

THE SIMMONDS SKI BOAT.

INSTRUCTION BOOKLET.

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SIMMONDS SKI BOAT

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GENERAL DESCRIPTION OF THE SIMMONDS SKI BOAT

The Simmonds Ski Boat is a stepless planing boat insofar as it receives its principal support whilst at speed from the dynamic reaction of the water. It skims over the surface of the water and is thereby distinguished from the displacement types of boats which merely float or plough through the water. Whilst going over the water at speed this dynamic force holds the boat steady and gives a nicely controlled bank in a turn.

The hull is made of corrosion-resisting aluminium alloy. This is strong but light in weight and stays watertight under the most stringent conditions. Most of the components and fittings are of aluminium alloy for the same reason. The hull is divided into 3 compartments, i.e. front buoyancy, front cockpit, engine and rear cockpit.

The drive is taken through a stainless steel propeller shaft with a flexible water seal, the engine being mounted on very resilient rubber mountings. A clutch is provided giving neutral and ahead but no astern. A trial spin in the boat will show you why. The special rudder gives exceptional manoeuvrability under all conditions, obviating the use of complicated reversing mechanism, and surface-heat exchangers. The fresh water closed circuit cooling system with thermostatic control is standard with a separate salt water pump for oil and exhaust cooling. This fresh water closed circuit is of special interest as it ensures a long trouble-free engine life by eliminating the deterioration inevitable if salt water is used for cooling the engine.

The engine is our own conversion of the World Famous Ford 1703 c.c. 4 cylinder overhead valve engine. The Simmonds conversion consists of twin Zenith carburettors, four branch exhaust manifold, deep aluminium oil sump with built in oil cooler and a Jabsco salt water pump which cool the oil and exhaust manifold before discharging overboard through the exhaust pipe.

The tank of over 12 gallons capacity is situated under the aft deck. The filler cap on the deck is fitted with a dip-stick and a reserve tap is provided. With the tap in the high position petrol will be cut off leaving approximately 3 gallons in the tank. To use this reserve petrol move the tap to the lower position.

The instruments comprise:- Tachometer, ammeter, oil pressure gauge and engine temperature gauge. On the dashboard the following controls are located: - Ignition switch, navigation light switch, starter button and Choke control. A secret ignition switch is provided for use in the event of losing the key.

The clutch lever is located on the starboard side of the front cockpit alongside the driving seat.

The hand throttle is located on the starboard side coaming in the front cockpit.

SPECIFICATIONEngine.

Type	4 cylinder, in line, Overhead valve type.
Bore	3.25 in (82.55 mm)
Stroke	3.13 in (79.50 mm)
Cubic Capacity	103.9 cu. in. (1703 cc)
Compression Ratio	7.8 to 1.
Valve Clearance	0.014 in (1356 mm) hot.
Firing Order	1, 2, 4, 3.
Max. Brake Horse Power	Appro. 70 b.h.p. @ 4400 r.p.m.

Lubrication.

Lubrication system	Pressure feed by submerged gear type pump. Full flow oil filter fitted direct to cylinder block.
Sump Capacity	9 imp. pints (10.7 U.S. pints 5.515 litres) 1 imp. pint additional for dry oil filter.
Lubricant	SAE 20 or 20W Viscosity Number Summer or Winter. Castrolite Oil (suitable)

Ignition System.

Type	Coil and distributor. Automatic control by distributor governor weight mechanism combined with vacuum control from the induction manifold.
Initial Advance	8° (crankshaft)
Sparking Plugs	14 mm Champion N.8.B. or N.8.
Sparking Plugs Gap	0.032. in (0.813 mm)
Contact Breaker Gap	0.014 - 0.016 in (0.356 - 0.406)

Fuel System.

Fuel	Premium Petrol. If lower grade only obtainable, adjust the ignition setting for the best r.p.m.
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Hull Dimensions.

Length	15 ft. 4 ins.
Beam	5 ft. 3 ins.
Draught	17 ins.
Weight (with standard Equipment)	850 lbs. approximately.

Hull Material

The hulls are fabricated from Sea-water resisting Aluminium Alloys to the following British Standard Specifications:-

Sheets	B.S. 1470/N/5
Extrusions	B.S. 1476/NE.6
Tubes	B.S. 1471/NT.5
Rivets	B.S. 1475/NG.5

Thicknesses.

Bottoms of hull	12 s.w.g. (.102 in.) (2.56 mm)
Sides and Top Deck	11 s.w.g. (.080 in.) (2.03 mm)
Engine Bearers	10 s.w.g. (.128 in.) (3.25 mm)

Propeller.

Material	Aluminium Nickel Bronze to British Standard Specification A.B.2. Tensile Strength 43/45 tons.
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OPERATING INSTRUCTIONS.Preliminary Inspection

Before starting the engine at the beginning of each day's use go through the daily routine servicing suggested in Section 4 of this Booklet.

Notes.

NEVER START THE ENGINE WITH THE BOAT OUT OF WATER AND THE CLUTCH ENGAGED AS THIS WILL RUIN THE RUBBER BEARING WHICH MUST AT ALL TIMES BE WATER LUBRICATED. To run the engine out of the water it is necessary to disengage the clutch. Always ensure that the clutch is disengaged before starting the engine, and do not run for more than a few seconds as without water injecting into the exhaust the rubber joints will be burned. The clutch is disengaged when in the rear position.

Starting the Engine.

Pull out choke control in the centre of dashboard, switch the ignition 'on' by turning key, and press starter button. Allow the engine to warm up before pushing choke control in again.

As soon as the engine is running at an even speed, check by the oil gauge and the &meter that the engine is working correctly and that the generator is charging the battery. Place a hand on the exhaust manifold jacket which should remain quite cool if water is circulating. A noisy exhaust also indicates failure of the exhaust water supply. Never continue running without water injecting into the exhaust. In the event of failure check that the inlet is not choked and that the Jabsco pump is functioning.

If the engine fails to start, first ensure that condensation on the ignition wiring is not the cause. For other faults causing failure to start see Section 5.

Manoeuvring.

At tick-over speed the boat is easily controlled by the steering and can be spun round in little over its own length. The rudder is effective with the engine stopped as long as the boat has steerage way i.e. moving through the water. It is, however, more effective with the propeller turning as the slip stream off the rudder assists in turning. When coming alongside, the most satisfactory way is to head the boat at tick-over speed directly for the place at which it is required to tie up. When you are at approximately 15 feet from the mooring, swing the wheel over and immediately disengage the clutch. The boat will then drift gently alongside and the engine can then be shut off. If there is a tide or current flowing the wheel should be turned so that the boat is headed up stream, (i.e. against the tide.)

With a little practice it is possible to manoeuvre the craft into the most restricted places with ease.

Handling.

When the craft is clear of its mooring or anchorage the throttle can be opened fully. The wash from the boat at full speed is very small and constitutes a nuisance to only the smallest and frailest craft in the vicinity. The amount of wash increases with decreasing speed until it is at its worst at about 10 m.p.h., it then decreases to nothing at tick-over.

It will be found that the steering is exceptionally light and sensitive and it should not be treated roughly.

The boat has been designed to operate for long periods at full throttle and a need for cooling the oil and exhaust has been found necessary to meet this condition. A salt water pump is provided on the starboard side of the engine for the purpose of cooling the oil and exhaust system. This pump will have a very long life if regular attention is given to the greasing cup provided on the spindle. The belt for this pump should not be very tight as over tightening will result in excessive wear of the plain grease-lubricated bearing and adjustment is effected by movement of the pump bracket.

High speed turns are best made by slightly throttling back just before the turn and opening up again through the turn. High speed manoeuvres should not be made when either passengers or driver are sitting on the deck.

In rough water judgement must be used to find the best speed to run the craft from the point of view of comfort and safety. There need be little fear of damage to the hull from rough water as it is designed to withstand greater buffeting than the human frame finds tolerable. However, reckless high speed driving in steep seas could conceivably result in the boat capsizing. The best advice under these circumstances is to run the boat at its minimum planing speed and never cut the throttle. It is possible to jump the boat clear of the water if the speed is too high. This is not advisable as the engine is liable to over rev.

Prevention of Condensation.

When the boat is not in use it is a good practice to open the engine hatch each morning for a short period to allow any condensation to dry out.

Running

The engine has had five hours running, as well as having been tested in the boat after installation for correct functioning and also power output, oil pressure and water temperature, etc.

A further running-in period is essential after delivery to the customer, and it is recommended that the engine should be run for at least 20 hours, the first 10 hours at not more than 2,500 revs and the next 10 hours at not more than 3,000.

It will be appreciated that careful running-in of the engine is necessary in order to obtain the best results from the boat afterwards.

After the engine has settled down some slight adjustment to the slow running and ignition may be necessary.

Clutch Adjustment.

If the boat creeps forward with the clutch lever in the neutral position adjust at the point provided on the starboard side near the clutch housing. (Adjust in the engaged position and check in the free position)

Approximately 1/8" of free play should be apparent on the end of the clutch actuating lever on the clutch housing when the clutch lever in the cockpit is in the fully forward position.

ROUTINE SERVICING.Daily.

Check the oil level with the dip-stick located on the port side of the engine. Add oil (SAE 20 or 20W - Castrolite is SAE 20) if necessary, to top up to the required level. The engine is filled with Castrolite when leaving the factory.

Check the cooling water level in the header tank and top up if necessary with FRESH water to within ½" of the top. Do not fill completely as allowance must be made for expansion of the water when hot. Normally very little topping-up should be required and if more than ½ pint is needed a check should be made that there are no leaks anywhere in the system.

Check that the amount of fuel in the tank is sufficient for immediate needs. When refueling from cans always use a funnel with a filter. The fuel system is completely rust proof so that any dirt found in the filter or the fuel pump or in the carburettors must have been put there by you. The use of dirty or rusty cans for refueling will certainly ensure trouble.

Make sure that the engine compartment is clean and free from spilt oil, water or petrol. Do not try to use the boat if the engine is not functioning properly. If it is running roughly, cutting or lacking in power, the cause will almost certainly be some easily rectified fault which any competent garage mechanic will be able to correct.

Weekly.

Check that the Fan and Jabsco Pump Belts are correctly tensioned.

Lubrication.

Attention should be given to the grease nipples at the following points :-

Plain bearing -	(Lower steering column bearing.
<u>Grease. Medium</u>	(Steering column stop and top bearing. (Top rudder post bearing (below steering quadrant (under aft deck) (Propeller shaft water seal housing and salt water (pump greaser.
Ball bearing -	Main propeller shaft thrust bearing (on rear
<u>Grease H.M.P.</u>	Mounting trunnion)

W A R N I N G

On no account should excessive pressure be applied to the propeller shaft water seal. This seal is a synthetic lip type seal

facing the rear of the boat, and excessive pressure will force this lip forward and allow grease to escape, and also water to leak into the boat. The first stroke of the gun when the grease annulus is not full will probably enter fairly readily and it should be quite easy to feel when the pressure increases at this point no further pressure should be applied.

Grease and oil all clutch operating parts and cable and exposed ends of control wire.

Oil generator wick with engine oil.

Regularly oil engine hatch hinges and stay-bracket bearing.

Monthly.

Change the engine oil (this is not necessary if the boat has done less than 200 hours running since the last oil change)

Apply a thin film of petroleum jelly to the faces of the contact breaker can in the distributor and also add one or two drops of engine oil through the hole in the contact breaker base plate to lubricate the governor weight assembly. The contact breaker points should not need adjustment during the season but they should be inspected to see that they are not worn, pitted or burned and that the correct gap is maintained at .014 to .016 ins.

The sparking plugs should need little or no attention other than keeping their exterior free from dirt to prevent the possibility of H.T. tracking. However, if difficulty is experienced in starting or the engine misfires check that the plug gaps are .032 in.

Check the slow running. This should be as slow as possible to assist low speed manoeuvring of the boat.

Cleaning the Boat.

For normal day-to-day cleaning, washing down with a damp chamois leather is all that is required. When this is not sufficient a mild abrasive scouring powder may be used.

Metal polish can be used to regain the brilliance of the polished Aluminium. A light application of wax polish will then preserve it.

If the boat remains in the water continuously through the season, marine growth may appear along the water line, and on the bottom. This should be scrubbed off periodically.

The bottom of the boat is left unpainted as it has been found that the bare metal is very resistant to marine growth, and ensures that the bottom remains smooth. A foul bottom will seriously reduce performance.

Never attempt to paint the bottom of the boat as this will reduce the efficiency of the engine cooling.

General.

A salt water pump is provided on the starboard side of the engine for the purpose of cooling the oil and exhaust system. This pump will have a very long life if regular attention is given to the greasing cup provided on the spindle. The belt for this pump should not be very tight as over tightening will result in excessive wear of the plain grease-lubricated bearing and adjustment is effected by movement of the pump bracket.

Bilge Water.

Do not allow water to accumulate in the bilge below the engine as an excess will result in water being flung on to the starter bendix by the fly-wheel, with consequent rusting and failure to operate. Remove starter and thoroughly clean bendix if necessary.

Steering Cable.

An adjuster is provided under the steering quadrant. Adjust to very slight tension.

Generator and Tachometer.

By adjustment of the generator, keep the belt fairly tight.

Engine.

Maintain oil level between marks on the dip-stick with the correct oil. (Castrolite, or oil to SAE 20 or 20W viscosity number.)

To change oil, pump out from the tap provided.

Change the engine oil and renew the filter element after the first ten hours running and then after each 200 hours running. Lubricate Distributor after 40 hours.

ENGINE FAULT FINDING.

We feel that a complicated list of possible faults which can cause the engine not to start or misfire or otherwise run imperfectly will only confuse those people who are not conversant with the running of an internal combustion engine, and will be superfluous to those who are. This will be confined therefore to a list of faults which from experience are the most likely. If in doubt consult an expert motor mechanic.

1. Starter will not turn engine - flat battery, faulty solenoid or starter drive sticking, in the latter case, the starter motor rotates without engaging the starter ring. The starter motor will have to be removed from the engine to clean and free the drive.

2. Engine will not start - Ignition. Check for condensation in the distributor cap. Check for spark successively at the plugs, the distributor, then the coil. Make sure that the ignition switch is working.

Fuel system - most common cause is blockage in fuel line due to dirt being allowed to enter the tank. Undo the petrol pipe connection at the carburettor, and check if fuel is being delivered by hand turning the engine or turning with the starter. Check the large filter in the fuel line.

3. Engine cuts or misfires - high tension lead shorting. Defective fuel pump. Cutting on 2 cylinders may indicate that a push rod has jumped out of the rocker. Remove cover and investigate.

4. Engine does not appear to give full power - can be caused by propeller being fouled by weeds or rope, another possible cause is a blown cylinder head gasket.

5. Engine vibrates - bent propeller shaft or bent propeller.

The general procedure regarding Fault Finding and Minor Repair procedure relating to the Ford Engine installed in the Simmonds Ski Boat is set out in an official Instruction Booklet published by the Ford Motor Company Limited, and a copy of this Instruction Booklet is available to all owners of Simmonds Ski Boat, and is complementary to the information given in this booklet issued by Messrs. Simmonds Speedboats.

REPAINTING

The boats are finished with a high grade synthetic yacht enamel paint manufactured by British Paints Limited and these paints come under the heading of their 'Little Ship' marine paints. When repainting it is advisable to use the same manufacturer's paint although if this is not obtainable other high grade synthetic yacht enamel will do.

It is most important NOT to use lead, copper or mercury based paints which will seriously attack the aluminium alloy resulting in rapid deterioration of the hull, nor is it advisable to use cellulose paint which will tend to strip the old paint off.

Usually repainting will entail rubbing down, filling where the paint has been chipped, and repainting. Only when the paint work has been allowed to deteriorate very badly is it necessary to strip off the paint completely.

The hull should be washed down thoroughly before repainting. If there is any grease or oil on the surface this should be removed with a cloth soaked in petrol.

The areas to be repainted should be rubbed down with a medium grade waterproof abrasive paper mounted on a block of rubber or felt. The surface should be wetted with a sponge, and the abrasive paper soaked in a bucket of water before applying to the surface. The paper can be kept free from paint accumulations by dipping it in the bucket, and the surface should be wiped with a damp sponge as necessary, to allow it to work freely with a fairly light pressure. After this preliminary preparation the surface should be washed with water and dried with a leather. Places where the paint has been chipped should then be filled by brushing on anti-corrosive primer (Zinc Chromate or Zinc Oxide) When dry, these places should be rubbed down as described above.

An undercoat should then be sprayed or brushed on (Two coats if necessary). When this is dry it is usually better to sand lightly with a fine grade abrasive paper and water before applying the finishing coat of enamel.

If it is necessary to strip the paint completely, the old paint should be removed with a paint remover or scraper. (it should NOT be burnt off) and the metal surface should be roughened with a wire brush to give a good key for the enamel paint. A Zinc Chromate primer should then be brushed on prior to undercoat and enamel. The above process will give a reasonable finish but if a spray plant is available and repainting is required to the same standard as the works finish the following process will have to be undertaken.

1. Degrease the surface thoroughly.
2. Spray self-etching primer.
3. Spray corrosion inhibiting- light alloy primer.
4. Spray heavy bodied filler coat.
5. Fill any irregularities with lead-free trowel cement.
6. Rub down thoroughly.
7. Spray undercoat.
8. Rub down lightly.
9. Spray enamel.

LAYING UP.

A few simple steps taken at the end of the season will ensure that the boat will not deteriorate whilst in storage through the Winter. While still in the water the upper cylinder parts should be oiled up. Run the engine at about 1500 r.p.m. and pour engine oil down the carburettor intakes and turn until the engine almost stalls and is eventually emitting clouds of blue smoke then switch off.

When the boat is hauled out of the water it should be thoroughly washed down with fresh water, cleaning off all adhering dirt, sand and sea water deposits which are liable to cause the onset of corrosion.

When laying up for the Winter, drain the cylinder block from the tap provided in the region of the starter motor. Disconnect the coolant pipes from the connections on the heat exchanger nearest the petrol tank and remove water from the heat exchangers by blowing in the header tank (close the cylinder drain cock for this operation and open afterwards)

Remove the seat cushions which should be stored in a dry place.

Remove the battery and keep in condition by regular charging.

Remove the propeller, clean it and store it inside the boat.

Protect the engine from rusting by spraying it with a corrosion inhibiting wax or lightly coating it with grease.

Rest the boat firmly on well padded chocks. Do not allow the hull to rest on damp concrete.

If the boat is stored under cover in a dry place no special precautions are necessary with the engine.

Pump all water from the bilges to avoid rusting of the fly-wheel or starter ring. Remove sparking plugs and inject a small quantity of lubrication oil into each cylinder, turning slowly with the starting handle in order to distribute the oil over the cylinder. Replace the plugs afterwards. Repeat this turning operation every two or three weeks during the Winter.

Where dampness is to be encountered it is most important that an air space should be maintained between the cover and the painted hull. If a damp cover is allowed to lie on the boat, blistering and peeling of the paintwork will result. Allowance should be made for ventilation to reduce the effects of excessive condensation.

REPAIR AND OVERHAUL.

The most common job to be-tackled under the above heading is the repair and replacement of the underwater transmission and steering, (i.e. propeller, propeller shaft, shaft bracket and rudder) This is due to the vulnerability of these items to damage from submerged rocks and floating logs, etc.

To Remove Propeller.

Loosen and take off Nut, and then the Cup Washer, and then the pin holding the Propeller, and then slide the Propeller off the shaft.

To Replace Propeller.

Adopt the opposite procedure to that described above.

Removal and Re-Assembly of Propeller Shaft.

Remove the locking wire and set screw in the Coupling, and slide the shaft out of the coupling until the Woodruffe Key can be removed. After removal of the key the shaft can be withdrawn from the boat.

If the shaft requires straightening, it should be straightened by resting in 'V' blocks and checking with a dial indicator. It might be necessary to have this done at an engineering firm locally, if required. It should be straight within .005".

When re-assembling you should check the alignment of the engine by removing the water seal carrier rubber tube, ensure that the shaft slides truly into the coupling and when in place the clearance in the shaft log around the shaft should be even all round. If the clearance is not even the engine shims should be adjusted until it is. At the same time the engine alignment with the shaft must be checked on the coupling with feeler gauges. After checking the alignment, withdraw the shaft sufficiently to re-assemble the water seal assembly. When sliding the shaft through the water seal take great care that the lip of the water seal is eased over the shaft as if this lip is forced into the forward direction it will not hold water or grease.

Engine Overhaul.

For procedure regarding Engine Overhaul and Repair Jobs, refer to the Instruction Booklet issued by the Ford Motor Company Limited, previously mentioned in this Booklet under the heading "Engine Fault Finding" (Section 5) which is issued to all owners of Simmonds Ski Boats, and which should be read in conjunction with this Booklet.

WATERSKI TOWING.

The boat has been designed to facilitate ski-ing as much as possible and the following advice is offered in the hope that this exhilarating sport can be made more enjoyable by efficient use of the boat.

Water Skis.

The size and shape of the skis are to a large extent a matter of personal choice but the following facts should be remembered.

1. The skier's weight is the important factor in the choice of size of skis but also the faster the boat's speed the smaller the size of skis necessary. In fact if the boat is travelling at about 40 m.p.h., it is possible to ski on bare feet.

2. Shorter skis are much harder to start up on but they are more manoeuvrable and easier to control on the water than large ones. Good average dimensions for ski for general use for skiers from 7 stone (98 lbs.) to 12 stone (168 lbs.) in weight are about 5 ft. 6 ins. long and 6¼" wide.

3. Heavier and longer skis are more comfortable in rough water and are better for jumping.

Tow Line.

The most satisfactory tow lines are made in twisted manilla rope about ¼" in diameter. This is strong for its weight and relatively inelastic. Nylon rope is too elastic and cotton lines are heavy when soaked and tends to drag in the water.

A convenient length of line is about 60 ft. although in confined waters it can be as short as 40 ft. As various types of handles are necessary for different manoeuvres it is a good idea to have these made up with a short length of rope to attach to the towing line as required. It is not advisable to use shackles for this as they can cut the hand when the skier picks the rope out of the water.

Handles.

Two types are commonly used, first the single bar about 12 inches long made up of about 1" round hard wood. Ropes attached near the ends of this handle should be spliced to the main rope about 18 inches from the handle. Second the double type consisting of two smaller wooden handles attached to the main rope about 5 feet from them.

The first type is recommended for beginners and is usually used for jumping. The idea of the second type is to permit pulling in and

letting out of the line without letting go. This is done by spreading the arms apart when the rope goes slack in a turn and eliminates the hand jerk which can occur after an accumulation of slack is suddenly taken up.

Starting to Ski.

First attach the rope securely to the towing point immediately behind engine hatch and coil it in a loose coil on the centre deck or aft cockpit. The boat should have been warmed up beforehand by a short run at full throttle so that it does not stall on the first take-off.

Pulling a skier out of the water.

Always have the clutch disengaged when in the vicinity of a person in the water and never engage it until he or she is reasonably clear. After handing the tow line to the skier and the skier clearing the boat engage the clutch with the engine ticking over and slowly take up the slack in the line. Disengage the clutch and wait for the skier to indicate that he is in the correct position and ready to be towed out. Engage the clutch and progressively open the throttle as required watching the skier to see that he has maintained his balance.

Pulling a skier off some platform in a sitting position.

With the skier in position and ready to go engage the clutch and creep forward slowly at first watching the tow line is uncoiling satisfactorily. When it is nearly paid out open the throttle fairly quickly to about 3000 r.p.m. and after successfully launching the skier open the throttle further as required. The initial throttle opening to snatch the skier off will largely depend on the skill of the skier. Too much power will almost certainly snatch all but the most experienced onto their face and a fresh start will have to be made.

Safety.

A good deal of practice is required to drive for waterski-ing with skill and safety. The experienced driver knows when extra speed will help or when a turn will avoid a spill etc. When beginners are skiing it is necessary to watch them almost constantly so that a second person in the boat should be the rule. Neither passenger or driver should be allowed to sit on the deck whilst towing at speed. A sudden turn or big wave can quite easily throw them overboard.

Beginners should be urged to wear a life jacket not only in case of an awkward spill but because the extra lift given by it conserves the energy and gives confidence, to the beginner, and makes it easier to be pulled out of the water. Until a skier becomes proficient it is advisable never to let them ski for longer than 5 minutes and not let them become exhausted by struggling with the skis after a fall. Putting skis on in the water can be very exhausting.

When the skier wishes to get into the boat from the water it is essential that the engine is switched off so that there is no danger of fouling the rotating propeller.

The simplest way of getting aboard is over the transom stepping on the trimming shelf and holding the ski-line.

Some important rules for safe water ski-ing are attached.