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Owners manual

PAGURO 6000





We thank you for the confidence you have shown in us, by purchasing the **PAGURO** for fitting in your boat.

The target of our design, to achieve a diesel unit with the power usually supplied in a small flat, in a compact size and light weight, is completely reached. So there is not the need to waste a large room in your boat, and even if the chosen place is away from the centerline of the boat, the reduced weight of the **PAGURO** will not influence the stability.

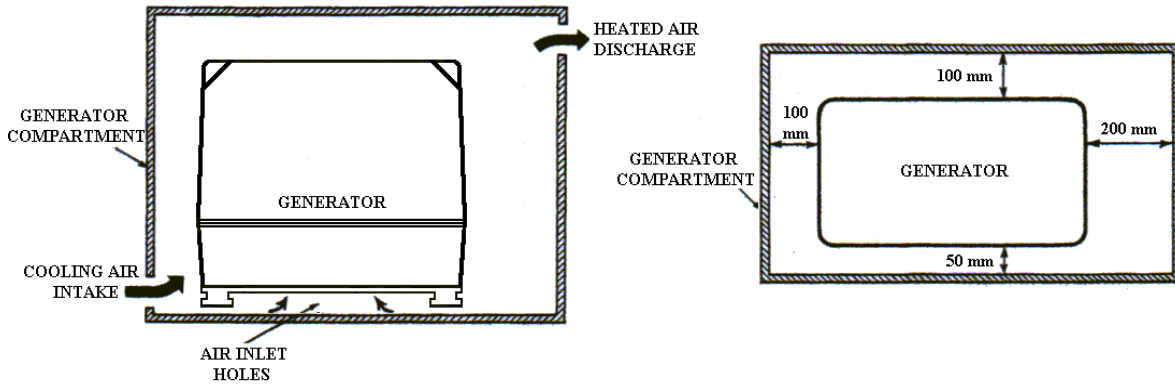
TECHNICAL SPECIFICATION AND PERFORMANCES

		PAGURO 6000
Diesel engine maker		Lombardini Marine - Italy
Engine type / cylinders n.		LDW 502 / 2 cyl.
Mechanical continuous power	50 cyc.	6.5 KW
	60 cyc.	7.5 KW
Continuous speed	50 cyc.	3000 rpm
	60 cyc.	3600 rpm
Specific fuel consumption		0.35 lt/KW/h
Cooling system		Fresh water with heat exchanger
Cooling pump		Johnson system self-priming directly driven, without belt
Starting and shut-off system		12 V electrical starter remote controlled
Generator maker		V.T.E. - Italy
Generator type		Synchronous, brushless, AC watercooled generator
Water cooling system		Through stainless steel AISI 316 L heat exchanger jacket
Electrical continuous power	50 cyc.	6 KVA – 5 KW
	60 cyc.	6.5 KVA – 5.5 KW
Pick current for 2 sec. (230V)		70 A
Voltage	50 cyc.	Single phase AC 230 V
	60 cyc.	Single phase AC 115 V
Auxiliary voltage for starting battery		12 V – 8 A
Remote control		fitted with hour meter, load indicator, autom. shut off device in case of low oil pressure and water over temp., starting motor self disengagement, 10 m cable and socket
Noise level		52 dB(A)
Weight (soundproof hood included)		130 Kg.
Engine serial Number		

WHERE TO FIT YOUR PAGURO

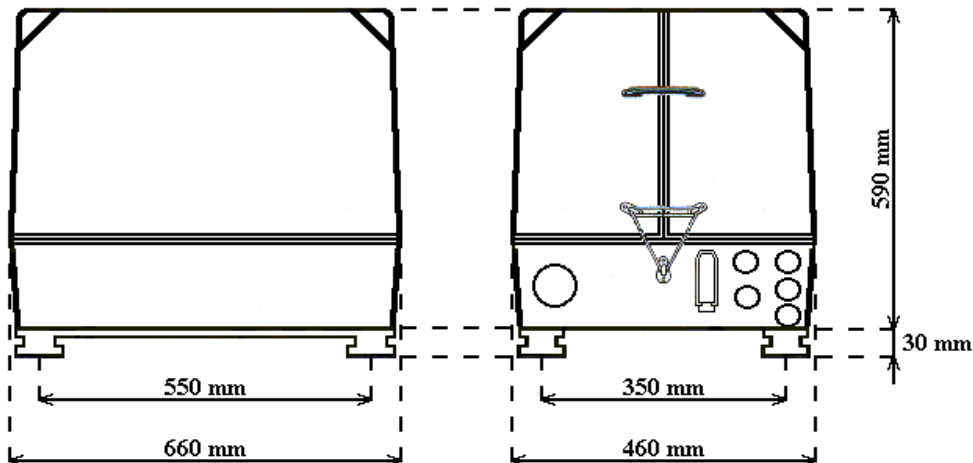
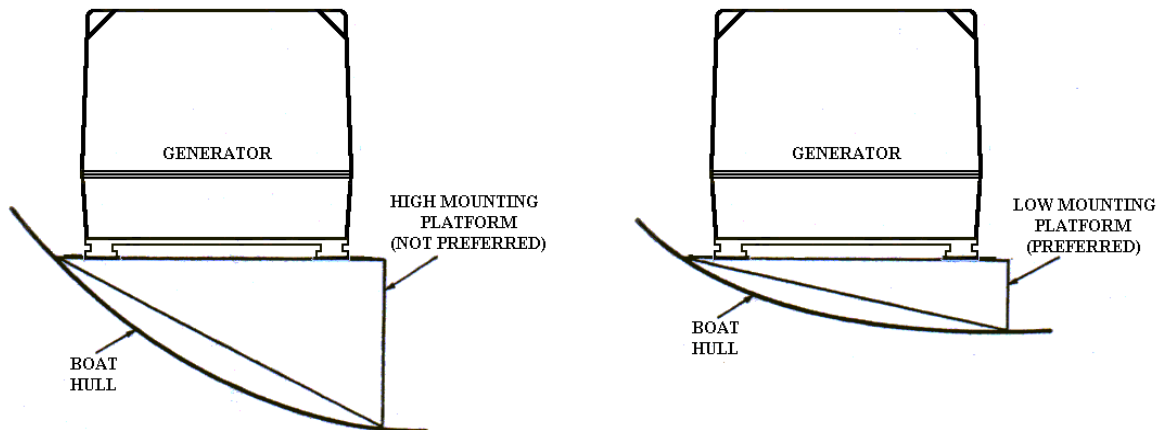
For a correct air replacement

Around the **PAGURO** have at least the shown tolerance; of course the ambient have to be naturally vented with more then one external connection.

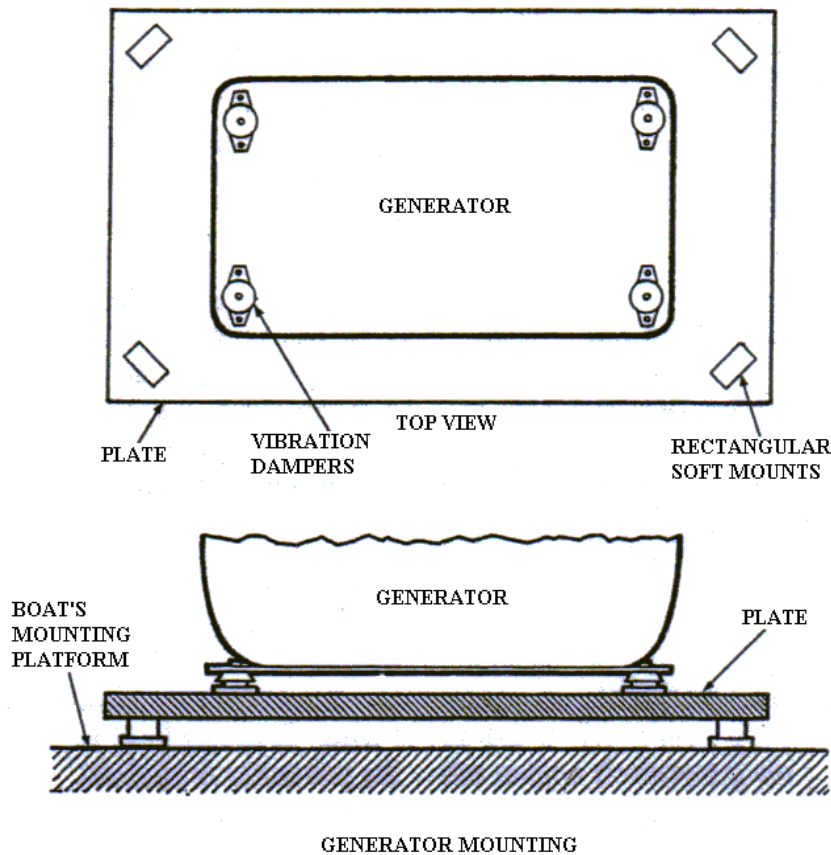


For fixing the PAGURO on board

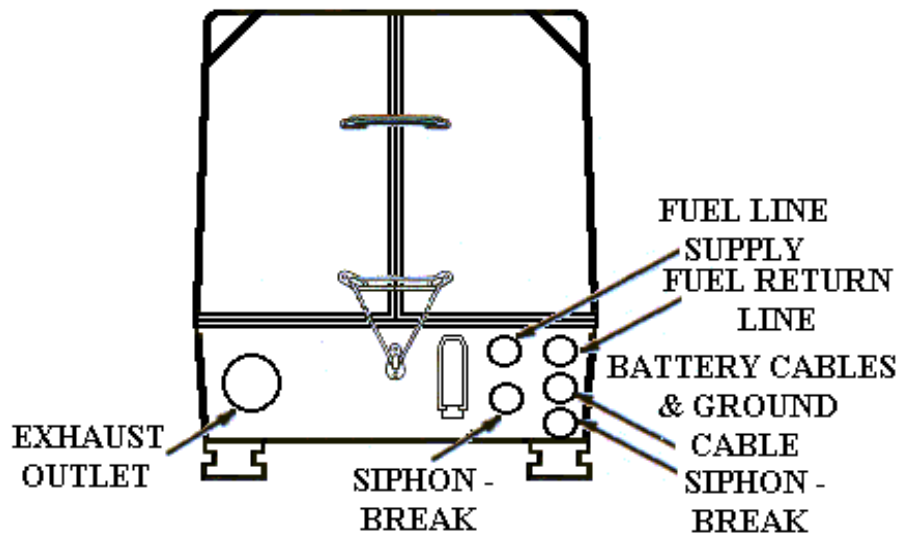
A metallic, wooden or fiberglass structure have to be achieved. It must be as small as possible to avoid the generation of vibrations and must keep the unit horizontally.

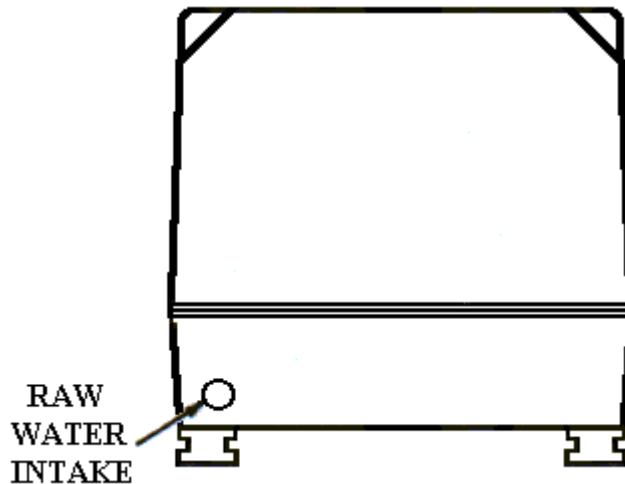


If the vibration-dampening mounts furnished with the generator are not adequate to muffle vibration or resonance in an installation where the mounting surface is not ideal, then adding a plate between the generator and the boat's mounting platform is a possible solution. This will also improve the sound insulation. For this plate, use 3 cm thick wood that weighs 10-15 Kg, and soft mounts that are rectangular. Position these mounts so they are on the diagonal and not aligned with the generator's mounts (see illustration). The generator's mounts may be turned in any direction. Mount the plate to the boat's platform, then mount the generator to the plate



EXTERNAL CONNECTIONS

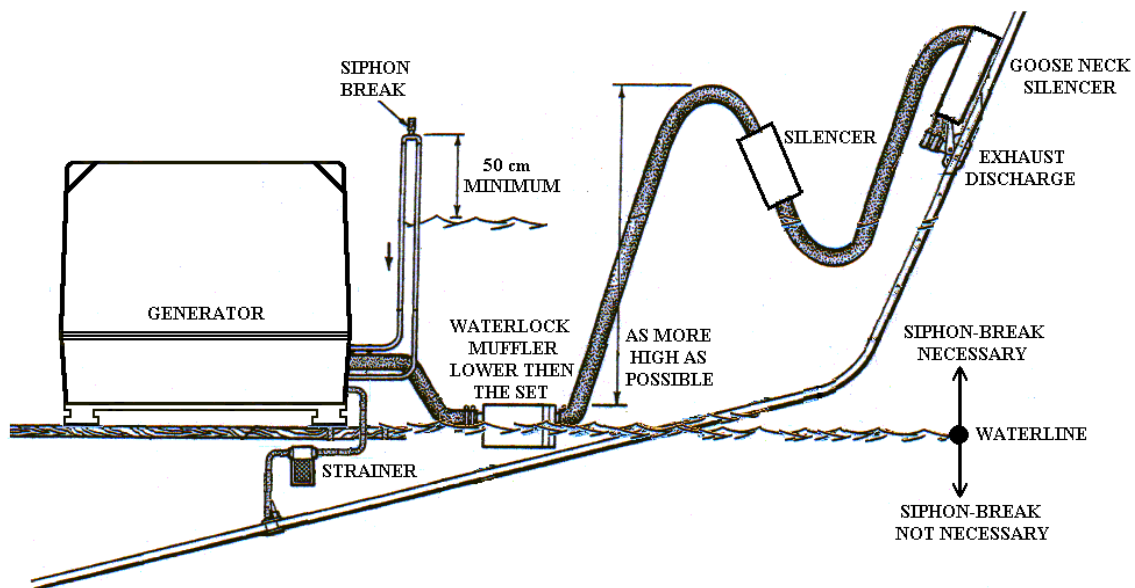




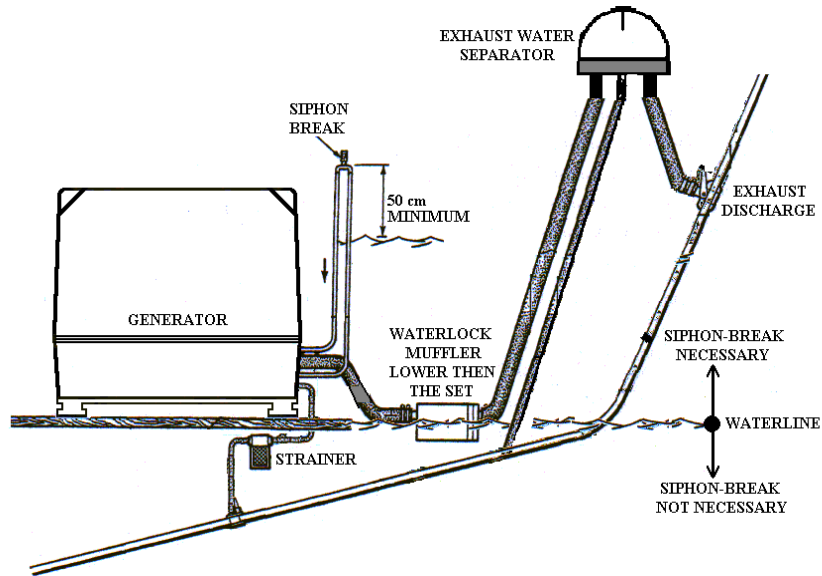
Note: The internal diameter of the pipes have to be respected to avoid untightening and leakage, but the external diameter is important too, because the correct size avoids a noise way-out from the sound-proof capsule.

Exhaust line (on request)

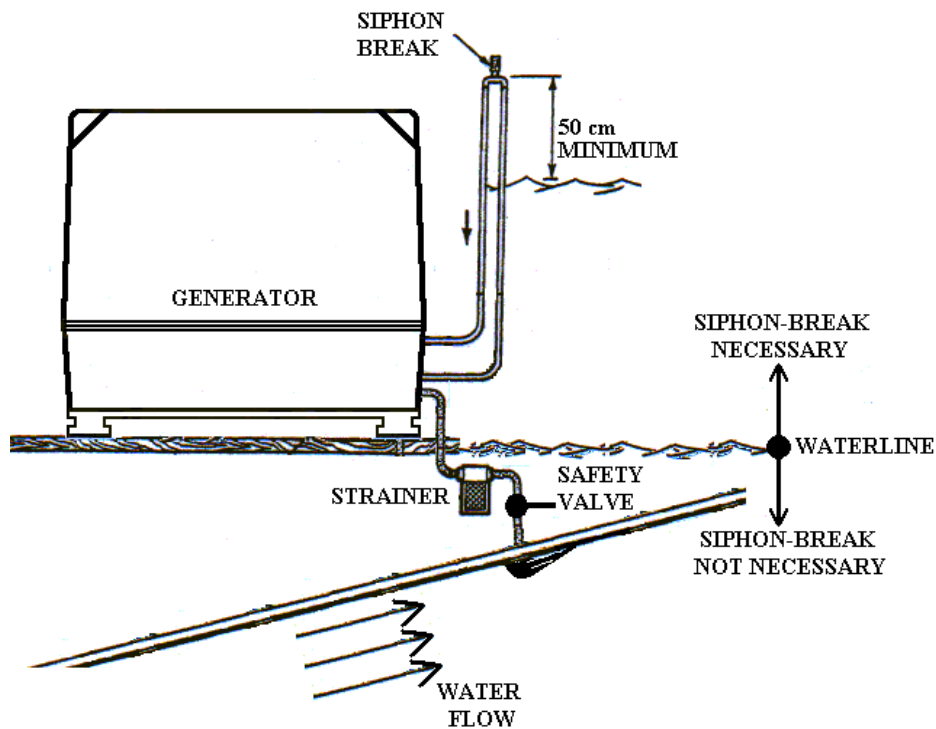
STANDARD SYSTEM: the best dumping result is obtained fitting the 3 typical "Vetus" exhaust mufflers:
 the first as water lock avoids the risk of water return into the engine and dumps 50% of noise so it must be installed; the second reduces a further 20% noise and must be fitted with a gradient towards the out let in order to avoid water return; the third dumps a further 10% and avoids the risk of external seawater due to waves.



IMPROVED SYSTEM: a further improvement in the noise dampening is achieved fitting instead of the third muffler the water separator. The cooling water is separately throw from a separate hole flowing smoothly, avoiding the noise produced by the water coming alternatively spread from the exhaust pipe.



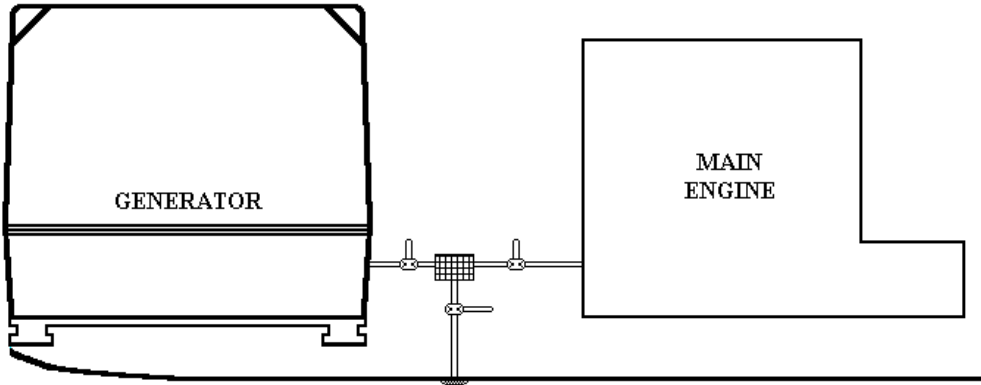
Cooling water intake (on request)



Note 1: The unit can be installed completely below the sea level; in this case the safety cooling vacuum valve has to be fitted out of the capsule and connected with separate pipes to the delivery of cooling pump.

Note 2: In case the hole in the hull for the water intake is undesired, the water line can be connected in parallel with the water intake of the main engine. In this case a couple of locking valves are necessary, because a failure of the main engine pump can influence the cooling of the set and voiceovers.

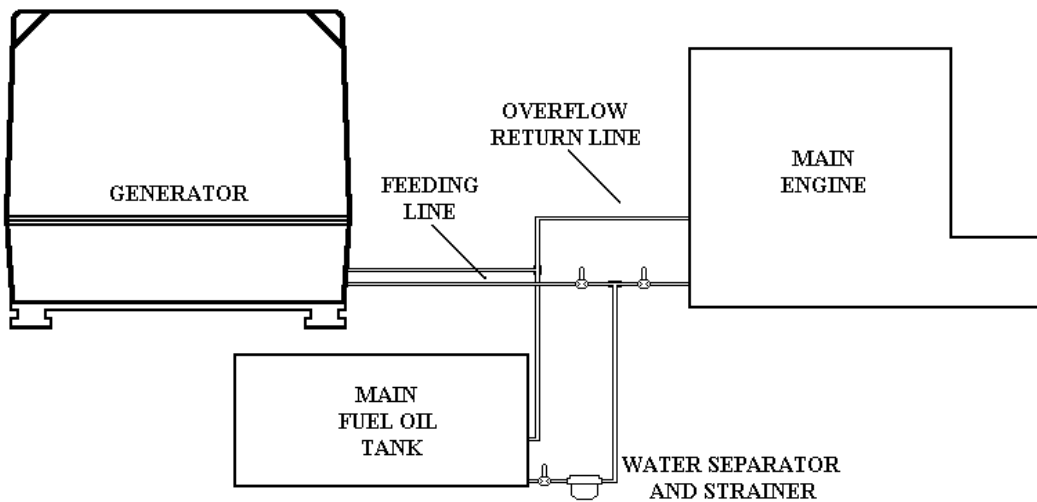
Note 3: In case the hole in the hull for the water intake is undesired, the water line can be connected in parallel with the water intake of the main engine. In this case a couple of locking valves are necessary, because a failure of the main engine pump can influence the cooling of the set and voiceovers.



Fuel oil line

It is usually employed the main fuel tank of the boat: the feeding pump driven by the engine assure a suction from a maximal height of 1 m, no length limits.

A separate line coming from the tank avoids air bubbles troubles, but in several cases the fuel can be taken from the pipe of the main engine: a couple of locking valve are necessary, because a failure in the non-return valve of the feeding pump of the main engine can influence the set and voiceovers.



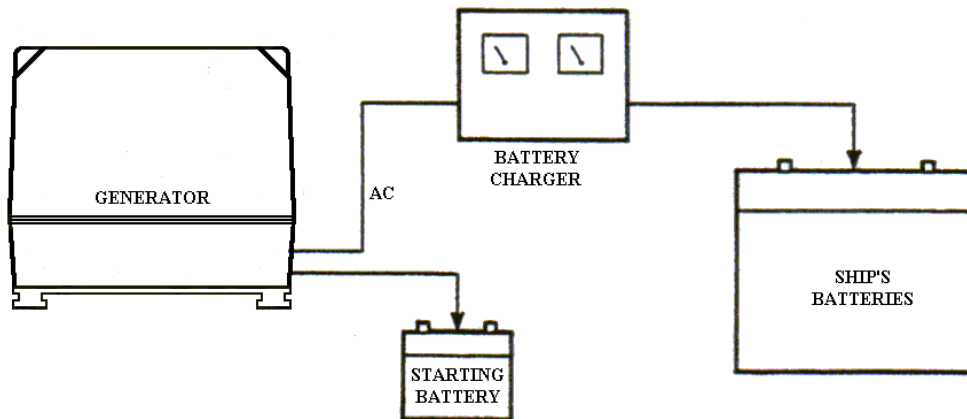
Note 1: The injection pump of the **PAGURO** is self-bleeding, it means that in case the engine shut-off for lack of fuel, after fuel tank filling up there is no need of disconnecting the pipes for bleeding, because this operation is simply obtained acting by hand on the lever of the feeding pump.

Note 2: Even if a small fuel filter is contained in the capsule, an external strainer and water separator is suggested to delay the replacement time.

Starting battery connection

The **PAGURO** is negative grounded, and can be connected to the main board batteries 12 V or to a separate small battery 12 V of about 90 Ah; in this second case its internal charging device takes care of feeding the battery with 8 A

Note : In case of connection to the main board batteries the 8 A are available as well, but are irrelevant for charging them: a static high power battery charger fed by the 230 V (115 V) of the set must be installed on board (on request).



Remote control (supplied)

It allows the user to **START** and **STOP** the unit, verify if there is a cooling water or oil pressure failure, (in that case the engine shut-off automatically and the **RED LED** is lighted) and the power supplied control.

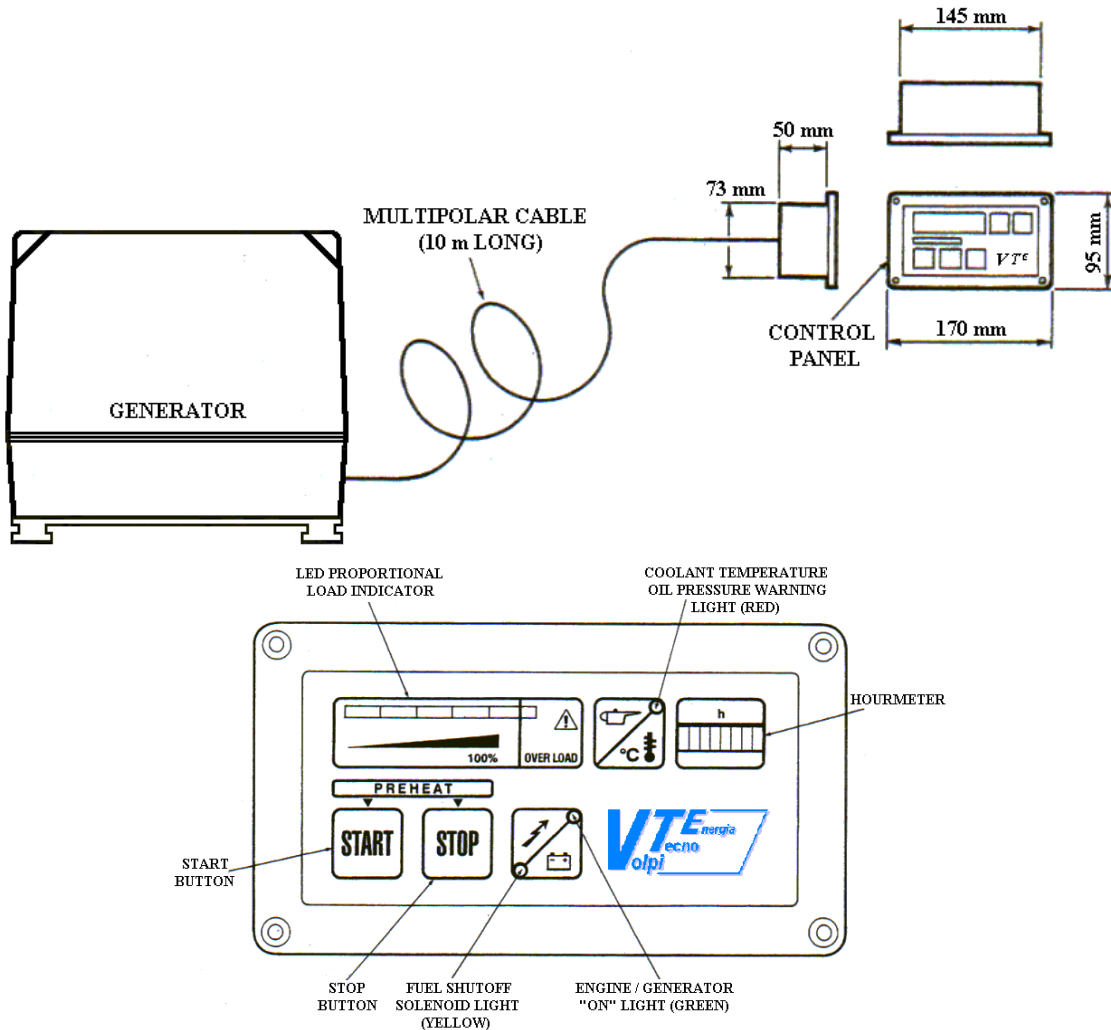
For preheating keep pushed contemporaneously the **START** and **STOP** buttons for about 10 sec.. The **GREEN LED** energized means that the preheating is in progress. For starting release the 2 pushed buttons, repushing the **START** only.

Note 1: The load indicator is designed to avoid overloading of the unit through feeding too many electrical loads; it begins to show the load after the first half power supplied and has to be considered normal when the bar is **GREEN**. The last **RED LED** lighted means an overcharge: switch-off the exceeding load to return at normal conditions.

Note 2: Do not forget the starter knob switched **ON** and the engine not running due to aborted starting attempt (**YELLOW LED** flashing), the **STOP** button should be pushed because on the contrary the engine shut-off valve remains energized and takes useless power from the starting battery.

Note 3: If the **YELLOW LED** remains flashing when the set is running normally, it means that the internal battery charger protection has tripped, so the starting battery is no longer connected to it. In that condition the automatic protection shut-off system is not operative, so **do not operate the set with the YELLOW light flashing**. Reset the device by pushing the button located on the side of the **GREY** box fitted on the set. The set can normally operate when the **YELLOW** flashing LED is **OFF** and the **GREEN** on the opposite corner is **ON**.

Note 4: If for operator's mistake the starting knob is pushed whilst the engine is already running, an electrical safety device avoids the gears re-engagement, protecting the starting motor and preventing failures.



For passing through small holes the remote control panel cable, the disconnection must be made panel side, opening the back cover, and not plug side, that is welded.

Main power 230 V (115 V)

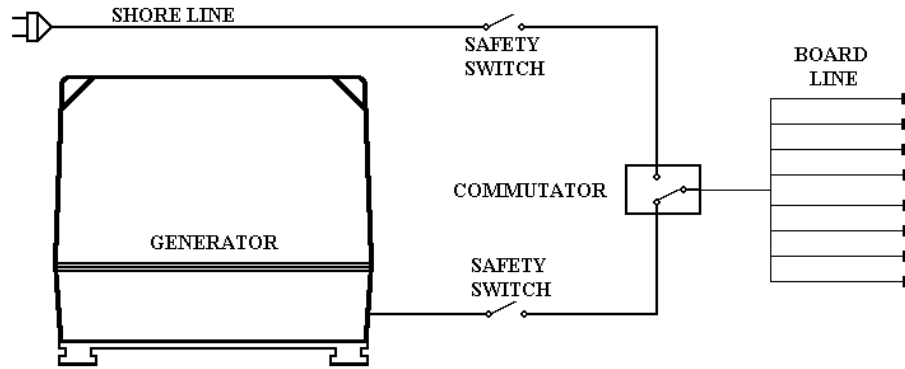
As the most of the boats have installed 230 V (115 V) feeding line from the shore, it has to be absolutely avoided that the main and the generator remain contemporaneously connected to the boat plant.

A manual safety commutator (on request), or an automatic safety commutator (on request) has to be provided.

Note: Both the lines or at least the generator line only, have to be protected with a magneto thermic safety switch, fitted on the main board panel.

For your **PAGURO** choose a:

	PAGURO 6000
If connected at:	Bipolar:
230V 50Hz	23A
115V 60Hz	55A



WHAT CHECKING BEFORE FIRST STARTING

- That the lubricating oil level in the engine reaches the upper line on the deep stick.
- That the valves of the following feeding pipes are properly open:
 - cooling sea water;
 - fuel oil suction;
 - fuel oil overflow return.
- That the main A.C. safety switch is SHUT-OFF.
- That the commutator GENERATOR / SHORE LINE is fitted in GENERATOR mode.

AFTER FIRST STARTING CHECK THAT

- Inside the capsule there is no leakage from the connections of the several pipes.
- The cooling water is flowing properly from the exhaust outlet, outboard.

When everything is in order, close carefully the capsule and your **PAGURO** is ready for supply trouble less energy.

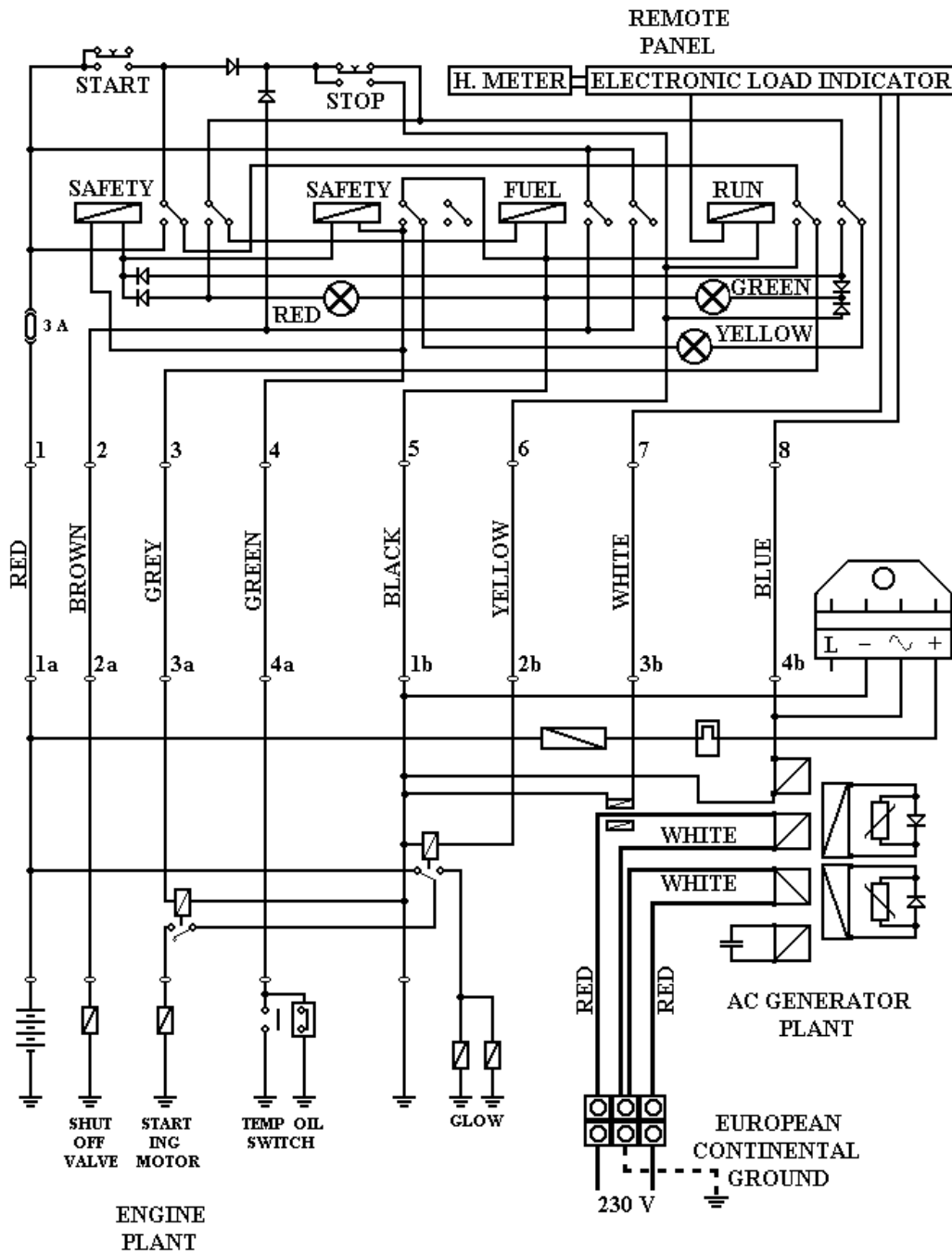
FAILURES

Each unit is carefully tested in our factory and the performances are verified; even so a readjustment can be sometime necessary according to the following suggestions.

PROBLEMS	CAUSES	REMEDIES
Alternator excitation failure	1. Low engine speed	1. Check rpm and set at the nominal value of 3100 rpm without load (3700 for 60 cycles)
	2. Faulty capacitor	2. Check and replace
	3. Faulty windings	3. Check that winding resistance as follows: - STATOR 0.50 Ω - ROTOR 3.51 Ω - EXCITATION 2.35 Ω
High no-load voltage(over 240 V)	1. Engine speed too high 2. Capacitor with too high capacity	1. Check and adjust rpm 2. Check and replace
Low no-load voltage (under 230 V)	1. Engine speed too low	1. Check and adjust rpm
	2. Faulty rotating diodes	2. Check and replace

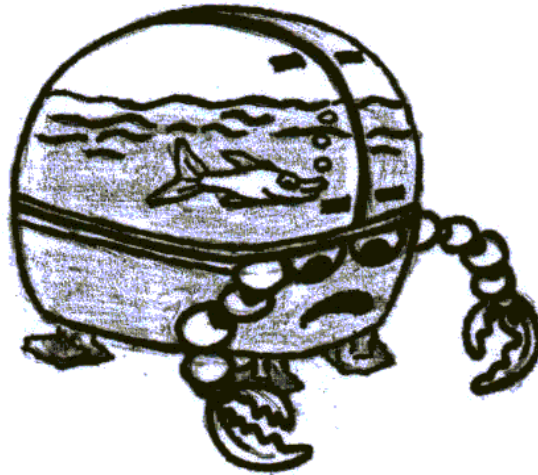
PROBLEMS	CAUSES	REMEDIES
Low no-load voltage (under 230 V)	3. Break down in windings	3. Check windings resistance as above
	4. Capacitor with low capacity	4. Check and replace
Proper no-load but low under load voltage	1. Low loaded engine speed	1. Dirty fuel filter
	2. Overload	2. Check the load indicator
	3. Rotating diodes short circuited	3. Check and replace
Unstable voltage	1. Loose contacts	1. Check connections
	2. Uneven rotation	2. Check for uniform rotation speed (dirty fuel filter)
Noisy generator	1. Broken bearings	1. Replace
	2. Loose coupling	2. Check and repair

PAGURO 6000 / 9000 ELECTRICAL PLANT



WARNING

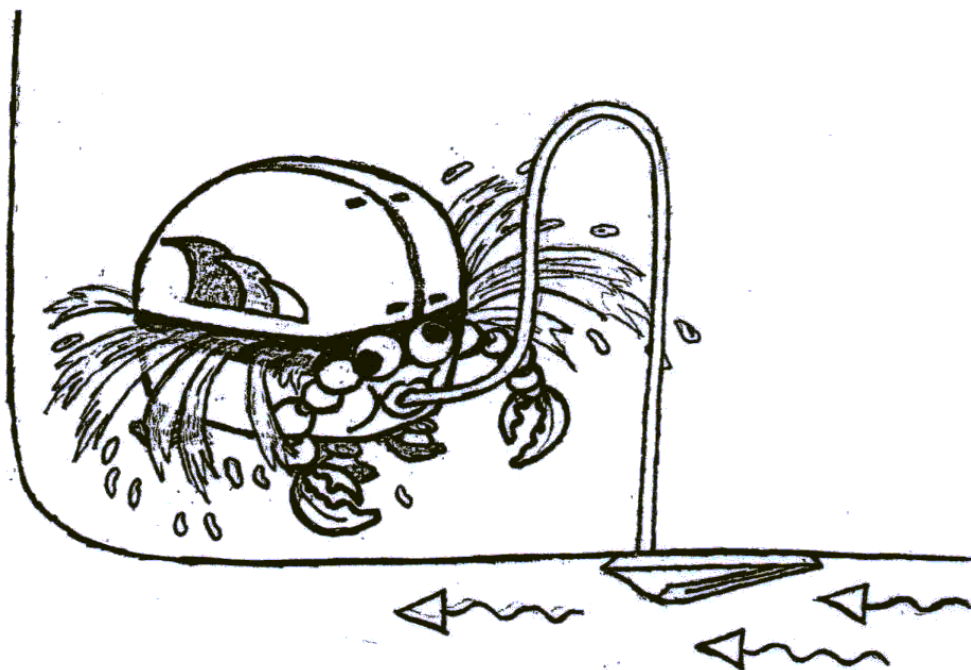
A great marine sets number of any type and manufacture, after first installation on board are flooded by sea water causing severe damages to the unit with high replacement or repairing costs, improperly claimed in warranty but gently refused, because it always depends from a critical installation, made compromising some physical rules.



We draw your attention on the most common mistakes to be avoided.

1st MISTAKE

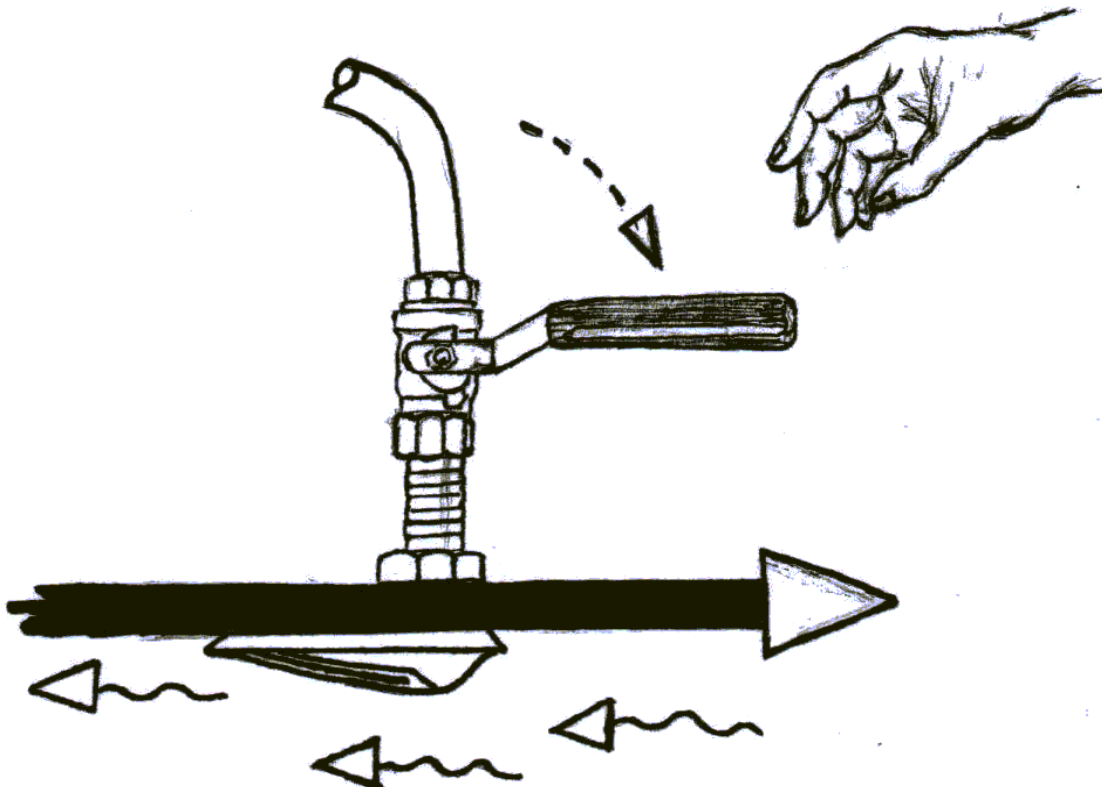
- Sea water intake oriented towards sailing direction, causing a dynamical pressure that, when the generator is not running, let flow sea water through the cooling pump, reaching the exhaust pipe and consequently the engine exhaust valve, flooding the cylinder and the oil sump.



- On a high speed motorboat, a neutral flush hull mounted water intake can cause as well dynamical pressure due to the hull gradient compared the sea surface, or the decreased water line level before reaching the proper trim.

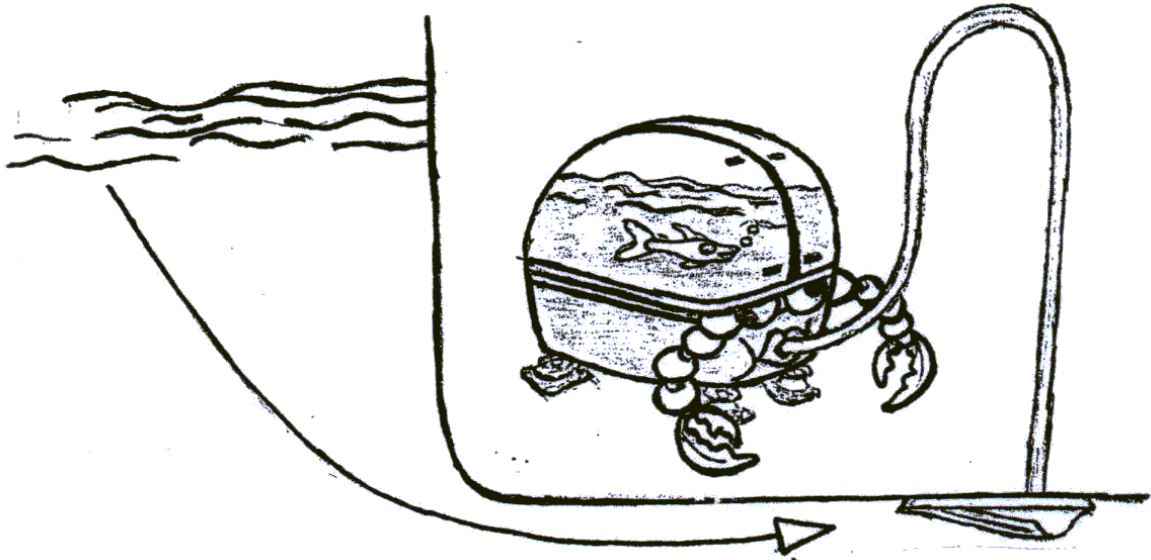


- For avoiding the risk, the water intake entrance must be fitted facing the rear position and even so, in critical sailing conditions the internal valve must be closed when the generating set is not in operation.

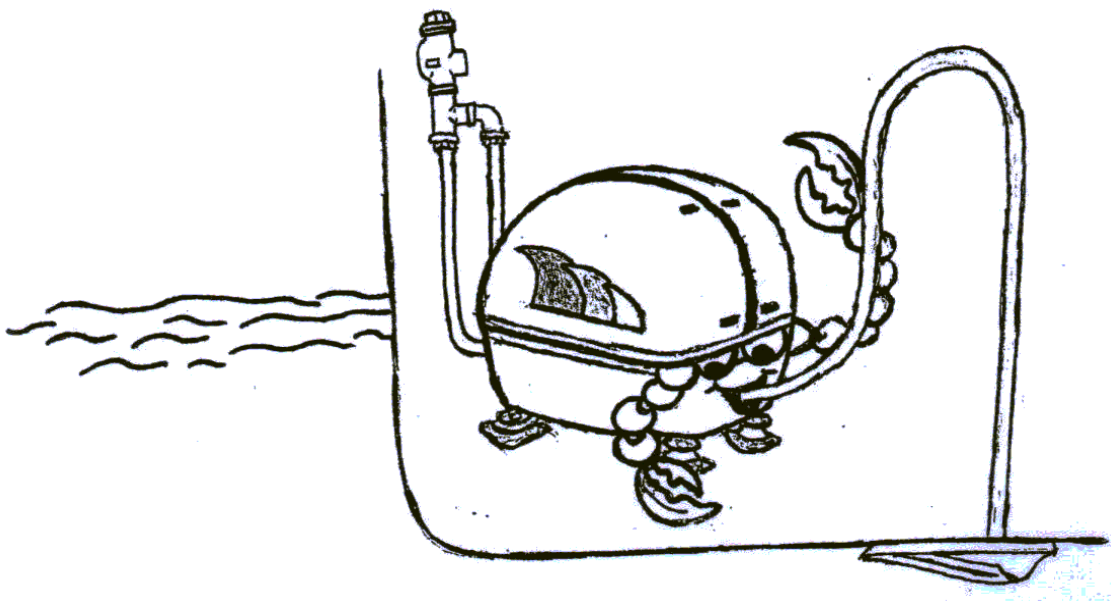


2nd MISTAKE

- Installation below the sea level without a proper cooling pipe goose neck and vacuum siphon break valve.

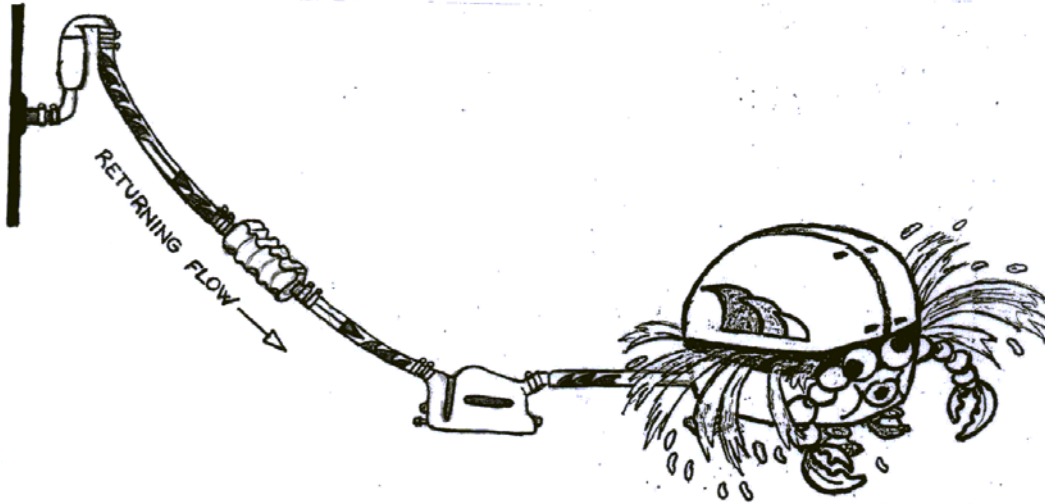


- If the set installation surface is just a little below the external sea water level but can be guessed that while sailing the difference is further increased, must be foreseen an external goose neck pipe with siphon break valve, on the contrary drop by drop an internal leakage through the pump clearance, fills the exhaust pipe with the same above explained result. For relevant level difference the leakage occurs when the boat is not sailing too.
- The vacuum siphonbreak valve must be fitted out of the hood, on a prolonged pipe, as more high as possible and in any case above the sea level, in connection to a cooling pipe at the engine pump delivery side, namely in pressure zone. On the several sets the pipe to be prolonged can be different, but each one chosen at the pump delivery side, is suitable.

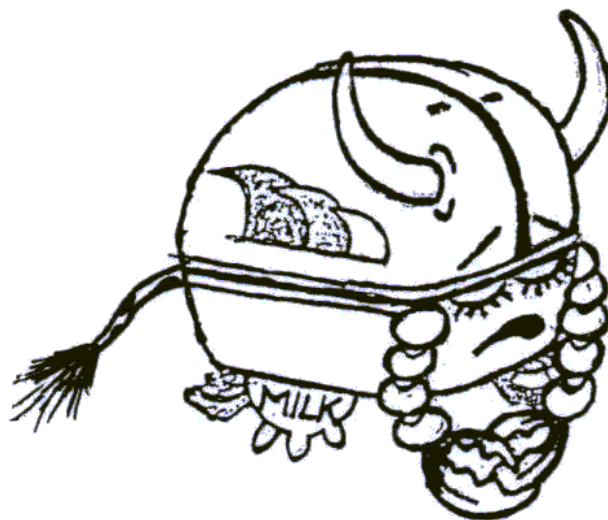


3rd MISTAKE

- An exhaust line trapping too much water for length excess or negative gradient course, that return back into the engine when the set is shut off.



- The first water lock muffler is designed for avoiding that risk, but if fitted not enough lower than the engine manifold either reversing the entrance with the outlet, or of too reduced capacity for the return water volume that has to contain, can be unable avoiding the problem.
- Particular care must be taken in designing the exhaust pipe course, preferring the alternatives that keep self draining towards outside as more pipe stroke as possible.
- In any case, to be sure of a correct and safety installation, especially during the first employment season, check often the lubrication oil integrity watching the engine steak level: a transparent yellow oil if new or a black color if old, mean no water entrance, but an emulsion similar to milk white/yellow not transparent or worst an increased level into the sump mean water flooding.



- Another water presence signal, becomes from starting difficulties as due to some roost on the exhaust valve, the compression does not reach the proper burning value.

Spraying some lubricating oil into the cylinder while insisting with the starter, very often the engine can be started. Better if the operation is made acting on the decompression device, for allowing some free engine revolution for better distributing the oil and adding the flywheel kinetic energy. When started the valve self cleans, but in some cases, of too long time water presence, also the piston rings are locked from roost, so the engine must be opened for repairing.

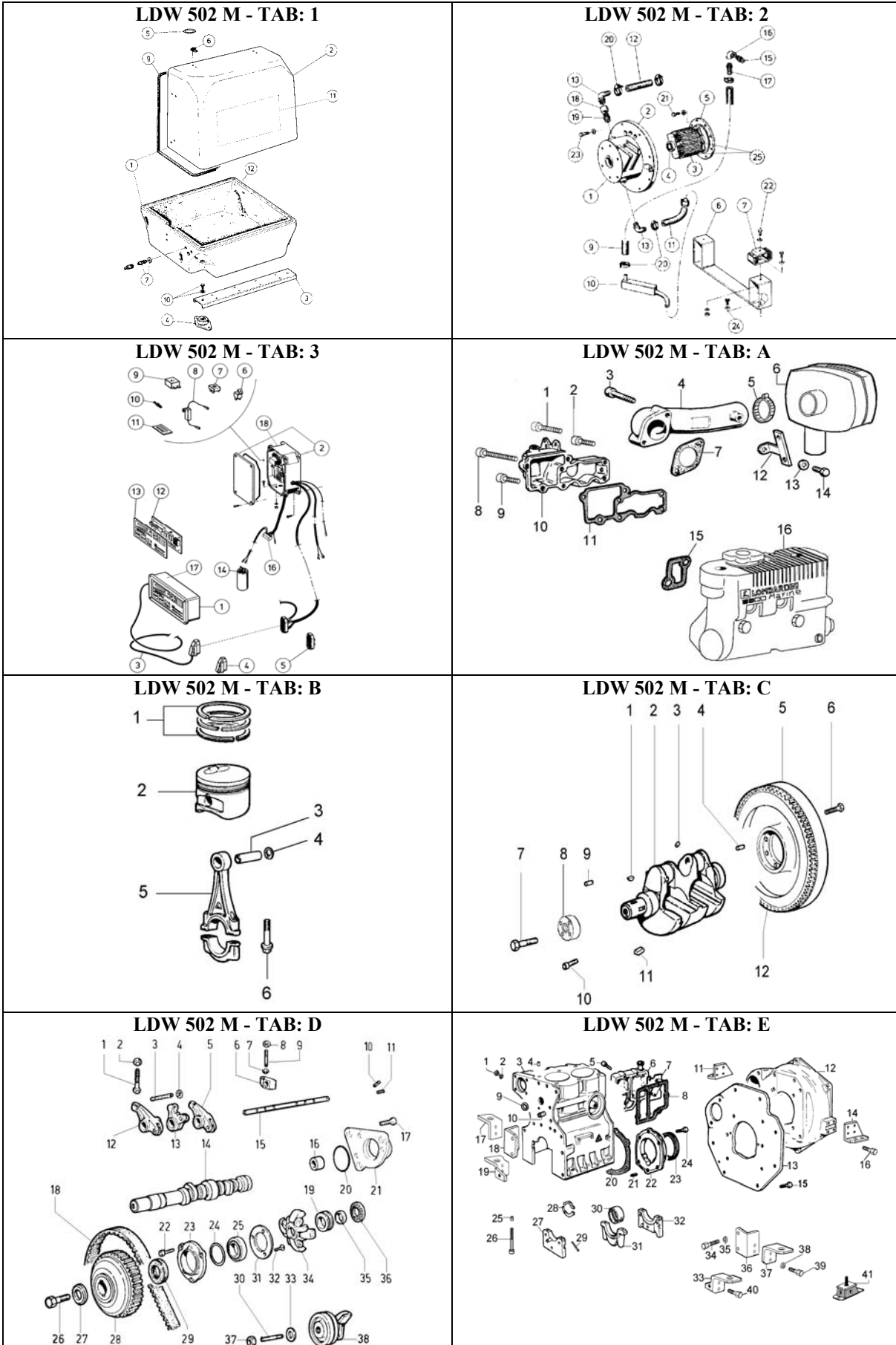
- In some cases the engine does not start for external reasons like lack of fuel, air bubbles, too flat battery. While insisting, the water pump deliver a certain quantity of water, that is not pushed out by the engine exhaust pressure, remaining trapped into the exhaust pipe even if correctly fitted. If that happens, drain the exhaust pipe when giving up the unsuccessful starting operation.

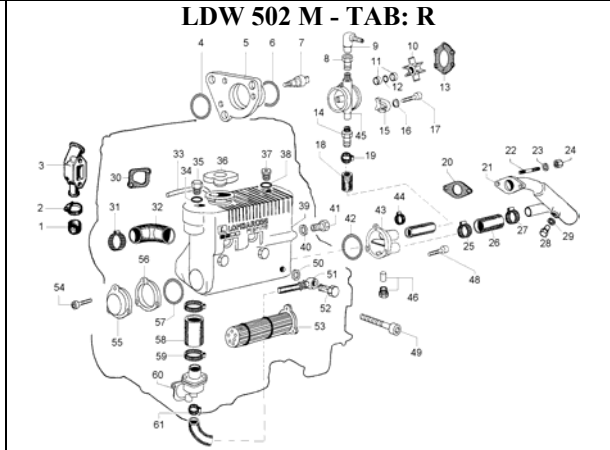
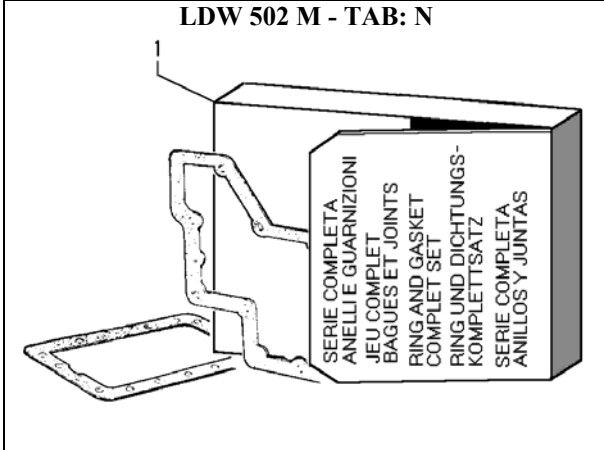
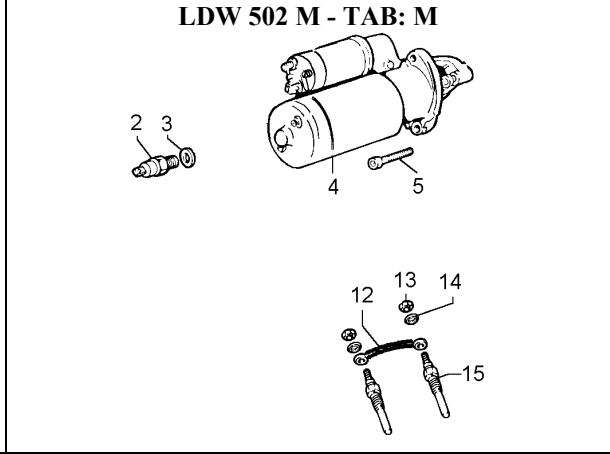
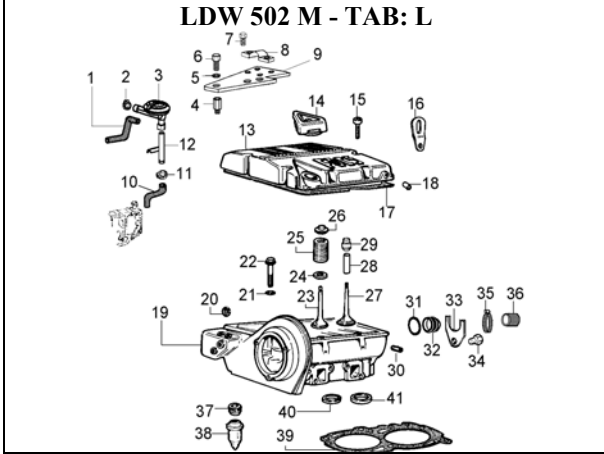
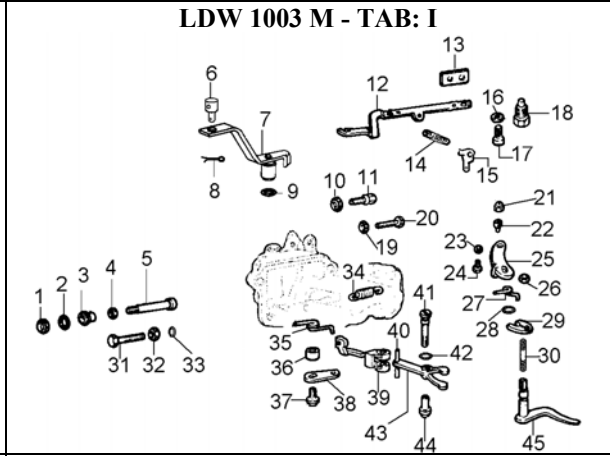
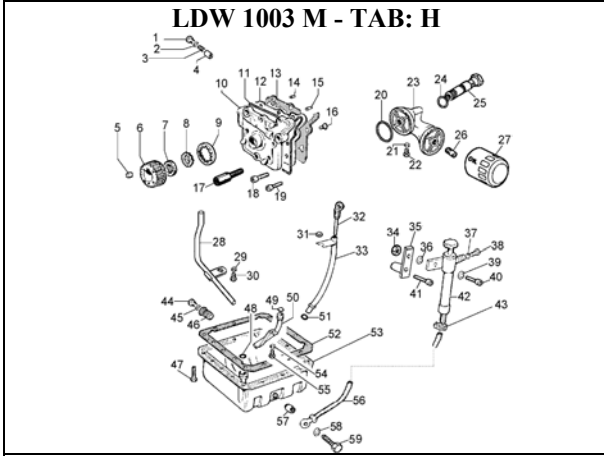
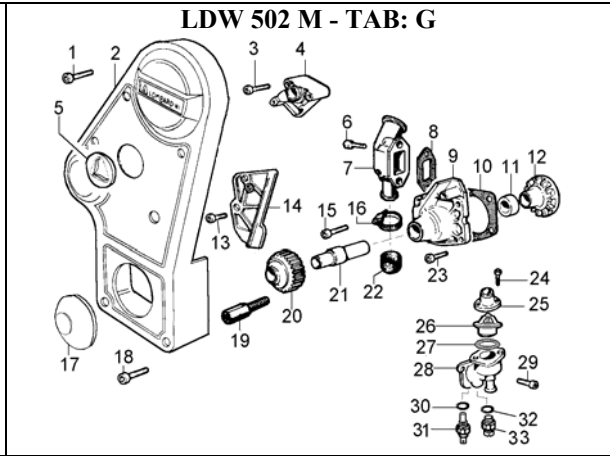
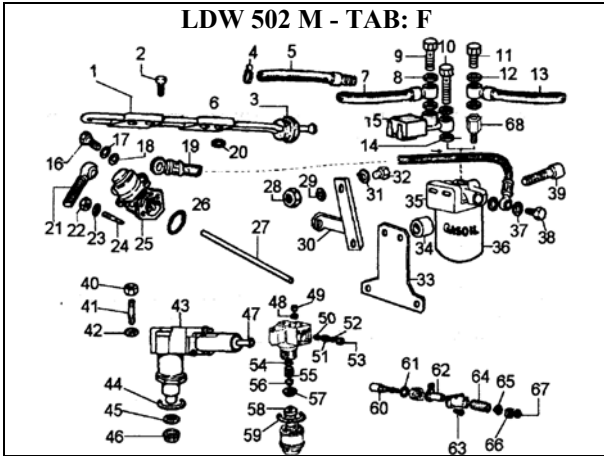
- When the installation is correctly planned and carried on, surveying the result during the first operative season, the generator on board give many troubles operative seasons, requiring lubricating oil and fuel filter replacement only, but there is another up keeping operation that prolong considerably the unit life. It consists in a "wintering" but useful in summer too if the set remains unemployed for more than two months. Due to temperature difference between night and day the water remaining into the exhaust pipe and muffler water lock causes condensation, that on the engine exhaust valve, produces roost. Spraying into the combustion chamber some lubricating oil, and disconnecting the exhaust pipe, moving the piston position by the handle or a flash starting attempt, avoids completely the roost risk for long time.

Consider that on the marine engines employed for the nautical generating sets, there are no critical connections between cooling water and fire zone, so in case of some gasket breakage there is water sprayed out of the engine, around it into the hood and never water entering into the piston or the sump zone.

Our technical staff is in any case at customer's disposal for additional suggestions or solving out of standard cases for getting the complete satisfaction result, that can be always reached putting more attention on the plant, or adding special accessories like a dry exhaust pipe and similar.







Tab	Pos	Number	Description
1	1	6009	Complete soundshield
1	2	6055	Soundshield lid
1	3	6010	External frame 550mm
1	4	6011	External rubber mounts
1	5	4014	Closing o-ring
1	6	4015	Shield hook
1	7	6054	Fuel connection
1	9	6016	Soundshield gasket
1	10	6012	Bolt and wash
1	11	4069	Label
1	12	6064	Soundshield bottom
2	1	6005	Stator with cooling jacket
2	2	6006	Flange
2	3	6002	Rotor
2	4	6004	Ball bearing
2	5	6003	Flexing coupling
2	6	6017	Internal frame
2	7	6020	Internal rubber mounts
2	9	6029	Water hose
2	10	6022	Oil cooler
2	11	6030	Water hose
2	12	6056	Water hose
2	13	6063	Fitting
2	14	6057	Gomito M/F
2	15	6058	Nipples 1/2" - 3/8"
2	16	6059	Gomito 1/2" F/F/fitting
2	17	6060	Fitting
2	18	6061	Fitting connection
2	19	6062	Nipples 1/2"
2	20	6031	Clamp
2	21	6090	Bolt washer
2	22	6091	Bolt washer
2	23	6092	Bolt flange 6x35 mm
2	23	6093	Bolt flange 10x20 mm
2	23	6094	Bolt flange 10x40 mm
2	24	6096	Screw
2	25	6049	Diode
2	25	6050	Zenamic
3	1	4034	Remote control panel
3	2	6038	Electrical box
3	3	4047	10 m cable with connector
3	4	4037	8 poles male connector
3	5	4036	8 poles female connector
3	6	4040	Relè
3	7	4041	Graetz bridge
3	8	4044	Resistor
3	9	6052	Transformer
3	10	4042	Fuse holder
3	11	4043	Fuse (10pz)
3	12	4035	Printed board
3	13	6051	Label
3	14	4039	Capacitor
3	16	4046	Connector
3	17	4048	Gray box
3	18	4053	Safety switch
A	1	9730.032	Screw M8x1,25x45
A	2	9732.063	Screw M8x1,25x35
A	3	9730.259	Screw TCEI M8x50
A	4	8741.162	Air filter support
A	5	3630.152	Clamp
A	6	3700.333	Air cleaner
A	7	4501.081	Gasket
A	8	9730.040	Screw M8x80
A	9	9732.064	Screw M8x30
A	10	2486.265	Inlet manifold
A	11	4420.050	Inl. manifold joint
A	12	.....	See drawing F
A	13	7565.048	Washer d.8
A	14	1770.123	Bolt M8x16

Tab	Pos	Number	Description
A	15	.....	See drawing R
A	16	.....	See drawing R
B	1	8211.143	Ring set +1,00
B	1	8211.142	Ring set +0,50
B	1	8211.141	Ring set std.
B	2	6501.429	Piston set +1,00
B	2	6501.428	Piston set +0,50
B	2	6501.427	Piston set std.
B	3	8480.081	Gudgeon pin
B	4	1261.099	Snap ring
B	5	1526.172	Connecting rod
B	6	1770.101	Bolt
C	1	2280.119	Key
C	2	1050.930	Crankshaft
C	3	9080.132	Pin
C	4	8400.120	in
C	5	9880.938	7" 1/2 flywheel with crown
C	5	9881.259	Flywheel crown
C	6	1780.097	Bolt M10x30
C	6	1780.105	Bolt M10x35
C	7	9865.258	Screw M16x1,5 Sin
C	8	7090.012	Timing pulley
C	9	8430.004	Lock pin
C	10	9732.016	Screw M6x1x40
C	11	2280.145	Key (mm8)
C	12	2816.088	Crown gear
D	1	9850.088	Adj. screw
D	2	3240.008	Nut
D	3	9850.110	Adj. screw
D	4	3240.151	Nut
D	5	6045.110	Rocker arm assembly
D	5	1541.126	Rocker arm
D	6	8615.105	Rock. Arm shaft supp.
D	7	7625.130	Washer
D	8	3240.033	Nut
D	9	6800.088	Stud
D	10	8430.061	Pin
D	11	9080.182	Plug diam.10
D	12	1541.126	Rocker arm
D	13	1541.220	Inj. pump. rocker arm
D	14	1011.259	Camshaft
D	15	6045.086	Rocker arm shaft
D	16	3580.018	Cam
D	17	9730.012	Screw M6x1x20
D	18	2440.343	Cog belt
D	19	5401.205	Control sleeve
D	20	1200.233	Rubber oil seal
D	21	8836.197	Water pump support
D	22	9730.010	Screw M6x1x16
D	23	2690.294	Governor cover
D	24	1202.037	Rubber oil seal
D	25	3001.066	Ball bearing
D	26	9820.142	Screw
D	27	7625.045	Washer
D	28	7090.012	Contr. gear pulley
D	29	1213.303	Seal ring
D	30	6800.033	Stud
D	31	6275.116	Plate
D	32	9800.061	Screw M6x1x16
D	33	7495.010	Washer
D	34	8805.048	Weight support
D	35	1585.085	Sleeve
D	36	3110.127	Thrust bearing
D	37	3240.033	Nut
D	38	4110.009	Jockey pulley
E	1	8965.003	Plug
E	2	4670.060	Copper joint
E	3	1510.653	Crankcase
E	4	1970.140	Dowel

Tab	Pos	Number	Description
E	5	9730.107	Screw M6x1x14
E	6	2610.056	Decanter cover
E	7	.....	See pos. 6
E	8	4431.144	Gasket
E	9	8990.022	Plug
E	10	8430.105	Lock pin
E	11	6429.351	Engine mount
E	12	2032.370	Bell housing SAE 5
E	13	6370.560	Flange
E	14	6429.350	Engine mount
E	15	1770.127	Bolt M8x1,25x14
E	16	1790.024	Bolt M12x28
E	17	6429.318	Front side eng. mount
E	18	6429.339	Side mount
E	19	6429.349	Engine mount
E	20	4501.100	Gasket
E	21	8400.108	Lock pin
E	22	3790.079	Flange
E	22	3790.078	Flange
E	23	1213.347	Seal ring
E	24	9730.010	Screw M6x1x40
E	25	1970.140	Dowel
E	26	9820.120	Fixing supp. screw
E	27	.....	See pos. 3
E	28	1257.081	Thrust washer std.
E	28	1257.082	Thrust washer +0,10
E	28	1257.083	Thrust washer +0,20
E	29	4400.054	Joint
E	30	1611.189	Support bearing -0,25
E	30	1611.184	Support bearing -0,50
E	30	1611.188	Support bearing -std.
E	31	.....	See pos. 3
E	32	.....	See pos. 3
E	33	6429.348	Engine mount
E	34	1790.024	Bolt M12x28
E	35	7565.013	Washer diam.12
E	36	6429.340	Side mount
E	37	6429.317	Front side eng. Mount
E	38	7565.013	Washer diam.12
E	39	1790.037	Bolt M12x20
E	40	9730.213	Screw 8x25
E	41	8636.150	Silent block
F	1	9375.964	Delivery pipe
F	2	9730.313	Fuel pipe fix.screw
F	3	4750.014	Del. pipe joint
F	4	3630.148	Clamp
F	5	9571.102	Bleeding pipe
F	5	9375.750	Bleeding pipe
F	7	9375.748	Fuel hose
F	8	4670.059	Copper gasket d.10
F	9	1901.115	Union bolt
F	10	1570.045	Union bolt
F	11	1901.032	Union bolt M14
F	12	4670.061	Copper gasket diam.14
F	13	9375.878	Fuel hose
F	14	4670.061	Copper gasket diam.14
F	15	3587.159	Electr-valve
F	16	1901.115	Union bolt
F	17	4670.059	Copper gasket
F	18	4670.059	Copper gasket
F	19	9375.944	Fuel pipe
F	20	1200.286	Ring oil seal 9,25x1,78
F	21	9375.909	Fuel pipe
F	22	3240.164	Nut
F	23	7625.010	Washer
F	24	6780.049	Stud
F	25	6585.080	Feed pump
F	26	1200.087	O ring
F	27	7200.168	Drive rod

Tab	Pos	Number	Description
F	28	3240.033	Nut M10
F	29	7625.019	Washer diam.10
F	30	8760.093	Fuel filter support
F	31	7565.011	Washer diam.10
F	32	1780.115	Bolt M10x1,5x30
F	33	8760.094	Fuel filter support MG
F	34	4670.061	Copper gasket
F	34	3521.052	Spacer
F	35	3730.080	Fuel filter
F	36	2175.045	Fuel filter element
F	37	4670.061	Copper gasket diam.14
F	38	1901.032	Union bolt M14
F	39	9731.088	Screw M10x50
F	40	3240.018	Nut
F	41	6780.135	Stud
F	42	7555.029	Washer
F	43	6590.307	Nozzle-injection pump
F	44	1200.213	Ring oil seal 26,70x1,78
F	45	4670.082	Copper joint
F	46	5989.007	Spark arrestor
F	47	1410.112	Tapped
F	48	4760.038	Gasket
F	49	9680.037	Bleeding valve
F	50	7470.007	Filler
F	51	5801.274	Inlet valve spring
F	52	4760.015	Valve gasket
F	53	9672.107	Delivery valve
F	54	8335.148	Adj. spacer 1,40
F	54	8335.151	Adj. spacer 1,10
F	54	8335.152	Adj. spacer 1,00
F	54	8335.149	Adj. spacer 1,30
F	54	8335.146	Adj. spacer 1,60
F	54	8335.145	Adj. spacer 1,70
F	54	8335.144	Adj. spacer 1,80
F	54	8335.143	Adj. spacer 1,90
F	54	8335.150	Adj. spacer 1,20
F	54	8335.147	Adj. spacer 1,50
F	55	5625.011	Pression spring
F	56	1420.048	Drive rod
F	57	3527.220	Spacer
F	58	6531.436	Nozzle
F	59	1200.287	O ring 25,12x1,78
F	60	6578.211	Plunger
F	61	1200.277	O ring oil seal 20,35x1,78
F	62	5375.017	Shim
F	63	9730.206	Screw TCEI M4x12
F	64	5755.113	Spring
F	65	6410.096	Lower retainer
F	66	7215.101	Push-rod
F	67	1241.009	Circlip d.19
F	68	3527.428	Spacer
F	80	7330.314	Racc. in termelettrostop con riarmo
F	81	7330.315	Racc. M14x1,5 ogiva per tubo D.10
G	1	9730.231	Screw M6x1x30
G	2	6927.322	Pulley guard
G	3	9730.031	Screw M8x1,25x40
G	4	8850.031	Jockey pulley support
G	5	9000.134	Plug
G	6	9730.016	Screw M6x1x35
G	7	3866.107	Union flange
G	8	4501.074	Gasket
G	9	6584.438	Water pump
G	10	4580.083	Pump body joint
G	11	.....	See pos.9
G	12	.....	See pos.9
G	13	9732.064	Screw M8x1,25x30
G	14	3800.031	Flange
G	15	9732.063	Screw M8x1,25x35
G	16	3630.147	Clamp

Tab	Pos	Number	Description
G	17	9000.130	Plug
G	18	9730.279	Screw M6x1x40
G	19	.....	See drawing H
G	20	.....	See pos.9
G	21	.....	See pos.9
G	22	9080.214	Plug
G	23	9732.074	Screw M8x1,25x20
G	24	9732.074	Screw M8x1,25x20
G	25	2750.279	Thermostat cover
G	26	9195.057	Thermostat
G	27	1200.091	O ring
G	28	4896.208	Thermostat assy
G	29	9732.064	Screw M8x1,25x30
G	30	4670.061	Copper gasket d.14
G	31	9195.077	Sensor
G	32	4670.061	Copper gasket
G	33	9195.077	Thermostat
H	1	9015.005	Plug
H	2	4670.060	Joint
H	3	5625.008	Spring
H	4	6495.045	Drive rod
H	5	.....	See pos. C 11
H	6	6975.292	Driving pulley
H	7	1213.343	Seal ring 35x50x6
H	8	.....	See pos.21
H	9	.....	See pos.21
H	10	6605.096	Oil pump ass.y
H	11	1200.292	o-ring/rubber oil seal
H	12	.....	See pos. C 10
H	13	4580.176	Gasket
H	14	8400.106	Lock pin
H	15	8400.108	Lock pin
H	16	9800.061	Screw M6x1x16
H	17	9865.174	Hollowstud
H	18	9732.064	Screw M8x1,25x30
H	19	9732.074	Screw M8x1,25x20
H	20	1202.036	o-ring/rubber oil seal
H	21	4670.061	Washer
H	22	9040.012	Bolt
H	23	8900.557	Oil filter support
H	24	1200.219	o-ring/rubber oil seal
H	25	7330.302	Union
H	26	7265.021	Oil filter connect.
H	27	2175.107	Oil filter element
H	28	9485.213	Oil return tube
H	29	7645.006	Washer
H	30	1760.130	Bolt
H	31	7625.012	Washer
H	32	1400.219	Oil dipstick
H	33	9330.088	Dipstick tube
H	34	3240.140	Nut
H	35	8545.594	Spacer
H	36	7565.048	Washer
H	37	4670.058	Copper gasket
H	38	1770.129	Bolt M8x12
H	39	7625.209	Washer
H	40	1770.123	Bolt M8x16
H	41	9730.259	Screw M8x50
H	42	6595.020	Filter oil pump
H	43	3630.129	Clamp
H	44	9040.024	Bolt
H	45	4670.088	Washer
H	46	4170.044	Nut
H	47	1760.130	Screw M6x1x12
H	48	1200.030	Rubber oil seal
H	49	1200.274	Rubber oil seal 8,00
H	50	9485.214	Scavenge oil pipe
H	51	1200.034	Rubber oil seal
H	52	4431.130	Gasket

Tab	Pos	Number	Description
H	53	6645.550	Oil pan
H	54	7625.008	Washer
H	55	1760.130	Bolt M6x1x12
H	56	9320.141	Suction pipe
H	57	3527.441	Grilled spacer
H	58	4670.061	Copper gasket 14x19x1,5
H	59	1901.119	Union bolt M14
I	1	3240.153	Nut
I	2	4670.062	Copper joint
I	3	4190.109	Nut
I	4	4480.046	Ring gasket
I	5	8576.077	Extra fuel device
I	5	8576.076	Extra fuel device
I	6	2501.104	Hollowstud
I	7	5200.753	Ext.lever
I	7	5200.856	Ext.lever
I	8	2800.079	Split pin
I	9	1200.052	Rubber oil seal
I	10	3240.008	Nut
I	11	9180.011	Wire end
I	12	1380.066	Connecting rod
I	13	6320.048	Plate
I	14	5655.256	Device spring
I	14	5655.257	Device spring
I	15	6370.331	Stop plate
I	16	7626.037	Washer
I	17	9732.096	Screw M3x0,5x6
I	18	9865.202	Screw M3x0,5x10
I	19	3240.008	Nut
I	20	1760.128	Adjusting bolt
I	21	3203.077	Nut M4
I	22	6000.049	Nut
I	23	7626.017	Washer
I	24	1755.001	Bolt M5x0,8x8
I	25	5200.414	External lever
I	26	3240.008	Nut
I	27	5660.047	Return spring
I	28	1200.051	Rubber oil seal
I	29	6275.114	Stop plate
I	30	6760.044	Stud M6x7
I	31	1760.128	Adjusting bolt
I	32	3203.074	Nut
I	33	4670.062	Copper joint
I	34	5655.210	Control spring
I	34	5655.185	Control spring
I	35	5660.065	Return spring
I	36	1957.009	Aleve
I	37	1760.081	Screw
I	38	5200.674	Internal lever
I	39	.....	See pos 43
I	40	6140.420	Journal
I	41	6110.101	Control lever pin
I	41	6110.107	Control lever pin
I	42	1200.037	Rubber oil seal
I	43	4896.360	Control lever
I	43	4896.330	Control lever
I	44	.....	See pos.43
I	45	5200.413	Internal lever
L	1	5365.076	Tube
L	2	3630.145	Clamp
L	3	9680.034	Pressure valve
L	4	2501.102	Hollowstud
L	5	7565.004	Washer
L	6	1760.115	Bolt M6x12
L	7	.....	See pos.8
L	8	6370.285	Plate
L	9	8490.114	Bracket
L	10	5365.075	Drain pipe
L	11	3630.145	Strip fixing

Tab	Pos	Number	Description
L	12	9599.165	Union pipe
L	13	2125.273	Rocker arm cover
L	14	9032.061	Oil filler cap
L	15	9730.012	Screw M6x1x20
L	16	8545.190	Lifting brace
L	17	4400.055	Gasket
L	18	9080.132	Plug diam.6
L	18	9080.133	Plug diam.8
L	19	9200.506	Cylinder head
L	20	8990.047	Plug diam.18
L	21	7625.130	Washer
L	22	9820.119	Special screw
L	23	9685.105	Exhaust valve
L	24	7625.185	Washer
L	25	5755.005	Valve spring
L	26	6410.017	Spring retainer
L	27	9652.101	Intake valve
L	28	4845.200	Valve guide +0,50
L	28	4845.220	Valve guide std.
L	29	4535.015	Gasket
L	30	9080.132	Plug d.6
L	31	1200.081	Rubber oil seal
L	32	9065.007	Union
L	33	5570.019	Retainer
L	34	1770.127	Bolt M8x14
L	35	3630.147	Clamp
L	36	9080.191	Plug
L	37	4130.096	Nut
L	38	6725.029	Precomb. Chamber
L	39	4730.591	Head gasket 1,45
L	39	4730.592	Head gasket 1,55
L	39	4730.593	Head gasket 1,65
L	40	8000.121	Intake v.seat
L	41	8000.122	Exhausting v. seat
M	2	6745.050	Pressure switch oil
M	3	4670.060	Copper gasket
M	4	5840.196	Start. Engine Bosh
M	5	9730.044	Screw M10x1,5x25
M	12	2185.548	Connection wire
M	13	3240.005	Nut
M	14	7626.066	Washer
M	15	2100.077	Glow plug
N	1	8205.072	Ring and gasket com
R	1	9080.214	Plug
R	2	3630.147	Clamp
R	3	.....	See drawing G
R	4	.....	See drawing D
R	5	.....	See drawing D
R	6	1200.233	Rubber oil seal
R	7	4240.044	Water pump coupling
R	8	5953.072	Nipple 1/2" - 3/4"
R	9	7330.284	Union 90 (Johnson - Jota Jabsco)
R	10	4200.193	Impeller (Johnson - Jota)
R	10	4200.204	Impeller (Jabsco)
R	11	8150.028	Ring set (Johnson - Jota)
R	11	8150.032	Ring set (Jabsco)
R	12	.....	See pos. 11
R	13	4775.498	Gasket (Johnson -Jota-Jabsco)
R	14	7330.245	Union (Johnson -Jota-Jabsco)
R	15	1557.098	Pump nut Johnson-Jabsco
R	16	7555.030	Washer
R	17	9730.220	Screw M8x20
R	18	9602.170	Union pipe
R	19	3630.111	Clamp
R	20	4501.098	Gasket
R	21	9543.069	Exhaust gas tube (6023 V.T.E.)
R	22	6780.142	Stud M8x18
R	23	7565.048	Washer
R	24	3240.140	Nut

Tab	Pos	Number	Description
R	25	3630.111	Clamp
R	26	9602.100	Union pipe
R	27	3630.111	Clamp
R	28	9040.012	Plug M14
R	29	4670.061	Copper gasket d.14
R	30	4420.070	Exhaust gasket
R	31	3630.128	Clamp
R	32	9340.017	Water pipe
R	34	9580.045	Breather pipe
R	35	8965.004	Plug
R	36	9000.114	Radiator cap
R	37	1770.123	Plug M8x16
R	38	4670.059	Copper gasket
R	39	7350.159	Cooling radiator "Mota"
R	40	4670.061	Copper gasket d.14
R	41	9040.012	Plug
R	42	1200.265	O ring
R	43	.....	See pos.39
R	44	3630.111	Clamp
R	45	6584.245	Water pump Johnson
R	45	6584.396	Water pump Jabsco
R	46	9080.215	Zinc plug
R	48	9730.211	Screw M6x16
R	49	9730.221	Screw M8x100
R	50	4670.061	Copper gasket
R	51	9602.073	Union pipe
R	52	1901.119	Connection bolt
R	53	.....	See pos.39
R	54	9730.211	Screw M6x16
R	55	.....	See pos.39
R	56	.....	See pos.39
R	57	1200.265	Rubber oil seal
R	58	9602.072	Union pipe
R	59	3630.128	Clamp
R	60	See drawing G
R	61	3630.129	Clamp



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