

Notice de conduite
Betriebsanleitung
Instruction Manual
Instructieboek
Instruksjonbok
Käyttöohje
Manual de instrucciones
Manuale d'istruzione

4.200 HE

4.220 HE

5.280 HE

Réf. 970310425

nannidiesel

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1 – SAFETY INFORMATION


These directions for use have been provided to help you to use your engine and its fittings. They include important instructions which should be observed while operating the engine.


These instructions must be read by the operator. They should be permanently kept in the place where the engine is used.

SAFETY SYMBOLS

These symbols are used to indicate danger. They are intended to attract your attention to those elements or operations which can endanger you or other users of this engine. Read the instructions highlighted by the safety symbols attentively. It is essential that you read the instructions and the safety regulations before starting the engine.

 **DANGER** Signifies that a very serious danger exists which may result in the strong possibility of death or serious injury if the specific suitable safety measures are not observed.

 **WARNING** Signifies that a danger exists which may cause injuries or death if specific suitable safety measures are not observed.

 **ATTENTION** Reminds you of safety measures or directs your attention to dangerous practices which may cause injuries to persons or damage the boat or its components.

The user should take all necessary precautions as regards operation and protection and should seek the advice of a professional.

Disregard for these safety instructions may lead to:

Bodily harm, environmental pollution dangers (leaks of dangerous substances), dangers to property with risks of failure of the essential functions of the engine.

OBSERVING THE SAFETY RECOMMENDATIONS

- Follow the warning and attention labels affixed to the engine
- Disengage the contact key and turn off the battery main switch before performing any work on the engine or its fittings
- Close the engine cover and replace the protection devices before starting the engine
- Always keep the area surrounding the engine clean and free of any debris
- Place any flammable liquids outside and away from the engine compartment
- Never use the engine when under the influence of alcohol or medication

WEAR PROTECTIVE CLOTHING

- To avoid bodily injury, remain clear of rotating parts and do not wear oversize garments close to a running engine
- Use safety equipment such as glasses, gloves, etc. according to circumstances and needs

FUELS AND LUBRICANTS

- Stop the engine before adding fuel or lubricant
- Do not smoke and do not draw near with an open flame whilst adding fuel
- Wear gloves when checking for any possible leaks

NANNIDIESEL
use and recommend

MOTUL

Instruction Manual / Edition 01/2000

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- Hot lubricating oil can burn you – allow the engine to cool before checking the motor oil level, changing the motor oil, or the oil filter cartridge
- Always use the fuels and lubricants recommended by NANNI DIESEL

ENGINE EXHAUST WARNING

- Run the engine in a well ventilated place, away from persons and animals—the accumulation of engine exhaust can be toxic

PRESSURE

- Do not open the engine coolant and motor oil reservoir caps when the engine is warm. Release all pressure in the line before loosening the caps
- Do not check for possible pressure leaks with bare hands – wear gloves – liquids ejected under pressure may cause serious injury – in case of contact with a spurt of fluid, immediately consult a physician

BATTERY

- A mixture of highly explosive, inflammable and volatile gas, forms when recharging the battery. Never smoke and do not draw near to the battery with an open flame or spark
- Never short circuit the battery terminals
- The battery electrolyte is highly corrosive – Wear protective gloves and glasses.

ELECTRICAL WIRING

- Turn off engine electrical contact and battery main switch before any repair to the electrical equipment.
- Check the state of the cables and the electrical wiring – a short circuit may cause fire.

DISPOSAL OF FLUIDS

- The different fluids used for the operation of the engine may be toxic and hazardous to your health. Carefully read the instructions appearing on the labels of these products.
- Observe the environmental protection regulations relative to the disposal of motor oil, fuel, engine coolant fluid, filters and batteries

2 – GENERAL INFORMATION

Your NANNI DIESEL engine is a product of the research and quality manufacturing of NANNI INDUSTRIES. It is constructed from the finest materials available, according to finite specifications, and in accordance with very strict production methods.

Your NANNI DIESEL engine is a dependable and long-lasting power source for your boat.

Proper installation of the engine on board your boat is of the greatest importance for safe navigation and also for respect of the environment.

The NANNI INDUSTRIES engineers are among the world's most highly skilled. Their experience, their knowledge of the seas, their mastering of

techniques in association with the skills of the engineers of MAN and KUBOTA guarantee you the best available combination of performance / reliability / economy.

⚠ WARNING : *The installation of your engine must be performed by a naval vessel mechanics professional, in compliance with the NANNI INDUSTRIES installation instructions.*

These operating instructions contain information which are necessary for the proper operation of the engine.

Present in over 50 countries through its network of agents and authorised dealers, NANNI INDUSTRIES guarantees your safety world-wide.

Whether it be parts, labour, or simply advice, everything has been considered to properly serve your needs.

Do not hesitate to contact your authorised NANNI DIESEL dealer.

We wish you pleasurable navigation.

Read this manual attentively before proceeding with the installation of the engine.

Follow the safety measures.

⚠ WARNING :

The proper operation of a marine engine is linked to use suitable for the engine and its gear box's specifications (type of boat, hours and RPM of use).

3 – ENGINE IDENTIFICATION

On all correspondence, requests for information and orders for parts, it is essential to indicate the references appearing on the engine and reversing gearbox identification plates.

- A- Type ① ② ③
- B- Serial number
- C- NANNI Serial number
- D- Specification

IMPORTANT: *Note the serial number and the engine and transmission model designations. Keep a copy of this information in a safe place.*

IDENTIFICATION OF PRINCIPAL PARTS

- 1 Heat exchanger ④ ⑤ ⑥
- 2 Engine coolant filler hole A
- 3 Engine coolant filler hole B
- 4 Fresh water pump
- 5 Sea water pump
- 6 Alternator
- 7 Flexible suspension
- 8 Electrical connector
- 9 Starter
- 10 Engine oil filler hole
- 11 Engine oil change pump
- 12 Air filter

- 13 Water injection exhaust elbow
- 14 Oil filter
- 15 Oil pressure transmitter
- 16 Reverse gear box
- 17 Injection pump
- 18 Fuel pump
- 19 Fuel filter
- 20 Stop control
- 21 Speed-control
- 22 Air cooler
- 23 Turbo
- 24 Heat exchanger oil drain plug

4 – PREPARATION BEFORE STARTING

Once the engine has been installed on board, and before removing the protective covers from the various filler holes, clean the external surfaces of the engine.

GENERAL VERIFICATION 7 8

- Fill with motor oil and transmission fluid
- Fill with heat exchanger coolant fluid
- Check tension of belts
- Check that the different connectors and oil and water change plugs are properly tightened
- Check that the electrical cable terminal, battery terminals, battery switch, extension wiring connectors are properly tightened
- Check the electrolyte level of the batteries
- Check the acceleration and stop controls (by moving them several times)
- Check for proper synchronisation of the "gas and clutch" lever (essential in the case of a single lever control). Clutching must terminate when starting to accelerate.
- Perform a final check of the clamps as well as a visual check of the marine propulsion assembly. If necessary, retouch the paint on the assembly and the accessories.

⚠ DANGER: • Do not do not draw near to the battery with an open flame or spark. A mixture of extremely explosive gas forms when the battery is being recharged - Do not short circuit

• The battery electrolyte is highly corrosive: if the battery acid comes in contact with the skin, immediately wash with soapy water - in case of contact with the eyes, rinse abundantly with water and immediately consult a physician.

- Start with the positive terminal when connecting cables to the battery.

- Start with the negative terminal when disconnecting cables from the battery

⚠ WARNING:

• Do not allow fuel or lubricant to spill on the engine.

• The fluids used for the operation of the engine may be dangerous to your health.

• The motor oil may damage your skin - wear gloves.

NOTE : Modern diesel engines are precision machines which require the use of high quality lubricants.

ENGINE AND REVERSING GEARBOX LUBRICATION

Engine

- Oil pump driven lubrication system, pressure regulated by a discharge valve.
- Disposable cartridge oil filter

Transmission 10

Refer to separate specifications

Adding motor oil 9

- Through the filler hole located on the rocker arm cover, unscrew the cap. check the level with the aid of the dipstick. Do not exceed the maximum level.

NOTE: Qualities and quantities of oil are described in the table of technical characteristics

FUEL SYSTEM

Composition 13

Main disposable cartridge filter

Fuel pump (A)

Injection pump (B)

High pressure injector pipe (C)

Injectors

Fuel system purge

- Check the fuel level in the reservoir
- Open the fuel valve. Unscrew the thumbwheel A. Move the fuel pump hand lever; if necessary, turn the crankshaft for resistance.
- Move the hand pump a certain number of times to expunge any air bubbles in the return system.
- Retighten the thumbwheel A
- Start

⚠ DANGER : - Do not smoke, or draw near with an open flame or spark.

- Always mop up any spilled fuel.

COOLING SYSTEM

It consists of two different systems: the closed liquid coolant system and the external sea water system.

Closed liquid coolant system

It consists of a pump controlled by the crankshaft by means of a V-belt, a heat exchanger and a thermostat.

Sea water system

It consists of a pump, a heat exchanger for the fresh water, a water injection elbow

Coolant fluid 11 12 14

Recommendations for the first use

- Check that the heat exchanger fluid drain plug and the carter motor are tightened.
- Prepare a permanent antifreeze mixture with 50% antifreeze and 50% fresh water. The necessary quantity is indicated in the technical specifications.

a) Engines with A and B caps: Fill the mixture into the A filler hole until the maximum fill level is reached; close cap A. Pour the mixture into the B filler hole until the maximum fill level is reached; close cap B. Start the engine and verify the A level after several minutes.. Subsequent checks are to be made only with the A cap; do not again open the B cap.

b- Engines with A cap: Fill the mixture into the A fill hole until the maximum fill level is reached; close the cap. Start the engine and verify the A level after several minutes.

Close the cap and start the engine.

Allow the engine to run for 2 to 3 minutes whilst gradually accelerating.

- Stop the motor and top off the heat exchanger fluid level.

- The additional fills will be only with fresh water when the engine is cold

- Every two years, at the beginning of the boating season, completely empty the cooling system, clean it with fresh water, and then refill it following the above instructions.

⚠ DANGER : *Fill the engine with coolant liquid only when the engine is turned off and cold*
- Do not smoke or draw near with a flame.
- Stay clear of rotating parts while the engine is operating.

⚠ ATTENTION : *Never add undiluted anti-freeze.*

Connection for hot water 15

An installation for on board hot water may be connected to the engine by diverting water from the internal fresh water system. Consult us for further information.

Sea water filter

It is recommended that a water filter between the pump and seacock be fitted. Check the filter regularly.

⚠ ATTENTION : *Before starting the engine, check to see that the seacock is open since dray operation, even for only a few seconds, can damage the water pump rotor.*
After cleaning the sea water filter, carefully close the cover in order to avoid air entering into the pump.

ELECTRICAL EQUIPMENT

Engine 16

- A Battery
- B Alternator
- C Starter
- D Glow plug
- E Stop solénoïd
- F Oil pressure alarm
- G Water temperature alarm
- H Water temperature gauge (option)
- I Connector
- J Oil pressure gauge (option)

Instrument panel 17 18 19 20

- a - Water temperature alarm indicator
- b - Oil pressure alarm indicator
- c - Glow plug indicator
- d - Battery charge indicator
- e - Audible alarm buzzer
- f - Starter key
- g - Stop button
- h - Instrument lighting
- i - Connector
- j - Tachometer with integrated hour counter
- k - Voltmeter
- l - Oil pressure gauge
- m - Water temperature thermometer

Wire position	Colour	Function
1	Red	Positive
2	Black	Negative
3	Brown	Starter
4	Brown 1	Glow plug
5	White	Stop
6	Grey	Oil pressure sensor
7	Violet	D + alternator
8	Grey-1	Oil alarm
9	Yellow-green	Water alarm
10	Yellow green 1	Water temp sensor
11	Blue	Tachometer (on terminal w)

5. ENGINE OPERATION

STARTING THE ENGINE

⚠ DANGER – *Firmly close the engine cover and replace the protective elements before starting the engine*

- Check the diesel fuel level
- Open the diesel fuel feeder valve
- Open the sea cock valve
- Check the engine and gear box motor oil levels
- Check the level of coolant fluid
- Close the battery valve
- Check that the gear box control lever is in the neutral position

- Desynchronise the clutch gas control by using the device on the box
- Position the gas control lever in the accelerate position
- Turn the starter key clock-wise, the oil alarm indicator will illuminate and the buzzer will sound
- Then preheat by holding the key in the clock-wise position (for 5 to 10 seconds depending upon the outside temperature)
- Then push the starter key and turn it clock-wise until the engine starts. Release it immediately after the motor has started
- Check the indicators and other functions after the engine starts
- Immediately stop the engine if the buzzer sounds, if the temperature rises abnormally or if the other indicators illuminate

! ATTENTION : Search for and eliminate the cause before starting the engine

- Allow the engine to run at approximately 1000 rpm
- Check that the sea water fans freely from the waste pipe
- If the engine does not start on the first attempt, repeat the steps after waiting 30 to 60 seconds after each attempt

! WARNING : Never cut the electrical circuit by using the battery main switch whilst the engine is running. This may cause damage to the alternator.

STOPPING THE ENGINE

- Return the control lever to the idle/neutral position
- Allow the engine to idle for several minutes in order to stabilise the temperature
- Push the stop button
- Turn off the battery main switch, close the sea-cock as well as the fuel valve.

IMPORTANT : Once the boat has been towed, stop the motor and turn off the sea water inlet valve to avoid accidentally filling the motor up with sea water.

TWIN-ENGINED BOATS : If using only one motor when sailing, close the back motor's sea water inlet valve. Do not forget to open it up again before starting up this motor.

! ATTENTION – Check the engine and the engine compartment for any possible leaks.

ENGINE RUN IN - GUARANTEE VISIT

Running in

During the first 20 hours of operation, it is recommended that you take precautions to properly Run

in your engine and that you not attain maximum engine performance except during short periods. Never race your engine immediately after starting, without having allowed it to warm up.

Guarantee visit

This mandatory visit with an authorised NANNI DIESEL representative will take place either after 20 hours of operation.

Every new engine is guaranteed against all parts defects according to the terms and conditions specified on the certificate of guarantee which is furnished to the buyer upon delivery of the engine (warranty card to be returned).

LIST OF GUARANTEE VERIFICATION OPERATIONS - (CUSTOMER'S RESPONSIBILITY)

! DANGER : To avoid bodily injury, stop the engine and allow it to cool, turn off the battery main switch before any repair
Follow the safety and environmental protection instructions

Change the lubricant of the:

- Engine
- Reverser gear box

Clean:

- The diesel fuel pre-filter

Check:

- The level of the coolant fluid
- The adjustment of the valves
- The tightness of the intake and exhaust manifold
- The tightness and the operation of the diesel fuel system
- The tightness of the cooling system
- The belt tensions
- The tightness of the screws and bolts
- The tightness of the engine mounts
- The alignment of the engine
- The stuffing box
- The lubrication of the stuffing box

Replace:

- The oil filter cartridge
- The diesel fuel filter cartridge.

Electrical equipment

Check:

- The tightness of the contacts and cable terminals
- The level and density of the battery electrolyte
- The alternator charge
- The correct operation of the instrument panel

Perform:

- A check of the condition of the battery.

6. MAINTENANCE

⚠ DANGER : To avoid bodily harm, stop the engine and allow it to cool, turn of the battery main switch before making any repairs

Follow the safety and environmental protection instructions

The performance level of lubricants necessary for the proper operation of the engine and the recommended maintenance schedule are described on page 24.

IMPORTANT – *These recommendations are essential. Following these recommendations will prolong the life of your engine and will affect the applicability of the guarantee which is provided.*

- Do not make any unauthorised modifications to the engine.
- Damage caused by the use of parts not bearing a manufacturer's reference number are not covered by the guarantee
- Repairs and maintenance must be performed by an authorised NANNI DIESEL engine repair facility

If the engine is used for a number of hours less than the number specified for maintenance intervals, then maintenance must be performed at least once per year.

In this case, it is recommended that maintenance be performed before winter storage. The engine will therefore be protected by new, clean lubricants.

Valve adjustments **22 23**

- The valves are adjusted according to their injection order
- Place the valves in a rocking motion on the cylinder before being adjusted
- Turn the crankshaft in the direction in which the engine rotates, so as to place the piston at upper dead centre
- Adjust the intake and exhaust valves (refer to the values in the table of technical characteristics)

Replacement of the water pump rotor

- Close the sea cock **24 25**
- Remove the water pump cover
- Extract the used rotor
- Replace the water pump cover using a new gasket
- Open the sea cock

Electrical equipment **26 27**

- Regularly check the tension of the alternator belt. Tighten the belt between the pulleys. It should have 10 mm give

⚠ DANGER – Stop the engine and turn off the battery main switch before making any repairs to the electrical system

Battery

- Check the battery charge once per season
- The density of the electrolyte should be between 1.270 and 1.285
- The electrolyte should be check periodically. The level should be maintained at 1 cm above the accumulator plates. Add distilled water, if necessary.

⚠ DANGER – Never draw near with a flame, and never check the battery with "a spark", because the gases which may be released are inflammable and explosive - The battery electrolyte is highly corrosive. If battery acid come in contact with your skin, immediately wash with soapy water. eyes, rinse abundantly with water and immediately consult a physician

- Do not short circuit.

RECOMMENDATIONS

In order to ensure proper operation of the alternator and integrated regulator:

Never

- Turn off the battery main switch whilst the engine is running (risk of damage to the regulator)
- Reverse the battery terminals. The terminals are respectively marked + (positive) and – (negative); the negative is earthen; the cable terminations and the cables must be correctly attached.
- Change the charge circuit while the engine is running.

For use of several batteries, install a charge distributor (consult with us).

In case of starting the engine with a spare battery and jumper cables, proceed in the following manner:

- Disengage the main battery circuit, connect the spare battery to the main battery by connecting the + to the + and the - to the -. Once the engine starts, disconnect the jumper cables and do not cut the main battery circuit.

You must disconnect the 2 battery cables when:

- you use a battery charger
- before any repair to the electrical system
- before doing any soldering work on a metal hull

Rinsing the cooling system **8 11 12**

Fresh water system

- Remove the heat exchanger cap
- Drain the water from the heat exchanger and from the engine block
- Refill the system with fresh water and let the

engine run for several minutes

- Drain the water and again replace it with a mixture of antifreeze and fresh water
- Fill the cooling system according to instructions.

NOTE: *In the case where a hot water system is connected to the engine, also completely empty the latter and, to refill it, note the quantity of the coolant mixture being added. Check to see that all air is purged from the system during the refilling*

! WARNING: *Liquid under pressure. Do not open the cap when the engine is warm. Allow the engine to cool and open the cap with caution.*

Sea water system

- Close the seacock
- Drain all of the sea water intake pipes, the filter, the sea water pump, the heat exchanger pipe, by unscrewing the assembly collars
- Drain the waste system since a certain quantity of water remains at the bottom of the water lock.

Cleaning the heat exchanger 28 29

Check the exchanger tube stack

- Remove the covers
- Remove the tube stack and clean it with water and washing soda
- Replace the O-rings and remount the tube stack and the covers
- Do not forget the copper gaskets on the covers assembly screws..

! WARNING : *Corrosive products may hazardous to your health. Read the instructions on the product label carefully.*

Replacement of the diesel fuel filter 30 31

The diesel fuel filter is a disposable-type filter.

- Close the fuel valve
- Unscrew the cartridge at the head of the filter
- Coat the gasket of the new cartridge with engine lubricant
- Screw the new cartridge onto the filter head, then tighten it by hand - of a turn (do not use tools)
- Open the fuel valve
- Purge the system
- Start the engine and check for sealing

! ATTENTION: *- Always mop up and spilled fuel*

- Follow the environmental protection instructions

Replacement of the injectors 32 33

Remove:

- The injectors piping
- The screw and the diesel fuel return piping
- The complete injector
- Dismantle the injector

- Replace the injector gasket and nozzle
- Remount the parts and check the injector calibration value

! WARNING: *Do not allow diesel fuel to spray onto your skin – wear gloves*

IMPORTANT: This work must be performed by an authorised NANNI DIESEL engine repair facility. The injectors should be checked every 400 hours or every 2 years

Motor oil change

It is preferable to remove the oil when the motor is slightly warm.

- Pump until the engine is completely drained
- Refill to full level with new motor oil
- Check the level with the use of the dipstick
- Do not exceed the maximum level

! WARNING : *Hot oil can burn you – Avoid all contact with your skin*

Respect the environmental protection regulations

Replacement of the oil filter 37 38

- The cartridge is of the disposable type
- Unscrew the cartridge at the head of the filter
- Coat the gasket of the new cartridge with engine lubricant
- Screw the new cartridge onto the filter head, then tighten it by hand - of a turn (do not use tools)
- Check that the filter does not leak when the engine is running
- Stop the engine and add motor oil to the maximum fill level if necessary

! WARNING: *Hot oil can burn your – Avoid all contact with your skin*

Respect the environmental protection regulations:

Reversing gear box 10

Refer to detailed instructions in the reversing gear box manual attached to the operating manual
Consult with us for specific reversing gear box information

Reversing gear box control system

Verify the remote controls regularly. The cable stroke should be 35 mm on both sides of dead centre (O - A = O - B). The lever must be able to move freely to its stroke limits.

Attention to the lever position 35

Turbo

Engines equipped with a Turbo: Turbo compressor should be checked every 400 hour for proper operation

⚠ DANGER: To avoid bodily injury, do not start the motor without the air filter

IMPORTANT: Allow the engine to idle before stopping the engine

Maintenance

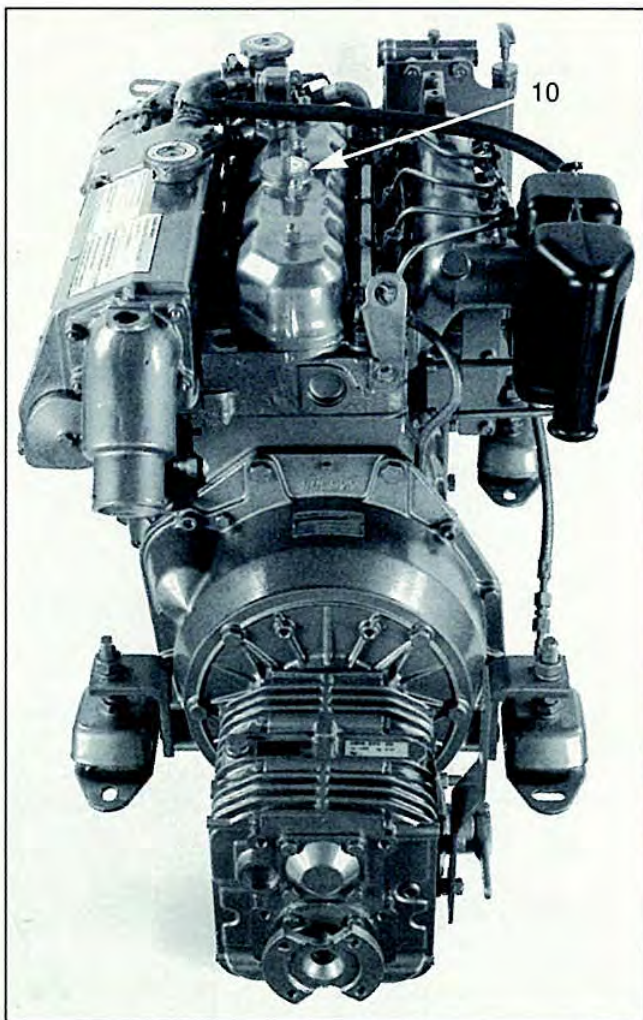
PERIODIC MAINTENANCE TABLE

	EVERY DAY	AT 20 H	100 HOURS	200 HOURS OR EVERY YEAR	400 HOURS OR EVERY 2 YEARS
CHECK					
Oil level (engine and gear box)	X				
Battery charge (indicator)	X				
Water temperature and operation	X				
General sealing			X		
Battery electrolyte level (every 15 days)			X		
Operation of the controls				X	
Belt tension		X		X	
Valve adjustment		X		X	
Starter and alternator mountings				X	
Tightness of screws and assemblies		X		X	
Sea water pump				X	
Engine mounting and alignment					X
Injector calibration					X
Sea water filter, clean if necessary	X				
Thermostat, to be cleaned			X		
Level in the heat exchanger	X				
Heat exchanger tube stack					X
Zinc anode (4.330 TDI)		X			
Air filter (4.330 TDI)		X			
CLEAN:					
Heat exchanger tube stack					X
Air cooler tube stack					X
Clean and check the turbo					X
REPLACE:					
Oil filter		X		X	
Fuel filter					X
Motor oil		X		X	
Gear box lubricant				X	
Coolant fluid					X
Gasoil prefilter		X	X		

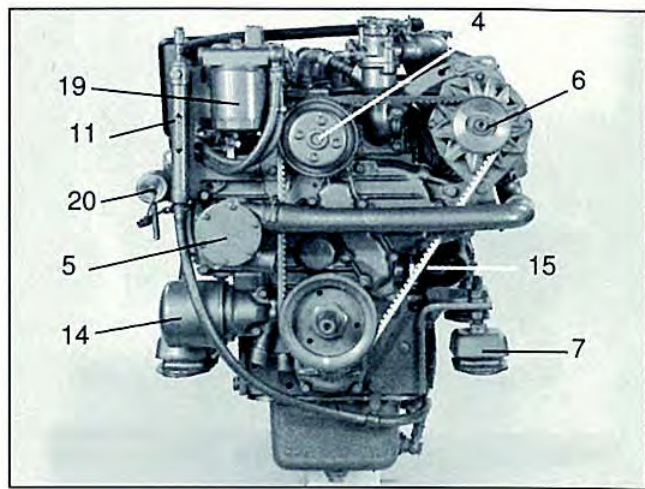
NANNI DIESEL ENGINE	4200 HE	4.220 HE	5.280 HE
Number of cylinders	4 in line	4 in line	5 in line
Maximum power (*)	31.6 kW (43 hp)	36.8 Kw (50 hp)	45.6 kW (62 hp)
Maximum rated load (*)	2 800 rpm	2 800 rpm	2 800 rpm
Idle speed (on gear)	850 rpm	850 rpm	750 rpm
Maximum no load speed	3 050 rpm	3 050 rpm	3 050 rpm
Cycles	4	4	4
Stroke-Bore ratio	87 x 92.4 mm	87 x 92.4 mm	87 x 92.4 mm
Cubic cylinder capacity	2197 cm ³	2197 cm ³	2746 cm ³
Rate of compression	23/1	23/1	23/1
Rotation direction	Counter clock-wise	Counter clock-wise	Counter clock-wise
Injection order	1-3-4-2	1-3-4-2	1-3-5-4-2
Injection pump	Bosch PFR 4M	Bosch PFR 4M	Bosch PFR 5M
Injection pressure	140 bar	140 bar	140 bar
Fuel consumption	190 g/kW/h	190 g/kW/h	190 g/kW/h
Advance injection timing (before UDC)	18°	18°	19°
Weight (including. gear box)	225 kg	232 kg	270 kg
Alternator	12 V – 60 A	12 V – 60 A	12 V – 60 A
Battery capacity (mini)	110 A/h	110 A/h	110 A/h
Cooling system	By fresh water / seal water heat exchanger		
Sea water pump	Neoprene type rotor		
Coolant fluid:			
50% water + 50 % antifreeze	9 l	9 l	11 l
Valve clearance (when cold)	0.18 to 0.22 mm	0.18 to 0.22 mm	0.18 to 0.22 mm
Motor oil	API CD - SAE 15 W 40	API CD - SAE 15 W 40	API CD - SAE 15 W 40
Motor oil capacity			
0°	7.5 l	7.5 l	12 l
15°	6 l	6 l	9 l
HURTH gear box (*)	HBW 100	HBW 125	HBW 250
HURTH gear box lubricant capacity	0.35 l	0.60 l	0.60 l
HURTH gear box lubricant capacity	Automatic transmission fluid, type A		
TECHNODRIVE gear box (*)	TMC 60	TMC 60	TM 345 A
TECHNODRIVE gear box oil cap	0.8 l	0.8 l	1.6 l
TECHNODRIVE gear box oil	API CD - SAE 15 W 40	API CD - SAE 15 W 40	API CD - SAE 15 W 40
Anti-pollution certification	BSO – Level 2	BSO – Level 2	BSO – level 2
Electromagnetic compatibility CEM 89/336/CE	Certificate no.CE P98155T	Certificate no.CE P98155T	Certificate no.CE P98155T

(*) **ATTENTION** : The specifications are defined only for use of pleasure craft.
Consult with us for all other uses.

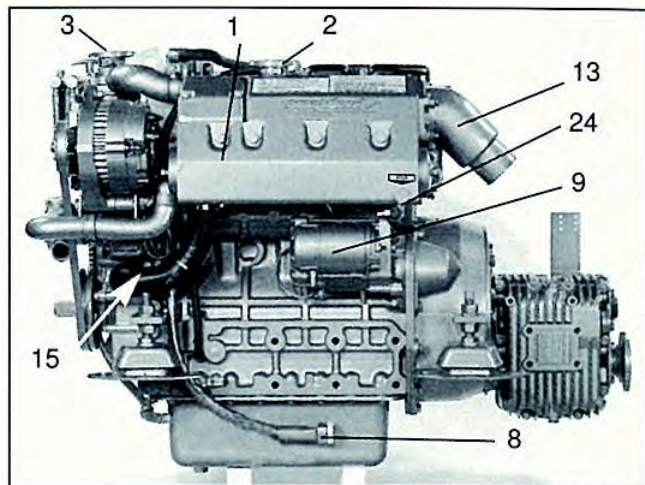
Recommended on board repair kit for motor types 4.200 HE - 4.220 HE - 5.280 HE				
DESCRIPTION	Quan	4.200 HE	4.220 HE	5.280 HE
V-belt	1	970 307 404	970 307 404	970 301 448
Motor oil filter	1	970 603 003	970 603 003	970 603 003
Fuel filter	1	970 622 350	970 622 350	970 622 350
Sea water impeller kit	1	970 604 591	970 307 475	970 307 475
Glow plug	1	970 307 393	970 307 393	970 307 393
Thermostat	1	970 307 282	970 307 282	970 307 282
O-ring tube stack	2	970 301 719	970 301 719	970 301 719
Alarm lamp	1	970 856 011	970 856 011	970 856 011
Rocker arm cover gasket	1	970 301 995	970 301 995	970 307 917
Complete nozzle fitting	1	970 307 387	970 307 387	970 307 760
Injector gasket	1	970 142 109	970 142 109	970 142 109



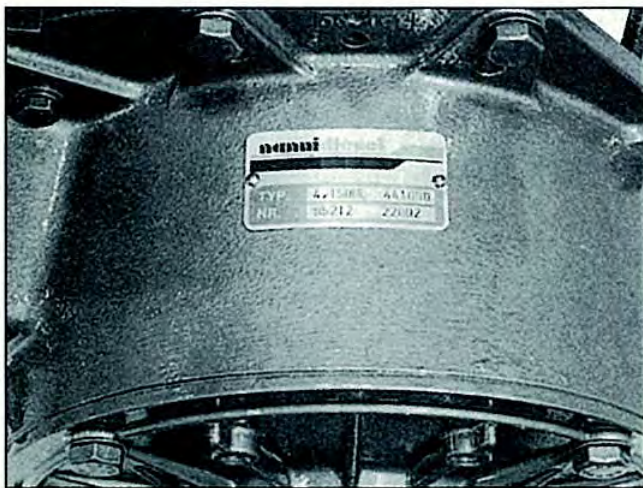
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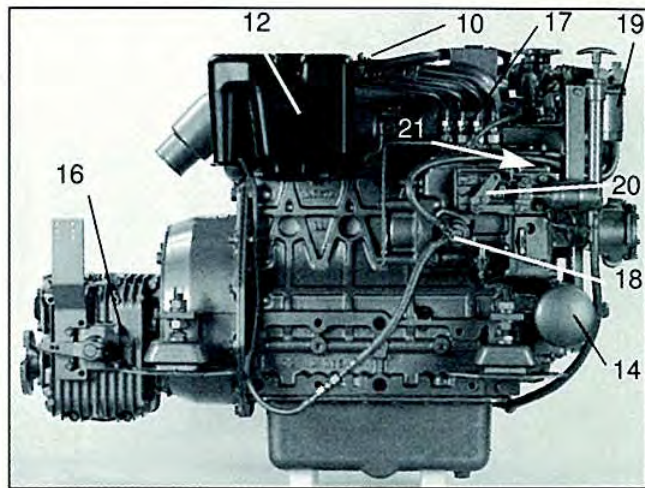
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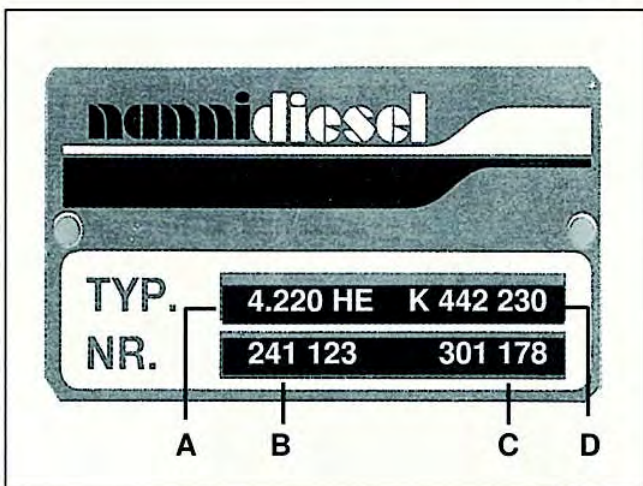
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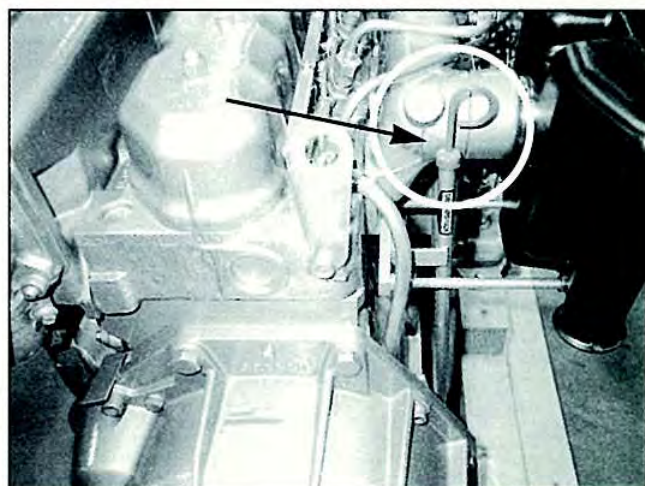
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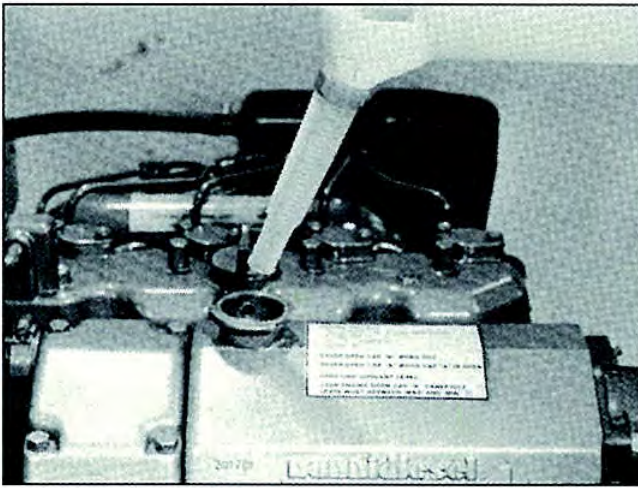
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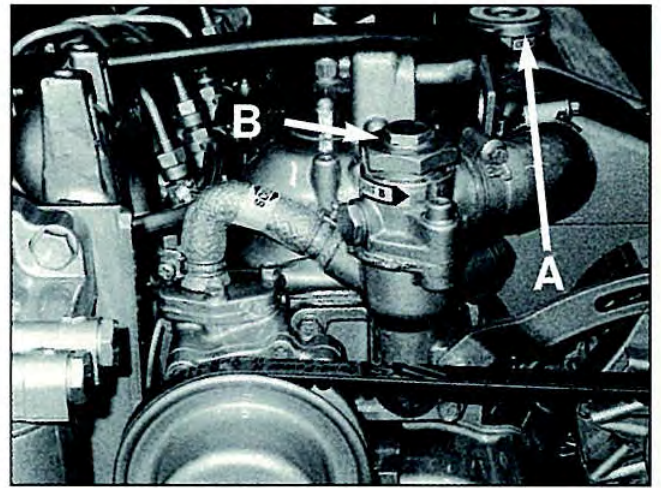
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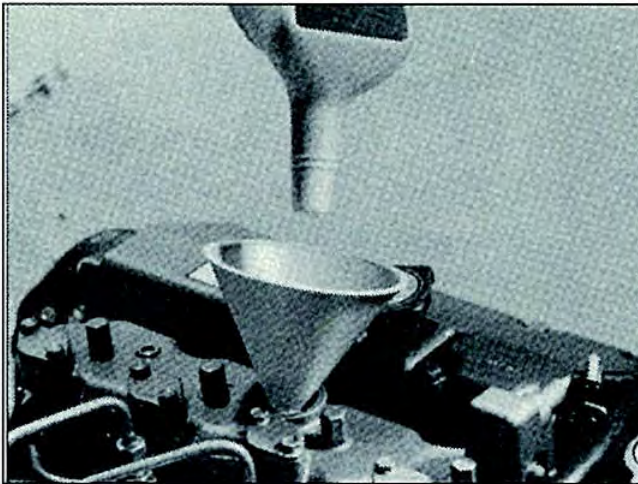
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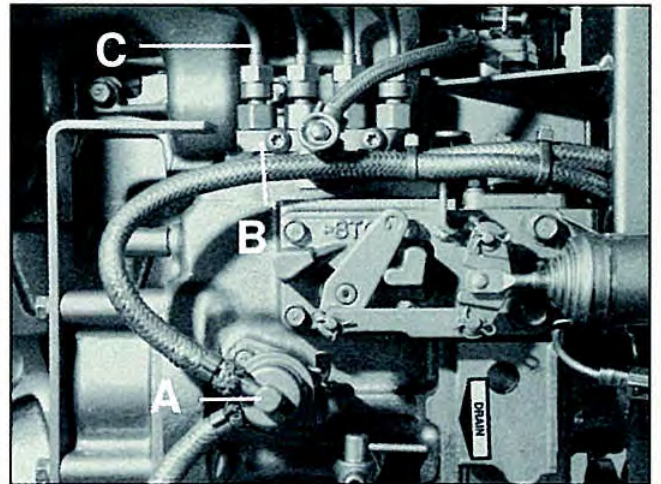
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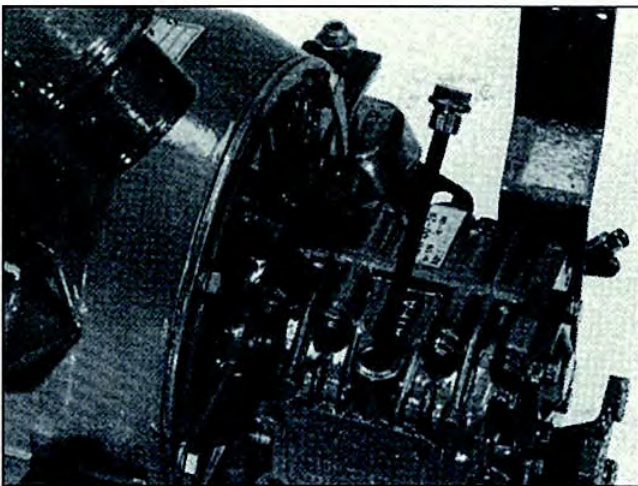
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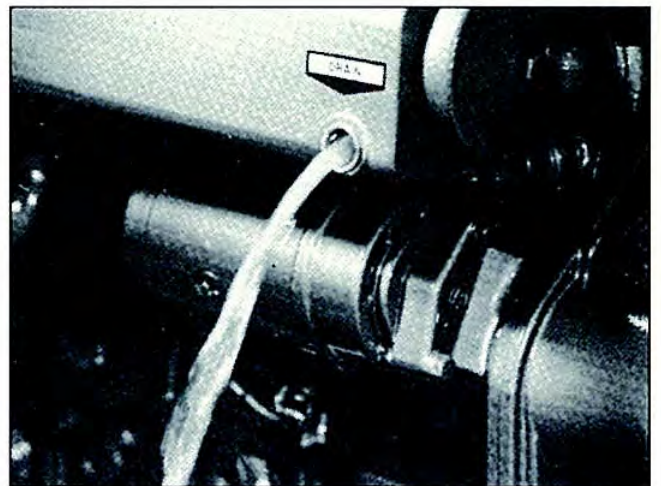
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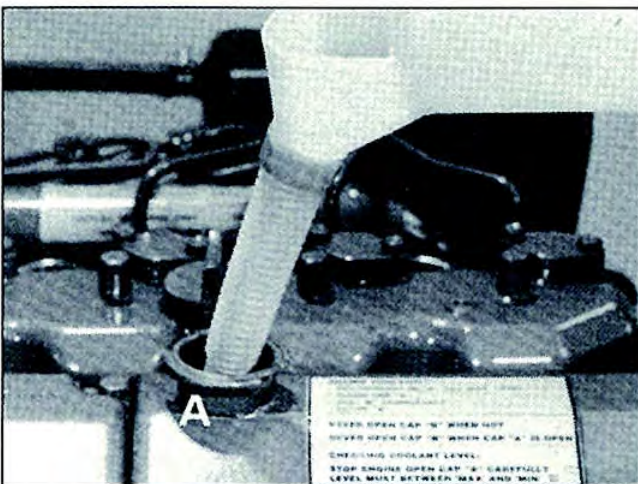
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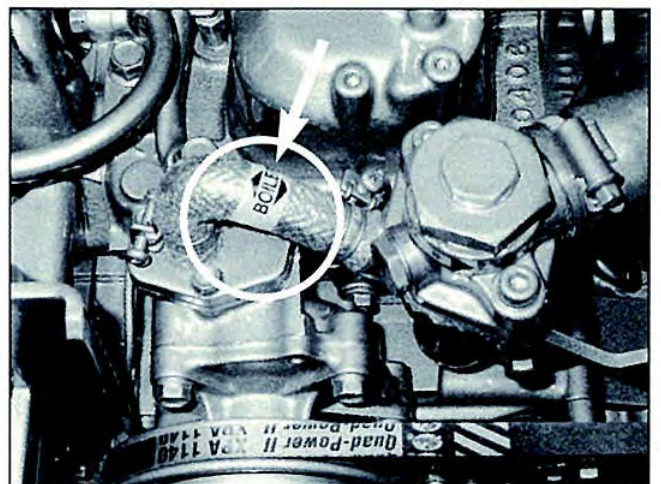
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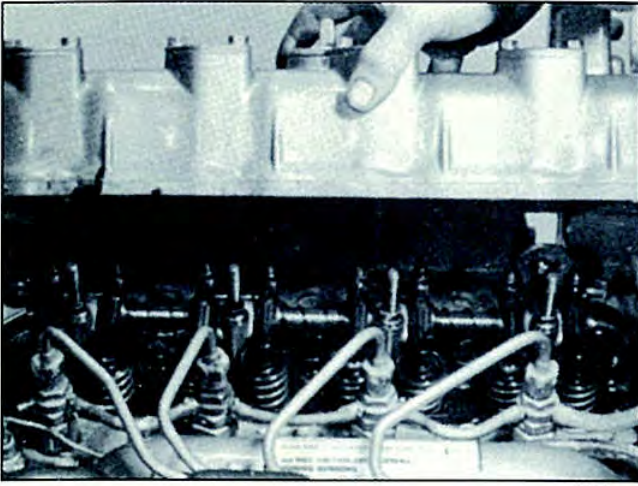
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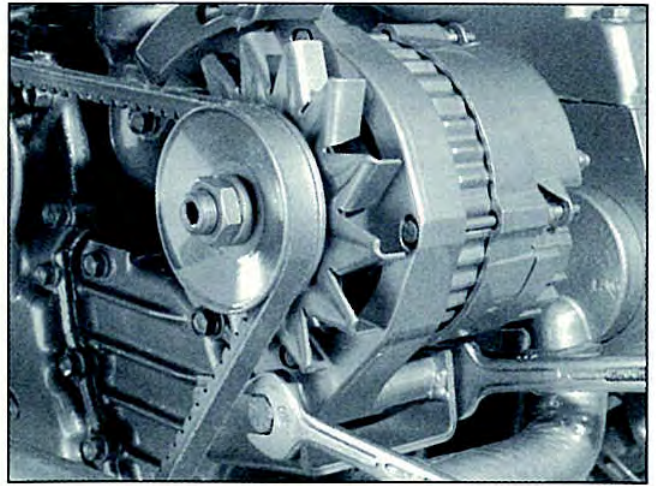
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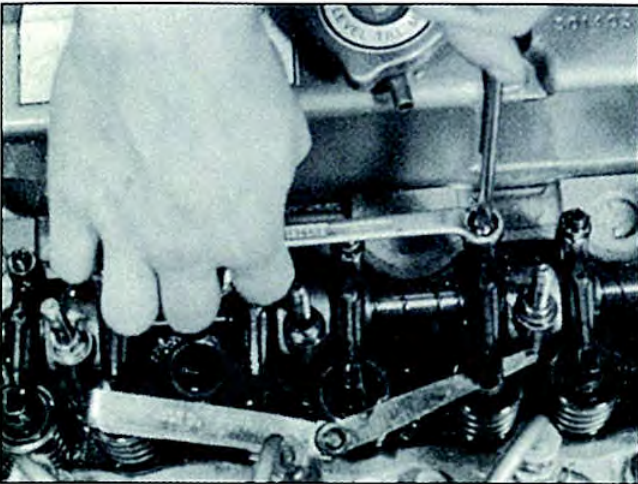
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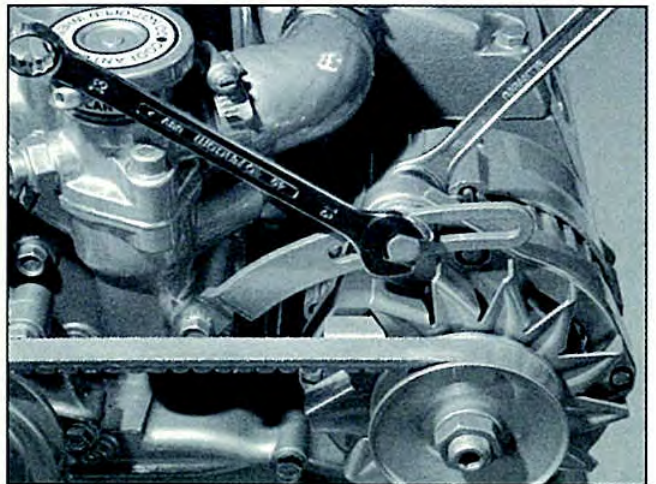
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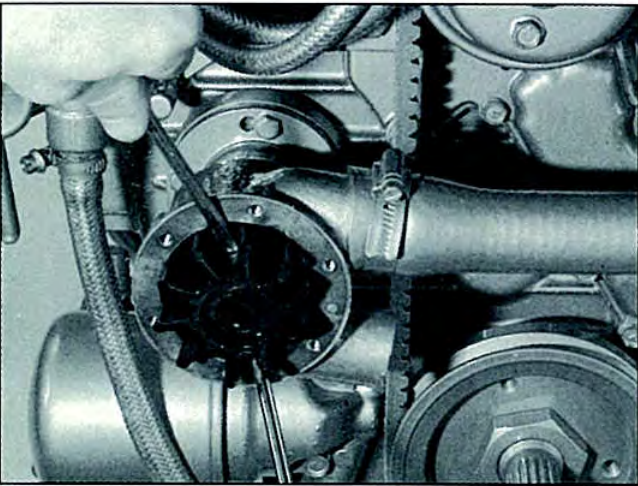
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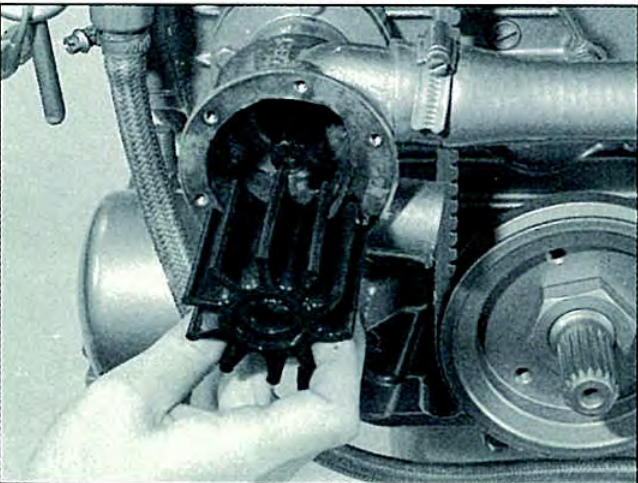
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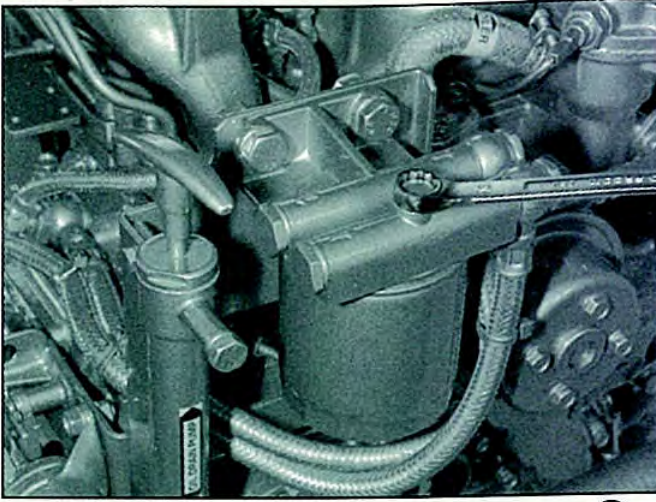
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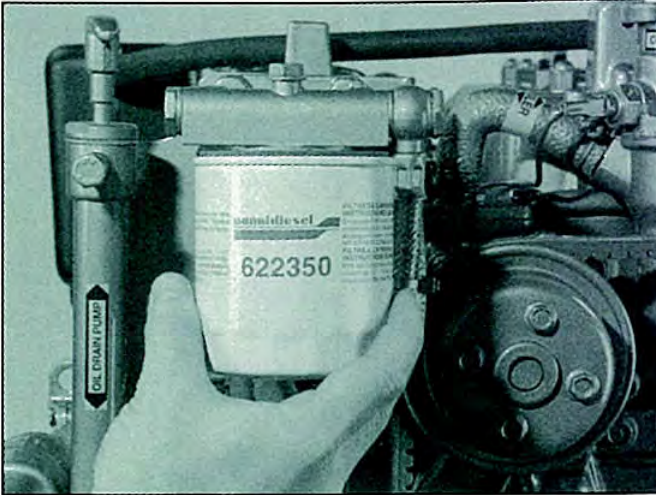
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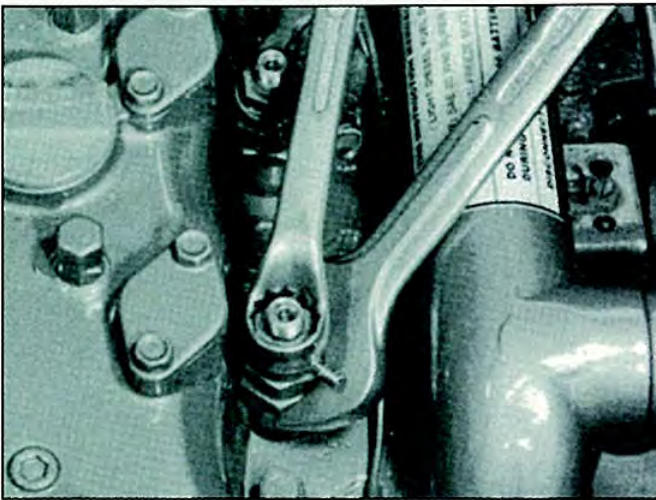
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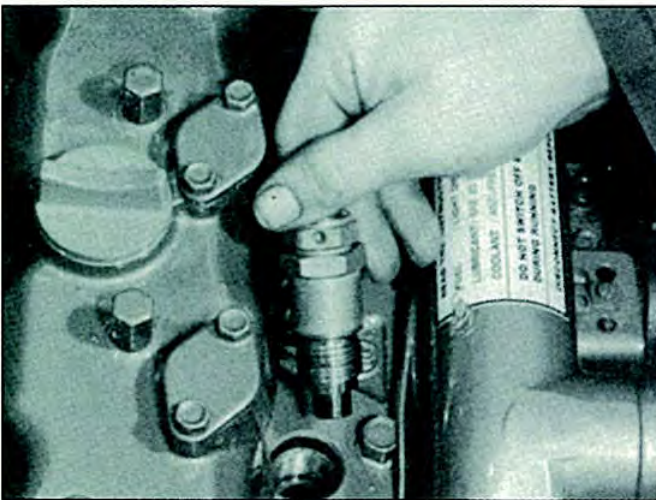
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31

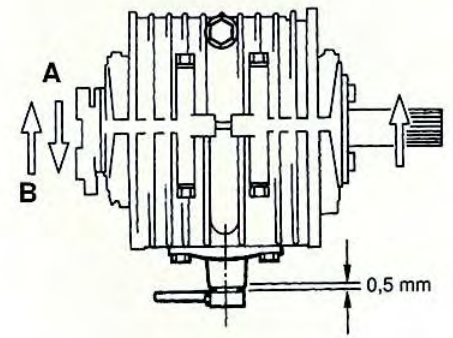
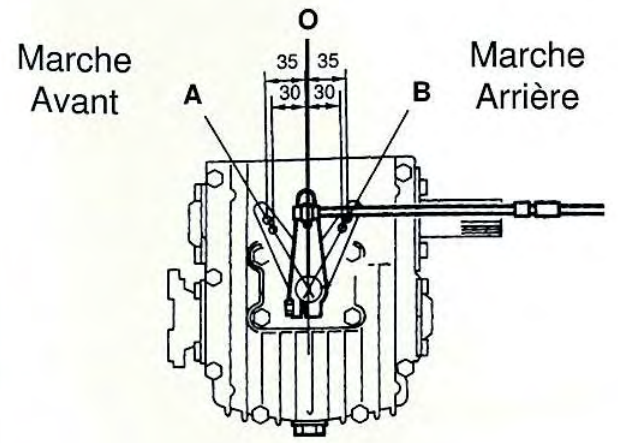


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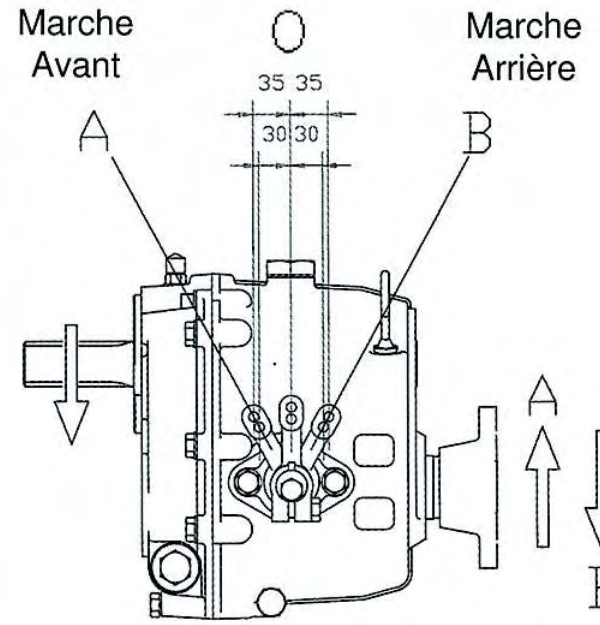
33

Inverseur Hurth

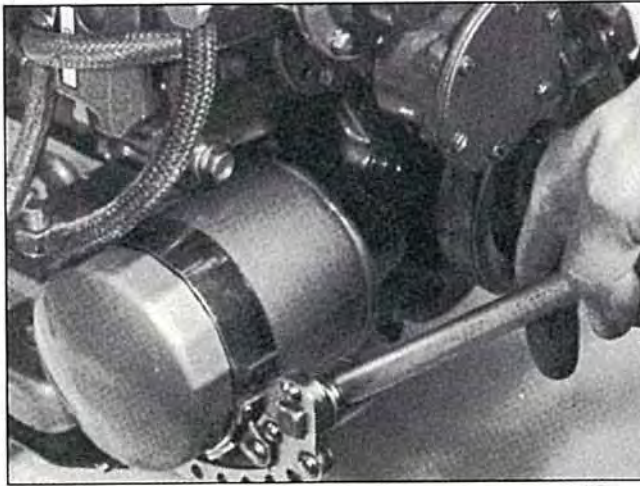


Hurth 35

Inverseur Technodrive



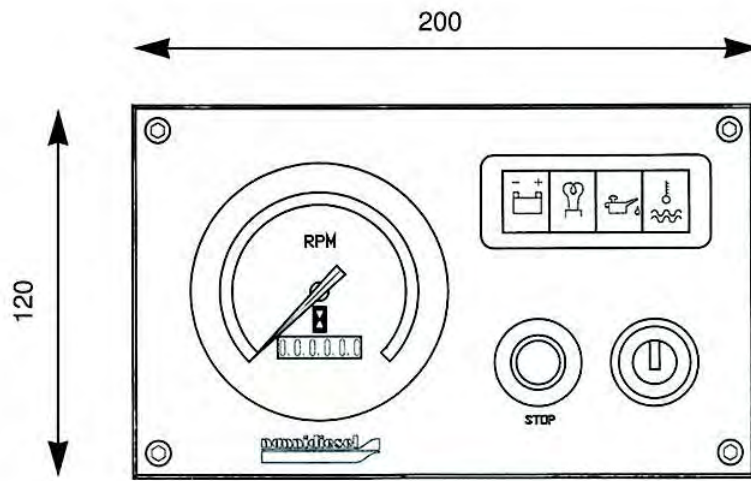
Technodrive 35



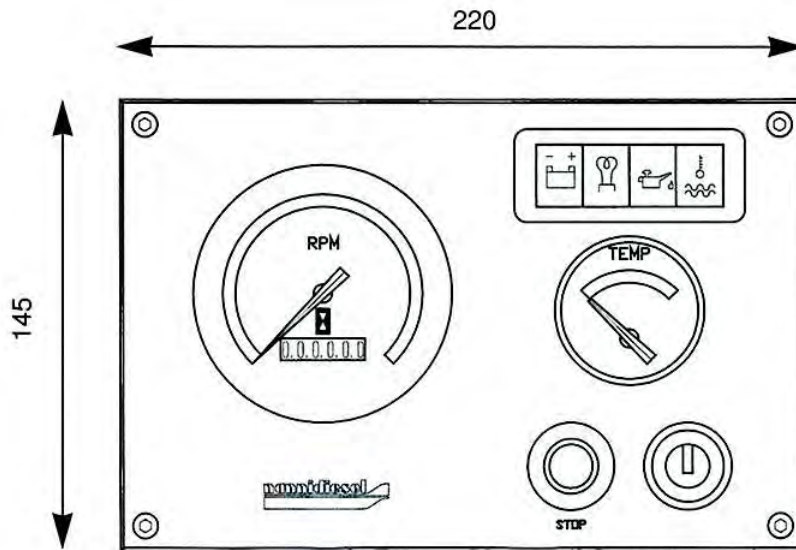
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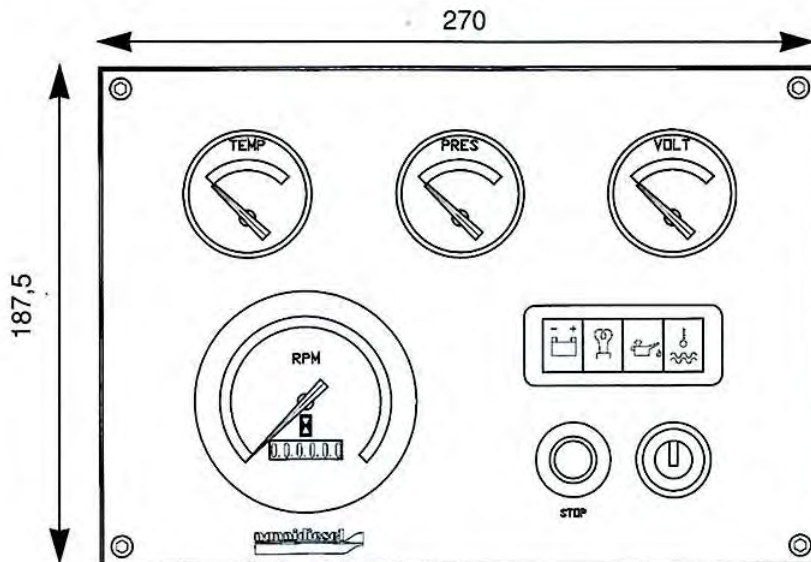
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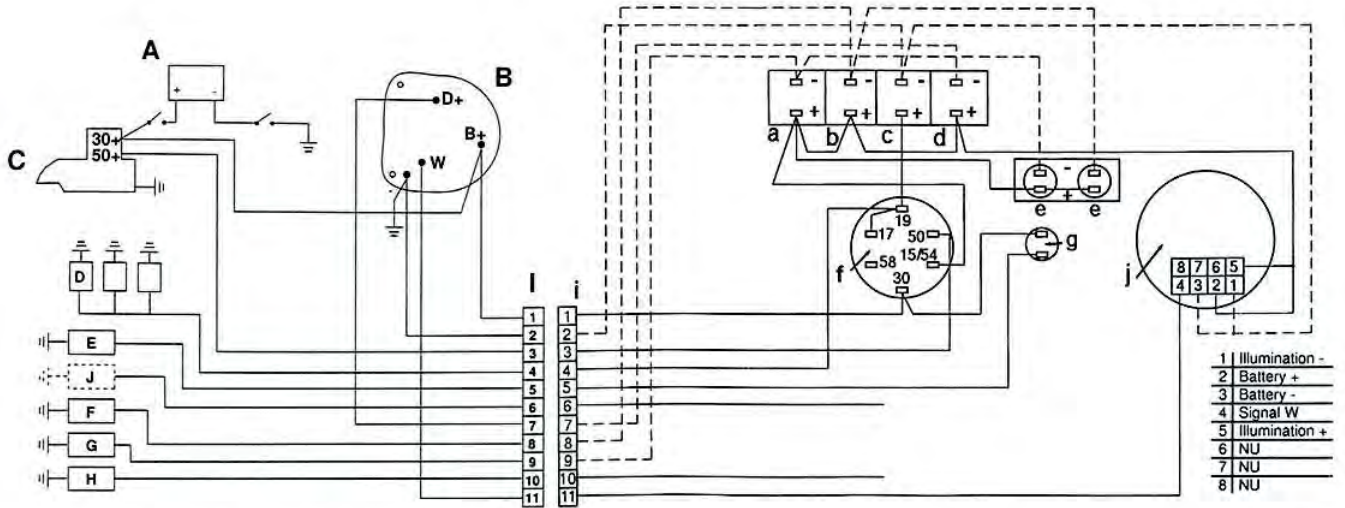
A2 18



B2 19



C2 20

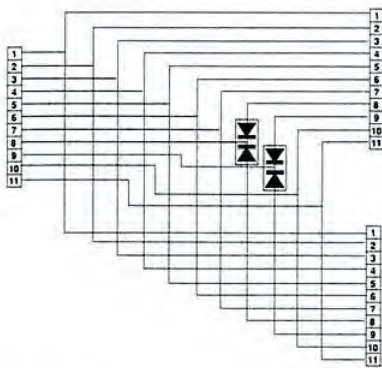


Engine Wiring N°307095 16

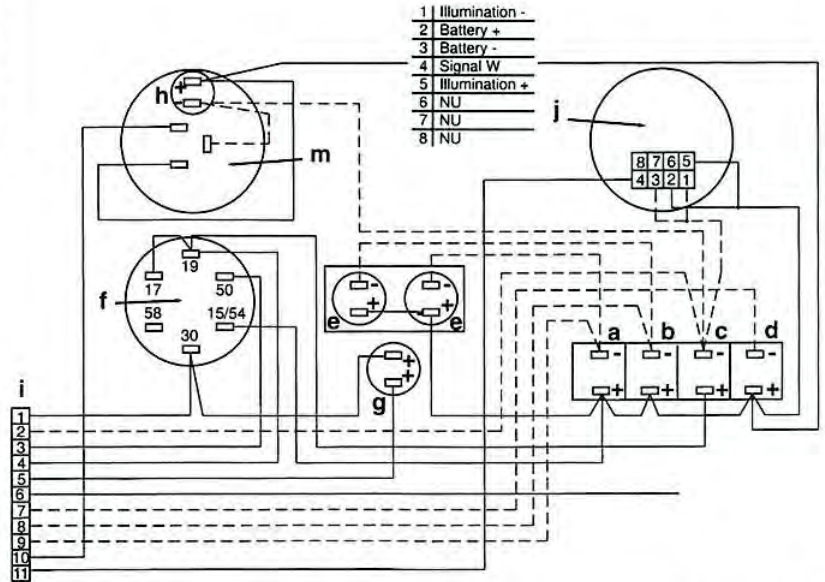
"A2" Panel N°674351 18

A	BATTERY
B	ALTERNATOR
C	STARTER MOTOR
D	GLOW PLUGS
E	STOP SOLENOID
F	OIL SWITCH
G	WATER SWITCH
H	TEMP SENDER
I	CONNECTOR
J	OIL PRESSURE SENDER

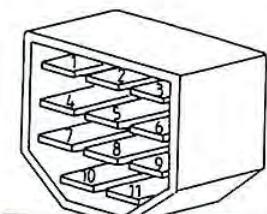
- 1 Illumination -
- 2 Battery +
- 3 Battery -
- 4 Signal W
- 5 Illumination +
- 6 NU
- 7 NU
- 8 NU



Y Junction N°304040

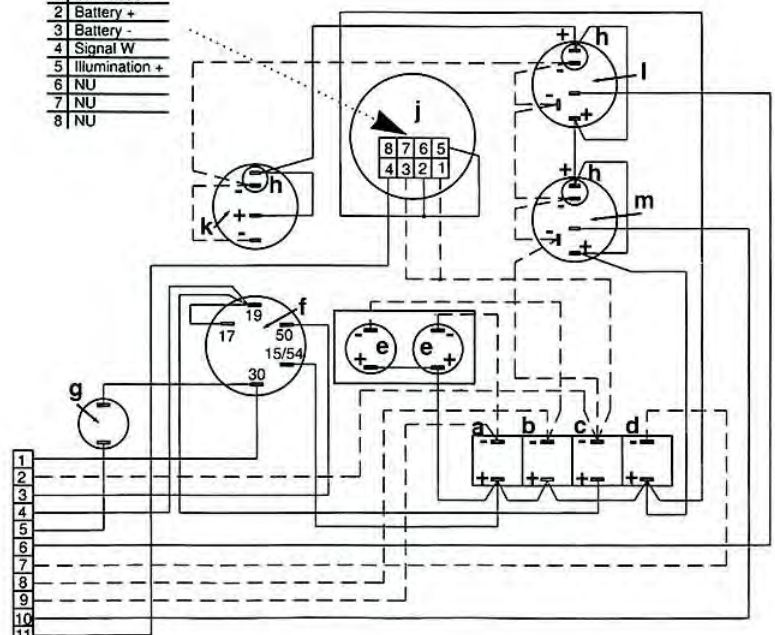


"B2" Panel N°674350 19



1	RED	+
2	BLACK	-
3	BROWN	STARTER
4	BROWN 1	PREHEAT.
5	WHITE	STOP
6	GREY	OIL SENDER
7	VIOLET	D+ (ALT.)
8	GREY 1	OIL SWITCH
9	YELLOW/GR	WATER SW.
10	YELLOW/GR1	WATER SEND
11	BLUE	REV. COUNTER "W"

- 1 Illumination -
- 2 Battery +
- 3 Battery -
- 4 Signal W
- 5 Illumination +
- 6 NU
- 7 NU
- 8 NU



Connector (panel side)

"C2" Panel N°674349 (optional) 20