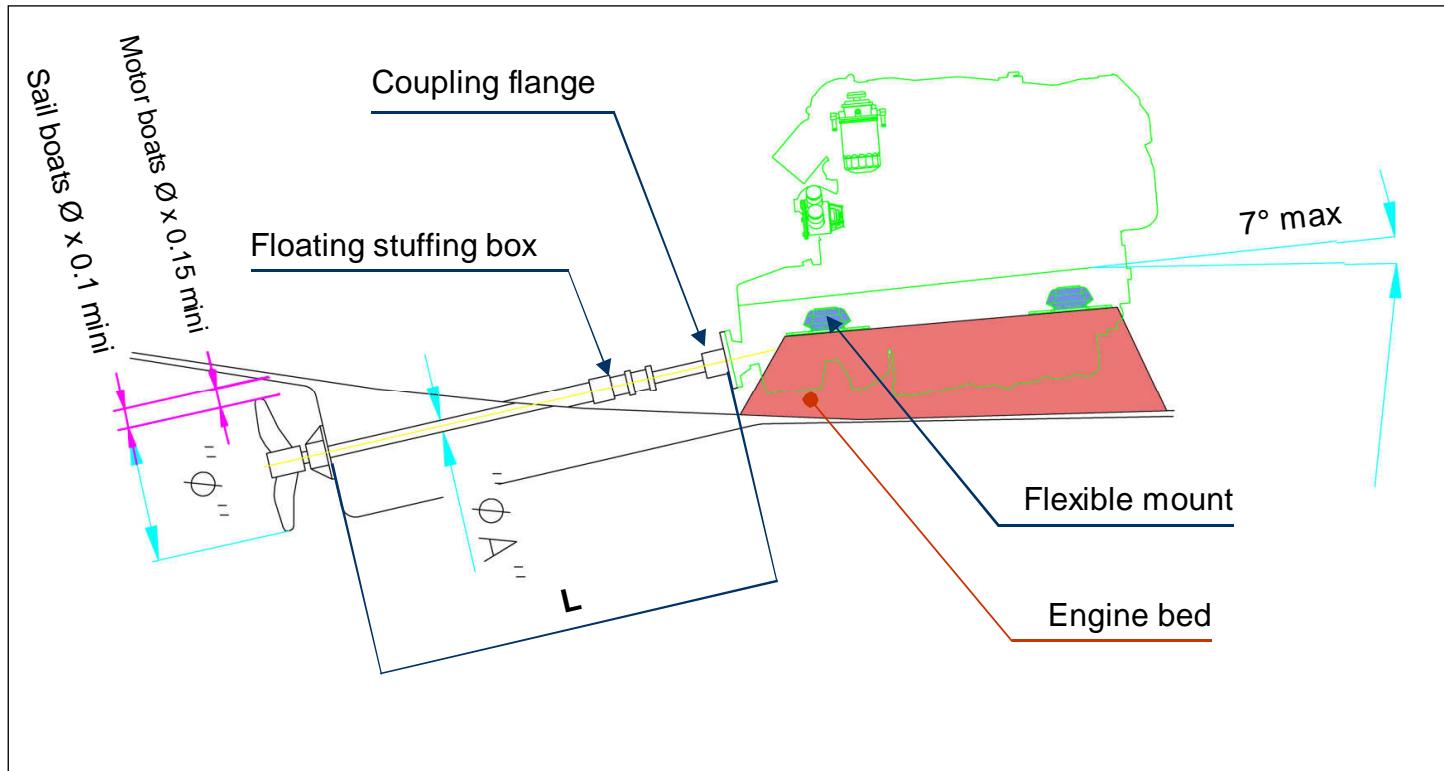


1 - Oil drain pump

**⚠ 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.

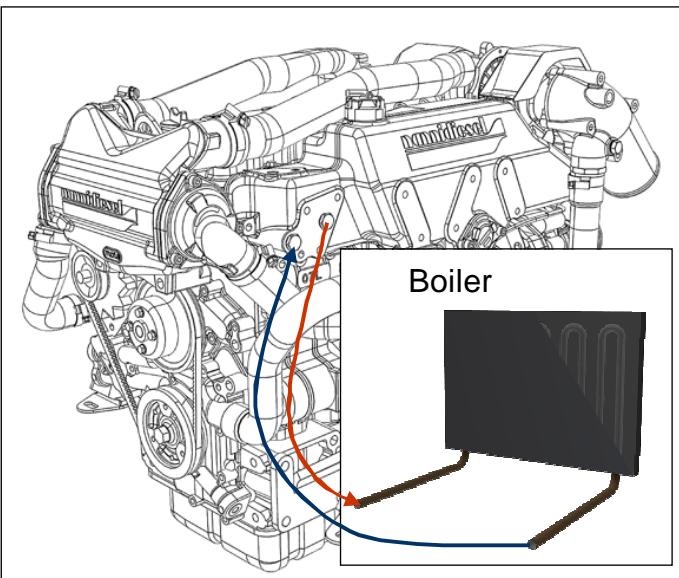
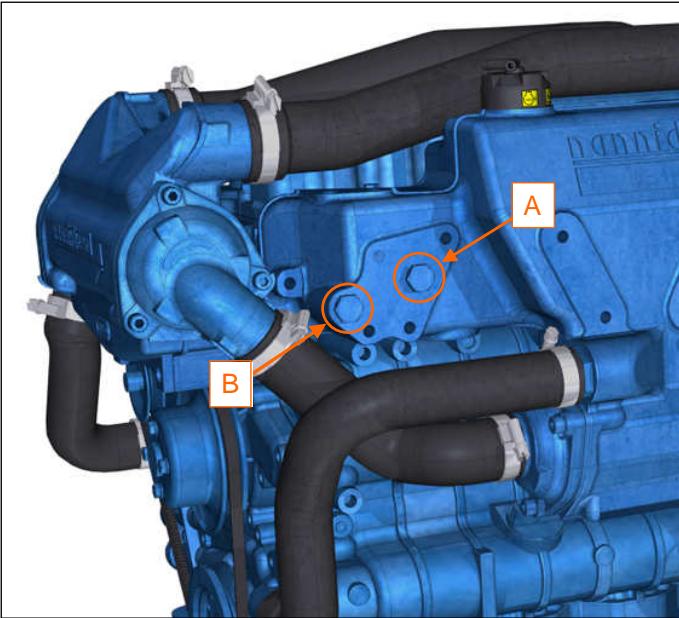
Engine	Reduction ratio	$\text{Ø A}^*$ (mm)	$\text{Ø}^{**}$ (inches)	$L^{***}$ (meter)	Engine RPM		
					Idling	Maxi rated load	Maxi without load
N4.100	1.5	40	17 / 18	1.65	825	2800	3020
	2	40	20 / 21	1.8			
	2.5	40	23 / 24	2.2			

\* Other diameter according to material consult « shaft lines » manufacturer

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

\*\*\* Maximum value accepted

## Boiler connections

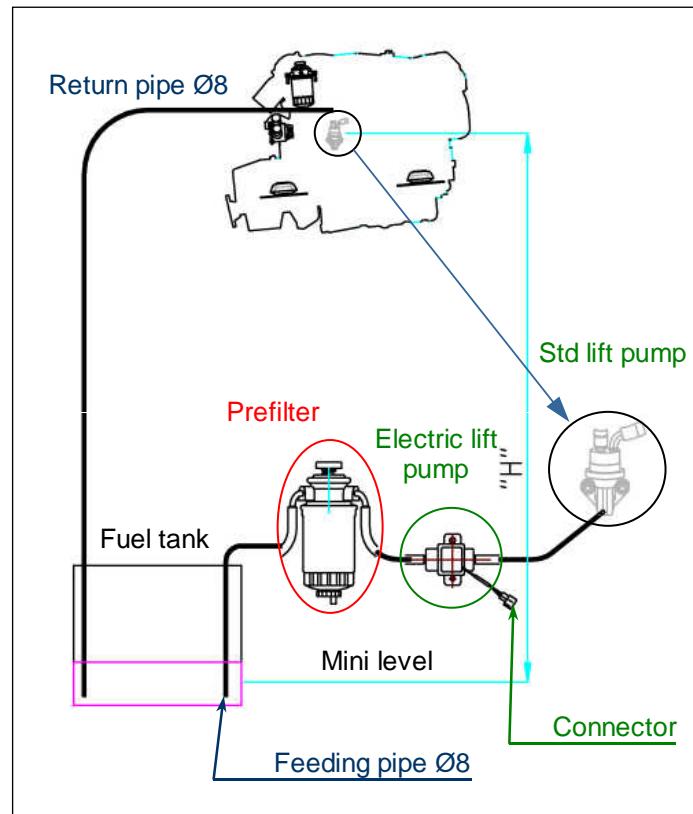


**A - Inlet from the engine**

**B - Outlet from the boiler**

- Ø hose = 16 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).

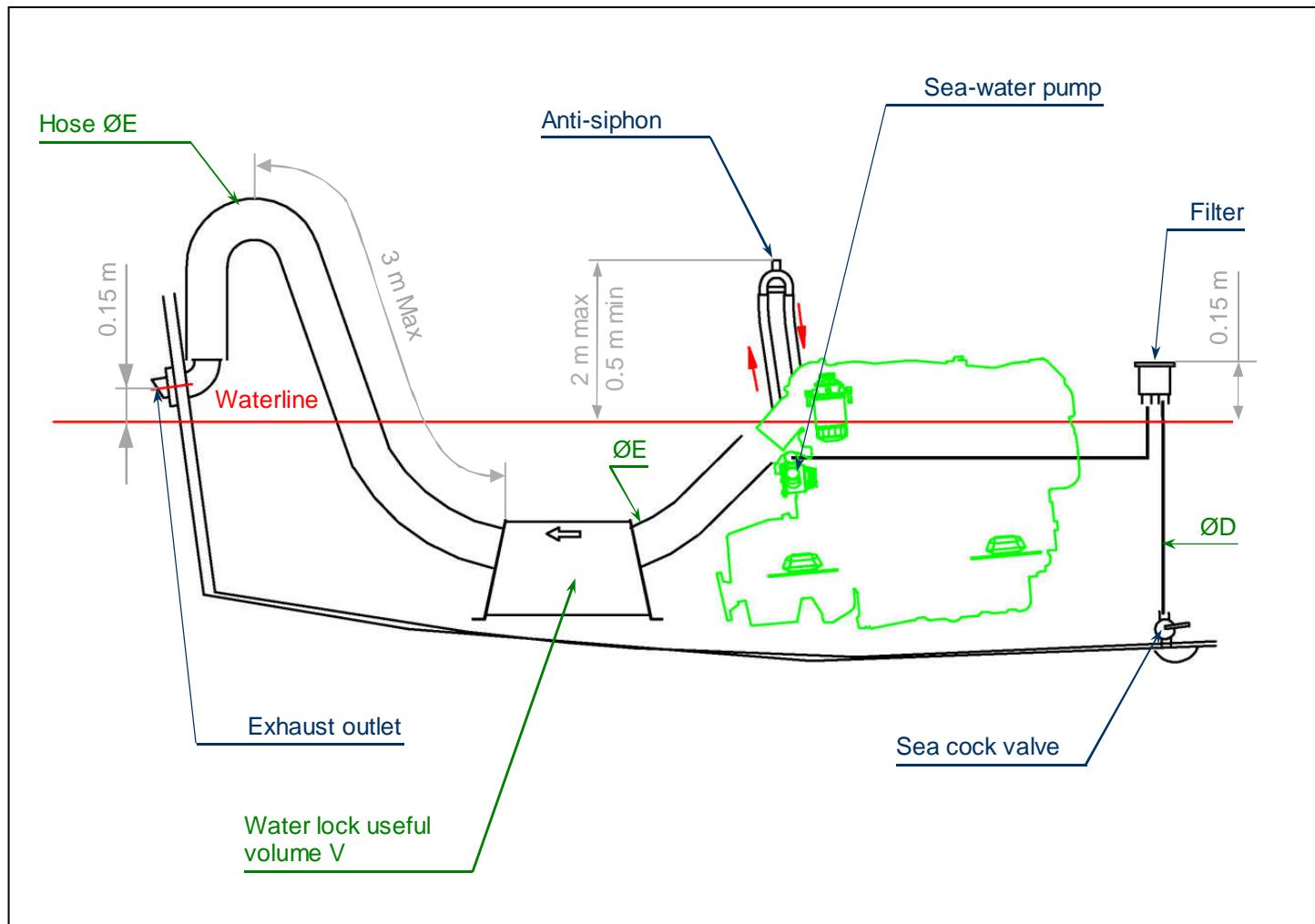
## Fuel connections



- 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.

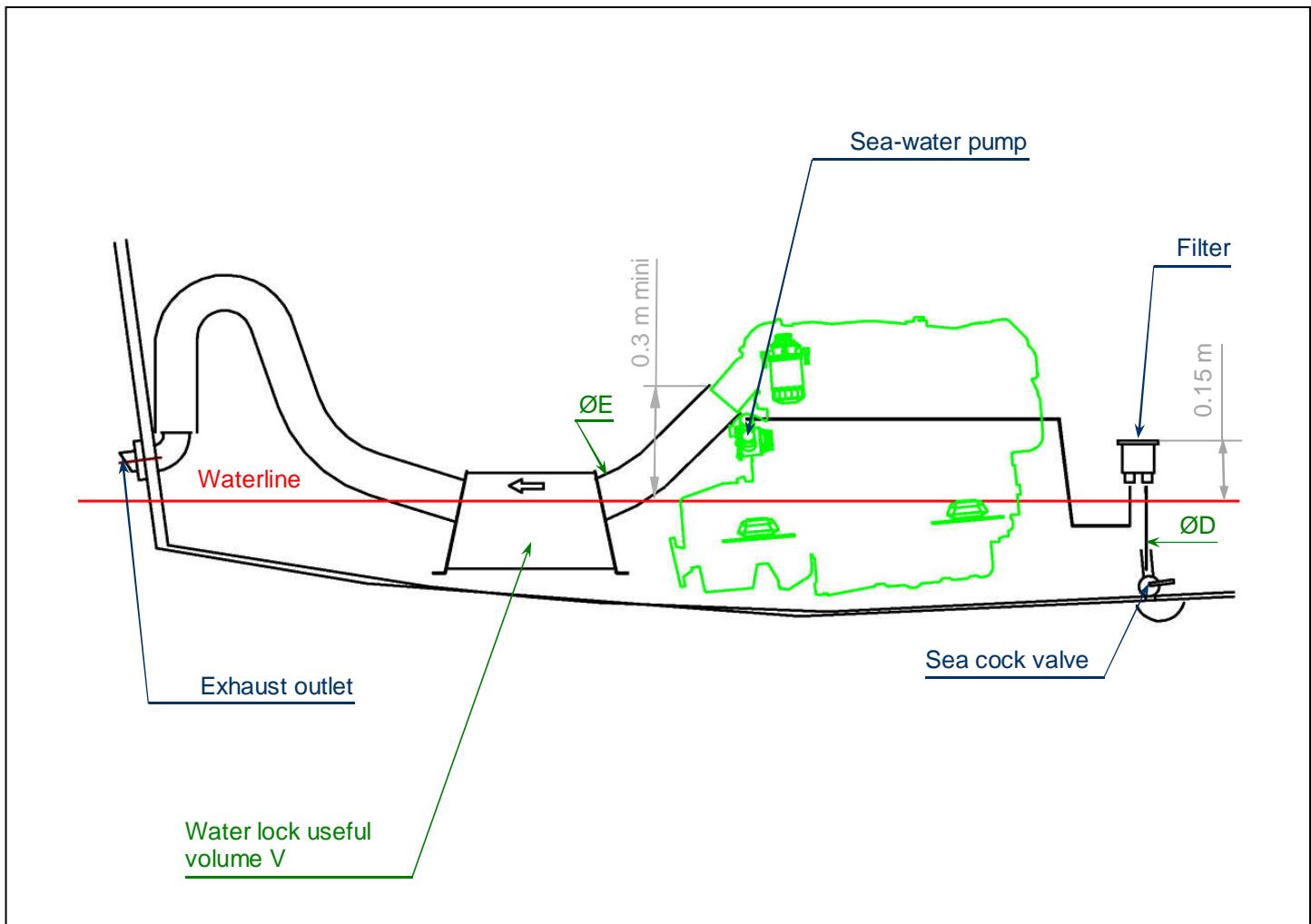
Pump	H maxi (meter)
<b>Standard</b>	0.5
<b>Electrical</b>	1.8

## Engine under waterline



Engine	ØD (mm)	ØE (mm / inches)	Max back-pressure (kPa / PSI)	V mini (litre)
N4.100	32	90 / 3.54"	12.7 / 1.842	20

## Engine under waterline



### Anti siphon valve

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

All sail boat

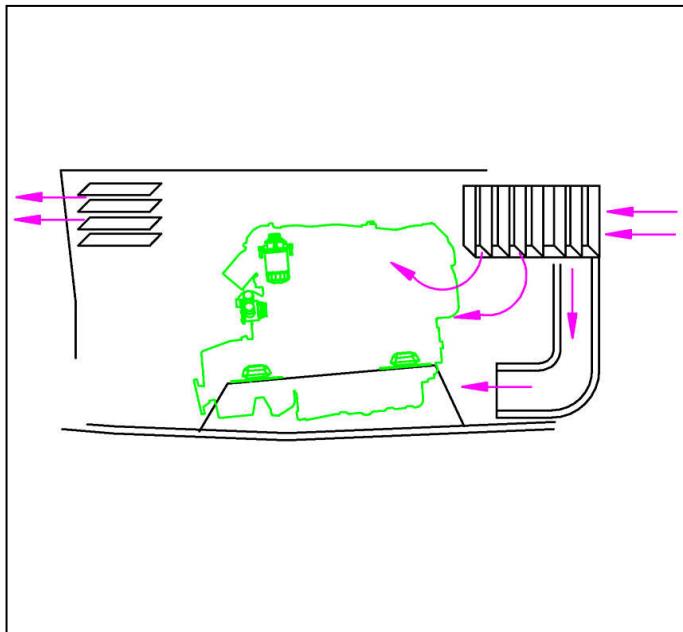
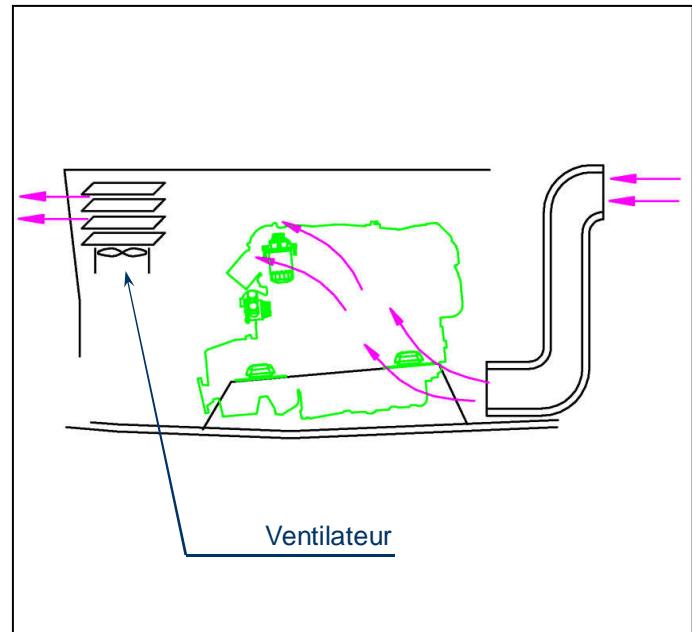


### Water lock

Must be always lower and near the engine

Motor boats



**Dynamical system****Forced system (by fan)****Ventilation system**

Dynamical (for fast boat)  
Forced (by fan)

**Air needs**

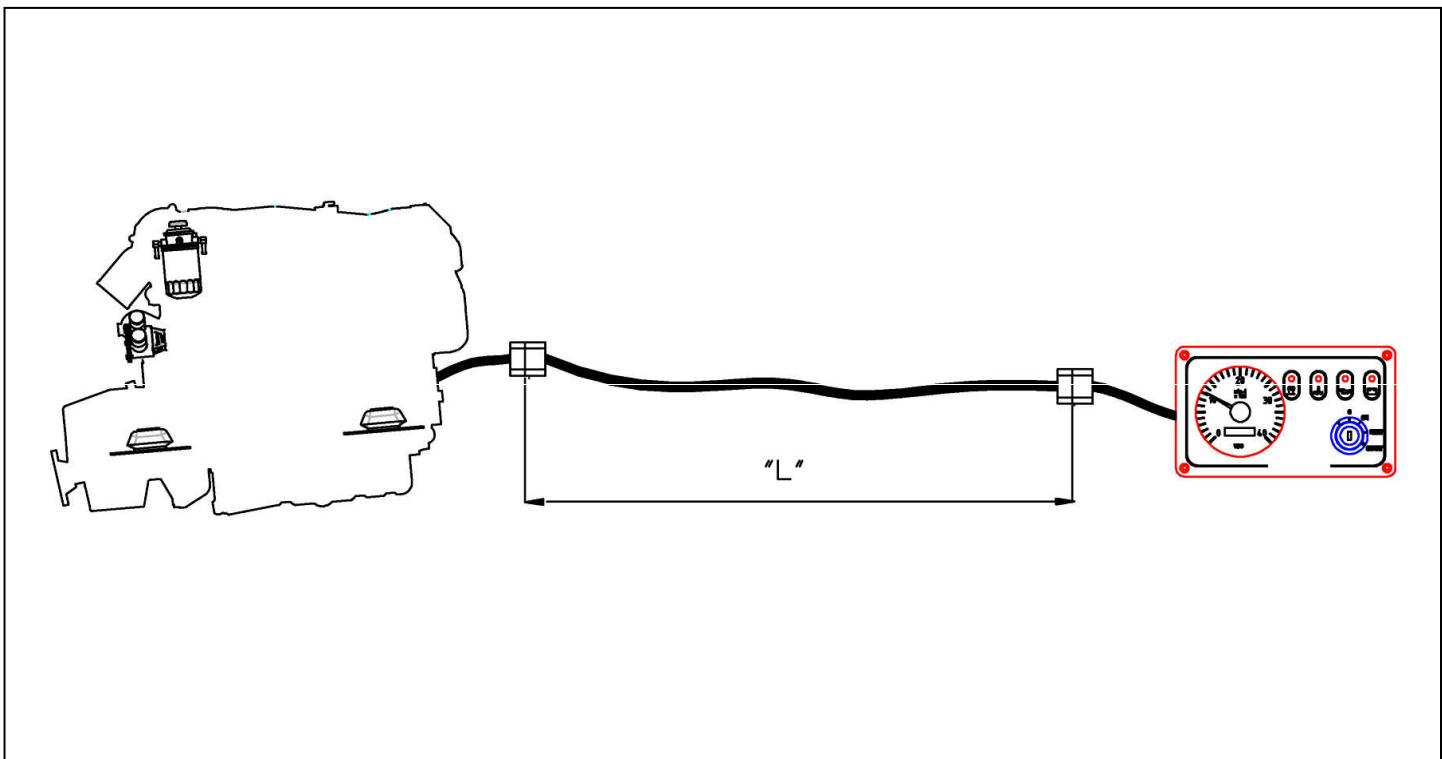
Outlet of warm air :  $450 \text{ m}^3/\text{h}$   
Engine air consumption :  $350 \text{ m}^3/\text{h}$

**Engine room temperature**

Not more than  $50^\circ\text{C}$  with a difference of  $15^\circ\text{C}$  ( $20^\circ\text{C}$  maxi) with ambient temperature.

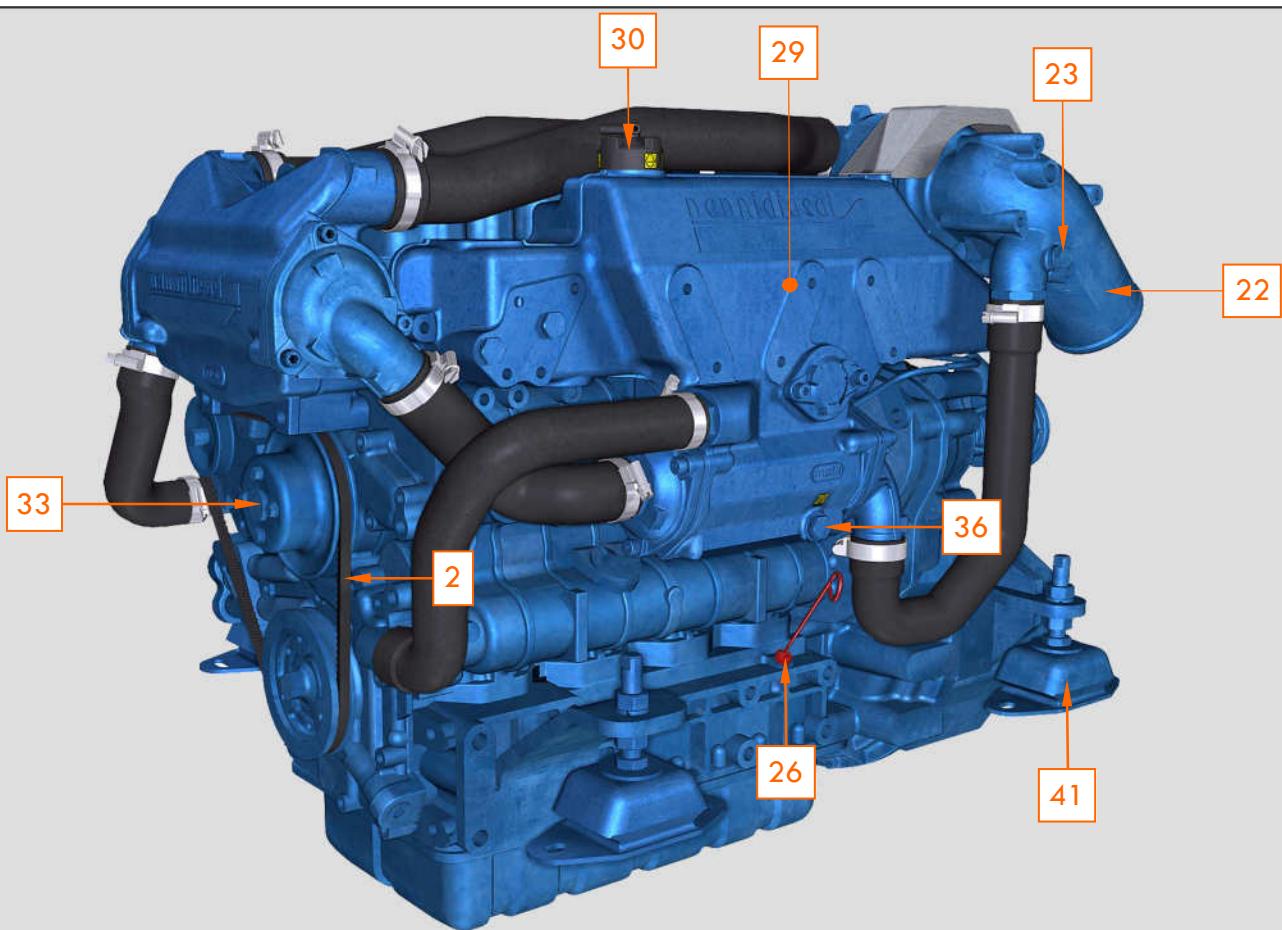
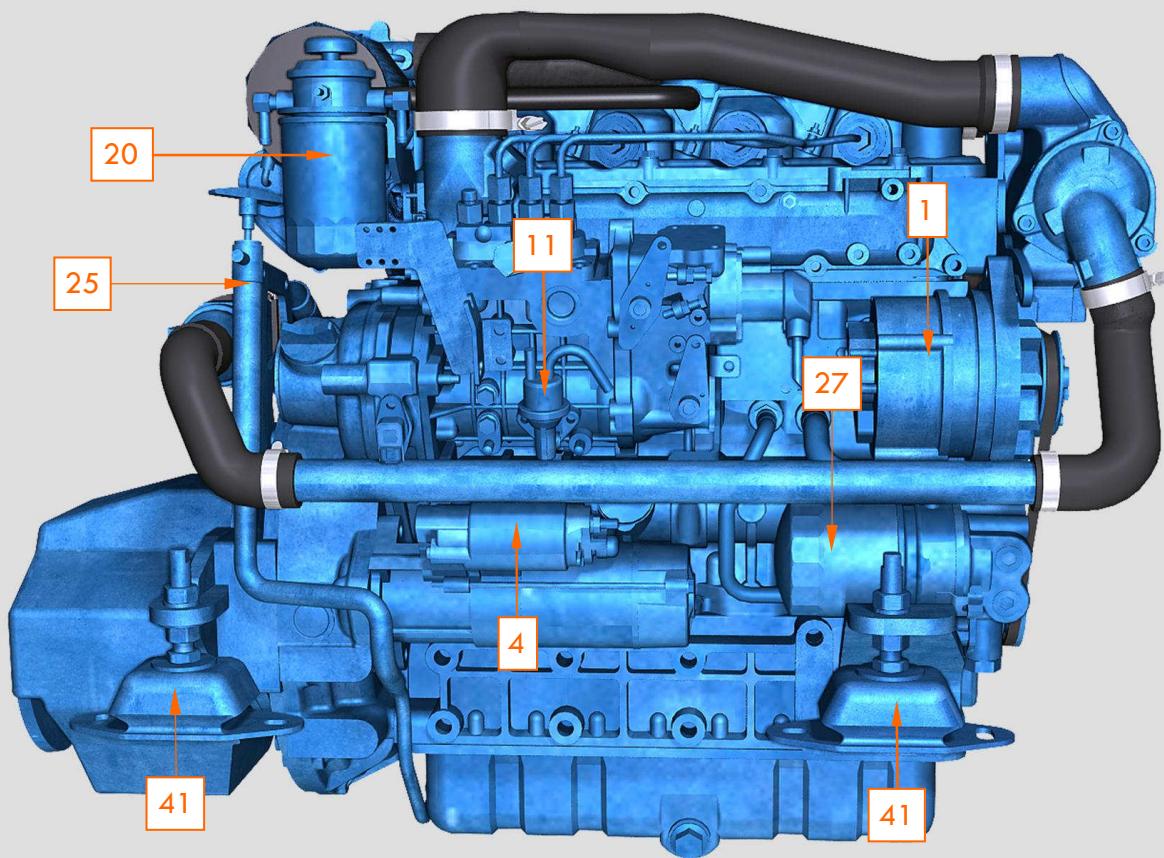
**Air flow**

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.

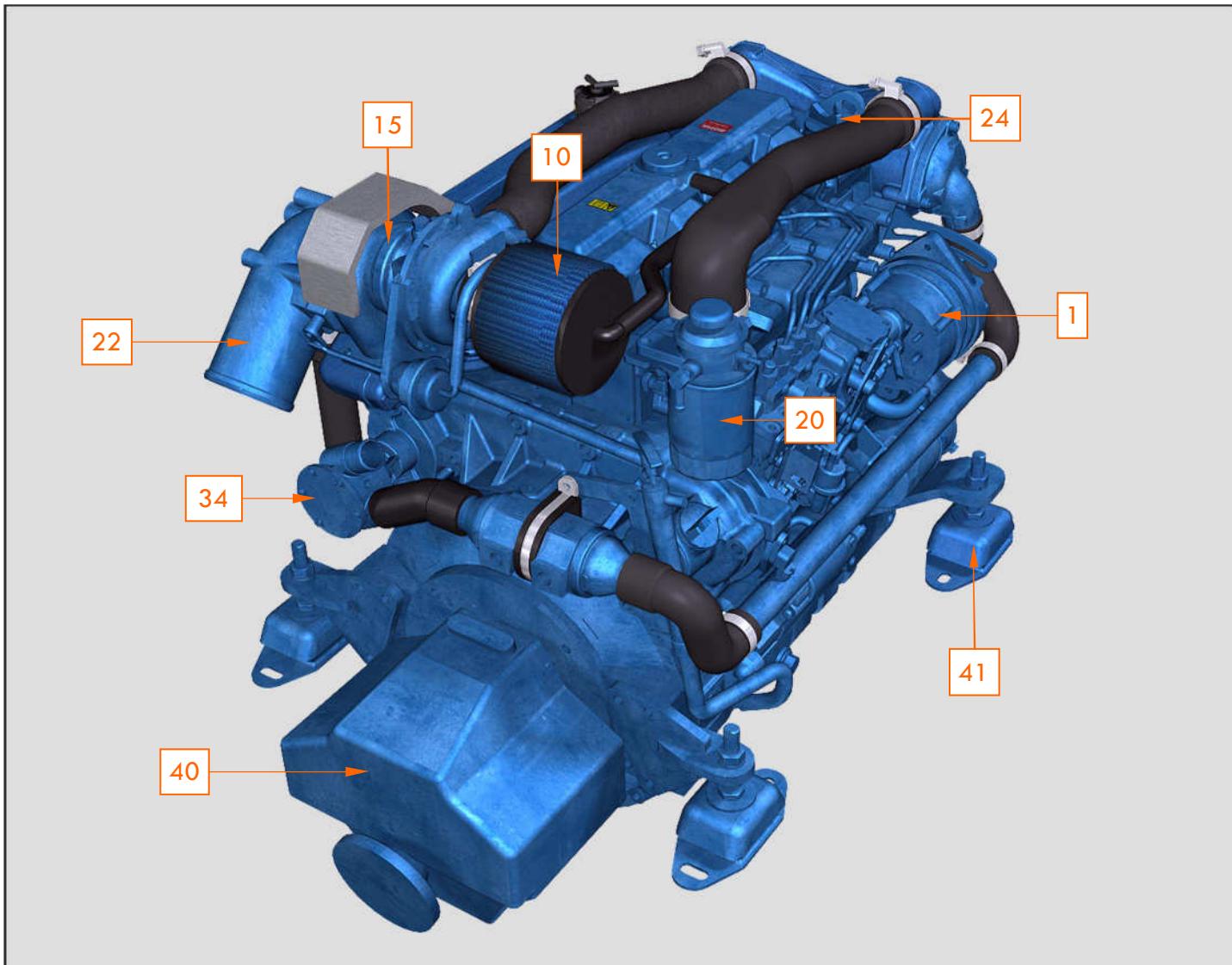
**A3 / B3 / C3 Panel**

<b>Connectors</b>	
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)

<b>Extension references</b>		
L =	2 meters	970 304 162
L =	4 meters	970 302 665
L =	8 meters	970 302 666



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



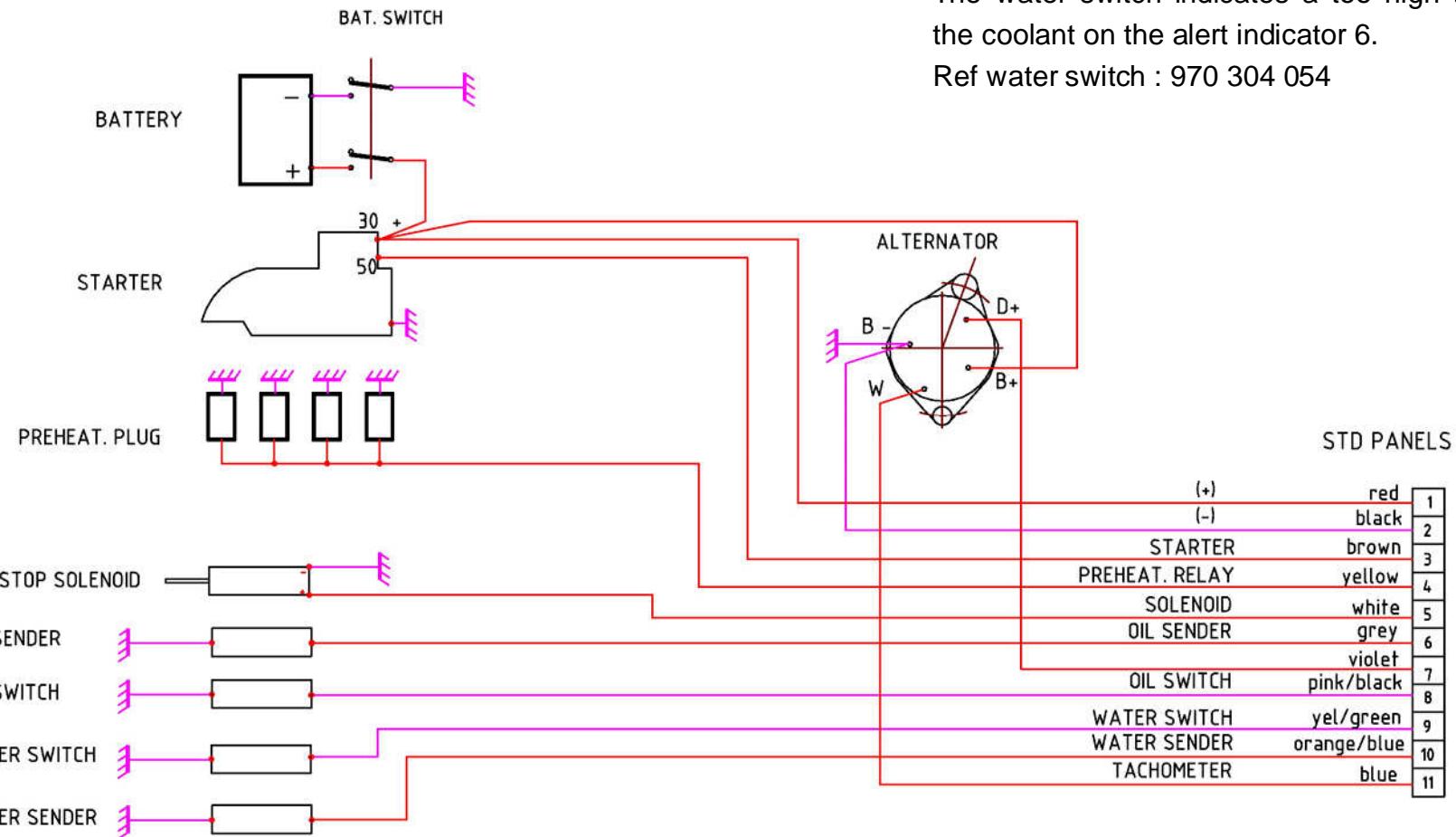
1 - Alternator  
2 - Alternator belt  
4 - Starter  
10 - Air filter  
11 - Injection pump  
15 - Turbocharger  
20 - Fuel filter  
22 - Water injection exhaust elbow  
23 - Anticorrosion anode  
24 - Oil filler port

25 - Oil pump (according to specific version)  
26 - Oil gauge  
27 - Oil filter  
29 - Heat exchanger  
30 - Coolant filler port  
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



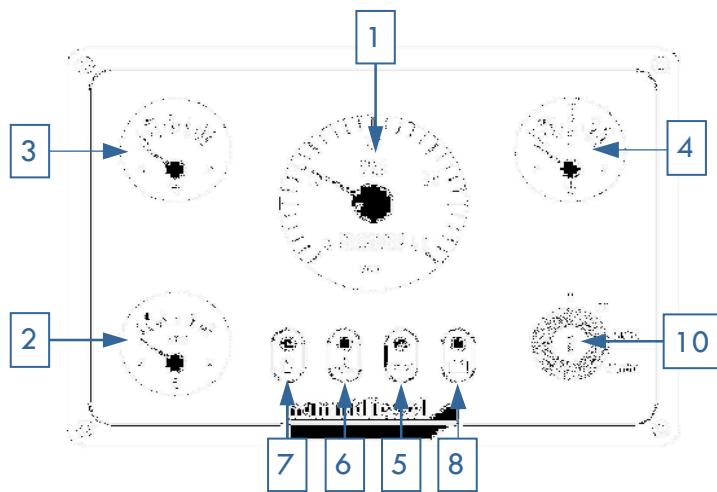
## Wiring diagram

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.

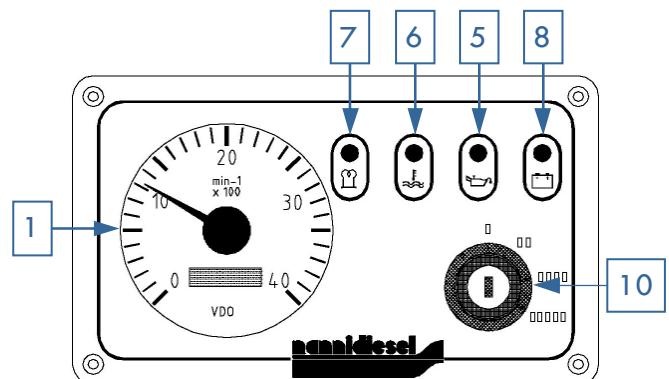
Some panels are not available with the whole range of engines.

**⚠** 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.

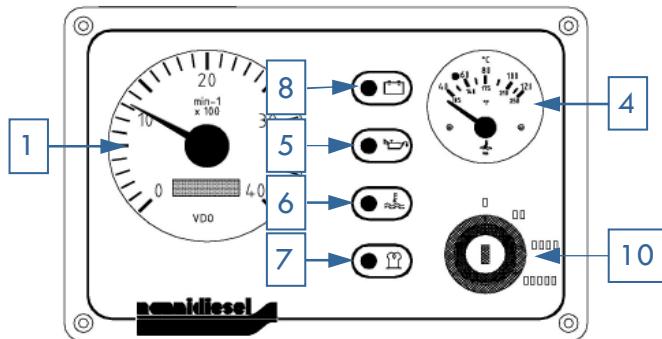
**C3 Panel**  
Dimensions 270 x 188 mm



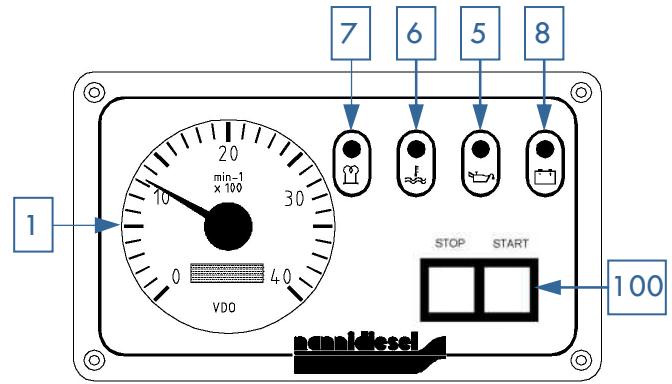
**A3 panel**  
Dimensions 205 x 120 mm



**B3 panel**  
Dimensions 220 x 145 mm



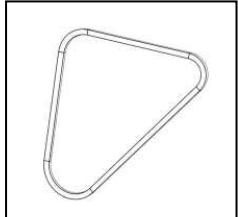
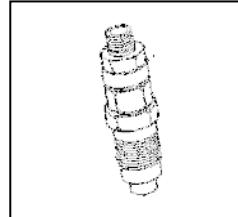
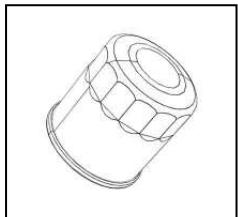
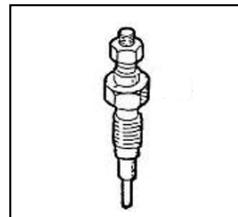
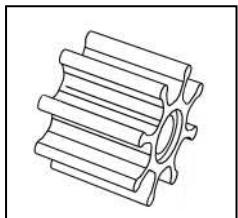
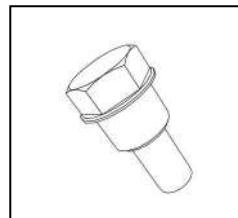
**Fly Bridge panel**



- 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

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

<b>Part name</b> Alternator belt <b>Reference</b> 48 108 036	<b>Part name</b> Injector <b>Reference</b> 970 314 910
	
<b>Part name</b> Engine oil filter <b>Reference</b> 970 603 003	<b>Part name</b> Pre heat plug <b>Reference</b> 970 314 948
	
<b>Part name</b> Fuel filter <b>Reference</b> 970 313 291	<b>Part name</b> Air filter <b>Reference</b> 48 100 936
	<b>Kit de nettoyage</b> <b>Reference</b> 970 312 809
<b>Part name</b> Sea-water pump impeller <b>Reference</b> 970 544 310	<b>Part name</b> Anode <b>Reference</b> 970 494 635
	



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**World Wide Service**

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