



## Department of Communications, Marine and Natural Resources

### Marine Notice No. 36 of 2005

*Notice to all users of Inflatable PFD / lifejackets, including Commercial Operators,  
Fishermen, and Recreational Boat Owners and Crew.*

Guidance on the use and periodic inspection of Inflatable PFD/Life jackets

(Refer to Marine Notice No.7 of 2002 for description of types of PFD/lifejackets)

#### **Background:**

Over the past number of years there has been an increased awareness of the importance of wearing PFD/lifejackets, among commercial and recreational boat Skippers and Crew.

S.I 259 of 2004 introduced legal requirements concerning the carriage and wearing of PFD/lifejackets on recreational craft, while S.I 586 of 2001 requires fishermen to wear personnel floatation devices at all times their vessel is under way.

This has been reflected in increased numbers wearing PFD/lifejackets while on the water.

Inflatable PFD/lifejackets now comprise a significant portion of the sales of new lifejackets to the boating public. They offer a number of advantages over traditional types including:

- Lightweight
- Easy to wear, do not constrain the wearer.
- Automatic operation options, range of models and types.
- Reasonable priced, and widely available.
- Ease of Stowage
- Perceived as "acceptable" to be seen wearing on the water.

Such PFD/lifejackets are now the primary choice of most boat owners, and are to be found in use on almost all craft.

However, with the increased proliferation of these PFD/lifejackets, there are real concerns that the associated essential maintenance required to ensure their reliability is being ignored by owners. It should be noted inflatable PFD/lifejackets have a finite lifespan, and this in turn is dependant on their being serviced and maintained on a regular basis, in accordance with their manufacturers instructions.

Full **servicing**, should only be undertaken by manufacturer-approved agents. In addition to inspection/renewal of firing mechanisms and CO2 cartridges, it involves the inspection, testing and renewal, of inflatable collar welded seams, webbing, sealing o-rings, internal non-return valves, and inflation/leak testing of the unit. Specialist tools and training are required, and it is essential that correct spare parts are always used. It is considered to be outside the competency of the average owner to undertake such a full servicing routine.

However, all owners should be familiar with the procedure to undertake an **inspection** of their PFD/lifejackets. The details of which are described in this notice.

### **Inflatable PFD/lifejackets:**

Inflatable PFD/lifejackets are designed to allow the wearer free and unimpeded movement on the deck of a boat, they comprise of a horseshoe type collar worn around the neck, and attached to the torso by suitable straps / webbing. Superior models will incorporate a safety harness with "D"-ring, and thigh straps. (Fig: 1)

Should the wearer fall overboard, the unit will activate an inflation chamber / bladder via a CO2 gas charge, the buoyancy of which keeps the wearer afloat.

Inflation may be "manual only" type - where the wearer operates the firing mechanism, or more commonly by "automatic" inflation whereby a sensing device will operate, causing the lifejacket to inflate if the wearer falls overboard or enters the sea.

There are two types of Automatic inflation systems currently available.

1. Soluble Pill or Collar type, - A spring loaded firing pin is retained in position by a cellulose collar within a firing cap. The tablet dissolves on contact with water, releasing the spring causing the firing mechanism to operate, piercing the bottle, and thus causing the jacket to inflate.

This design located the bottle outside the inflatable bladder making it easier to check, but leaving it prone to corrosion attack.

Movement of the jacket can also gradually cause the bottle to loosen in the firing mechanism.

This method has the advantage of operating immediately it comes in contact with water, but there are instances of them operating inadvertently, due to becoming wet or damp following to exposure to heavy rain or spray. Modern designs incorporate protection to reduce the frequency of this occurring.

2. Hydrostatic - requires the wearer to be immersed to a minimum depth of water before operating, but will not fire if the unit is wet.

The firing mechanism requires submersion to a depth of approx 100 - 150mm before it will operate.

The firing bottle is located within the bladder offering protection from corrosion.

To change a bottle requires the breaking of a major seal on the unit, it is recommended that any maintenance on these inflatable lifejackets is only undertaken by trained personnel.

Automatic types are also equipped with manual firing in the event of failure of the automatic mechanism to deploy. Inflatable PFD/lifejackets are also fitted with an oral means of inflating or topping up the inflation chamber by the wearer.

### 1. Soluble Pill or Collar Type Inflatable PFD/Lifejackets

The inflation chamber, CO2 charge bottle, firing mechanism and manual inflation tube, are all packed within the external cover most wearers are familiar with. (Fig: 1 & 2)

*Owners should read and keep, all manufacturers care and servicing instructions supplied with new inflatable PFD/lifejackets*



Fig.1 150N Inflatable PFD/Lifejacket

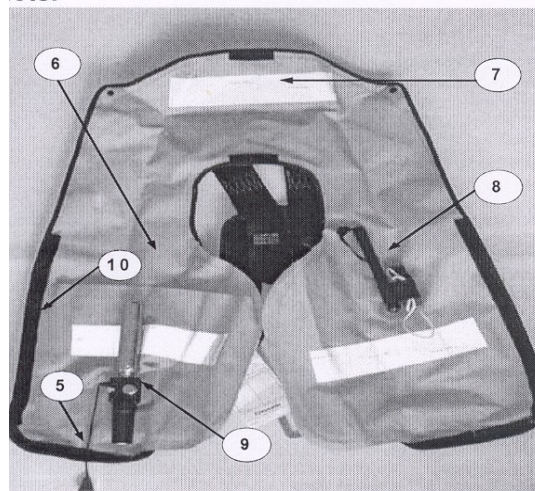


Fig.2 PFD/Lifejacket components

- 1 External Cover
- 2 Webbing
- 3 O-Ring for safety Harness
- 4 Buckles
- 5 Manual Firing Toggle
- 6 Inflatable collar
- 7 Retro reflective tape
- 8 Manual Inflation Tube and cap
- 9 Firing Mechanism
- 10 Velcro Sealing tape

### Inspection prior to each use

The following brief safety checks should be undertaken **each time before** donning.

- Harness straps / stitching inspected, and checked for damage / wear
- External lining inspected for wear / damage.
- All buckles checked / adjusted as required.
- Crotch/thigh straps attached.
- CO2 Firing Cylinder *firmly* screwed in position.
- Manual Firing lanyard positioned for use if required.
- Be aware of any marked expiry dates of the firing mechanism components, do not use the unit with expired components.

### Periodic Inspection by owners - Standard models.

Refer to figs. 2, 3, 4

- Lay jacket out on a suitable flat worktop surface
- Visually inspect the external lining for wear or damage.
- Inspect all webbing, plastic or stainless buckles, "D"-rings, and fittings for wear damage, or corrosion.
- Open the velcro edge-sealing strip, undo any pop closers on the neck area, and carefully open out the yellow inflator collar, noting the manner it has been packed.
- Locate, unscrew, and remove the CO2 Cartridge from the inflation mechanism. Unscrew and remove the firing cap - the unit is now safe to work on. (Fig 3 & 4)

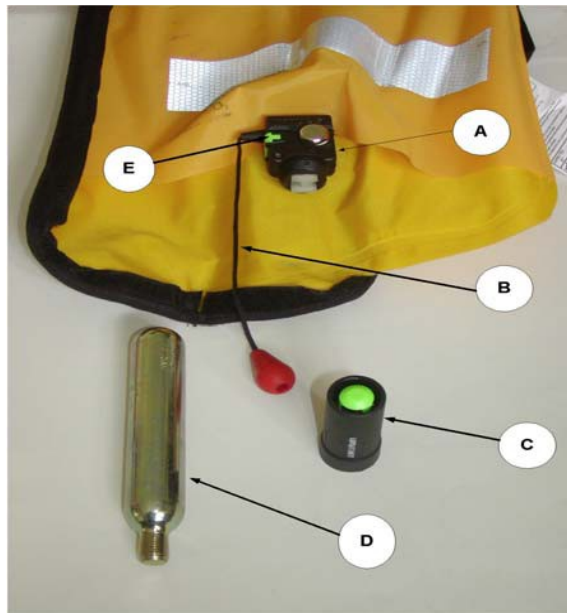


Fig.3 Firing mechanism unit (armed)

Fig.4 Firing mechanism (unarmed)

**A** - Firing Mechanism. **B** - Manual Release Lanyard. **C** - Firing Cap. **D** - CO2 Cartridge **E** - Firing Safety Tab.

- Examine the condition on the CO2 bottle, ensure the unit has not previously discharged - the seal in the bottle neck should be intact, and the bottle weight should correspond to that stamped on the outside.  
Renew the CO2 bottle if any signs of corrosion are noted, pay particular attention to any damage to the threaded section of the cartridge. Fig 5. below shows a selection of cartridges, only the unit on the left is suitable for reuse, the others have been condemned.



Fig.5 CO2 cartridges, (new and condemned models)

- Examine the firing cap, - some may be stamped with an expiry date, replace before this date, otherwise renewal frequency should be based on manufacturers instructions. The firing cap may have safety tags fitted to indicate if the unit has operated, ensure they indicate correctly and are in place. (Green tag on fig 4 item C.)
- Firing mechanism units may also be fitted with safety tabs, which detach in the event of operation, and offer external evidence of the unit having fired - if fitted check it is in position. (fig:4.item E)
- With the bottle removed, check the operation of the firing mechanism by pulling on the manual lanyard, the action should be free, with the operating plunger returning to the housed position on release.
- Examine the sealed edge of the yellow inflatable collar for damage, ensure it has not failed in way of the creases caused due to folding within the outer lining. I . Ensure all Retro Reflective tape strips are in place. (Fig: 2 item 7)
- Remove the cap from the manual inflator tube, orally inflate the collar (**DO NOT** use a compressed air supply) and leave for 24hrs, re-examine, while there may be some slight fluctuation due to temperature variation, if a significant loss of pressure occurs, the unit should be sent to the manufacturers approved service station for attention.





Fig 6 Oral Inflation Tube and Cap -incorporating pressure release on reverse side of cap.

- If the pressure remained satisfactory, deflate the collar via the manual inflation tube, the tube cap is designed to be reversed and used to hold open the associated non-return valve, thereby allowing pressure release.
- **DO NOT** attempt to vent the tube by inserting any foreign item into the tube valve assembly (e.g. a pencil) damage to the inflation valve may result, and will render the PFD/lifejacket unsafe. If any concerns exist regarding this inflation valve always return the jacket to the manufacturer's service centre.
- Ensure all air is completely expelled from the inflatable collar, replace the manual inflation cap.
- Rearm the unit by replacing the firing cap, ensure the firing pin is housed correctly and will not inadvertently operate the CO2 cartridge on tightening into the housing before replacing the CO2 cartridge; it is **essential** that the bottle is screwed fully and firmly into place and checked *for* tightness.

Carefully repack the yellow inflator collar as originally found inside the external lining, generally inflator collars are packed in order to inflate outwards on pressurising.

### **Warning**

In the event of a PFD/lifejacket inflating due to its gas charge, take great care to avoid inhaling the gas when deflating to repack the unit. CO2 is hazardous to health.

## 2 Hydrostatic Type Inflatable PFD/lifejackets\_- e.g. Hammar models

This type of jacket operates subject to water pressure when the wearer is immersed to a certain depth.

Due to the increased skill, technical knowledge and specialist tools required, **no attempt** should be made to service the firing device other than by manufacturer approved personnel.

General inspection is limited to an external inspection of the firing unit to check that it is still within its expiry date, and that the operating indication still shows it is armed (Green tag showing). Fig 7. Item B

Note that the CO2 cartridge is housed within the inflatable collar, and requires the unit to be dismantled to renew it. This should only be undertaken by manufacturer approved personnel due to complexity of obtaining ~ correct seal on assembly.

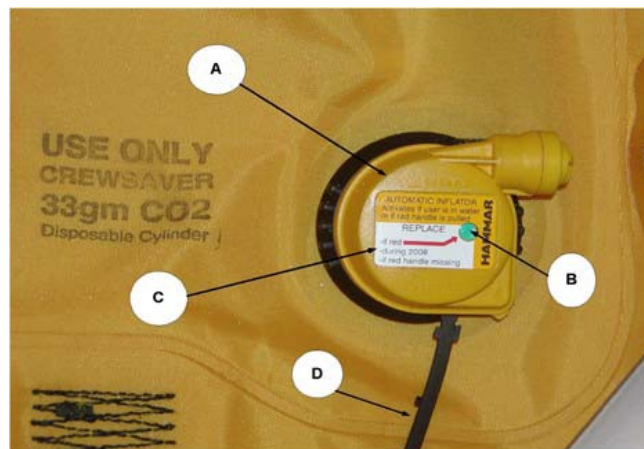


Fig.7 Hammar Hydrostatic Unit.

- A - Hydrostatic firing unit CO2 cartridge housed within the inflatable collar.
- B - Firing indication tag (green = ready, Red= discharged)
- C - Unit expiry date.
- D - Manual firing lanyard

The inflatable collar may be manually inflated and checked as in the previous sections

### **Care of Inflatable PFD/lifejackets**

Inflatable PFD/lifejackets only have a finite lifespan, and while offering substantial advantages over traditional PFD/lifejackets, they require regular servicing, inspection, and correct storage when not in use. They should not be left in high moisture environments e.g. tender bilges, and they are not designed to sustain substantial mechanical abuse.

If following an inspection, ANY concern exists regarding the unit or a component on it ALWAYS refer it to an approved service agent for immediate attention, Identify the PFD/lifejacket, remove it off the boat and do NOT use it!

Inflatable PFD/lifejackets are supplied with a service routine by the manufacturers that should always be adhered to by owners.

Suitably competent and trained individuals should only undertake servicing of PFD/lifejackets, using correct spares parts.

Director General  
Maritime Safety Directorate  
Department of Communications, Marine and Natural Resources,  
Leeson Lane,  
Dublin 2.

22<sup>nd</sup> December 2005

For any technical assistance in relation to this Marine Notice please contact  
The Marine Survey Office, Leeson Lane, Dublin 2 +353 1 678 3400  
For information in relation to technical specification/type approval of radio equipment contact the Radio  
Surveyors +353 1 678 2363/2364/2365/2367.  
For general enquiries please contact the Maritime Safety Division at +353-1-678 3418  
Any enquiries concerning Marine Notices should be addressed to:  
Maritime Safety Directorate, Leeson Lane, Dublin 2  
Email: [marine.notices@dcmnr.gov.ie](mailto:marine.notices@dcmnr.gov.ie)  
Or visit us at: [www.dcmnr.ie](http://www.dcmnr.ie)