



Kiwi  
Yachting



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# Owner's Manual



## Cormorant 470 / 430 / 390 AL

**Please keep this manual in a secure place and hand it over to the new owner when you sell the craft.**

If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own comfort and safety, ensure that you obtain handling and operating experience before assuming command of the craft. Any boat dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

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# 1 WELCOME

Congratulations on becoming the new owner of a: Cormorant 470 / 430 / 390 AL

Make sure you receive a full explanation of all systems from the person transferring ownership to you.

## 1.1 Boating Experience

If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own comfort and safety, ensure that you obtain handling and operating experience before assuming command of the craft.

Any boat dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors

Regardless of the craft's seaworthiness and its certified design category, protection from freak sea and wind conditions cannot be guaranteed. Beware of offshore winds and currents. The ability, experience and fitness of the crew, therefore, should be taken into consideration before making any voyage.

## 1.2 Responsibility

It is the boat owner/operator's responsibility to:

- 1 Know the limitations of your boat;
- 2 Follow the rules of the road;
- 3 Keep a sharp lookout for people and objects in the water;
- 4 Ensure that the anticipated wind and sea conditions will correspond to the design category of your boat and that you and your crew are able to handle the boat in these conditions;
- 5 Never sail when the operator is under the influence of drugs or alcohol;
- 6 Be aware of the crew/passenger's safety at all times;
- 7 Ensure all crew receive suitable training, particularly with regards to location and operation of safety equipment;
- 8 Reduce speed when there is limited visibility, rough water, people in the water nearby, boats, or structures;
- 9 Ensure the craft is properly maintained at all time;
- 10 Have the craft inspected by qualified personnel at regular intervals and whenever a cause for concern is raised; and
- 11 Ensure compliance with all legislation in place in the area of operation. These may include requirements for the carriage of life saving equipment, licensing of the helmsman and respect for the environment.

## 2 ABOUT THIS MANUAL

This manual has been compiled to help you to operate your craft with safety and pleasure. It contains details of the craft; the equipment supplied or fitted its systems and information on their operation. Please read it carefully and familiarise yourself with the craft before using it. Ensure that everyone who will operate the vessel reads this manual before setting out.

This manual complies with the EU Recreational Craft Directive (RCD) and should not be perceived as an exhaustive guide to the vessel. A manual is not a replacement for experience and common sense!

### 2.1 Original Equipment Manufacturer (OEM) Manuals







This manual includes important fundamentals regarding equipment supplied by other manufacturers. More detailed information regarding such equipment can be found in manuals provided by the OEM.

A list of these manuals is given here:






- Outboard engine
- Bilge pumps

### 2.2 Safety Labels

The craft and this manual show symbols which advise the owner/operator and crew of imperative safety precautions to follow when operating and/or servicing equipment. The following symbols may be found on your craft. They should be respected at all times.

	Hazard - usually followed by text description (see following section)		Read the Owners Manual
	Electrical Hazard		Fuel fill point: letter 'D' denotes suitability for 'diesel fuel'
	Location of fire extinguisher		Dedicated discharge opening for extinguisher

### 2.3 Explanation of Hazard Warnings

	Danger	Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.
	Warning	Denotes a hazard exists which can result in injury or death if proper precautions are not taken.
	Caution	Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components.
	Information	Denotes useful or important facts or suggestions that can greatly enhance safety and efficiency of operations.
	Caution	Do not remove or obstruct any safety label. Replace any label which becomes illegible.

### 3 GENERAL ARRANGEMENT



#### 3.1 Boat Identification & CE Marking Classification

Type of Boat	Cormorant 470 / 430 / 390 AL				
Manufacturer's Craft Identification Number	NZ-QFXSerieA919				
Name of Boat Manufacturer	Kiwi Yachting Consultants T/A Southern Pacific Inflatables				
RCD Design Category		A	B	C	D
Maximum recommended number of people	adults				7

1 RCD = EU Recreational Craft Directive (2013/53/EU)

2 See table in section

3 For maximum weight limit see: 3.2.3

##### 3.1.1 RCD Design Category Explanation

This vessel carries the CE marking (shown here) to indicate that it complies with the EU Recreational Craft Directive. It has been assigned the Design Category explained below:



A watercraft given design category D is considered to be designed to operate in typical steady winds of Beaufort force 4 or less and the associated significant waves heights of up to 0,3 m and occasional waves of 0,5 m height. Typically such conditions might be encountered on sheltered inland waters, and in coastal waters in fine weather. Depending on atmospheric conditions, winds can gust to about 12 m/s.

## 3.2 Principal Dimension Cormorant 470 AL

### 3.2.1 Hull Size

Length of Hull	$L_H$	4.700	(m)
Length on waterline	$L_{WL}$	3.500	(m)
Length - max. overall	$L_{MAX}$	4.700	(m)
Beam of hull	$B_H$	1.850	(m)
Beam on waterline	$B_{WL}$	1.000	(m)
Beam - maximum	$B_{MAX}$	1.850	(m)
Deadrise Angle	$\beta$	18.000	(deg)
Freeboard fwd	$F_F$	0.710	(m)
Freeboard amidships	$F_M$	0.520	(m)
Freeboard aft	$F_A$	0.220	(m)
Maximum draft	$T$	0.531	(m)
Air draft: max.	$H_A$	1.350	(m)

### 3.2.2 Maximum Recommended Power

Power measurement to EN ISO 8665 Marine propulsion engines and systems - Power measurements and declarations

Horsepower	50	(hp) (metric)
Kilowatts	37	(kW)

### 3.2.3 Weights

All weights in kilograms (kg)

A 'maximum load' has been used for assessing stability and buoyancy, comprising:

Maximum Recommended Load (ISO 14946)	692 kg
Essential safety equipment & liferaft	14 kg
Maximum Number of Persons	525
Baggage & other carry on weights	125
Heaviest allowable outboard motor	110
Edible stores & provisions	15
Portable fuel tanks	14
Max Load as on Builder's Plate	789 kg

The boat in the 'empty craft condition' has a mass of	113 kg
Unladen weight (lightcraft) without engine	188 kg
Weight Fully Laden	991 kg

## 3.2 Principal Dimension Cormorant 430 AL

### 3.2.1 Hull Size

Length of Hull	$L_H$	4.300	(m)
Length on waterline	$L_{WL}$	3.100	(m)
Length - max. overall	$L_{MAX}$	4.300	(m)
Beam of hull	$B_H$	1.850	(m)
Beam on waterline	$B_{WL}$	1.000	(m)
Beam - maximum	$B_{MAX}$	1.850	(m)
Deadrise Angle	$\beta$	18.000	(deg)
Freeboard fwd	$F_F$	0.710	(m)
Freeboard amidships	$F_M$	0.520	(m)
Freeboard aft	$F_A$	0.230	(m)
Maximum draft	$T$	0.490	(m)
Air draft: max.	$H_A$	1.350	(m)

### 3.2.2 Maximum Recommended Power

Power measurement to EN ISO 8665 Marine propulsion engines and systems - Power measurements and declarations

Horsepower	40	(hp) (metric)
Kilowatts	29	(kW)

### 3.2.3 Weights

All weights in kilograms (kg)

A 'maximum load' has been used for assessing stability and buoyancy, comprising:

Maximum Recommended Load (ISO 14946)	648 kg
Essential safety equipment & liferaft	13 kg
Maximum Number of Persons	525
Baggage & other carry on weights	65
Heaviest allowable outboard motor	95
Edible stores & provisions	35
Portable fuel tanks	16
Max Load as on Builder's Plate	736 kg

The boat in the 'empty craft condition' has a mass of	105 kg
Unladen weight (lightcraft) without engine	133 kg
Weight Fully Laden	876 kg

## 3.2 Principal Dimension Cormorant 390 AL

### 3.2.1 Hull Size

Length of Hull	$L_H$	3.900	(m)
Length on waterline	$L_{WL}$	3.000	(m)
Length - max. overall	$L_{MAX}$	3.900	(m)
Beam of hull	$B_H$	1.850	(m)
Beam on waterline	$B_{WL}$	1.200	(m)
Beam - maximum	$B_{MAX}$	1.850	(m)
Deadrise Angle	$\beta$	16.000	(deg)
Freeboard fwd	$F_F$	0.700	(m)
Freeboard amidships	$F_M$	0.500	(m)
Freeboard aft	$F_A$	0.450	(m)
Maximum draft	$T$	0.506	(m)
Air draft: max.	$H_A$	1.350	(m)

### 3.2.2 Maximum Recommended Power

Power measurement to EN ISO 8665 Marine propulsion engines and systems - Power measurements and declarations

Horsepower	30	(hp) (metric)
Kilowatts	22	(kW)

### 3.2.3 Weights

All weights in kilograms (kg)

A 'maximum load' has been used for assessing stability and buoyancy, comprising:

Maximum Recommended Load (ISO 14946)	614 kg
Essential safety equipment & liferaft	12 kg

Maximum Number of Persons	525
Baggage & other carry on weights	65
Heaviest allowable outboard motor	90
Portable fuel tanks	17
Max Load as on Builder's Plate	697 kg


The boat in the 'empty craft condition' has a mass of	98 kg
Unladen weight (lightcraft) without engine	124 kg
Weight Fully Laden	828 kg



### 3.2.4 Tubes

Specification: Standard Product: 7307/7318 Valmex-Germany vinyl coated (PVC)  
 Option: ORCA 866 Neoprene

### 3.2.5 Structural Fittings

 <p>Warning</p>	<p>Attention is drawn to the completion process whereby structural items, for example steering consoles, seats and superstructures, are installed by parties other than the manufacturer of the boat. These items should be installed to comply with the relevant clauses of ISO 6185-4 so it can be ensured that any such installations do not invalidate the original assessment.</p>
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## 4 SYSTEMS DESCRIPTIONS

### 4.1 Bilge Pumps


Bilge Pumps are fitted as follows:

Location	Power	Make & Model	Capacity (Litres/min)	Bilge Compartment(s)
Bilge aft	Electric	Rule	32	aft sum

The bilge should always be checked after launch. A small amount of water in the bilge is normal. Large amounts of water or any signs of fuel or oil require immediate investigation. Never pump fuel or oil overboard when your boat is in the water.

Check function of pumps regularly & clear debris from their inlets.

It is recommended that a bailer/bucket is carried aboard for emergency bailing purposes. Ensure the bucket is protected against accidental loss.

 <p>Warning</p>	<p>Never use flammable solvents (i.e. kerosene) for bilge cleaning, however oily it becomes.</p>
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## 4.2 Electrical System

ALWAYS.....

- Check battery and charging system condition before going to sea
- Disconnect and remove the battery when the craft is in winter storage (cold weather areas) or long term storage

NEVER.....

- Work on the electrical installation while the system is energised;
- Modify the craft's electrical system or relevant drawings: installation, alterations and maintenance should be performed by a competent marine electrical technician;
- Alter or modify the rated current amperage of overcurrent protective devices;
- Install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit;
- Leave the craft unattended with the electrical system energised, except automatic bilge-pump, fire protection and alarm circuits.

	Danger	Petrol vapour can explode. Only fit ignition protected, marine parts to replace such items as starters, distributors, alternators, generators, etc.
	Warning	Do not use jump leads in the petrol engine/tank space or carry out any activity that could create sparks.
	Warning	Protective terminal covers, such as rubber boots on electrical connections, must be in place at all times except when servicing equipment.

### 4.2.1 DC System

#### Description

The direct current (DC) electrical system derives its power from the series of batteries listed below. The batteries supply the components listed in tables below which show the settings of the overload protection breakers/fuses.

Refer to the wiring diagrams at the back of the manual for further details.

The DC system consists of the following circuits:

Battery Bank	Voltage	Rating	Battery Location	Disconnect Switch
Starter	12	0	in Helm console	Stbd Helm console

The battery selector switch is located at: Stbd Helm console

Main DC Panel Board Location: Helm console

DC fuses are provided in the various circuits as shown in the following table:



#### 12 V DC System

Circuit	Rating (A)	Protection
Nav Lights		

### Removal of Batteries

To remove the battery cables:


- 1 Turn off all items drawing power from the battery.
- 2 Turn the battery switch to the OFF position
- 3 Remove the negative cable first, then the positive cable. To replace the cables, first replace the positive cable, then the negative.

	Caution	Ensure that the battery space is well ventilated at all times.
	Caution	When charging and (dis)connecting a battery ensure that no water or metal objects can contact the terminals.

### Battery Disconnection

Battery selector switch location:                   Stbd Helm console  
 Disconnect switch location(s):                   See table of batteries on previous page.

Information           Batteries should be disconnected when not in use and especially while the boat is unattended.

	Caution	Do not disconnect all batteries while the engine is running; alternator and wiring damage could occur.
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### Battery Maintenance

1. Check the fluid levels in the cells (if appropriate for the battery type) approximately every 4 weeks, and weekly in summer and hot zones.
2. The fluid level must be between the lower and upper markings.
3. Replenish only with distilled water. Do not use metal funnel.
4. Coat battery terminal clamps with silicone grease.
5. Keep batteries clean and dry.
6. The life of some battery types is shortened if drained to zero charge. It is recommended that a battery not be discharged more than 50 percent. If the battery does become run down, recharge it as soon as possible.
7. Running the engine to recharge the battery may not be effective. The alternator only creates charging power at higher engine speeds, idling for long periods will not generate enough power to recharge the battery.
8. If you need to charge a battery, use only a battery charger designed to charge automotive/marine batteries. Use charger only when batteries are disconnected from the boat's electrical circuit. Follow the charger instructions.
9. If your boat will not be used for several weeks remove the batteries from the boat and connect them to a charger.







### 4.3 Fuel System

The craft has:                      Portable  
    Petrol fuel system

The following components are supplied by the fuel system:

Item	Number	Location
Engine	1	outboard

Refer to manufacturer's instructions for details of the above equipment.

	Warning	Do not smoke or use open flame when filling with fuel, when working on the fuel system and when in the engine room.
	Danger	Never use a flame to check for leaks
	Warning	Inspect fuel lines at least annually. Replace if deterioration or openings are found.
	Caution	All components that burn fuel require an air supply. Ensure all air intakes are clear before fuel burning components are running.
	Warning	If leakage is detected, have the system repaired before further use. System repairs should be made by a competent person.
	Danger	Bio-fuels and fuels that have significant alcohol content, can attack plastic fuel tanks. Such fuels should not be used in this craft.





## 4.4 Steering System

Information The boat's steering system has the following components:

Steering Hardware: Wheel  
 Turning device: Drive unit  
 Mechanism: Direct link/Flexible cable


The craft is fitted with the following steering position(s):

Helm console

 Caution	Refer to the system manufacturer's documentation for information pertaining to the steering gear.
 Caution	All components of the steering system must undergo periodic inspection & maintenance to ensure safe operating conditions. Refer to the maintenance section of this manual for further details.
 Warning	Failure of the steering system will cause loss of control of your boat. Any change in steering such as looseness, tightness, binding, etc., must be checked immediately by a qualified person.
 Caution	A kill-chord is provided at the helm so that the engine will cut-out when pulled. The helmsman should connect him/herself to the kill-chord when the engine is running.

## 5 PRE-LAUNCH OBSERVATIONS







### 5.1 Recommended Safety Equipment

	Caution	The sea can be unpredictable. Be prepared by carrying the following equipment, as a minimum, at all times.
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- 1 Life jacket or buoyancy aid for each person
- 2 Appropriate weatherproof clothing
- 3 Compass
- 4 Charts
- 5 Anchor and line
- 6 At least 2 warps - see section 6.5
- 7 First aid kit including compress and thermal blanket
- 8 Bucket
- 9 Distress flares
- 10 VHF radio
- 11 Binoculars
- 12 Knife in protective sheath
- 13 Drinking water

### 5.2 Risk of Loss of Stability

The stability and buoyancy of this boat has been assessed on the basis of the weights specified in section: 3.2.3


	Warning	The boat should never carry more than the manufacturer's recommended load. The load should be suitably distributed, bearing in mind that stability is most significantly reduced by any weight added high up in the boat
	Caution	Stability can also be adversely affected by sloshing fluid. Bilge water should be kept to a minimum
	Warning	Loose equipment can cause damage to the craft and affect stability. Ensure all loose equipment is properly stowed before setting out.
	Caution	The stability of this boat is significantly reduced at speeds above displacement speed.
	Caution	Stability may be reduced when towing or lifting heavy weights using a davit or boom.
	Caution	Breaking waves are a serious stability hazard

### 5.3 Risk of Flooding

	Caution	In rough weather, hatches, lockers and companionway/doorways should be closed to minimise the risk of water ingress.
	Caution	Ensure all limber holes are clear
	Caution	Check function of bilge pumps regularly & clear debris from their inlets.

### 5.4 Risk of Fire

Information Always keep the bilges clean and check for fuel regularly

	Information	<p>NEVER</p> <ul style="list-style-type: none"> <li>• obstruct portable extinguishers in lockers</li> <li>• obstruct safety controls (shut off valves, switches)</li> <li>• modify craft's systems, especially fuel.</li> <li>• fill any fuel tank whilst machinery is running</li> <li>• smoke while handling fuel or gas</li> <li>• use gas lights in craft</li> </ul>
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### 5.5 Risk of Falling Overboard


Information The working deck is the area of the boat that is safe for use at all times. Areas outside the specified working deck should only be used whilst leaving or arriving at a mooring or whilst the boat is not underway.

On this boat, the working deck area is defined as:

All inside deck

For maximum weight limit see: 3.2.3

For crew area limits, see section: 5.2

	Warning	Most slips and falls occur during boarding and disembarking. Be aware that wet decks can be slippery. Wear slip resistant footwear at all times.
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## 6 NAVIGATION & OPERATION

### 6.1 Use of Engines

The craft is fitted with the following motive power:

Engine 4 Stroke spark-ignition- Outboard engines CE Marked

- Cormorant 390 AL - All Brands 30HP (22 kW) CE marked
- Cormorant 430 AL - All Brands 40HP (29 kW) CE marked
- Cormorant 470 AL - All Brands 50HP (37 kW) CE marked




Propeller depend

Information Before starting the engine:

- Check the bilge water level.
- Ensure that ventilation openings are clear to prevent overheating
- Ensure there is sufficient fuel for the anticipated journey - including a margin for contingencies.

Take care not to damage fuel lines and check regularly that they are in good condition


Avoid placing flammable materials on or near hot parts.

	Danger	If a fuel leak or fumes are detected, do not start the engine. Ensure all crew leave the boat and have a qualified person repair the fault as soon as possible.
	Warning	Controls installed with the motor must have a start-in-gear protection device. It is the owner's responsibility to ensure this is so, should the engine or its controls be repaired/replaced.
	Caution	So as to avoid high-speed moving parts, never run a motor with the cover removed.



## 6.2 Handling Characteristics

Information This craft is primarily intended to be supported by a combination of buoyancy and planing forces

	Caution	This craft may be entirely clear of the water for short periods of time in normal operation (i.e. become airborne)
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Information Maximum speed: 35 knots 65 km/h

Information Periodic inspection of the propeller for excessive wear or damage is recommended in order to maintain peak performance and to maximise the longevity of the engine.

Information Ensure all crew are informed about the craft's behaviour.

Information Before conducting any rapid acceleration or high-speed manoeuvres, passengers must be warned to sit and hold-on.

Information The helmsman may have to take sharp avoiding action at any time. Passengers should, therefore, be seated and holding-on when underway.

	Caution	Seaways are infinitely variable and all craft can meet conditions that will challenge the boats handling characteristics and/or the helmsman's ability. Proceed with a margin for error at all times. Avoid making sharp turns at speed, particularly in a short seaway.
	Caution	It is strongly recommended that helmsmen receive adequate training in boat handling before setting to sea for the first time.
	Caution	Be aware that factors such as altitude, temperature, load, and bottom growth may affect performance.

## 6.3 Visibility from the Main Steering Position

Information Operator vision from the helm can be obstructed by high trim angles of the craft and other factors caused by one or more of the following conditions:

- Propulsion engine trim angles
- Loading and load distribution
- Speed
- Rapid acceleration
- Transition from displacement to planing mode
- Sea conditions
- Rain and spray
- Darkness and fog
- Persons or movable gear in operator's field of vision




The international regulations for preventing collisions at sea (COLREG's) and the rules of the road require that a proper lookout be maintained at all times and observance of right of way. Make certain no other vessels are in the path before proceeding.

## 6.4 Navigation Lights

Information Night boating requires running lights. The craft is fitted with the following navigation lights:




Port	Helm console
Stbd	Helm console

The running/navigation lights are controlled at the switch board.

	Caution	Check for proper operation of navigation lights before heading out and carry replacement bulbs for all navigation lights
	Caution	Navigation lights may be marked with expiry dates. Ensure that they are replaced as required.
	Caution	Always replace bulbs with one of the same wattage.


## 6.5 Anchoring, Mooring & Towing

Information It is the owners / operators responsibility to ensure that the mooring lines, towing lines, anchor chains, and anchors are adequate for the vessel's intended use. Owners should also consider what action will be necessary when securing a tow line on board.

	Caution	The breaking strength of lines / chains should not exceed 80% of the breaking strength of the strong point to which it is attached.
	Caution	Always tow or be towed at slow speed. Never exceed the hull speed of a displacement craft when towing or being towed.
	Caution	A tow line shall always be made fast in a way that it can be released when under load.

Information When at anchor, it is damaging to leave the full load of the boat resting on the windlass. It is recommended that the chain be tied onto a local strong point.


## 6.6 Filling With Fuel

	Caution	Never smoke when refuelling, or inspecting or working with the fuel system.
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Information For locations of filler caps, see: 3.2.3

Use the following procedure for filling tanks:

- Remove portable tank(s) from the craft for filling ashore.
- Open the filler cap & start filling the tank.
  
- Check the contents of the tank by monitoring the tank level indicator
- Don't fill the tank to its maximum: allow for expansion
  
- Close deck fittings tightly, but don't over-tighten since this will damage the rubber o-rings
- (make an entry in ship's log)



	Caution	Fuel is considered chemical waste. Keep an absorbing cloth close by when filling tanks.
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## 7 MAINTENANCE

Regular inspection and maintenance is an essential activity to ensure the boat's longevity and the crew's safety.

This section includes a generic table which details typical inspection and maintenance intervals. This is not specific to your craft and some sections will not apply.

The necessary frequency of service or maintenance depends upon the environment in which the boat operates. The intervals listed in this section should be viewed as maximums.


	Caution	Modifications that may affect the safety characteristics of the craft should be assessed, executed and documented by competent people.
	Caution	Any change in the disposition of the masses aboard may significantly affect the stability, trim and performance of the boat

**KEY:** X - Activity required Y - Activity required by qualified individual

Item	Required Maintenance/Service	INTERVAL				
		Before Every Use	After First 20 Hours	Every 25* Or 50 Hours	Every 50* Or 100 Hours	Every 6 mnth or Annual
<b>Miscellaneous</b>						
Battery	Check water level	X	X	X		
Navigation Lights	Check working	X				
Bilge Area	Clean & limber holes free					X
Bilge Blowers	Hose connections tight			X		X
Bilge Pumps	Float switch operates freely					X
Bilge drain plug	Installed and tight	X				
Zinc anodes	Check and replace	As needed				
Hull	Check for loose, damaged or missing parts	Whenever out of the water and always after striking an object				
<b>Controls</b>						
Steering	Check for proper operation					Y
Steering	Power steering oil level	X				
Throttle	Lubricate. Include all shift linkage and pivot points		X		X	X
<b>Electrical</b>						
Connections	Check for looseness					Y
<b>Engine</b>						
Alarm	Check	X				
Cooling System	Check for leaks with engine running	X				
Crank vent system	Clean		X		X	
Drive belts	Check for wear	X				
Flame Arrestor	Clean		X		X	
Fuel Filter	Replace				X	
Mounts (Fasteners)	Tighten		X			X
Oil and Filter	Replace				X	X
Oil Level	Check	X				
Propeller	Inspect for damage	Always after striking object				
<b>Fuel System</b>						
Connections & Lines	Check for leaks & wear	X	X	X		
Tanks	Check for leaks & tightness of connections	X	X	X		
<b>Exterior</b>						
Topside & Supplies	Check for loose, damaged or missing parts					X


## 7.1 Maintenance & Storage of Tubes

For details of the tube arrangement, see: 3.2.4

	Caution	The tubes are made of a material that will deteriorate when stored in strong direct sunlight for prolonged period.
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Always store the boat inside, away from harmful ultra-violet rays.

UV protection waxes are recommended to prolong the life of the tubes and to preserve their colour.


	Caution	Certain liquids, such as (battery) acids, oil and petrol can be corrosive to the tube material.
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Rinse-off, immediately, any liquid other than water that comes into contact with the tubes.

## 7.2 Maintaining the Electrical System

	Warning	Work on electrical wiring can create shock hazards or sparks.
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Always disconnect power sources and shut off battery switch, breakers and/or pull fuses before checking electrical wiring or connectors.

	Caution	To prevent arcing or damage to the alternator, always disconnect battery cables before doing any work on the engine's electrical system.
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	Caution	Power feeds for accessory equipment must not be taken from the voltmeter terminals.
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Information

- Check all wiring for proper support.
- Check all wiring insulation for signs of fraying or chafing.
- Check all terminals for corrosion - corroded terminals and connectors should be replaced or thoroughly cleaned.
- Tighten all terminals securely and spray them with light marine preservative oil.


### 7.3 Winter Storage

You should refer to the advice given in the various handbooks supplied with this manual.

In addition to this you should, for example, consider the following:

- Remove, charge and store the batteries in a warm & dry ventilated place
- Grease the appropriate steering gear components
- Ensure the engine cooling water has the correct proportion of anti-freeze
- Take away any removable delicate on board electrics and electronics
- Check and protect all the systems on the boat
- Remove all water from the craft and protect it from rain
- Ensure deck drains are clear
- Check the sacrificial anodes and replace as necessary

### 7.4 Maintaining the Power Steering System

	<p><b>Caution</b></p>	<p>Refer to the engine operator's manual for proper fluid levels and lubricants as well as operating and warranty information.</p>
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Information

Lubricate the control valve on the power steering cylinder through the grease fitting with multipurpose lubricant until grease appears around the rubber boot.

Lubricate control valve through grease fitting with multi-purpose lubricant until grease is visible around rubber boot.

Coat power steering output shaft and exposed steering cable end with multi-purpose lubricant.


Lubricate cable end guide pivot point with engine oil.

Run engine for 20 to 30 minutes and check power steering fluid level. If low, add type "A" automatic transmission fluid to bring level up to the FULL mark on the dipstick.

NOTE: If the engine is cold, allow room for expansion.

Inspect all hydraulic lines and hoses for leaks. Ensure all lines and hoses are free from friction and exposure to extreme heat. Tighten all fittings and clamps as required.

Check all bolts for tightness.

	<p><b>Warning</b></p>	<p>Check pump pulley drive belt for wear and proper tension. Avoid over tightening drive belts. Belts that are too tight can cause excessive bearing wear and failure.</p>
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## 8 ENVIRONMENTAL AWARENESS

The previous sections of this manual provide information on how to protect the boat and its crew from the environment. This section gives information on how the environment may be protected from the boat and its crew.

The environment should be understood as including one's neighbours as well as the world of plants and animals.

In many regions of the world, there are strictly enforced regulations regarding environmental protection. It is the responsibility of the owner/operator to be aware of applicable regulations and to ensure compliance with them.

### 8.1 Leakage of Petrochemicals

	Warning	Any oil must be treated as chemical waste.
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ALWAYS: Investigate the source of any oil leaks as soon as possible.

Dispose of recovered spilt oil correctly.


Have oil-absorbing cloths or rolls on board.

NEVER: Dispose overboard of any oil, paint or other chemical that is potentially harmful to the environment. Sanctions are in place in most parts of the world for those who disregard this rule!

### 8.2 Black & Grey Water

	Warning	The discharge of effluent into navigable waters is forbidden by law in many areas. If such discharge causes a film or sheen upon or a discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water, violators may be subject to a penalty. It is the responsibility of the boat user to ensure that they are aware of local legislation regarding discharge
	Caution	Keep bilges clean to avoid the automatic bilge pumps discharging illegal effluent.

### 8.3 Household Waste

	Warning	When at sea for periods longer than space allows onboard storage of waste, only jettison organic waste.
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ALWAYS Retain any household waste until it can be properly disposed of ashore.


### 8.4 Noise

NEVER Make excessive noise. Most people take to the water for relaxation which is ruined by noise.

Run the engine or generator unnecessarily.

### 8.5 Wash / Waves

ALWAYS Adapt your speed to the water in which you are navigating. Consider the comfort and safety of other (particularly small) boats around you.

	Warning	Be aware that in some areas speed restrictions are in place to avoid erosion of banks/coastline.
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