

# AXOPAR



## OWNER'S MANUAL

AXOPAR 37 **ST/TT**

***AXOPAR***

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## FOREWORD

Congratulations on your new boat! We thank you for choosing this boat and wish you safe and enjoyable moments out on the waters

In this owner's manual you will find important information that will help you handle and maintain your boat in a safe and easy manner. Furthermore, the manual contains detailed information about the boat and the systems installed, and general information about handling and taking care of your boat.

We advise you to read the manual carefully and familiarise yourself with your boat before you start to use it. Naturally this owner's manual is not a substitute for boating safety skills or good seamanship. If this is your first boat or if this boat type is new to you, we ask for your own comfort and safety that you ensure you can handle the boat before you set out for the first time. Your boat dealer, local boat clubs and national motorboat or yacht federations will gladly inform you about local sea schools or recommend approved instructors.

You should ensure that the anticipated wind and wave conditions correspond to the design category of your boat, and that you and your crew are able to handle the boat in these conditions. Design category B corresponds to wind and wave conditions that can vary from storm to strong winds. Category C also indicates a risk of exceptional swell and gust. Even though your boat is designed for such conditions, they are still very dangerous. Only a capable, fit and trained crew, using a well maintained boat, can satisfactorily operate in such conditions.

This owner's manual is not a detailed maintenance or troubleshooting guide. If problems occur, you should contact the boat manufacturer or their representative. When you are in need of maintenance or repair and alteration work, you should always turn to competent and trained workshops. Changes that can affect the boat's security features must be assessed, carried out and documented by competent professionals. The boat manufacturer cannot be held responsible for unauthorised modifications. Every change to the boat's centre of gravity (from highly mounted heavy equipment or a new engine type etc.) will significantly affect the stability, trim and performance of the boat.

The boat owner must take local and international regulations into consideration concerning the boat crew, equipment and handling of the boat. In some countries, a driving licence or a separate authorization is required for driving the boat and in some countries special regulations might also be in force.

Always maintain your boat properly and make allowance for the deterioration that

will occur over time and as a result of heavy use or misuse of the boat. Any boat, no matter how strong it may be, can be severely damaged if not used properly. Inappropriate use of this boat i.e. use which is not compatible with safe boating, is not allowed. It is always important to adjust the speed and direction of the boat to the sea conditions and your own boating experience.

If your boat is fitted with a life raft, carefully read its operating manual. Onboard, the boat should have the appropriate safety equipment according to the type of boat, weather conditions, etc. This equipment is compulsory in some countries. The crew should be familiar with the use of all safety equipment and the most important actions in different emergency situations (man overboard recovery, towing, etc.). Sailing schools and clubs regularly organize rescue drills.

The equipment in your boat may differ from the equipment used in the pictures and illustrations in this manual. The reason for this might be due to any optional equipment you have chosen or modifications that have been adapted since this manual was made. In such cases we recommend that you contact your local dealer for additional information regarding the equipment in question.

Keep this manual in a safe place and pass it on to the new owner if you sell your boat. If the manual is mislaid or destroyed, a copy can be ordered from your dealer. The warranty on the engine, as well as optional equipment such as trim tabs, bow thrusters, navigation equipment and other equipment fitted afterwards, is on the individual supplier's conditions. The warranties for this equipment and the suppliers' contact information are enclosed. Concerning all other warranty claims, please contact you Axopar dealer mentioned on the cover page.

See the purchase agreement/order for the scope of your purchase. In case something does not work satisfactorily with your boat or its equipment, you can check the service documents for possible service and repair measures. In the event of uncertainty, you should always contact your dealer. Please note that your boat is a recreational boat, thus not suitable for professional use.

Specifications, illustrations and examples and related constructional data in this publication are not binding. We reserve the rights for changes.

# 1 GENERAL

The purpose of the owner's manual is not to be a complete service guide or repair handbook, but to guide the owner into the characteristics of his/her new boat and to handle it in a proper way.

The warnings and precautions in this manual are defined as follows:

## DANGER!

Maximum caution should be observed to prevent fatal injury or permanent harm.

## WARNING!

Denotes that an extreme inherent hazard exists which very likely could result in death or serious injury if proper precautions are not taken.

## CAUTION!

Take precautions to prevent injury and/or damage to the boat and its components.

Units in line with the SI system have been used in this manual, but in some cases other units have been added in parentheses. An exception is wind velocity, which in the Recreational Boat Directive is given in the Beaufort Scale. In this manual, the right side of the hull is referred to as STB (starboard) and the left side as Port.

## 1.1 CE-CERTIFICATION

This boat is classified as Category B and C.

The category is determined according to the maximum number of persons allowed onboard. CE certification means that a boat is designed and built in such a way that it retains its stability and buoyancy in given circumstances and meets other important requirements that are characteristic of the category in question. One of these requirements is that the boats must be easy to manoeuvre.

The CE-categories means also that boats in each category must be designed and constructed to withstand the following parameters in respect of stability, buoyancy, and other relevant essential requirements stated.

### A. Ocean

These boats are designed for extended voyages, where conditions experienced may exceed wind force 8 Beaufort Scale and include significant wave heights of at least 4 metres. Under such conditions these boats must be largely self-sufficient.

### B. Offshore

These boats are designed for offshore voyages, where conditions up to and including wind force 8 Beaufort Scale and significant wave heights up to and including 4 metres may be experienced.

### C. Inshore

These boats are designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 Beaufort Scale and significant wave heights up to and including 2 m may be experienced.

### 1.1.1 IDENTIFICATION

Each boat is supplied with a unique identification code, containing the data described below. The identification code comprises 14 characters plus a hyphen. The height of the code text is 6 mm and it is applied to the starboard side of the stern. The identification code reads as follows:

FI – AXOE7001E818

FI	Country of manufacturer
-	Hyphen
BOT	Manufacturer:
E7	Boat model E=SC
001	Boat number
E	Month of manufacture: A = January, B = February, etc.
6	Year of manufacture
16	Model year

### 1.1.2 BUILDER'S PLATE

The cooperation with VTT (Technical Research Centre of Finland) means that VTT as an external and independent organisation has inspected that the boat fulfils the Recreational Boat Directive and related standards requirements.

The manufacturer's plate is always fitted close to the steering position in the boat. The manufacturer's plate gives the following information:

BOAT TYPE	Boat model
DESIGN CATEGORY	Boat class. See additional information in the chapter CE-category.
MAX. LOAD	Buoyancy. Total weight of persons including personal luggage (excluding tank contents).
MAX. NO	Maximum number of persons on board

A comprehensive explanation of the information given on the plate is presented in each chapter respectively in this manual. (Load and max. engine power)

### 1.1.3 ID OF NOTIFIED AUTHORITY

VTT Expert Services Oy, Notified authority number 0537

## 1.2 TECHNICAL DATA

### WARNING!

When loading the boat, never exceed the maximum recommended load of the boat. Always load the boat carefully and always distribute loads appropriately to maintain design trim. Avoid placing heavy equipment or material high up in the boat. Overloading the boat can damage the engine, even when shut off.

### CAUTION!

The specified tank capacity is not necessarily fully available, depending on the trim and load on board. The tank should always be kept at least 20% full.

### WARNING!

You must not exceed the max. number of persons of the boat. Regarding the number of persons you must also always take into consideration that the total weight of the persons on board and their personal luggage must never exceed the max. load of the boat. When out on the water, always use the seats intended for passengers.

### CAUTION!

The liquids in the built-in tanks are not included in the max. load shown on the Builder's plate.

### 1.2.1 GENERAL FACTS

#### BOAT MODEL

AXOPAR 37 ST AND TT

#### DESING CATEGORY

B and C

#### DIMENSIONS

SI units      US units

HULL LENGTH LH	10,8M	35ft 5in
OVERALL LENGTH LMAX (excl. Engine)	11,2M	36ft 9in
HULL BEAM BH	3,3M	10ft 10in
MAXIMUM NUMBER OF PERSONS (CATEGORY B)	10	(DEFAULT WEIGHT OF ONE ADULT 75KG, A CHILD 37,5 KG)
MAXIMUM NUMBER OF PERSONS (CATEGORY C)	12	
DRAUGHT AT MAX. LOAD (EXCLUDING ENGINE)	0,9M	2ft 9in
HEIGHT MEASURED FROM WATERLINE AT LIGHT LOAD	2,7M	10ft 5in
MAXIMUM RECOMMEDED ENGINE POWER	2x261 Kw	700hp

#### LOADING

##### CATEGORY B

##### CATEGORY C

#### CREW LIMIT

10

12

SI units      US units      SI units      US units

TOTAL WEIGHT OF ALL PERSONS	750 kg	1653 lb	900 kg	1984 lb
WEIGHT OF UNLOADED BOAT WITH MAX. WEIGHT OUTB. ENGINES	4337 kg	9561 lb	4337 kg	9561 lb
MAXIMUM RECOMMEDED LOAD	1585 kg	3494 lb	1735 kg	3825 lb
BOAT WEIGHT AT MAX. LOAD	5922 kg	13056 lb	6072 kg	13387 lb

#### OF WHICH:

SI units      US units

WEIGHT OF BOAT'S HULL (EXCLUDING ENGINE)	3530 kg	7782 lb
MAXIMUM RECOMMEDED ENGINE WEIGHT	644 kg	1420 lb
PERSONAL LUGGAGE	100 kg	220 lb
FRESH WATER	100 kg	220 lb
SEPTIC WATER	70 kg	154 lb
FUEL	548 kg	1208 lb
OTHER LIQUIDS (HEATER FUEL)	17 kg	37 lb
WEIGHT OF LIFERAFT	30 kg	66 lb
TOTAL WEIGHT OF FUEL, WATER AND OTHER LIQUIDS	735 kg	1620 lb
MASS AT TRANSPORT	5002 kg	11028 lb

**TANK CAPACITY**

FUEL TANK	730L	193 gal
FRESH WATER TANK	100L	26 gal
SEPTIC TANK	70L	18 gal

Assessment of the stability of the boat has been done at max. load conditions. The maximum recommended load contains only the weight components mentioned above.

**LAYOUT AND EQUIPMENT****GELCOAT / PAINT**

HULL (WHITE).....	SVG 80541 S (Reichhold)
HULL (GREY, VERSION R OR COOL GREY) ..	GN RAL 7037 HA (Ashland)
DECK.....	SVG 80541 S (Reichhold)
SWITCH PANEL MODULE.....	Nextel

**ELECTRICAL SYSTEM 12V (RECOMMENDATION)**

START BATTERY .....	2 pcs. 65 Ah AGM BATTERY
SERVICE BATTERY.....	2 pcs. 110 Ah AGM BATTERY

**ELECTRICAL SYSTEM 230V**

BATTERY CHARGER .....	65 AH SHOREPOWER CONNECTOR
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**1.3 DECLARATION OF CONFORMITY AND ESSENTIAL SECURITY REQUIREMENTS****SAFETY**

Basic data	EN ISO 8666:2002
Hull identification	ISO 10087:2006
Manufacturer's plate	RDC ANNEX I
Owner's manual	EN ISO 10240:2004
Preventing falling overboard	EN ISO 15085:2003/A1:2009
Life raft stowage	RSG Guidelines
Escape	EN ISO 9094-1:2003
Anchoring and towing	EN ISO 15084:2003
Running lights	1972 COLREG
Emissions control	EN ISO 8099:2000

**INSTALLATIONS**

Engines and engine spaces	-
Fuel system	EN ISO 10088:2013, EN ISO 11105:1997, EN ISO 21487:2012
Electrical system	EN ISO 10133:2012, ISO 28846:1993/ A1:2000 EN ISO 13297:2012
Steering system	EN ISO 10592:1995/A1:2000
Gas systems	EN ISO 10239:2014
Fire protection	EN ISO 9094-1:2003

**DIMENSIONING**

Structure	RSG Guidelines, ISO 12215-5:2008, ISO 12215-6:2008
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**HYDROSTATICS**

Stability and freeboard	EN ISO 12217:2013
Buoyancy and floatation	EN ISO 12217:2013
Manufacturer's maximum recommended load	EN ISO 14946:2001/AC 2005
Openings in hull, deck and superstructure	EN ISO 9093-1:1997, EN ISO 12216:2002
Flooding	EN ISO 11812:2001, EN ISO 15083:2003, ISO 8849:2003

**HANDLING CHARACTERISTICS**

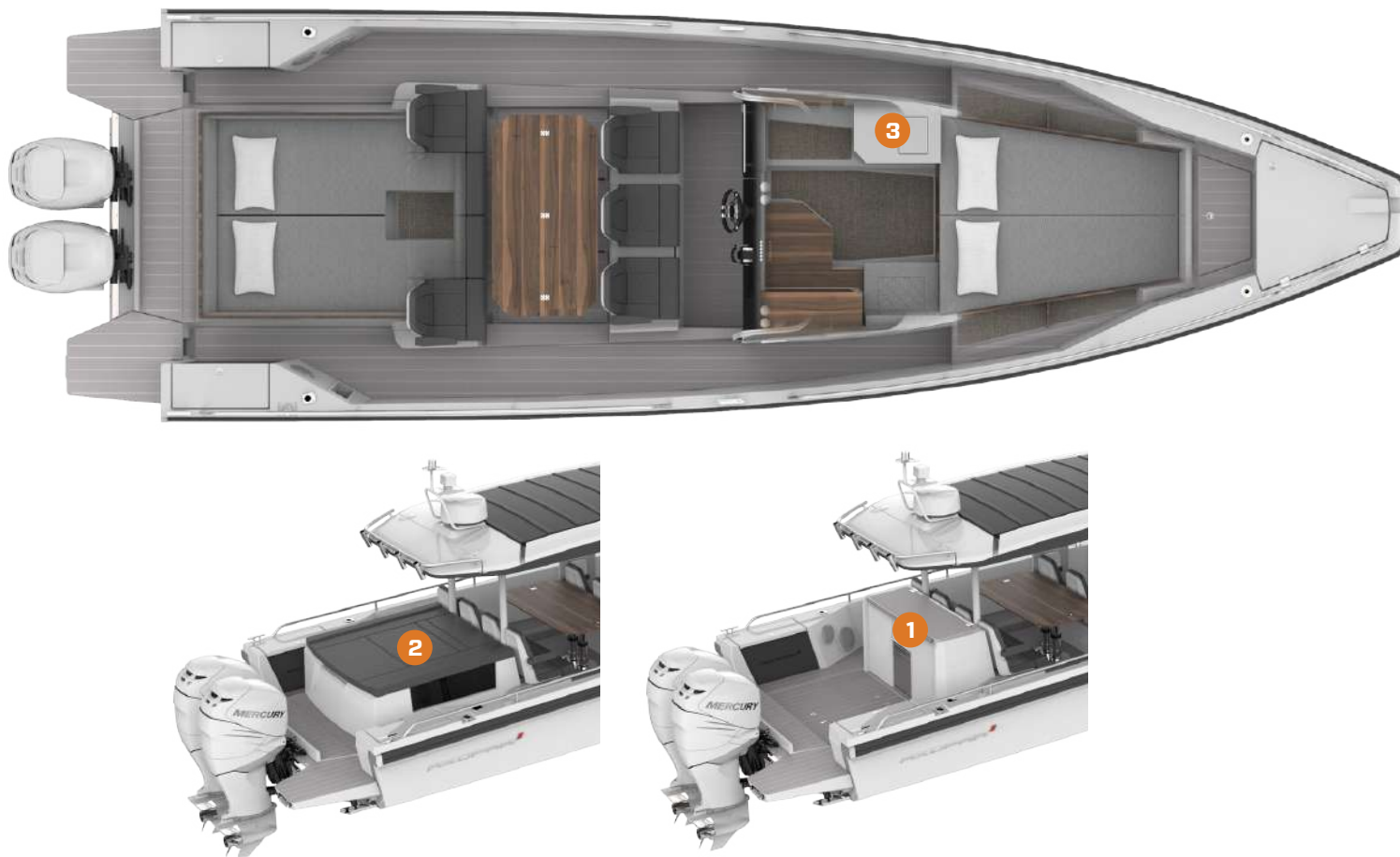
Handling characteristics	RFU 144, ISO 6185-4:2011-7.3.3 EN ISO 8665:2006
Visibility from the steering position	EN ISO 11591:2011

**EXHAUST EMISSIONS OF ENGINES -****NOISE EMISSIONS -**



## 1.4 GENERAL LAYOUT

The Axopar boats have two different deck options. The boat can be equipped with a wetbar (1) or an aft cabin (2). The boat's fore cabin may be equipped with a galley module (3). The layout of equipment and technical components may vary between boats due to different accessory alternatives.



## 2 STABILITY AND BUOYANCY

### 2.1 GENERAL

All weight dispositions (for example installing a fishing tower, radar or furling mast, engine replacement etc.) can have a significant impact on the stability, trim, and performance of your boat. The bilge water level should be kept at a minimum. The stability of your boat will be compromised if any weight is placed in a high position. In stormy weather all hatches, compartments and doors should be kept closed to minimize the risk of flooding. The stability can be diminished when towing or lifting heavy objects using the davit or jib crane. Breaking waves represent a serious significant danger to stability.

#### CAUTION!

To avoid the risk of flooding, always keep sea valves closed when not in use. (For example, the sea valve for the toilet's flushing water).

### 2.2 SELF DRAINING SYSTEMS

The Axopar boat is equipped with self-draining systems for the forward and aft cockpits, which include drain holes. There are drain holes for water in both aft corners of the deck (see next Figure). The openings are directly connected to the sea. The deck of the boat has been designed to allow the water to drain straight into the sea via the water gullies (see next Figure).

In addition to rainwater, the drain holes are intended to drain water ending up on the deck through splashing or from breaking waves. The drain holes must be open at all times and the holes regularly cleaned by removing any accumulated debris to prevent clogging.

The system is built so as to drain the water from the deck in normal use. Do not close the taps when using the boat or when the boat is attached to the dock.

In the cockpit of boat are two recesses, recess under driver and passenger where in both are separate draining systems. These drain holes are located in both aft corners of the recess. Recess drains via sea-cock which locates transom of the boat.

#### WARNING!

Do not close draining sea-cocks if boat is in the use.

#### CAUTION!

The self-emptying open space is meant for the removal of such water that ends up on the deck through rain, splashing or from breaking waves. A part of the rain water as well as water condensation in the bilge may end up in the bilge.

Do not leave the boat unattended in the water for a long time. Observe the floating position of the boat and empty the bilge when necessary. Leaving the boat unattended in the water for a long time may cause damage.

#### WARNING!

Do not close the drain holes when using the boat.

### 2.3 DOORS, HATCHES AND SEACOCKS

There are several inlets through the boat that include taps for opening and closing the inlets. It is recommended to keep these closed if the boat is out of use for a long time, and to open them again when the boat is used again. Check always before and after boat use that every deck- and service hatches are securely closed especially inspection hatch of the engine bracket.

We recommended that you keep the windows, doors, deck hatches and vents shut while driving. However, on occasion and depending on the weather they can be kept open. In stormy weather, always keep deck hatches, storage room doors and openings closed to minimize the risk of water getting into the boat.

In certain conditions and speeds it is possible that water is sprayed inside through canopies, hatches or other openings, due to negative pressure or other effects. This can be prevented by closing the canopies, hatches or other openings.

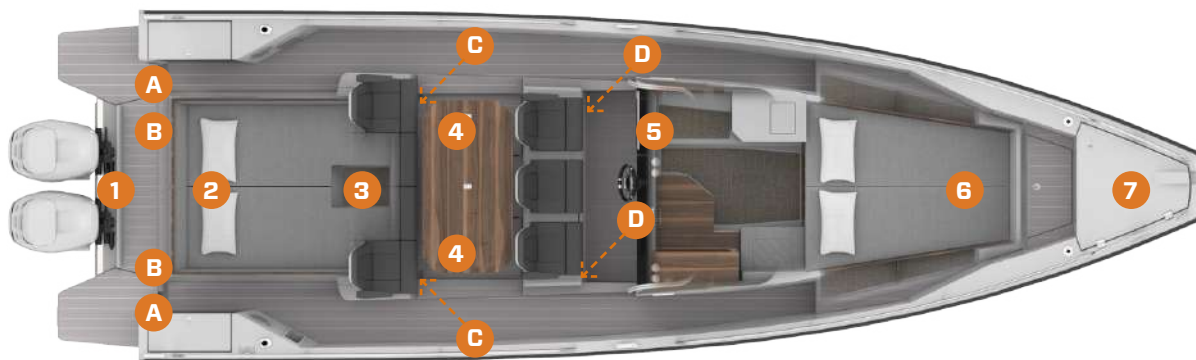
#### WARNING!

Doors to cabin, aft cabin hatches, cabin roof hatch must be kept shut when under way.

On the next page is shown openings that are required to be shut when boat is underway. These openings can be open at nice conditions and must be closed if waves or wind conditions are harsh.

The picture below shows the hatches, seacocks and inlets through the side. The hatches in the picture (1–7) must be kept closed while under way or when the boat is attached to the dock. Always check in the spring when launching that the inlets through the side and bottom (A–M) are tight.

1. Inspection hatch of engine bracket
2. Roof hatches of aft cabin or hatches of storage box
3. Door of aft cabin\*
4. Floor hatches of cockpit
5. Door of fore cabin
6. Bow door of fore cabin
7. Hatch of bow storage box



- A. Draining of aft deck
- B. Draining sea-cocks of cockpits
- C. Draining of aft cockpit
- D. Draining of fore cockpit
- E. Ventilation of heater tank\*
- F. Ventilation of fresh water tank
- G. Ventilation of holding tank
- H. Draining of front cabin sink \*
- I. Water inlet of toilet seat
- J. Draining of manual bilge pump
- K. Draining of aft bilge pump
- L. Draining of midship bilge pump
- M. Draining of fore bilge pump



\*Depening of equipment level

## 2.4 BILGE PUMP SYSTEM

The bilge pump system consists of several different pumps that cover all the lower sections of the boat. Both electric and manual bilge pumps have been installed. The boat also has a sign that displays the draining area of each pump. The electric bilge pumps are equipped with a float which triggers them automatically if there is water in the bilge space. The pumps can also be controlled from switches on the steering console. The automatic bilge pumps are equipped with an alarm signal which is activated when the pump starts.

The manual bilge pump (1) is controlled with its handle, which is located in the port side stowage casing of the afterdeck. The purpose of the manual bilge pump is to drain the tank space.

The electric pumps are submersible. One of them is located under the berth of the aft cabin or under storage hatch (2), another under the front cabin floor (3) and a third under the berth in the fore cabin (4). The bilge water level should remain at a minimum.

The output of each automatic bilge pump is 41 litres per minute. The manual bilge pump's output is 33 litres per minute.

### CAUTION!

Avoid pollution! The purpose of the boat's electrical bilge pumps is to minimize the risk of accidental discharge of oil polluted water. The boat owner should check the bilge water regularly for contaminants such as oil, diesel, glycol etc. The bilge pump system comprises several different pumps that cover all areas of the boat. Your boat has electrical as well as manual bilge pumps. There is also a sign in the boat indicating the draining area of each pump respectively.

### CAUTION!

Do not run bilge pumps dry for long time.

### DANGER!

Check the functionality of the bilge pumps regularly. Remove any waste from the intakes. The combined capacity of the bilge pump system is not designed to pump out the boat in the event of hull damage. The pumps are constantly activated and pump out the boat as required. The pumps can also be started manually from the boat's main control panel.





## 3 BOAT OPERATION

### 3.1 HANDLING DEVICES OF BOAT

#### 3.1.1 STEERING CONSOLE

The controllers are situated so that the driver can easily manage them from the steering console. The location and quantity of the devices depends on what optional equipment and engine models have been chosen. Any further information on the devices can be found in other sections of this manual, as well as from the manuals of the devices.



Components of steering console:

1. Chart plotter
2. Chart plotter
3. Compass
4. Fusion multimedia player
5. Active trim control unit
6. Engine display
7. Switch panel
8. Bow thruster control panel
9. Trim tabs control unit
10. VHF radio
11. Engine remote control
12. Emergency stop
13. Ignition key
14. Builder's plate

### 3.1.2 WINDSCREEN WIPERS

The boat's windscreen wipers are controlled by the switches in the boat's steering console. When pushed forward, the wipers wipe only once, and when pulled back, they wipe continuously. A switch for the windscreen washer is installed next to the switch for the windscreen wipers. The windscreen wash-fluid tank is located under the helmsman's seat.

### 3.1.3 STEERING SYSTEM

#### CHECKING AND TOPPING UP OIL

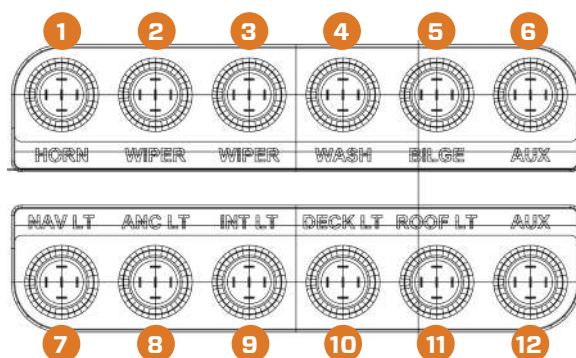
The safety of the boat depends on effective steering, so the oil level in the pump should be checked before casting off. Hydraulic oil is added to the steering system via the filling plug in the steering wheel pump. The oil level must be approx. 10 mm below the filler hole. Read the manufacturers manual for oil recommendation for the steering system. (For steering systems provided by engine manufacturer read the engine manufacturers instructions).

#### MAINTENANCE OF THE STEERING

Check couplings, mountings and bearings. For maintenance of the steering system: See the manufacturer's instruction manual.

#### SWITCH PANEL OF STEERING CONSOLE

1. Horn
2. Wiper Port
3. Wiper STB
4. Windscreen washer
5. Switch of bilge pumps
6. Aux
7. Navigation lights
8. Anchor light
9. Interior lights
10. Deck lights
11. Roof lights
12. Aux



### 3.1.4 STARTING THE ENGINE

Read the engine manufacturer's manual.

1. Set the engine lever in neutral.
2. Turn the ignition on and check the fuel level.
3. Start the engine by turning the ignition key.
4. Check that the gauges for oil pressure and volt meter show normal values.
5. Run the engine to operating temperature at idling speed. Never rev up a cold engine.

For further information, read the engine manufacturer's manual.

#### DANGER!

Risk of carbon monoxide poisoning. It is important to be aware of the risks with engine exhausts. Under certain conditions (e.g. turbulence or disadvantageous wind conditions), exhaust can enter the boat. If this happens you should avoid idling the engines. Should these problems occur under way, do not open hatches and ventilators, as this can worsen the problems. Instead, a solution to the problem might be to change the boat's speed or weight distribution for example.

#### WARNING!

Never step onto the swim ladder when the engine is running. Stop the engine while the steering and propeller are being inspected.

#### WARNING!

Do not operate this boat with an engine having capacity of rated power larger than recommended by the manufacturer.

### 3.2 REGULAR INSPECTION FOR USER

Due the safety reasons following inspections have to be made for the boat before and after the use:

#### 3.2.1 BEFORE LEAVING HARBOUR

Check following things:

#### SAFETY:

- Ensure that all people onboard has own life jacket.
- Sea condition is sufficient for your boat.

- Dead man's switch is switched to driver.
- Ensure that you have fire extinguisher(s) onboard and they are not expired.
- Ensure that you have needed ropes and anchor onboard.

#### **DRAINING AND TIGHTNESS:**

- Check that there is no water on bilge.
- Check that all bilge pumps work.
- Check that there are no fuel or oil leaks, bilge.
- Check that deck drain system is clean and valves are open.
- Every All deck hatches are closed tightly.

#### **ELECTRIC AND ENGINE:**

- Every fuses are lower position.
- Main switches are switched on.
- Batteries have enough power.
- Engine works properly.
- Engine cooling water flow.
- You have enough fuel onboard.

#### **3.2.2 AFTER USE**

- Check following things:
- Main switches are switched off.
- Sea-cocks of septic tank and toilet seat are closed.
- Ensure that direct supply switches are switched on.
- Bilge is empty of water.
- Function of every bilge pumps.
- Deck drainings works properly and every draining valves are open.
- All deck hatches, roof canvas and doors are closed tightly.

### **3.3 BOAT HANDLING**

#### **3.3.1 BEFORE LEAVING HARBOUR**

For safe navigation under all weather conditions, proper sound signaling equipment in compliance with regulations (COLREG, 1972) must be carried on board. Make sure that the sound signaling equipment on your boat is compliant with these regulations.

#### **CAUTION!**

Before leaving harbor it is important to note following:

- Check that the boat and its equipment are in seaworthy condition.
- All persons on board should wear an appropriate life vest when on deck. Note that, in some countries, it is a legal requirement to wear a life vest in accordance with national regulations at all times.
- Always listen to long-term weather forecasts when planning longer trips.
- Always make sure there is enough fuel and freshwater in the tanks.
- Always keep the engine compartment closed when starting the engine.
- Check that all items on board are properly stowed and adequately secured to manage rough sea and wind conditions.
- Make sure that the swim ladder is raised out of the water before moving off.
- Make sure that the steering is correctly positioned before starting

#### **3.3.2 LEAVING THE JETTY**

Before casting off, consider how best to leave the jetty. What is the wind direction? Using a bow thruster, it is easy to move the bow out and then engage the propeller.

If your boat has two engines, it is easy to move away from the jetty by engaging the engine nearer the jetty astern at idling speed and engaging the other engine ahead at idling speed on. The boat will swing out from the jetty astern. As the bow will move against the jetty, it is important to fend off properly.

With only one engine this can be a little more challenging, especially if the wind is pressing the boat firmly against the jetty. Then you have to use a spring to get the stern out. Firmly fend off the bow from the jetty. Take a line from the bow around a bollard or cleat, so that it can be easily let go. Engage idling speed ahead and turn the rudder so that the stern glides out from the jetty. When the boat has reached a position, where it can safely be reversed, release and retrieve the line, quickly center the rudder and engage astern.

**CAUTION!**

Gather in all lines and fenders while you are still in sheltered water. A rope around the propeller can disable a boat.

**3.3.3 DRIVING THE BOAT**

Going out in a motor boat involves a responsibility, not just to those on board but also to others we meet on the water. Showing consideration for others makes boating comfortable. Everyone has the same right to be at sea, whatever kind of boat they go afloat in.

The physical laws that apply to a boat are rather different from those affecting a car, for example, as are the possibilities of influencing its manoeuvrability. You can influence a boat's behavior and the level of comfort on board primarily by adapting the speed to the prevailing sea conditions and by the intelligent use of the trim tabs. A planning boat rides almost level in the water at maximum speed. As the speed of the boat is reduced the trim angle increases and the bow rises slightly. This is normal, and is a prerequisite for good performance.

**DEAD MAN'S SWITCH**

If your boat is equipped with a dead man's switch, attach its lanyard to yourself immediately after detaching the mooring lines. For more detailed instructions, refer to the engine manual. It is very important that the boat stops if you for some reason fall overboard or stumble on board, particularly if you are alone. However, remember to detach the lanyard from your wrist before docking or beaching operations to prevent the engine from stopping unintentionally.

**DRIVING AT HIGH SPEED**

Although the Axopar boats have passed the CE requirements for swerve tests at full speed, we do not recommend making sharp turns at high speed. When exceeding a certain speed limit any hull construction might lose its grip. This might lead to passengers hurtling out of the boat, especially in a single engine configuration.

- Do not use the boat if it has an engine with a higher power rating than indicated on the capacity plate.
- Do not drive the boat at high speed if the engine's rig angle is negative (bow down).
- Do not drive at full speed on congested waterways or if the visibility is limited because of weather conditions or waves.
- Reduce your speed and wake as a matter of courtesy, and also for the safety of yourself and others.

- Observe and obey speed limits and prohibitions associated with a swell.
- Follow the rules of navigation and the requirements of COLREG (Convention on the International Regulations for Preventing Collisions at Sea).
- Always make sure that you have the space needed for avoiding collisions and coming to a halt and for evasive manoeuvres.
- Always use a dead man's switch if available.
- Reduce speed in high seas for increased comfort and safety.
- Learn your boat's speed potential. Utilize this knowledge for economical and safe cruising.
- Avoid using high speed along with large rudder movements when going astern, because that places great strain on the rudder and steering mechanism.
- Avoid sudden steering manoeuvres at high speeds.
- Avoid staying in the bow area when driving at high speeds.

You should avoid sudden changes in direction of travel at high speed. Let the boat come to a stop, and the engine rev down before shifting between forward and reverse. Otherwise excessive strain is put on the engine, which could cause the engine to stop. In the worst case, sea water may enter the engine.

A right-handed propeller rotates clockwise and a left-handed propeller anti-clockwise, seen from the stern. The rotation of the propeller is critical for steering the boat. The right-handed propeller pushes the stern of the boat to starboard when the engine is engaged ahead and to port when it is going astern. The direction of rotation of the propeller has a major impact on the turning radius. A right-handed propeller gives a smaller turning radius to port than to starboard. This is called the propeller's paddlewheel effect.

Your propellers have considerable propulsion power that provides powerful acceleration. Take this into consideration to avoid dangerous situations arising from this.

**DANGER!**

A revolving propeller is life-threatening to a swimmer or a person who has fallen overboard. Use the dead man's switch and turn off the engine when someone is climbing on board.

**DRIVING IN ROUGH SEAS**

Never go out in rough seas, if you are uncertain whether the boat and those on board can cope. Follow these simple rules:



- Be well prepared.
- Remember to secure loose equipment.
- Always have a sea-anchor and other emergency equipment easily accessible.
- Avoid breaking seas that can appear close to land and over shallows.
- If there are significant waves, always reduce speed to guarantee the safety of the persons on board.
- Use the trim tab to trim the bow down to reduce hull slamming in a head sea.

#### IN A HEAD SEA

- Adjust speed to suit the size of the waves.
- Adjust the trim angle to the size of the waves. Avoid taking seas beam on.

#### IN A FOLLOWING SEA

Remember to keep the bow high in a following sea. Avoid crashing through waves, maintain low speed. If necessary, deploy the sea anchor to reduce speed.

Planning boats can be particularly exposed in rough following seas. The stern of the boat rises and the rudder does not answer, so the boat broaches while the bow cuts down into the sea.

#### MANOEUVRING IN NARROW CHANNELS

When manoeuvring the boat in narrow channels the engine speed should be kept as low as possible so that manoeuvres are calm and steady. In difficult wind and current conditions, more revs might be necessary to make full use of the power of the engine. In these conditions, it is important that manoeuvres are made quickly and precisely to prevent the boat from drifting into trouble for example.

A good rule, before starting a manoeuvre under difficult conditions, is to think through the different situations which could arise. Pay attention to the wind and current conditions and decide in advance which manoeuvres you will make. It is also important to brief crew members on what they should do in different situations.

Always keep in mind that the stability of the boat may be reduced when towing.

#### CAUTION!

Even a non-slip moulding can be slippery to walk on when the deck is wet.

#### 3.3.4 VISIBILITY FROM HELMING POSITION

Take the visibility from the helming position into consideration. Among other things the following factors can considerably reduce visibility:

- Gear trim angle
- Trim tab angle
- Load and load positioning
- Speed
- Rapid acceleration
- Changeover from displacement speed to planning
- Sea conditions
- Rain and thunderstorms
- Darkness and fog
- Position of curtains
- People and equipment that can block the helmsman's view.

The International Regulations for Preventing Collisions at Sea (COLREG) demand that a proper lookout is kept at all times, and the "right of way" rule must be observed. It is essential that these rules are followed.

#### WARNING!

Make only small adjustments at a time. Holding down the button for the trim tab for any length of time can result in partial loss of control of the boat.

#### 3.3.5 USING THE TRIM TABS

A boat does not need trim tabs to get up on the plane or to give good performance. Trim tabs are, however, a very useful aid, if used correctly. There are two situations in particular where trim tabs should be used. These are when it is desirable to trim the bow down in a rising sea and at speeds between going up planning and cruising speed, as well as when running with a strong beam wind.

A planning boat always leans into a strong side wind. This reduces the boat's sea-keeping qualities, which is why listing to one side should be eliminated as far as possible. Lowering the trim tab on the windward side brings the boat back into normal attitude.

For trimming the bow down, both trim tabs are used in parallel. Begin by retracting both trim tabs completely, then lower both of them a little at a time, so that you retain complete control over how the boat is affected.

When running with a following sea, both trim tabs should always be fully raised.

The reason for this is that boats have a tendency to “dive” in a strong following sea, which can result in uncontrollable slowing. Therefore you should run the boat with a high bow angle in a following sea.

### 3.4 PREVENTING FALLING OVERBOARD AND HOW TO GET BACK ON BOARD

The boat's working decks are areas where people can move about when the boat is being maneuvered. These decks are shown in orange in the picture. Do not sit, stand or spend time in other parts of the boat while the boat is under way. Moving about in the aft part of the afterdeck and on the foredeck while the boat is under way is not recommended.

If a person has fallen into the water, the easiest way to get back on board is to use the swim ladder. The ladder can be pulled down also from the water. Keep the gates in the flat afterdeck area closed while the boat is under way.

### STAYING ON DECK

Staying on the deck is not allowed for safety reasons in speeds exceeding 30 knots. If the sun deck cushions of the fore deck table are in place then observe the maximum speed of 15 knots to avoid the cushions or table detaching at speed or in high waves.

### DANGER!

A revolving propeller is life-threatening to a swimmer or a person who has fallen overboard. Use the dead man's switch and turn off the engine when someone is climbing on board.

## 3.5 ANCHORING, DOCKING AND MOORING

### 3.5.1 FASTENING POINTS

Fastening points are indicated in the illustration in the picture below. Points (or cleats) are located both at the stern, midship and bow.

When anchoring or towing, the forward force is 37,6 kN.

When mooring the forward force is 30,7 kN.

When mooring the rearward force is 26,2 kN

### 3.5.2 DOCKING

Always brief your crew how you are planning to dock. Fenders and at least one mooring line fore and aft must be in place before approaching the jetty.

It is always easiest to dock against the wind. Try to hold the bow exactly into the wind and maintain sufficient speed for the boat to answer the rudder. If the bow is blown off in one direction, back out and repeat the manoeuvre. Bring the bow up to the jetty, and make sure you get a line ashore quickly.

Docking with a side wind is a little more difficult. Do not steer parallel to the jetty letting the boat blow in as there is always a risk of the bow being blown off towards other boats or the jetty. Instead, try to manoeuvre the boat so that the wind comes directly from astern. Then the boat can be manoeuvred straight ahead



since the wind helps hold the boat on a straight course. It is good to have someone on the foredeck that can go ashore and quickly turn the bow in the desired direction after the boat has stopped completely.

Try to always avoid sharp movements of the throttle, since idling speed in ahead and astern is generally adequate. Sharp movements of the throttle can lead to panic manoeuvres.

### CAUTION!

The tensile strength of the lines or chains should normally not exceed the strength of the fastening point in question.

### 3.5.3 BEFORE ANCHORING

1. Check the chart to see if anchoring is permitted in the area.
2. Listen to the weather forecast for the area and take note of the expected wind conditions.
3. Switch on the echo sounder.
4. Study the seabed conditions and make sure that there is good holding ground.
5. Check that the safety chain has been released from the anchor.
6. Wait until you have reached the intended anchoring point before lowering the anchor.
7. Let out the anchor line equal to at least three times the depth of the water.
8. Put the engine in astern to check that the anchor has taken hold. (Only when bow anchoring)
9. Note your position on the GPS. Regularly check that the boat has not moved from its position.
10. Set the echo sounder to "Anchor Watch"

### DANGER!

Always fix the anchor in such a way that it is secure fastened onto the boat. An anchor that falls off when under way may cause serious damage to the boat and mortal danger to the crew.

### 3.5.4 TOWING AND MOORING

#### CAUTION!

When towing another boat or being towed, always drive slowly. If the boat you are towing is of the displacement hull type, never exceed its hull speed

Always attach the tow line so that it can be detached under load. It is the owner's/operator's responsibility to ensure that mooring lines, towing lines, anchor chains, anchor lines and anchors are adequate for the vessel's intended use

Always remember that the stability of a boat may decrease when being towed.

### 3.5.5 LIFTING AND TRANSPORTING

#### LIFTING

Commission only a reputable lifting company or a boatyard with sufficient lifting capacity to lift the boat. Make sure the company has full insurance cover, in case of any damages. In addition to the boat's own weight (see technical details), take into account also the equipment and other possible loads in the boat. Location of the lift straps are indicated in the following image.

Before operating lift equipment:

- Check and determine applicability of federal, state, or local requirements;
- Follow the lift equipment manufacturer's requirements and recommendations;
- Check the boat's lift points, weights and other information. Lift points are shown follow picture.
- Straddle lift operation is a highly technical area that requires trained and experienced operators.

During lifting:

- Have access to boat interior.
- Ensure that all hull penetrations are closed or secure.
- Check boat for bilge water before lifting. Excessive quantities of bilge water can shift, changing the balance of the load.
- Check for thru-hull appendages such as knot meters and stabilizers, rub, spray, and splash rails, so that they are not damaged by lifting equipment;
- Check the hull structure to locate shafts, rudders, struts, and the forward and aft ends of any keels.

- Check the hull's structural configuration, including the location of bulkheads, stringers, engines, and tanks.
- Check bilges for water ingress following launch.
- Transport boat as close to the ground as practicable.

### **DANGER!**

Lift slings may slip on the hull.

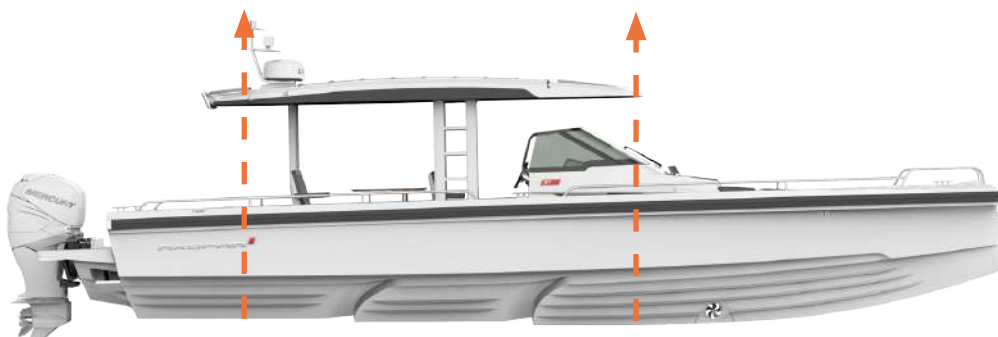
Avoid serious injury or death from dropped load.

When appropriate, tie slings together before lifting.

The position of the slings may need to be adjusted depending on how the boat is loaded.

### **CAUTION!**

Do not stay under the boat when it is hanging in the crane.



### **TRANSPORTING**

Before lifting your boat onto the trailer, make sure that the trailer is suitable for your boat: that there are a sufficient number of supports to distribute the weight properly without excessive point loads, and the capacity and dimensions of the trailer are sufficient to carry the boat and its engine, equipment, battery, boating accessories and fuel on board.

Before loading the boat on the trailer, remove any unnecessary weight from the boat and drain the bilge water. Adjust the side supports of the trailer so that the most weight of the boat rests on the keel supports and the side supports only offer lateral support. Protect the boat by placing suitable padding between the tiedown straps and the boat if necessary. Refer to the engine manual for any instructions on trailering.

In addition, pay attention to any equipment and accessories in the boat during trailering. Make sure you secure all loose items in the boat. Do not use a hood, canopy, tonneau cover or other similar top or cover on the boat during trailering. These hoods and covers can become detached at high speeds and damage the boat and cause a danger to traffic.

Moreover, a hood or other cover flapping in the wind during trailering can damage the boat surface. Keep the hood in its dedicated storage compartment during trailering, or remove the hood completely if necessary. Also make sure that the boat door is properly closed before trailering.

### **CAUTION!**

The trailer must be a little nose heavy. Make sure that the boat is securely fastened to the trailer, that it cannot move into any direction, and that the side supports provide an even support for the weight of the boat. The hull of the boat can be damaged if the boat swings against a single support during transport.

### **WARNING!**

A boat trailer that does not have sufficient capacity or that is poorly maintained can become damaged and cause a danger on the road. Make sure that the trailer capacity is sufficient to also carry the weight of the engine, fuel and equipment.

### **CAUTION!**

The lifting beam should be exactly the same width as the boat. Always take great precautions near and around the boat when lifting. Note the location of the log transducer to avoid damaging it. Protect the hull sides well to avoid damages.

## 4 TECHNICAL SYSTEMS

### 4.1 ELECTRICAL SYSTEM

Location of the component are shown in the diagram

1. High-current fuses
2. Batteries
3. Main switches
4. Fuse panel and 12 V output
5. 12 V output
6. Shorepower input and fuses
7. Shorepower charger
8. 230 V socket



### 4.2 12 V SYSTEM

Your boat is equipped with the 12V electrical direct current (DC) system. The 12-Volt DC-electrical system consists of engine driven alternators, battery chargers for shore-side electricity, batteries and equipment. The power supply happens from charger or alternator via diodes for batteries. Most equipment of the boat uses the 12 V system. 12V equipment is working only when a main switch and a switch in the Main switch panel is switched on. Damaged equipment must be maintained before taking back to use. When the electronic circuit is switched on, actuators can be operated from the switchboard in the helmsman's spot

#### WARNING!

- Never:
- switch off the current when the engine is running, because this may cause damage to the alternator.
- carry out electrical installations when the power is switched on
- modify the boat's electrical system or diagrams; service and maintenance must be carried out by a qualified electrician
- modify the nominal rated amperage of the overvoltage protector
- install or replace electrical equipment with components that cause the circuit's nominal rated amperage to be exceeded
- leave the boat unattended with the electrical system switched on, except for the automatic bilge pump or alarm system



**WARNING!**

Never leave the boat unattended with the electrical system energized, except automatic bilge pump, fire protection, and alarm circuits.

**4.2.1 MAIN SWITCHES**

The different electronic circuits of the boat are controlled by the main switches on the distribution board. The main switches allow the batteries to be disconnected from all devices that consume electricity. When the main switches are in the ON position, the current is conducted to the distribution board and from there to different parts of the boat.

The background color of the main switch and the text "ON" shows that the electronic circuit is switched on, and when the circuit is switched off, the background color is red and the text says "OFF".

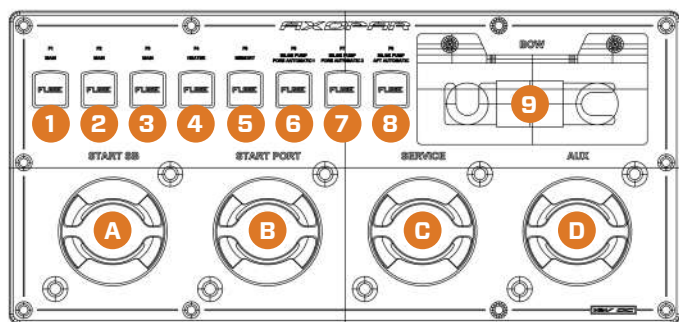
When you leave your boat for any length of time, switch the current off from all main switches and devices but leave the direct supply switches on.

The base drawing of the craft's electrical system is presented in Appendix 2. The main switch is located under after seat.

In the main switch panel are direct supply switches for critical equipment and main switches for Start batteries (A and B), Service battery (C) and Aux battery (D).

Current feed to the engine is achieved by turning the switch START to the ON position, feed to other equipment is achieved by turning the switch SERVICE to the ON position and feed to the bow thruster and windlasses is achieved by turning the switch AUX to the ON position.

1. Main fuse
2. Main fuse
3. Main fuse
4. Heater
5. Radio's memory
6. Fore bilge pump 1
7. Fore bilge pump 2
8. Aft bilge pump

**4.2.2 DIRECT SUPPLY SWITCHES**

Some of the devices in the boat are supplied by direct supply switches. Direct supply switches are intended for such equipment that need current when main switches are turned off.

When pushed down, the switch is on and when pushed up it is off. The switch indicates a short circuit or interference in the electronic circuit by springing up to the "off" position. The switch can be reconnected by pushing it back down to the "on" position. Do not reconnect the switch before you have found out the reason for the interference.

The direct supply switches must be left on even if the current from other circuits is switched off. An appliance that is switched off too early may cause the appliance to overheat and become damaged.

Switches are located main switch panel and it are presented in the next figure.

**WARNING!**

Turning the direct supply switch off too early may cause the device (e.g. heater) to break or catch fire, because the devices have a ventilation feature that works even if the device is otherwise switched off. Make sure the device is cooled down before turning it off completely. For more information, see the manual of the device in question.

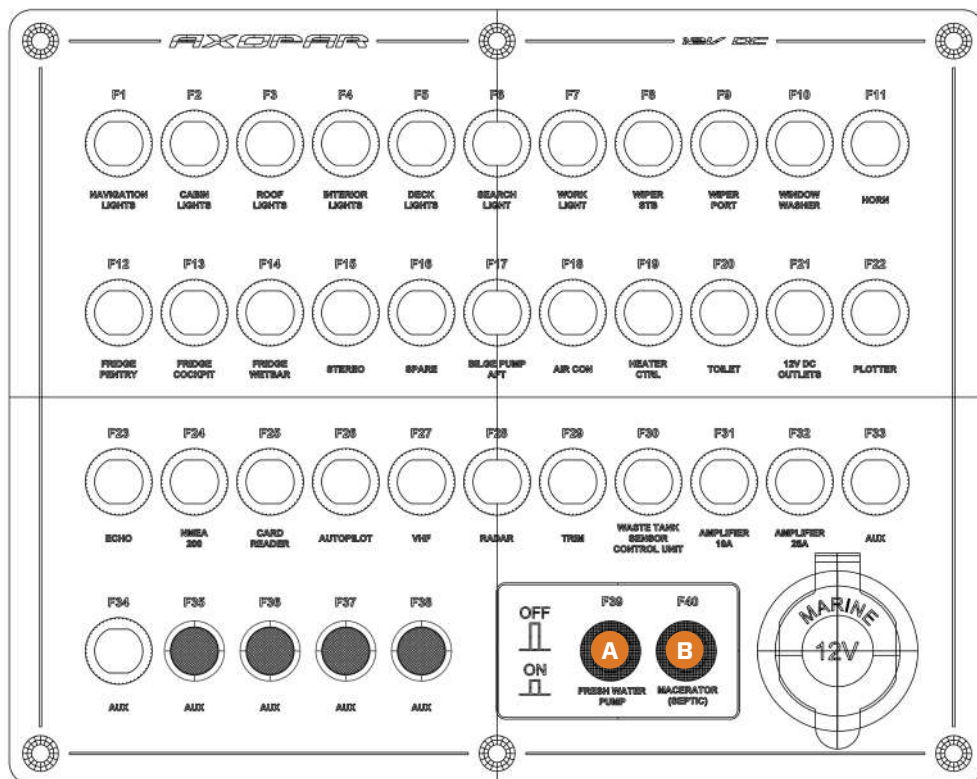
**4.2.3 FUSES**

The fuse panel includes fuses for the boat's equipment. The fuses are in the form of trip switches that break the circuit and spring up when tripped. Do not reset the switch before you have found out the reason for the breaker tripping; then press the switch back down.

The fuse panel is located in the toilet room. The panel has a combined switch and fuse for a fresh water pump (A) and septic crusher (B). The fuse panel also has a 12 V output.

**WARNING!**

Before connecting an electric circuit make sure that the circuit is not damaged and that there will be no short circuit or a fire caused by possible damages in the electric circuit. Any damaged equipment must be maintained or changed before they are again taken into use.



#### 4.2.4 HEAVY DUTY FUSES

The functioning of fuses can be checked from the holes in the fuse's cover. If the metal strip visible in the hole is unbroken, the fuse is operational.

In the boat are fuses panels containing fuses for appliances and electronic circuits which require large currents, such as windlasses. The bow thruster's and windlasses high-current fuses are located under front deck and behind aft deck hatch hatch and battery charger fuses behind toilet's wall panel.

If the metal strip is damaged, meaning that an overload has occurred, contact a qualified nautical electrician. Opening the cover is not recommended, as there is a danger of electric shock and serious injury. The panel contains fuses for the appliances listed below. If it is necessary to open the cover, make sure that all the current cables from the batteries are disconnected.

#### 4.2.5 BATTERIES

The battery system has been designed and built so that the boat's engine starts even if its Start batteries are dead, because then the Service battery supplies the current. However, this function does not work the other way around.

The batteries are located under the aft cabin's berth. The location of the batteries is presented in the section Electrical System. When you leave your boat, switch off the current from the main switch but do not forget to check that all direct supply switches are on.

Remove the battery from the boat for winter storage. When removing the battery, detach the negative pole first. Use only AGM maintenance-free batteries in the boats. When disconnecting batteries, be careful not to touch both poles same time with metal tool.

#### CAUTION!

Use only AGM maintenance-free batteries in the boats.

Your boat is equipped with five batteries, of which the START batteries supply current to the engine and power steering, Service batteries for other appliances and equipment on the craft. There is also one battery for the bow thruster.

#### CHARGING THE BATTERIES

Make sure that the battery compartment is always well ventilated when charging batteries. Only charge batteries in the boat with own chargers of boat. In other cases, remove batteries from the boat. Remember that the batteries discharge an explosive oxy-hydrogen gas at a voltage of 14.4 volts. The voltage of a normal battery in unloaded status is 12.3-12.7 V. During charging, the voltage increases and the charging regulator stops the charging process automatically at a preset level. The voltage measurement should be taken at the battery terminals, not the alternator, to achieve the correct result.

#### CHARGING STATUS

The best method for determining charging status is to measure the specific gravity of the battery acid. This is done using a hydrometer (acid measurer). Normal specific gravity for a fully charged battery at 20 °C is 1.26-1.28g/cm<sup>3</sup>. Note that the specific gravity varies with temperature. Batteries from different manufacturers can have a different specific gravity. Ask your dealer for the correct information. If the specific gravity varies from cell to cell, then the battery is not in good condition, and should be replaced. For winter storage, the batteries can be left on board only if they are fully charged. A partially discharged battery can freeze and crack. Always disconnect the cable terminals from the battery to avoid oxidation.

## WINTER STORAGE

For winter storage, the batteries can be left on board only if they are fully charged. A partially discharged battery can freeze and crack. Always disconnect the cable terminals from the battery to avoid oxidation. When removing batteries, disconnect the negative pole first and make sure that there are no flammable or explosive materials or liquids nearby. When putting the batteries back in place, connect them in reverse order (positive pole first).

## CLEANING THE BATTERIES

The top of the batteries should be cleaned regularly to avoid current leakage between the cells. If the battery is located in a separate area it is normally sufficient to clean it in the spring and autumn. Make sure that the air holes in the cell plugs are open so that gas can be vented. The terminals and cable terminals must be lubricated to prevent deposits and corrosion.

### 4.3 110/230 V SYSTEM

You can choose to equip your boat with the optional extra of 110/230V AC system with a shore power connection, which will allow you to use devices that run on the standard mains current. The system obtains its power from an external supply on shore or from the jetty (shore power). In the European market system used 230 V and in the American market 110 V.

The system functions when a shore power cable has been connected to the shore power socket connection. Turn off the shore power switch before connecting or disconnecting the cable. Connect the shore power cable to the boat before connecting it to shore power. Disconnect the shore power cable from shore power before disconnecting from the boat. Close the hatch of the boat's shore power connection.

The system's main fuse is located separate control panel. The system includes a battery charger, which starts charging batteries automatically when the boat has been connected to shore power. The location of the components is presented in the section Electrical System.

The shore power system should be checked at least biannually. Always disconnect the shore power cable when the system is not in use. Metal casings of installed electrical equipment must always be connected to earth in the boat electrical system. Use electrical equipment equipped with earth protection only.

## WARNING!

- Do not touch an energized high voltage system
- Do not change the plug of the shore power cable. Use compatible connectors only

- Try to minimize the risk of electric shock, short circuit and fire.
- Do not allow the shore power cable to hang in the water. If it does, a hazardous electric field could be created in the water.
- Never modify the connections on the shore power cable. Use compatible connectors only.
- If the earth fault breaker is tripped, disconnect the shore power cable immediately. In such a case contact a qualified electrician for repairs before the system is used again.

## WARNING!

- To avoid an electric shock and risk of fire:
- Switch off the shore power switch before connecting and disconnecting the cable.
- Connect the shore power cable to the boat before connecting it ashore.
- Disconnect the shore power cable ashore before disconnecting it from the boat.
- Close the hatch to the shore power socket on the boat carefully, avoiding getting it wet.

### 4.4 FUEL SYSTEM

The boat is fitted with a separate fixed fuel system and extra fuel filter on the suction line. The extra fuel filter is a water separating type. The fuel tank is located midpart of keel. Try to prevent damage to the fuel lines. See the instruction from manual of engine for care and maintenance of the fuel system.

Do not smoke or handle open flames when refueling. Remember that it is not allowed to store fuel in spaces not specifically designed for it. Since there is no ventilated storage space on this boat, possible spare fuel cans must be stored on deck.

For boats that are produced for European region is using "normal" fuel system and for American region Axopar Boats is using EPA fuel system regarding NMMA certification rules. Drawing of this system is in the Appendixes.

The inlet pipe for fuel (3) is located in the STB side of the deck. If the boat has been equipped with an extra diesel tank, the inlet fitting (4) and tank (5) are located forward. In the normal system fuel tank valves located under helm's seat. EPA fuel system is equipped with automatic fuel valve. Component of the tank are under helm's seat.



## USE

When refueling a boat with composite decks, (Esthec or FlexiTeek) the deck should be wetted down with water before refueling. This ensures that any fuel spillage will float on the water and won't penetrate the decking material.

Water reaching the engine's injection system can cause rapid corrosion damage to the precision components in the injection pump components. For this reason, it is vital to check the extra fuel filter regularly for water. Every so often, drain a small quantity of fuel into a suitable container (avoid fuel spillage) and check that there is no condensation water. If there is water in the filter, continue to drain until only clean fuel appears.

The fuel system on the engine is sensitive to air bubbles in the fuel. Always fill the tanks well before they are completely empty. If the system has been run dry, it must be bled before the engine can be started again. See the engine manufacturer's instruction manual before bleeding the fuel system.

## WARNING!

Appliances which burn fuel consume oxygen in the cabin and discharge combustion products into the boat. Ventilation is essential when using appliances. Open vents as indicated, when using gas appliances. Never use the cooker or oven for heating the boat. Never cover ventilation openings. (The boat owner should keep information about locations of ventilation openings and types in every space where a gas appliance is installed.)

## WARNING!

Never:

block access to safety equipment, fire extinguishers, fuel valves or main power switches.

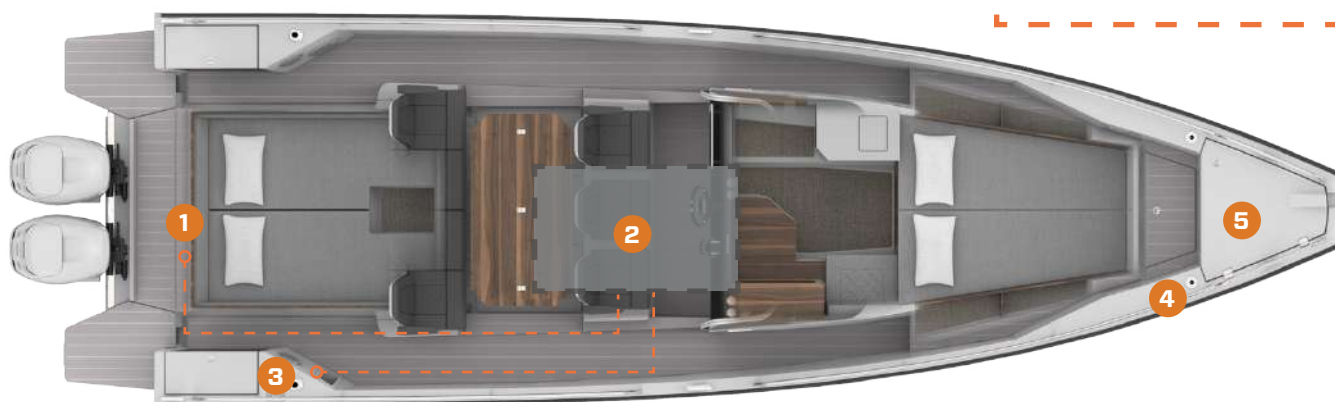
block any ventilation openings made in the boat because their purpose is to clear the air of fuel fumes.

use a wrong type of fuel in the heater or cooker as this may damage them.

use an open flame when detecting leaks.

Fuel system components:

1. Fuel filter
2. Fuel tank
3. Fuel inlet fitting
4. Diesel tank inlet fitting (under hatch)
5. Diesel tank



## 5 EQUIPMENT

### 5.1 FRESH WATER SYSTEM

You can choose to equip your boat with a fresh water system as an optional extra. The fresh water system consists of a fresh water tank, pump and accumulator. Your craft may also be equipped with a water supply point in the galley and a deck shower and a water supply point for the wet bar. The tank is located under front deck. The pump and hydraulic accumulator are next to the tank. The fresh water tank is filled via the inlet pipe on the foredeck.

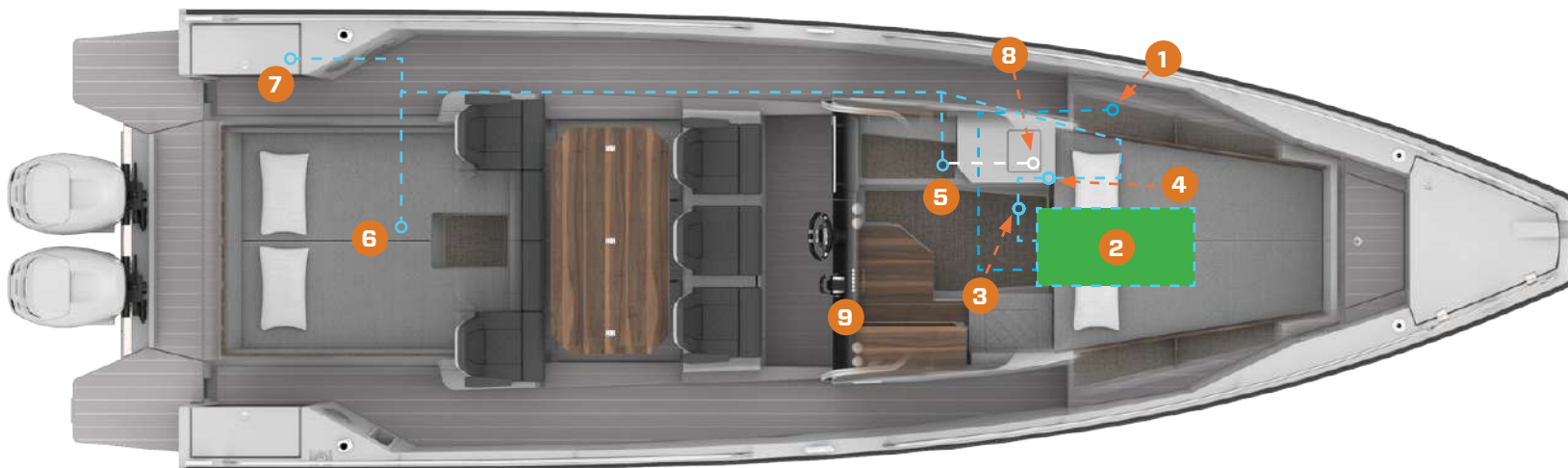
The fresh water system is turned on by switching on the fresh water pump. The pump switch is located on the fuse panel. The system maintains a working pressure automatically with the assistance of a hydraulic accumulator, which is why the pump does not need to be shut after use. Switch the system off when leaving your boat. Do not forget to check filter in the pump regularly.

#### CAUTION!

The fresh water system must be thoroughly emptied for winter storage. It is not recommended to use any anti-freeze products in the fresh water system.

Fresh water system components:

1. Inlet pipe for water tank
2. Fresh water tank
3. Fresh water pump
4. Pressure tank
5. Galley tap
6. Waterbar tap
7. Deck shower
8. Water draining from sinks
9. Switch for water system



## 5.2 SEPTIC SYSTEM

### 5.2.1 TOILET SEAT

In the boat can be equipped two different septic system. Manual toilet seat system uses seawater and electrical toilet seat system uses fresh water. Electrical toilet is used with a separate operating switch. For more information on the device, see the manual for the toilet. Before using manual toilet, open the water intake cock, which is behind the service hatch. Do not forget to close the cock after use.

Clean the toilet with a mild cleaner. Never use cleaning agents or deodorants which contain pine oil, formaldehyde or chlorine, nor corrosive or petroleum-based agents. These can damage plastic and rubber parts in the toilet. Lubricate the pump shaft with Vaseline to increase the service life of the seal. Flush the toilet system thoroughly with fresh water when the boat is not in use. Never put any other objects but toilet paper in the toilet. Under no circumstances is it allowed to flush paper towels, fabric or rubber products, hard objects, oil products or solvents down the toilet. In order to avoid various damages, you must also not pour hotter than lukewarm water into the toilet.

### 5.2.2 SEPTIC TANK

Avoid environmental pollution! The black water tank is fitted with a deck outlet pump using an international standard type connection. Using the pump, the black water can be emptied to a permanent septic tanks ashore. These facilities must always be used. In areas where there are no permanent septic tanks, the septic crusher is used to evacuate the contents of the tank straight into the water as follows:

Open the sealed sea valve. If possible empty the tank daily and always in deep waters far from the shore. The location of the pump is indicated on the construction drawing.

Septic system components:

1. Toilet
2. Toilet flush water inlet and septic tank sea-cock
3. Holding tank
4. Breather valve for septic tank
5. Deck suction fitting
6. Septic crusher

### CAUTION!

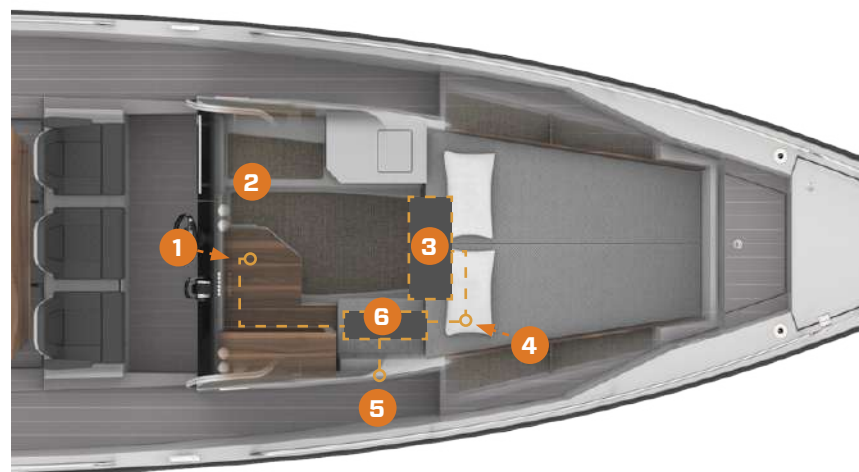
The shut-off valve must be closed after the evacuation. Do not allow the tank to become full. This can lead to paper becoming compacted in the bottom of the tank, making it more difficult to empty. See the cleaning instructions in the chapter Winter lay-up.

### CAUTION!

Before the boat is laid-up for winter storage, the whole system must be cleaned and flushed through while the boat is still in the water. The whole system must be thoroughly drained of water when the boat is lifted out of the water. This measure prevents frost damage, bacteria growth and smells.

We do not recommend the use of antifreeze, since it is impossible to guarantee that it reaches all parts of the system.

### 5.2.3 SEPTIC DIAGRAM



### 5.3 HEATING SYSTEM

The boat can be equipped with a heating system as an optional equipment. The heater and diesel tank are in the front part of boat. Heater unit is located behind front wall of toiler room. In addition, there are a different number of heating vents available, depending on the craft's standard of equipment. The operation panel is located in the steering console. The inlet pipe for the tank is located on the foredeck next to the tank.

#### WARNING!

Heater components may break if the wrong kind of fuel is used. For more information, read the manufacturer's manual.

Do not switch off the heater's direct supply current before you have made sure that the appliance has cooled down.

Appliances that burn fuel consume oxygen and discharge toxic combustion products into the boat. Good ventilation is essential when such an appliance is in use. Open ventilation holes and make sure that they are not blocked and that air flows freely through them.

Never leave the boat unattended when a heater or LPG cooker is in use.

### 5.4 BOW THRUSTER

The boat is equipped with bow thruster. The bow thruster enhances the maneuverability of the bow when docking or performing other maneuvers which requires increased operator control.

Use the device for only short periods at a time; do not exceed four duty cycles (max. 30 seconds long in 25 mins). Incorrect use may cause overheating and short circuiting. If overloading occurs, contact a qualified nautical electrician. Batteries must be disconnected from the electronic circuit before changing a fuse. For more information, read the manufacturer's manual.

#### DANGER!

Do not touch the bow thruster or its fuse if the main switch Aux is switched on. Even if the current is switched off, we do not recommend changing the windlass fuse, because the high current may cause an electric shock, which may be fatal.

#### WARNING!

Use the bow thruster for only short periods at a time. Longer use may cause overheating and pose a fire risk.

### 5.5 ANCHOR WINDLASS

The boat can be equipped with a fore and aft anchor windlass as an optional extra. The operating switches for the windlasses are located next to the helmsman. The main switch (Aux) for the windlasses is next of battery Anchor windlasses are powered by the Aux battery and its fuse are located next to the windlasses.

Always before using an anchor windlass check that the windlass is in working order and that the anchor chain can move freely. It is also important to check that the anchor and chain cannot damage the craft when lowered. While under way, an anchor windlass must be fixed mechanically to prevent it from coming loose. For more information, read the manufacturer's manual.

#### DANGER!

Always fix the anchor windlass mechanically in place before getting under way. If the windlass comes loose when the boat is moving at great speed, it may cause great damage to the boat, its passengers and outsiders.

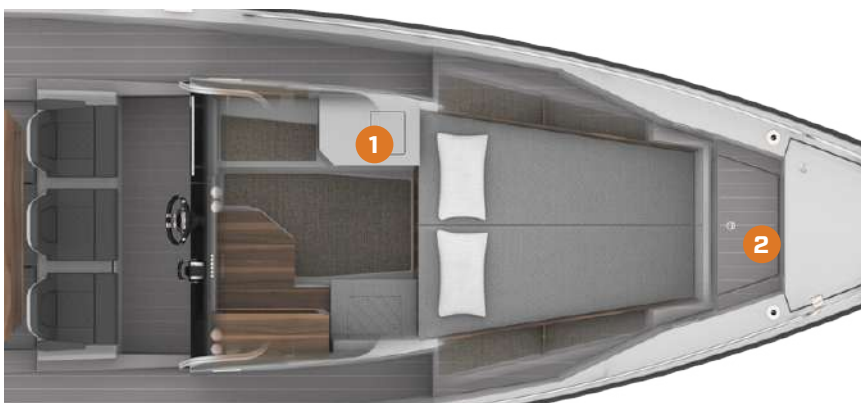
#### DANGER!

Do not touch the anchor windlass or its fuse if the main switch Aux is switched on.

## 5.6 LPG SYSTEM

The Axopar craft can be equipped with an LPG system for a cooker, as an optional extra. The system consists of a cooker (1) and gas cylinder (2). The system is tested and approved before delivery. The apparatus is equipped with a shut-off valve (in connection with the cooker) and a decompression valve. A ventilation hole is provided on the outside of the hull in the space where the gas cylinder is installed. A fire blanket must be installed right next to the cooker.

Fuels that produce a naked flame consume oxygen and discharge combustion products into the boat. Good ventilation is therefore essential when an appliance is in use. The cabin door must be kept open when using the cooker.



### WARNING!

Never:

- use an open flame when detecting leaks.
- use the cooker or oven for heating the boat.
- cover ventilation openings. (The boat owner should keep information about locations of ventilation openings and types in every space where a gas appliance is installed.)
- leave the boat unattended when LPG appliances are in use.
- Do not smoke or use open flames when a gas container is being replaced.

### WARNING!

Before opening the valve to the gas container, make sure that the appliance valves are properly closed

Appliances which burn fuel consume oxygen in the cabin and discharge combustion products into the boat. Ventilation is essential when using appliances. Open vents as indicated, when using gas appliances.

The fire blanket must be stored in the correct position.

#### 5.6.1 LIGHTING THE LPG COOKER

1. Open both shut-off valves. Each burner has an ignition cut-out which cuts the gas supply when the flame is out.
2. Press in the knob for the required burner and turn to max. position while holding the lighter beside the burner. Keep the knob pressed in for about 20 seconds after the burner lights. If it is released sooner, the burner may go out. The reason for the burner going out is that the ignition cut-out might not be hot enough. If the burner does not light, it may be because a valve is closed, the knob is incorrectly set or the gas container is empty.

#### 5.6.2 THE LPG USE

##### VALVES

Close the valves on the supply pipes and the container valve when no appliance is in use. Close the valves before refuelling and immediately in an emergency. Check that the appliance valves are closed before opening the container valve.

Keep the valves of empty cylinders closed and disconnected. Fit the protective covers, caps or plugs. Store spare or empty containers on an open deck or in drained areas designed for the purpose. The regulating valve does not last forever. It contains a thin rubber diaphragm which eventually dries out or swells up. If the diaphragm breaks, gas can escape from the cylinder with full pressure into the system, thus causing a fire. We recommend that the valve is replaced every 10 years.

##### INSPECTIONS

Regularly test the LPG system for leaks by brushing with soapy water or a detergent solution which does not contain ammonia. Check all connections for leakages. If a leakage is detected, close the container valve and repair the system before using it again. Repairs must be carried out by a qualified gas fitter.

##### VENTILATION

Appliances which burn fuel consume oxygen and discharge combustion products into the boat. Good ventilation is essential when an appliance is in use. Never use the LPG cooker for heating the boat. Never cover ventilation openings.

**NOTE**

- Make sure that you always have free and rapid access to the LPG system.
- The ambient temperature for LPG systems is  $-20 - +60^{\circ}\text{C}$ .
- Do not use areas intended for LPG containers for storing other equipment.
- Never leave the boat unattended when LPG appliances are in use.
- Do not smoke or use open flames when a container is being replaced.
- Hoses and pipes in the system must be inspected regularly, at least once a year. They must be replaced if there is any deterioration or damage. LPG hoses should be replaced every second year outside the cabin, and every 3 to 5 years inside.
- Check flue ducts at least once a year. They must be replaced if there is any deterioration or damage.
- Connection gaskets for the regulating valve must always be checked when containers are replaced and replaced annually.

**CAUTION!**

Do not use solutions that contain ammonia.

An LPG container must only be kept in a space designed for it.

## 6 SAFETY

### 6.1 GENERAL

If there is a fire in your boat, it may result in an explosion. Most common fire sources are the engine and the stove. Fire spreads usually very fast, so extinguishing the fire must proceed quickly. Fire should be put down by extinguishing, i.e. by depriving the fire of oxygen. Use the fire extinguisher on your boat. The exact location can be found in the General safety diagram. Using water in fuel-based fires does not help.

If the fire starts to get out of control, leave the burning boat to save lives, because if the fire reaches fuel containers, it may cause an explosion and cause even a large area around the boat to burn. Keep the bilge always clean; check it periodically for fuel fumes and oil leakages.

Do not drape any curtains or other flammable material near a stove or heater.

#### CAUTION!

Never:

- Block evacuation routes or emergency exits.
- Block access to safety equipment such as fuel valves or main power switches.
- Block access to fire extinguishers, visible or concealed.
- Leave the boat unattended when the cooker or heater is switched on.
- Modify the boat's systems (especially electrical, fuel or gas systems).
- Refuel or replace gas containers when the engines are running.
- Smoke when handling fuel or gas.

### 6.2 FIRE CONTROL

This boat must be fitted with hand-held fire extinguishers with the following output and locations. The fire extinguisher must have a fire rating of at least 13A 89B (2 kg). The total fire rating of a fire extinguisher (or several) must be at least 8A / 68B and for an individual extinguisher at least 5A / 34B. Check the correct locations of the extinguishers from the diagram below.

A fire blanket should be kept beside the LPG cooker.

Keep the bilge clean and check regularly for fuel and gas fumes or fuel leaks. Do not hang curtains or other fabrics near or above the LPG cooker or other equipment with naked flames.

### 6.2.1 BOAT OWNER'S/USER'S RESPONSIBILITIES

It is the boat owner's/user's responsibility to ensure that:

- the fire extinguishing equipment is checked regularly at the intervals specified for the equipment.
- equipment with expired dates is replaced immediately with equivalent or better equipment.
- the crew and guests are advised of the location and instructions for fire control equipment, and the location of evacuation routes and emergency exits.
- the fire control equipment is accessible at all times.

#### ACTION IN THE EVENT OF FIRE IN THE ENGINE

- Stop the engine.
- If possible, steer the boat up against the wind.
- All passengers on board must put their life jackets on.
- If necessary, evacuate the passengers.
- If necessary, call for sea rescue.
- Shut off fuel, LPG and main power switches.
- Wait until fully certain that the fire has been extinguished before opening the engine hatches. Carefully open the engine hatch and be prepared to use the handheld fire extinguisher if necessary for post-fire extinguishing.
- Put out possible smouldering fires with water.

#### ACTION AFTER THE FIRE HAS BEEN EXTINGUISHED

- Open doors and windows for better ventilation.
- Make sure that the fire extinguishing equipment is refilled or replaced after use.

### 6.3 LIFE RAFT STORAGE

Your boat is not equipped with life raft by the manufacturer. If you decide to get one for your boat, we recommend that you stow it to the aft of the boat, so that it is easily accessible in case of emergency.



### 6.3.1 USE OF LIFE RAFT

In case of an emergency, the life raft should be tied to the stern of the boat, and prepared for use. When the life raft is ready and tied to the stern, loading of the raft can be done through the swimming deck. Also in an emergency, the life raft is easiest and safest to board from the swimming deck. Switch off the engine when using the life raft. Follow also the life raft manufacturer's instructions.

### 6.4 CARBON MONOXIDE

In the boat is carbon monoxide monitor system. Alarm of the system is located main switch panel. Check regular intervals function of the monitor system. Do not turning system switch of if boat is in use.

In the boat is carbon monoxide monitor system. Alarm and sensor of the system is located in the cockpit. Check regular intervals function of the monitor system. Do not turning system switch of if boat is in use.

#### **DANGER!**

- Carbon monoxide gas (CO) is colourless, odorless, tasteless, and extremely dangerous.
- All engines, generators, and fuel burning appliances produce CO as exhaust.
- Prolonged exposure to low concentrations or very quick exposure to high concentrations will cause brain damage or death.
- Open all doors, curtains, windows, and hatches to let fresh air circulate, when running engine, generator or burning any fuel when boat is anchored, moored or docked.

Symptoms of carbon monoxide poisoning are dizziness, ears ringing, headaches, nausea and unconsciousness. A poisoning victim's skin often turns cherry red. Because carbon monoxide gas (CO) is odorless, colourless and tasteless, it is unlikely to be noticed until a person is overcome.

Dangerous concentrations of carbon monoxide will be present if:

- the engine and/or generator exhaust systems leak;
- insufficient fresh air is circulating where people are present; and
- fumes move from the rear of the boat into the cockpit and cabin area.

Next page figure gives examples of boat operating conditions that can lead to high concentrations of carbon monoxide gas.

To minimize the danger of CO accumulation when the engine and/or generator are running, or using burning fuel applications.

- Be sure to have sufficient ventilation when using canvas or window-type side curtains when underway, anchored, moored or docked.
- If the convertible top is installed, operate with the forward hatch open and leave cabin door open.
- Operate all burning fuel appliances, such as charcoal, propane, LPG, CNG or alcohol cooking devices in areas where fresh air can circulate. Do not use such devices where there is no noticeable air movement, especially in the cabin, when anchored, moored or docked.
- Do not idle engine without moving boat for more than 15 minutes at a time.
- Inspect the exhaust system regularly. (See Section 8, Required Inspection, Service and Maintenance).

If CO poisoning is suspected, have the victim breath fresh air deeply. If breathing stops, resuscitate. A victim often revives, then relapses because organs are damaged by lack of oxygen. Seek immediate medical attention.

High levels of carbon monoxide may accumulate following way

- Blocking hull exhausts operating at slow speed or dead in the water.
- Using canvas curtains.
- Winds blowing exhaust toward boat occupants.
- Operating engine and/or generator in confined spaces.
- Operating with the bow high.



## 6.5 GENERAL SAFETY DIAGRAM



Safety equipment:

1. Swim ladder
2. Storage place of liferaft
3. Main switch
4. Fire extinguisher
5. Fire blanket
6. Shut-off valve for LPG system
7. Gas cylinder

← Emergency exit

## 7 MAINTENANCE

To counteract decarburising and heat stress after the engine(s) has/have been run, let it/them idle in neutral for a couple of minutes. This is particularly important after running at high revs.

Stop the engine(s) by turning the ignition key to position S.

### 7.1 MAINTENANCE

When not in use, keep the gelcoat surface out of the sun or covered with a canvas tarpaulin. Do not use plastic or other non-porous materials, which can trap moisture between the cover and the surface. Wash the surface with a mild detergent. For best results, use cleaner recommended for fibreglass and follow label directions.

#### CAUTION!

Do not use automatic dishwasher detergent, abrasives, bleaches, and strong chemicals with acids/bases or ammonia.

Wax at least twice yearly to restore gloss and protect the finish. Use only wax recommended for fibreglass and follow instructions carefully.

#### CAUTION!

Never wax a gelcoat surface in direct sunlight.

#### 7.1.1 MAINTENANCE NOTES

The boat requires a certain amount of maintenance. This is especially relevant for external parts which are exposed to sun and salt water.

- A proper maintenance of your boat comprises the following:
- Regularly wash the boat with freshwater.
- If the boat is used throughout the year, the hull should be polished approximately every fourth months.
- Polish the stainless and chromed parts with Autosol or similar chrome polish.
- Aluminium parts are cleaned with fresh water to which soap solution is added if necessary.
- Rinse the cover in fresh water. Allow to dry thoroughly before folding away.
- A teak deck requires maintenance. We recommend cleaning a composite deck using a soft brush and a mild soap solution. Over time, the teak deck takes on a satin grey appearance.

- Avoid using aggressive cleaning agents.
- If the boat is stored or docked in an environment where is noticeable hard air conditions for example near harbours, in lively sea routes, highways and power stations, you have to pay special attention to the RST-parts of the boat. This kind of air conditions can cause premature corrosion to the RST parts and damage to gelcoat surfaces.
- Gelcoat (specially coloured gelcoat parts) and RST parts should be polished and waxed approximately every fourth month so that the parts won't face fading or other visual defects.

### 7.2 CORRECTIVE PROCEDURES

#### CHALKING

A fine rubbing compound as well as a mild detergent will reduce the weathering and chalking accumulated on the surface. Use only a fine grit compound and follow label directions carefully. For best result, wax after compounding.

#### CAUTION!

Do not apply rubbing compound in direct sunlight.

#### SCRATCHES AND NICKS

Most will be removed by using a rubbing compound followed by waxing as described above.

#### STAINS

Most will be removed by washing with a mild detergent. For stubborn stains, use a fine abrasive household cleanser followed by waxing to restore original lustre.

Non water-soluble stains such as grease and oil, rubber heel marks, etc. can often be removed by using a solvent such as acetone, rubbing alcohol, toluene or xylene, followed by a mild detergent. If these solvents are not effective, try a rubbing compound or fine sanding followed by waxing.

#### DEEP MARKS, GOUGES OR HOLES

These should be repaired professionally. Gelcoats can be well repaired by professionals, and in most cases the repair will be undetectable.

In cases where the damage has pierced the gelcoat layer, further exposure to water or chemicals should be avoided. Failure to observe this precaution may result in extensive and potentially costly damage to the underlying laminate structure.

### 7.2.1 WOODEN INTERIORS

The interior details of the boat, such as the locker doors and drawer fronts, wooden strips, etc. are made of oiled walnut. Clean them with a damp cloth and a little soapy water. Treat the wooden surfaces again every year to protect the wood.

Plastic and painted surfaces are cleaned by wetting the surface evenly with water before the actual cleaning. Regular stains are removed with a brush and a lightly diluted cleaner. Grease is removed with a brush/sponge and window cleaner. Clean the surface afterwards with sponge and water. Wipe dry with a piece of cloth.

The interior fabrics are washed according to separate washing instructions (marking) or as follows: Wash in 40°C with a light spin cycle and hang to drip dry. The material may shrink slightly. If you want to avoid this, take the fabrics to a dry cleaner.

Clean the tracks of sliding doors and hatches regularly and lubricate if necessary. Do not lubricate the sliding surfaces of the tracks. Lubricate handles and locks with regular lock lubricant.

### 7.2.2 CLEANING THE COVER

Let the fabric cover soak for at least 24 hours. The cover should be thoroughly cleaned two or three times a year. After soaking, wash the inside- and outside of the cover with a sponge or soft brush. Use mild soapy water and plenty of water, max. 30 degrees Celsius. Rinse thoroughly with freshwater. We recommend mixing 12% vinegar in the final rinsing water to neutralize the soap residues. Finally hang the cover to drip dry.

#### CAUTION!

Never use high pressure washers or chemical cleaning agents.

### 7.2.3 COVER

New covers may leak initially, since the seams need to swell. To prevent quick deterioration of the cover, it should be tightly secured in a folded-up position to prevent flapping.

#### CAUTION!

- Hang to dry. Never use a drying cabinet or iron to speed up drying.
- Check that the cover is completely dry before stowing. A moist cover can cause mould damage.
- Store the cover in dry indoor conditions for the winter.
- The cover must not be stored in the boat.

### 7.2.4 PREVENTING FROST DAMAGE

- The bilge pump system is fitted with a water lock on the hose. Detach the hose and fully drain the water from the water lock and run the pumps dry. Otherwise the pumps may freeze and break.
- Unscrew the frost plug on the underside of the shower fittings. If there is no frost plug, unscrew the shower hose.
- Drain the water tank and all other components containing water in order to avoid frost damage.
- Run the freshwater pump dry to drain out all the water.
- Make sure that no water remains in the boat under any circumstances. Leave the hatches in the cabin partially open.

### 7.2.5 ACTIONS BEFORE WINTER LAY-UP

1. Wash the hull and bottom immediately after lifting the vessel out of the water.
2. Leave all lockers, drawers, cabin and wardrobe doors open.
3. Wash all parts inside, also under the floorboards.
4. Carpets and cushions should preferably be stored indoors in a dry place. If this is not possible, make sure that the cushions are dry and position them on their side. Remove the carpets.
5. Be very thorough about having good ventilation in the boat.
6. If the batteries are being left aboard, make sure they are fully charged, otherwise the batteries can freeze and crack.

### 7.2.6 ACTION BEFORE LAUNCHING

1. Remove the tarpaulin in good time before launching.
2. Wash the hull with a regular shampoo and soft brush.
3. Wax the hull if necessary. Use a standard boat wax.
4. If there are small scratches on the hull, or if some of the surface gelcoat has lost its shine, use a rubbing compound on these areas before polishing.
5. Paint the bottom with antifouling paint.
6. If the batteries have been removed, put them back and check the electrolyte level in the cells. Check the condition of the batteries.

7. Check all cables, clamps, engine mountings and other fastenings.
8. Check the steering before launching.
9. Check the instrumentation.
10. Close all water drain plugs.
11. Check that the seacocks are in order and tight, check for any frost damage.
12. Check all pipes, hoses and cocks.
13. Make a note of any frost damage

## **8 THE ENVIROMENT**

When handling environmentally hazardous substances such as fuel, oils, solvents, grease, bottom coats etc. you should consider the following matters:

- Always read the instructions for each product carefully and handle the product with care. Make sure that used packaging, cans and similar items are discarded in designated collection points. If you are in any doubt whether the product is hazardous or not, contact the supplier or vendor of the product.
- The backwash from boats wears down the shoreline and creates problems for other boats near you. Always adjust your speed to the situation and the surroundings to avoid unnecessary backwash.
- Always drive your boat at the most economical engine revs possible, taking the prevailing conditions in account, to avoid unnecessary emissions and noise.
- Make sure that the engine is properly maintained at regular intervals so that noise and emission levels are minimised. Read the engine manufacturers manual carefully.
- As a boat owner you should be aware of local environmental laws, and respect codes of good practice.
- Never empty the septic tanks or black water tank into waters.
- Familiarise yourself with the international regulations on the prevention of marine pollution (MARPOL) and comply with these regulations as far as possible.

### **8.1 REQUIREMENTS FOR NORTH AMERICAN REGION**

The EPA standards state that in freshwater lakes, freshwater reservoirs or other freshwater impoundments whose inlets or outlets are such as to prevent the ingress or egress by vessel traffic subject to this regulation, or in rivers not capable of navigation by interstate vessel traffic subject to this regulation, marine sanitation devices certified by the U.S. Coast Guard installed on all vessels shall be designed and operated to prevent the overboard discharge of sewage, treated or untreated, or of any waste derived from sewage.

The EPA standards further state that this shall not be construed to prohibit the carriage of Coast Guard-certified flow-through treatment devices which have been secured so as to prevent such discharges. They also state that waters where a Coast Guard-certified marine sanitation device permitting discharge is allowed include coastal waters and estuaries, the Great Lakes and interconnected waterways, freshwater lakes and impoundments accessible through locks, and other flowing waters that are navigable interstate by vessels subject to this regulation ( 40 CFR 140.3).

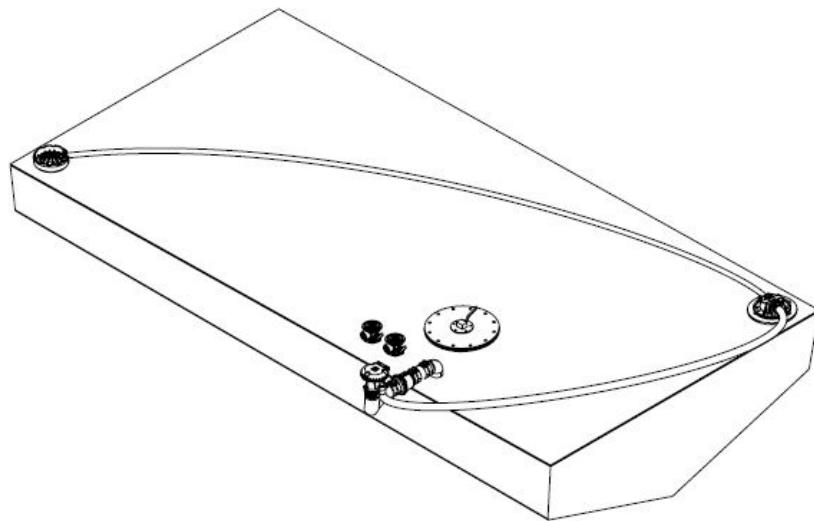
## 9 APPENDIXES

### APPENDIX 1 WARRANTY POLICY

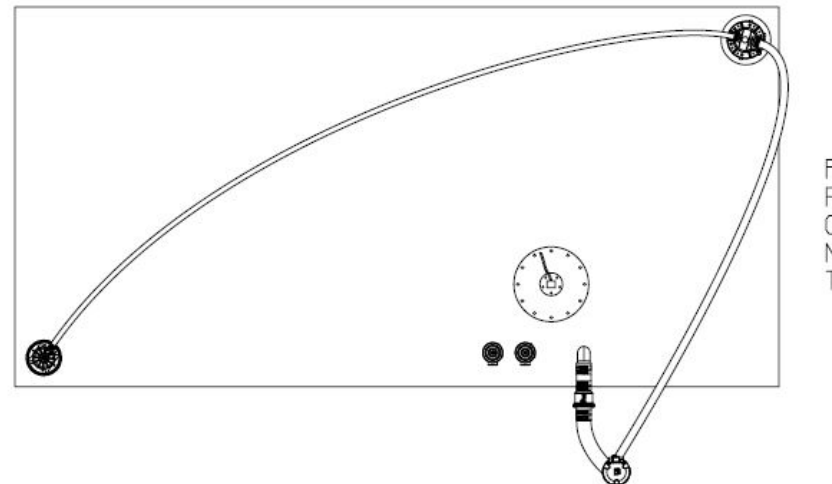
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### APPENDIX 2 ELECTRIC DIAGRAM

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	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXXX





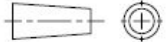
FRONT

THIS SYSTEM WAS DESIGNED TO MEET REGULATIONS  
ABYC H24.18.2, ABYC H24.18.3 AND ABYC H24.18.4

## NOTES:

- HOSE LENGTHS AND ROUTINGS TO BE DETERMINED BY BOAT MANUFACTURER, IN CO-ORDINATION WITH ATTWOOD.
- CARBON CANISTER LOCATION/PACKAGING TO BE DETERMINED BY BOAT MANUFACTURER, IN CO-ORDINATION WITH ATTWOOD.
- CURRENT 5/8" VENT PORT IS NO LONGER NEEDED.
- ALL FASTENING FEATURES (TANK TO BOAT) REMAIN UNCHANGED.
- IF THE ICV AND/OR CARBON CANISTER IS LOCATED IN THE ENGINE DEPARTMENT, A HEAT SHIELD FOR THAT COMPONENT WILL BE REQUIRED.
- "BOAT MANUFACTURER PART NUMBER" & "TANK MANUFACTURER PART NUMBER" REFER TO CURRENT PRODUCTION PART NUMBERS.

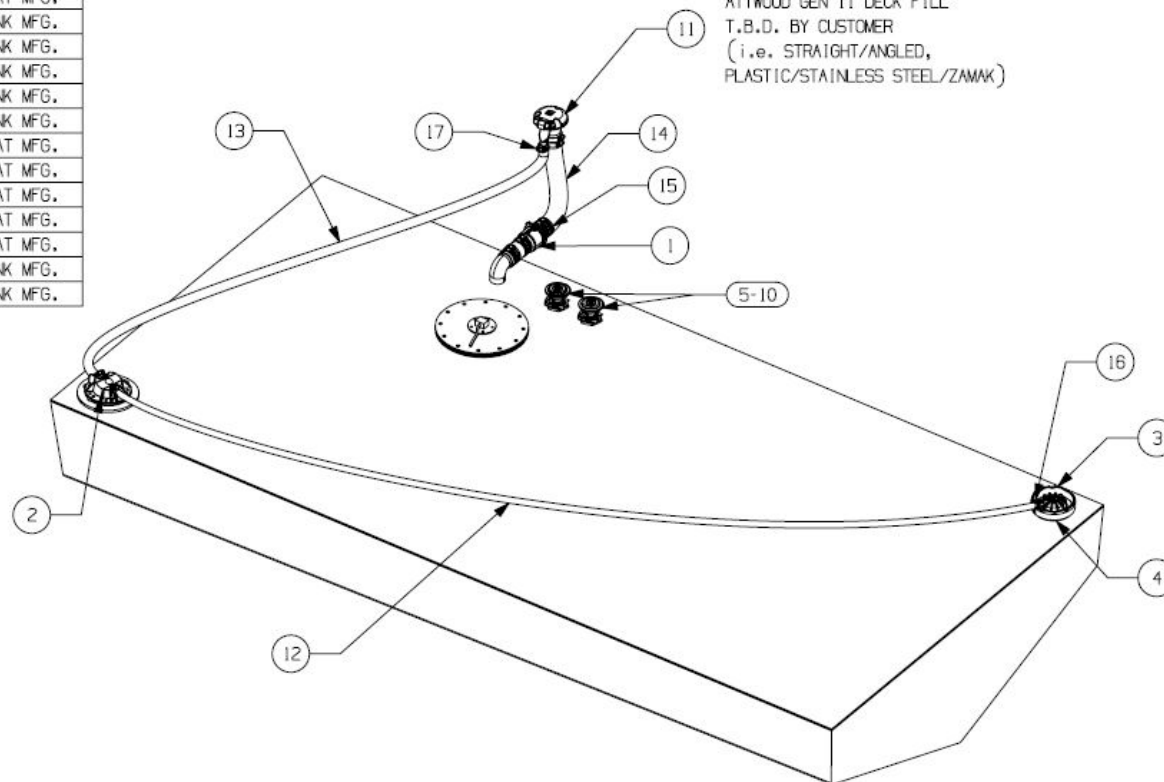
TANK MATERIAL/WALL THICKNESS	ALUMINUM/0.196 INCHES
TIP ANGLES	FRONT DOWN 4° REAR DOWN 4° RIGHT DOWN 2° LEFT DOWN 2°
COMPLETE TANK VOLUME	205.43 GALLONS
93% OF COMPLETE TANK VOLUME	191.05 GALLONS
SHUT-OFF HEIGHT (FLV)	2.28 INCHES (PURPLE)
SHUT-OFF VOLUME	188.03 GALLONS
USABLE VOLUME	131.28 GALLONS

1	TIP STUDY AT 1' BOW UP SFA, 0.25" PLATEAU USED	20JUL16	LT					
REV	DESCRIPTION	DATE	BY	PMR	CHK	DATE	ECN NO.	
SHEET 1 OF 4		 attwood						
		THIRD ANGLE PROJECTION		TOLERANCES			PROPRIETARY INFORMATION	
				2 PLACE TOLERANCE ± .01 3 PLACE TOLERANCE ± .005 ANGULAR TOLERANCE ± .5°				
NAME TIP STUDY-PROJECT#1517, AXOPAR								
INCHES	DO NOT SCALE	SCALE 1:15	REFERENCE NO. REF NO	ITEM NUMBER 0010XXXXX		REV		

ITEM	PART NUMBER	REF NUMBER	PART NAME	QTY	ASSEMBLED BY
1	001007929	991CV000	ASM-VALVE,CHECK,INTEGRATED (ICV)	1	BOAT MFG.
2	001007584	99FLB230	ASM-VALVE,VENT,FUEL LIMIT 2.28" (GASKET INCLUDED)	1	TANK MFG.
3	001007283	99GVN000	ASM-VALVE,GRADE ROLLOVER (GRV)	1	TANK MFG.
4	001007365	99GVG000	GASKET-GRV,2.395 ID	1	TANK MFG.
5		991FDV00-1	ASM-VALVE,FUEL,DEMAND,INT	2	BOAT MFG.
6		99DVP03-1	PLUG/CAP WITH SEAL	2	TANK MFG.
7		99DVB01-1	BARB WITH O RING	2	TANK MFG.
8		99DVC01-1	KIT-CLIP,VALVE,FDV	2	TANK MFG.
9		99DVP02-1	PLASTIC BASE	2	TANK MFG.
10		99DVP04-1	NUT	2	TANK MFG.
11		99DFPVXXX	ASM-DECKFILL,STRT,PRV	1	BOAT MFG.
12			HOSE-VENT,5/16 (USCG TYPE A2)	1	BOAT MFG.
13			HOSE-VENT,5/8 (USCG TYPE A2)	1	BOAT MFG.
14			HOSE-FILL,1.5 (USCG TYPE A2)	2	BOAT MFG.
15			CLAMP-FILL HOSE,ICV	8	BOAT MFG.
16			CLAMP-VENT HOSE,GRV	2	TANK MFG.
17			CLAMP-VENT HOSE,FLVV	2	TANK MFG.

	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXXX

NOTE:  
ATTWOOD GEN II DECK FILL  
T.B.D. BY CUSTOMER  
(i.e. STRAIGHT/ANGLED,  
PLASTIC/STAINLESS STEEL/ZAMAK)



SHEET 2 OF 4

**MotorGuide**  
**SWIVLEZE**  
an Attwood brand
THIRD ANGLE  
PROJECTION

TOLERANCES	
2 PLACE TOLERANCE	± .01
3 PLACE TOLERANCE	± .005
ANGULAR TOLERANCE	±° .5°

PROPRIETARY  
INFORMATION

NAME

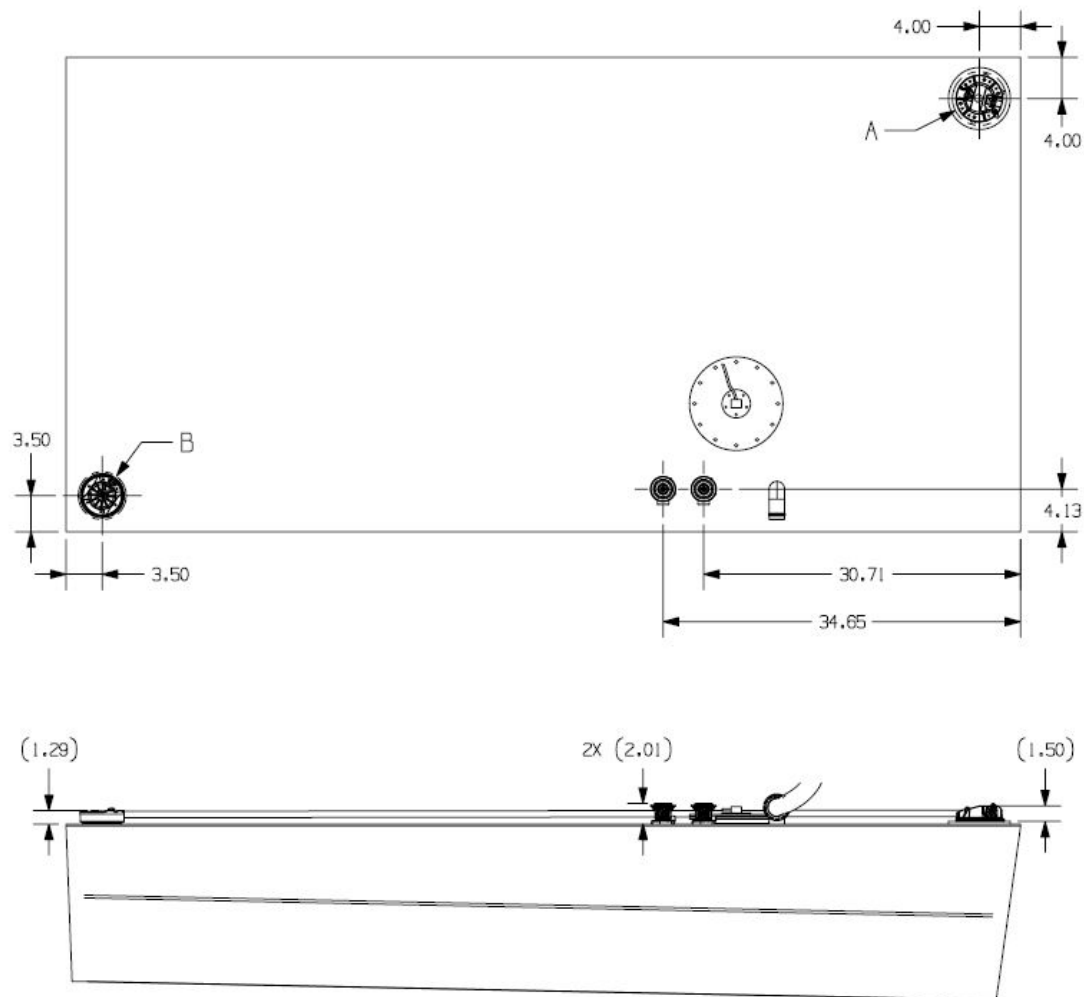
TIP STUDY-PROJECT#1517, AXOPAR

INCHES

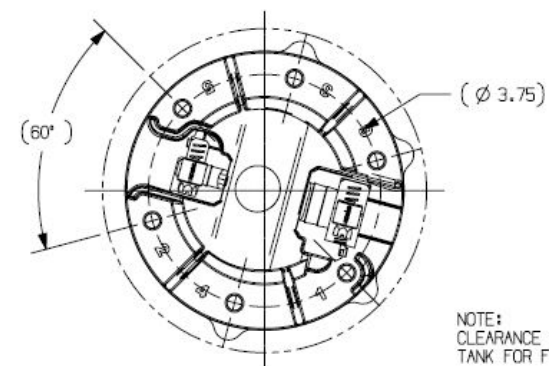
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SCALE  
1:12REFERENCE NO.  
REF NOITEM NUMBER  
0010XXXXXREV  
1



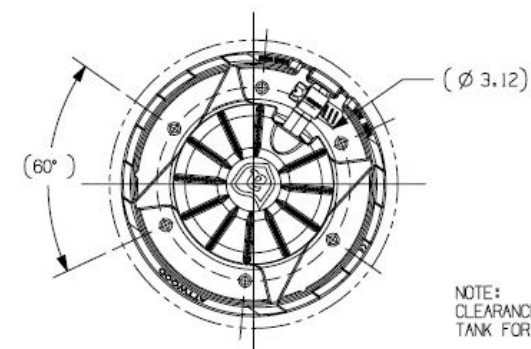


	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXXX



NOTE:  
CLEARANCE HOLE ON  
TANK FOR FLV =  $\phi$  2.75

DETAIL A  
SCALE 1:2  
VALVE ORIENTATION SHOWN AS REFERENCE



NOTE:  
CLEARANCE HOLE ON  
TANK FOR GRV =  $\phi$  2.00

DETAIL B  
SCALE 1:2  
VALVE ORIENTATION SHOWN AS REFERENCE

SHEET 3 OF 4

**attwood**

**MotorGuide**  
**SWIVLEZE**  
attwood



THIRD ANGLE  
PROJECTION

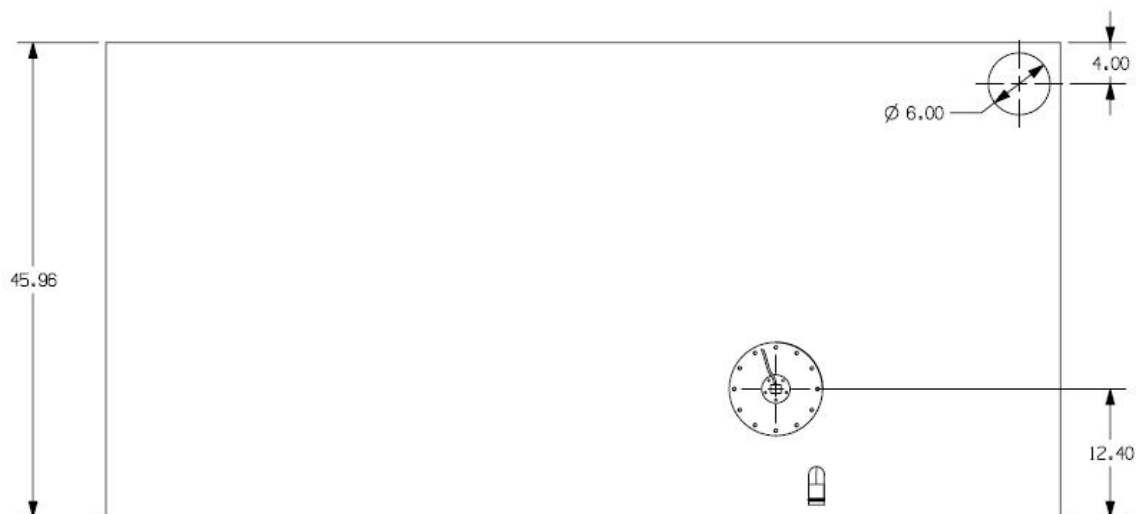
TOLERANCES	
2 PLACE TOLERANCE	$\pm$ .01
3 PLACE TOLERANCE	$\pm$ .005
ANGULAR TOLERANCE	$\pm$ ' .5"

PROPRIETARY  
INFORMATION

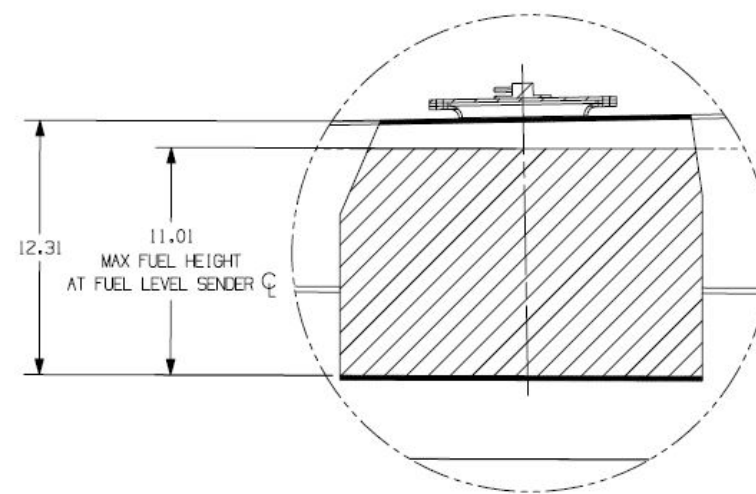
NAME  
TIP STUDY-PROJECT#1517, AXOPAR

INCHES	DO NOT SCALE	SCALE 1:12	REFERENCE NO. REF NO	ITEM NUMBER 0010XXXXX	REV 1
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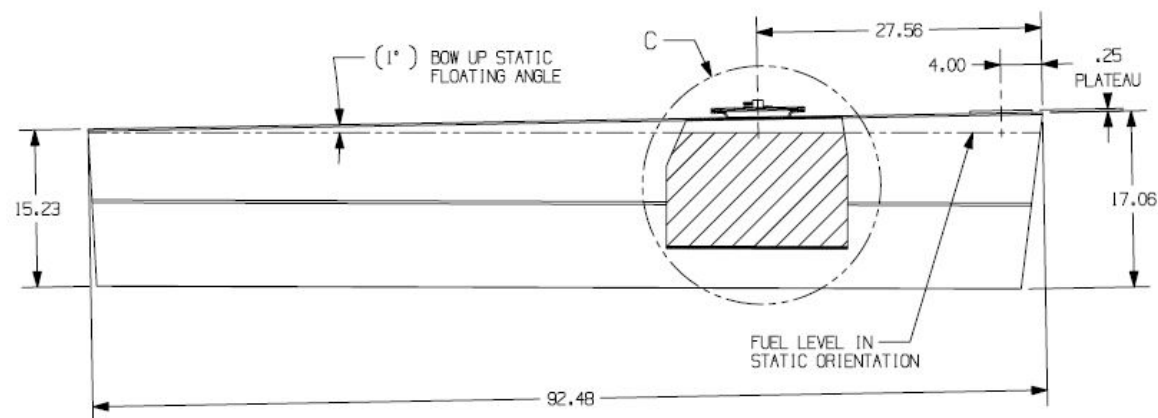




	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXXXX



DETAIL C  
SCALE 1:6



SHEET 4 OF 4

**attwood**

**MotorGuide**  
**SWIVLEZE**  
attwood



THIRD ANGLE  
PROJECTION

TOLERANCES	
2 PLACE TOLERANCE	$\pm .01$
3 PLACE TOLERANCE	$\pm .005$
ANGULAR TOLERANCE	$\pm .5^\circ$

PROPRIETARY  
INFORMATION

NAME

TIP STUDY-PROJECT#1517, AXOPAR

INCHES

DO NOT SCALE

SCALE  
1:12

REFERENCE NO.  
REF NO

ITEM NUMBER  
0010XXXXXX

REV  
1

***AXOPAR***