Greenline
± HYBRID

OWNER'S MANUAL

GREENLINE 33

Revision 04 **19-03-2012**

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1. INTRODUCTION

INTRODUCTION FOR THE OWNER'S MANUAL

This manual has been compiled to help you to operate your craft with safety and pleasure. It contains details of the craft; the equipment supplied or fitted its systems and information on its operation. Please read it carefully, and familiarise yourself with the craft before using it.

This owner’s manual is not a course on boating safety or seamanship. If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before "assuming command" of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

Ensure that the anticipated wind and sea conditions will correspond to the design category of your craft, and that you and your crew are able to handle the craft in these conditions.

Even when your boat is categorised for them, the sea and wind conditions corresponding to the design categories A, B, and C range from severe storm conditions for Category A, to strong conditions, for top of category C, open to the hazards of a freak wave or gust, and are therefore dangerous conditions, where only a competent, fit and trained crew using a well maintained craft can satisfactorily operate.

This owner's manual is not a detailed maintenance or trouble shooting guide. In case of difficulty, refer to the boat builder or his representative. If a maintenance manual is provided, use it for the craft's maintenance.

Always use trained and competent people for maintenance, fixing or modifications. Modifications that may affect the safety characteristics of the craft shall be assessed, executed and documented by competent people. The boat builder cannot be held responsible for modifications he has not approved.

In some countries a driving licence or authorisation are required, or specific regulations are in force.

Always maintain your craft properly and make allowance for the deterioration that will occur in time and as a result of heavy use or misuse of the craft.

Any craft – no matter how strong it may be, can be severely damaged if not used properly. This is not compatible with safe boating. Always adjust the speed and direction of the craft to sea conditions.

If your craft is fitted with a life raft, read carefully its operating manual. The craft should have onboard the appropriate safety equipment (lifejackets harness, etc.) according to the type of craft, weather conditions, etc., these equipments are mandatory in some countries. The crew should be familiar with the use of all safety equipment and emergency manoeuvring (man overboard recovery, towing, etc), sailing schools and clubs regularly organise drill sessions.

All persons should wear a suitable buoyancy aid (Life jacket/Personal Floatation Device) when on deck. Note that in some countries it is a legal requirement to wear a buoyancy aid that complies with their national regulations at all times.

This manual is meant to help you enjoy and sail your boat comfortably and safely. It includes hints about the boat, the equipment and systems delivered or installed and operation and maintenance guidance. Before you put to sea, read it carefully if you really want to have fun and avoid damage and trouble. Read carefully and make yourself at home on the boat, before you sail it.

We keep improving our boats as we want you to benefit from technological breakthroughs, new equipment or materials and our own experience; therefore, the characteristics and information provided may vary without notice or updating obligation.

This manual is designed in accordance with the ISO 10240 Standard requirements.

DEGREES OF DANGERS

The following degrees of danger are used in the manual:

DANGER!	Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.
WARNING!	Denotes a hazard exists which can result in injury or death if proper precautions are not taken.
CAUTION!	Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the boat or components.

This is a broad-line manual which may describe equipment or accessories, or address subjects which do not concern your boat; in case of doubt, you should check with the inventory submitted upon delivery of your boat.

If this is your first boat or if you are changing to a boat type which is new to you, before "taking command", get some training on boat control and sailing, to ensure your safety and comfort. Your dealer, international sailing association, or yacht club will be pleased to suggest local sailing schools or professional instructors.

Even if everything has been provided for and designed for the safety of the boat and the safety of her users, do not forget that sailing highly depends on the weather conditions, the sea condition and that only an experienced and very fit crew, handling a well-maintained boat can sail satisfactorily.

The sea and wind conditions that correspond to the design categories (A, B or C) are changeable and are dependent on the hazards of unusually strong waves or gusty winds. Therefore a total safety cannot be guaranteed, even if your boat meets the requirements of a category.

Always listen to the weather forecast before you go out to sea.

Make sure that the sea and wind conditions will correspond to the category of your boat, and that you and your crew are able to handle the boat in these conditions.

The sea and the water are not the natural environment of Man and one has only to respect their laws and strength. Adapt the use you make of your boat to her condition; your boat wears out with time and use.

Any boat, however solid she may be, may be severely damaged if badly used. This is not compatible with a secure navigation. Always adapt the speed and direction of the boat to the conditions of the sea.

The " COLREG ", an international regulation in order to prevent collision at sea, published by the International Maritime Organization, specifies the helm and course regulations, the navigation lights etc.. all over the world. Make sure you know these regulations and you have on board a manual that explain them.

In numerous countries, a licence, an authorization or a training course are requested. Make sure you have this legal authorization before you use the boat.

Always apply to an experienced professional for the maintenance, the assembly of accessories and minor modifications. The written authorization of the builder or of his legal representative is compulsory for the modifications that alter the specifications of the boat particularly the vertical layout of the masses (fitting of radar, change of engine, etc...).

For the essential or optional equipments (engine, electronics ....), please refer to their respective manuals delivered with the boat.

The users of this boat are informed of the following:

- The entire crew must have an appropriate training;
- The boat must not be loaded more than the maximum load recommended by the builder (in particular as for the total weight of the food supplies, of the different equipments that are not supplied by the builder and the weight of the persons on board) and this load must be properly distributed;
- The water of the bilges must be kept at its minimum;
- The stability is reduced when you add some weight in the upper parts;
- In case of rough sea, the hatches, lockers and doors must be closed in order to minimize the risk of water coming in;
- The stability may be reduced when you tow a boat or when you lift heavy weights with the davits or the boom;
- Breaking waves are important dangers to stability;
- The crew must be familiar with the use of all the safety equipment (harness, flares, life- raft, etc...) and the emergency safety handlings (man overboard fishing out, towing, etc...).

PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT."

2. SPECIFICATION & WARRANTIES

SPECIFICATION

Parameter	Symbol	Units	Value
Length			
maximum length	L_{MAX}	m	9,99
length of hull	L_H	m	9,99
length of waterline (at DWL)	L_{WL}	m	9,85
Beam			
maximum beam	B_{MAX}	m	3,49
beam of hull	B_H	m	3,47
beam of waterline (at DWL)	B_{wl}	m	3,07
Depth			
maximum depth	D_{MAX}	m	2,02
midship depth	$D_{LWL/2}$	m	1,86
Freeboard			
freeboard forward	F_F	m	1,56
freeboard midship	F_M	m	1,31
freeboard aft	F_A	m	1,09
Draught			
canoe body draught	T_C	m	0,575
maximum draught (LDC displacement)	T_{MAX}	m	0,750
Height			
air draught (at DWL,excluding antenna)	H_A	m	3,10
Displacement			
volume displacement (at DWL)	V_D	kg	5700
light craft condition mass (LCC)	m_{LCC}	kg	5100
minimum operation condition (MOC)	m_{MCC}	kg	5310
loaded craft mass (LDC)	m_{LDC}	kg	6800
maximum load	m_{MTL}	kg	1700
immersion (at DWL)		kg/cm	209
Engine			
number of engines			1
model			VW SDI 75-5
maximum power at crankshaft		kW(HP)	55(75)
maximum speed of crankshaft		RPM	3600
dry weight		kg	245
model (option)			VW TDI 230-6
maximum power at crankshaft (option)		kW(HP)	175(230)
maximum speed of crankshaft (option)		RPM	4200
dry weight (option)		kg	330
Performance			
maximum design speed (loaded craft)		kts	15
Batteries			
HYBRID (LiPo); (option)		Ah (V)	240(48)
ENGINE (Lead Acid)		Ah (V)	100(12)
SERVICE (AGM)		Ah (V)	130(12)
Tankage			
fuel tank STB		L	250

fuel tank PORT		L	250
water tank STB		L	150
water tank PORT		L	150
water heater		L	25
black tank		L	60
grey tank (option)		L	137
Passengers/Crew			
crew/passengers			8
Certification			
EU RCD category			B ˝Offshore˝

General specifications (ISO8666)

The engine is the main propulsion means of the GREENLINE 33.

Boat builder: **SEAWAY YACHTS – RC NMPT d.o.o.**

Puconci 80

SI - 9201 PUCONCI

SLOVENIA

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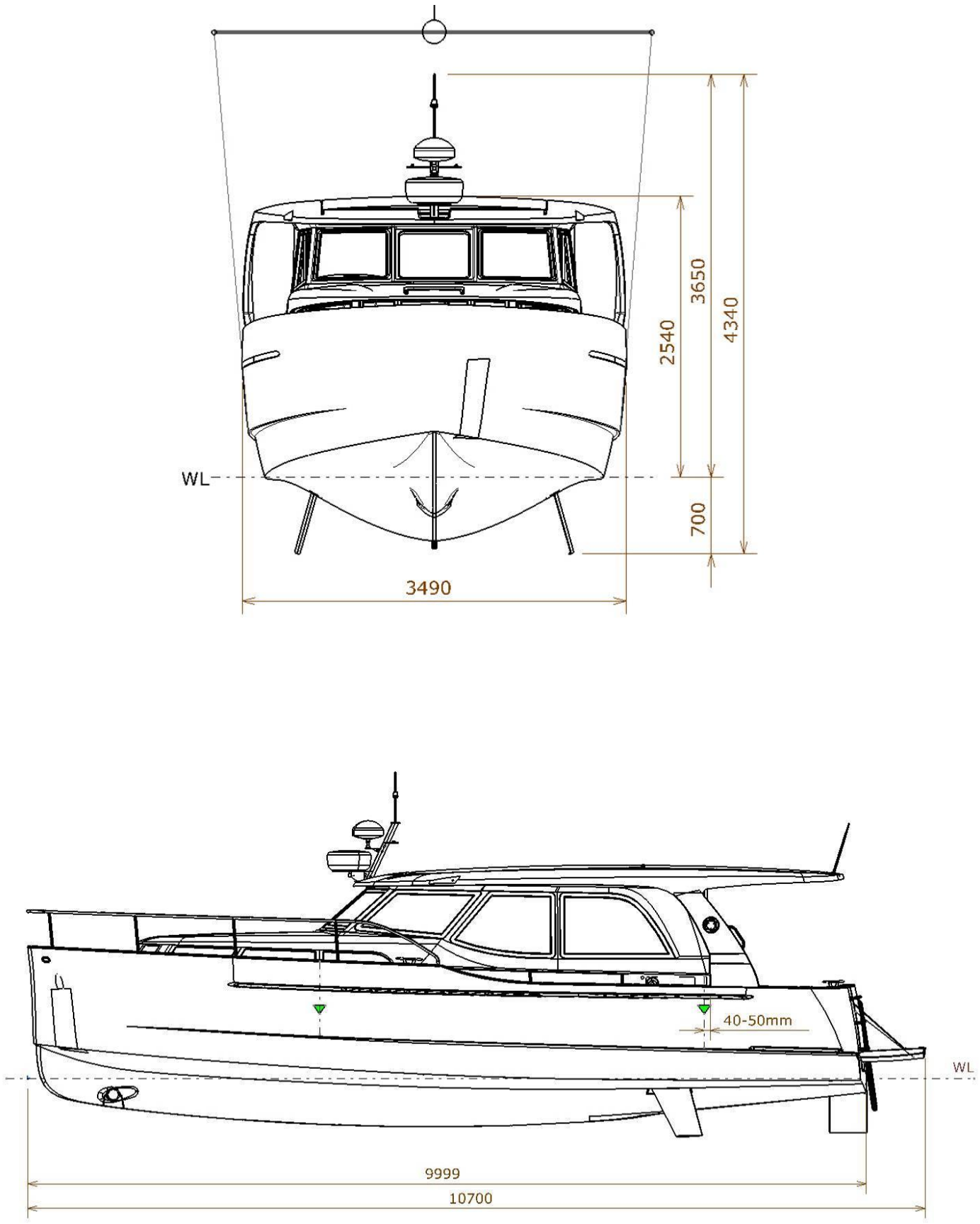

Figure 1: Boat main dimensions

1. GENERAL WARRANTY CONDITIONS*

A. Warranty against osmosis is valid for 5 years

B. Warranty that the yacht is free from defects of workmanship (outfit and installation of systems, structural engineering and lamination) is valid for 2 years under condition that after first 12 months from the delivery the yacht has been examined by the Dealer (Builder) and the warranty hereby extended for the next 12 months.

**see B. DEROGATIONS below.*

2. WARRANTY DETAILS

A. DEFINITONS

The warranty starts from the date of delivery and is strictly limited at the exclusive Builder's discretion to the replacement/repair without indemnification whatsoever of any parts which have been defined as defective by the Builder.

B. DEROGATIONS

However in derogation with the above mentioned GENERAL WARRANTY CONDITIONS are as follows:

1) Warranties on structural elements and workmanship are limited to 1 year with respect to boats used for professional purposes (as charter, fishing, work boats, etc.)

2) Warranty on parts that deteriorate rapidly due to wear and tear, including but not limited to 12 V batteries, external decorations, cushions, hull bottom protection, etc. is limited to 1 year.

C. VALIDITY

The warranty is only valid after the acceptance the Delivery certificate by the Dealer/Agent.

D. CLAIM PROCEDURE

1) NOTIFICATION

In order to be covered by the contractual warranties, the Dealer/Agent must provide a written notification to the Builder accompanied by evidence in form of photo, written report, independent export report or any other document that may assist in assessing the claim. Notification must be detailed and precise and provided within 15 days the defect is discovered.

The failure to notify the Builder within 15 days will result in Dealer's/Agent's liability for the consequences of this delay.

2) TRANSPORTATION

The costs of transporting the boat or any defective part as well as any additional related costs due to impossibility of using the boat and/or her equipment are to be borne exclusively by the Agent/Dealer.

3) EXTENTION OF WARRANTY

The application of any the warranties prolongs the corresponding warranty period for the part or accessory thus repaired or exchanged, during a period equal to the necessary time to perform the warranty work only, provided that said work necessitates at least 7 consecutive days of labour to be performed.

E. NON-WARRANTY CLAIMS

The following and potential consequences thereof are specifically excluded from the warranty:

1) effects of normal wear

2) varying effects of climatic and environmental conditions, airborne chemicals, salt and use conditions

3) gel-coat fissures, cracks or discoloration

4) deterioration of parts that were replaced by inadaptable parts, or from another origin or which were modified or repaired, even partially by a shop not authorized by the Builder

5) damages resulting from:

* non observance of maintenance recommendations as described in the Owner's Manual submitted with the boat or non compliance with the normal rules of boat maintenance;

* improper use, especially negligent, reckless, abusive or abnormal use;

* negligence with regards to the use of protective measures when necessary;

* an accident such as collision or grounding, improper docking or mooring, transportation, sailing in adverse weather conditions, or disaster such as explosion, fire, storm, lightning, riot, theft or shock.

F. EXPANSION OF WARRANTY

The dealers, agents or re-sellers of the Builder are not qualified to modify the above mentioned warranty, but are authorized for their own account and under their sole responsibility to grant other warranties that would in no way be under the Builder's responsibility.

EC Type Examination Certificate

on examination subject to the Directive for Recreational Craft (94/25/EC), amended by 2003/44/EC, as per June 2003

Record-No.:	**92084-2**
Manufacturer:	Seaway Group d.o.o. Pot Na Lisice 2 4260 Bled Slovenia
Manufacturer's marking:	Greenline 33
CIN-No.	SI-SWY 33AEP D 212
Description:	Motor Boat, L_H = 9,99 m, B_H = 3,47 m, T_{max} = 0,75 m
Boat design category:	B - "Offshore"
Module:	B - „EC type-examination", Annex VII of the Directive
Basis of examination:	EN ISO 10087, EN ISO 14945, EN ISO 15085, EN ISO 11591, EN ISO 10240, EN ISO 12215, EN ISO 12217-1, EN ISO 12216, EN ISO 9093, EN ISO 11812, EN ISO 15083, EN ISO 14946, EN ISO 9094-1, EN ISO 10088, EN ISO 10133, EN ISO 13297, EN ISO 10592 and EN ISO 8099
Number of persons recommended:	8
Loaded displacement mass (mLDC), kg:	6800
Maximum load (mMTL), kg:	1700
Maximum rated engine power, kW:	175

Results of examination:

The product described above meets the essential safety requirements of Directive 94/25/EC, amended by 2003/44/EC, Annex I

A.2.1 Craft Identification (CIN) - A.5.8 Discharge Prevention.

Other documentation:

Examination reports Nos. 1/29 to 29/29 including pertinent design documents according to the annex of this certificate.

Hamburg, 2012-03-06

Germanischer Lloyd
EU-Certification for Recreational Craft
Code-No. 0098
Head of Certification Body

(Dirk Brügge)

Figure 2: Boat examination report

INTERNATIONAL MARINE CERTIFICATION INSTITUTE
International Non-Profit Association
Rue Abbé Cuypers 3 / B-1040 Bruxelles / Belgique / +32 2 741 6836 / +32 2 741 2418
www.imci.org / info@imci.org

EC-TYPE EXAMINATION CERTIFICATE

We hereby certify that the product below manufactured by

Volkswagen AG, Volkswagen Marine

Brieflach 7366-Industriestraße-Halle 4-Sektor 20 - D-38231 SALZGITTER - GERMANY

Propulsion engine or engine family

SDI 75-5

Scope	Exhaust Emission
Module type	B
Certificate number	EXVWM002

Specification of engines within family
- SDI 75-5 (55 kW, 3600 Rpm)
- SDI 55-5 (55 kW, 2500 Rpm)

meets the requirements of the Recreational Craft Directive 94/25/EC as amended by 2003/44/EC in accordance with ISO 8178-1

INTERNATIONAL MARINE CERTIFICATION INSTITUTE IMCI BRUSSELS CE

DR.-ING. UDO WOLFF PP.
Ulrich Heinemann (Managing Director)
for EU - Notified Body : 0609
2009-12-01
This certificate is valid for product identified as a
2010 model

References to the relevant standard(s) used are given on the Declaration of Conformity

BELAC NBN EN 45011 accredited organisation - Certificate No 228-PROD

Figure 3: Engine examination certificate (VW SDI 75-5)

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www.imci.org / info@imci.org

EC-TYPE EXAMINATION CERTIFICATE

We hereby certify that the product below manufactured by

Volkswagen AG, Volkswagen Marine
Brieflach 7366-Industriestraße-Halle 4-Sektor 20 - D-38231 SALZGITTER - GERMANY

Propulsion engine or engine family
TDI 165-5

Scope	Exhaust Emission
Module type	B
Certificate number	EXVWM004

Specification of engines within family
- TDI 165-5 (121 kW, 4000 Rpm)
- TDI 150-5 (111 kW, 4000 Rpm)
- TDI 150-5 D (108 kW, 4000 Rpm)
- TDI 140-5 (103 kW, 3500 Rpm)

meets the requirements of the Recreational Craft Directive 94/25/EC as amended by 2003/44/EC in accordance with ISO 8178-1

INTERNATIONAL MARINE CERTIFICATION INSTITUTE IMCI BRUSSELS CE

Ing. Udo Wolff pp.
Ulrich Hellemann (Managing Director)
for EU - Notified Body : 0609
2009-06-19
This certificate is valid for product identified as a
2009 model

References to the relevant standard(s) used are given on the Declaration of Conformity
This document edition #2 supersedes the preceding edition #1, dated 2009.5.27

BELAC NBN EN 45011 accredited organisation - Certificate No 228-PROD

Figure 4: Engine examination certificate (VW TDI 165-5)

Declaration of Conformity of Recreational Craft with the Design, Construction and Noise Emission requirements of Directive 94/25/EC as amended by Directive 2003/44/EC

(To be completed by boat builder)

Name of craft manufacturer: SEAWAY group d.o.o.

Address : Pot na Lisice 2

Town: Bled **Post Code:** SI-4260 **Country:** Slovenia

Name of Authorised Representative (if applicable): _____

Address: _____

Town: _____ **Post Code:** _____ **Country:** _____

Name of Notified Body for design and construction assessment (if applicable): Germanischer Lloyd

Address: Brooktorkai 18

Town: Hamburg **Post Code:** 20457 **Country:** Germany **ID Number:** 0098

ECtype-examination Certificate number: 92084 **Date:** (yr/month/day) 09 / 11 / 06

Name of Notified Body for noise emission assessment (if applicable): _____

Address: _____

Town: _____ **Post Code:** _____ **Country:** _____ **ID Number:** _____

Module used for construction assessment: ☐A ☐Aa ☒B+C ☐B+D ☐B+E ☐B+F ☐G ☐H

Module used for noise emission assessment : ☐A ☐Aa ☐G ☐H

Other Community Directives applied: _____

DESCRIPTION OF CRAFT

Craft Identification Number SI SWY33 _____

Brand name of the craft: GREENLINE 33 **Type or number:** _____

Type of craft:
- ☐sailboat
- ☒motorboat
- ☐inflatable
- ☐other (specify): _____

Type of hull:
- ☒monohull
- ☐multihull
- ☐other (specify): _____

Construction material:
- ☐aluminium, aluminium alloys
- ☒plastic, fiber reinforced plastic
- ☐steel, steel alloys
- ☐wood
- ☐other (specify): _____

Maximum Design Category: A☐ B☒ C☐ D☐

Engine power: **Max. Recommended:** 121kW, **Installed:** 121kW (if applicable)

Length of hull L_A: 9.99m **Beam of hull B_H:** 3.47m **Draught T:** 0.75m

Type of main Propulsion:
- ☐sails
- ☐petrol engine
- ☒diesel engine
- ☐electric motor
- ☐oars
- ☐other (specify): _____

Type of engine:
- ☐outboard
- ☒inboard
- ☐z or sterndrive without integral exhaust
- ☐z or sterndrive with integral exhaust
- ☐other (specify): _____

Deck
- ☒fully decked
- ☐partly decked
- ☐open
- ☐other (specify): _____

This declaration of conformity is issued under the sole responsibility of the manufacturer. I declare on behalf of the craft manufacturer that the craft mentioned above complies with all applicable essential requirements in the way specified (and is in conformity with the type for which above mentioned EC type examination certificate has been issued) – delete text between brackets if no EC type examination certificate has been issued.

Name and function: Janez Grašič (Maneger)
(identification of the person empowered to sign on behalf of the manufacturer or his authorised representative)

Signature and title: _____
(or an equivalent marking)

SEAWAY group

Date and place of issue: **(yr/month/day)** 11 / 01 / 04

ADCO approved - 15 Dec 2005

Figure 5: Declaration of Conformity

Essential requirements (reference to relevant articles in Annex IA & IC of the Directive)	Standards	Other normative document/ methods	Technical file	Please specify in more detail (*: Mandatory Standards)
General requirements (2)	☒			EN ISO 8666:2002 *
Craft Identification Number – CIN (2.1)	☒			EN ISO 10087:2006 *
Builder's Plate (2.2)	☒	☐	☐	EN ISO 14945:2004/AC:2005
Protection from falling overboard and means of reboarding (2.3)	☒	☐	☐	EN ISO 15085:2003
Visibility from the main steering position (2.4)	☒	☐	☐	EN ISO 11591:2000; 11192:2005
Owner's manual (2.5)	☒	☐	☐	EN ISO 10240:2004
Integrity and structural requirements (3)				
Structure (3.1)	☒	☐	☐	EN ISO 12215-5:2008
Stability and freeboard (3.2)	☒	☐	☐	EN ISO 12217-1:2010
Buoyancy and floatation (3.3)	☒	☐	☐	EN ISO 12217-1:2002
Openings in hull, deck and superstructure (3.4)	☒	☐	☐	EN ISO 12216:2002; EN ISO 9093-1:1997;EN ISO 9093-2:2002
Flooding (3.5)	☒	☐	☐	EN ISO 11812:2001; EN ISO 15083:2003; ISO 8849:1990
Manufacturer's maximum recommended load (3.6)	☒	☐	☐	EN ISO 14946:2001/AC:2005
Liferaft stowage (3.7)	☐	☐	☒	Stowage provided/RSG Guidelines
Escape (3.8)	☒	☐	☐	EN ISO 9094-1:2003; EN ISO 12216:2002
Anchoring, mooring and towing (3.9)	☒	☐	☐	EN ISO 15084:2003
Handling characteristics (4)	☐	☐	☐	NA
Engines and engine spaces (5.1)				
Inboard engine (5.1.1)	☒	☐	☐	EN ISO 10088:2009; EN ISO 7840:2004; EN ISO 9094-1:2003
Ventilation (5.1.2)	☐	☐	☒	
Exposed parts (5.1.3)	☐	☐	☒	
Outboard engine starting (5.1.4)	☐	☐	☐	NA
Fuel system (5.2)				
General – fuel system (5.2.1)	☒	☐	☐	EN ISO 10088:2001; EN ISO 7840:2004; EN ISO 9094-1:2002
Fuel tanks (5.2.2)	☒	☐	☐	EN ISO 10088:2001, EN ISO 21487:2006
Electrical systems (5.3)	☒	☐	☐	EN ISO 10133:2000; EN ISO 13297:2000;EN60092-507:2000
Steering systems (5.4)				
General – steering system (5.4.1)	☒	☐	☐	EN ISO 10592:1995
Emergency arrangements (5.4.2)	☐	☐	☒	Emergency tiller provided
Gas systems (5.5)	☐	☐	☐	EN ISO 10239:2000; EN ISO 14895-2003
Fire protection (5.6)				
General – fire protection (5.6.1)	☒	☐	☐	EN ISO 9094-1: 2003
Fire-fighting equipment (5.6.2)	☒	☐	☐	EN ISO 9094-1:2003
Navigation lights (5.7)	☐	☒	☐	1972 COLREGS; prEN ISO 16180
Discharge prevention (5.8)	☒	☐	☐	EN ISO 8099:2000
Annex I.B – Exhaust Emissions	see the Declaration of Conformity of the engine manufacturer			
Annex I.C – Noise Emissions[1]	☐	☐	☐	
Noise emission levels (I.C.1)	☐	☐	☐	
Owner's manual (I.C.2)	☐	☐	☐	

[1] Only to be completed for boats with inboard engines or sterndrive engines without integral exhaust

ADCO approved - 15 Dec 2005

WARNING!	Do not exceed the maximum recommended number of persons. Regardless of the number of persons on board the total weight of persons and equipment must never exceed the maximum recommended load. Always use the seats/seating spaces provided.

WARNING!	When loading the craft, never exceed the maximum recommend load. Always load the craft carefully and distribute loads appropriately to maintain design trim (approximately level). Avoid placing heavy weights high up.

DEFINITION OF THE DESIGN CATEGORIES: CATEGORY B

A boat given design category B is considered to be designed to operate in winds up to Beaufort force 8 and the associated wave heights. Such conditions may be encountered on offshore voyages of sufficient length or on coastal waters when unsheltered from the wind and waves for several dozens of nautical miles. These conditions may also be experienced on inland seas of sufficient size for the wave height to be generated.

BUILDER'S PLATE

Figure 6: Builders certificate plate

REGISTRATION DETAILS

NAME OF BOAT .....

OWNER'S NAME .....

ADDRESS .....

.....

.....

.....

HULL NUMBER .....

CIN CODE .....

REGISTRATION NUMBER .....

ENTRANCE KEY NUMBER .....

ENGINE TYPE .....

ENGINE SERIAL NUMBER .....

GEARBOX SERIAL NUMBER .....

HYBRID DRIVE SERIAL NUMBER .....

ENGINE KEY NUMBER .....

DATE OF DELIVERY .....

COMMISSIONING DISTRIBUTOR

NAME OF DISTRIBUTOR .....

ADDRESS .....

.....

.....

.....

TELEPHONE NUMBER .....

FAX NUMBER .....

3. SAFETY

LIFE RAFT STORAGE

1	*Swimming ladder (means of comming back onboard)*
2	*Position of the liferaft (not supplied)*

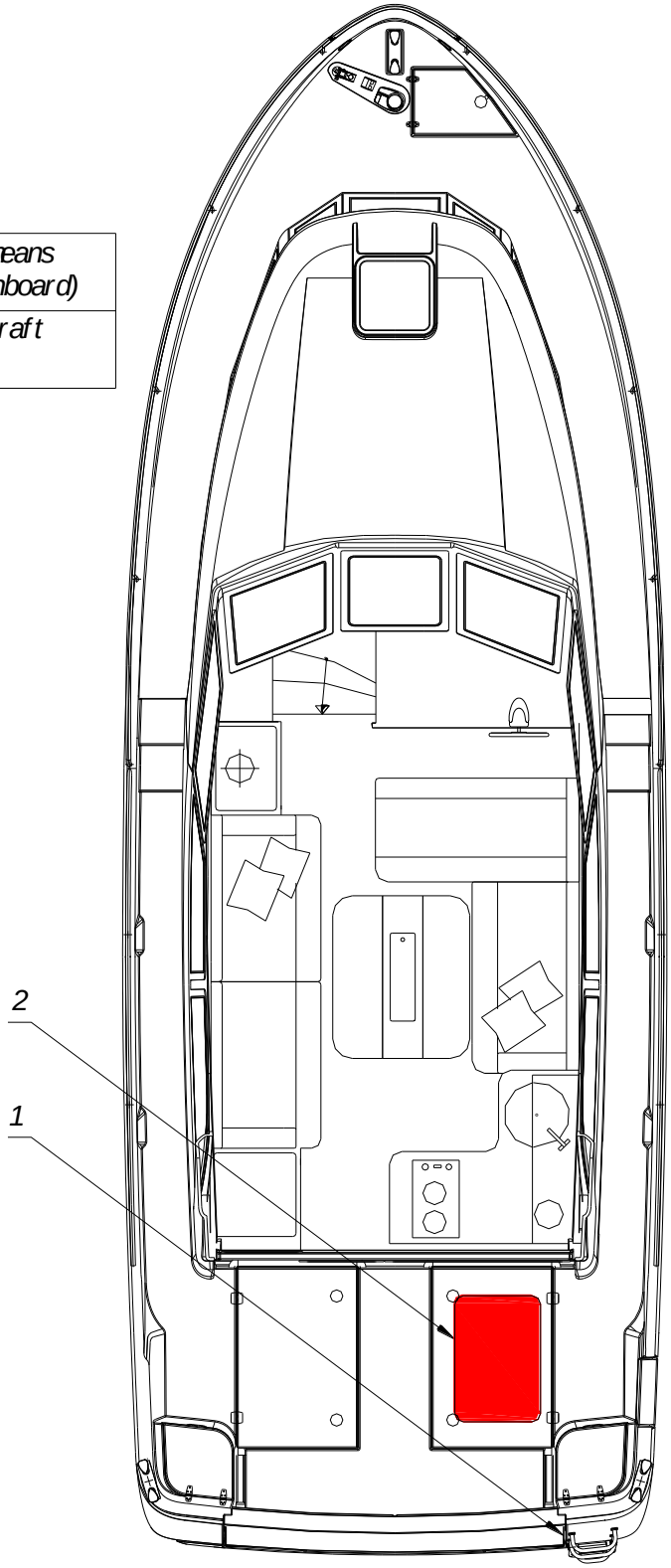


Figure 7: Liferaft storage location

RECOMENDATION!

The launching procedure is indicated on the raft and should be read carefully before putting to sea.

WARNING!	Check the safety equipments inventory before each trip.

RECOMENDATION!

We advise you to close the deck hatches and portholes before each trip.

We advise you the following: Do not store anything below the floorboards.

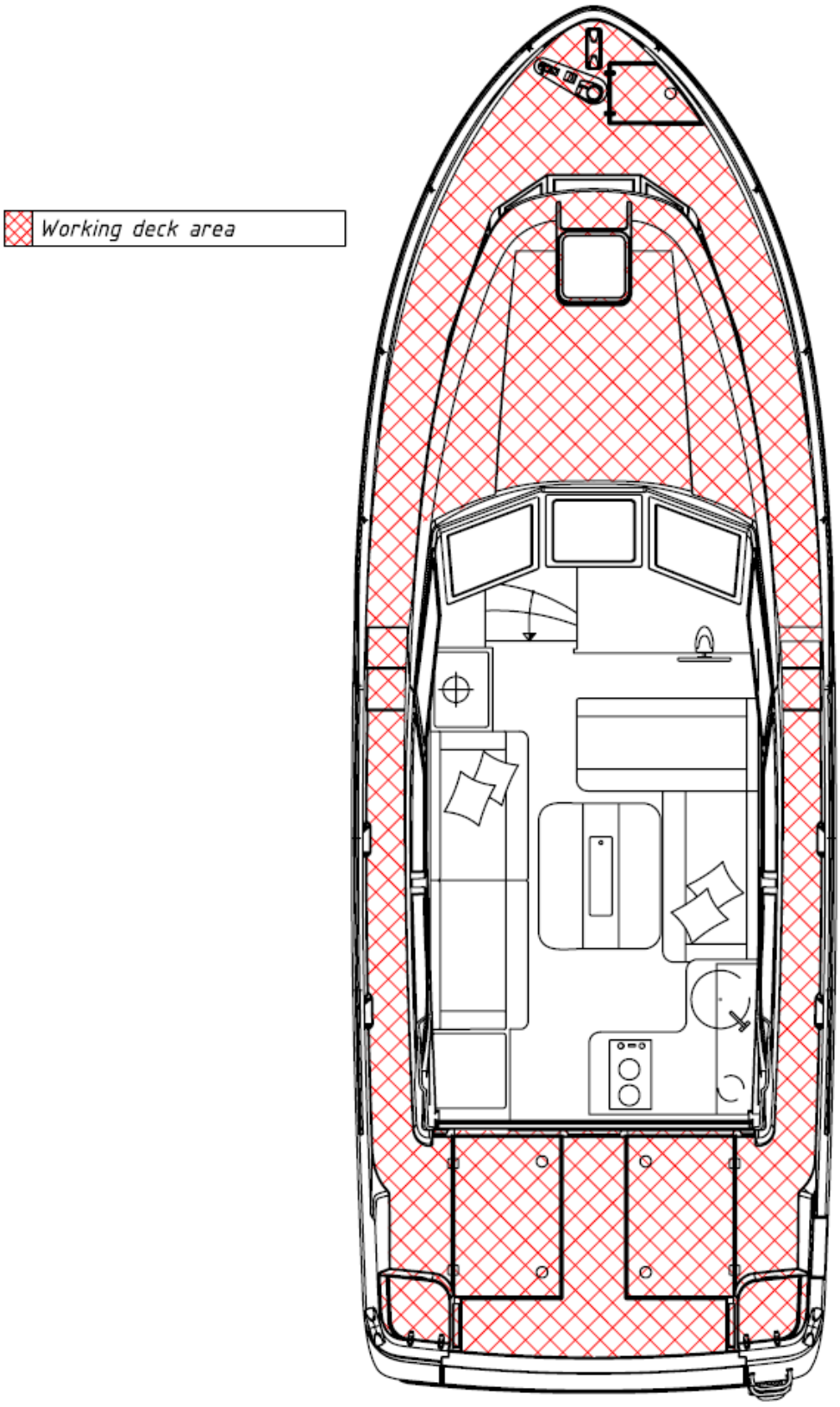


Figure 8: Working deck area plan

1	Gas cylinder
2	Ventilated gas cylinder compartment
3	Gas hose
4	Gas circuit valve
5	Gas cylinder valve
6	Cooker-oven

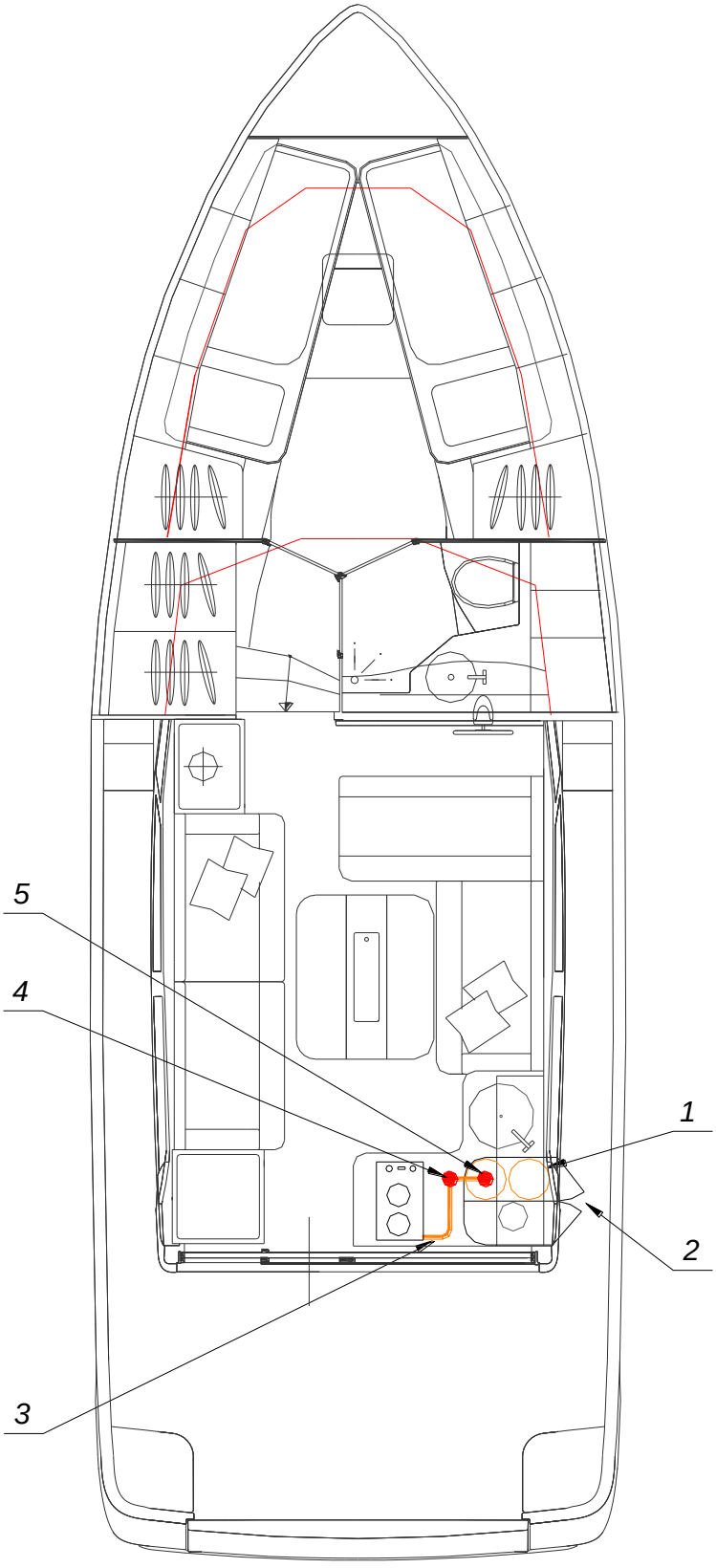


Figure 9: LPG system plan

Shut the valves in the system and on the cylinder when the appliances are not in use. Close the valve before any change of cylinder and immediately in case of emergency. Never leave appliances burning unattended.

Do not fit or store flammable materials above or over the stove (curtains, papers, napkins, and so on...).

Be sure that the valves of the appliances are turned off before you turn on the valves of the gas cylinder or of the hoses.

If you smell gas or find that the burners have gone out, by accident (although appliance models cut off automatically if the flames go out) turn off the gas taps and do ventilate the boat in order to get rid of any residual gas. Find the cause of the problem.

Regularly test the gas system for leaks.

Shut the appliance valves and open the cylinder and check all connections for leaks with soapy water or a detergent solution. In case of leak, shut the cylinder valve and repair before using the cylinder again.

The appliances burns oxygen in the cabin and releases combustion gases, therefore ventilation is mandatory when the appliances are used.

Don't obstruct the ventilation holes and at least leave the door open.

Don't use the oven or cooker for cabin heating.

Immediate access to the gas system components must be unobstructed at all times. Empty cylinders must be disconnected and their valves must be shut. Keep the protective covers, plugs and hatches in place.

Store the empty or spare bottles on the deck or in a locker, if ventilated to the outside. Do not use the gas cylinder storage space to store any other equipment and never store the gas cylinders in another place.

Test the LPG system for leakage regularly. Check all connections for leakage by

- routine observation of the bubble- leak detector (if fitted with a detector),
- observation of the pressure gauge for pressure drop with appliance valves closed and cylinder valve opened, then closed (if fitted with gauge on supply pressure side),
- manual leak testing,
- testing with soapy water or detergent solution (with appliance burner valves closed and cylinder and system valves open).

CAUTION!	Do not use solutions containing ammonia.

WARNING!	NEVER USE FLAME TO CHECK FOR LEAKS

WARNING!	Fuel-burning open-flame appliances consume cabin oxygen and release products of combustion into the craft. Ventilation is required when appliances are in use. Open designated vent openings while appliances are in use. Do not use the stove or oven for space heating. Never obstruct ventilation openings.

WARNING!	Never leave craft unattended when LPG consuming appliances are in use. Do not smoke or use open flame when replacing LPG cylinders.

Pay particular attention to keep in good condition the screw thread of the cylinder on which the regulator is. Check the condition of the regulator every year and change it if necessary. Use a regulator identical to the ones that are fitted. Inspect flue pipes at least annually. Replace if deterioration or openings are found.

Do not use the stove when high angles of rolling or sustained angles of heel are likely (if the craft is not equipped with a gimballed stove). Always apply to an experienced professional for repairs.

DANGER!	It should be noted that gas systems are a potential hazard unless operated properly.

SUGGESTIONS TO SET THE EXTINGUISHERS

The portable extinguishers are not part of the standard equipment.

It is compulsory that the extinguishers are within 5 meters from the centre of each berth.

An extinguisher shall be within 2 meters from the engine fire port.

An extinguisher or a fire blanket (ISO 1869) shall be within 2 meters from each open flame appliance.

An extinguisher shall be within 1 meter from the helm position.

Extinguishers on GREENLINE 33 are positioned as shown on the drawing and are with minimum capacity of 8A/68B.

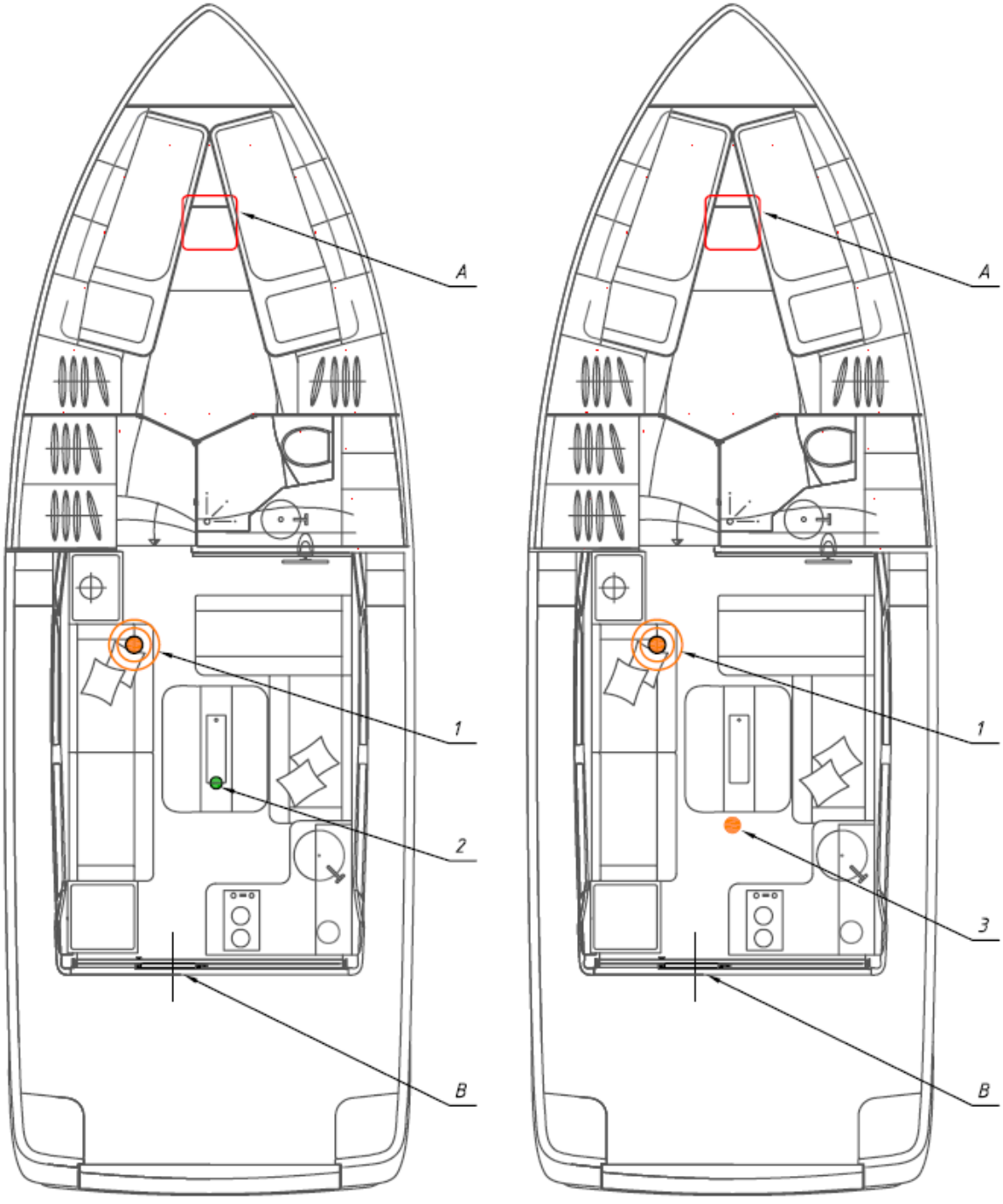
The dealer must remove the security pins on the fixed extinguishers when delivering the boat.

FIRE EXTINGUISHERS POSITIONS

1	Accomodation extinguisher
2	Fire port
3	Engineroom extinguisher

EMERGENCY EXITS

A	Fore cabin hatch
B	Saloon access



a) Standard engine version

b) VW TDI 165-5 engine version

Figure 10: Fire extinguishers positions & Emergency exits

The extinguisher must be located within easy reach and away from possible fire.

The engine compartment includes a fire port to inject the extinguishing agent without opening the normal access hatch.

The engine compartment (if your boat is equipped with engine stronger than 120kW) is fitted with fixed extinguisher with automatically activated control.

Your dealer shall have to take the pin out of the extinguisher on receiving the boat.

Steps to be taken in case of fire in the engine compartment:

- Stop the engine,
- Switch off power and shut the fuel supply and close engine room ventilation,
- Inject the extinguishing agent through the aperture or activate fixed fire Extinguisher (if installed)
- Wait a minute,
- Open the access hatch for access to repairs.

CAUTION!	Keep an extinguisher nearby to react in case the fire should resume.

It is the owner's or the skipper's responsibility:

- To equip the boat with extinguishers.
- To have the extinguishers checked in pursuance of the instructions given.
- To replace the extinguishers by others with an equal or a greater capacity if the extinguishers have expired or are empty

To tell the crew:

- where the extinguishers are and how they work,
- where the emergency exits are.
- Make sure the extinguishers can be reached easily when people are on board.

WARNING!	NEVER: Obstruct the ways to the emergency exits. Obstruct the safety controls (fuel oil valves, gas valves, switches). Block the extinguishers located in the lockers. Leave the boat vacant while a stove or a heater is on. Use gas lamps in the boat. Change the boat systems (electricity, gas, fuel). Fill a tank or change a gas bottle when the engine is running or when a stove or a heater is on. Smoke while handling fuels or gas.

Keep the bilge clean and regularly check if there is fuel or gas vapour.

For the extinguishers you shall use only compatible spare parts; they shall have the same information or they shall be equivalent as far as their technical qualities and their heat resistance are concerned.

See to it that the curtains are not hanging loose close to the stoves or other appliances with an open flame.

The combustible products shall not be stored in the engine compartment. If you store non-combustible products in the engine compartment, they shall be fastened so that they cannot fall onto the engine or block the way.

WARNING!	The CO2 extinguishers shall be used to fight against electric fires only. In order to avoid suffocation, clear the area immediately after use and air before entering.

The boat owner/operator shall:

- have fire-fighting equipment checked at the intervals indicated on the equipment,
- replace portable fire extinguishers, if expired or discharged, by devices of identical fire fighting capacity, and
- have fixed system refilled or replaced when expired or discharged.
-

It is the responsibility of the boat owner/operator:

1. to ensure that fire-fighting equipment is readily accessible when the boat is occupied, and
2. to inform members of the crew about:
   - the location and operation of fire-fighting equipment,
   - the location of discharge opening into the engine space,

- the location of routed and exits.

Cautionary notices to the boat operator

Keep the bilges clean and check for fuel and gas vapours or fuel leaks frequently.

When replacing parts of the fire-fighting installation, only matching components shall be used, bearing the same designation or having equivalent technical and fire-resistant capabilities.

Do not fit free-hanging curtains or other fabrics in the vicinity of, or above, cookers or other open-flame devices.

Do not stow combustible material in the engine space. If non-combustible materials are stowed in the engine space, they shall be secured against falling into machinery and shall cause no obstruction to access into or from the space.

EXPLANATION OF THE SYMBOLS DISPLAYED IN THE CRAFT

Symbol	Colour		Application	Source
	Symbol/Text	Background		
	white	red	Designated place of portable fire extinguisher or locker where it is stowed	ISO 6309:1987: 11
	white	green	Direction to escape	ISO 3864-1:2002, Figure 15
	white	green	Direction to escape	ISO 3864-1:2002, Figure 15
	white	green	Near escape, e. g. escape hatches	ISO 7001:1990, Sheet No. 027
	white	red	To indicate the manual control of a fixed fire-extinguishing system	ISO 6309:1987: 1
	Circular band: red Diagonal bar: red Match symbol: black	white	Near flammable liquids (filler caps, tanks, LPG locker	ISO 3864:1984: B.1.2
NOTE Other symbols may be used as appropriate, preferably from ISO 6309:1987.				

Figure 11: Table of symbols

ELECTRIC BILGE PUMP:

The electric bilge pump can be energized from the electrical switch board. The capacity of the bilge pump is 126 l/min.

Figure 12: Automatic bilge pump with automatic switch

EMERGENCY BILGE PUMP

The control arm of manual bilge pump is located in the port side of the cockpit. The control arm must be accessible permanently. The capacity of manual bilge pump is 60l / min.

Figure 13: Manual bilge pump with integral handle in cockpit

1	Manual bilge pump in cockpit
2	Outlet on vessel's side
3	Automatic bilge pumps
4	Bilge strainer
5	Automatic float switch

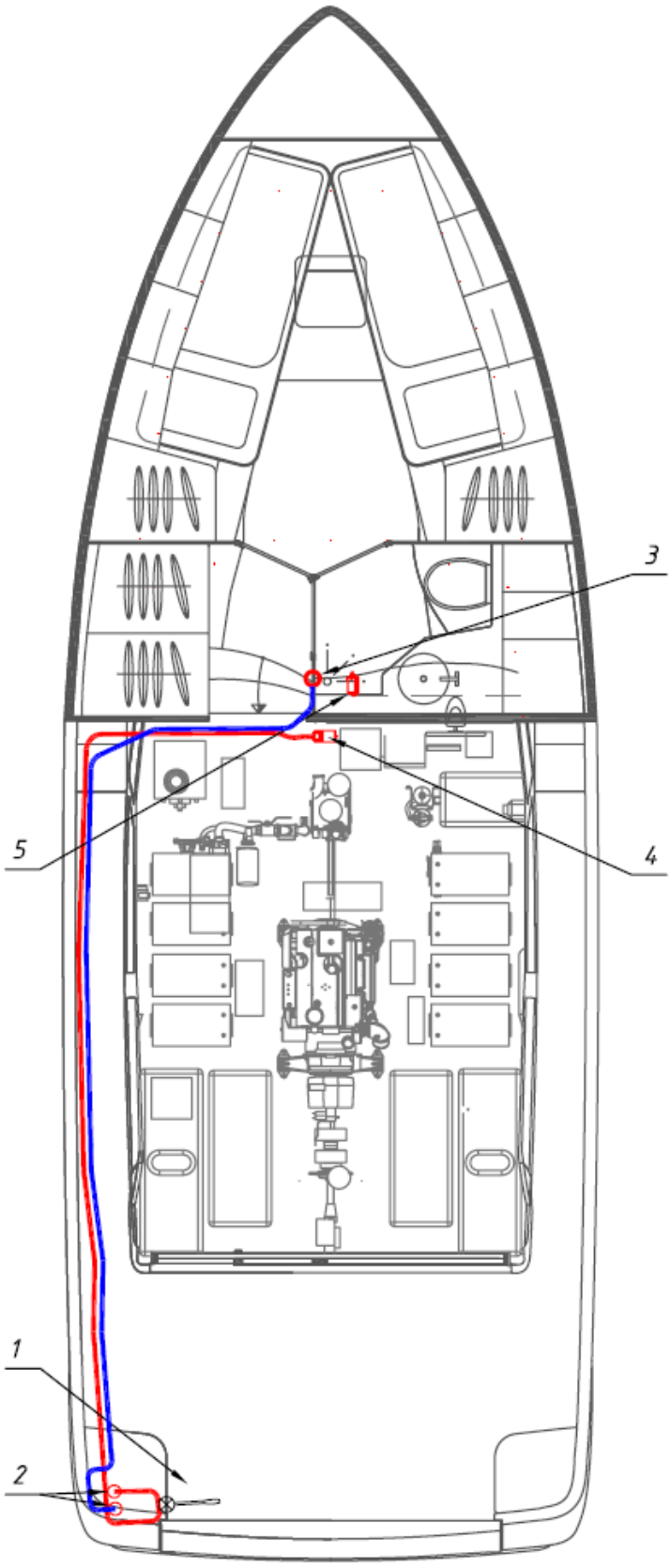


Figure 14: Bilge pump system plan

CAUTION!	Check the function of all bilge pumps at regular intervals. Clear debris from the pump inlets. If fitted, the sea cocks in the fore and aft peak bulkheads shall be kept closed and shall only be opened to let water drain into the main bilges.

WARNING!	The combined capacity of the system is not intended to drain the craft in the case of hull damage.

EMERGENCY CONTROL

In case of damage of the steering system, it is possible to have control on the manoeuvres of the boat using emergency tiller.

Figure 15: Base position for emergency tiller

4. HULL

THROUGH HULL FITTINGS

Pos.	Name
1	Engine sea water intake
2	AC & el. engine cooling water intake
3	WC sea water intake
4	Black water outlet
5	Sump box outlet
6	AC & el. engine cooling water outlet

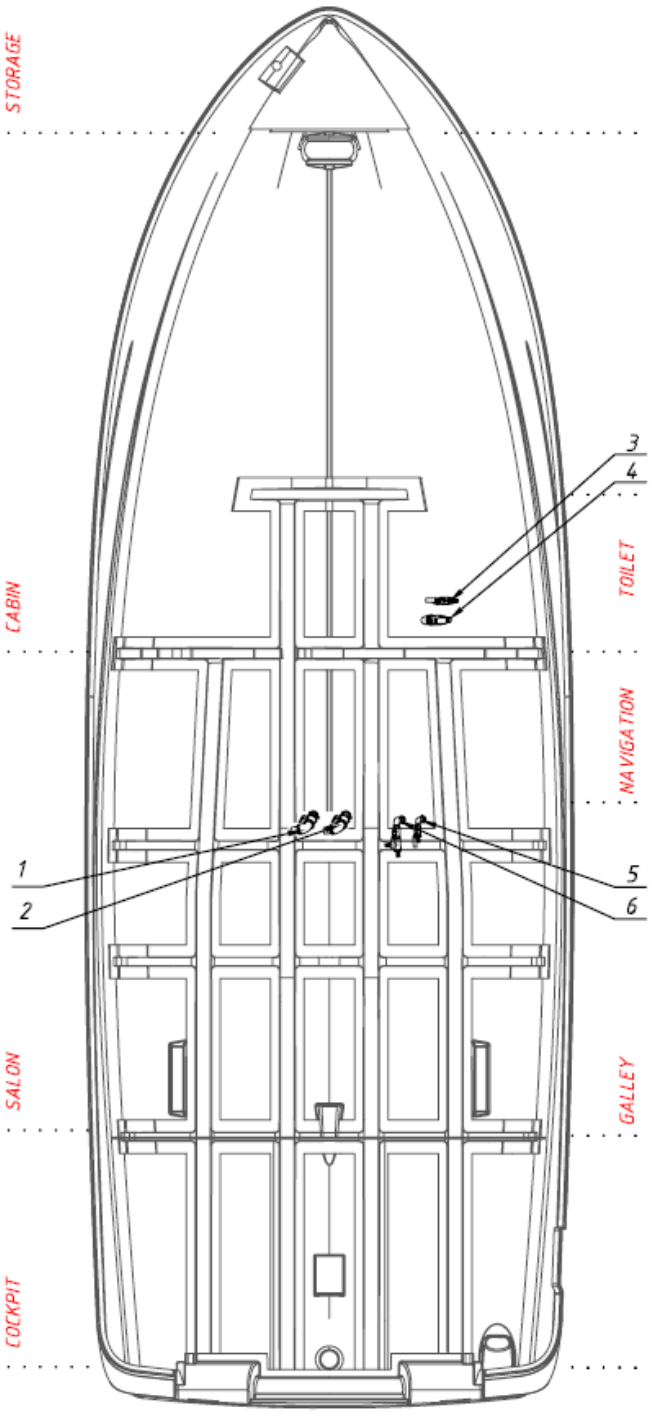


Figure 16: Thru hull fitting positions

SEACOCK

CLOSED VALVE

OPENED VALVE

HULL MAINTENANCE

The equipment and materials of your boat were selected because of their performance and quality, and ease of maintenance; nonetheless, a minimum maintenance will be required to protect your boat from outside attacks (sun, salt, electrolysis...).

Use small amount of cleaner and do not reject them in the sea. Try to wash your boat on shore.

Do not use any solvent or solvent based products.

The hull shall be washed frequently with ordinary cleaners and fresh water.

RECOMENDATION!

We strongly advise you to refrain from using hydro jet cleaning.

Hot water or steam is prohibited.

DRY DOCKING

An annual application of antifouling will spare time-consuming and frequent dry-docking. An epoxy coat is nonetheless recommended. In that respect, we must remind you that sanding or priming before anti-fouling are tantamount to attacking your gel-coat and impair its reliability. Therefore, we recommend very gentle sanding.

Hydrochloric acid may be used against rooted fouling in way of the boot top, allowed to act for 10 minutes and rinsed liberally.

Polish pastes can restore the gloss of your ship. In case of lasting problems, consult your distributor.

Biodegradable cleaners and maintenance products have been tested and approved by the shipbuilder, since they protect both the materials and environment.

RECOMENDATION!

The hull is not designed for an excessive and permanent load on the transom extension (for instance a jet ski, ...)

In this case, there is a risk of water inlet through the engine exhaust.

In that case the engines would be damaged and out of guarantee.

The load limit is determined by a maximum sinking that can be measured when in the marina (Full tanks and no crew onboard).

GEL-COAT REPAIRS INSTRUCTION

MIXING RATIO

Our products include an accelerator; you just have to add the catalyst (colourless liquid). The usual ratio is 2%.

The gel setting-time is about half an hour, curing takes approximately ten hours.

RECOMENDATION!

Successful repairs require two critical factors:

dry weather and temperature between 15° and 25°C.(60°-80°F)

APPLICATION

- To seal off scratches or blister holes, clean the surface with acetone and sand the area,
- Prepare the required amount of gel-coat preferably on a glass plate,
- Apply the product with a spatula or pointed tool,
- Apply an over-sized coat to allow for sanding with abrasive and water and polishing to achieve the required gloss,
- Blending minor touch up on smooth surfaces is obtained by sticking scotch tape (or better still, Mylar tape) on the freshly applied gel-coat, then separate it after curing (sand with extra-fine abrasive and polish to obtain a high gloss finish).
-

WARNING!	The catalyst is a dangerous product and should not be left within children reach. Avoid contact with the skins and mucosa. In case of contact, wash with soapy water and rinse liberally.

GEL-COAT STORAGE

Get-coat components must be stored in a cool place, protected from moisture and light for maximum 6 months, to ensure adequate preservation. The usual precautions for flammable products should be adhered to for polyester products.

TOOLS CLEANING: Clean all tools with acetone.

5. DECK

DECK LAYOUT

1	Mooring cleat
2	Towing
3	Swimmladder

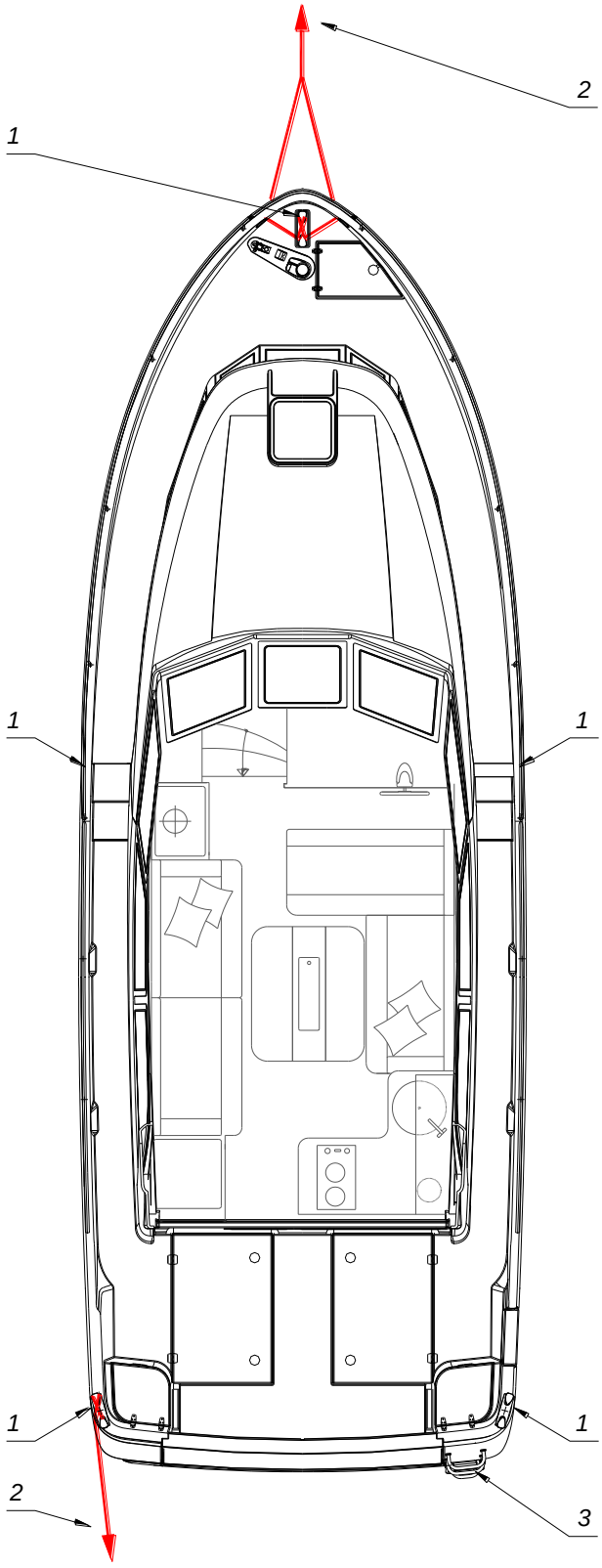


Figure 17: Deck layout

DANGER!	Wear your life-jacket ; In heavy weather, wear the safety harness and hang you on the boat. Keep the transom door(s) closed and padlocked at sea.

MOORING

A sufficient number of mooring ropes, of adequate dimensions and suitable for the environment should be on board.

- Always manoeuvre the boat with the engine,
- Handle the boat consistent with the current and wind,
- Protect the boat with suitably-sized fenders,
- Always keep the ropes unfolded and home,
- Handle the boat at slow speed.

DANGER!	Never try to stop the boat with your foot, your hand or a boat-hook.

When taut:

- Protect the ropes from chafing with plastic sleeves,
- Make allowance for the tide, as the case may be.

TOWAGE

Tug:

Tow slowly and avoid tightening and slackening.

Be especially watchful when sending or catching the tow-line: Propeller may be fouled by a line during these handlings.

Stability can be reduced when towing.

Towed boat:

Keep steering and be careful not to stray from tug's wake.

As a general rule, the chain should be paid out over at least three times the depth of water.

RECOMENDATION!

Before anchoring, check the depth of water, current power and nature of the sea bed.

Figure 18: Anchor winch with chain stopper

ANCHORING:

- Lough the boat through to lose way,
- Pay out.

When anchored:

- Release the chain or cable from the cable-lifter,
- Secure the chain on the cleat.

RECOMENDATION!

Don't use the cable lifter to secure the chain.

HEAVING UP ANCHOR:

- Lock the windlass snubber,
- Ensure that the chain is properly seated in the cable lifter,
- Heave in slowly with the engine. Don't use the windlass to hoist the boat,
- Heave the anchor up to the pipe,
- Check the anchor for position on the bow bracket for changing berth, or secure it into the chain locker,
- With an electrical windlass, switch the power off immediately when the chain is fast.

RECOMENDATION!
Adjust the chain under the windlass sheave and keep your hand away! If your boat is fitted with an electrical windlass, keep the engine running during all — anchoring operations to avoid discharging the batteries. In case of battery failure, perform the manoeuvre manually

STERN ANCHORING:

- Stern anchoring should be performed with the engine stopped,
- Secure the required length of the cable on the mooring cleat,
- Pay out slowly to avoid damaging the propeller or rudder blade.

WARNING!	All windlass operations are dangerous ; therefore, the anchor line shall always be clear and free; Always proceed with care and using gloves.

RECOMENDATION!
After every trip, rinse the windlass and anchor chain with fresh water. Refer to the manufacture's brochure for windlass maintenance before and after the season.

RADAR

RECOMENDATION!
Do not stand up on the fore-deck when the radar is in use. Before any use, refer to the brochure supplied with the boat.

SWIMMING PLATFORM

You have two commands for operating the swimming platform. First is a wireless remote control, second a manual switch located under the port cockpit seat. The platform has no limiting switches so it is recommended for safety reasons that you have visual contact while operating it.

Opening the platform: when platform comes to a horizontal position, stop pushing the command button. Make sure the rope is tight.

Closing the platform: when the platform gets to the end position immediately stop rising the platform. Make sure the rope is not too tight (max 200N). Close the latch on the both sides after closing the platform.

Figure 19: Manual switch for el. platform

Figure 20: Latch on the platform

WARNING!	**When using the platform (UP or DOWN) make sure that platform is free of any obstacles.** **Do not stand on the platform while operating the platform.** **When closing: do not put any subjects between the platform and the hull!** **Max load on the platform is 150 kg**

DECK MAINTENANCE

Do not use any solvent or solvent based products.

Regularly brush the deck with a degreasing shampoo and fresh water.

EQUIPMENT

- Rinse liberally all equipment with fresh water,
- Regularly lubricate all blocks, sheaves, bottle screws, winches, rails and travellers with a water-repellent grease,
- Clean and polish the stainless steel parts that may have small rusty spots or minor oxidation pits (you will find this product in the maintenance case).

OUTSIDE VARNISHED WOOD

- Rinse varnish with degreasing shampoo mixed with fresh water,
- Polish with shammy leather.

OUTSIDE MASSIVE WOOD

- Regularly rinse woodworks with freshwater and scrub with soft brush.
- Dress massive-wood with fine sand paper to restore its colour. Minor deck damages (small abrasions) can be sanded out. Caulking damages is recommended to repair to prevent water ingress into the seams
- Stain can be removed with scrubbing locally across the grain with stiff brush using water and detergent. For heavy duty stains you can use Teak Cleaner. Rinse off thoroughly.
- To reduce wood drying, you can use wood natural's preserving oil ("teak oil").

PLEXIGLASS

- Rinse Plexiglas with fresh water (do not use any solvent base products),
- Brighten up with soft rags soaked in paraffin oil,
- Use special polish paste adhering to remove scratches.

6. ACCOMODATIONS

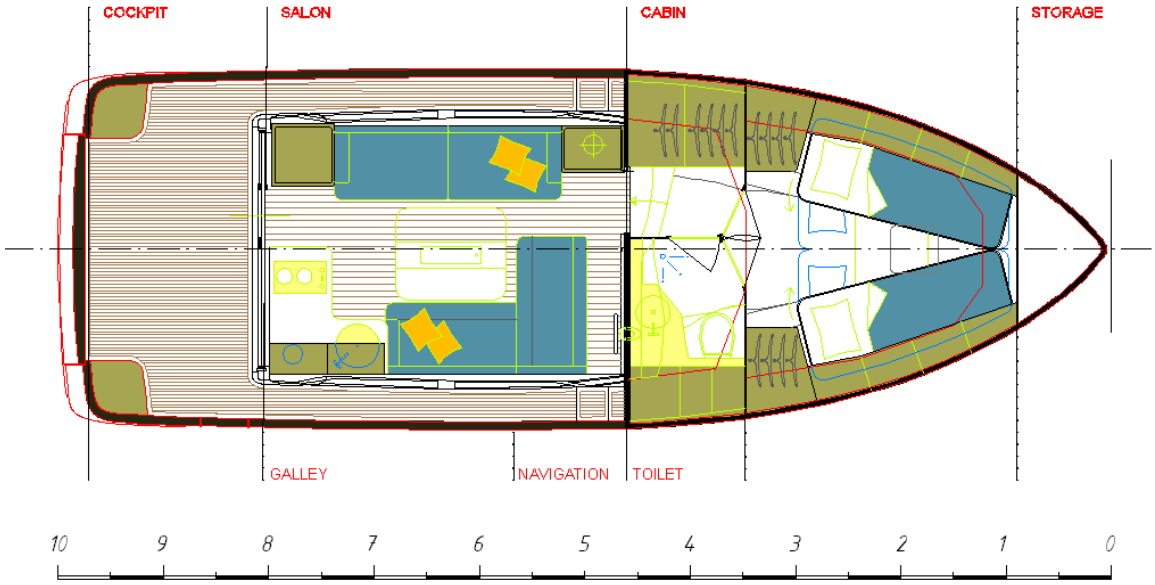


Figure 21: Accomodations

MAINTENANCE

INSIDE:

- Take advantage of fine weather to raise and ventilate the cushions when you leave your boat,
- Use blinds to protect the inside of your boat from UV rays,
- Bred crumps must be systematically eliminated,
- Ensure that the bilges are cleaned and dry.

INSIDE VARNISH:

- Rinse inside varnish with degreasing shampoo mixed with fresh water,
- Polish inside varnish with shamy leather.

RECOMENDATION!

Use the less cleaner products as possible and do not thrown them out in the sea.

Clean preferably your boat on shore.

RECOMENDATION!

Mark up each cover and foam cushion on dismantling.

- Stains:

Remove as much of the stains as possible with a knife blade moving from the edge towards the centre.

Dab with clean rags.

Remove the stains using clean rag and a solvent (never pour solvent directly over the stains).

Rub with a clean and dry rag, than brush the fabrics against the pattern.

Clean with a vacuum cleaner when dry.

- Coated or PVC fabrics:

Use a sponge and soapy water (Olive oil soap type).

Dab away stains, without rubbing, with a white spirit soaked cloth.

RECOMENDATION!

For PVC fabrics: Solvents or solvent based products (pure alcohol, acetone, and trichloroethylene) are strictly prohibited.

- 100% polyester Jackard / Dralon :

If you can remove the fabric: hand wash with a commercial lye at 30°C.

In both cases, dry cleaning is possible. Remove stains as soon as possible with moist rags.

- Cotton Jackard :

Dry cleaning.

Do not iron.

Do not use chlorine.

Remove stains with fractionated petrol.

- Alcantara :

Wash in lukewarm water with neutral soap. Allow to dry.

Dry clean with perchlorethylene.

- Leather :

Use special leather paste for routine maintenance.

Never use any detergent or silicone-based products.

Clean with a sponge and soapy water.

7. PLUMBING

Sea water plumbing

Pos.	Name
1	Engine seawater intake
2	Engine water strainer
3	El. engine & AC seawater intake pump
4	El. engine water strainer
5	El. engine cooling pump
6	El. system cooling pump outlet
7	WC seawater intake
8	Water strainer
9	WC & Chain wash down seawater pump
10	WC bowl
11	Chain wash down
12	AC cooling pump

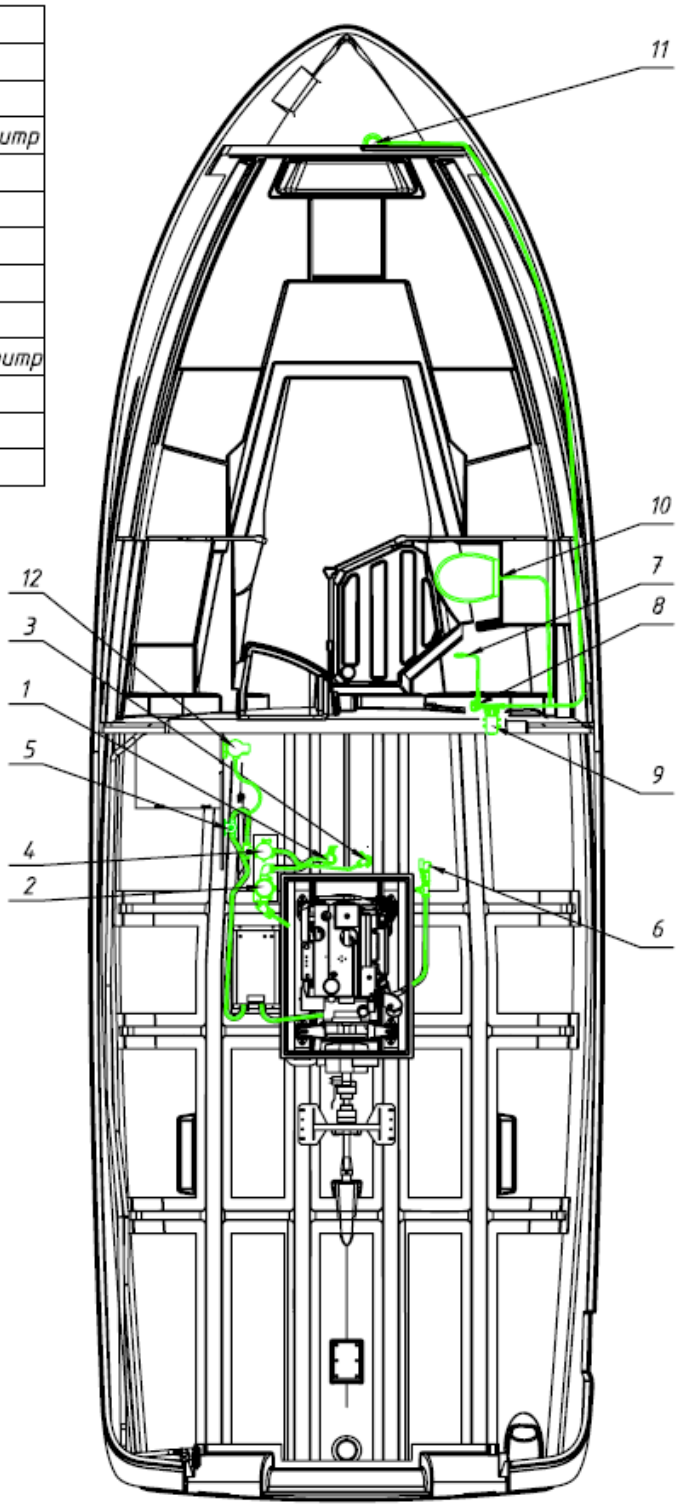


Figure 22: Sea water plumbing

Cold water hose
Hot water hose
Engine cooling fluid hose

1	Water heater
2	Water pressure pump
3	Water pump strainer
4	Water tank
5	Deck filler
6	Air vent
7	Galley tap
8	Toilet tap
9	Shower tap
10	Deck transom shower
11	Shore connection fitting
12	Engine boiler connection hose

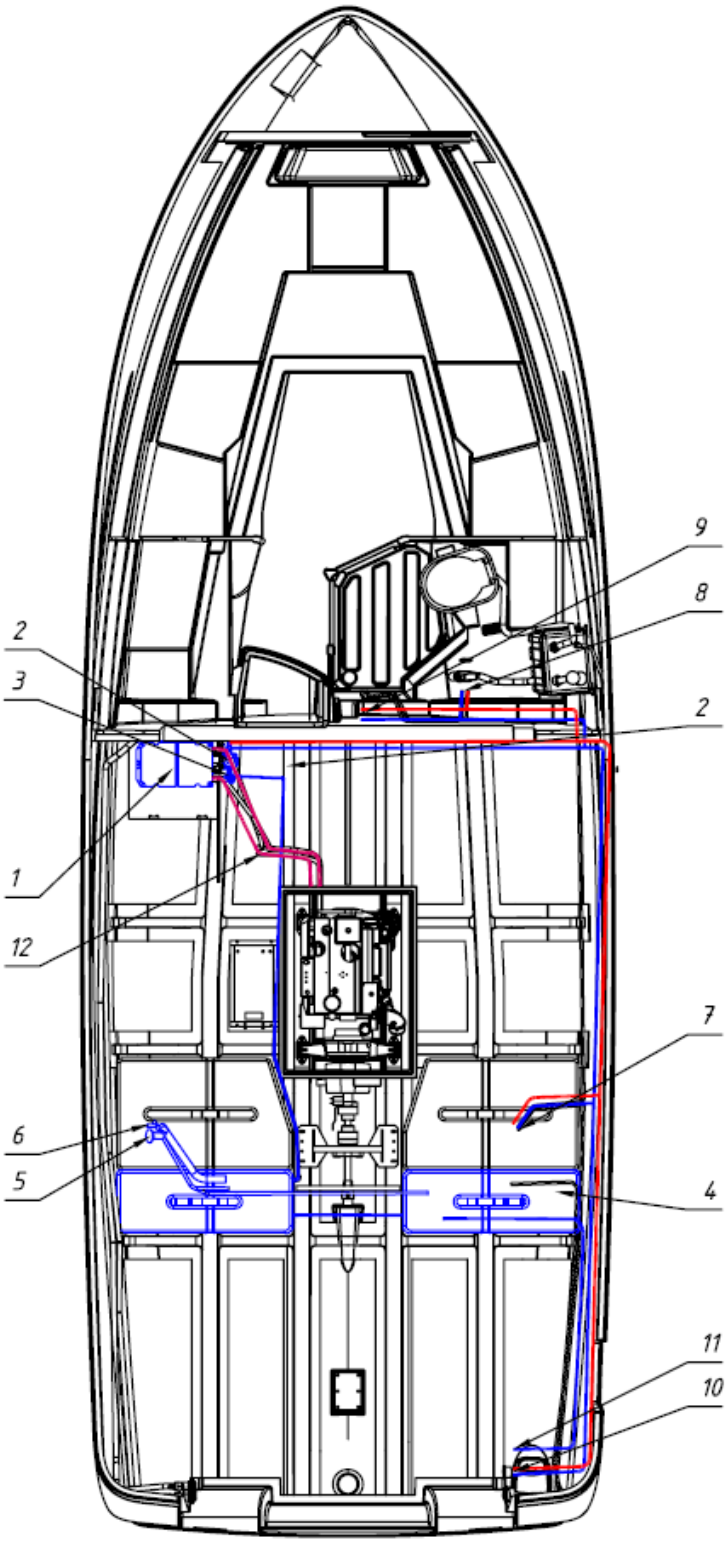


Figure 23: Fresh water plumbing

Grey water plumbing

Pos.	Name
1	Sump box
2	Sump box pump
3	Galley sink draining
4	Shower draining
5	Toilet sink outlet
6	AC unit draining
7	Vented loop
8	Thru hull outlet

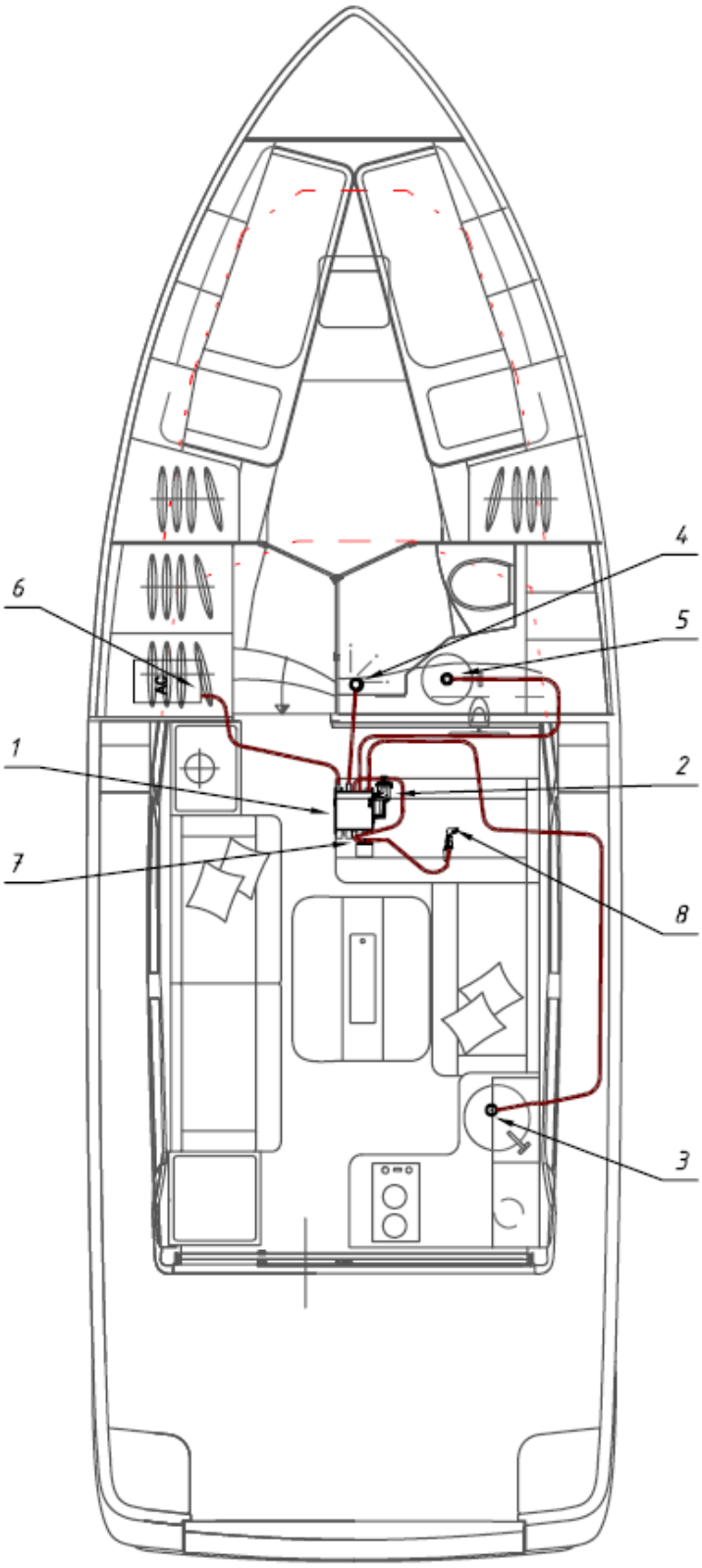
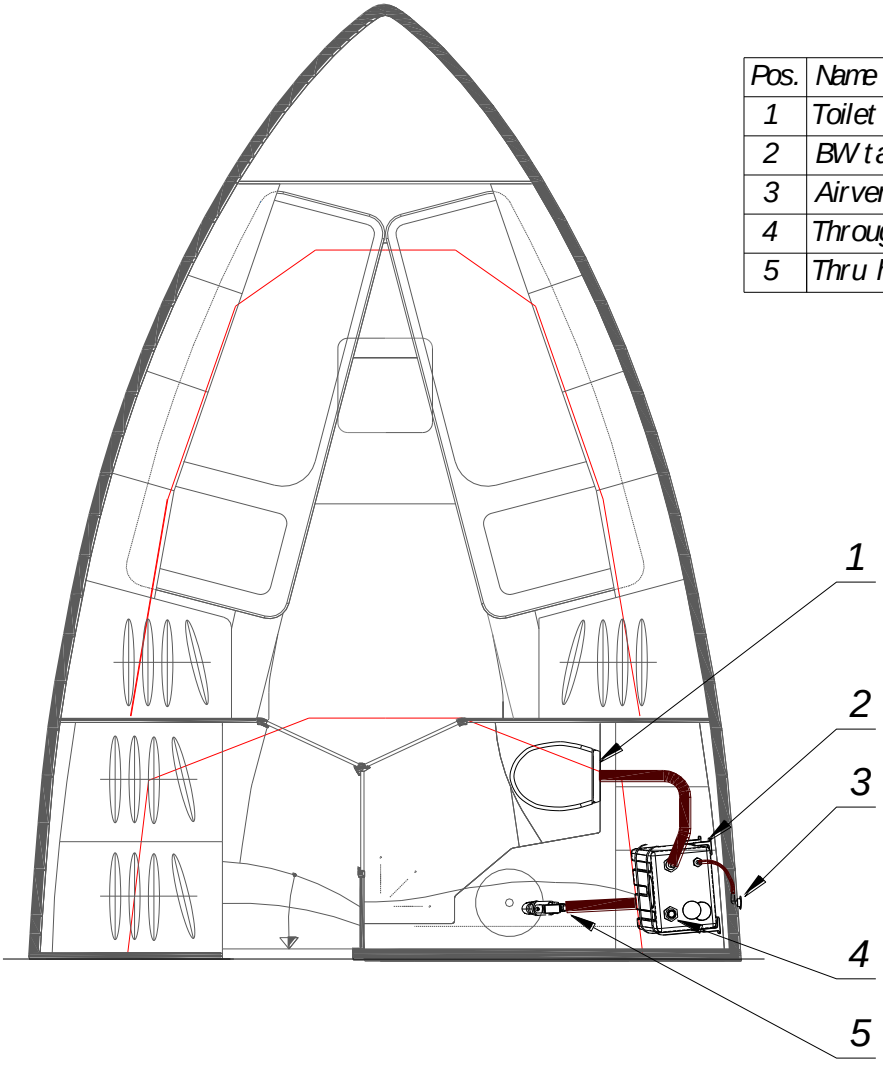


Figure 24: Grey water plumbing



Pos.	Name
1	Toilet
2	BW tank
3	Air vent
4	Through deck draining
5	Thru hull outlet

Figure 25: Black water plumbing

WATER TANK FILLING

In order to avoid handling mistakes, never fill the water and fuel tanks at the same time. During filling, avoid handling contaminants near the filling plugs.

Open and close the filling plugs with the special key or winch handle.

Check the filler plug seals for condition during filling.

The tanks are fitted with overflow outlets and vents.

To prevent a pressure build-up in the system, never press the water filling hose deep into the system.

Figure 26: WATER deck filler on PORT side

RECOMENDATION!

Monitor the quality of water taken on board at remote locations.

The tanks can be sterilized by adding a "clonazone" tablet (available from pharmacies).

Purify the tanks and pipes with acetic acid or white vinegar if the boat is to stay unmanned for a long period.

Inspection ports are provided on tanks, through which internal cleaning can be performed.

Refer to chapter 11 for winter precautions.

Note

The capacity of the water tank indicated on the page “Specifications” may not completely be used according to the trim and load of the boat.

FRESH WATER SYSTEM

Figure 27: Fresh water pump

RECOMENDATION!
Never run the water system if the tank is empty to avoid damaging the water pumps.
Regularly check the water filter for condition as instructed in the manufacture's manual.

CAUTION!	In winter time boat is shipped from factory with antifreeze in water system. Consumption of antifreeze may cause illness/death. System must be thoroughly flushed several times to remove antifreeze before use.

TOILET OPERATION

CAUTION!	Please do no discharge any black water into the sea within 12Nm from the shore.

The toilet system is arranged so that the toilets are pumped into a holding tank.

If the holding tank discharge seacock is open, the tank drains by gravity overboard. If this valve is closed, waste is stored in the holding tank.

The holding tank can be emptied by draining overboard at sea or by using a dockside pump-out connected to the deck pump-out waste fitting.

The capacity of the tank is 60 litres . The indicator will show when the tank is full.

The holding tanks may be flushed. If cleaning is required only use ecologically friendly materials.

System shall be empty during storage at freezing temperatures.

GAS SYSTEM

When changing the cylinder, refit the cap on the pressure reduction valve threaded section to avoid corrosion. See the Figure XX.

RECOMENDATION!

Don't forget to shut off the gas safety valve and pressure reducing valve when the stove is not in use.

WATER DISCHARGE

Waste water from the closets is discharged by sea chests, fitted with quarter turn valves (when the valve handle is perpendicular with the pipe, the valve is closed, and open when along the pipe centreline).

Water from the floor and stuffing boxes flow sat the centre of the boat. There is two separated zones fore and aft the engine compartment (A waterproof carter under the engine receive the possible oil leaks).

The zone is drained by means of an electric pump.

RECOMENDATION!

Check the valves and sea cocks for water tightness and operation regularly.

Shut the valves when the system is not in use.

Visually check whether the pumps discharge.

Check the clamps and hose pipe couplings and seals for condition.

Ensure regularly that the bilge and strum-boxes are perfectly clean.

If one pump should be running while all water supplies are shut,

switch the power off immediately.

Check the water system and eliminate the breakdown.

WARNING!	The bilge pump system is not designed to maintain the buoyancy of the boat in case of damage. It is intended for driving out the water coming from sea spray or leaks, but absolutely not from a hole in the hull resulting from a damage.

SANITARY APPLIANCE OPERATION

ELECTRIC MARINE HEAD OPERATION:

Ensure that the water supply and discharge valves are open before using the head.

To drain the bowl, set the pump lever to "FLUSH" and actuate the pump. To empty the bowl, set the pump lever back to "DRY" and actuate the pump.

Use exclusively absorbent, biodegradable paper to avoid clogging the heads and rinse the system regularly with fresh water.

Shut the valves after every use and especially when the boat is unattended.

WASH BASINS AND SHOWERS OPERATION:

The valves and cocks should be closed after use. To drain the shower tub, actuate the pump switch.

CAUTION!	The system should be emptied during storage at freezing temperatures.

RECOMENDATION!

During shore stay, use if possible the club-house sanitary appliances.

Waste water rejection is restricted in some country or marina; Waste tank is necessary.

8. ELECTRICAL SYSTEM

ARRIVING ON THE BOAT

When arriving on the boat you should switch the main switches ON (except for the parallel switch; (Pic.1). If you are planning to stay docked in the marina or at anchor (A.), it is not necessary to switch ON the propulsion switches, you can switch them ON before departure (B.)

STAYING AT DOCK OR ANCHOR A + B. GETTING READY TO SAIL-12 V SERVICE battery switch (Pic. 1)

-48V HYBRID/HOUSE battery switch (Pic. 2)

-24h CONSUMERS switches (Pic.4)

-INVERTER ON: supplies 230V (Pic.5)

-12 V ENGINE battery switch (Pic. 1)

-48V HYBRID DRIVE switch (Pic. 2)

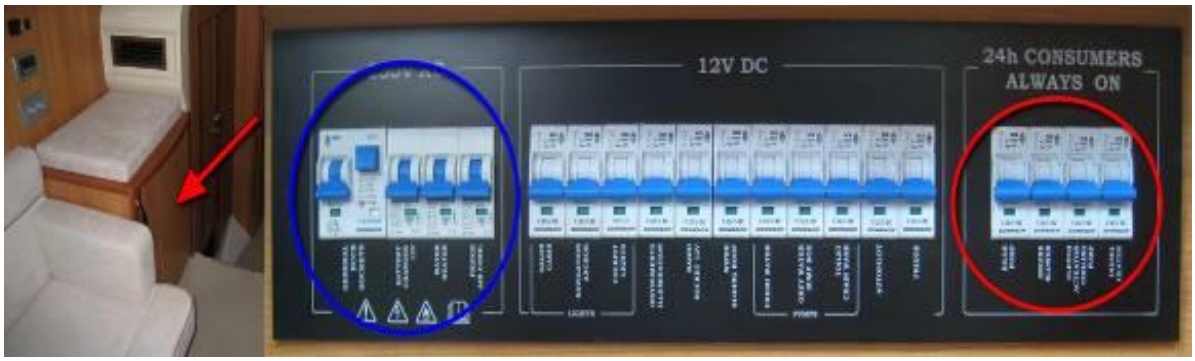
-BOW THRUSTER switch in front cabin (Pic. 3)

Picture 1: ENGINE and SERVICE main switch

ENGINE and **SERVICE** main switch. Leave the **PARALLEL** switch OFF.

Picture 2: HYBRID DRIVE and HYBRID/HOUSE main battery switch

Picture 3: BOWTHRUSTER (optional) switch in the cabin



Picture 4: 24h CONSUMERS on the right side; 230Vac CONSUMERS on the left side

Picture 5: INVERTER switch – Phoenix multi control on the dashboard

SELECTING ELECTRIC or DIESEL DRIVE

ELECTRIC DRIVE

Make sure that the engine throttle lever is in neutral position.

Set the Hybrid switch to ELECTRIC.

Turn the DIESEL engine key to the »ON« position.

-GREEN LIGHT on the panel switches on.

Wait for cca 5 seconds for the system to set to the electric drive.

Ready to sail

Switching the Electric drive OFF –Turn the DIESEL engine key to the »OFF«

position.

GREEN LIGHT on the panel switches off

DIESEL DRIVE

Make sure that the engine throttle lever is in neutral position.

Set the Hybrid switch to DIESEL.

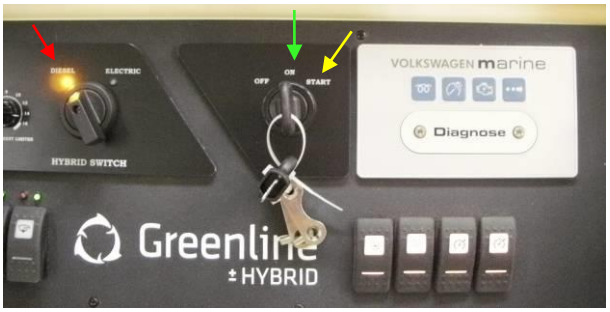
Turn the DIESEL engine key to the »ON« position.

- YELLOW LIGHT on the panel switches on.

-»NEUTRAL« should appear on the VW control display (if not, check the position of the throttle lever).

Turn the DIESEL engine key to the »START« position to start the engine.

Ready to sail.



Switching the Diesel drive OFF – Turn the DIESEL engine key to the »OFF«

position.

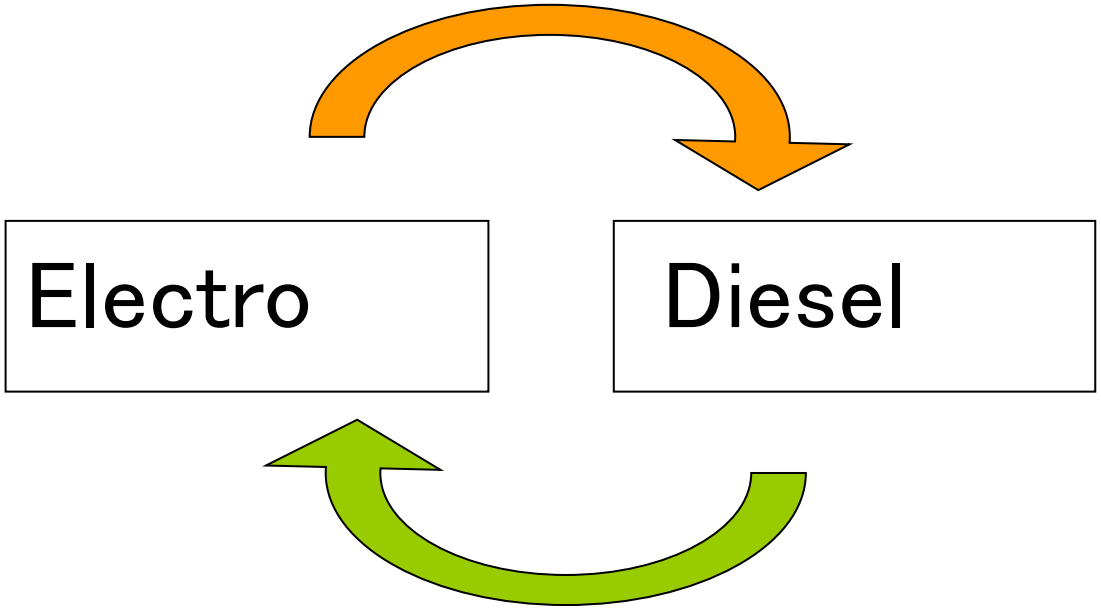
YELLOW LIGHT on the panel switches off

There are also important monitors for the hybrid drive parameters. For details see Hybrid monitoring (chapter 3.) propulsion/generator and Battery monitoring – BMV.

CAUTION!	If switching from electro to diesel (step 1) after step 2: first put the throttle lever in neutral, turn the hybrid switch to diesel and wait for 5 seconds before starting the diesel engine, allowing the clutch to reconnect the diesel engine.

CAUTION!	**In electric drive the alternator is not turning. You have to turn 12 V charger ON to supply continuous power to hybrid cooling pump. (Inverter ON, F39 ON, F40 ON)**

1. diesel engine key to the »OFF«
2. HYBRID switch to DIESEL
3. diesel engine key to the »ON«
4. diesel engine key to the »START«
5. ready to sail in DIESEL mode



1.throttle lever in NEUTRAL
2.HYBRID switch to ELECTRIC
3.wait for 5 sec
4.ready to sail in ELECTRIC mode

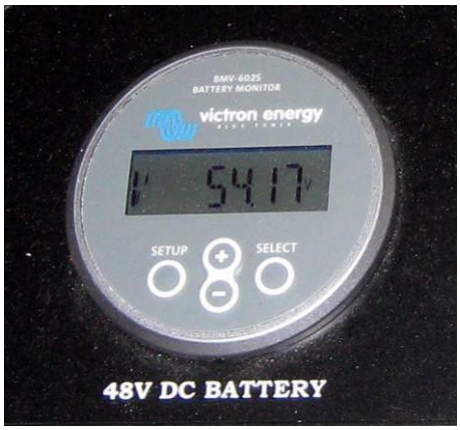
Screen consists of two lines. When error occurrs in hybrid system the third line is displayed. Below the display there is a LED and when the hybrid system works properly, the LED is green. If malfunction occurs somewhere in the hybrid system, the LED turns red.

	Data 1	Description	Data 1 normal range	Data 2	Description	Data 2 normal range
SCREEN						
Line 1	*Mode*	Operation mode	Neutral, Error, Electric, Generator	*Ib*	Battery current	from -180 to 110 A
Line 2	*MotT*	Motor temperature	from -10°C to 100°C	*RPM*	Speed (RPM)	0 to 4500
ERROR LINE						
Line 3	*IG Errors*			*AC Errors*		
SCREEN: Connection lost						
Line 1	*!! HCU LOST !!*					
Line 3	**AC** software version			**DDI** software version		
Line 4	**IG** software version			**HCU** serial number		

For more information check Iskra »Hybrid drives – owner's manual«.

BATTERY MONITORING - BMV

The battery monitor shows important data about the main 48V LiPo battery bank and about the 12V service battery.



Standard information and alarms:

- Battery voltage of LiPo battery (full battery @ 54.3V).
- Battery voltage of service battery (full battery @ 14.4V).
- Battery charge/discharge current (A): - consumption, + charging
- Ampere-hours consumed (Ah).
- Battery status (%).
- Time to go (time to empty) at the current rate of discharge (see Victron owner`s manual).
- Visual and audible alarm: **over and under voltage. (**During an alarm the buzzer will sound. The alarm buzzer can be silenced by pressing any button.)

For switching between the data screens press »+« or »-«. For detailed information and changing the settings, please read the manufacturer's owner's manual.

CAUTION!	**If the battery voltage drops under 44V, the alarm will turn ON (it will turn OFF after voltage rises above 46V) – turn off all consumers (incl. propulsion) and recharge the battery.**

CAUTION!	**If the battery voltage rises above 54.7V, the alarm will turn ON (it will turn OFF after voltage drops under 54.4V) – turn off the power sources (generator, shore cable) and discharge the battery (with propulsion or**

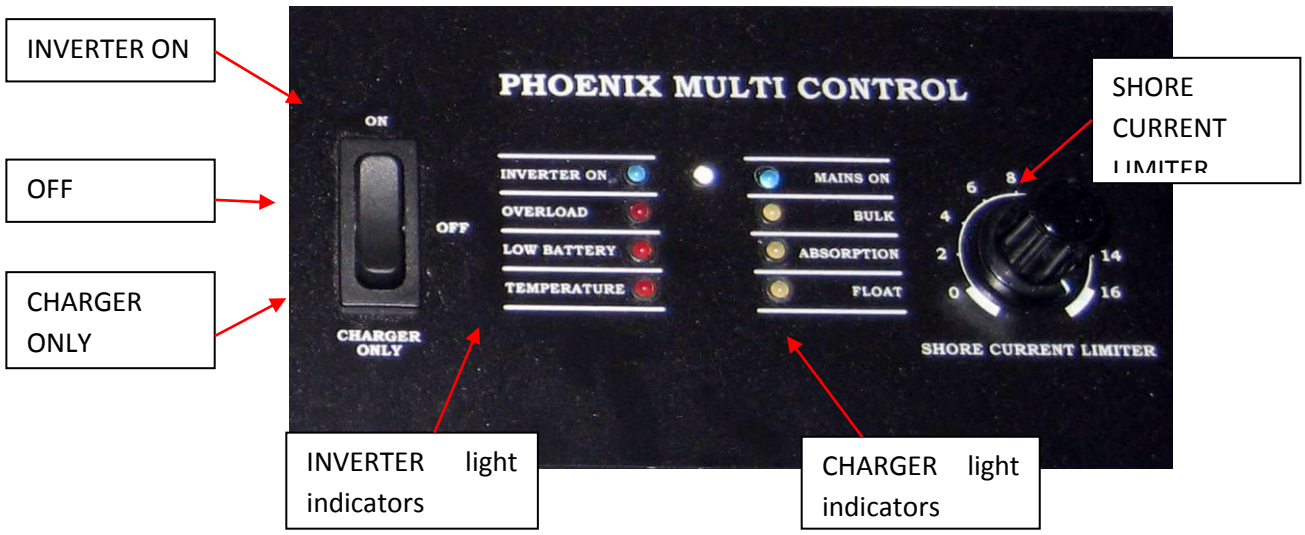
	consumers through the inverter). **If the over voltage alarm turns on frequently, please report the error to your local dealer.**

CAUTION!	**Never discharge the LiPo battery under 43V!** **Do not change or tamper with the charging system!** **Never overcharge the LiPo battery above 54.5V!**

PHOENIX MULTI CONTROL INVERTER / CHARGER

Phoenix multi control (Pic. 06) is the main control panel regarding the 48Vdc / 230Vac inverter/charger.

You can choose between ON (charger ON, 230V output ON) and CHARGER ONLY (charger ON, no 230V output).



Picture 6: Phoenix multi control

SAILING WITH DIESEL ENGINE

In GENERATOR mode, the Li-Po batteries are being charged with up to 100 A up to 50V (5 kW) (depending on the rpm of the Diesel engine), then current start to decrease (depending on battery voltage). Li-Po battery is being charged up to 53.6V. There is enough power on board for choosing different consumers.

Inverter switch in ON position:

- inverter on will be illuminated – 230V output. Maximal power consumption is limited to 3 kVA (2.5kW).
- 12V batteries are being charged by VOLKSWAGEN alternator with up to 120 A and through 12V battery charger (getting power from inverter).

SAILING WITH ELECTRIC MOTOR

Electric motor is consuming up to 150 A on full throttle and appx. 50A at cruising speed, which is sufficient for up to 4 hrs of sailing (flat seas, no wind). By switching ON the inverter, consumption of the electricity will rise for cca. 30 A (depending on the consumers) -consequently the sailing range will drop.

During the electro propulsion, it is recommended that you reduce consumption of 230V consumers (normally keeping on the fridge and 12 V charger only).

Inverter switch in ON position:

- inverter on will be illuminated – 230V output. Maximal power consumption is limited to 3 kVA (2.5kW).

CAUTION!	When sailing in electric mode inverter should be turned ON to supply AC power to battery charger to charge 12V batteries (also fuses F39 & F40 turned ON). From 12V batteries important consumers are supplied which are necessary for sailing: hybrid cooling pump, instruments, navigation lights, etc...

IN THE MARINA

Assuming that the shore power cable is plugged in, the shore power fuse (under starboard cockpit seat – see FUSE LOCATION) is turned ON and the inverter switch is turned to the ON position:

- mains on is illuminated, bulk, absorption or float is illuminated (depending on charging phase)
- with shore current limiter you can limit the current from the shore (in the case of weak shore fuses you need to adjust the consumption to meet the shore supply). If you decrease it under the consumers current, then the inverter will turn on (inverter on will illuminate)
- if you turn the switch to Charger only, there won't be any 230V output, only the LiPo battery will be charged.
- if the shore current limiter is at 0A and the switch is in Charger only position, mains on will blink, warning that there is no 230V output and there is no LiPo battery charging.
- it is also recommended that the 230V fuse for the 12V battery charger is turned on, so that all 12V batteries are being charged.

AT ANCHOR

Inverter switch in ON position:

- inverter on will be illuminated – 230V output. Maximal power consumption is limited to 3 kVA (2.5kW).
- it is also recommended that the 230V fuse for the 12V battery charger is turned on, so that all 12V batteries are being charged.

CAUTION!	When using 230V on board you should take care of the consumption of electricity. **If you use air conditioning, kitchen appliances and water heater together, the OVERLOAD LED will illuminate and the power will go out. Reduce the consumption!**

○ LED off
☼ LED flashes
● LED illuminated

INVERTER – light indicators

● inverter on
○ overload
○ low battery
○ temperature

The inverter is on and supplies power to the load.

● inverter on
○ overload
☼ low battery
○ temperature

The battery is almost fully exhausted.

● inverter on
☼ overload
○ low battery
○ temperature

The nominal output of the inverter is exceeded. The "overload" LED flashes
Reduce electric consumption !!!

○ inverter on
○ overload
● low battery
○ temperature

The inverter has switched off due to low battery voltage.

○ inverter on
● overload
○ low battery
○ temperature

The inverter is switched off due to overload or short circuit.

● inverter on
○ overload
○ low battery
☼ temperature

The internal temperature is reaching a critical level.

○ inverter on
○ overload
○ low battery
● temperature

The inverter has switched off due to the electronics

○ inverter on
● overload
● low battery
○ temperature

The inverter switched off due to excess ripple voltage on the

○ LED off
☼ LED flashes
● LED illuminated

BATTERY CHARGER – light indicators

● mains on
● Bulk
○ absorption
○ Float

The AC input voltage is switched through and the charger operates in bulk mode.

● mains on
● Bulk
● absorption
○ Float

The mains voltage is switched through and the charger is on. The set absorption voltage,

● mains on
○ Bulk
● absorption
○ Float

The mains voltage is switched through and the charger operates in absorption

● mains on
○ Bulk
○ absorption
● Float

The mains voltage is switched through and the charger

● mains on

☼ Bulk

☼ absorption

○ Float

The mains voltage is switched through and the charger operates in equalize mode.

☼ mains on

○ bulk

○ absorption

○ float

The AC input is switched through. The AC output current is equal to the preset

SOLAR PANELS

Hybrid version is equipped with 6 solar panels (optional) producing 1.4 kW of power (peak power). They are wired 2 parallel x 3 series and they are connected directly to LiPo battery via relays K6 & K7. Relays K6 & K7 are operated by BMS solar output. BMS opens relays when LiPo voltage rises above 53.8 V and closes them when LiPo voltage drops below 52.8 V.

The peak power depends on solar radiation, on angle of incidence of solar radiation, on cleanliness of solar panels and on shadows of masts in marina and radar mast when sailing.

RECOMENDATION!

To keep the best performance keep solar panels clean

WARNING!	**Cleaning of solar panels is dangerous task. It must be done by professional only. Fall from the roof can result in serious injury or death.**

PARALLEL SWITCH

The parallel switch is for starting the diesel engine in emergency situations only.

Parallel switch is a connection between the service and engine battery.

Picture 7: Parallel switch

If the engine battery is empty, (faulty connection between charger/alternator and the battery, if you forgot to turn on the 12V charger while driving in electric mode, etc.) you can use this switch to start the diesel engine (jump start). When you start the engine, the alternator will begin to charge the batteries and you can turn OFF the parallel switch.

If the reason for discharging is a faulty connection between charger/alternator, you will have to drive the boat directly to the nearest service station with the parallel switch turned to the ON position.

If the reason for discharging is different, you can easily charge the engine battery with the 12V charger through the inverter or with the shore cable.

There are 3 main electrical wirings on the boat. For hybrid system the voltage is 48V. For instruments, lightning, bowthruster, etc. there is 12V wiring. For regural house consumers there is 230V AC wiring.

SWITCHES

See table 1 and pictures 1,2,3 for main switches details.

Table 1: Main switches

#	Switch	Consumers	Voltage [V]
S1	Engine	Starter, E.R. ventilator, clutch actuator*, hybrid cooling pump*	12
S2	Parallel	For jump start only (See hybrid drive manual)	12
S3	Service	Instruments, autopilot, fridge, navigation lights, anchor light, instrument illumination, salon light, cabin light, toilet, radio, socket 12V, sliding roof, windscreen wiper, pumps (fresh water, sea water, sump, grey water)	12
S4	Bowthruster**	Bowthruster, anchor winch	12
S5	Hybrid drive*	Electric propulsion	48
S6	Hybrid/house* battery	230V Inverter/charger (at anchor all 230V consumers via Inverter, in marina LiPo battery charger)	48

* - with Hybrid version only

** - with Mooring pack only

Picture 8: 12V main switches

Picture 9: Bowthruster switch

Picture 10: 48V main hybrid switch

FUSES

Main AC / DC panel is located in the saloon locker near the portside sofa.

Notice that these switches are automatic fuses at the same time.

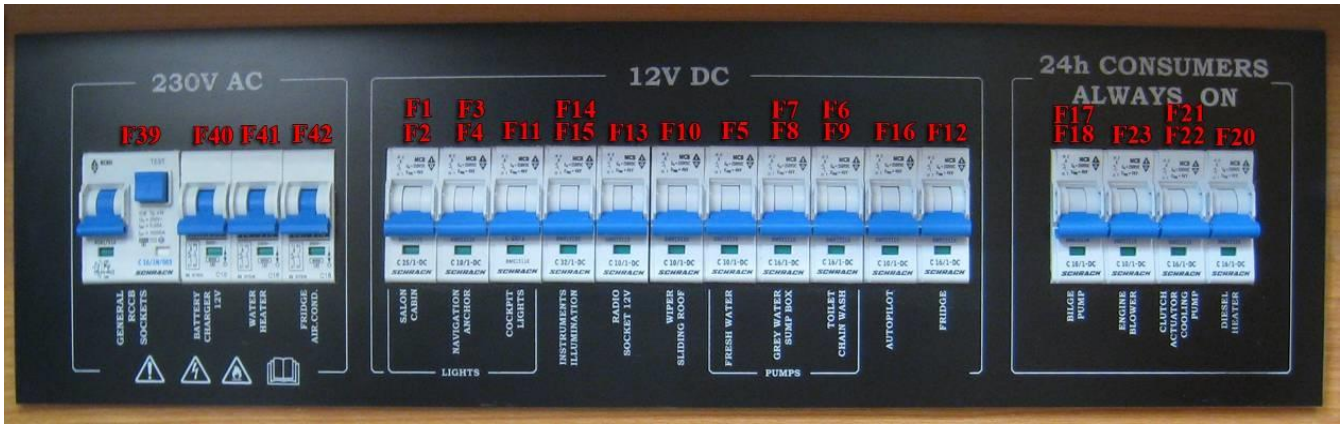
Before leaving the boat make sure that you choose which 24 h consumers will be switched ON.

It is reccomended that all 24 h consumers are ALWAYS ON to avoid possible system malfunction.

Pay special attention to the automatic bilge pump system.

Picture 11: Location of AC/DC panel

AC/DC panel



Picture 12: AC/DC panel

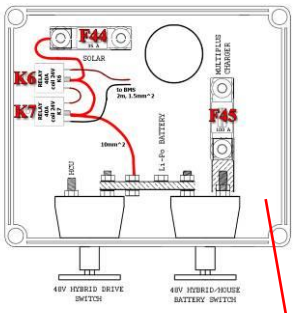
Table 2: Fuses and relays (full option)

#	Fuse	Power supply / wiring path / description	Voltage [V]	Rating [A]	Type
F1	Cabin lights, salon lights	From service bat. via S3 via F32	12	25	CB
F3	Navigation lights, anchor lights	From service bat. via S3 via F32	12	10	CB
F5	Fresh water pump	From service bat. via S3 via F32	12	10	CB
F6	Toilet, chain wash	From service bat. via S3 via F32	12	16	CB

F7	Sump box pump, Grey water pump	From service bat. via S3 via F32	12	16	CB
F10	Wiper/sliding roof	From service bat. via S3 via F32	12	10	CB
F11	Cockpit lights	From service bat. directly via F30	12	10	CB
F12	12V fridge	From service bat. via S3 via F32	12	16	CB
F13	Radio/socket 12V	From service bat. via S3 via F32	12	10	CB
F14	Instruments, instruments illumination	From service bat. via S3 via F32	12	32	CB
F16	Autopilot	From service bat. via S3 via F32	12	10	CB
F17	Bilge pump	From service bat. directly via F30	12	10	CB
F20	Diesel heater	From service bat. directly via F30	12	16	CB
F21	Clutch actuator, cooling pump	From engine bat. via S1 via F26	12	16	CB
F23	Engine blower	From engine bat. via S1 via F26	12	10	CB
F24	12V charger	From 12V charger to diode splitter	12	35	ANL
F26	Engine consumers	From engine bat. via S1 via F27	12	35	ANL
F27	Engine battery	Main engine battery fuse	12	355	ANL
F28	Diode splitter	From diode splitter to engine battery	12	125	ANL
F29	Diode splitter	From diode splitter to service battery	12	125	ANL
F30	24h consumers, swimming platform	From service battery directly via F31	12	35	ANL
F31	Service battery	Main service battery fuse	12	200	ANL
F32	Service consumers	From service bat. via S3 via F31	12	80	ANL
F33	Anchor winch	From borthruster battery via S4 via F37	12	80	RCCB
F34	Anchor winch commands	From borthruster battery via S4 via F37	12		ATO
F36	Diode splitter	From diode splitter to bowthruster battery	12	125	ANL
F37	Bowthruster battery	Main bowthruster battery fuse	12	250	ANL
F38	Shore power	Main shore power fuse	230ac	16	RCCB
F39	General RCCB	From inverter or F38; main consumers fuse	230ac	16	RCCB
F40	Battery charger 12V	From F39	230ac	10	CB
F41	Water heater	From F38	230ac	16	CB
F42	Sockets/ air cond.	From F39	230ac	16	CB
F44	Solar panels	From solar panels to LiPo battery via relays K6 & K7	48	35	ANL

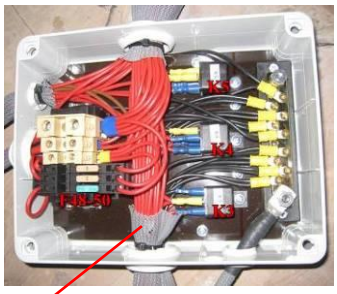
F45	Inverter/charger	From LiPo battery via S6 via F47	48	100	ANL
F46	Hybrid control unit	Main HCU fuse	48	355	ANL
F47	LiPo battery bank	Main LiPo battery fuse	48	300	ANL
F48	Radio memory	From service bat. directly via F30	12	5	ATO
F49	Diesel heater controls	From service bat. directly via F30	12	5	ATO
F50	Defroster	From service bat. via S3 via F32	12	30	ATO
K3	Hybrid cooling pump	From F21 (control from engine key switch #201)	12	30	Relay
K4	Engine blower	From F23 (control from engine key & hybrid switch (D) #200)	12	30	Relay
K5	Defroster	From F50 (control from defroster switch on console #95)	12	40	Relay
K6	Solar panels	From F40 to LiPo battery	24	40	Relay
K7	Solar panels	From F40 to LiPo battery	24	40	Relay

FUSES LOCATION

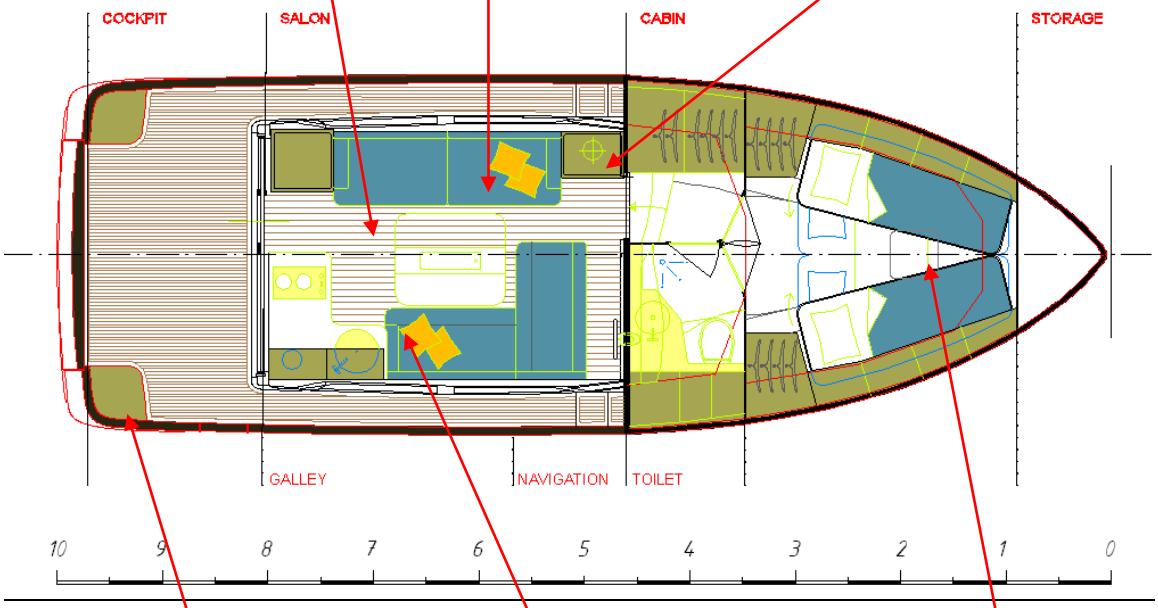


Hybrid box fuses

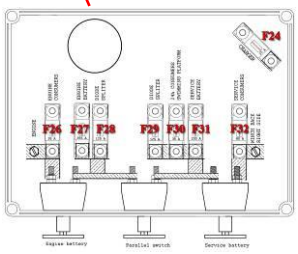
LiPo battery bank main fuse



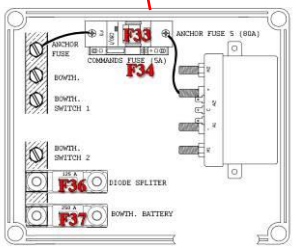
Main 12V power box



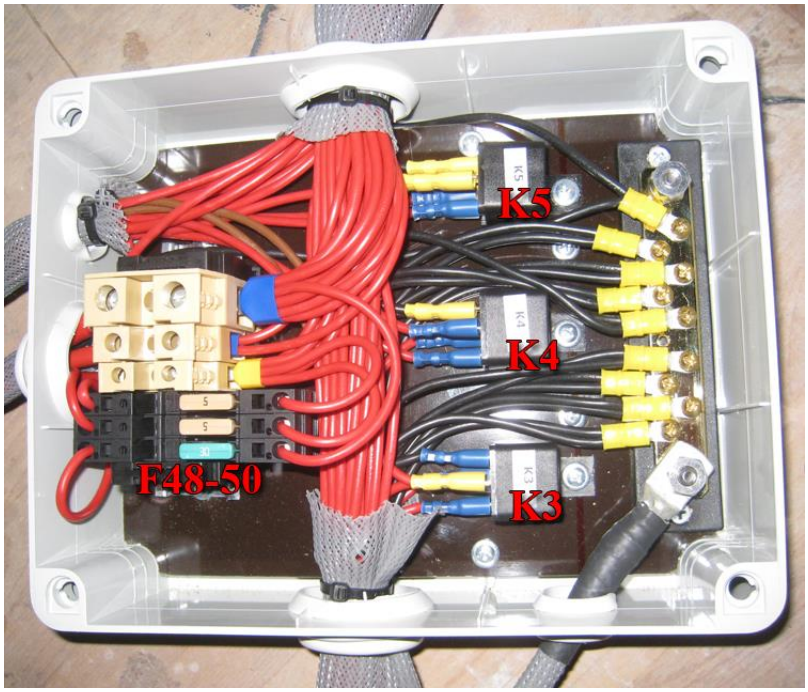
Shore power cable and fuse



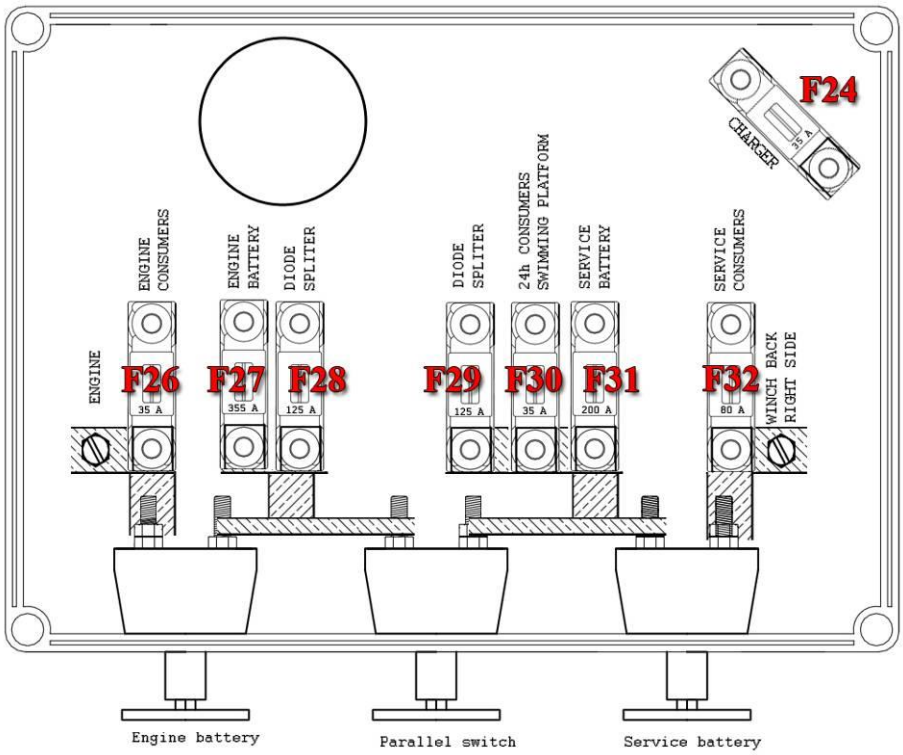
Service box fuses



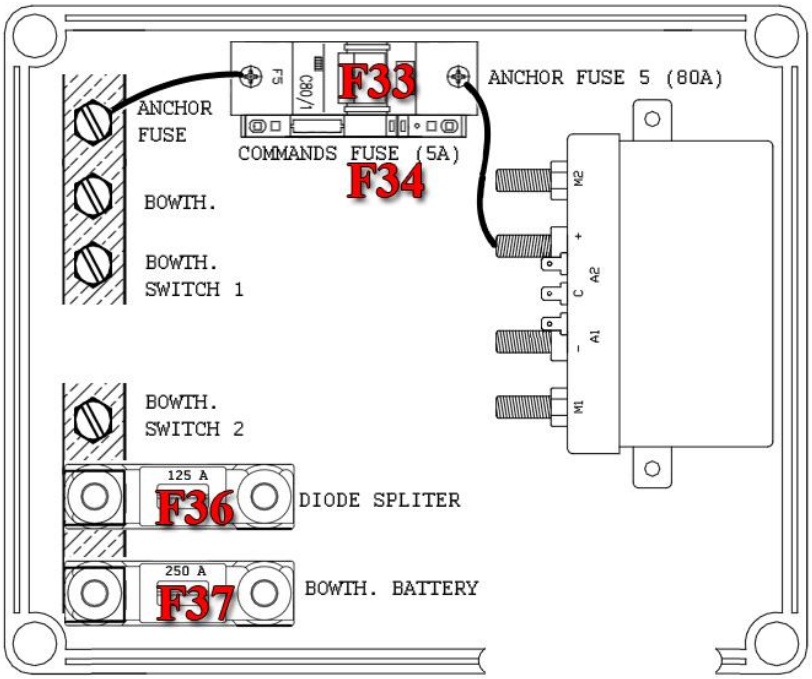
Mooring box fuses



Picture 13: Main 12V power box



Picture 14: Service box fuses

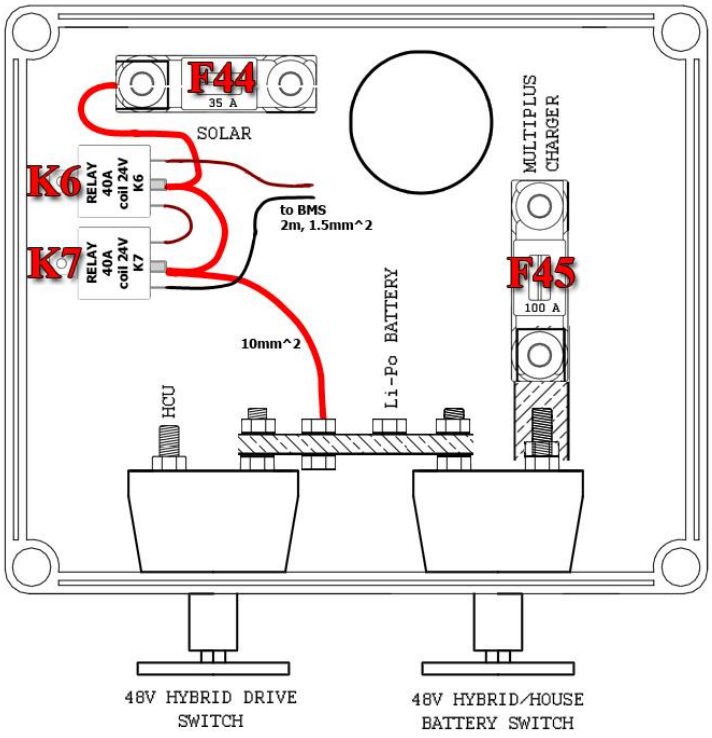


Picture 15: Mooring box fuses

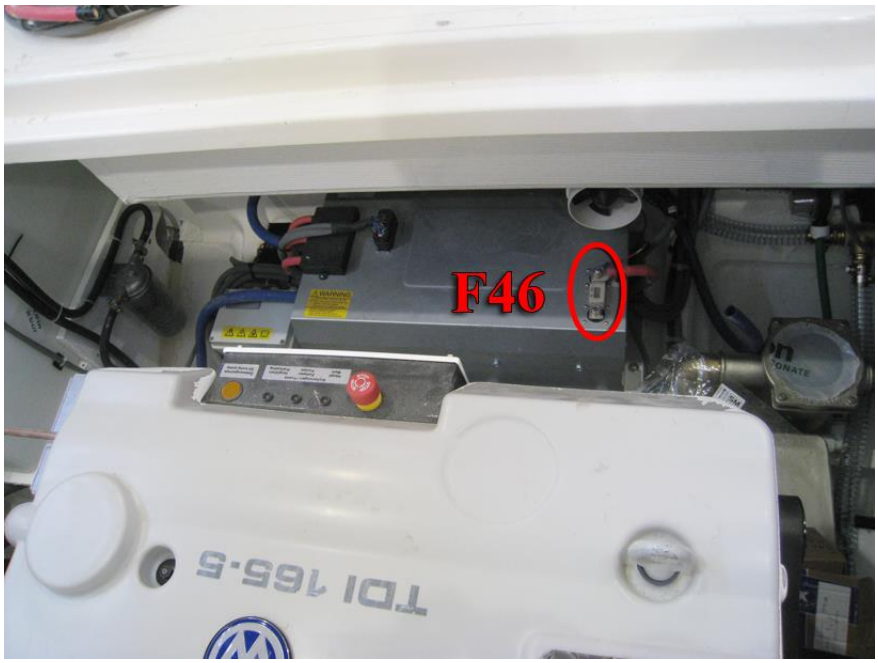
Picture 16: Mooring box (located under the bed in the cabin); anchor winch fuse

Picture 17: Shore power fuse

Picture 18: LiPo battery bank main fuse



Picture 19: Hybrid box fuses



Picture 20: Hybrid control unit main fuse

12V power source:

There is one 12V socket on console for phone chargers, etc. (Pic. 23). For power supply informatoin see table 2, F13.

Picture 21: 12V socket on console

230Vac power source:

230V circuit is powered from shore cable through Multiplus inverter/charger (hybrid only) or directly (standard). When shore cable is not connected Multiplus goes to inverter mode (hybrid only).

There are seven 230V plugs for house consumers. Four in the salon (kitchen and above port locker), two are in the cabin under bed on port side and one in the toilet. (See Pic. 24-27).

Picture 22: Kitchen 230V sockets

Picture 23: Salon 230V sockets above port locker

Picture 24: Cabin 230V sockets under the port bed

Picture 25: Toilet 230V socket

Other 230V consumers are preplugged. These are (full option): 12V battery charger, air conditioning, water heater, 2x LCD TV, 2x DVD player, fridge, electric hob, microwave oven.

CAUTION!	When using 230V power you have to turn ON fuses F38-F42 (see table 2). Fuse F41 (water heater) is also a switch! Turn F41 OFF if you are not using water heater. Maximal power consumption under 230V wiring system is 3kW. If you overload the system the circuit breaker will go trip. Maximal power consumption under 230V wiring system through inverter is 3kVA (2.5kW). If you overload the system the red light »overload« on phoenix multi control (on console) will illuminate and the power will go out. **Reduce the consumption!**

SHORE POWER

Shore power can be used in the marina. Just connect shore power cable to a marine outlet, (see picture 28) and turn on fuses F38-F42 (see chapter »Power sources«). **It is recommended to fully charge the batteries in the marina with shore power!**

Picture 26: Shore power cable (230V input) and main fuse

Shore power cable (230V input), fuse F38 under cockpit seat, stbd side.

WARNING!	Disconnect shore-power connection when the system is not in use. Do not allow the shore-power cable end to hang in the water. An electrical field can be caused which can cause injury or death to nearby swimmers. Turn off craft's shore-power connection switch (F38) before connecting or disconnecting shore-power cable. Connect shore-power cable to craft's inlet before connecting to shore-power source. Disconnect shore-power cable at shore-power source first. Close shore-power inlet cover (or cockpit seat) tightly.

BATTERIES

WARNING!	The batteries must be handled with care. Do not open the batteries. In case of electrolyte splashing, thoroughly rinse the part of the body that has been in contact with it and take medical advice. For aditional safety and health risks please read the manufacturer's safety manual.

Greenline 33 Hybrid (full option) has three 12V batteries (engine (100Ah), service(120Ah), bowthruster(100Ah)) and one LiPo 48V battery bank (240Ah). For the list of consumers powered from an individual battery, please see table 2.

12V batteries are charged from the 12V battery charger and from the engine alternator via the diode splitter.

The LiPo battery bank is charged from the Victron Multiplus inverter/charger (shore cable connected, inverter ON, switch S6 ON) or from hybrid generator when sailing in diesel mode.

Use your battery charger when connected to shore power in order to sail off with properly

charged batteries.

Always check the condition of all the batteries and the charging system before you set sail.

CAUTION!	Never discharge the 12V AGM batteries under 70% of the rating, to ensure a satisfactory service life. For LiPo charging/discharging and for battery monitoring see Hybrid drive manual.

CAUTION!	**When the boat is unattended for a longer period, check the battery voltage once per month. Charge them if necessary!**

MAINTENANCE AND ADDITIONAL WARNINGS

CAUTION!	**When the boat is unattended for a longer period, check the battery voltage once per month. Charge them if necessary!**

CAUTION!	Do not modify the craft's electrical system or relevant drawings. Installation, alternations and maintenance should be performed by a competent marine electrical technician. Inspect the system at least biennially.

WARNING!	**Never:** - work on the electrical installation while the system is energized, - modify the boat's electrical system or relevant drawings; Installations, alternations and maintenance should be performed by a competent marine electrical technician, - alter or modify the rated current amperage of over current protective devices, - install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit, - leave the craft unattended with the electrical system energized, except automatic bilge pump, fire protection and alarm circuits.

CAUTION!	**Leaving the boat unattended for a shorter period:** - Turn OFF all main switches (S1-S6) - Disconnect shore power (see shore power chapter) - Turn OFF fuse F38 and F39. - Leave F17-F23 always ON (also written on DC panel) - You can choose to leave F11 (cockpit light) ON – anyone can turn ON your cockpit light and empty the service battery.

CAUTION!	**Leaving the boat unattended for a longer period:**

	- Turn OFF all main switches (S1-S6) - Disconnect shore power (see shore power chapter) - Turn OFF fuse F38 and F39. - Leave F17-F23 always ON (also written on DC panel) - It is highly recommended to turn OFF F11 (cockpit lights)

CAUTION!	**Winter storage:** For winter storage it is recommended to turn OFF all the consumers from boat batteries. - Turn OFF all main switches (S1-S6) - Disconnect shore power (see shore power chapter) - Turn OFF fuse F38 and F39. - Turn OFF F11 (cockpit lights) - You can also turn OFF diesel heater (F20, **make sure that it is cooled before turning OFF**) - In water leave F17 ON (bilge pump) - Out of water turn OFF F17 (bilge pump)

CAUTION!	**Winter storage LiPo battery bank:** To prevent LiPo battery from damaging you have to store it in temperature range from -20°C to +60°C at SOC 40% - 60% (app. 48V). In case when the boat can not be stored in this temperature range, you have to un-mount the LiPo battery and store it somewhere else to meet the temperature range.

9. ENGINE & STEERING GEAR

ENGINES

Refer to the brochure supplied with the boat.

You must read carefully the brochure which includes detailed hints about the engine operation and how to run it properly.

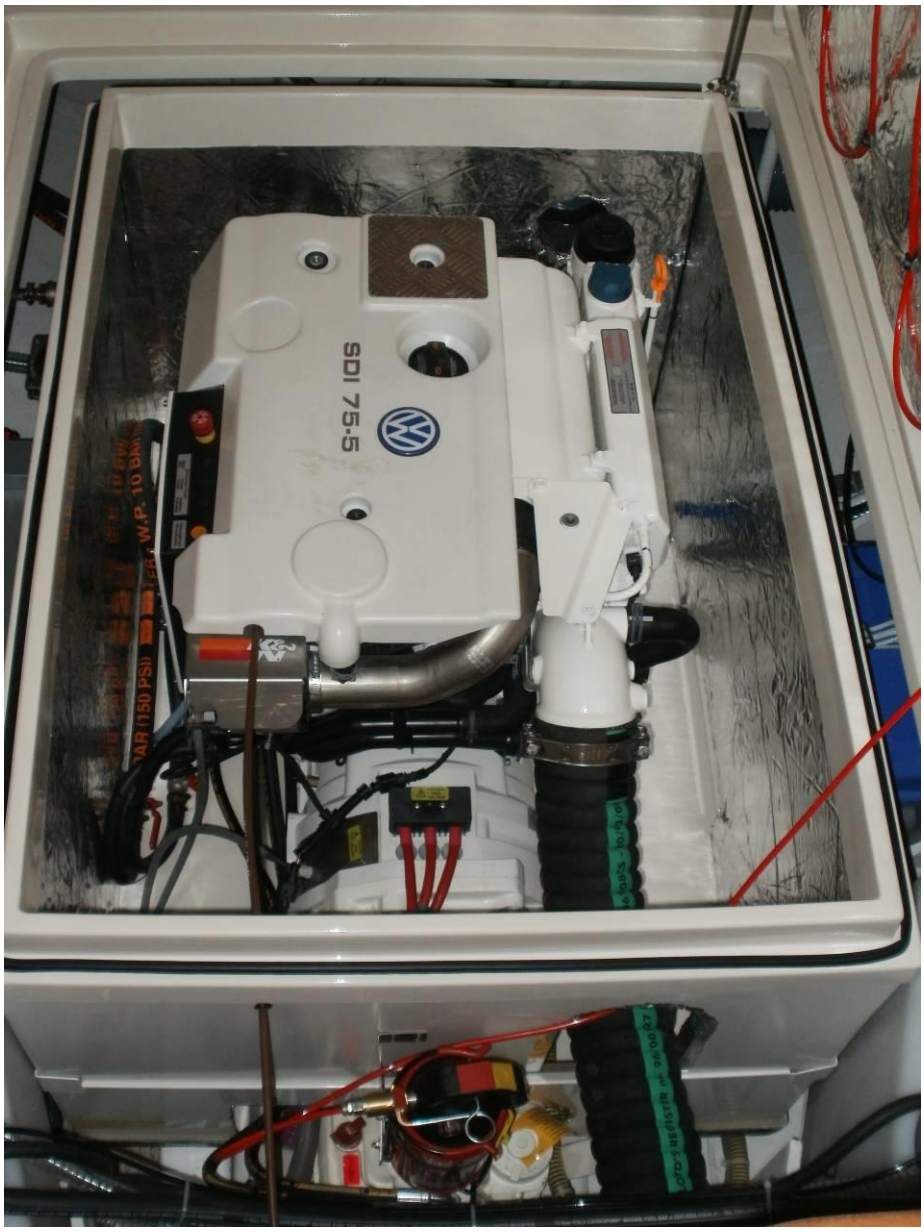


Figure 28: Engine with Hybrid drive

CAUTION!	Never run the engine if the boat is dry-docked

ACCESS TO THE ENGINE:

Access to the engine is from the hatch on saloon floor.

When you operate the cover, keep away the persons and objects that may be in the way when opening or closing it.

CAUTION!	Stop the engine before you open the hatches or keep away from the belts and moving parts. Be careful with full clothes, long hair, rings that may get caught in them. Wear appropriate clothes (gloves, cap, etc...).

ENGINE SEA VALVE:

The engine sea valve ensures a critical duty in the engine operation and, therefore, the strainer must be brushed whenever the ship is docked and kept clean and free from clogging or anti-fouling paint.

The sea valve must be open before starting the engine; otherwise the exhaust and the engine may incur severe damages.

Figure 29: Engine seawater inlet with water strainer

ENGINE OPERATION:

Before starting the engine:

- Open the engine cooling valve,
- Actuate the battery master switch to energize the electrical system,
- Before starting the engine, disengage the reversing gear to accelerate from

dead stop,

- Refer to the engine manufacture's brochure before starting up the engine.

VENTILATION SYSTEM

Do not obstruct or modify the ventilation system.

Figure 30: Engine compartment air intake

Figure 31: Engine compartment air outlet with exhaust blower

DETERMINATION OF MAXIMUM PROPULSION POWER RATING

Maximum propulsion power rating for the craft 1 X 175 kW.

Do not operate this craft with an engine of rated power larger than that posted on the capacity label in the craft

Do not operate at maximum speed while in congested high traffic waterways or in weather and sea conditions of reduced visibility high winds or large waves. Reduce speed and wake as a courtesy and as a safety consideration to yourself and others. Observe and obey speed limit and no wake zones.

Observe right-of-way as defined by Rules of the Road and required by COLREG.

Always be certain to have sufficient distance to stop or manoeuvre if required to avoid collisions.

DASH BOARD / CONTROL LEVER

All engine controls are located on the dash board, which does not require any special pre-cautions (refer to engine brochure).

Figure 32: Engine control lever

Refer to the manufacturer's brochure supplied with the boat for steering station switch (inside or flying-bridge).

Check the accelerator and clutch cables (lubricate the spacers and fork ends).

RECOMENDATION!

Avoid making noise and waves near other users when the boat is engine-powered.

Respect speed-limits.

VISIBILITY IN THE STEERING STATION

The International Regulations for preventing Collisions at sea (COLREGS) and the rules of the road require that a proper lookout be maintained at all times and observance of right way observance of these rules is essential. Make sure that no other boat is on your route.

The visibility from the steering station can be reduced because of the following:

- Power trim and planing trim
- Transition from the "moving" to the "planing" mode
- Load and distribution of load
- Sea conditions, rain, spray, fog or darkness
- Lights inside the boat
- People and removable equipments in the helmsman's visibility field
- Position of tops and curtains.

PROPELLERS

The propeller supplied with your boat embodies the results of tests carried out jointly with the engine manufacturer.

RECOMENDATION!

Don't change the propellers without specialist's advice.

ANODE

RECOMENDATION!

Check regularly the anode on the transom and on the drive for corrosion and renew as required.

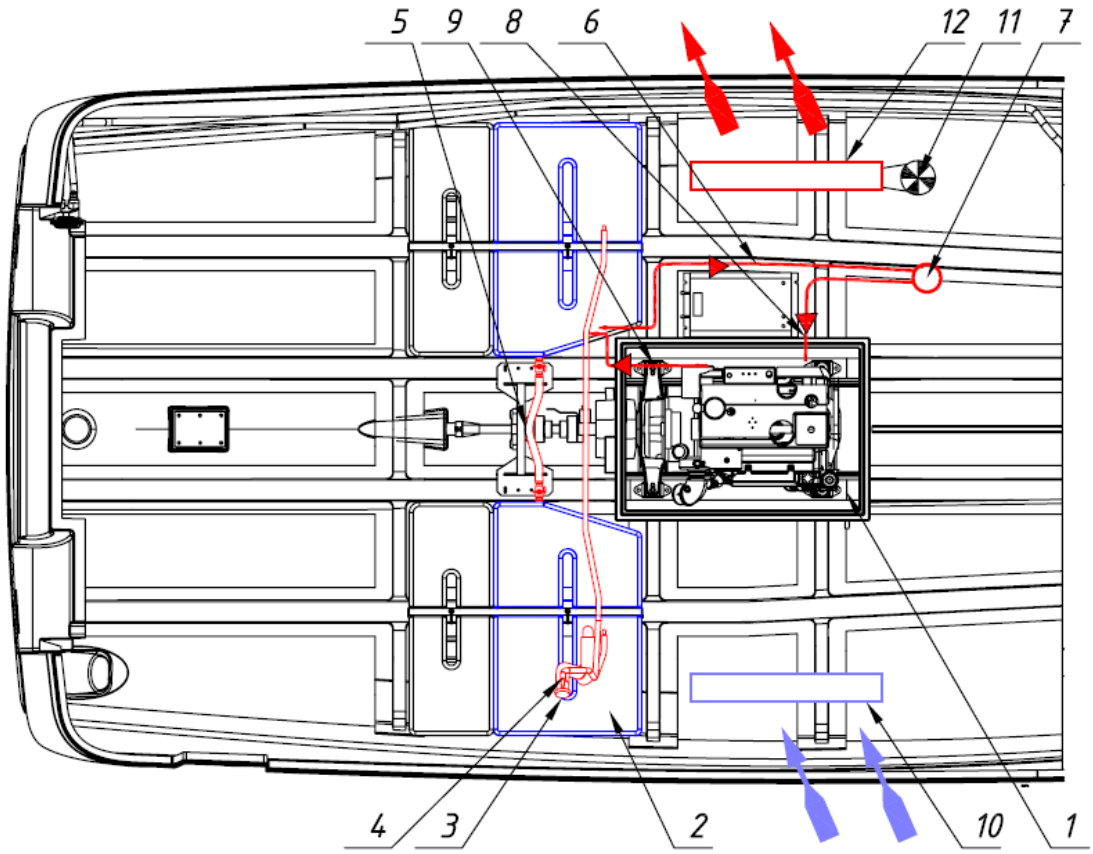
Check and replace the "hydro lube" oil ring if necessary

RECOMENDATION!

Propulsion and steering system check and maintenance must be done by a professional.

Refer to the manufacturer's brochure supplied with the boat.

Figure 33: Propeller and anodes



1	Engine	7	Fuel prefilter
2	Fuel tank	8	Fuel supply hose to engine
3	Deck filler	9	Fuel return hose
4	Tank air vent	10	Engine compartment air intake
5	Tank connection hose	11	Air exhaust blower
6	Fuel supply hose to prefilter	12	Engine compartment air outlet

Figure 34: Fuel system

FUEL TANK

TANK FILLING

Comply with the general precautions indicated in chapter 7 for tank filling.

To protect the deck from possible fuel splashes, wet up the area around the deck filler with sea water before taking the plug off. In case of splashes, rinse the deck liberally (after fitting the filler plug back in place).

Figure 35: FUEL deck filler on STBD side

DANGER!	During fuel tank filling, the engine must be stopped and smoking must be prohibited.

RECOMENDATION!

Check the filler plug 0-ring condition regularly to avoid water ingress.

Don't shut the fuel valve after every utilization, except before an extended unattended period.

Ensure that the tank is full to avoid condensation.

Clean the tank every five years to remove sludge deposits.

Every year check the condition of the fuel system (tubes, valves ...) and have the damaged parts changed by a professional.

NOTE

The capacity of the fuel tank indicated on the page « Specifications » may

not completely be used according to the trim and load of the boat.

Always keep 20 % fuel as a reserve.

DANGER!	Never obstruct the ways to the fuel valve.

FUEL FILTER

Engine running problems may have several causes, amongst which dirty fuel is a major one and the injection pump will be soon destroyed by water in the fuel.

Figure 36: Fuel pre-filter

Water results either from the condensation in an insufficiently filled tank or seeps in through the mislocked filler plug or through a damaged seal.

The fuel is run via two filters to control the foregoing risks:

- One filter is integral with the engine to ensure fine fuel filtration (refer to the engine brochure to find out the filter renewal frequency and maintenance work),
- The other one is a first-stage filter located in the pipe system between the engine and the fuel tank.

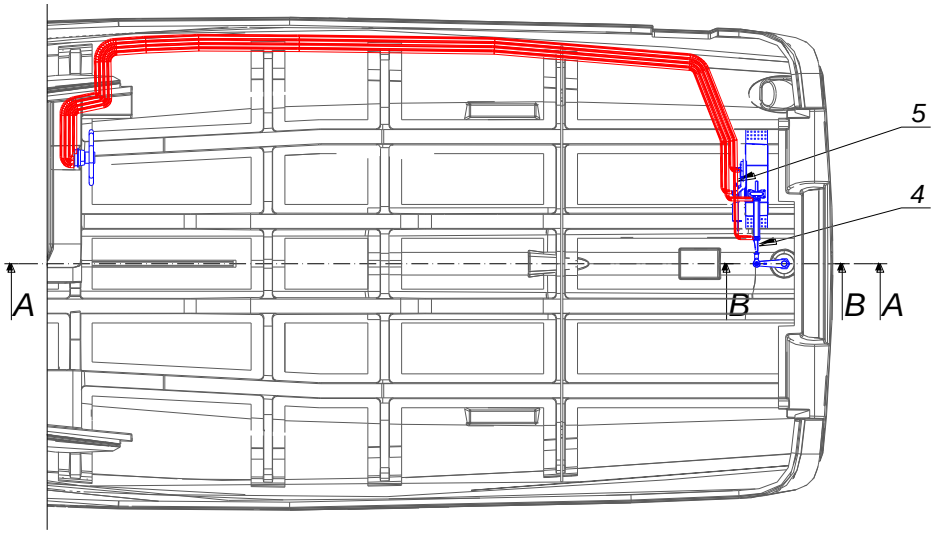
Undo (but do not remove) the knurled screw at the base of the settling bowl, allow to flow into a tray until clean, water free fuel appears. Purge the system several times a year. Remove the bowl for access to the first-stage filter, which should be replaced at least once a year.

FUEL

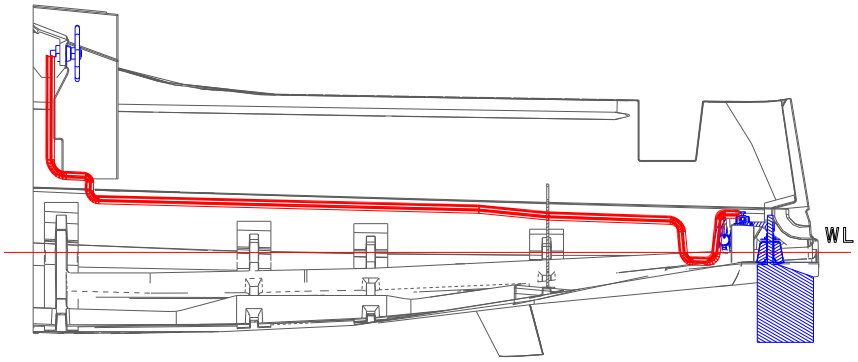
Refill before the fuel tanks are depleted to prevent the fuel system from running dry. Before sailing be sure to have enough fuel.

RECOMENDATION!

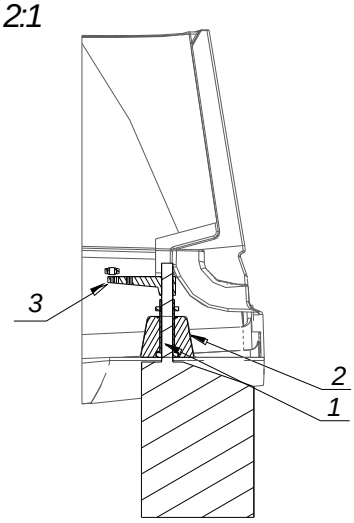
Refer to the manufacturer's brochure supplied with the boat. Look after all eventual risk of oil or fuel leaks. Check the exhaust gas colours.



Section view A-A



Section view B-B
Scale 2:1



1	Rudder stock
2	Rudder bearing
3	Tiller arm
4	Steering piston
5	Steering pump

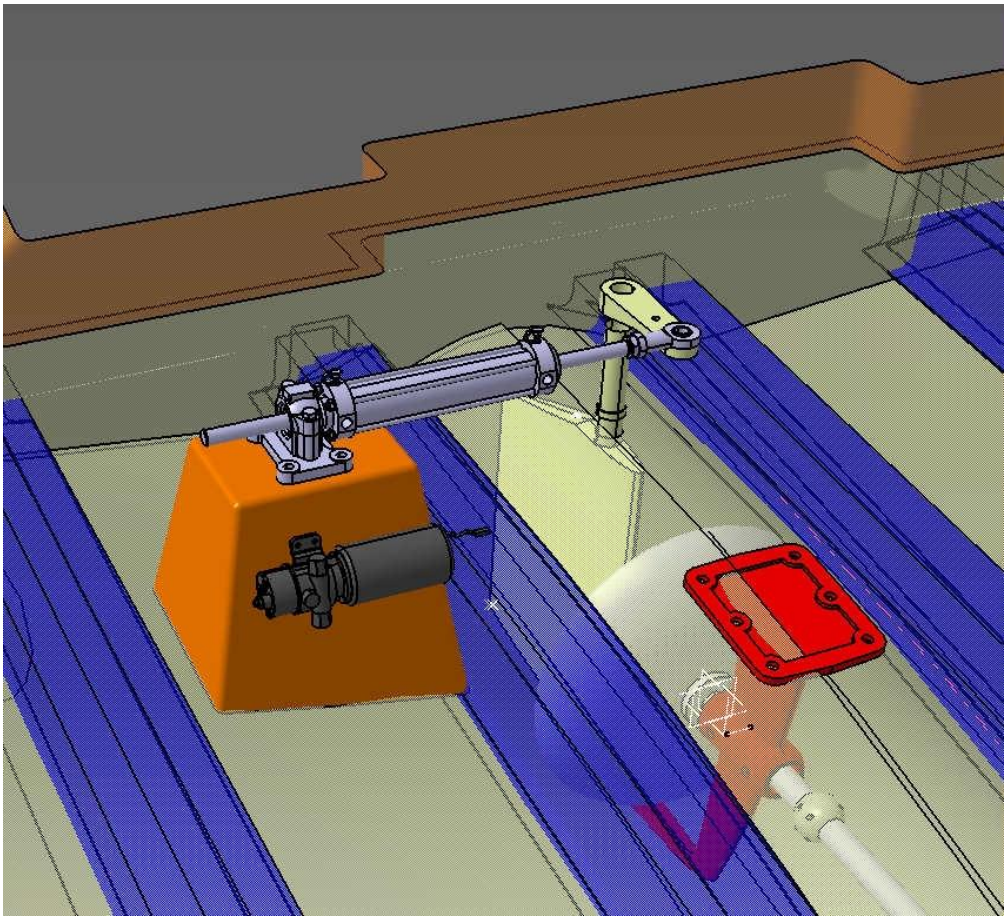
Figure 37: Steering system

Regularly check the tightness of steering system components.

Regularly lubricate all the elements.

Maintain the nylon, ertalon or Teflon bushes only with suitable lubricants.

In case of steering mechanism failure mount emergency steering tiller directly on rudder shaft.



10. LAUNCHING

LAUNCHING HINTS

The following precautions are required in case you should launch your ship yourself:

BEFORE LAUNCHING:

- If the boat is fitted with a lock and speedometer, install the relevant fittings, - Check the suction strainer for cleanliness,
- Check the reduction gear and engine oil level (refer to the engine maintenance manual). The engine cooling water drain corks must be shut,
- All optional accessories must be sealed off with paste,
- Retract the speedometer in its housing (this can be damaged by the handling belt),
- On-line engines: ensure that the node is in place and the nut is properly locked (the lock-washer must be folded back on the nut). The anode should not be painted,
- All sea suction and discharge valves must be shut (sink, washbasin, closets, engine).

HOISTING:

- Install a line forward and a line aft and fenders as necessary,
- Before hoisting, ensure that the belts will not crush the locks, speedometers, shafts, etc...

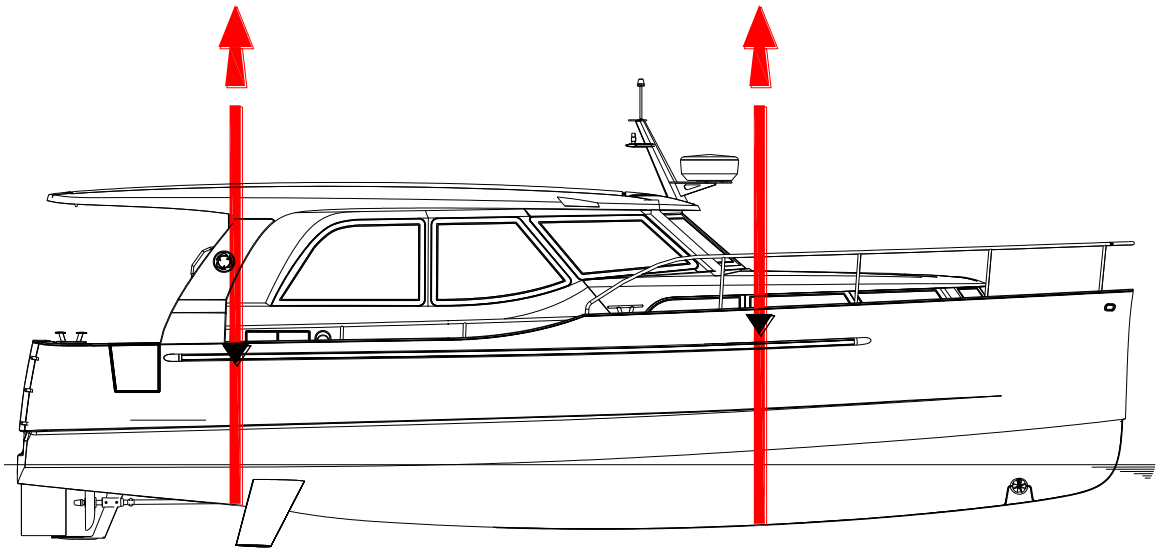
  To that effect, mark the belt position (adhesive tape on the moulding) for hoisting after launching (most boats are already fitted with the stickers).

  The crane hook shall be fitted with a gantry or spreader with two belts. Under no circumstances shall the belts be hooked directly on the hook as this would result in excessive compressive stresses on the hull.
- Hoist up gently and control the boat moves with the lines.

WARNING!	Don't stay on-board or under the boat during hoisting.

AFTER LAUNCHING:

- Check the speedometer and lock fittings for tightness, as the case may be,
- Open and check the valves for sealing with the hull and relevant pipe; release air out of the boat sea water system (cooling system of engine, hybrid drive, AC units,…)
- Press a few times stuffing box against the propeller shaft, so to enable »the water lubrication of the seal«
- Before starting the engine, refer to Chapter 9 "Engine".



POSITION OF HOISTING CRADLE AND STRAPS

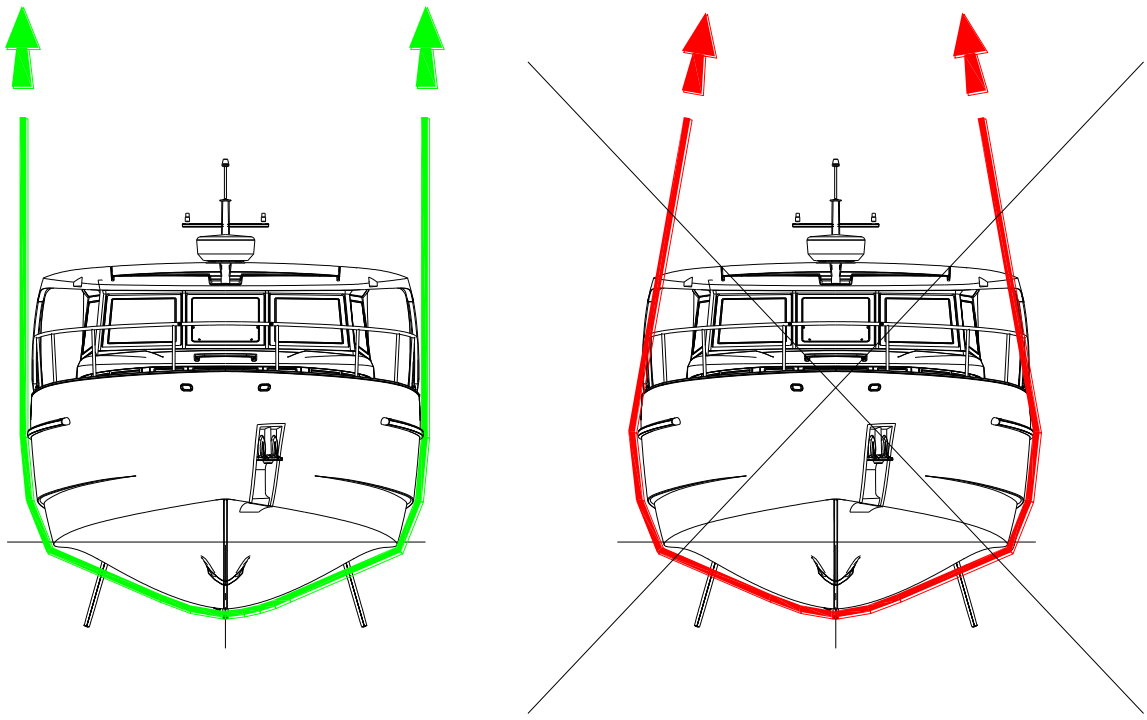


Figure 38: Position of hoisting cradle and straps

11. LAYING UP AND WINTER PRECAUTIONS

LAYING UP

Take ashore all ship's documents, loose lines not used for mooring, galley equipment, stores, clothes, safety equipment, and battery.

Mark up the safety equipment and check the expire dates; obtain immediate overhaul of the raft (Easter is the deadline after which it will be too late!).

Draw up a complete inventory of the ship's equipment.

PROTECTION AND MAINTEINANCE

INSIDE:

- Drain all fresh water pipes and rinse with a solution of vinegar and water (don't use chlorine-based products),
- Lubricate and shut all sea water valves and sea-cocks, rinse and drain the closets in full,
- Retract the loch and speedometer heads, seal-off air inlets and install a de hydrator in the saloon and leave all doors open (cabins, lockers, wardrobes, iceboxes),
- Leave the cushions in the outside for a long time and re-install in the boat in upright position to limit contact surfaces.

OUTSIDE:

- Rinse liberally the hull, deck, lubricate all mobile and mechanical components with petroleum jelly (locks, hinges, bolts, etc.),
- Protect all surfaces from chafing lines, mooring lines,
- Protect the boat with fenders and ensure that the lines are taut.

The above hints are not a comprehensive check-list;

ENGINE:

Engine winter lay-up shall be performed by a professional organization, and will not be the same if the boat remains afloat or ashore.

The following are a few major tasks:

Afloat:

- Drain the cooling system,
- Switch off the master switch, lubricate the terminals with petroleum jelly and test the battery voltage,
- Change the anode,
- Fill the fuel tank to maximum to avoid condensation,
- Refer to the engine manual for everything concerning the engine.

Ashore:

- Take the battery ashore and keep it under maintenance charging,
- Drain all cooling, lube oil, fuel oil and exhaust systems and perform winter pre-cautions specified by the manufacturer, bearing in mind the fact that the freezing hazard is more significant if the boat is ashore,
- Remove and lubricate the sea-cocks included in the cooling systems, leave the sea-cocks open, check the hoses,
- Slack off the pumps and A.C. generators belts.

ELECTRICAL SYSTEM:

For winter storage it is recommended to turn OFF all the consumers from boat batteries.

- Turn OFF all main switches (S1-S6)
- Disconnect shore power (see shore power chapter)
- Turn OFF fuse F38 and F39.
- Turn OFF F11 (cockpit lights)
- You can also turn OFF radio memory (F19) (you will loose all your radio memory) and diesel heater (F20, **make shore that it is cooled before turning OFF**)
- Afloat: leave F17, F18 ON (bilge pumps)
- Ashore: turn OFF F17, F18 (bilge pumps)

Leaving the boat unattended for a longer period:

- Turn OFF all main switches (S1-S6)
- Disconnect shore power (see shore power chapter)
- Turn OFF fuse F38 and F39.
- Leave F17-F23 always ON (also written on DC panel)
- It is highly recommended to turn OFF F11 (cockpit lights)

When the boat is unattended for a longer period check the battery voltage once per month. Charge them if necessary!

LiPo BATTERY BANK – WINTER STORAGE

To prevent LiPo battery from damaging you have to store it in temperature range from -20°C to +60°C at SOC 40% - 60% (app. 48V). In case when the boat can not be stored in this temperature range, you have to un-mount the LiPo battery and store it somewhere else to meet the temperature range.

To un-mount the LiPo battery bank just follow the instructions bellow in correct order (1-8).

For mounting the LiPo battery bank (spring time) follow the same instructions in reverse order (8-1).

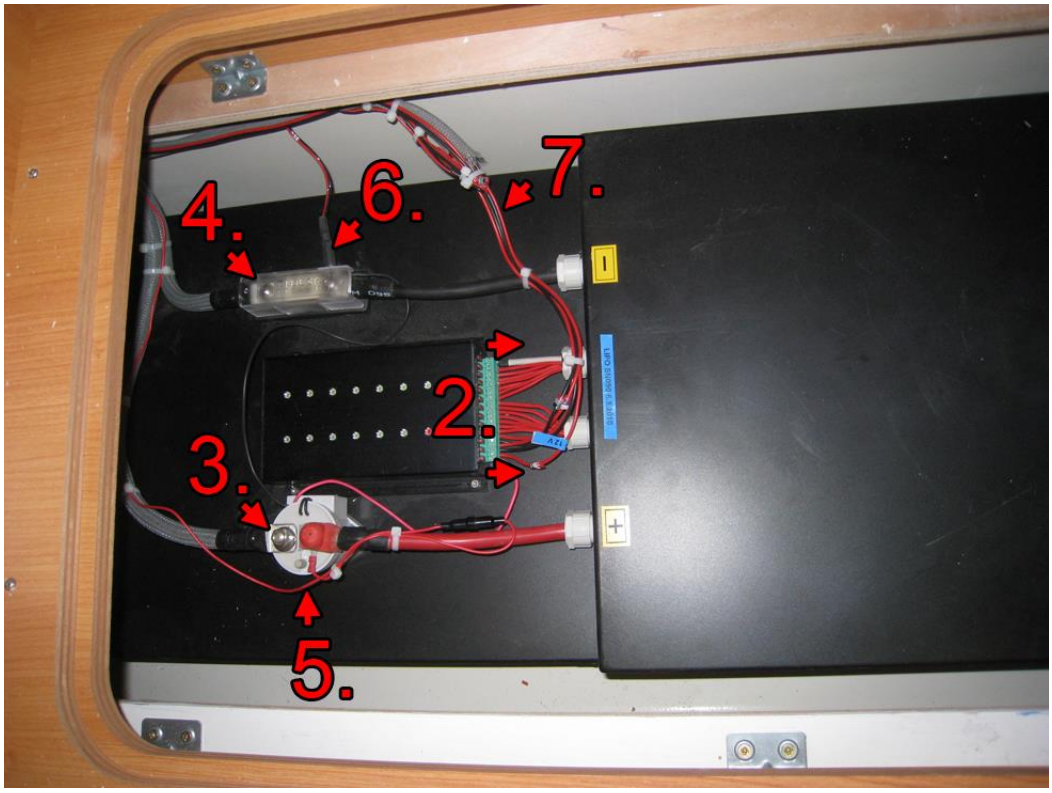
RECOMENDATION!
For easier mounting the battery (spring time) mark all the cables (and make the picture of the battery before un-mounting).

CAUTION!	**Un-mounting and mounting the LiPo battery bank should be done by professional only. Reversing the polarity of any cable could cause permanent damage on BMS or/and LiPo battery bank.**

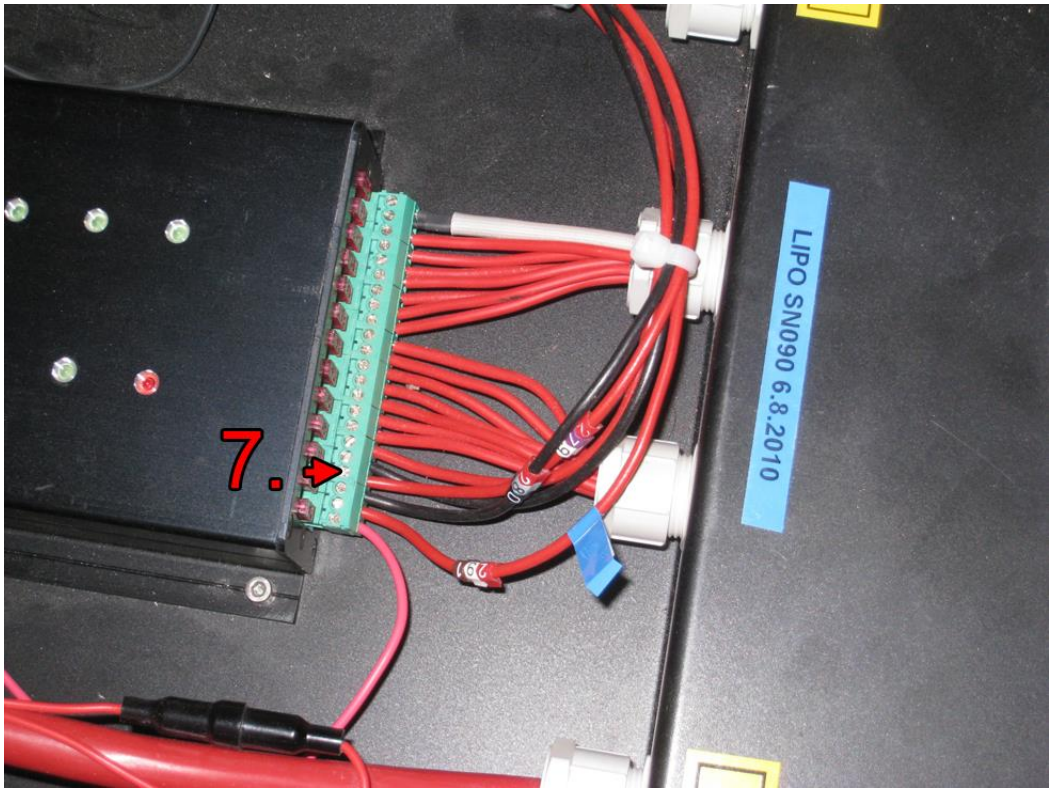
CAUTION!	**Storage condition:** -dry environment -temperature range: -20°C to +60°C -40~60% SOC -do not step on the battery -handle with care

UN-MOUNTING LIPO BATTERY BANK (8 STEPS)

Picture 1: Step 1.



Picture 2: Steps 2-7.



Picture 3: Step 7.

Picture 4: Step 8.

Step 1:

Turn off switch 5 and switch 6 (48V hybrid switches).

Step 2:

Disconnect green connector from BMS by pulling on sides.

Step 3:

Disconnect positive cable from Tyco contactor and isolate it.

Step 4:

Disconnect negative cable from main ANL fuse and isolate it.

Step 5:

Disconnect the positive signal cable (for battery monitor) from Tyco and isolate it.

Step 6:

Disconnect temperature sensor (on ANL fuse).

Step 7:

Remove all cables (coming with cable bundle #7) from green BMS connector. The number of cables is not constant (depending on boat packages), usually 5.

Remove these cables one by one! Mark them (cable with pin #)! Isolate them!

Step 8:

Unscrew the screws on the side of battery box (4x) and pull out the battery through a sofa. Use side handles to lift the battery. The weight of the battery is 80kg, handle with care!

12. APPENDIX A: Wiring diagrams

13. APPENDIX B: List of errors displayed by Hybrid monitor

IG ERROR LISTING

IG Error listing (HEX field):

Error Name	HEX Code	DEC Code	IG response	Reason	Remedy	Note
No error	0x0000	0	/	/	/	
DC-link overvoltage	0x0001	01	Error mode	DC-link voltage is above 270 V	Wait for DC-link voltage drop	1
Power module warm	0x0002	02	Power reduction	IG IGBT module temperature is above 85°C	Reduce load / Check HCU cooling	
Power module hot	0x0004	03	Increased power reduction	IG IGBT module temperature is above 90°C	Reduce load / HCU cooling required	
Power module excessive hot	0x0008	04	Error mode	IG IGBT module temperature is above 95°C	Stop / HCU cooling required	
Step up undervoltage	0x0010	05	Electric propulsion interrupted	Battery voltage dropped below 42 V	Recharge battery	
Bad power module	0x0020	06	Only error flag signalization	IG IGBT module temp. sensor failed	Check / replace IGBT	
CAN lost	0x0040	07	Permanent error mode	CAN Communication with AC part interrupted	Check / replace HCU	2
Battery overvoltage	0x0080	08	Error mode	Battery voltage is above 61 V	Check battery	

AC Error 1 listing (HEX field):

Error Name	HEX Code	DEC Code	AC response	Reason	Remedy	Note
No error	0x0000	0	/	/	/	
IG part lost	0x0001	01	Permanent error mode	CAN communication with IG part interrupted	Check / replace HCU	1
Actuator fail	0x0002	02	Permanent error mode	Clutch signals have the same logic state for more than 6 s	Check clutch signals	
Cont. high ph. current	0x0004	03	Permanent power reduction	Phase current continuously above max level	Stop / Check load	3
Cont. high bat. current	0x0008	04	Permanent power reduction	Calculated battery current continuously above max level	Stop / Check load	3
Hall failure	0x0010	05	Error mode	Hall sensor malfunction	Check / replace hall sensors assembly	
Motor temp. max	0x0020	06	Error mode	Measured motor temperature above 120°C	Stop, electric motor cooling required	
HCU temp. max	0x0040	07	Error mode	HCU temperature above 95°C	Stop, HCU cooling required	
Battery voltage max	0x0080	08	Error mode	Battery voltage above 58 V	Check battery	
DC_link over voltage	0x0100	09	Error mode	DC-link voltage above 270 V	Wait for DC-link voltage drop	4
Invalid HCU command	0x0200	10	Error mode	Wrong state of HCU command inputs	Check HCU inputs wiring	
Battery temp. max	0x0400	11	Error mode	Battery temperature above 55°C	Check battery and temp. sensor	5
Motor	0x0800	12	Error mode	Measured motor temperature	Check / replace hall sensors assembly	

temp. min				below -10°C		
Battery temp. min	0x1000	13	Error mode	Battery temperature below -20°C	Check battery and temp. sensor	5
Short-circuit in Gen. mode	0x2000	14	Error mode	Potential short-circuit detected during generator mode	Check HCU power terminals	
ECU part lost	0x4000	15	Permanent error mode	CAN communication with ECU part interrupted	Check ECU	1,2
/	0x8000	16	/	/	/	

Note 1: Error decimal code numbers 1 and 2 can occur due to:

• AC part HW or SW failure,

• IG part HW or SW failure,

• bad CAN BUS wiring of both controllers inside HCU,

• electromagnetic noise inside HCU.

Note 2: Error decimal code number 2 can occur due to:

• ECU stops to send PGN0 message

• bad CAN BUS wiring of external devices (PC, DDI, etc.),

• external electromagnetic noise.

Note 3: Exact limit value depends on current HCU operating mode.

Note 4: Error decimal code number 9 shall not be apprehend as an error, if battery voltage is between 53,4 V and 53,7 V when HCU operates in generator mode (this is usual HCU behaviour when battery is overcharged).

Note 5: Error decimal code numbers 11 and 13 can not occur due to the absence of the battery temperature measurement. The battery temperature is fixed to 20°C in the current HCU software.

AC Error 2 listing (HEX field):

Error Name	HEX Code	DEC Code	AC response	Reason	Remedy	Note
No error	0x0000	/	/	/	/	
Over current	0x0001	17	Power reduction	Phase current above 150A	Check load	1
Motor overheat	0x0002	18	Power reduction	Measured motor temperature above 115°C	Reduce load, el. motor cooling required	
HCU overheat	0x0004	19	Power reduction	HCU temperature above 85°C	Reduce load, HCU cooling required	
High bat. current	0x0008	20	Power reduction	Calculated battery current above max level	Reduce load	2
High ph. current	0x0010	21	Power reduction	Phase current above max level	Reduce load	2
High elect. power	0x0020	22	Power reduction	Calculated electrical power above max level	Reduce load	2
High mech. power	0x0040	23	Power reduction	Calculated mechanical power above max level	Reduce load	2
/	0x0080	24				
Charging level invalid	0x0100	25	Neutral mode / Charging interrupted	Battery voltage do not follow charger predefined level	Wait for battery voltage drop	
Charging voltage high	0x0200	26	Neutral mode / Charging interrupted	Battery voltage in generator mode above 53,4 V	Wait for battery voltage drop	
Bat. volt. prop. min	0x0400	27	Neutral mode / El. prop. interrupted	Battery voltage in electric propulsion mode below 42 V	Recharge battery	
DC-link volt. prop. min	0x0800	28	Neutral mode / El. prop. interrupted	DC-link voltage in electric propulsion mode below min level	Recharge battery / Reduce load	3
DC-link volt. prop. max	0x1000	29	Neutral mode / El. prop. interrupted	DC-link voltage in electric propulsion mode above max level	Wait for DC-link voltage-drop	3

Over speed el. prop. mode	0x2000	30	Neutral mode / El. prop. interrupted	Rotational speed in electric propulsion above max level	Wait for electric motor speed-drop	3
/	0x4000	31				
Bad temp. sensors	0x8000	32	Warning	After power-up detected HCU, motor or battery temperature out of normal limits	Check temperature sensors	

Note 1: Error decimal code number 1 can sometimes occur in starter mode if electric motor is heavily loaded.

Note 2: Exact limit value depends on the current HCU operating mode.

Note 3: Exact limit value depends on chosen speed setting of the electric propulsion mode.

14. NOTES