SURF LIFE SAVING®
NEW ZEALAND

Inflatable Rescue Boat

Training Manual
2020

SURF LIFEGUARD
30
MERCURY
BP SURF RESCUE

Contents

Inflatable Rescue Boat (IRB)

A Equipment

Design and features of an IRB hull 7
Design and features of an IRB engine 10
Engine Reinstatement 15

B Fuel

IRB fuel type 19
Filling the fuel bladder 19

C Communication

Signals 23

D Maritime Regulations

Driver Responsibility 27

E IRB setup

IRB hull setup 31
IRB engine setup 37
Starting the engine 39

F Basic skills and technique

Moving the IRB on land 41
Crewperson skills 43
Driving skills 46
IRB capsize 53

G Rescues

General rescue information 55
Rescue types 58

H IRB closedown

Loading the IRB on to trailer 61
IRB hull closedown 61
IRB engine closedown 62

I Operations

Patrol 65
Safe stowage of equipment in an IRB 66
Towing the IRB on public roads 66
IRB Repair 67
Engine troubleshooting guide 68
IRB Equipment Suppliers 69

Start

One weekend in 1978, representatives of the New Zealand Surf Life Saving Association and a delegation of twelve Australian Surf Life Saving personnel trialled various inflatable boats at Piha beach. The inflatable boat was seen as a possible replacement option for a number of jet boats used in various parts of New Zealand.

The intention of the Piha trials was to test several boats in the demanding west coast surf in order to identify a suitable boat that could be utilised by clubs throughout New Zealand.

A visitor to the trial was John Speight from Arancia, and following a discussion with the National Powered Craft Officer Don Wright, a meeting was arranged to view the Arancia 3.8m Sport and Dive boat.

Inflatable Rescue Boat

Arancia then agreed to design an Inflatable Rescue Boat (IRB) specifically for Surf Life Saving use. The prototype Arancia IRB was delivered to Piha SLSC in November 1978 and within hours of it being launched the IRB was involved in rescuing a swimmer washed up onto the rocks. The IRB quickly became established as an effective and efficient front line rescue tool for surf lifesaving in New Zealand.

The Arancia design has evolved over the years. However, the current design is still very similar to the original. Other manufacturers have also supplied IRBs from time to time, although Arancia is the only current Surf Life Saving New Zealand (SLSNZ) approved IRB manufacturer.

The first outboard engine used on an IRB was a Johnson/ Evinrude 25hp (horsepower) two stroke fitted with a stainless steel propeller and an aluminium/stainless propeller guard. Subsequently, 30hp engines by Mariner and Yamaha were approved, and the current engine of choice is the Mercury 30hp surf engine.

SLSNZ is now the world leader in the field of Inflatable Rescue Boat Operations and the IRB is involved in more than 50% of all rescues in New Zealand each year.

A Equipment

This section details the design and features of an IRB.

Equipment

This section details the design and features of an IRB

Design and features of an IRB hull

Arancia IRBs are made with neoprene coated polyester fabric proofed with an outer surface of Hypalon® which is very tough and resistant to ultraviolet radiation, water, petrol and oil.

The design and construction of an IRB must be approved by SLSNZ.

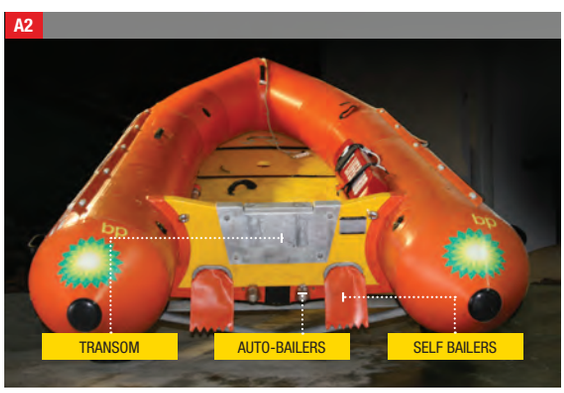
IRB hull features

An IRB hull consists of:

- Four inflatable compartments: A1
  - Three pontoons
  - A keelson
- A removable floor board
- IRB carry handles
- Auto bailers A2
- Self bailers
- Transom
- Fuel bladder clip attachments A3
- Fuel bladder
- Fuel line loops
- Bow rope
- Crewpersons boarding handgrip
- Crewpersons handgrip
- Drivers foot strap A4
- Drivers hand grip
- Side pontoon loop ropes
- Crewpersons foot strap
- Bow carry handle A5
- Removable valves
- Primer Bulb A6
- Fuel Bayonet

A1

A2

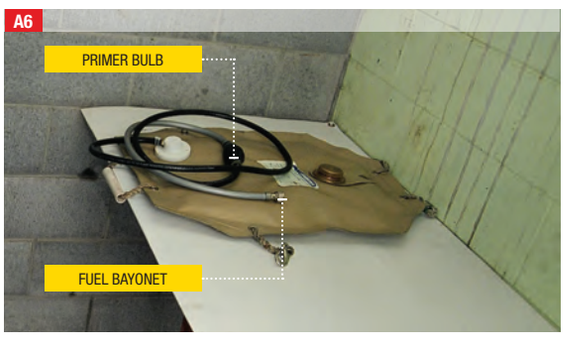


A3

A4

A5

A6



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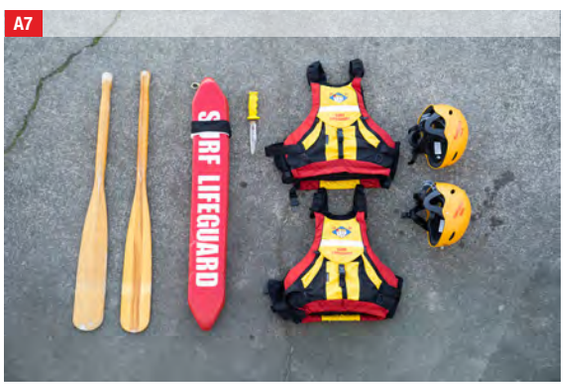


There are a number of items that must be included/worn when the IRB is in use: A7

- Rescue tube
- Blunt ended knife
- Two paddles
- Two personal floatation devices (PFDs)
- Two helmets

It is compulsory for the driver and crewperson to wear New Zealand Standards approved PFDs and helmets at all times when operating an IRB.

IRB valves

IMPORTANT:
Do not stand or put any weight on the valves when the IRB is not inflated as permanent damage will occur to the valve pin. Always ensure valves are in the closed position when the IRB is deflated.

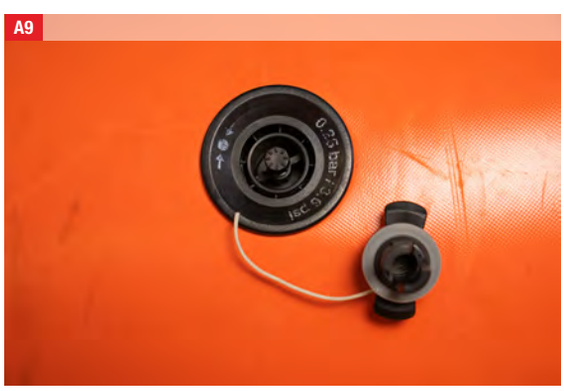
Old valves – identified by the external rubber housing

Valves should be regularly removed for inspection and lubricating. To remove the valve, use the valve removal tool supplied with the IRB, turning anticlockwise. Alternatively use long nose pliers ensuring the valve is in the deflation position. Clean the brass threaded area then smear with silicon grease and re-assemble, tightening to hand pressure only. A8

New valves – identified by the external plastic housing

The latest type of valves should not be removed from the boat to deflate it or for transporting. Push and rotate the internal centre mechanism in to deflate pontoons. If the cores have to be removed because they are damaged or leaking, be extremely careful in screwing them back into the valve bodies as cross-threading can occur. This is due to the valve body having a plastic screw thread. A9

A9



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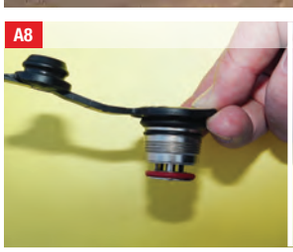
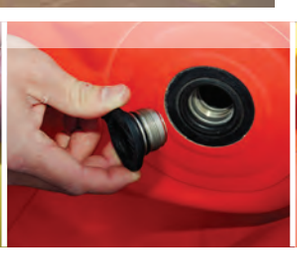
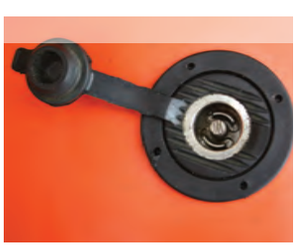






IRB transom auto bailers

The auto bailers are vulnerable to damage from contact with flush tanks. This usually occurs when the IRB is lifted at the front to lower the engine deeper into the flush tank. The flush tank should be altered to accommodate the auto bailers. Damage may also occur through poor positioning on an IRB trailer.

The IRB will take on water when it is stationary unless the auto bailers are in good working order.

Basic spare hull parts A10

Spare parts are available from Arancia Industries:

info@arancia.co.nz

- Auto bailer
- Pressure gauge
- Inflation valve
- Knife
- Valve removal tool

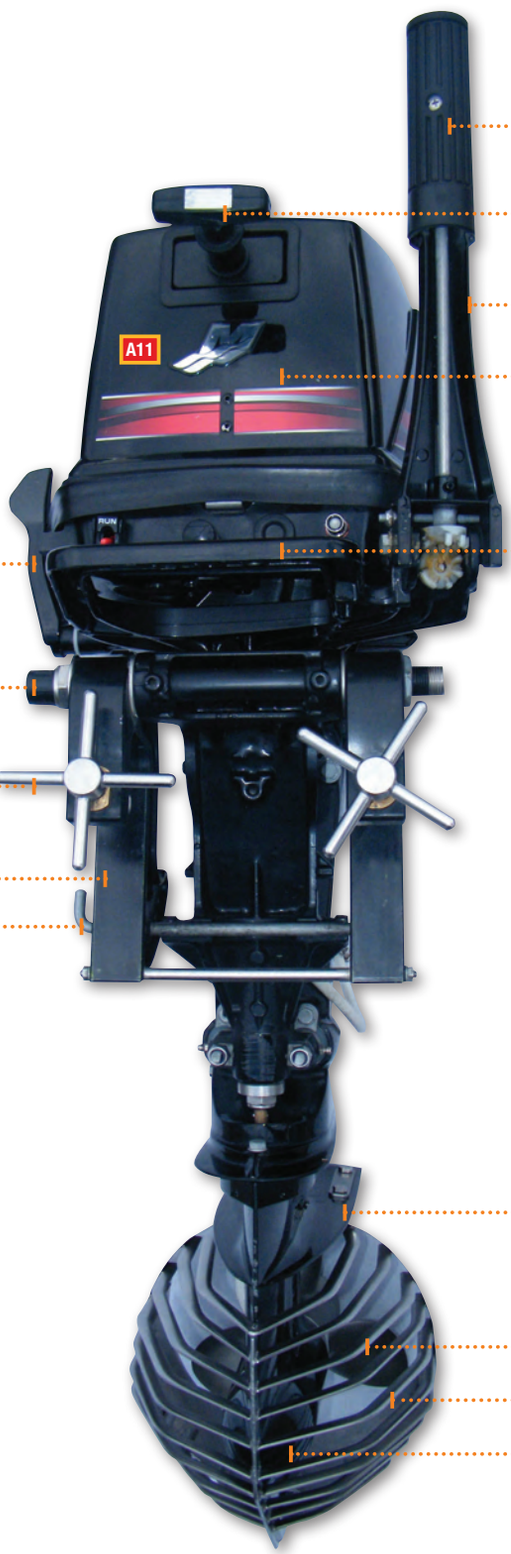
A10

Design and features of an IRB engine

The Mercury 30hp surf engine has evolved through a SLSNZ evaluation process (as does all SLS equipment) to be the surf engine of choice.

- 30hp
- Single carburettor
- Two stroke (cycle)
- Manual pull start
- Fitted with a propeller guard and stainless steel propeller
- Strengthened to suit surf rescue operations and to enhance safety and performance.

IRB engine features A11 to A15



A Gear lever

B Tilt tube and nut

C Transom clamp screws

D Transom bracket

E Adjustable tilt pin

F Throttle

G Pull start

H Tiller arm (steering arm)

I Cowling cover

J Steering Bracket

K Mid section

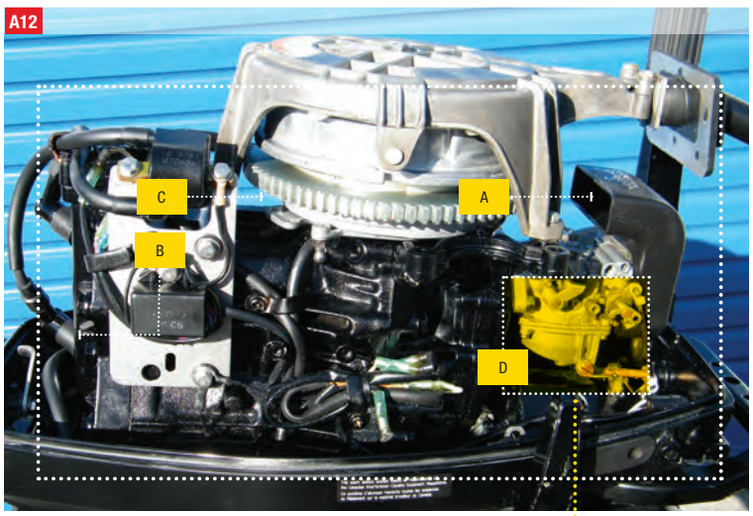
L Cavitation plate

M Propeller

N Propeller guard (prop guard)

O Gear box

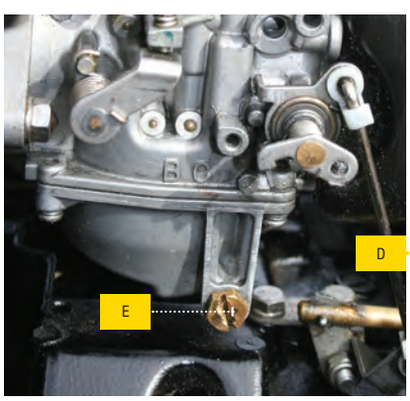
A12



- Powerhead A12
- A Air intake
- B Spark plugs
- C Fly wheel
- D Carburettor
- E Carburettor drain plug

A14

Bungee security cord and safety strop. A14



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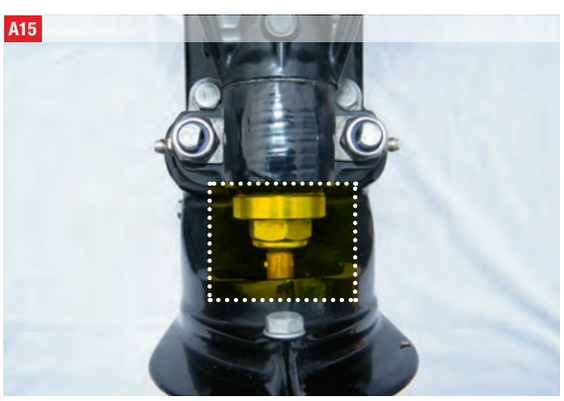
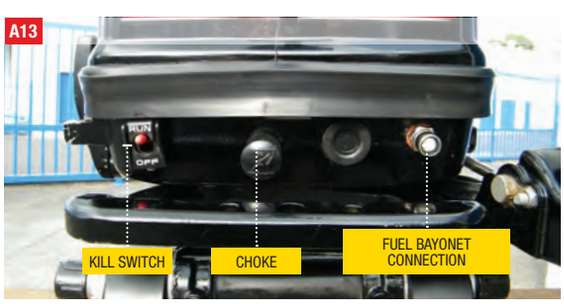


Compression tube

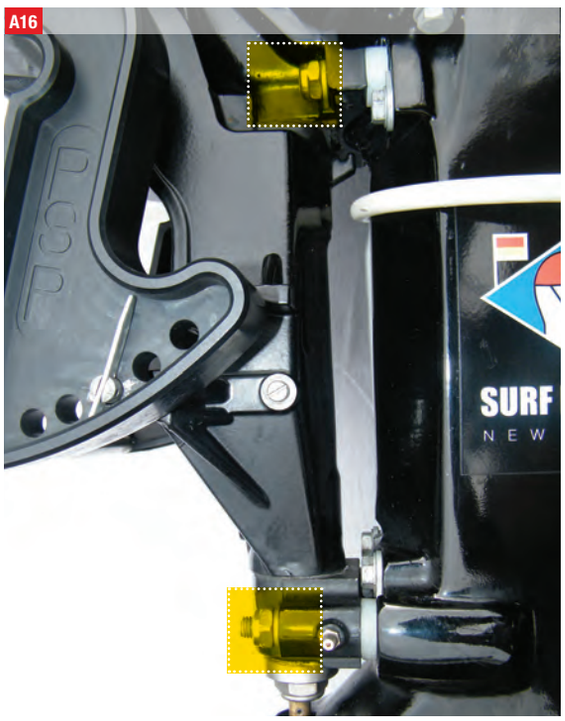
The compression tube is designed to strengthen the 'steering bracket' and is also used to adjust steering tension. The lock nut should be tightened until reasonable resistance is felt in the steering (moving tiller arm from side to side). A15

A13



- Fuel bayonet connection A13
- Choke
- Kill switch

A16



Engine mounts

Engine mount nuts should be checked regularly to ensure they are tight. A16

Carburettor

Keep both sides of the choke shaft lubricated to avoid seizure. A17

Spark plug leads

Keep spark plug leads away from the engine cover attachment. A18

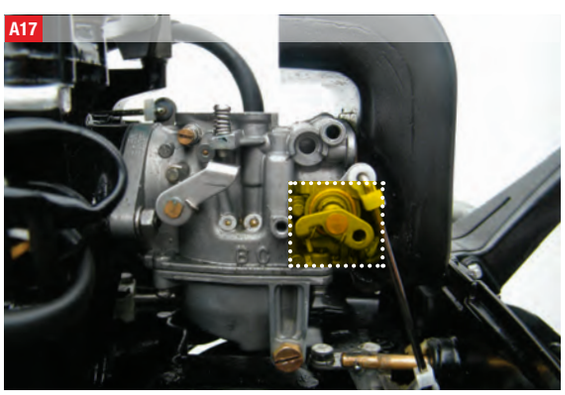
Water pump

The function of the water pump (impeller) is to circulate water around the engine, keeping it cool. It is subject to considerable wear. A19

A steady stream of water through the tell tale indicates that the water pump is working. This should be checked on a regular basis when the engine is in use.

On no account should the engine be started when it is out of water (dry start) as immediate and permanent damage to the water pump will occur.

A17



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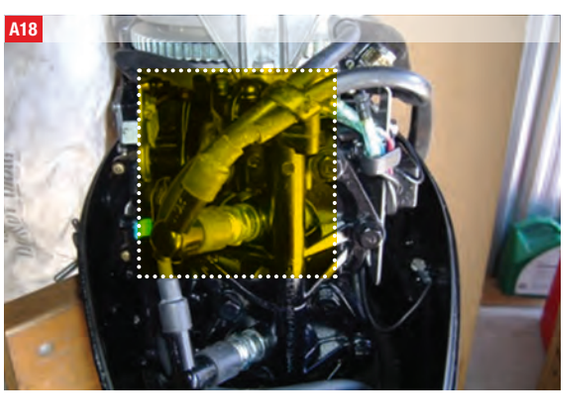


A19

The benefits of using a dewatering agent include: A20

- Dispelling water
- Penetration
- Lubrication
- Corrosion reduction

IMPORTANT:
Excessive use of dewatering agents may have a detrimental effect on some rubber components, resulting in breakdown over time.

Propeller

A propeller is made up of two parts: A21

- Propeller body and blades
- Driver bush/rubber shock absorber

The propeller blades should be checked for damage regularly. Only stainless steel propellers are used on surf engines.

Propeller guard

All surf engines are fitted with a SLSNZ approved propeller guard (prop guard). This is to increase safety when operating the IRB.

Areas of the prop guard to check are: A22

- Tightness of nuts and bolts
- Damaged or broken vanes
- Damaged or bent ring guard
- Clearance between propeller and guard

Spark plugs

The model and type of spark plug has been selected by the engine manufacturer to best suit that engine.

Replacement with the wrong type can lead to serious engine damage for example:

- Cold plugs may foul
- Hot plugs can cause pre-ignition and will destroy pistons
- Long plugs will cause mechanical damage (pistons will hit spark plugs)

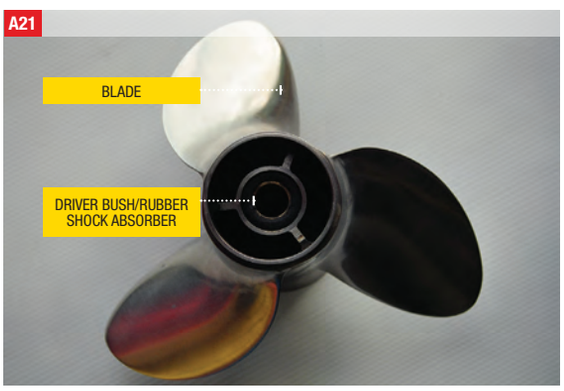
Spark plugs are a relatively inexpensive item and should be replaced regularly. This may help to reduce many starting and running problems. A23

Spark plug types (Mercury surf engine)

- NGK B7HS-10
- NGK BR7HS-10
- CHAMPION L82C

A20

A21



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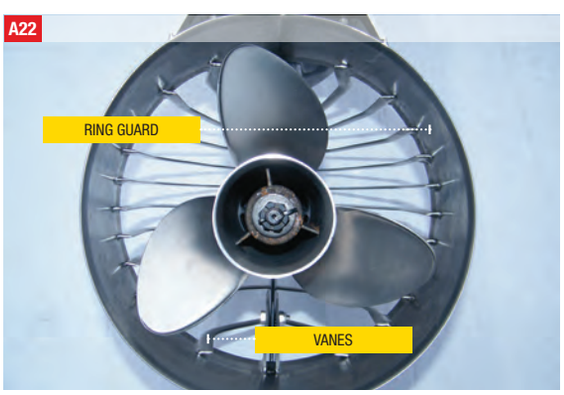


A23

Tools A24

- Tilt tube ring spanner 32mm (1¾ inch)
- Socket set
- Spark plug remover
- 10mm & 13mm ring spanners
- Long nose pliers
- Assorted screw drivers
- Sandpaper
- Dewatering agent
  (e.g. CRC 66 Marine, WD40, Castrol DWF)

Basic spare engine parts A25

- Pull start rope (spare provided with new engine)
- Stainless steel prop shaft split pins
- Stainless steel bolts/washers for prop guard
- Spark plugs (see spark plug section for more information)
- Water pump impeller housing
- Water pump impeller
- Safety strop
- Clamp screw
- Pull start spring
- Compression tube
- Clamp brackets
- Kerosene
- Cleaning brush
- Jug/container
- Cleaning rags

Essential Items

- Engine flush tank capable of containing inverted engine
  (if reinstatement is not successful)
- Fire extinguisher
- Dewatering agent

A24

A25

Engine Reinstatement

Reinstating the engine after submersion

A26

Engine Reinstatement

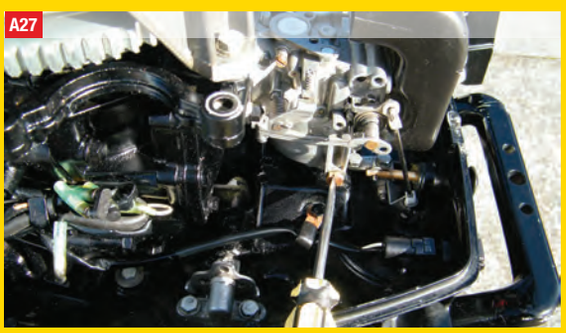
Follow the step by step instructions to reinstate an IRB engine after submersion.

IMPORTANT:

If not reinstated correctly after a rollover then engine seizure will likely result.

1. **Gather items you will require:** A26
   - Dewatering agent
   - Foot pump
   - Fuel
   - Screwdriver
   - Spare spark plugs
   - Spark plug spanner
   - Flush tank
   - Fire extinguisher.
2. **Wash Engine**
   - Hose the engine thoroughly - including inside the engine cover - with fresh water.

A27



3. **Drain carburettor** A27
   - Loosen the drain plug from the carburettor and tilt the engine, allowing water and fuel to drain from the carburettor.
4. **Flush carburettor**
   - Stand the engine upright.
   - Connect fuel line bayonet.
   - Pump fuel through the carburettor to ensure no water remains.
   - Retighten drain plug.

A28

5. **Remove spark plugs**
   - Remove both spark plugs using a spark plug spanner.
6. **Pump water from powerhead** A28
   - Tilt the engine so that the spark plug holes are facing down.
   - Ensure kill switch is in OFF position and pull start the engine 20 times.
   - This process should be completed in a manner that captures all fuel contaminates. E.g. using a fuel blanket.

A29

7. **Flush the cylinders with fuel** A29
   - Tilt the engine so that the spark plug holes are facing up and pour about half a cup of fuel mix into each cylinder.
   - Hold the engine vertically and shake vigorously back and forth and side to side.
   - Place the engine in a horizontal position (spark plug holes facing down). Ensure kill switch is in OFF position. Pull start the engine 10 times.

A30

A31

8. Replace spark plugs and lubricate powerhead A30

- Clean, dry and replace spark plugs.
- Spray inside spark plug caps lightly with dewatering agent and refit to plugs.
- Spray powerhead lightly with dewatering agent.

9. Run engine in flush tank

- Place the engine in the flush tank and start engine.
- Check the tell tale and run in tank for 10 minutes.

10. Run engine at sea

- Fit the engine to IRB, launch and run under load for at least 30 minutes.

IMPORTANT:
It is essential the powerhead generates sufficient heat to remove any water vapour, failure to achieve this will likely result in early bearing failure.

If the engine fails to start, repeat procedures 3 to 10 at least three times. Also try new spark plugs and new fuel.

When the engine is next serviced ask the service person to check under the fly wheel for corrosion and to remove sand or grit that may be trapped there.

IMPORTANT:
If the engine won't start, totally immerse the engine powerhead in fresh water until a qualified service person is consulted and service arrangements made. Internal corrosion (permanent damage) will occur if the engine is not attended to by a qualified service person immediately following removal from the fresh water.

If the engine starts but cannot be run in the surf due to broken parts resulting from rollover (e.g. engine bracket or tiller arm broken) then the powerhead must be totally immersed in fresh water until a qualified service person is consulted and service arrangements made. A31

B Fuel

This section gives information on the type of fuel used in an IRB engine, how to fill a fuel bladder and storage of fuel.

Fuel

IRB fuel and refueling procedures

IRB fuel type

The fuel used in IRB engines is a mixture of petrol and two stroke outboard engine oil. The mixture is fifty parts petrol to one part oil (50:1).

BP 91 or 95 octane petrol is ideal. However it is most important only 'fresh' fuel is used. If fuel is stored (up to a maximum of four weeks) then it is recommended BP Ultimate (98 octane) petrol is used. Do not use fuel if it has been stored for more than four weeks because the fuel goes 'stale' and starting/performance problems may occur.

Examples of a fuel mix

Petrol	Outboard Engine Oil
50 litres	1 litre
20 litres	400ml
10 litres	200ml

A simple way to calculate the oil mix content (in millilitres) for petrol is to double the quantity of petrol and add a '0' on the end. This will give you the required amount of two stroke outboard engine oil.

For example, for 15 litres of petrol, double it (30) and add a '0' on the end. This equals 300: the millilitres of oil required for 15 litres of petrol.

It is very difficult to tell if the petrol has had oil added to it. If you are at all uncertain add the appropriate quantity of oil required at the ratio of 50:1.

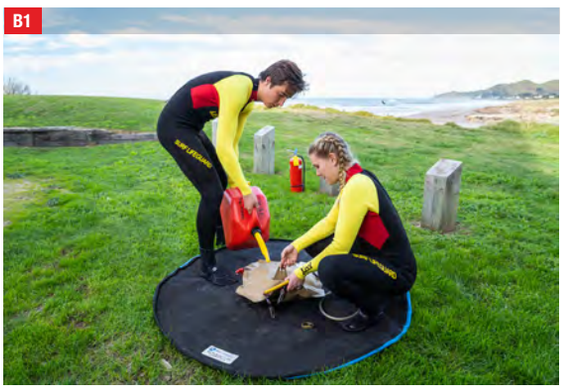
IMPORTANT:
A double amount of oil in the petrol is not harmful to the engine, whereas if oil is not added to the petrol substantial damage to the engine will occur.

Filling the fuel bladder

When filling the fuel bladder it is important to observe the following precautions/steps below:

- The bladder must be removed from the IRB.
- Ensure the correct fuel is used.
- Fill bladder in a well ventilated area, the bladder should be fueled while on a fuel stock mat. B1
- Fire Extinguisher should be positioned 2-3 meters away.
- Remove all air from the bladder (this is achieved by applying gentle pressure to the bladder until the fuel rises to the filler opening). B2
- Wash away all spilt fuel, including any on the bladder B3
- Check for leaks.
- Check the fuel line bayonet is clean, free of sand and not leaking fuel. B4

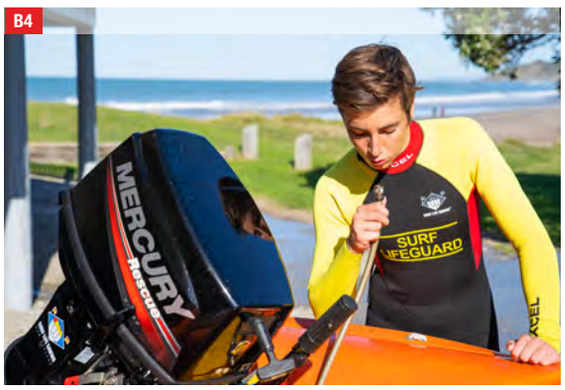
B1



B2

B3

B4



B5

IMPORTANT:
The fuel bladder should be stored full, on a flat surface separate from the IRB and away from direct sunlight, ready for immediate use. If an emergency should arise then the IRB can be launched with minimal delay. B5

Fuel spilt in the IRB can cause serious damage. The glues used in the manufacturing of the IRB may react with the fuel. The bladder, fuel line, and primer bulb should be checked regularly for leaks.

C Communication

Effective communication with/from an IRB.

Communication

Effective communication with/from an IRB

Signals

Signals are the most common method of communicating between IRB and shore. Radio communications are not always available, therefore driver and crewperson must know and understand these signals.

When signalling to the IRB the following should be taken into account:

A location should be used on the shore which will ensure that the signals can be clearly seen, i.e. patrol tower, higher ground or sand dunes.

Signal communication is not limited to the use of rescue tubes. Alternatives include arms, paddles, flags, or signalling discs. These methods do, however, have their advantages and disadvantages. For example, when a cross wind is blowing, signal flags can be easily seen, but when the wind is blowing onshore, flags are difficult to use.

Communication from the IRB

IRB control signals can be of assistance to the driver in heavy surf or where there are swimmers and/or craft riders in the area the IRB is attempting to negotiate. Hand signals should always be accompanied by verbal signals to assist the driver in making quick decisions.

These signals are given by the crewperson to assist the driver in steering the IRB. However the final decision is the prerogative of the driver.

Arm signals from the IRB are more easily seen when given at the top of a swell.

A Surf Lifeguard should continue to send a signal until it is clear that the message has been understood by the receiver.

Signalling From Sea to Land

Shore Signal Received and Understood

One arm held vertically, then cut away sharply.

Assistance Required

One arm waved to and fro above the head.

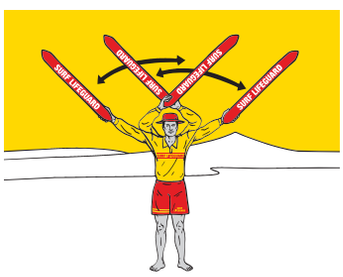
All Clear

Both arms held in the horizontal position.

Ok Signal

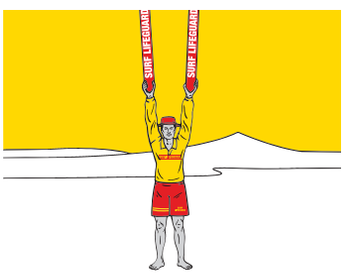
Internationally recognised diver's signal. One arm is curled round the top of the head to form an "O".

Signalling From Land to Sea

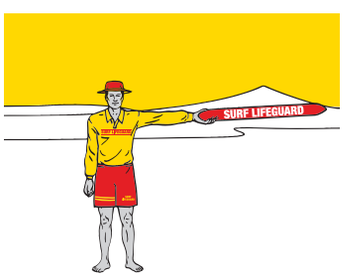


To Attract Attention between Boat and Shore
Two rescue tubes waved to and fro, crossing above the head.

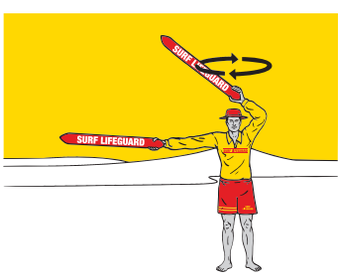
Return to Shore
One rescue tube held above the head.



Proceed Further out to Sea
Two rescue tubes held above the head.

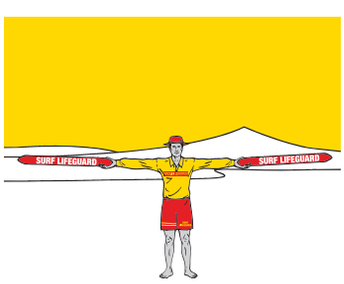


Proceed in the direction indicated
One rescue tube held at arm's length parallel to the ground and pointed in the required direction.



Pick up Swimmers.
One rescue tube waved in a circular manner around and above the head and a second held parallel to the water's edge and horizontal to the ground.

Message Understood-Clear.
One rescue tube held stationary above the head and cut away quickly.



Remain stationary
Two rescue tubes held at arms length parallel to the ground.

D Maritime Regulations

This section outlines the rules and regulations IRB drivers must abide by on the water.

Maritime Regulations

Rules and regulations on the water

Driver Responsibility

The driver is responsible for the safe operation of the IRB, the safety of the crew, and must abide by Maritime rules and regulations at all times.

Coastal inshore waters are used by many recreational and commercial operators, all of whom must abide by statutory Maritime regulations.

In the case of an accident, or breach of maritime rules, limited knowledge or ignorance of the Martitime Transport Act 1994 and Regional Maritime Bylaws are not acceptable excuses. Heavy fines are possible for breaches of Maritime rules. Additionally, a lifesaving standards breach is likely to be issued to the driver and Club by SLSNZ.

Code of conduct

Accepting the fact that the IRB has to be driven with aggression in the surf zone, the driver must not allow this aggression at the expense of safety and consideration towards others, respecting the right of swimmers and the public to enjoy their time at the beach.

Profile

The IRB is regarded as 'high profile' and will therefore draw attention, the driver has a responsibility to the community and Surf Life Saving to act in a considerate and safe manner at all times.

Understand your limitations

Respect and understand the limitations of driver and crewperson in varying conditions. Care must be taken by crew when assessing risk.

It is an offence to maintain or operate a boat (or any other maritime product) in a way that causes any unnecessary risk to another person or property.

Operational details

Drivers must understand the rules and regulations that relate to boating and water-based activities in their specific region and be familiar with the application of the following legislation:

- Maritime Transport Act 1994
- Regional Maritime Bylaws
- Health and Safety at Work Act 2015
- Additionally, drivers must be familiar with the application of the following SLS documents:
- IRB Operations Log Book – details of all IRB usage.
- NSOP (National Standard Operating Procedures).
- CSOP (Club/Service Operating Procedures).
- Patrol Captains Report Form – weather and surf conditions.
- SLSNZ Incident Report Form.
- SLSNZ Event Safety Policy
- SLSNZ Buoyancy Support in IRBs Policy
- Lifesaving Acitivities around Rocks Policy

Rules of the road (on the water)

It is compulsory for the driver and crewperson to wear a NZ Standards approved (or equivalent) personal flotation device and helmet at all times while the IRB is on the water.

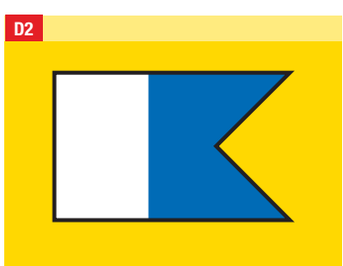
Speed

No person may without reasonable excuse, propel or navigate a vessel (including a vessel towing a person or an object) at a proper speed exceeding 5knots (9km/h) in these circumstances: D1

- Within 50 metres of any other vessel, raft, or person in the water.
- Within 200m of the shore or of any structure.
- Within 200m of any vessel that is flying Flag D2 of the International Code of Signals (divers flag).

D1

D2



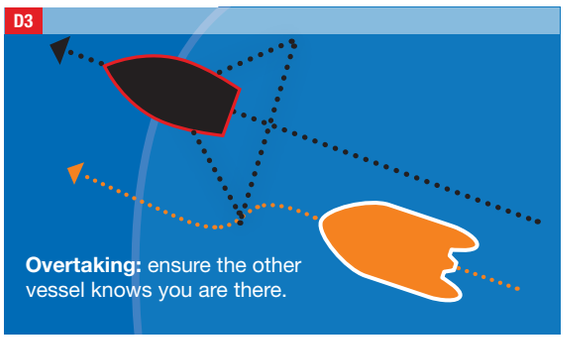
Reasonable Excuse

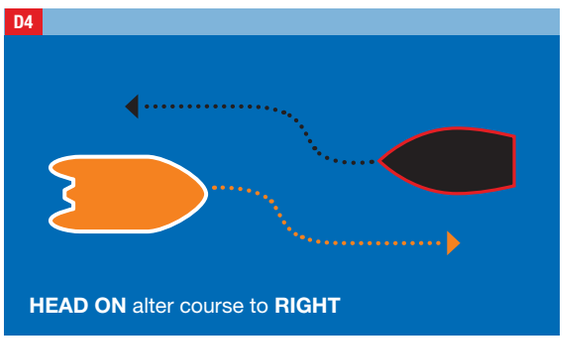
All Clubs and operators of IRB's will be permitted to: Only exceed the 5 knot rule under Navigation Safety Rule 91.9, where there is a clear 'reasonable excuse' to do so. For example, where the IRB is being operated to:

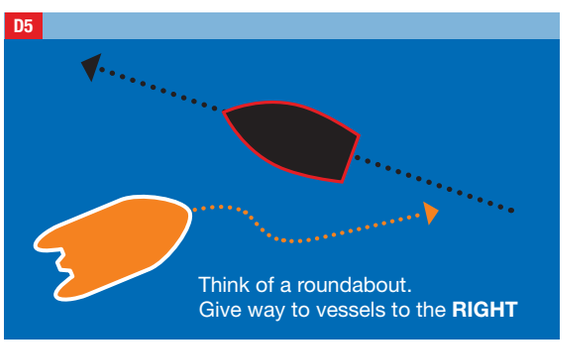
- Rescue a person
- Assess that person's safety in the water, or
- Prevent immediate danger to a craft, including the rescue craft from capsizing within the surf zone.

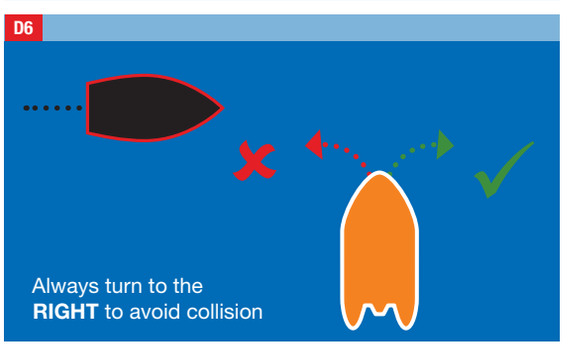
At all times, reasonable speed must be applied during these situations, which does not endanger any water users, the driver or crewperson.

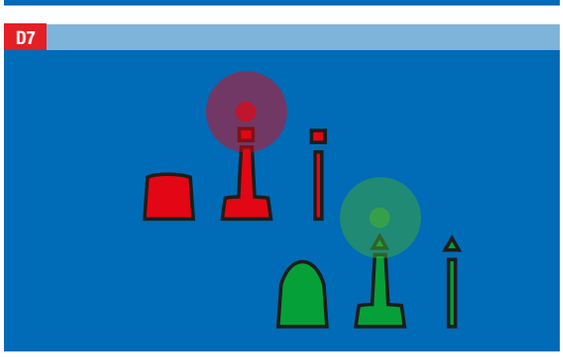
Operating an IRB in excess of 5 knots just to get to a destination quicker is not a valid or 'reasonable excuse' to











breach Navigation Safety Rule 91.6. In the case where high speed transit is required, do so at least 200m off shore and outside of speed limited areas.

When two boats meet

Overtaking:

Overtaking is considered to be when approaching another vessel anywhere in a 135 degree sector at its stern.

The overtaking vessel must keep clear of the vessel being overtaken. The overtaking vessel is in a give-way position until past and well clear. The vessel being overtaken must maintain course and speed. D3

Head on:

Power vessels approaching head-on should alter course to starboard, passing down each other's port side. D4

Crossing:

If two power vessels are crossing, the vessel with the other on its starboard side should steer clear. Think of a roundabout. Give way to the right. D5

Collision avoidance:

Always turn to the RIGHT to avoid collision. D6

When a powered vessel meets a boat being rowed or under sail, the power boat gives way (unless the sail boat is overtaking).

Buoys and beacons in and around harbours

- These are the road signs on the water.
- Channel markers indicate port (left) and starboard (right) sides when entering the channel:
  - Port mark, a red can shape (at night a red flashing light may be shown). D7
  - Starboard mark, a green conical shape (at night a green flashing light may be shown).

In channels and harbours

All boats must keep to the starboard (right) side of any channel, estuary or river.

Inside a harbour, the IRB must keep out of the way of any ship (large vessel) and should not attempt to pass when the ship is operating in a narrow channel.

You must not create a wake which causes unnecessary danger to other boats or people.

Entering and Exiting Rules

When ENTERING HARBOUR the port (red) lateral mark should be kept on the boat's (left) side. D8

When EXITING HARBOUR the port (red) lateral mark should be kept on the boat's (right) side. D9

Night time activity

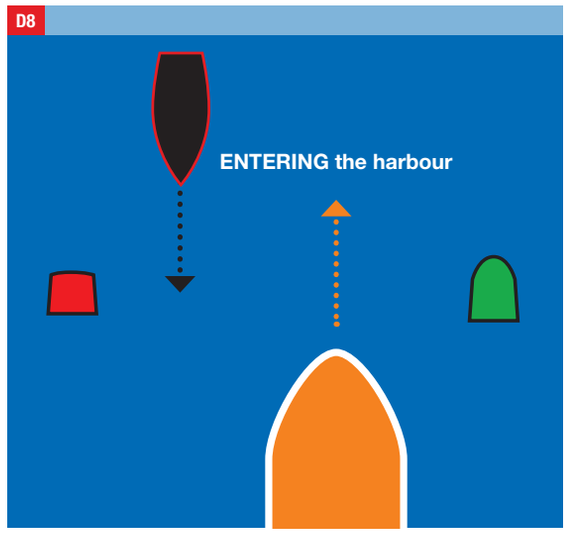
The IRB is limited to operating during daylight hours where visibility is sufficient to see the shoreline and surf zones at all times. The IRB does not comply with regulations concerning lighting.

Distress signals

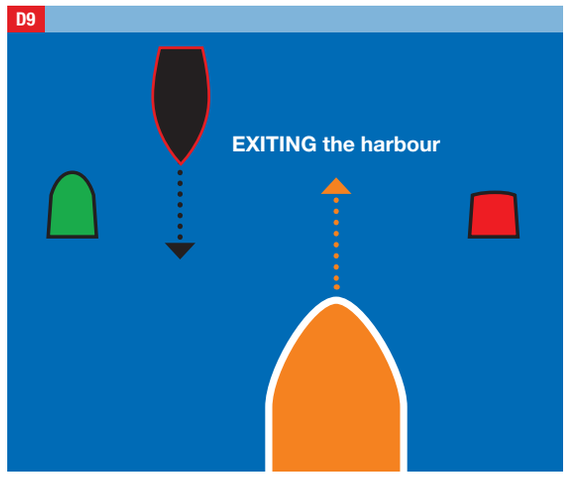
IRB drivers and crew should be able to recognise and respond to common distress signals from vessels on the water such as:

- Orange smoke flare.
- Red flare, hand held or parachute.
- Radio signal
  - "Mayday-Mayday-Mayday" used in a life threatening situation
  - "Pan-Pan" used to indicate assistance required.
- Waving arms to attract attention.
- Continuous sounding of a whistle or similar.

D8



D9



E IRB Setup

This section provides procedures for the correct setup of an IRB hull and engine including engine start up.

IRB Setup

Procedures for the setup of an IRB

IRB hull setup

Inflation

It is essential that the pontoons and keelson are inflated to the correct pressure at all times during operation:

- Pontoon pressure – 23 kPa (kilopascals)
- Keelson pressure – 27 kPa

A pressure gauge should always be used. E1

Under inflation caused by a minor leak in the keelson, pontoon or valves could result in severe damage (such as a broken floor board or the transom tearing away from the fabric support). Under inflation will also cause the IRB to flex unduly and make it extremely unstable in the surf. An IRB taken to sea with a slow leak can place the crew in a difficult situation as the IRB may distort, resulting in a capsize.

Over inflation will cause the fabric to stretch and fail over time. E2

Foot pump

When using a foot pump to inflate an IRB the following considerations should be taken into account:

DO E3

- Inflate the IRB in the gear shed with foot pump on a clean hard surface.
- Place a towel or similar under the foot pump if using on grassed area.
- Ensure intake on foot pump is clear and that shoes, if worn, do not contain dirt or sand.

DON'T

- Inflate the IRB using a foot pump directly on the sand or grass.
- Use excessive force on the pump (i.e. jumping up and down on the pump with two feet) as damage may occur to the pump or IRB may be overinflated.

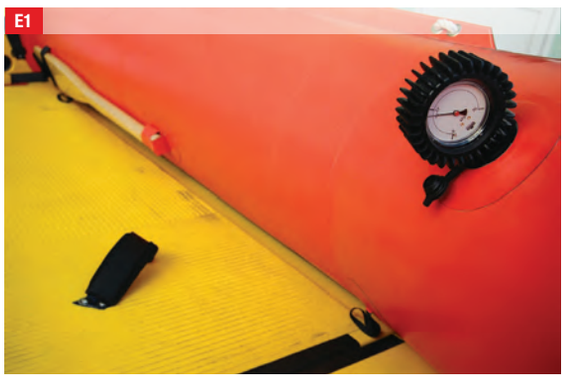
Any foreign objects (grass, sand etc) sucked into the pump will be blown into the IRB and remain there for the life of the IRB.

Foot pumps are capable of delivering 70 kPa and over inflation of pontoons/keelson could result if the pressure gauge is not used or is defective (i.e. damage may occur to a pressure gauge if dropped). Always check inflation pressure using the pressure gauge.

Compressor

Use of a compressor must be closely monitored with an accurate pressure gauge. The risk of over inflation is greater with a compressor than a foot pump and will likely result in a distorted hull.

E1



E2

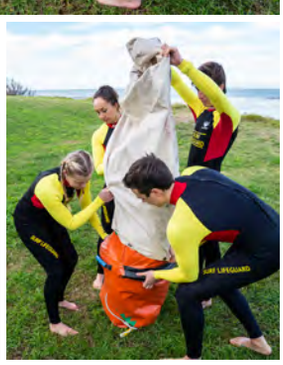
E3

IRB hull assembly from storage bag

Use the following steps to assemble an IRB:

1. Check the previous log in the IRB Operations Log Book for any damage to the hull and/or engine (if IRB has been previously used).
2. Lay the storage bag on a flat surface then lift vertically to remove the bag. E4
3. Unroll the IRB hull on a clean flat surface. E5

E4



E5

4. Ensure the keelson valve is closed to avoid damage to the valve pin prior to fitting floor.
5. Slightly inflate the IRB hull.
6. Insert the floor board into the IRB hull, putting the back end in first under the transom thrust board and pulling the bowboard tight up under the bow. Ensure a snug fit. E6
7. Pull the fabric up while gently pushing down with your foot where the floor board is hinged. E7
8. Ensure the black wear strips are clearly visible when the floor board is in place.
9. Inflate the side pontoons to 3.5 kPa and then the bow pontoon to the same. Align keelson with centre of floor and inflate to 3.5 kPa.
10. Store IRB.

It is necessary to inflate the side pontoons first as they have front facing cones inside. This is important because if the bow pontoon deflates during use, the IRB will still remain operational, though in a reduced capacity.

Setting up the IRB hull for operation

It is important that the following procedure is strictly adhered to:

1. Check the previous log in the IRB Operations Log Book for any damage to the hull and/or engine (if IRB has been previously used). E8
2. Ensure floor board is correctly fitted.
3. Inflate the side pontoons to 23 kPa.
4. Leave the pressure gauge in the right side pontoon with the dial facing forward and inflate the bow pontoon until the pressure gauge pointer just begins to rise. E9
5. Align the keelson with the centre of the floor. If the IRB is not on a trailer, lift one side of the IRB to remove the weight from the valve and inflate to 27 kPa.
6. Refit all valve bungs to prevent air leaks or water entering the valves.
7. Listen for air escaping or loose valves.
8. Check IRB for abrasions.
9. Check the auto bailers for damage.
10. Check transom for damage.
11. Check carry handles, rollover rope and bow rope are secure.

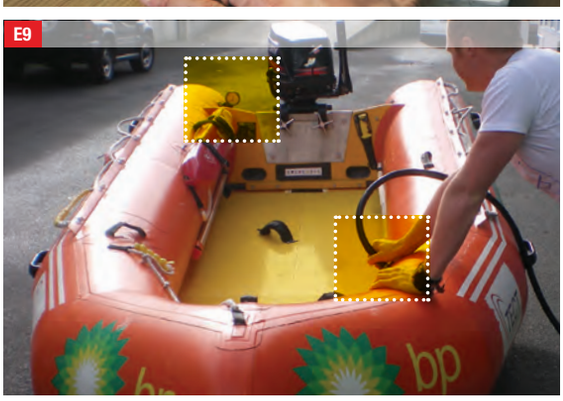
E10

E6

E7

E8

E9

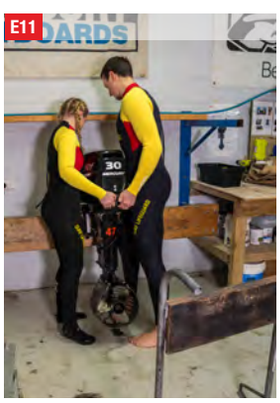


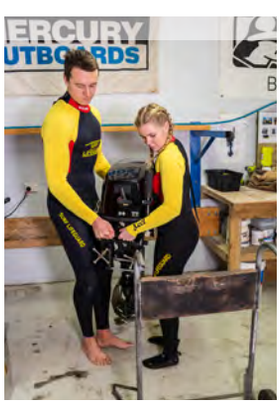
12. Check equipment – the minimum is a blunt ended stainless steel knife, two paddles, a Rescue Tube (secured), two personal flotation devices (PFDs)
13. Secure the fuel bladder to the correct position in the IRB. E9
14. Secure the fuel line through loops provided.

Moving the engine safely on the trolley

1. A minimum of two people are required to lift the engine.
2. To move the engine from a fixed storage mount, each person needs to sercurely have one hand holding the steering bracket and the other hand holding under the cowling cover. E11
3. Lift the engine off the fixed storage mount and onto the trolley. Ensure both transon clamp screws are secured tightly. E12
4. Holding the trolley handgrips, place one foot on the axle and lever the trolley towards you to move the engine safely. E13

E11





E12

E13

Fit and secure engine to IRB hull

1. A minimum of two people are required to move the engine. E14
2. Each person needs to sercurely have one hand holding the steering bracket and the other hand holding under the cowling tray.
3. Fit and secure engine to IRB. Ensure engine is centred on transon plate and clamp screws are tight. Take care when lifting the engine onto the transon as clamp screws can be easily damaged. E15

E14

E15

Lifting and carrying the engine on the beach

1. A minimum of two people are required to move the engine.
2. Each person needs to sercurely have one hand holding the steering bracket and the other hand holding under the cowling tray.
3. While securing holding the engine in an upright position slowly lower the engine down so it is resting on the back of the cowling tray and the propeller gaurd. E16
4. Unscrew the transon clamps and insert carry handle and tighten clamp screws. E17
5. With both people securing holding the carry handle bend your knees and lift the engine to transport onto the beach. E18

E16

E17

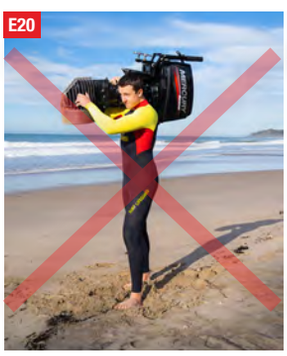
E18

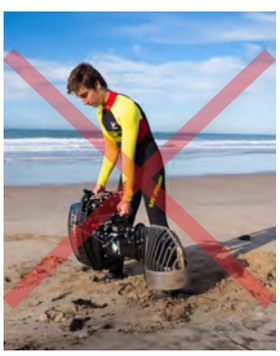
Note: When carrying the engine using this technique, the prop must be facing forward to avoid kicking when walking.

Do not lift or carry engine on your shoulders. Do not attempt to carry the engine with straight arms. E19 **Using any of these techniques could cause injury and damage equipment.** E20

E19

E20





IRB engine setup

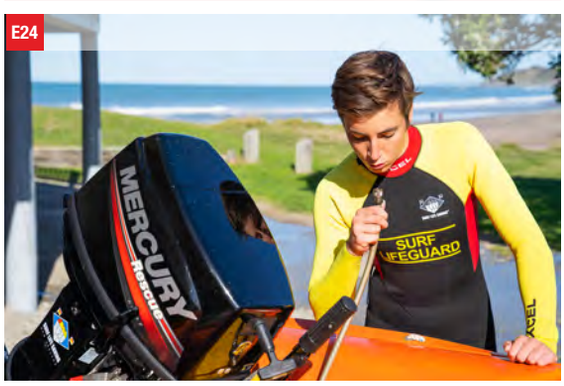
1. Check the previous log in the IRB Operations Log Book.
2. Fit and secure engine to IRB. Ensure engine is centred on transom plate and clamp screws are tight. Take care when lifting the engine onto the Transom as clamp screws can be easily damaged.
3. Carry out engine check including prop and guard:
   - Split pin in good condition.
   - Minimal slop with prop on shaft.
   - No broken vanes on prop guard.
   - All bolts tight.
   - No nuts or bolts missing on prop guard.
   - Good clearance between prop and prop guard, E21
   - Check tilt pin setting and adjust as necessary (position two from the bottom is normal).
4. Check engine cowling cover is correctly secured and bungee security cord attached. E22
5. Attach engine safety strop. E23
6. Attach fuel line to the engine, ensuring that the bayonet fitting is clean, free of sand and not damaged. E24
7. Start and run engine in flush tank (see 'starting the engine' section for more information).
8. Check for smooth running and tell tale water emission.
9. Fill out IRB Operations Log Book.

E21

E22

E23

E24



Engine Tilt Adjustment

The engine should be able to hold the tilted position. A fully tilted engine should only require a slight push on the cowling cover for the engine to drop down to its normal position. Newer model engines are fitted with an engine tilt mechanism. This allows the engine to be held in a permanent tilt position. E25

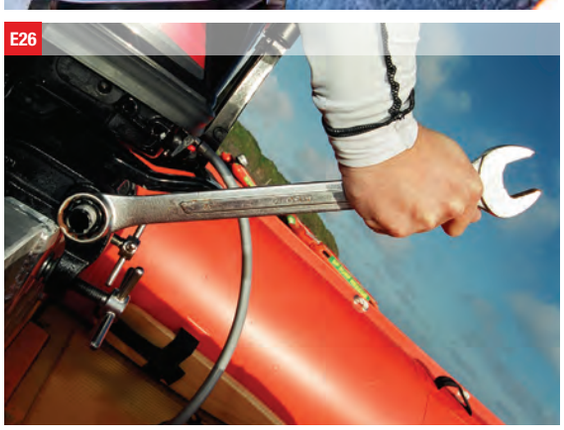
Always loosen one of the clamp screws before adjusting tilt. E26

Benefits of correct tilt adjustment include the IRB being easier to drag on the beach, reduction of impact on the transom and reduction of stress on the swivel bracket.

E25

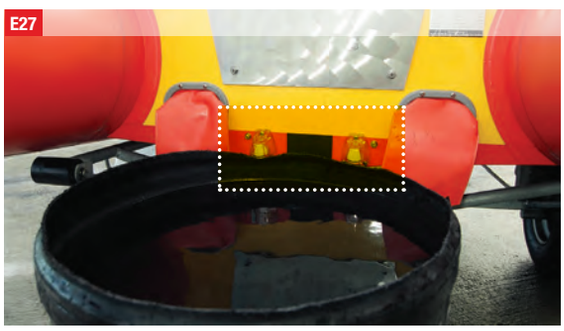
E25

E26



Starting the engine

1. Place the engine in the flush tank (ensure auto bailers are not damaged by contact with the flush tank). E27
   - The water level in the flush tank must be 150mm (6") above the engine cavitation plate for the tell tale to operate.
   - Ensure gear lever is in neutral position.
   - Pump fuel through until the primer bulb is firm (approximately 4-5 pumps) and check bayonet. E28
   - Set kill switch to 'run' position.
   - Starting is best achieved by rapid rotation of the fly wheel ensuring a hot spark start. Accordingly, the driver should be positioned for a high speed pull on the cord.
2. Cold engines should always be started with the choke fully engaged.
3. Set the throttle to 'start' position. While maintaining a constant grip on the throttle handle start the engine by pulling gently on the starter rope handle. When the engagement of the starter mechanism is felt, finish the stroke with a strong pull. Return the starter rope handle to normal position without letting go.
4. The engine should 'fire' after approximately 2-3 pulls.
5. Immediately after the engine 'fires' disengage the choke, apply ¾ throttle, pull start again and the engine should run.
6. Do not rev a cold engine.
7. Check tell tale for water emission. E29
8. Run for 3-5 min in flush tank to warm it up ready for use.


E27

E28

IMPORTANT:
If the engine does not start it may be 'flooded' with fuel due to numerous unsuccessful start attempts. Two options available are:

- Remove spark plugs, clean, dry, replace and repeat start procedure.
- Apply full throttle with no choke and pull start engine rapidly until 'flooding' clears and engine 'fires'.

Alternative engine start:

1. **Pump fuel through until the primer bulb is firm.**
2. **Set kill switch to 'off' position.**
3. **Engage choke.**
4. **Complete one pull start (fully extended arm).**
5. **Disengage choke.**
6. **Set kill switch to 'run' position.**
7. **Set throttle to half speed.**
8. **Complete one pull start (fully extended arm).**
9. **Do not rev a cold engine.**
10. **Check tell tale for water emission.**
11. **Run for 3-5 min in flush tank to warm it up ready for use.**

F Basic Skills and Technique

In this section is information on the skills and techniques required to become an effective IRB crewperson and driver

Basic Skills and Technique

Skills required to become an effective crewperson and driver

Moving the IRB on land

Removal of IRB from trailer

Select the best place to launch and carefully remove the IRB from the trailer using the following method:

- Once near the waters edge, lift the front of the trailer (nose of the IRB) with the IRB on it so the rear of the pontoons take the weight on the sand. F1
- The weight of the front of the IRB is taken by a surf lifeguard leaning against the hull with arms extended; meanwhile another surf lifeguard will pull the trailer out and place well above the high tide mark.
- The second surf lifeguard will then assist the first to bring the IRB back down to rest on the sand. F2

Shifting IRB from sand to sea

Before taking the IRB into the water:

- The driver should check the fuel line primer bulb is tight ensuring sufficient fuel in carburettor, the engine gear lever is in the neutral position and the kill switch is in the 'run' position.
- Both the driver and crewperson must lift/drag the IRB using the front carry handles until the IRB is into a depth of water sufficient for the propeller guard to clear the bottom. F3

Lifting and carrying

Surf lifesaving duties involve the lifting and carrying of equipment and rescued persons. A common injury is to the lower back, caused by incorrect lifting or handling of heavy, awkward or large objects.

In surf lifesaving, objects such as the engine and IRB floor board are particularly heavy and/or awkward, and they require careful handling and manoeuvring. Not only could you injure yourself but you could also damage the equipment and hurt others around you if you do not handle and manoeuvre equipment safely. Health and safety is everybody's responsibility.

How to lift

Firstly, it is important that the environment or area that you are required to lift in is safe. This will depend on things like:

- Where and how equipment is laid out.
- The storage method of the equipment.
- The size and weight of mobile equipment.
- How far you have to carry equipment or goods.
- The terrain you have to negotiate.

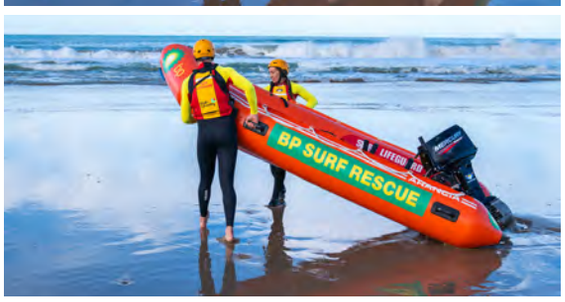
Below is a set of steps that describe how to lift correctly. These steps outline how to lift heavy items on your own or when lifting with two or more people:

- Face in the direction of the object you intend to lift.
- Bend the knees and crouch down, with a straight back.

F1

F2

F3



- Balancing with a wide base of support, take hold of the object securely.
- Keep the load close to the body wherever possible.
- One member coordinates the lift and calls 'ready, one, two, three, lift' or 'two, six, yip'.
- Brace your stomach muscles and whilst keeping your back in a neutral position, lift the object, taking the weight with your legs.

IMPORTANT:
Do not bend forward with your legs straight to lift. This places excessive load on the lower back. The use of trailers, quad-bikes and ATV vehicles are also important tools in the transportation of heavy objects.

Do not lift, drag or pull the IRB bowel rope or side pontoon white loop ropes.

Doing this may cause injury and damage to equipment. F4

F4

Crewperson skills

Launching the IRB - crewperson

- When the IRB is situated in the correct water depth for launching it is the crewperson's responsibility to ensure the IRB is held securely into oncoming waves. For safety reasons the crewperson should be facing the surf. F5
- The driver will board the IRB and start the engine. F5
- The driver will instruct the crewperson when to board the IRB. The crewperson will board the IRB using the crewpersons' boarding handgrip and bow rope. Alternatively, the crewperson may board by securing the boarding handgrip with the right hand and using the left arm as a lever on the pontoon.

Basic crewing position

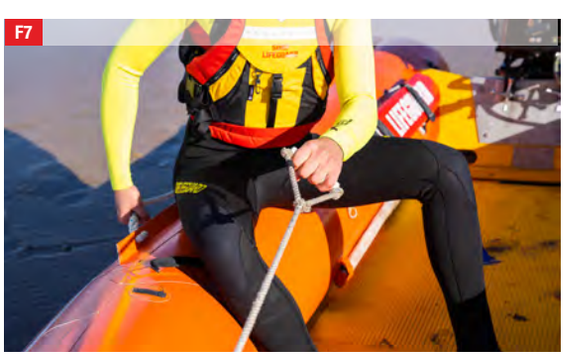
Below is the basic positioning for a crewperson in flat conditions with a level IRB:

- The crewperson should be seated on the starboard (right) side of the IRB near the bow. F6
- The crewperson should hold the bow rope with their left hand and the crewperson's handgrip with the right. F7
- The left foot should be locked into the crewperson's left foot strap. F8
- The crewperson should ensure three points of contact with the IRB to maintain position and balance.

IMPORTANT:

When proceeding through surf do not grab the bow black handle to "punch" through a wave. This will cause injury. F9

F7



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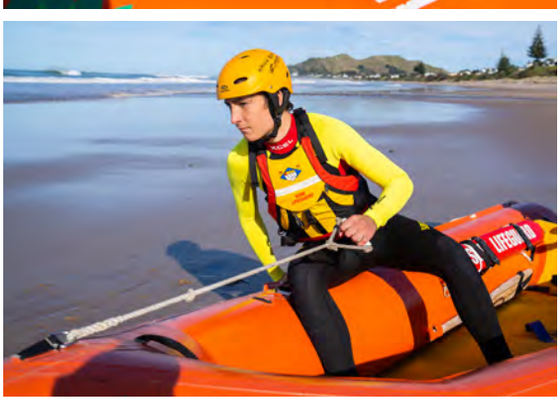

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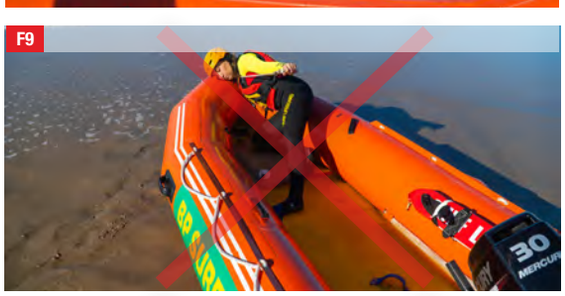

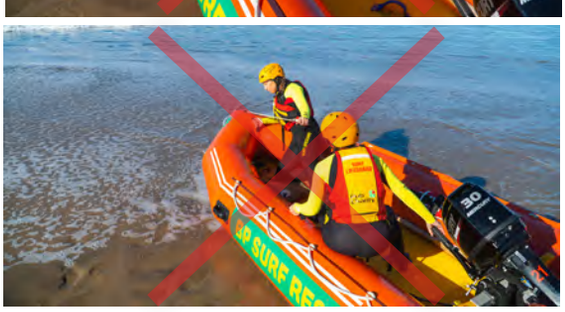

Proceeding through surf

- The crewperson plays a very important part in maintaining the balance of the IRB when negotiating surf. Correct technique is required when impacting large waves to minimise the risk of injury, and to ensure the IRB successfully negotiates the surf.
- As the IRB rises over a large broken or green wave the weight of the crewperson should be centred over the starboard (right) pontoon. The crewperson must lean forward over the pontoon with their chest to help negate bow rise. F10
- It is very important the crewperson maintains a strong grip with their right hand on the crewperson hand grip and their left foot secured in the foot strap. The left hand should hold the bow rope on impact.
- As the IRB bow begins to drop after impact of a wave, the crewperson will take the shock of the impact through both (bent) legs.
- As the IRB impacts a small broken or green wave the crewperson should remain seated on the starboard pontoon, while leaning forward to help negate bow rise. F11

Parallel running – crewperson

In many rescue situations we are required to move from point to point on the beach or coastline at speed. The most effective way to perform this task is to manoeuvre the IRB along the beach/coastline parallel to the beach – parallel running.

The role of the crewperson when parallel running is to keep the IRB as balanced as possible. If the crewperson does not balance the IRB correctly it will capsize.

When parallel running with the crewperson on the seaward side, balance the IRB by leaning into the wave. F12

If the crewperson is on the beach side of the IRB they may need to lean into the middle of the IRB to keep it balanced when a wave hits.

Returning to shore

When returning to shore the crewperson should direct the passage of the IRB by hand signals supplemented by verbal signals. However in all cases the final decision is the driver's.

The crewperson should constantly scan the sea to avoid swimmers, surfers, seaweed, fishing lines and other hazards. F13

When the driver gives the command "Out", the crewperson should jump out of the IRB with the driver and hold the IRB facing toward the beach so any following wave will push the IRB straight up the beach.

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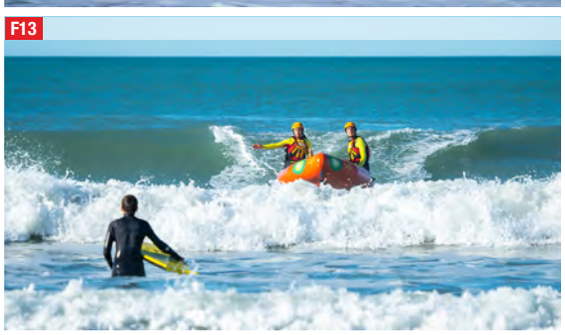

To remove the IRB from the water, lift the IRB by the front handles to waist height and then drag, or where four persons are present, lift the IRB completely off the sand, and carry up the beach above the water line, leaving the IRB in the draining position (facing up the beach). Alternatively the IRB may be stored on the trailer for quick access to the water in an emergency. F14

F14

Falling out of the IRB

If you fall out of the IRB you should:

- Let go of all connections with the IRB.
- Form your body into a ball so that if there is any contact with the engine/propeller guard, your body will be knocked away without serious injury.

Re-boarding the IRB

It is recommended when the crewperson is required to re-board an IRB, they use the following techniques:

- On the driver's side, crewperson grips the side rope or black carry handle.
- Then then straighten both arms, driving themselves as deep into the water as possible (straight down).
- Using the momentum generated and the side rope, they propel themselves head first over the side pontoon and into the IRB.
- Once onto the pontoon the crewperson can use a footstrap to lever into the boat.

F15

Driving skills

Launching the IRB – driver

In a basic starting procedure the driver should:

- Board the IRB while the crew holds the IRB secure facing oncoming waves.
- Start the engine as per procedures in the 'Starting the engine' section. F16
- The driver may also wish to start the engine in the standing position. F17
- Engage forward gear and order the crewperson aboard and immediately proceed out to sea according to judgement of the surf conditions and the break; OR
- Order the crewperson to remain in their position, holding the IRB until such time as a break may appear and then engage the forward gear and order the crewperson aboard. F18

IMPORTANT:
Engaging the gear with the engine revving too fast will likely result in a broken drive shaft. Manual movement of the gear shift lever should be a swift movement. If too slow, damage may be done to the gear mechanism.

Depending on the surf conditions there are alternative procedures which may be adopted to successfully launch the IRB, for example, the driver starts the engine, then:

- Moves forward to bow and assists the crewperson to lift the IRB over an oncoming broken wave. F19
- Moves back and boards the IRB.

Driver recovery

If you are crewing an IRB and the driver falls out or is knocked out of the IRB by a wave, the steps below must be followed:

- Switch off the engine.
- If in a dangerous position, get out of the IRB.
- If in surf conditions that are manageable, the crewpersion should stabilise the IRB by holding the bow carry handle and acting as a sea anchor.
- If both driver and crewperson all out of the IRB no attempts should be made to re-board the IRB when it is running out of control.

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Basic driving position

The driver will be positioned on the port (left) pontoon, gripping the engine throttle in the right hand and holding on to the driver's handgrip with the left hand, the right foot is locked into the drivers foot strap.

The driver must not apply downward pressure on the tiller arm or damage/breakage may occur. F20

When negotiating a wave the driver should move his body position forward and lean towards the front of the IRB while still maintaining a secure grip on the throttle and hand grip. F21

During operation regularly check the engine transom clamp screws for tightness and check that the tell tale is working satisfactorily. The driver should periodically check that there is adequate fuel left in the fuel bladder for the patrol operations and that the IRB is maintaining its correct inflation pressure.

Basic manoeuvres

An IRB instructor should accompany a trainee driver in the IRB at all times until the trainee driver has the confidence and ability to operate the IRB without instruction.

Before a trainee driver attempts to drive an IRB out through the surf it is essential that the trainee driver has some experience in still water handling. This should include launching the IRB, returning to shore, and basic manoeuvres such as port (left) and starboard (right) turns, coming alongside an object and picking up an object such as a rescue tube.

When learning to turn the IRB, trainee drivers should start on port turns, that is, pushing the steering arm away from the driver.

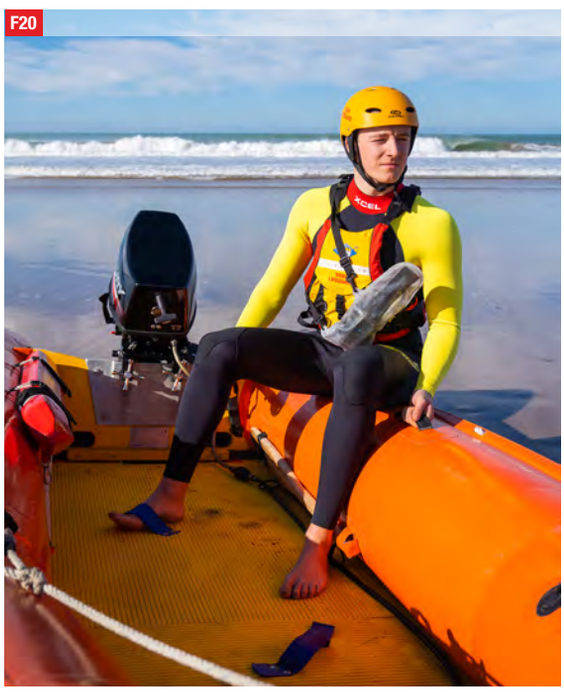
Starboard turns should not be attempted until the driver has mastered the throttle control.

When negotiating starboard turns there is a natural tendency for the driver to turn the wrist down while pulling the steering arm towards the body, which means the throttle moves down and consequently revs the engine faster than needed. This will cause the IRB to turn faster than anticipated and the driver may be thrown out of the IRB.

To counteract this tendency, the driver should lean into the IRB and maintain the wrist in a bent position when pulling the steering arm towards the body. This will keep the throttle at an even rate.

When a driver has confidently mastered turns in both directions they should then practice the figure '0' and figure '8' manoeuvres, gradually tightening the turns as they gain confidence and experience.

F20



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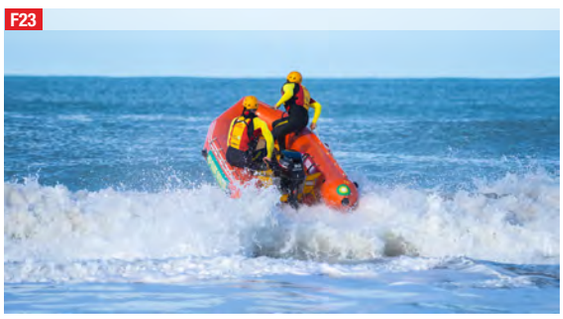

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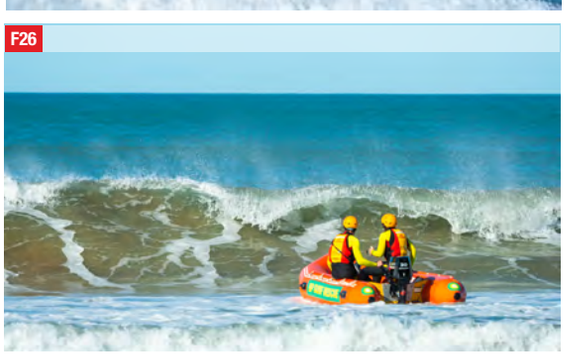


Proceeding through surf

When negotiating the surf break a driver should be aggressive and move quickly from one line of broken surf to be in the best position to take on the next line of surf. F22

It is important to just over-match the force of the wave with the speed and power of the IRB. This requires practice at timing the approach to oncoming waves. F23

Small broken and green waves may be negotiated at an angle. F24

However, large broken waves should always be taken head-on so that the force of the broken wave is evenly distributed along each side of the IRB. As the IRB rises over the crest of the wave an experienced driver can flick the IRB slightly to port and this can eliminate a 'high' ride by the crewperson. F25

In heavy surf dumping on to a sand bar the driver can hold the IRB 'in the break' with just enough throttle to go over the white water without moving forward. This position can be maintained until a lull occurs and then the driver should proceed forward at speed to negotiate the sand bar. F26

The driver should make adjustment for drift which could carry the IRB away from the best position to negotiate the sand bar.

When going over broken waves or green swells do not use excessive speed. Once the wave area has been cleared set the throttle for a speed appropriate to the conditions.

In large surf, the driver should take on the wave after it has broken, or position the IRB to go over the wave before it has 'capped'.

When approaching a wave, the driver should throttle back just before the IRB reaches the base of the wave so that the IRB rises over the wave in such a manner that it doesn't leap off the top of the wave and become airborne.

In a situation where the wave is reasonably large it may be necessary to accelerate the IRB slightly after the initial impact, to ensure that the IRB continues to travel up and over the wave.

IMPORTANT:
Immediately after a wave is negotiated prepare for the next oncoming wave. Be decisive. Do not make last minute decision changes. The driver must not apply downward pressure on the tiller arm or it will break.

Remember that excessive throttle is only required in emergencies and causes uneconomical operation of the engine and undue wear and tear. Excessive throttle in white water can cause the formation of vapour-filled and air-filled bubbles or cavities at or on the surface of a rotating propeller. This is called cavitation. When a propeller is cavitating there can be a large decrease in effectiveness of the propeller and hence the speed of the IRB.

Parallel running – driver

As discussed in the crewperson section, there are many rescue situations where you may be required to move from point to point on the beach or coastline at speed. Parallel running is the best way to achieve this.

In the hands of an experienced driver the IRB can be driven at full throttle but for the trainee driver it is important to learn the correct technique for parallel running first.

After launching the IRB, turn and head along the beach. Make sure that you have enough water so as not to run aground. Leave yourself a safety margin. While you are running in front of the wave you should be using ¾ throttle.

As the white water approaches and is about to make impact the driver should apply more throttle while at the same time turn the IRB nose into the wave (30-45 degrees is usually enough). The angle at which you take each wave will vary according to the size and strength of the surf. Remember the whole idea is to keep moving at a constant speed. A smooth and flowing method is the correct way. F27

Returning to shore

Select a suitable wave to follow and move in behind it. Ensure that you remain in zone A F28 between waves, without slipping back into the wave behind. The driver should watch carefully how the wave forms and breaks to ensure the IRB is capable of maintaining a position behind the wave in front, yet remain ahead of the wave behind, particularly with patients aboard. If the IRB is not safe between waves, abort the attempt and try again.

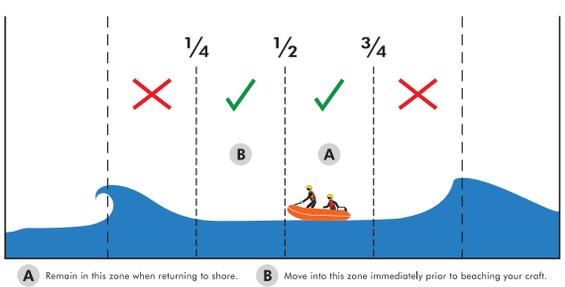
Where the driver does not have a clear view ahead, the crewperson should stand where practicable to do so, and shall direct the passage of the IRB by hand signals supplemented by verbal communication. If the IRB is transporting a patient, the crew must safely position the patient on the floor, from the mid to rear of the boat before the crewperson attempts to stand and assist the driver.

Drivers should not over run the wave in front unless absolutely necessary to do so, e.g. undertaking a rescue, or if the wave behind is travelling faster than the wave in front and is likely to catch up the wave in front, causing a double up. Care must be taken to ensure the way ahead is clear of other users, and where available and practicable, an onshore spotter should be engaged to guide the IRB ashore using hand signals and/or radio communication.

As the IRB approaches shore, the IRB should move to zone B F28 immediately prior to beaching the IRB, but only if it is safe and practicable to do so, i.e. ensure the way ahead is clear of other users. By moving to the back of the wave ahead, there should be sufficient time to beach the IRB before the next wave arrives.

F27

F28



The driver should constantly scan the sea to avoid swimmers, surfers, seaweed, fishing lines and other hazards. Extreme care should be exercised to avoid surfers who may emerge without warning through the back of a wave. Craft and ski riders can prove particularly hazardous as they rise across the face of a wave and then suddenly flick back out behind. F29

In certain conditions the wave may catch up and over-run the wave in front of the IRB. If this occurs the driver should:

- Call the crewperson back (they should slide back along the pontoon approximately one metre).
- Drive the IRB at full throttle over the wave and down the face, maintaining speed.
- Do not allow the following wave to catch the rear of the IRB as it will result in capsize.
- When going down the face of a large green or broken wave, always steer the IRB straight. F30

As the IRB approaches the beach, be aware of sand bars. When the driver considers the IRB is approaching a situation where the propeller guard is about to hit the sand, the driver should switch off the engine, tilt the engine inboard and place the gear lever in neutral. F31

Once on the shore the IRB can be transported up the beach by lifting the front handles and dragging above the water line, or by using the trailer. The driver should ensure the engine gear lever is in the 'neutral' position and the kill switch is in the 'run' position.

Removal of water from IRB

When negotiating the break the IRB is sometimes filled with water. Where the IRB has 100mm (4") or more of water above the floor board and is within the break, the IRB should be returned to shore. Where the IRB is in open water or in a safe situation inside the break, the excess water can be quickly emptied from the IRB by the following simple manoeuvre:

The driver calls the crewperson back to the rear of the IRB and both the driver and the crewperson sit as far back as possible hanging on to the pontoon ropes. The driver then accelerates the IRB forward allowing the bow to rise to a position of approximately 45 degrees to the horizontal with the IRB travelling preferably into the wind. This allows the excess water in the IRB to quickly drain out over the transom and out through the self bailers. F32

Further excess water can be drained out by maintaining the IRB on the plane at a reasonably fast speed and allowing the water in the IRB to flow out through the self bailers.

If the IRB is taking on water during low speed operation or when stationary, the likely cause is damaged transom auto bailers.

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Crewperson recovery

If a crewperson falls overboard, the IRB stability will be affected. Therefore drivers should practice to get the feel of the IRB with only 'one up' so they can safely manoeuvre the IRB solo in the break and return to a position where the crewperson can re-board. F33

Unless absolutely necessary do not head directly towards incoming waves but proceed at a slight angle to the waves to enable the IRB to be turned around quickly. Approach incoming broken water at a speed necessary to manoeuvre safely.

Propeller hazards

Weed on propeller

One of the major hazards for IRBs is weed in the surf. Weed should be avoided where possible.

The driver can generally tell if there is weed on the prop guard because of:

- Different engine tone.
- Loss of speed.

The quickest remedy, particularly if the driver is faced with an incoming wave, is to throttle back the engine to low speed (still in gear) tilt the engine inboard so the propeller clears the water and then quickly lower the engine into the driving position. This manoeuvre will generally allow the weed to fall off the prop guard.

Alternatively, if the weed is wedged into the propeller and guard, the crewperson should jump over the bow and hold the bow carry handle acting as a sea anchor. The engine should be stopped and tilted into the IRB with the gear lever placed in neutral. The weed can then be cleared by hand. F34

Other propeller hazards

Buoy lines and fishing lines must be watched for. To travel across a buoy line, the driver should shift the gear lever into neutral, then tilt the engine momentarily and glide across the line.

The rope and shoulder strap on rescue tubes are hazardous, if loose in the IRB these may pass through the self bailers and into the propellor.

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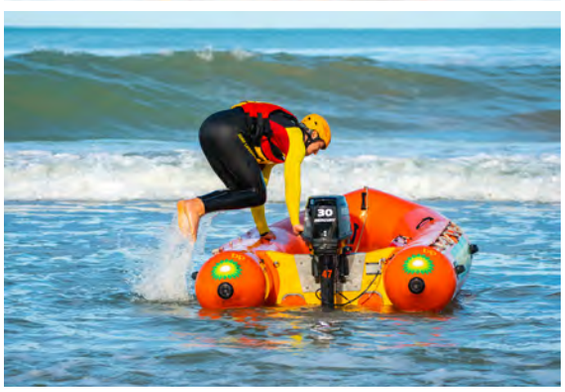

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Solo driving

Solo driving is not a recommended practise under normal circumstances, the IRB should not put to sea without a crewperson and driver. However, should the crewperson fall out at sea the driver needs to have the necessary skills to drive the IRB solo and recover the crewperson.

Launching off the beach

When learning to solo drive there are several different methods. A solo driver may choose to start the engine from outside the IRB then board, engage forward gear and then proceed. This will allow more control of the IRB while going through the engine start procedure. F35

When driving solo, move your body physically forward a bit more than the normal position. This takes weight away from the back of the IRB, helps it to get up on the plane faster and helps in getting through the surf. F36

Parallel running

Transfer of driver's weight (position) in the IRB is necessary to balance the IRB during parallel running. Move to the middle of the IRB. This will also keep the IRB even and stable when turning right (left is very easy to turn when driving solo but there will be times when a driver will have to turn right). F37

Driving in surf

Try and keep your bodyweight towards the middle of the IRB. This will stop the IRB veering left and give a more direct line towards the surf.

Approaching waves

Keep driving as if a crewperson is in the IRB. Hit waves on the angle going to the right where possible. This keeps the weight on your side of the IRB and prevents capsize.

IMPORTANT:

Never let go of the throttle/steering arm. Always control the speed of your IRB. Avoid hitting waves too hard as the less air you get, the less chance of capsize. Choose your lines carefully through the surf and always be aware of what is happening around you as there is no crewperson to give directions.

IRB capsize

During a season of IRB training and patrol operations the law of averages indicates that an IRB will be capsized several times. Accordingly, it is most important that the driver and crewperson know the procedures to be adopted in case an IRB is capsized.

All capsizes, collisions, mishaps or notifiable injuries, illness or serious first aid that occurs during IRB operations (e.g. during patro, search and rescue, sport training, lifeguard training) needs to be reported to either your Regional Lifesaving Manager via email within 24 hours of the incident occurring. Intentional capsizes of an IRB for training purposes are not required to be reported.

Common causes of IRB capsize are:

- Loss of engine power as the IRB is about to take on a wave.
- Engine failure within the break.
- Driver error in taking on a wave too fast.
- Driver error in taking on a wave at an angle.
- Driver error in taking on a wave too fast and at an excessive angle.
- Driver error in misjudging an oncoming wave and allowing insufficient time to turn and run.
- Crewperson error by shifting weight balance across to driver's side pontoon.

When capsized the driver and crewperson should immediately attempt to re-right the IRB by:

- Climbing onto the upturned keel, locating and releasing the rollover rope from its pocket (look for the indicator arrow). F38
- Standing on the opposite pontoon to the rollover rope connection, raise one hand to protect your head and simultaneously pull on the rollover rope and the IRB will quickly right itself. F39
- If surf conditions permit, the driver should reboard the IRB while the crewperson holds the IRB steady facing the oncoming surf by holding the bow carry handle.
- The driver should immediately attempt to restart the engine. If the engine will not restart, the driver should jump overboard and turn the IRB around so that the stern is facing the oncoming waves. The IRB can then be manoeuvred towards the beach by the crew holding onto the stern pontoon ropes and using their bodies as sea anchors. F40
- When returing the IRB to shore the IRB will manoeuver more freely on the waves if the engine is in neutral and not in running gear. F41

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G Rescues

This section details the knowledge and skill required to respond to rescue situations.

Rescues

Knowledge and skill to respond to rescue situations

Speed is the essence in an emergency rescue, and calculated risk may be necessary. However the risk should be tempered by sound judgement.

General rescue information

The skills, technique and knowledge required by the crewperson and driver for rescue situations in this section will need to be incorporated into the rescue types covered in later sections.

The driver should approach the patient from a slight angle so by the time they secure the patient the IRB will naturally come into a position of facing out to sea.

It is important in all rescue manoeuvres where the IRB is coming alongside a patient for a 'pick up' that the crewperson moves across the IRB smoothly and as late as possible to maintain the balance of the IRB.

Patient pick ups

Conscious patient pick up

The following technique should be used by the crewperson when lifting a conscious patient into the IRB:

- Plant your feet under the port pontoon in a wide stance (well over shoulder width) lean your knees on the pontoon for support.
- Alternatively you can plant your left foot under the port pontoon and your right foot pushed against the starboard pontoon for support.
- Lift the patient aboard by grasping under the armpits or by their outstretched arms, lift the patient as high as possible.
- The driver will then accelerate the IRB slightly forward so the patients legs rise to the surface.
- The driver then grasps the patients legs with the left hand while commencing a port (left hand) turn that will assist to roll the patient into the IRB. H1

Unconscious patient pick up

If the patient is unconscious or is incapable of obeying instructions, the following pick up technique should be used:

- The crewperson will adopt the same stance as used for a conscious patient pick up. Have the patient facing away from the IRB, turn if necessary.
- Grasp the patient under the arms and lift as high as possible.
- The driver will then assist in the same way as the conscious patient pick up. H2

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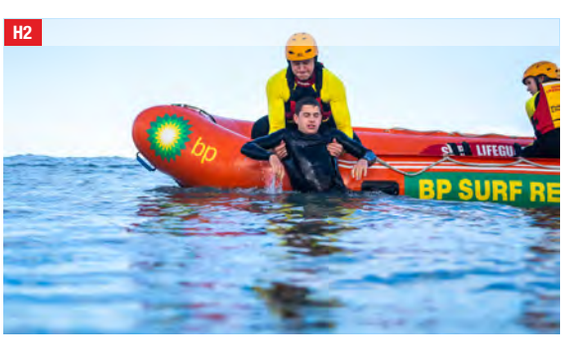

H3

Suspected spinal injuries

In the sea most spinal injuries are caused by diving into water which is too shallow (such as a rock shelf or sand bar) or being dumped by a wave onto a sand bar. There is often an associated head injury which makes recognition of the spinal injury more difficult.

Recognition of spinal injuries:

- Pain over the spine is the most important symptom.
- The patient may suffer loss of muscle power in the limbs.
- The patient may have a loss of feeling in the limbs and body.
- The patient may have difficulty in breathing.
- The patient may be found floating face down in the water.

Treatment of spinal injuries

It is essential the crewperson makes the driver aware a possible spinal injury has been identified, so a signal for assistance required can be given. Emphasis is on immobilisation of the neck and maintenance of the airway from commencement of the pick up. The patient should be positioned on their back and instructed not to move. The crewperson should support the patient in the neutral alignment position and minimise movement of the patient against the motions of the IRB.

The driver should immediately signal for assistance on nearing the shore. The driver should manoeuvre the IRB through the surf to avoid any undue discomfort for the patient and reduce the likelihood of causing further damage to the injury.

On reaching the shore, where conditions permit, the patient should be left in the IRB until medical assistance arrives. However the crew should ensure that the IRB is not excessively knocked by incoming waves. Removing the engine from the IRB will assist this.

The IRB can be used as a stretcher to carry the patient to a suitable location for transfer by a medical team to an ambulance or helicopter.

It is imperative that the patient is supported in an immobilisation position at all times to avoid any further complications. H3

Patient lift and carry from the IRB

The driver will beach the IRB as close as possible to the waters edge. The patrol will assist if available.

- The crewperson should lift the patient up under the armpits and at the same time the driver should lift the patient's legs. H4
- The driver will step out of the IRB followed by the crewperson. H5
- They may allow for a pause by resting the patient on the side pontoon half-way through this procedure. H6
- The patient should then be carried up the beach with the crewperson holding the patients chin to support their head.
- Appropriate patient care should then be administered as required. H7

IMPORTANT:
If the patient is unconscious an open airway (pistol grip) must be maintained throughout the above procedure.

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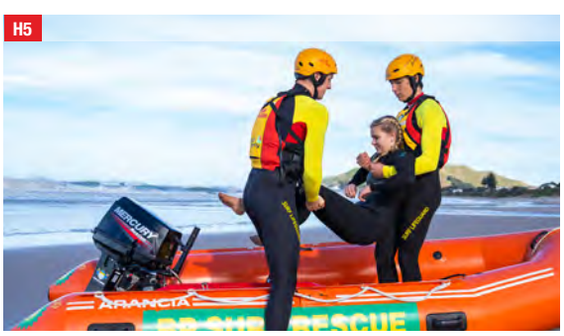

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Rescue types

The following rescue types are described fully, incorporating both driver and crewperson responsibilities. It is described in this way as both driver and crewperson need to know what the other is doing in order to complete the rescue effectively and efficiently.

If a rescue is made inside the break it should be done just after a wave hits the patient to allow maximum time to carry out the pick up before the next wave arrives. The IRB should be pointing into oncoming waves.

Single conscious patient rescue

Proceed directly to the patient. Position the IRB to have the patient alongside the port pontoon at the bow.

- On reaching the patient the driver idles the engine (in gear).
- If the patient is conscious and not panicking the crewperson moves smoothly across to the port pontoon and begins to lift the patient (see conscious patient pick up for more detail).
- The driver will then assist by commencing a port turn and lifting the patient's legs (see conscious patient pick up for more details).
- If the patient is in need of assistance the diver should signal 'assistance required' to the shore patrol.

Unconscious patient rescue

As with the conscious patient rescue the driver proceeds directly to the patient and positions the IRB to have the patient along side the port pontoon at the bow, with the engine idling in gear.

- The crewperson moves across to the port pontoon and commences an unconscious patient pick up (see unconscious patient pick up for more details). H8
- Once the patient has been lifted into the IRB the crewperson adopts a seated position in the bow leaning back against the pontoon. The crewperson positions the patient between their legs, reclined against their body, supporting their head. H9
- The crewperson will then check the Airway, Breathing and Circulation (ABC).
- If unconscious and breathing, maximum head tilt should be applied.
- If the patient requires resuscitation this should be carried out immediately by the crewperson, with the patient's head resting on the crewperson's thigh, in maximum head tilt. Clear the airway, give two slow full breaths and then proceed with rescue breathing until the IRB reaches the shore.
- When returning to shore with an unconscious patient the driver should signal 'assistance required' to the shore patrol. H10

H8

H9

H10

Multiple patient rescue

Often patients will be part of a group swept out to sea in the same rip. In this case:

- Proceed directly to the patients.
- If needed, signal ‘assistance required’ to the shore patrol. H11
- If safe, place the engine in neutral gear while a mass rescue pick up is taking place, as patients have a tendency to come from all directions.
- If safe, instruct the patients to grasp the pontoon ropes
- Lift most at risk cases on board.

Where rescue tubes are available they should be thrown out to the patients. H12

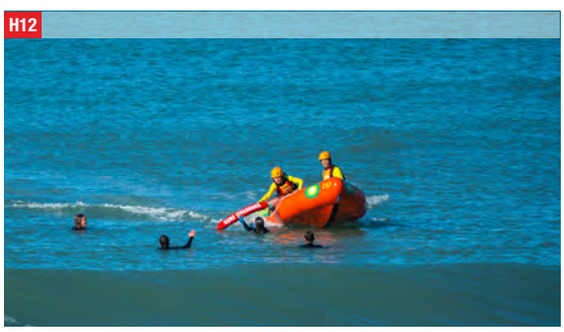
In some situations the crewperson may need to stay with distressed patients while the driver takes other patients back to shore. H13

Before taking patients back to shore, reassure all others in the water that you will be returning very soon. Repeat the operation until everyone is on shore.

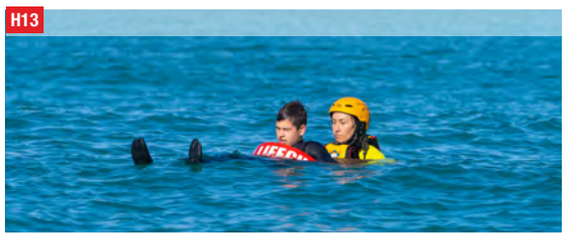
Alternatively, where conditions permit, the driver can slowly drive the IRB out to a still water situation with the patients inside the IRB and also hanging on to the pontoon ropes, ensuring that the patients are clear of the propeller.

H11

H12



H13

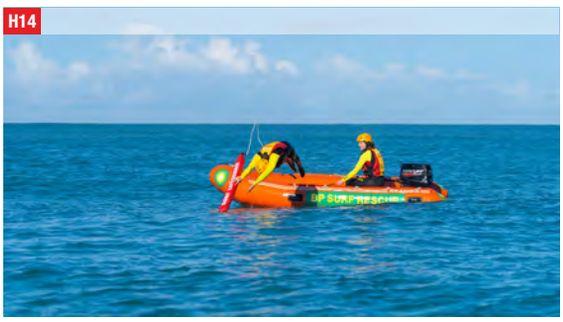


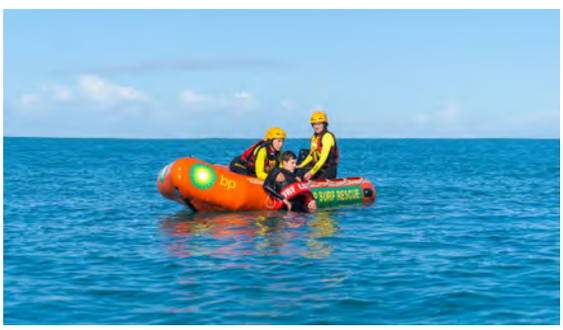
Tube rescue

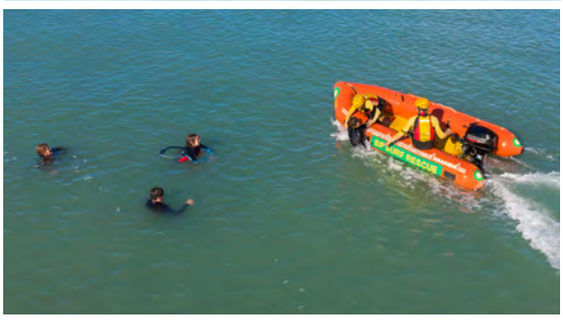
Where the patient is in broken surf near rocks or in such a position that it would be unsafe for the IRB to perform a normal pick up:

- Proceed as close as possible to the patient. The crewperson should put on the rescue tube shoulder strap and swim fins. Leave the IRB on the port side, swim to the patient and secure with rescue tube. Administer resuscitation if necessary.
- The crewperson then swims the patient back to the IRB which should be idling in a safe position to allow the patient to be safely lifted aboard. H14

H14







H IRB Closedown

This section describes how to complete a closedown of an IRB hull and engine after use.

IRB closedown

Procedures for the closedown of an IRB

G1

Loading the IRB on to trailer

To load the IRB on to the trailer the crew should work together to lift the nose of the IRB. Once lifted one of the crew brings the trailer in under the hull. The IRB can then be gently lowered onto the trailer. G1

If you are not physically strong enough to hold the IRB before loading the trailer under the boat a third person will be required to assist.

Correct placement of the IRB on the trailer is essential to avoid damage to the auto bailers.

Fuel bladder closedown

- Remove the fuel bladder and wash. G2
- Refill the fuel bladder and store on a flat dry surface, not in the IRB. G3
- If there is evidence of any fuel bladder leakage the IRB must be deflated, floorboard removed, re-inflated and both hull and floorboard washed with soapy water.

IRB hull closedown

1. Wash IRB systematically, starting at the bow and working to the stern including a light spray of the engine with cover on (engine should then be removed for closedown by the driver).
2. Check IRB for damage and abrasion.
3. Ensure all sand is removed and flush out the auto bailers (sand acts like sandpaper and will grind away at the IRB).
4. Wash trailer including wheels and hubs.
5. Wash all equipment used that day such as PFDs and check for any damage or deterioration.
6. Deflate the IRB to approximately 3.5 kPa at the end of use. This will relieve the pressure on the seams and valves, helping to extend the life of the IRB.
7. Elevate the front of the trailer to allow the IRB to drain when stored. G4

G2

G3

G4

The IRB should always be stored on a trailer when not in use. Never store the IRB on a bare concrete floor. When shifting the IRB never drag it, always lift the IRB clear of the ground.

IMPORTANT:
If your club gets after hours call outs regularly then leave an IRB fully inflated, but fuel bladder removed.

IRB Routine maintenance

The IRB should be regularly examined for excessive wear and tear.

Every weekend (or at the end of every patrol for beaches with heavy shell or debris content), the following IRB maintenance should be observed:

- Deflate the IRB and remove the floor board.
- Re-inflate the IRB and keelson and hose down with fresh water, completely removing all sand and debris from inside the IRB and from the floor board.
- Scrub with soapy water if required.
- Deflate the IRB and re-fit the floor board.
- Re-inflate the IRB ready for storage. G5

Life expectancy

The life expectancy of an IRB is dependant upon five major factors:

- Hours of use
- Correct inflation
- Type of use
- Maintenance and cleaning
- Correct IRB positioning on trailer (sitting level, and situated in the middle of the trailer).

It is in the four latter categories that the life expectancy of an IRB can be extended, in fact doubled, by good management.

It is important to record evidence in the IRB operations log book, of any IRB servicing peformed by club members and/or service agent.

IRB engine closedown

1. While attached to the hull, lightly hose the engine with cover still on.
2. Remove engine from IRB, fit to engine stand and place the engine in the flush tank.
3. If required, remove the engine cover and very lightly rinse powerhead, avoiding the carburettor, to remove possible salt/sand deposits. G6
4. Remove remaining water from the powerhead using a cleaning rag or blow dry with the foot pump. G7
5. Wipe inside engine cover with a damp rag and set down the correct way up to avoid scratching.

G5

G6

G7

5. Wipe inside engine cover with a damp rag and set down the correct way up to avoid scratching.
6. Ensure gear lever is in neutral position. Start engine, check tell tale for water emission and run until engine stops (carburettor runs out of fuel). **Do not rev engine when running out of fuel. Alternatively if the engine is to be used the next day then it is not necessary to run the fuel out, simply switch the engine off.**
7. Remove engine from flush tank.
8. Lightly spray powerhead with dewatering agent and wipe dry with a clean rag. Be careful to ensure dewatering agent stays away from pull start handle and any rubber components on the engine.
9. Remove any grime/oil stains with a clean rag (and cleaning agent if required) while completing a systematic check of the engine top to bottom.
10. Sit the engine cover loosely on the engine so that air can get in and around the powerhead.

– Alternatively place a dry towel over the powerhead and then place the engine cover loosely on top. G8

11. Store the engine on a stand or engine rack.
12. Record driver/crewperson time in IRB Operations Log Book.
13. Record any problems in Log Book and advise the Club IRB Officer.
14. Record any rescues, preventatives, first aids on the relevant Patrol Captains and Incident Report forms.

G8

IRB engine maintenance

Surf engines require regular maintenance and servicing. The frequency and type of servicing will depend on hours of use, operating conditions and general care. The engine is the most vital, but also the most vulnerable part of the IRB.

Engine service record

It is important to record evidence in the IRB operations log book of any engine servicing performed by club members/ service agent/SLS Engine Maintanence Workshop.

Cleaning of engine

When cleaning the engine, use a clean rag to wipe off grime and oil stains on the external engine. Periodically clean the complete engine including powerhead using kerosene and a paint brush. Lay engine on its back and rinse over with fresh water avoiding the carburettor area. G9

G9

Mechanical stress

Common areas of mechanical stress are:

- Throttle
- Tiller arm
- Steering bracket
- Transom clamp screws
- Transom bracket
- Cavitation plate
- Gearbox
- Propeller guard

These areas should be inspected before and after use.

IMPORTANT:
All damage should be immediately reported to your club's IRB Officer and recorded in the club's IRB Operations Log.

I Operations

Control of an IRB for patrol and non-patrol activities.

Operations

Control of an IRB for patrol and non-patrol activities.

Patrol

The use of the IRB during patrol will be at the direction and request of the patrol captain. When the IRB is in the water the driver is responsible for its safe operation. I1

It is compulsory for the driver and crewperson to wear a New Zealand Standards approved personal flotation device (PFD) and helmets at all times when the IRB is on the water.

The driver should:

- Advise the patrol captain that the IRB is ready for patrol.
- Check surf conditions, rips, channels, location of swimmers. Check the tide timetable for the day.
- Decide the best place to launch the IRB.

When the IRB is left on the beach during patrol, it should always be left with the bow facing up the beach so that the IRB is in a natural draining position. It is also important to have the IRB sitting next to the flagged area ready to respond to rescue situations. I2

Training during patrol hours

Any training undertaken during patrol hours must have the approval of the patrol captain. The following precautions must be undertaken:

- Use 'Training in Progress' sign. I3
- Drive the IRB responsibly at all times.
- Make it clear to the public that you are training.
- Train during a quiet time of the patrol day.
- Train in an area that does not affect normal patrol operations i.e. well outside the patrol flags.
- Ensure you maintain regular contact and stay within signalling distance of the patrol in case the IRB is needed.

I1

I2

I3

Safe stowage of equipment in an IRB

If you are required to carry equipment in the IRB, the following procedures **must** be applied.

Anchors and Heavy objects

- Anchors and heavy objects **must** always be stowed securely at the back of the IRB against the transom. I4
- All equipment must be clear of the driver's feet and legs.
- The weight of the equipment, driver and crew must not exceed the maximum permissible load for the IRB, i.e. 600 kg.
- All anchors must have a buoy attached to them during transportation in an IRB.

IMPORTANT:
Anchors, heavy objects and bouys must never be stored at the front of the IRB. This course cause serious injury or harm. I5

Deployment of bouy's

- All ropes must remain coiled, until the deployment of each individual buoy.
- Only one buoy should be deployed at a time, meaning that only one rope should ever be uncolled within an IRB.

Driving in surf with equipment

Driver's should aviod breaking waves where possible, when proceeding out to sea. All steps to minimise equipment movement in the IRB should be taken.

When returning to shore, select a wave to follow and move in behind it. The driver should watch carefully how the wave forms and breaks to judge whether the IRB is capable of holding position behind the wave, particularly with equipment aboard.

I4

I5

Towing the IRB on public roads

Refer to LTSA fact sheet 13d

If the distance from the rear of the trailer to the most rearward point of the load is greater than one metre (and the projecting part is less than one metre wide) then one warning device must be attached to the centre of the projecting part of the load:

- In daylight, a flag or hazard panel (facing backwards).
- During the legal hours of darkness, a red light visible from at least 200 metres away.

For more information see www.ltsa.govt.nz

- Inflate the IRB to working pressure when towing.
- Do not tow long distances with the engine on the transom.
- Ensure the IRB is well secured to the trailer.
- Ensure the trailer is registered with a WOF and lights are in working order etc, if applicable.
- Ensure load flag is displayed if applicable.

IRB Repair

The IRB is constructed using two types of gluing techniques: One permanent (used for the majority of IRB construction) and one semi-permanent (used for attaching wear strips).

A repair kit is supplied with each new IRB. The following items should be held in store for emergency repairs:

- A selection of repair patches.
- A tube of Bostik Super Contact Bond.
- A short stub 20mm paint brush.
- A pencil.
- Abrasive paper for sanding.
- A solid roller (a glass bottle will suffice).

Repairing minor tears and punctures

Leaks and punctures can be readily detected by coating the suspected area with soapy water. Bubbles will appear at the puncture site.

- Before effecting a repair, the pontoon or keelson should be deflated and the affected area clean and dry.
- Choose a suitable area to do the patching, for example, in the gear shed out of the sun.
- Select a suitable patch to cover the tear – this should have a 25mm overhang. Rest the area to be patched on a smooth flat surface. Mark around the patch with a pencil.
- Sand both the patch and IRB until the fabric has a dull matt finish. Remove all dust from both sanded surfaces.
- Using Bostik Super Contact Bond, apply a thin layer of glue to both surfaces and allow 20 minutes drying time. Apply another thin layer of glue and allow 15-20 minutes to become tacky.
- Touch down one edge of the patch and roll down. Use roller or similar to smooth down patch.
- Remove excess glue from around the patch by rubbing with your finger. Leave for 24 hours and if you are not happy with the result, have the hull repatched by an Arancia approved IRB Service agent.
- Drying time will vary depending on air temperature.

Bostik Super Contact Bond does not have waterproofing qualities and is recommended for minor patching, preferably above the water line. For major repairs, Bostik 2402 (a two part glue) must be used. This is not readily available from retail outlets and where possible the repair should be completed by an IRB service agent.

NOTE:

To patch fabric abrasions (not leaking air) carry out the same procedure but with the IRB inflated to working pressure. I5

I5

Engine troubleshooting guide

This guide details what to do when the engine doesn't start. The three main components that a two stroke engine needs to run are FUEL, SPARK and COMPRESSION. If an engine has all of these then it should start.

The following guidelines take you through a process covering these three main components and how to check them. Should the engine still not start after completing this process then contact your Service Agent.

- Check the IRB Operations Log Book to see if the engine has been recently submerged as there may still be some residual water in the carburettor and another reinstatement may be necessary.

- There must be reasonable resistance (compression) on both cylinders when you pull the engine over.
- Check choke mechanism is engaging correctly (butterfly is opening and closing).
- Check fuel is getting to the Carburettor (primer bulb is tight) and fuel is fresh.
- If you have flooded the engine and can see/smell overflow of fuel then push choke in, place kill switch in the 'run' position, apply full throttle and pull engine over using two hands to generate a high speed pull. If engine starts after around 6-8 pulls, hold throttle on until the engine clears surplus fuel, then back off the throttle and allow engine to idle.

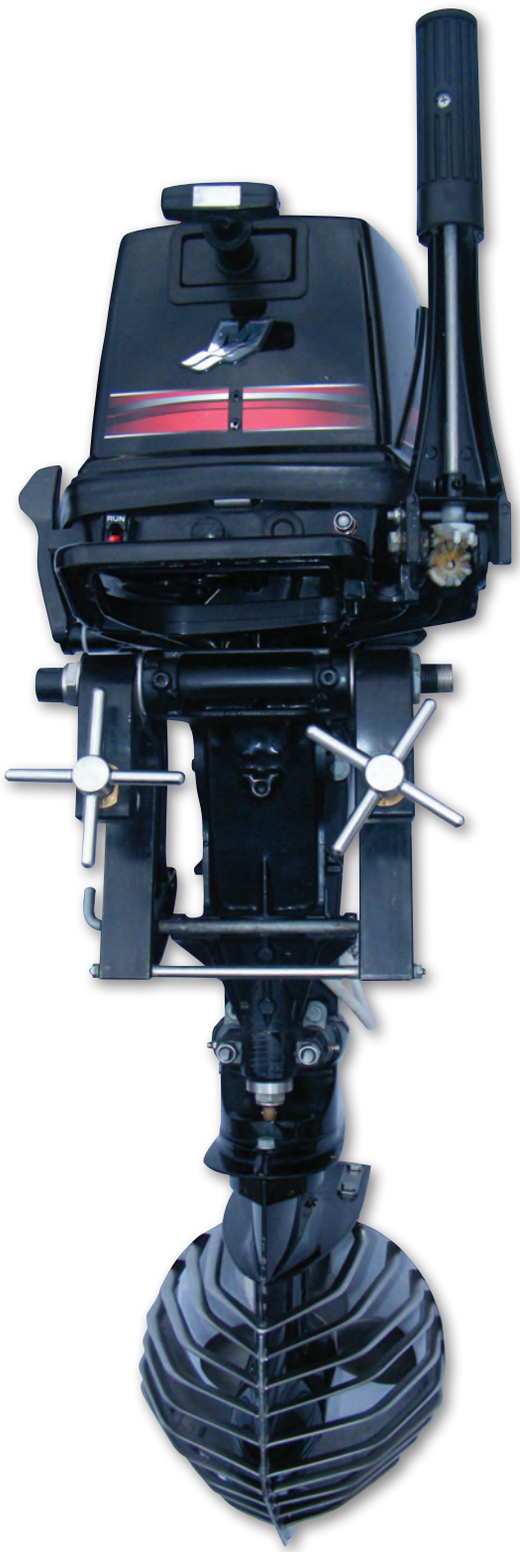
If the engine still does not start:

- Remove spark plugs and replace with a new set.
- If reusing existing plugs, clean and dry then check for a healthy spark by connecting the HT lead to the plug cap and, using insulated pliers, earth the plug onto the powerhead block (well away from spark plug holes). With kill switch in the 'run' position, pull engine over to generate spark. Repeat this process with the the other plug and HT lead.
- If no spark is found replace plug(s) and check for spark again.

CAUTION!!

Ensure any spilt/surplus fuel around the engine powerhead is washed away before testing for spark as the fuel may ignite resulting in a fire.

- If the engine still won't start follow the white wire from the kill switch and pull apart at connection joint. If the engine fires this suggests a faulty on/off switch. You can stop the engine if it is running with the switch disconnected by disconnecting the fuel bayonet.



IRB Equipment Suppliers

Arancia IRB

Quotes and supply
09-8150469
info@ararida.co.nz

Surf Engines

Quotes and supply
David Hickey 09-5246641 027-2806420
david.hickey@surflifesaving.org.nz

IRB Trailer / IRB Engine Trolley

Foxton Engineering Ltd
06-3638132
foxeng.nz@xtra.co.nz

East Coast Bays Engineering
09-4154416
thomas@ecbeng.co.nz

IRB Trailer Light-Bar

East Coast Bays Engineering
09-4154416
thomas@ecbeng.co.nz

Fuel Bladders

Covertex 15 Litre
Covertex 20 Litre
(Discount if you supply old fittings to be reused)

Covertex
09-8368255
sales@covertex.co.nz

Fuel Bladder Clips

Type 2470 (70mm x 31mm)

PSP Engineering
09-6241004
psp@pl.net

Propeller Guard (and repair)

Stainless Design Ltd
07-8491005
info@stainlessdesign.co.nz

Propellers

Propeller Services NZ Ltd
07-5422699
info@propellerservices.co.nz

IRB Spares

Foot Pump
Knife
Auto Bailers
Paddles
Pressure Gauge and Adaptor
Repair Glue
Barrel Nuts and Bolts for Foot Straps
Adjustable Footstrap

Arancia
09-8150469
info@arancia.co.nz

IRB Paint

Colour international orange to paint over signage

Sailors Corner
2 Westhaven Drive, Auckland
09-3096153
rhys@sailors.co.nz

Engine Surf Kit Parts

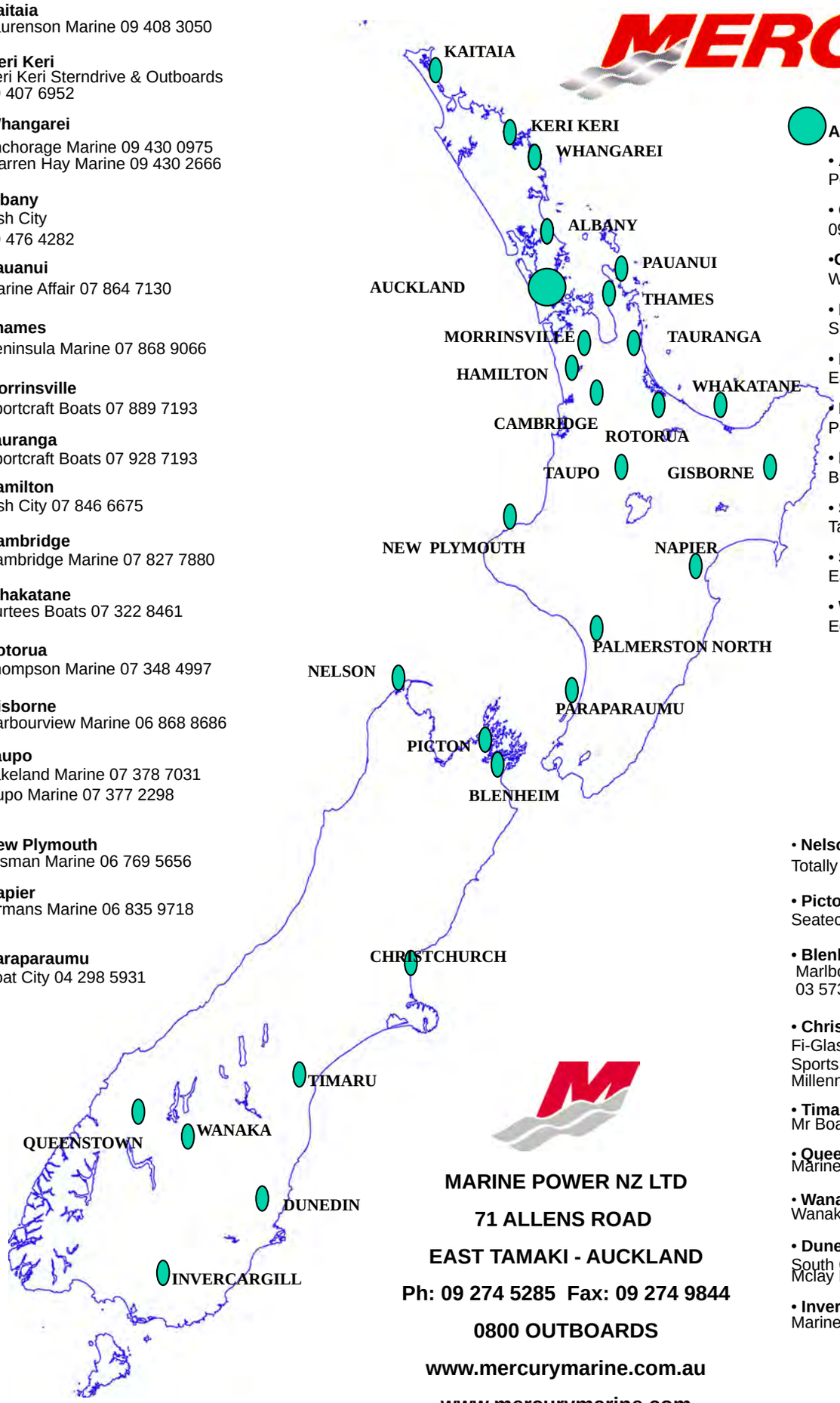
Spinners and brass inserts
Stainless Steel Compression Tube
Clamp Brackets
Pull Start Extension
Nolathene Solid Engine Mounts
Safety Strop

PSP Engineering
09-6241004
psp@pl.net

Personal Flotation Device (PFD)

Hutchwilco
09-5280788
www.hutchwilco.com

MERCURY



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  East Tamaki 09 274 9918
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