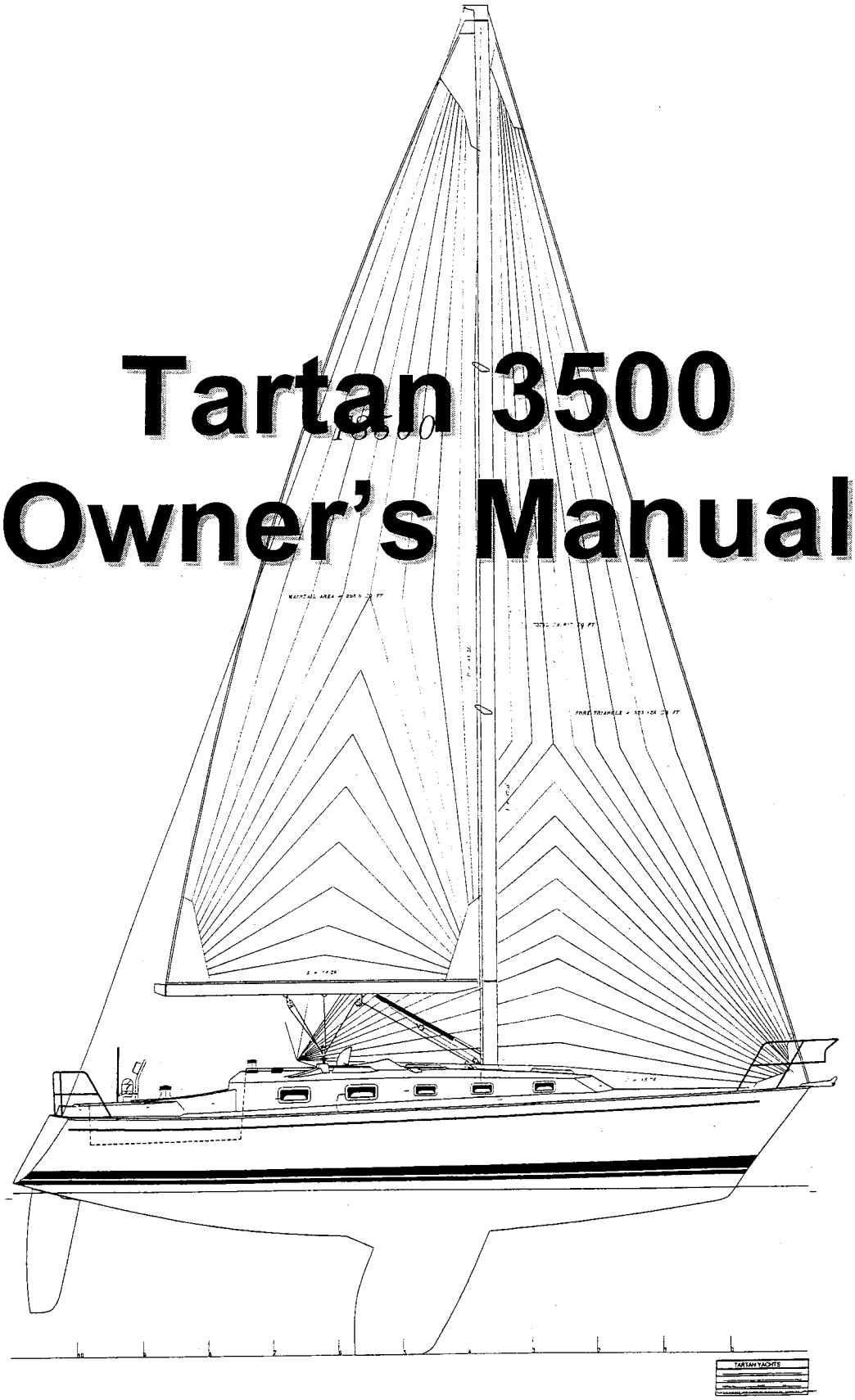
Tartan 3500
Owner's Manual



TARTAN 3500 OWNER'S MANUAL INDEX

Again, this manual is intended to help you to know your new Tartan Yacht. It is most important to familiarize yourself thoroughly with all aspects of operating and maintaining your yacht in a safe and efficient manner. Read your manual carefully as well as the booklets supplied by the manufacturers of the components. If any questions arise for which you can not find an answer, your Tartan dealer will be pleased to help you.

It is Company policy that the Tartan line of yachts is continually upgraded and improved. Thus, you may find your yacht equipped with gear different from that shown in your manual. Any new piece of equipment will be in all cases equal to or better than, its predecessor.

On taking delivery of your yacht, be sure to read and understand the Tartan warranty. Complete the warranty card or the change of ownership card and return it to Tartan immediately.

If you are a seasoned sailor much of the manual may be old news but if this is your first boat, we hope this will prove useful. We know that you will have many satisfying and happy hours of sailing in your Tartan Yacht.

Should you need to contact Tartan Yachts please use the following addresses and numbers:

Tartan Yachts
Customer Service
1920 Fairport Nursery Road
Fairport Harbor, OH 44077
Phone: 440-354-3111
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Websites: www.tartanyachts.com and www.tartanparts.com

We would like to take this opportunity to thank you for choosing Tartan Yachts and we wish you good sailing.

2.0 LIST OF ILLUSTRATIONS AND TABLES

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3.0 CONSTRUCTION

3.1 Hull

The hull of the Tartan 3500 is a single unit fiberglass molding which incorporates a specially developed NPG/ISO gelcoated hull. Alternating layers of strand mat and Unidirectional 'E' glass in Isotholic resin are locally reinforced and cored with Balsa in order to achieve an optimum balance of strength, stiffness and weight in the laminate composite.

The construction process ensures the complete weaning of the laminate complex with no voids or bubbles. Extra laminate is used in any area that would be subject to additional stresses. The exterior finish consists of gelcoat molded into the fiberglass backed up by a 4mm barrier coating of Vinylester anti-corrosive resin. The boot stripe is applied using ***DuPont Centari Acrylic Enamel*** while the cove stripe is a premium vinyl film. A Balsa Core is sandwiched between the laminate layers to add significant strength and stiffness properties to the hull, and yet ensuring that overall weight is kept to a minimum. The strength/weight characteristic of the sandwich composite as well as resistance to impact and abrasion is magnified by the use of Unidirectional 'E' glass in the laminate.

3.2 Deck

The deck and cockpit, like the hull, is a single unit fiberglass molding with a gelcoat surface. A Balsa core is incorporated into the structure between the laminate layers for additional stiffness. A non-skid finish is molded into the working areas of the deck.

3.3 Hull / Deck Joint

The top flange of the hull is capped with marine adhesive sealant. The deck is then fitted and fastened through the Teak or Aluminum toerail by means of stainless steel bolts. As the bolts are tightened, the sealant is forced into exposed crevices. If a leak should ever develop in the hull / deck joint, the through bolts may be tightened accordingly.

3.4 Rudder & Steering

The rudder is constructed of two molded composite shells, which are bonded together and injected with two-part foam for added strength. The rudderpost is all stainless steel with a flat stainless steel plate reinforcing weldment positioned within the rudder.

Wheel steering is standard. The pedestal system is a silky-smooth Compact Rack & Pinion Whitlock steering system.. The pedestal manufacturer (Whitlock) has provided maintenance instructions concerning the steering system.

3.5 Ballast

The keel of your Tartan Yacht is of lead alloyed with antimony for added strength and cast to exacting tolerances. In addition to providing the yacht's stability, the foil shape of the keel produces hydrodynamic lift while sailing to weather, enhancing upwind performance.

The keel is fastened to the hull by means of stainless steel bolts, which are cast into the lead. These bolts project through the bottom of the boat and are bedded with a flexible ***Thiokol*** compound which allows for the divergent expansion and contraction rates of lead and fiberglass to prevent water leaks. The bolts are secured by stainless steel nuts and washers, which are visible in the bilge.

4.0 RIGGING

4.1 General Description

In order to tune your mast effectively, it is important that you are familiar with the basic associated principles. Some definitions and explanations follow.
The term 'standing rigging' refers to fixed pieces of stainless steel rod or wire supporting the mast. Those which offer fore and aft support are called 'stays' (backstay, forestay, etc.). Those which provide transverse support are called 'shrouds'.

The shroud running from the masthead to a chainplate on the deck near the rail is called the main or upper shroud. If it were to travel this route directly, the angle of support would be so fine as to induce extremely large tensile forces in the shroud and equally large compressive forces in the mast. To increase this angle of support, a spreader is positioned according to load requirements. This spreader should be angled upwards to bisect the angle formed by the shroud as it bends over the spreader tip. A horizontal spreader, or worse still a spreader angled downwards, is dangerous. The spreader may be forced to slip further down the shroud resulting in the loss of the spreader and possible collapse of the mast.

The spreader becomes a compressive member, and when properly loaded tends to push the middle of the mast to leeward. To eliminate such a leeward bow, a lower shroud is installed running from the mast at the base of the spreader down to the deck near the upper shroud chainplate. The primary purpose of the lower shroud is to provide athwartship support. The addition of the spreader and the lower shroud means that the mast is supported at more places transversely than fore and aft. Therefore, the mast itself need not be as strong transversely as fore and aft. The mast then may have a lesser (more aerodynamically advantageous) transverse dimension than fore and aft dimension.

4.2 Spars

Based upon the relationships described above, the more spreaders and shrouds used transversely, and the more intermediate forestays and running backstays used longitudinally, the smaller the allowable mast section may be. This can be advantageous as weight aloft and windage may be reduced in addition to minimizing the undesirable aerodynamic effect of the mast on the mainsail. The smaller the mast section, the less disturbed is the air flow across the main. However, a practical and functional balance of rig complexity and aerodynamic efficiency has governed the design of the rig of the Tartan 3500. Running backstays are not fitted on this model. The spar section is sufficiently large with appropriate wall thickness to be supported by a double spreader system; drag and its detrimental effect on the main is reduced by virtue of the sophisticated, aerodynamically shaped cross section to the mast.

Tuning involves adjusting the tension in these shrouds and stays so that the mast will remain straight in most sailing conditions with an appropriate amount of rake for comfortable helm balance. Tuning is carried out in two phases - tuning at the dock and tuning while under sail.

4.3 Tuning at the Dock

All turnbuckles are equipped with toggles at their base, which eliminates bending load on the swage and turnbuckle threads. Toggles are fitted to both ends of the forestay. As the boat tacks and the headsail loading varies from side to side, the forestay terminals are subject to extreme fatigue loading.

Start tuning the spar by ensuring that the mast is in the center of the boat, perpendicular to the designed transverse water line. Your boat may not sit level at the dock due to distribution of gear, stores and tankage levels, so check the water line position both sides. Then slacken the lower shrouds completely by undoing their turnbuckles. Take the main halyard and lead the shackle end to a point on the rail or chainplate. Adjust the halyard so that the shackles just touch the reference point on the rail or chainplate with a given downward tension, and then cleat the halyard. Then take the halyard to the same reference point on the other side of the deck. With the same amount of downward tension, you will be able to just touch the shackle to the reference point if the mast is plumb transversely. If not, let off one upper shroud turnbuckle and take up on the other in order to bring the masthead closer to center line until the halyard shackle touches both reference points under the same downward tension.

The particular part of the rail or deck you choose as your reference point is not important as long as it is the same point on each side. Once the mast is centered transversely, tighten both upper shroud turnbuckles uniformly, one full

turn one side, then one full turn on the other. Repeat until the turnbuckles become difficult to turn. Pin the turnbuckles.
Tighten the lower shroud turnbuckles so that almost all of the slack is removed; the center point of each lower shroud should have about 1 inch of play in either direction. Sight up the aft side of the mast to make sure that it is straight. The lower shrouds may require adjustment to straighten the mast.

Now check the rake. Rake is the fore and aft angle of the spar. The Tartan 3500 spar is designed to carry up to (approx.) **9** inches of rake. Rake effects the position of the center of effort of your sail plan and, consequently, the balance of the helm. The effects are more pronounced in heavier winds. The extent of rake on our boat should be determined by your particular sailing characteristics, the typical local wind conditions and your sailmaker's suggestions.

Forward rake should be avoided. The main halyard may be used to measure rake. In calm wind and sea, with the boat floating level on her lines, hang a plumb weight or equivalent, such as a hammer or wrench, from the main halyard. Adjust the halyard so that the weight is suspended just above the gooseneck. The fore and aft distance between the mast and the halyard at the gooseneck level is the amount of rake. Ease off the forestay turnbuckles and tighten the backstay turnbuckle (or vice versa) until the desired rake is achieved. Pin both fore and backstay turnbuckles.

Unless the rake has to be re-adjusted in the future to correct helm balance, these turnbuckles will need no more adjusting. Additional tension may be applied by the backstay adjuster.

Check that the outboard ends of the spreaders are padded and taped to avoid chafing the genoa.

Ensure that all turnbuckles are pinned. The mast should be fixed at the step to prevent fore and aft movement and to hold the mast in the step.

You are now ready to complete the tuning procedure while sailing.

4.4 Tuning While Sailing

Select a day with a steady 8 to 12 knot breeze and reasonably flat sea. Put the boat on starboard tack, close hauled. Sight up the luff groove of the mast. If the mast seems to fall off to leeward at the spreaders, luff up slightly and tighten the starboard lower shroud as necessary. Put the boat back on the wind and check the spar again, adjusting as necessary. When the mast appears straight, bring the boat about and do the same on the port side.

Check the following carefully:

When the upper shrouds are at optimum tension and when at about 15 to 20 degrees of heel, the leeward rigging should look slack. This is quite appropriate and should never be tightened. When close hauled under genoa and main, the forestay may appear quite sagged. Tensioning the backstay will reduce the amount of sag, but the sag itself can never be eliminated. As a rule of thumb, the maximum static backstay pressure should never exceed one quarter of the backstay breaking strength.

If your boat is brand new, the rigging may seat and stretch to the extent that tuning from scratch again will become necessary in a matter of weeks. However, after this initial working-in period, you will find that the rig tends to hold its tune for considerably long periods of time. After becoming used to the feel of the boat, you may wish to either increase or decrease the amount of weather helm. Any sailboat, when sailing up wind, should have a slight tendency to "round up" or head into the wind if the helm is let go. If you find it typically difficult to hold the boat off the wind, the boat is carrying too much weather helm. This can be alleviated by reducing rake, which will move the center of effort of the sailplan further forward. Conversely, if you find the boat tends to fall off when sailing upwind and you must constantly push her to weather, then the boat carries lee helm and the rig will require more rake.

With constant tuning as the season progresses, your boats performance will improve. The boat will feel more comfortable to sail.

You will find that tuning is a bit of an art and you will begin to notice subtle changes in the behavior and response of your boat as you make subtle changes in tuning. The important thing to remember is to go about the process in a slow and orderly fashion. To record the details of the tuning and re-tuning procedures as well as the results achieved will provide you a better understanding of the rig and will serve as a useful reference for rigging the boat on subsequent occasions.

5.0 FUEL SYSTEM

5.1 Fuel Tank

The aluminum fuel tank has been pre-tested and is static grounded.

5.2 Fuelling

Before opening the fuel inlet deck cap, be sure all open flames aboard the yacht are extinguished, no person is smoking and that the electrical main switch as well as all electrical circuits are turned to "off". Once the tank has been filled, close the inlet cap tightly and wash down any spills with fresh water.

5.3 Fuel Grade

For specific fuel grades refer to the engine Owner's Manual.

6.0 POWER PLANT AND TRANSMISSION OF POWER

6.1 Engine

All necessary specifications and information concerning the engine installed aboard your yacht may be found in the engine Owner's Manual. Read this manual carefully so that it is thoroughly understood. The life and performance of the engine will depend upon the care it is given.

6.2 Transmission

The reduction gears and reverse gears are contained in the transmission casing attached to the after end of the engine. These gears normally require little maintenance, however, the oil should be checked from time to time (see the Engine Owners Manual).

To avoid damage to the gears and to increase clutch life, the engine should ALWAYS be at idle when shifting gears.

6.25 Saildrive (Optional)

All necessary specifications and information concerning the Saildrive installed aboard your yacht may be found in the engine Owner's Manual. Read this manual carefully so that it is thoroughly understood. The life and performance of the engine will depend upon the care it is given

6.3 Propeller Shaft (Standard)

The shaft is supported at the inboard end by the shaft coupling and at the outboard end by the strut which contains a water lubricated bearing. The shaft passes through the hull at the stuffing box.

6.4 Shaft Alignment

The propeller shaft and the engine are carefully aligned prior to delivery. However, each time the yacht is launched, the alignment should be checked, particularly if there is excess vibration when the engine is running or if loss of engine speed becomes evident.

Alignment is checked in the following manner:

1. **Remove the flange bolts on the shaft coupling adjacent to the transmission box.**
2. **Support the weight of the shaft and coupling, then slide the coupling faces together by hand.**
3. **While holding the coupling faces together, insert a feeler gauge of 0.003 thickness at 4 points around the coupling. (3,6,9,& 12 o'clock)**

If the feeler gauge does not pull out evenly around the entire coupling, misalignment is indicated. If the coupling faces are misaligned at the same point of coupling circumference, the engine mounts can be adjusted until the coupling faces match evenly. If the misalignment changes 180 degrees as the shaft is rotated 180 degrees, a bent shaft is probable, and the shaft must be removed and serviced as required.

Replace flange bolts after successfully completing the alignment check.

6.5 Stuffing Box

The stuffing box is located at the inboard end of the fiberglass tube, which passes through the hull. The fiberglass tube and the stuffing box are connected by means of a short length of flexible rubber tubing held in place by hose clamps. These clamps and the stuffing box should be inspected on a regular basis. If leaking is found, the hose clamps should be checked. If the leak is but a slight drip from the packing nut of the stuffing box, we recommend no further adjustment. If the leak is excessive, the stuffing box may be tightened by loosening the lock nut and tightening the gland nut slightly (perhaps one-quarter turn), then re-tightening the lock nut. Do not over tighten the stuffing box. This may cause excessive heating and possible seizure of the unit.

If the stuffing box continues leaking after tightening the gland nut and after the engine has been running for a number of hours, new stuffing box packing may be required. To replace the packing (available from your marine dealer), unscrew the gland nut and wind 3 or 4 turns of new packing around the shaft in the direction of nut installation. The gland nut is then moved towards the stuffing box against the packing, tightened just until the leak stops. The lock nut should then be tightened. If leaking still persists, have your Tartan Dealer investigate for a possible bent or scored shaft.

NOTE: The rubber tubing at the stuffing box must be inspected yearly. Replacement every two years is advised.

6.6 Propellers

The standard propeller supplied with the yacht is a fixed three-bladed bronze unit. (Folding standard on Saildrive)

When sailing, it is advised to lock the propeller shaft by putting the engine "in reverse" after it has been shut off. This will prevent the propeller from rotating or "free wheeling". In order to reduce drag, it is ideal to lock the propeller in the vertical position, aligned with the keel or strut rather than protruding horizontally into less disturbed water. This requires that the shaft be rotated to a predetermined position prior to locking. One must observe the propeller in its vertical position, then mark that position with a reference line on the shaft or coupling adjacent to the engine. Rotating the shaft into this referenced position before locking will ensure that drag from the propeller is minimized.

If a folding propeller is fitted, it should be locked in a position, which prevents either blade from falling open. In this case the reference point should be determined with the blades in the horizontal position. When the shaft is locked, neither blade can hang downward and both blades will be uniformly closed by pressure of the flow of water from both sides. (The folding propeller on the Saildrive will always self align)

A feathering propeller when installed will automatically feather with any forward motion. This eliminates the requirement of locking the shaft in a predetermined position.

6.7 Removal of Propeller

For both fixed and folding propellers, a propeller puller is usually required. This is available from a yard or major marine hardware dealer.

To remove a folding propeller, proceed as follows:

Remove all cotter pins from the pivot bar for blades and shaft. Salvage these cotter pins if possible.

Pull pivot bar from the blades. It will be noticed on some propellers that one end of the pivot bar is tapped for a bolt. Thread the bolt into this end of the pivot bar and pull the bar by means of the bolt, on other types, the pivot bar may be tapped out with a drift punch and hammer.

For both fixed and folding propellers:

Remove the shaft nut, which is counter sunk inside the propeller hub on folding props and exposed on fixed props. To remove the shaft nut, a ½" square drive handle with extension is required for folding props; a socket for fixed props.

To remove the propeller, leave the propeller retaining nut in place, but installed about one or two turns loose from the fully tight position (to protect the threads). The puller shaft should never bear directly on the end of the propeller shaft. As it bears on the propeller retaining nut, a spacer of brass, aluminum or copper should be used to protect the nut. The puller must be installed straight and centered carefully so that its maximum effectiveness can be realized. Place the claws of the prop puller behind the propeller hub and withdraw the propeller.

6.8 Installation of the Propeller

Ensure that the bore of the propeller is free from dirt and corrosion and that the end of the shaft is clean. The keyways of the propeller and shaft must be free from burrs. Place the propeller on the shaft with the keyways in the shaft and propeller in line. The key should fit snugly at the sides with a 0.0111 minimum clearance at the top. Do not force the key in as this may cause the propeller to be forced off center. The propeller, locking nut and the cotter pin are then assembled on the shaft. Check to ensure that the propeller is correctly aligned.

6.9 To Check Propeller Alignment

Clamp a piece of thin metal or wood on the propeller strut so that it just touches one blade of the propeller. Rotate the shaft and propeller by hand. Any variance in the track of the blades will be indicated by either a gap between the next blade or that blade striking the indicator. If the propeller is found to be out of line, it should be checked and balanced by a marine yard.

6.10 Exhaust System

The exhaust system utilizes a horizontal type muffler. In operation, the engine water pump draws water through the engine intake port, circulates it through the engine block then into the muffler. The water is mixed with the exhaust gases in

the muffler and discharged overboard through the exhaust port in the stern of the yacht.

In a yacht fitted with fresh water cooling, an auxiliary pump draws water through the intake port, circulates it through a heat exchanger then pumps it into the muffler and overboard through the exhaust port. Seawater in the heat exchanger lowers the temperature of the engine coolant circulated through the engine block by means of the normal engine water pump.

7.0 CONTROLS

7.1 General

Please refer to the engine Owner's Manual for starting procedure and engine panel functions.

7.2 Starting and Operating the Engine

1. Turn main battery switch to "on".
2. Check that engine water intake valve is open.
3. Check that the gear shift lever is in neutral.
4. Follow specific instructions as offered in engine Owner's Manual.

Note: When a folding propeller is fitted, excessive vibration may occur when the engine is placed in forward gear. This may be caused by one blade of the propeller not opening. Should this occur, slow the engine to idle, shift into reverse gear and accelerate the engine. This should open the blade. Idle the engine and shift to forward gear.

Note: When sailing, it is always advisable to start the engine before the sails are lowered. In this way, it is still possible to maneuver if the engine should not start.

7.3 Engine Shut Down

1. Close the throttle to slow idle. Place the gear shift in neutral. Stop the engine.

2. If the engine is not to be used again for a long period, the water intake valve may be closed.

3. Turn the main battery switch to "off", if no other electrical service is required.

8.0 ACCESSORIES

8.1 Installation of Thru Hull Fittings

Note: To ensure correct positioning of the thru hull fitting, consult with your local TARTAN Dealer.

Installations in Non-Cored Areas:

A. Drill hole size to accommodate the thru hull fitting.

B. A small backup plate is required for strength purposes. Marine plywood is suitable. A hole the same size as that in the hull should be drilled in the wood. The holes may then be aligned, and the wooden backup plate may be bedded with marine sealer and allowed to dry.

C. Install the thru hull fitting, and securely tighten the nut.

Installations in Cored Areas

A. Drill hole size to accommodate the thru hull fitting.

B. Using a knife, remove the Balsa core from the area surrounding the hole at least two inches beyond the edge of the hole.

C. Fill this area with resin saturated fiberglass mat and let cure. The hole may have to be trimmed or reshaped to accommodate the thru hull.

D. Mount the thru hull fitting with marine sealer on the flange portion of the fitting. A layer of marine sealer should also be applied between the interior portion of the fitting and the hull. Allow to dry.

Note: After applying the marine sealer between the exterior of the fitting and the hull, tighten the nut. The thru hull fitting should not be allowed to turn as this may break the seal. A wrench to tighten the nut and a wrench to hold the thru hull will be required.

9.0 ELECTRICAL

9.1 General

The electrical system in your Tartan Yacht has been designed to ensure as much trouble free operation as possible. Wiring and connections are kept as high in the interior of the yacht as practicable, reducing the possibility of exposure to water. The main switch panels are located to protect them as much as possible from the elements.