

**AXOPAR**



## **OWNER'S MANUAL**

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**AXOPAR 24 HT**

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**AXOPAR** 

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## FOREWORD

Congratulations on your new Axopar 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 craft 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 craft, 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.

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

# 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 Craft 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.

Always maintain your craft properly and make allowance for the deterioration that will occur over time and as a result of heavy use or misuse of the craft. Any craft, no matter how strong it may be, can be severely damaged if not used properly. 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 craft to the sea conditions and your own boating experience.

If your boat is fitted with a life raft, carefully read its operating manual. On-board, the craft should have the appropriate safety equipment according to the type of craft,

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 craft, 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.

### 1.2 CE-CERTIFICATION

This boat belongs to category C. The CE-categories means 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. One requirement is that the boats must be easy to manoeuvre

#### 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.

### 1.2.1 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 – AXOA4001EA16

- FI Country of manufacture
- Hyphen
- AXO Manufacturer:
- A4 Boat model A=OPEN B=TT C=HT
- 001 Boat number
- E Month of manufacture: A = January, B = February, etc.

- 6 Year of manufacture
- 16 Model year

### 1.2.2 MANUFACTURER'S PLATE

The cooperation with VTT Expert Services Oy means that company as an external and independent organisation has inspected that the boat fulfils the Recreational Craft 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. NO	Maximum number of persons on board.
MAX. LOAD	Buoyancy. Total weight of persons including personal luggage (excluding tank contents).

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

### 1.2.3 ID OF NOTIFIED AUTHORITY

VTT Expert Services Oy,

### 1.3 TECHNICAL DATA

BOAT MODEL: .....	AXOPAR 24 HT
DESING CATEGORY .....	C (ONSHORE)
HULL LENGTH LH .....	7.77 M
HULL BEAM BH .....	2.55M
MAXIMUM NUMBER OF PERSONS (Category C).....	8(DEFAULT WEIGHT OF ONE ADULT 75KG, A CHILD 37.5 KG)
TOTAL WEIGHT OF LIQUIDS .....	265 KG

DRAUGHT AT MAX. LOAD (EXCLUDING ENGINE) .....	0.54 M (WITH OUTBOARD MOTOR 1 M)
HEIGHT MEASURED FROM WATERLINE AT LIGHT LOAD .....	HT 2.48 M (WITH LIGHTMAST +86 CM)
MAXIMUM RECOMMENDED ENGINE POWER .....	184 KW (250 HP)

### 1.3.1 LOADING CATEGORY C

MAXIMUM RECOMMENDED ENGINE WEIGHT .....	315 KG
WEIGHT OF BOAT'S HULL (EXCLUDING ENGINE) .....	1680 KG
WEIGHT OF UNLOADED BOAT .....	2109 KG (WITH MAX. RECOMMENDED ENGINE LOAD)
MAXIMUM RECOMMENDED LOAD .....	915 KG
BOAT WEIGHT AT MAX. LOAD .....	3024 KG
OF WHICH:	
TOTAL WEIGHT OF ALL PERSONS .....	600
PERSONAL LUGGAGE .....	50 KG
AMOUNT OF FRESH WATER .....	50 KG (50 L)*
AMOUNT OF BLACK WATER .....	40 KG (40 L)*
AMOUNT OF FUEL .....	175 KG (233 L)
OTHER LOAD OF LIQUID .....	17 KG (HEATER FUEL)
TOTAL WEIGHT OF FUEL, WATER AND OTHER LIQUIDS .....	265 KG

\*DEPENDING OF EQUIPMENT LEVEL

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.

### 1.4 DECLARATION OF CONFORMITY AND ESSENTIAL SECURITY REQUIREMENTS

Basic data .....	EN ISO 8666:2002
Hull identification .....	ISO 10087:2006
Manufacturer's plate .....	EDC ANNEX 1, 2.2
Owner's manual .....	EN ISO 10240:2004

### LAYOUT AND EQUIPMENT

Preventing falling overboard .....	EN ISO 15085:2003/A1:2009
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**CAUTION!**

The fluids in fixed tanks are not included in the load stated on the manufacturer's plate.

**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.

**WARNING!**

When loading the craft, never exceed the maximum recommended load of the boat. Always load the craft 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.

**1.3.2 GENERAL FACTS**

**GELCOAT/PAINT**

GELCOAT / HULL.....	Ashland Max Guard
DECK.....	Ashland Max Guard
SWITCH PANEL MODULE .....	Nextel

**TANK CAPACITY**

FUEL TANK.....	233 L
FRESH WATER TANK .....	50 L
HOLDING TANK .....	40 L

**ELECTRICAL SYSTEM 12V**

STARTER BATTERY .....	105A
SERVICE BATTERY .....	105A

**ELECTRICAL SYSTEM 230V**

FEQUENCY	
BATTERY VHARGER .....	12 AH
SHOREPOWER CONNECTOR	

Life raft stowage .....RSG Guidelines  
Escape .....EN ISO 9094-1:2003  
Anchoring and towing .....EN ISO 15084:2003  
Running lights .....1972 COLREG  
Emission control .....EN ISO 8099:2000

**INSTALLATIONS**

Engines and engine spaces –

Fuel system .....EN ISO 10088:2013, EN ISO 11105:1997,  
Electrical system .....EN ISO 10133:2012, ISO 28846:1993/A1:2000,  
Steering system .....EN ISO 10592:1995/A1:2000 5.5

Gas systems –

Fire protection .....EN ISO 9094-1:2003

**DIMENSIONING**

Structure RSG Guidelines .....ISO 12215-5:2008, ISO 12215-6:2008

**HYDROSTATICS**

Stability and freeboard .....EN ISO 12217:2015  
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,  
Flooding .....EN ISO 15083:2003, ISO 8849:2003

**HANDLING CHARACTERISTICS**

Handling characteristics .....EN ISO 11592:2001, EN ISO 8665:2006  
Visibility from the steering positios .....EN ISO 11591:2011

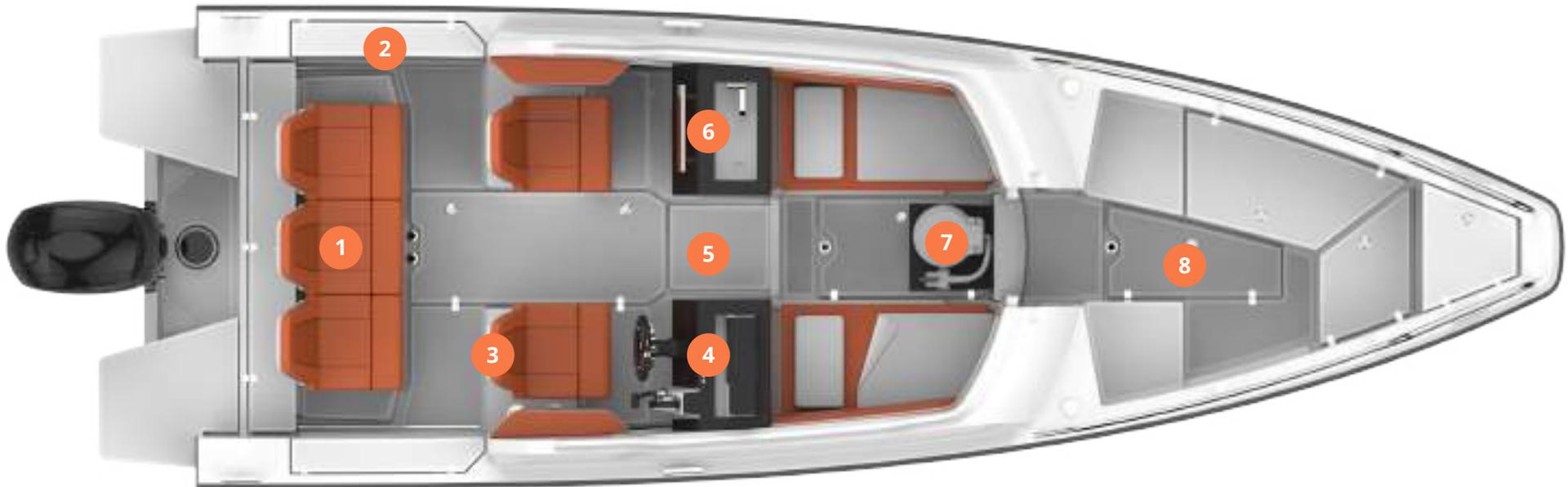
**EXHAUST EMISSIONS OF ENGINES -**

**NOISE EMISSIONS-**

## 1.5 GENERAL LAYOUT

The locations of the most important equipment of the Axopar 24 boat are presented in the picture below. Some of the equipment items are optional extras.

1. Batteries
  2. Manual bilge pump
  3. Main switches
  4. Control panel
  5. Fuel tank
  6. Pentry equipment\*
  7. Toilet\*
  8. Wresh water and holding tank\*
- \* Depending of equipment level



## 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 minimise 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 boat's open space is designed to empty itself of rain water by allowing the water to drain straight into the sea via the drain holes. Both aft parts of the afterdeck have drain holes through which water flows straight into the sea. From midships, any water in the open space runs through the drain hole to a separate drainage pump. This drainage pump starts automatically when water enters it. Clear any rubbish from the pump container regularly. The boat will support passengers even if it is filled with water.

The drain holes are intended for the removal of both rain water and water that has splashed onto the deck. These drain holes must be open in all circumstances and any rubbish accumulating in them must be regularly cleared to avoid the holes clogging up.

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.

#### 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.

We recommended that you keep the windows, doors, deck hatches and vents shut while driving or when the boat is docked. 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.

The picture below shows the hatches, seacocks and inlets through the side. The hatches in the picture (13–19) must be kept closed while under way. Always check in the spring when launching that the inlets through the side and bottom are tight.

You can access the seacocks in the open space from the inspection hatches behind the batteries. The toilet flush water cock and the septic tank seacock can be accessed via the service hatch, which is under the hatch (13) in the open space.

## 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 output of each automatic bilge pump is 41 litres per minute. The manual bilge pump's output is 33 litres per minute. 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 is controlled with its handle, which is located in the port side stowage casing of the afterdeck

### CAUTION!

Avoid pollution! The purpose of the boat's bilge pumps systems 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.

### CAUTION!

The pumps must not be run dry for any length of 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.

1. Water inlet of toilet seat\*
  2. Septic tank outlet seacock\*
  3. Pentry tap and front cockpit outlet
  4. Midboat bilge pump outlet
  5. Fuel tank ventilation
  6. Draining of manual bilge pump
  7. Electric bilge pump outlet
  8. Cockpit draining outlet
  9. Aft electric bilge pump
  10. Manual bilge pump
  11. Mid electric bilge pump
  12. Cockpit draining holes
  13. Engine bracket inspection hatch
  14. Storage box inspection hatches
  15. Cockpit compartment box hatch
  16. Mid boat compartment box hatch
  17. Fore compartment box hatch
  18. Fore compartment seat hatch
  19. Fore anchor box hatch
- \* Depending of equipment level



## 3 BOAT OPERATION

### 3.1 HANDLING DEVICES OF BOAT

#### 3.1.1 STEERING CONSOLE

Below is a picture of the boat's handling devices. The number and location of the devices depends on the boat's standard of equipment and engine. Any further information on the devices can be found in other sections of this manual, as well as from the manuals of the devices.



1. Chart plotter\*

2. Engine control display\*

3. Steering console switches

4. Trim tabs control switch\*

5. Engine remote control\*

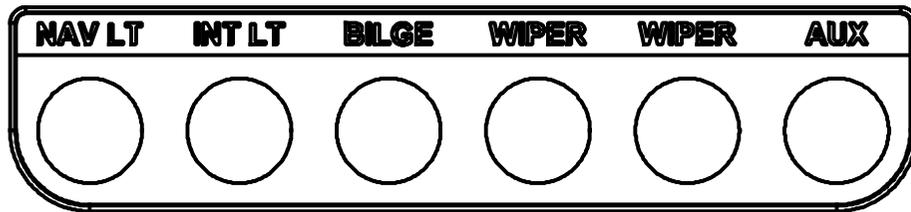
6. Dead man's switch\*

7. Ignition key\*

\* Depending of equipment level

### SWITCH PANEL OF STEERING CONSOLE

1. Navigation lights
2. Interior lights
3. Switch of bilge pumps
4. Windscreen washer Port
5. Windscreen washer STB
6. Vara



#### 3.2.1 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 manufacturer's manual for oil recommendation for the steering system

##### MAINTENANCE OF THE STEERING

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

#### 3.2.2 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!

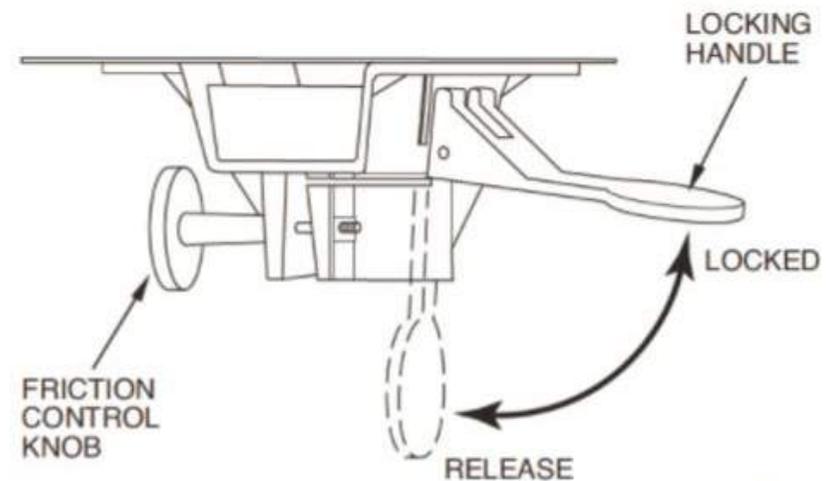
Risk of carbon monoxide poisoning. It is important to be aware of the risks with engine exhausts. Under certain conditions (e.g. turbulence or disadvantageous wind conditions), exhaust can enter the boat. If this happens you should avoid idling the engines. Should these problems occur under way, do not 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.

#### 3.3 SWIVEL SEAT – DRIVER AND PASSENGER SEATS

Press the locking handle down to release the lock; this will allow you to rotate the seat on the post. Twist the friction control knob to control friction on the post. The locking handle must be in the locked position and the friction knob must be tightened when boat speed exceeds 5 mph (8 km/h).

### DANGER!

Avoid serious injury or death due the ejection. The locking handle must be in the locked position and the friction control knob tightened before boat speed exceed 5 mph (8 km/h).



### 3.3 REGULAR INSPECTION FOR USER

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

#### 3.3.1 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.

#### 3.3.2 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.

### 3.4 BOAT HANDLING

#### 3.4.1 BEFORE LEAVING HARBOUR

Before leaving harbour 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.
- 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
- Always brief your crew on how you plan to leave the jetty.

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

#### CAUTION!

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

#### WARNING!

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

### 3.4.2 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 centre the rudder and engage astern.

#### 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.

#### CAUTION!

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

### 3.4.3 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 craft 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 behaviour 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 planing 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 24 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.

- The maximum rated engine power is 184 kW
- 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. Utilise 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.

#### **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.
- Planing 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.

### 3.4.4 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 planing
- Sea conditions
- Rain and thunderstorms
- Darkness and fog
- Inner lighting when under way in the dark
- 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.

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.

### 3.4.5 USING THE TRIM TABS

An Axopar 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 planing and cruising speed, as well as when running with a strong beam wind.

A planing boat always leans into a strong beam 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.

#### 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.

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.

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

The boat is designed for 8 people. The above picture shows the seating for them. Do not sit, stand or spend time in other parts of the boat while the boat is under way.

If a person has fallen into the water, the easiest way to get back on board is to use the swim ladder (1). The ladder can be pulled down also from the water. Keep the gates in the flat afterdeck area closed while the craft is under way.

#### 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.



### 3.6 ANCHORING, DOCKING AND MOORING FASTENING POINTS

#### 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 beam 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. 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 23,5 kN. When mooring the forward force is 19,2 kN. When mooring the rearward force is 16,4 kN.

#### CAUTION!

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



## 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 securely 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.

## 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.

### 3.6.1 LIFTING AND TRANSPORTING

Position the lifting straps as shown in the picture below. When the straps have been attached to the lifting hook on the crane they should be secured with lines to the bow and stern cleats to prevent the lifting straps from sliding

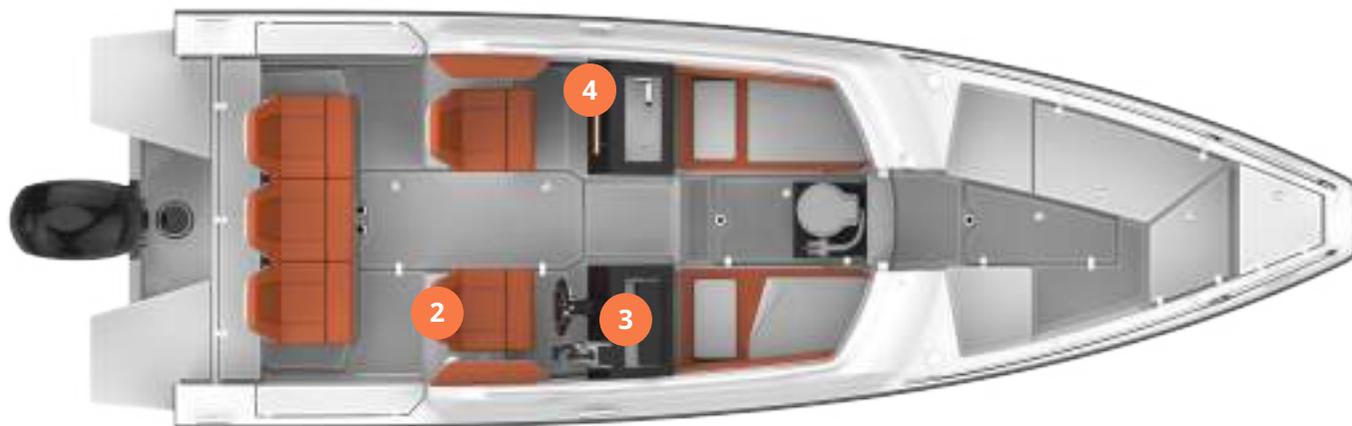
Always use an authorized boat transport company for transporting the boat on land. Make sure the company has full insurance cover, in case of any damages.



## 4 ELECTRICAL SYSTEM

### 4.1 DIAGRAM OF THE ELECTRICAL SYSTEM

1. Batteries
2. Main switches and 12 V output
3. 12 V output
4. Steering console and 12 V output



### 4.2 12 V system

Your craft is equipped with the 12V electrical direct current (DC) system. The 12-Volt DC-electrical system consists of engine driven alternators, batteru chargers for shore-side electricity, batteries and equipment. The power supply happens from charger or alternator via diodes for batteries. Equipment of the craft 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.

The base drawing of the craft's electrical system is presented in Appendix 3. The main switch is located in the aft of the craft under the back seats in the open space. When the electronic circuit is switched on, actuators can be operated from the switchboard in the helmsman's spot.

#### WARNING!

##### Never:

- 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

### 4.2.1 MAIN SWITCH PANEL

The different electronic circuits of the craft 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 craft. The main switches are located to the aft of the craft in the port-side footwell of the back seat

The background colour 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 colour is red and the text says "OFF".

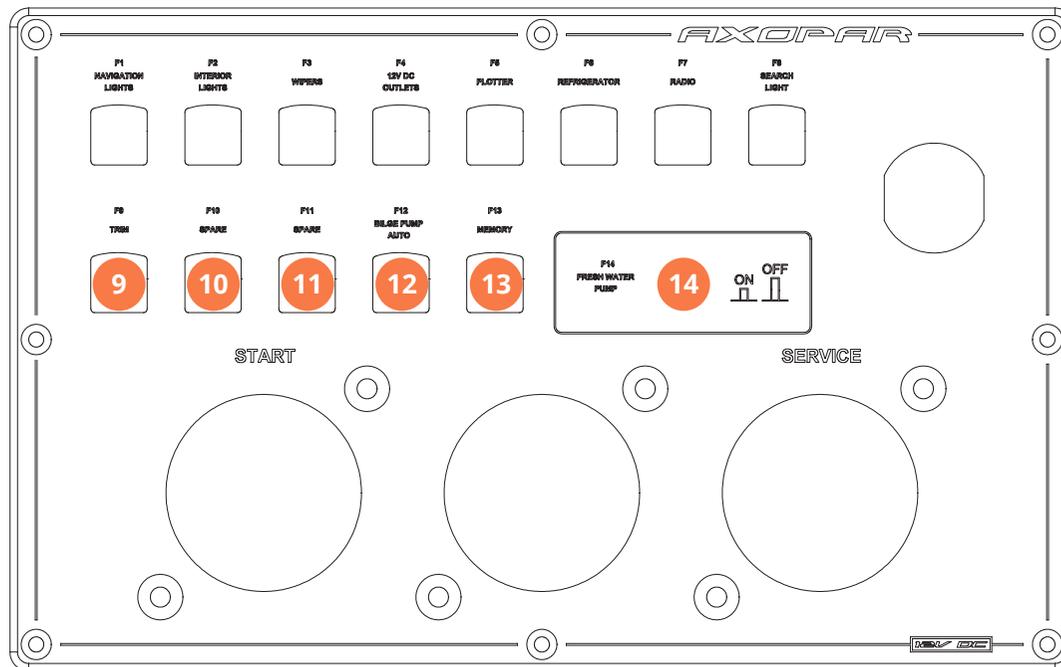
Current feed to the engine is achieved by turning the switch START (A) to the ON position, feed to other equipment is achieved by turning the switch SERVICE (B) to the ON position.

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 main switch panel also includes the boat's fuses (1-11), direct supply switches (12-14) and a 12V DC outlet (C).

- 1. Navigation lights
- 2. Interior lights
- 3. Window washer\*
- 4. 12 V DC outlets
- 5. Plotter\*
- 6. Fridge\*
- 7. Stereo
- 8. Search lights\*

- 9. Trim\*
- 10.Spare
- 11.Spare
- 12.Aft bilge pump
- 13.Radio memory\*
- 14.Fresh water pump
- \*Optional equipment



### 4.2.2 DIRECT SUPPLY SWITCHES

Some of the fuses for the boat's devices are equipped with direct supply switches. Direct supply switches are intended for such equipment that need current when main switches are turned off. The switches are located on the distribution board.

The switches (12-13) are equipped with an automatic fuse and power switch features. The switch for the fresh water pump (14) can be switched off when the pump is not in use.

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 (12-13) must be left on even if the current from other circuits is switched off.

#### 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 boat is equipped with trip switches that break the circuit and spring up to the "off" position when tripped. The fuses are positioned on the main switch panel.

#### 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 BATTERIES

Your boat is equipped with two batteries, of which the START batteries supply current to the engines and SERVICE batteries for other appliance. The battery system has been designed and built so that the craft'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. Use only service free AGM batteries in the boat.

#### CHARGING THE BATTERIES

Make sure that the battery compartment is always well ventilated when charging batteries. Only charge batteries in the boat with boat's own chargers. 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.

#### 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).

## BATTERY SERVICING

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.

### **DANGER!**

The main switches for the batteries are located on the main switch panel. The batteries are charged when the engine is running, or with a battery charger or other optional extras.

Do not use matches, a cigarette lighter or other form of naked flame when checking the electrolyte level, because the battery gives off explosive gas.

## 5 TECHICAL SYSTEMS

### 5.1 FUEL SYSTEM

The boat is fitted with a separate fixed fuel system and extra fuel filter (1) on the suction line. The extra fuel filter is the water-separating type. The fuel tank (2) is located under the seats in the cockpit. The inlet pipe for fuel (3) is located in the aft corner of the craft's portside. The fuel tank is equipped with a fuel cock located on top of the tank.

Try to prevent damage to the fuel lines. See the engine's instruction manual for care and maintenance of the engine's fuel system.

Do not smoke or handle open flames when refuelling. 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 North America region Axopar Boats is using EPA fuel system regarding NMMA certification rules. Drawing of the this system is in the Appendix 3.

#### USE

When refuelling a boat with composite decks, (Esthec or FlexiTeek) the deck should be wetted down with water before refuelling. 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!

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.

## 5.2 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 hydraulic accumulator. The tank is located under the forward open space. The pump is located at the rear of the tank space. The fresh water tank is filled via the inlet pipe (4) on the foredeck. The position of the components is given in the picture below.

The fresh water system is turned on by switching on the fresh water pump. The pump switch is located on the main switch panel. Switch the system off when leaving your boat. Do not forget to check the pump's filter 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.

## 5.3 SEPTIC SYSTEM

You can choose to equip your boat with a septic system as an optional extra. The system consists of a hand operated toilet, a septic tank and septic crusher.

### TOILET

The toilet is used with a separate operating switch. For more information on the device, see the manual for the toilet.

Before using the 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

### HOLDING 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.

See the cleaning instructions in the chapter Winter lay-up.

### SPRING PREPARATION OF THE TOILET

1. Lubricate the pump cylinder with Vaseline.
2. Flush the system with fresh water.
3. Connect the hoses and open both valves.
4. Check the connections thoroughly for leaks.

### 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.

### WINTER LAY-UP

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

**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.

**5.3.1 FRESHWATER AND SEPTIC SYSTEM DIAGRAM**

1. Fresh water inlet pipe
2. Fresh water tank
3. Fresh water pump
4. Pentry tap
5. Fresh water pump switch
6. Septic tank
7. Septic pump
8. Septic tank suction outlet pipe
9. Toilet seat
10. Septic tank seacock and toilet flush water inlet



## 6 SAFETY

### 6.1 GENERAL

If there is a fire in your craft, 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 craft. 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 craft 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.

### 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 8A 68B. Check the correct locations of the extinguishers from the diagram below. A fire blanket should be kept beside the LPG cooker.

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 COMPARTMENT

- 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

#### LIFE RAFT STORAGE

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

#### 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.

## USE OF LIFE RAFT

In case of an emergency, the life raft should be tied to the stern of the craft and prepared for use. When the life raft is ready and tied to the stern, loading the raft can be done via the swimming deck. Also in an emergency, the liferaft 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 GENERAL SAFETY DIAGRAM

1. Swim ladder
2. Fire extinguisher
3. Main switch



## 7 MAINTENANCE

### 7.1 MAINTENANCE

If the boat is stored or docked in an environment where there are noticeable hard air conditions (e.g. near harbours, lively sea routes, highways and power stations) you have to keep special observation to RST-parts of the boat. These air conditions can cause premature corrosion to RST parts and damage to gelcoat surfaces. Gelcoat and RST parts especially coloured parts should be polished and waxed approximately every fourth month so that parts won't come fading or other visual defects.

### 7.2 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 ajar.
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.

### 7.3 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.
7. Check the condition of the batteries.
8. Check all cables, clamps, engine mountings and other fastenings.
9. Check the steering before launching. 15. 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.

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

## 8 THE ENVIROMENT

### CAUTION!

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 APPENDICES

### 9.1 WARRANTY POLICY

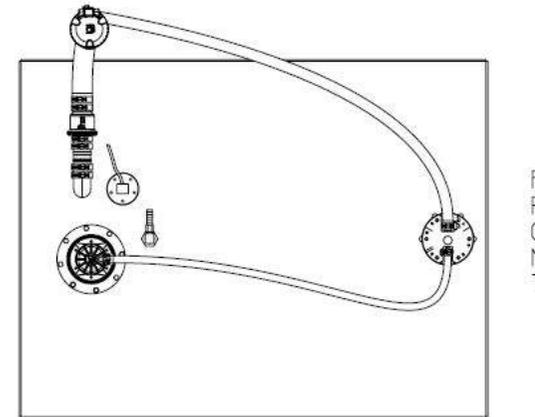
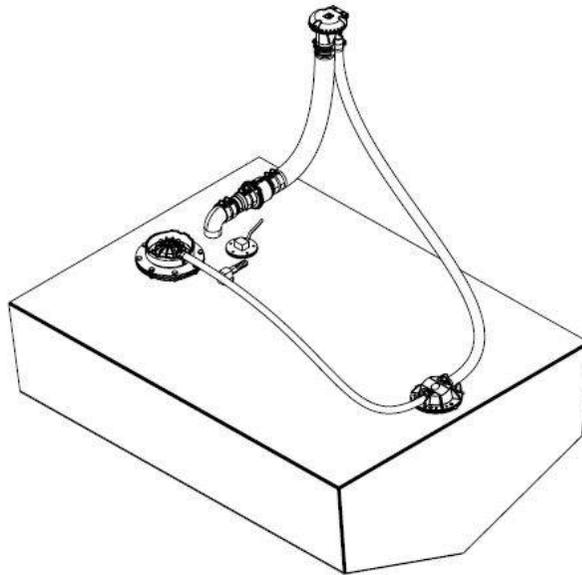
Separate appendix

### 9.2 ELECTRIC DIAGRAM

Separate appendix

### 9.3 FUEL SYSTEM FOR NORTH AMERICAN REGION

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



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/0.157 INCHES
TIP ANGLES	FRONT DOWN 17°
	REAR DOWN 17°
	RIGHT DOWN 7°
	LEFT DOWN 7°
COMPLETE TANK VOLUME	61.66 GALLONS
93% OF COMPLETE TANK VOLUME	57.35 GALLONS
SHUT-OFF HEIGHT (FLVV)	1.36 INCHES (GRAY)
SHUT-OFF VOLUME	57.35 GALLONS
USABLE VOLUME	57.27 GALLONS

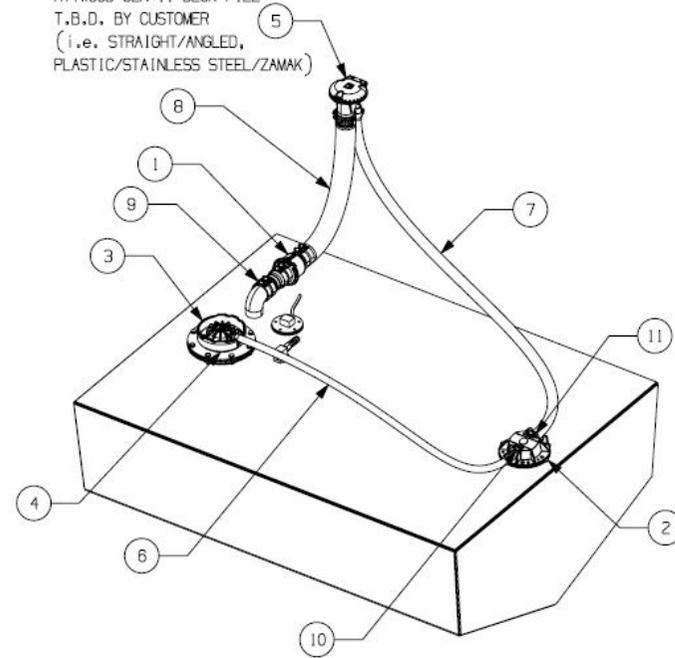
1	TIP STUDY AT 1.0° BOW UP STATIC FLOATING ANGLE	24JUN16	LT					
REV	DESCRIPTION	DATE	BY	PMR	CHK	DATE	ECN NO.	
SHEET 1 OF 4						THIRD ANGLE PROJECTION		
		TOLERANCES 2 PLACE TOLERANCE ± .01 3 PLACE TOLERANCE ± .005 ANGULAR TOLERANCE ± ° .5°		PROPRIETARY INFORMATION				
NAME TIP STUDY-PROJECT#1516, AXOPAR								
INCHES	DO NOT SCALE	SCALE 1:10	REFERENCE NO. REF NO	ITEM NUMBER 0010XXXX	REV 1			

ITEM	PART NUMBER	REF NUMBER	PART NAME	QTY	ASSEMBLED BY
1	001007929	991CV000	ASM-VALVE,CHECK,INTEGRATED 1(CV)	1	BOAT MFG.
2	001007582	99FLB140	ASM-VALVE,VENT,FUEL LIMIT,1.39" (GASKET INCLUDED)	1	TANK MFG.
3	001007283	99GVND00	ASM-VALVE,GRADE ROLLOVER (GRV)	2	TANK MFG.
4	001007365	99GVG000	GASKET-GRV,2.395 ID	2	TANK MFG.
5		99DFCCXX	ASM-DECKFILL,STRAIGHT,NON-VENT	1	BOAT MFG.
6			HOSE-VENT,5/16 (USCG TYPE A2)	1	BOAT MFG.
7			HOSE-VENT,5/8 (USCG TYPE A2)	1	BOAT MFG.
8			HOSE-FILL,1.5 (USCG TYPE A2)	2	BOAT MFG.
9			CLAMP-FILL HOSE,ICV	8	BOAT MFG.
10			CLAMP-VENT HOSE,GRV	2	TANK MFG.
11			CLAMP-VENT HOSE,FLVV	4	TANK MFG.

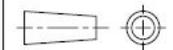
	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXXX

NOTE:

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



SHEET 2 OF 4



THIRD ANGLE  
PROJECTION

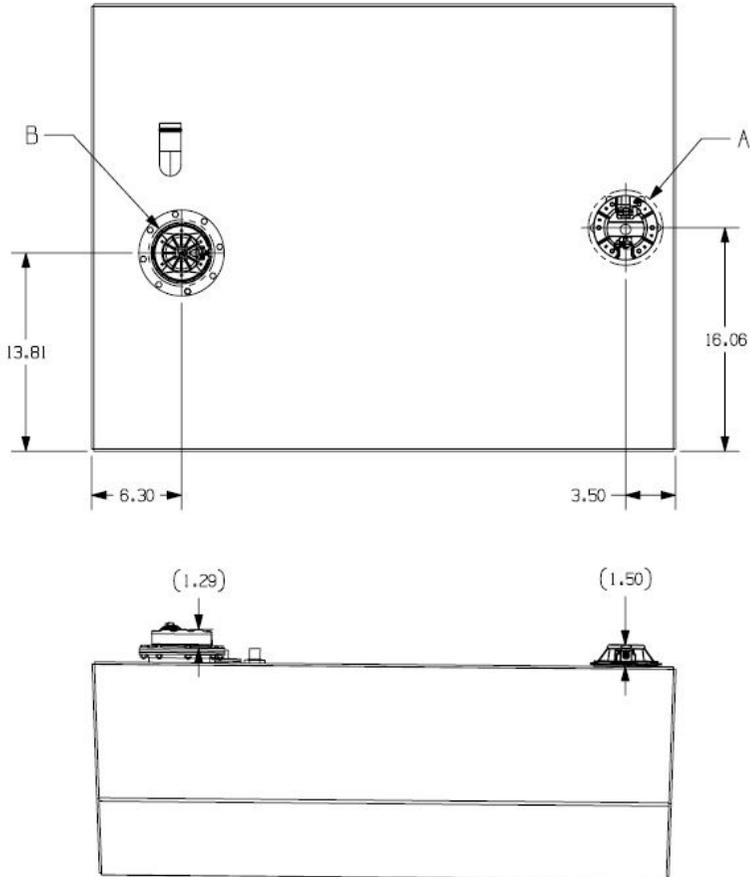
TOLERANCES

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

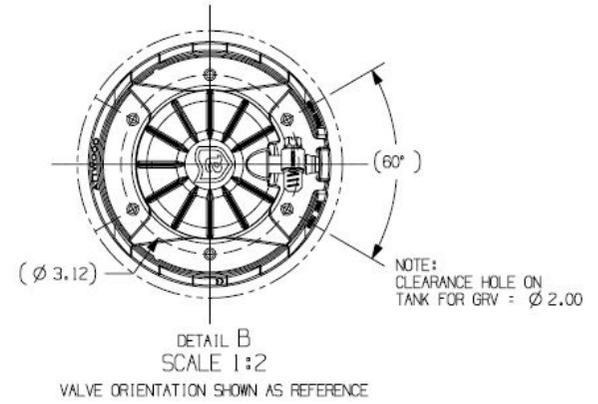
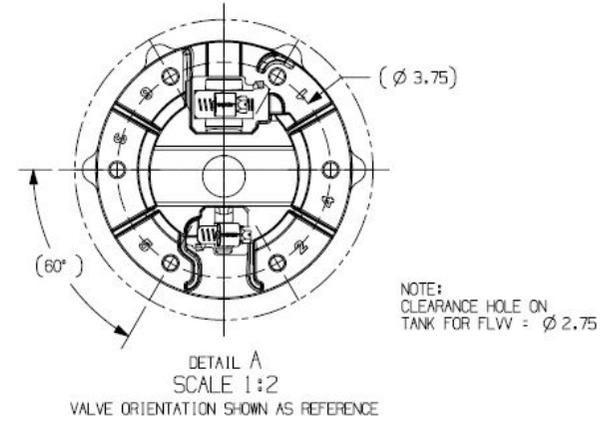
PROPRIETARY  
INFORMATION

NAME  
TIP STUDY-PROJECT#1516, AXOPAR

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



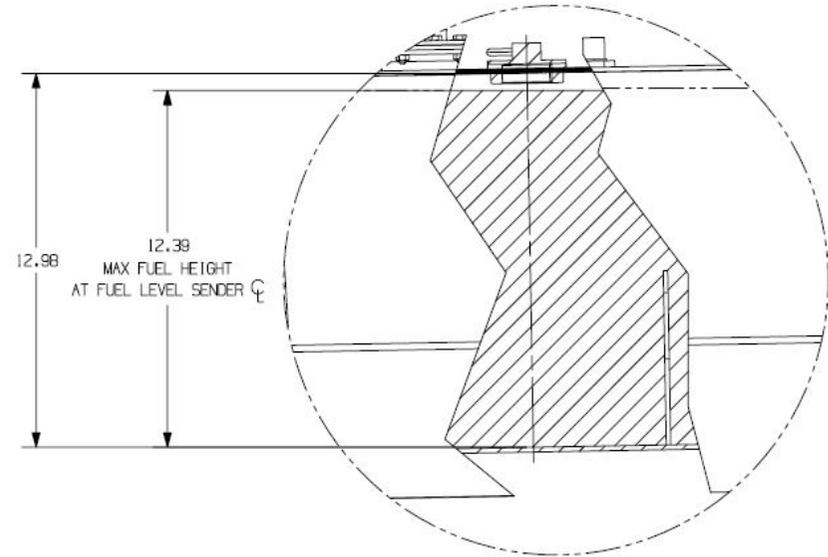
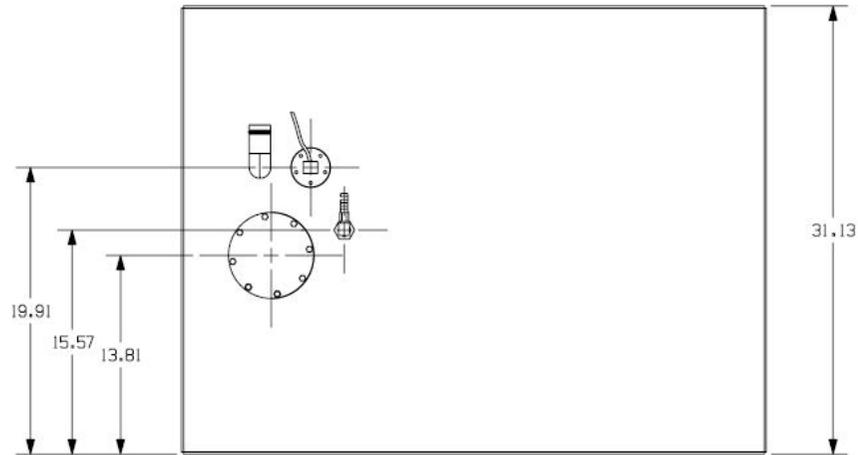
	BOAT MFG. PART NO	TANK MFG. PART NO	ATTWOOD PART NO
OLD			N/A
NEW			0010XXXX



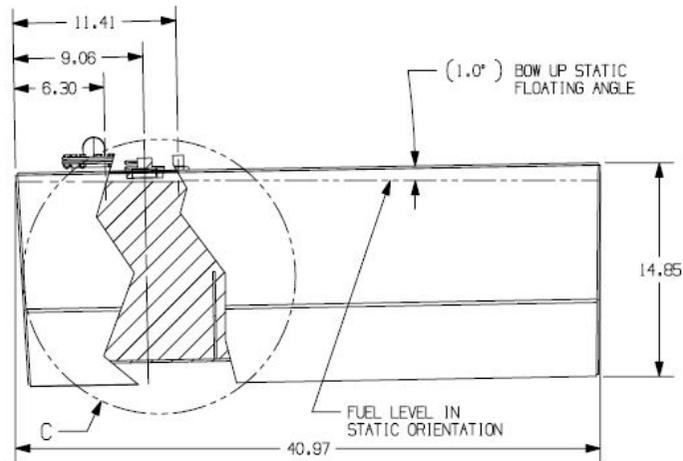
SHEET 3 OF 4

<p>THIRD ANGLE PROJECTION</p>	<p>TOLERANCES</p> <p>2 PLACE TOLERANCE <math>\pm</math> .01</p> <p>3 PLACE TOLERANCE <math>\pm</math> .005</p> <p>ANGULAR TOLERANCE <math>\pm</math> ' .5"</p>		<p>PROPRIETARY INFORMATION</p>		
	<p>NAME</p> <p>TIP STUDY-PROJECT#1516, AXOPAR</p>				
	INCHES	DO NOT SCALE		SCALE 1:8	REFERENCE NO. REF NO

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



DETAIL C  
SCALE 1:4



SHEET 4 OF 4



TOLERANCES		THIRD ANGLE PROJECTION	PROPRIETARY INFORMATION
2 PLACE TOLERANCE	± .01		
3 PLACE TOLERANCE	± .005		
ANGULAR TOLERANCE		± .5°	

NAME  
TIP STUDY-PROJECT#1516, AXOPAR

INCHES	DO NOT SCALE	SCALE 1:8	REFERENCE NO. REF NO	ITEM NUMBER 0010XXXXX	REV 1
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**AXOPAR** 