

RESCUE BOAT - COAST GUARD (CG-5214) REVIEW (DATE)  
(MANUFACTURER) (MODEL)

Material reviewed:

1. (LETTER)
2. (DRAWINGS: MAIN ASSEMBLIES, DIAGRAMS, LABELS)

**REQUIREMENTS**

**MANUFACTURER COMMENTS**

**COAST GUARD REVIEW**

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**DRAWING LIST**

Lists all drawings, specifications, manuals for approval

- number
- revision issue/date
- title

(List Dwg # or document where applicable information can be found)

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**GENERAL ARRANGEMENT**

Overall arrangement

Principal dimensions - not less than 3.8 m and not more than 8.5 m in length

**Fast Rescue Boat, not less than 6 m in length.**

Unless the rescue boat has adequate sheer, it shall be provided with a bow cover extending for not less than 15% of its length.

Persons capacity - Rescue boat shall have capacity for at least 6 persons including 1 lying down. (see seating arrangement)

<<No stretcher size in SOLAS; USCG "Stokes" litter measures 0.61 m x 2.13 m x 0.229 m (tapered at legs & head) >>

(Dwg # / Doc # requested in {all/most} blocks below)

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Condition A & B weights

Every rescue boat shall be so arranged that an adequate view forward, aft and to both sides is provided from the control and steering position for safe launching and manoeuvring.

Except in the vicinity of the rudder and propeller, a buoyant lifeline shall be becketed around the outside of the rescue boat. Buoyant lifeline of ultraviolet resistant material, or other suitable handholds, must be provided on the outside of the rescue boat, above the waterline, and within easy reach of a person in the water.

Skates or fenders required to meet impact test?

Rigid and rigid-inflatable rescue boats which are not self-righting when capsized shall have suitable handholds on the underside of the hull to enable persons to cling to the rescue boat. The handholds shall be fastened to the rescue boat in such a way that, when subjected to an impact sufficient to cause them to break away from the rescue boat, they break away without damaging the rescue boat. Handrails must extend for half the length of the boat on both sides of the hull, and the clearance between the rail and hull must also be at least 38 mm (1.5 in). The rails must be attached to the hull below the chine or turn of the bilge, must be faired to prevent any fouling, and not project beyond the widest part of the boat.

Fast rescue boats must be self-righting or capable of being readily righted by not more than two of their crew.

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LINES PLAN

**REQUIREMENTS**

**MANUFACTURER COMMENTS**

**COAST GUARD REVIEW**

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**STABILITY DATA**

Righting arm curves (required for self-righting boats)

- light/intact
- light/flooded
- loaded/intact
- loaded/flooded



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**SEATING ARRANGEMENT**

Must meet SOLAS diagrams / dimensions

Each seating position not on a bench or chair clearly intended for one person, must be indicated by a semicircle of a color that contrasts with the color of the seat.



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**EQUIPMENT INSTALLATION AND STOWAGE PLAN**

Boarding ladder. The lowest step of the ladder shall be not less than 0.4 m below the rescue boat's light waterline. Ladders for rigid rescue boats must be able to be used at any entrance.

Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts



**REQUIREMENTS**

**MANUFACTURER COMMENTS**

**COAST GUARD REVIEW**

All rescue boats shall be fitted with sufficient stowage to provide for the storage of the small items of equipment.

Each storage compartment must be supported and secured against movement. It must have adequate hand access for removing and storing the required equipment, provisions, or water, and for cleaning the inside of the compartment.

**Fast rescue boats must be self-bailing or be capable of being rapidly cleared of water.**

Each rescue boat which is not automatically self-bailing must be provided with a manual bilge pump approved under subpart 160.044.

**HULL CONSTRUCTION PLAN - RIGID**

Specification and identification of materials for critical parts such as steel, aluminum, fiberglass, cloth used in the boat's manufacture. Provide copy of standard if not U.S. national standard or international standard.

Steel. Sheet steel and plate must be low carbon, commercial quality, either corrosion resistant or galvanized as per ASTM A 525, coating designation G115. Structural steel plates and shapes must be carbon steel as per ASTM A 36. . All steel products, except corrosion resistant steel, must be galvanized to provide high quality zinc coatings suitable for the intended service life in a marine environment. Corrosion resistant steel shall be a standard 302 stainless steel or equal.



Metals:  
Dissimilar materials:  
Glass reinforcement:  
Resin:  
Buoyancy material:

**Discussion on steel selection:**

For the purposes of comparison, A 36 is a low carbon, structural quality steel with a low brittle transition temperature, however, for boats to be used in arctic service, steel with a lower transition temperature should be used.

A 36 Composition

C	Mn	P	S	Si
0.29	0.8-1.2	0.04	0.05	0.15-0.30

A 36 Properties

Tensile	400-550 MPa (58-80 ksi)
Yield	220-250 MPa (32-36 ksi)
Elongation	20% in 200 mm (8 in) 23% in 50 mm (2 in)

Manufacturers of lifeboats are required to test and/or calculate strength of load-bearing parts for approval, and have an acceptable safety factor. So, even “low-strength” materials could be used, if enough is used. Main consideration in selection of alternative steels should be brittle fracture, especially at lower temperatures.

Therefore

- Published elongation at failure data should be around 20%
- Carbon content should not exceed the 0.29% of A 36, since increasing C content generally increases transition temperature and decreases toughness.
- Manganese can reduce transition temperature of low-carbon steels, so Mn content should generally not be less than the 0.80% limit for A36.
- High Sulfur content can decrease toughness, so S content should not exceed the 0.05% permitted for A36.
- Increasing Phosphorus increases transition temperature, so P content should not exceed the 0.04% permitted for A36.
- Silicon is used in amounts of 0.15-0.30% to deoxidize (kill) steel, and lowers transition temperature. Si should be roughly in this range.

- Aluminum. Aluminum and aluminum alloys must be high purity for good marine corrosion resistance, free of iron and containing not more than 0.6% copper. Generally – Alloys in the ASTM 5xxx and 6xxx series are suitable Alloys in the ASTM 2xxx and 7xxx series are **NOT** suitable

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- Dissimilar materials. Metals in contact with each other must be either galvanically compatible or insulated with suitable non-porous materials such as plastic, rubber, or neoprene based compounds, micarta, or equivalent materials. Provisions must also be made to prevent loosening or tightening resulting from differences of thermal expansion, freezing, buckling of parts, galvanic corrosion, or other incompatibilities.

- Glass reinforcement. The reinforcement used in FRP construction must be a good quality "E" or electrical grade glass.

- Resin. Resin shall be fire-retardant and approved.

- Buoyancy material. The buoyancy material must be approved.

Method of installation and buoyancy volume provided

Layup schedule

Specify

- Resin content and allowable range

- Flexural ultimate strength

- Tensile strength, lengthwise

Weight of finished molding(s)

Particulars of joins, welds (including weld size and welding procedure), seams, and other fabricating details

**REQUIREMENTS**

**MANUFACTURER COMMENTS**

**COAST GUARD REVIEW**

All rescue boats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the rescue boat is not waterborne and shall automatically close to prevent entry of water when the rescue boat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the rescue boat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the rescue boat and their position shall be clearly indicated.

**HULL CONSTRUCTION PLAN - INFLATED**

Specification and identification of materials for critical parts such as steel, aluminum, cloth used in the boat's manufacture. Provide copy of standard if not U.S. national standard or international standard.

- Coated Cloth. MIL-C-17415F, Type 16, Class AA or equivalent.

Particulars of joins, seams, and other fabricating details

All surfaces on which persons might walk shall have a nonskid finish.



(see rigid hull section for metals, etc.)

Coated Cloth:

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

All rescue boats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the rescue boat is not waterborne and shall automatically close to prevent entry of water when the rescue boat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the rescue boat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the rescue boat and their position shall be clearly indicated.

The buoyancy of an inflated rescue boat shall be provided by either a single tube subdivided into at least five separate compartments of approximately equal volume or two separate tubes neither exceeding 60% of the total volume. The buoyancy tubes shall be so arranged that, in the event of any one of the compartments being damaged, the intact compartments shall be able to support the number of persons which the rescue boat is permitted to accommodate, each having a mass of 75 kg, when seated in their normal positions with positive freeboard over the rescue boat's entire periphery.

The buoyancy tubes forming the boundary of the inflated rescue boat shall on inflation provide a volume of not less than  $0.17 \text{ m}^3$  for each person the rescue boat is permitted to accommodate.

Each buoyancy compartment shall be fitted with a non-return valve for manual inflation and means for deflation. If the deflation valve is designed to be opened only by using a tool, it must be stowed separately with the loose equipment.



## REQUIREMENTS

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A safety relief valve shall be fitted unless the Administration is satisfied that such an appliance is unnecessary.

Each safety valve must have a hand-operable screw-type plug, permanently secured on or near the valve, to close the valve in case of a leak.

Underneath the bottom and on vulnerable places on the outside of the inflated rescue boat, rubbing strips shall be provided to the satisfaction of the Administration.

Where a transom is fitted it shall not be inset by more than 20% of the overall length of the rescue boat.

Suitable patches shall be provided for securing the painters fore and aft and the becketed lifelines inside and outside the boat.

Each patch or strip must be so designed so that if the lifeline, painter or towing connection is torn away, the inflated chamber remains intact.

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## INNER LINER CONSTRUCTION PLAN

Buoyancy material identified and approved

Specification and identification of materials for critical parts such as steel, aluminum, fiberglass, cloth used in the boat's manufacture. Provide copy of standard if not U.S. national standard or international standard.



## REQUIREMENTS

- Steel. Sheet steel and plate must be low carbon, commercial quality, either corrosion resistant or galvanized as per ASTM A 525, coating designation G115. Structural steel plates and shapes must be carbon steel as per ASTM A 36. All steel products, except corrosion resistant steel, must be galvanized to provide high quality zinc coatings suitable for the intended service life in a marine environment. Corrosion resistant steel shall be a standard 302 stainless steel or equal.
- Aluminum. Aluminum and aluminum alloys must be high purity for good marine corrosion resistance, free of iron and containing not more than 0.6% copper.
- Glass reinforcement. The reinforcement used in FRP construction must be a good quality "E" or electrical grade glass.
- Resin. Resin shall be fire-retardant and approved. Color orange where not covered by canopy or bow cover.

All surfaces on which persons might walk shall have a nonskid finish.

Layup schedule

Specify

- Resin content and allowable range
- Flexural ultimate strength
- Tensile strength, lengthwise

Particulars of joins, welds (including weld size and welding procedure), seams, and other fabricating details

Weight of finished molding

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Steel:

Aluminum:

Glass reinforcement:

Resin:

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## CONTROL AND STEERING STATION

The engine and transmission shall be controlled from the helmsman's position.

Complete rescue boat controls and displays must be provided at the control and steering station.

- lowering and launching
- hook release
- maneuvering
- steering

The control and steering station should be designed and laid out in accordance with ASTM F 1166, Section 30 and 31, so that controls and displays are unambiguous, accessible, and easy to reach and use from the operator's normal seated position, while wearing an immersion suit or a lifejacket.

Each control must operate in a logical manner and be marked with an arrow to show direction of movement of control which will cause an increased response.

For inboard engines, gages, and audio and visual alarms, must be provided to monitor at least the following parameters:

- Coolant temperature, for a liquid cooled engine
- Oil pressure, for an engine with an oil pump
- Tachometer, for an engine not provided with overspeed protection
- State of charge, or rate of charge for each rechargeable engine starting power source.

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Provide Coast Guard approved compass located in an area clear of large steel objects and strong electrical fields for at least 30 cm (12 in) on each side.

If compass does not have photoluminescent dial, it must be illuminated.

The compass in rescue boats must be permanently mounted and be visible and easily readable from the control and steering station.

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## PROPULSION SYSTEM PLANS

Engine approved

The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources. Any necessary starting aids shall also be provided. The starting systems shall not be impeded by the engine casing, thwarts or other obstructions.

Means shall be provided for recharging all engine-starting, radio and searchlight batteries. Radio batteries shall not be used to provide power for engine starting. Means shall be provided for recharging rescue boat batteries from the ship's power supply at a supply voltage not exceeding 55 V which can be disconnected at the rescue boat embarkation station.

Fuel tank capacity must be sufficient for 4 hours of operation at 6 knots.

Fast rescue boat fuel tank capacity must be sufficient for 4 hours of operation at 20 knots with 3 people on board..

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Fuel system must meet 56.50-75(b).

46 CFR 58.30 requires hoses and fittings to meet 46 CFR 56.60. Sec. 56.60-25(c) covers nonmetallic flexible hose, which must meet SAE J-1942 with hose end fittings meeting SAE J-1475. Push-on type fittings such as Aeroquip 1525-X, 2556-X and FC332-X are not permitted. Length of flexible hose limited to 760 mm (30 in).

Permanent fuel tank must meet modified 58.50-10:

- Aluminum tanks of B209 or 5086 alloy, 6 mm (0.25 in) (USSG 3) thick min.
- Nickel-copper tanks of B127 hot-rolled sheet or plate, 0.9 mm (0.037 in) (USSG 20) thick min.
- Steel or iron (no interior galvanizing on diesel tanks), 1.9 mm (0.0747 in) thick min.
- FRP (see next section)
- No flanged-up top edges that could trap water.
- Openings for fill and vent pipes on topmost surface. No openings on side or bottom except:
  - fuel supply
  - threaded fitting with plug for cleaning purposes
  - liquid level gage must penetrate at least 50 mm (2 in) above bottom of tank
- all tank joints welded
- all nozzles, flanges, fittings to be welded or brazed
- liquid level indicators heat resistant, protected from mechanical damage, self closing if ruptured

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

- tank over 0.75 m (30 in) long must be baffled at intervals not exceeding 0.45 m (18 in).
- any baffles same minimum thickness as tank, welded or brazed, limber holes at bottom, air holes at top
- A fuel level indicator must be provided for each fuel tank.
- The fuel tank vent piping must be at least 6 mm (0.25 in) outside diameter tubing.
- A shut-off valve must be provided at the fuel tank, but not at the fuel pump.
- electrically bonded to common ground.

FRP fuel tanks must

- Be at least 5 mm (0.187 in) in wall thickness
- Be sealed against porosity by at least one ply of chopped strand mat
- Be reinforced in the way of tank openings
- Be fitted with corrosion-resistant fittings
- Have each joint at the top of the tank
- Have each joint bonded and through-bolted.

Portable fuel systems for outboard engines must meet UL Standard 1185 or equal, except that hoses must be USCG Type A, and hose clamps, primers, filters, and strainers must be successfully tested in accordance with 33 CFR 183.590. Anti-siphon devices must be provided in the fuel system to prevent fuel spillage when the hose is disconnected. Arrangements must be provided to secure the fuel tank in its normal operating position on the boat.

Fuel systems for outboard engines using non-integral, permanently installed fuel tanks must meet the requirements of 33 CFR 183, Guideline J - Fuel Systems. UL Standard 1102 meets these requirements for fuel tanks.

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Engine exhaust routed away from bilge and potential oil drips. Any paint used on engines, manifolds or exhaust must not give off fumes when heated. All exhaust lagging must be non-absorbent. The exhaust pipe shall be so arranged as to prevent water from entering the engine in normal operation.

The design of all engine exhaust pipes, air ducts and other openings shall be such that water is excluded from the engine when the rescue boat capsizes and re-rights.

The rescue boat engine, transmission and engine accessories shall be enclosed in a fire-retardant casing or other suitable arrangements providing similar protection. Such arrangements shall also protect persons from coming into accidental contact with hot or moving parts and protect the engine from exposure to weather and sea. Adequate means shall be provided to reduce the engine noise.

Starter batteries shall be provided with casings which form a watertight enclosure around the bottom and sides of the batteries. The battery casings shall have a tight fitting top which provides for necessary gas venting.

The throttle must be a continuous manual control and must also be able to be set and locked at any position.

The propeller shafting shall be so arranged that the propeller can be disengaged from the engine. Provision shall be made for ahead and astern propulsion of the rescue boat.

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

All rescue boats shall be designed with due regard to the safety of persons in the water and to the possibility of damage to the propulsion system by floating debris.

Engines in fast rescue boats must stop automatically or be stopped by the helmsman's emergency release switch should the rescue boat capsize. When the fast rescue boat has righted, each engine or motor must be capable of being restarted, provided the helmsman's emergency release, if fitted, has been reset.

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### HYDRAULIC SYSTEM INSTALLATION

Meet subpart 58.30:

- Nonmetallic flexible hose may be used only where flexibility is needed and not more than 760 mm (30 in) in length. Exception allowed in steering systems since emergency steering arrangement must be provided.
- Nonmetallic hose must meet SAE J-1942, hose end fittings meet SAE J-1475. Push-on type fittings such as Aeroquip 1525-X, 2556-X and FC332-X are not permitted.
- Acceptable rigid piping materials listed in 56.60

If a hand pump is provided, or if the engine has a manual starting system, adequate space must be provided for the hand pump or hand start operation.

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### STEERING SYSTEM PLANS

All rescue boats shall be provided with a rudder and tiller.



## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Fast rescue boats must be steered by a wheel at the helmsman's position remote from the tiller.

When a wheel or other remote steering mechanism is also provided the tiller shall provide direct control of the rudder, water jet, or outboard motor in case of failure of the steering mechanism.

The rudder shall be permanently attached to the rescue boat.

The tiller shall be permanently installed on, or linked to, the rudder stock; however, if the rescue boat has a remote steering mechanism, the tiller may be removable and securely stowed near the rudder stock. There must be sufficient clear space to install, operate, remove and stow the removable tiller arm. The tiller arm and its connection to the rudder stock must be of sufficient strength so that there is no slippage or bending of the tiller arm.

The procedure to change over from remote to local steering must be simple, not require the use of tools, and be clearly posted.

The rudder and tiller shall be so arranged as not to be damaged by operation of the release mechanism or the propeller.

Rudder stops or other means must be provided to prevent the rudder from turning too far on either side.

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RELEASE MECHANISM  
INSTALLATION

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Approved release mechanism.

Fast rescue boats should, if possible, be equipped with an easily and safely operated fixed single-point suspension arrangement or equivalent.

6:1 Safety Factor on ultimate strength of materials - review parts not included in release mechanism approval.

Specification and identification of materials for critical parts such as steel and aluminum - review parts not included in release mechanism approval. Provide copy of standard if not U.S. national standard or international standard.

- Steel. Sheet steel and plate must be low carbon, commercial quality, either corrosion resistant or galvanized as per ASTM A 525, coating designation G115. Structural steel plates and shapes must be carbon steel as per ASTM A 36. All steel products, except corrosion resistant steel, must be galvanized to provide high quality zinc coatings suitable for the intended service life in a marine environment. Corrosion resistant steel shall be a standard 302 stainless steel or equal.

- Aluminum. Aluminum and aluminum alloys must be high purity for good marine corrosion resistance, free of iron and containing not more than 0.6% copper.

- Dissimilar materials. Metals in contact with each other must be either galvanically compatible or insulated with suitable non-porous materials such as plastic, rubber, or neoprene based compounds, micarta, or equivalent materials. Provisions must also be made to prevent loosening or tightening resulting from differences of thermal expansion, freezing, buckling of parts, galvanic corrosion, or other incompatibilities.

Steel:

Aluminum:

Dissimilar materials:

**REQUIREMENTS**

**MANUFACTURER COMMENTS**

**COAST GUARD REVIEW**

Particulars of joins, welds (including weld size and welding procedure), seams, and other fabricating details

Release lever or control must be red in color, and the area immediately surrounding the control must be a sharply contrasting light color.

**PANTER RELEASE DEVICE**

Unless boat does not require a painter to launch, arranged to release painter from inside the boat.



**ELECTRICAL SYSTEM INSTALLATION**



Searchlight must be certified by its manufacturer to meet ASTM F 1003 or meet requirements as follows:

- Be constructed of corrosion resistant material
- Have an enclosure certified by its manufacturer to meet a degree of protection of at least 5, as specified in IEC Standard, Publication 529 or meet NEMA Type 4X protection for watertight enclosures
- Be connected to its power source via watertight electrical fittings
- Be permanently mounted on the canopy, or have a stanchion or collapsible type portable mounting on the canopy. The mounting must be located to enable operation of the searchlight by the boat operator in a 360° horizontal plane and 60° above and 45° below the horizontal. A means must also be provided to lock the searchlight in any desired position. [Smaller boats may use a hand-held light stowed in a bracket.]

The searchlight and it's power source working on a single charge, must be capable of operating for at least:

- 3 hours continuous operation; or
- 6 hours total "on" time in cycles consisting of 15 minutes on and 5 minutes off.

If the power source is an engine starting battery, there must be sufficient battery capacity to start the engine at the end of either operating period specified.

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

Each rescue boat must be fitted with navigating lights, in accordance with the International Regulations for Preventing Collisions at Sea, 1972 (COLREG 72), for a vessel of its size.

(2) Each navigating light enclosure must be certified by its manufacturer to meet a degree of protection of at least 5, as specified in IEC Standard, Publication 529 or meet NEMA Type 4X.

(5) The power source must be connected to the navigating lights using watertight electrical fittings.

The normal equipment of a fast rescue boat should include a hands free and watertight VHF radiocommunications set.

## PLACARDS AND LABELS

All labels, caution and danger notices, and operating, maintenance, or general instructions provided on the rescue boat, should be in accordance with ASTM F 1166, Sections 27, 28, 29, 30, and 31, in terms of format, content, lettering size and spacing, color, and posted location. They must be illustrated with symbols in accordance with Resolution A.760(18), as applicable.

Audio and visual displays which present system status or system readiness information should be designed in accordance with Section 9 of ASTM F 1166.

## REQUIREMENTS

## MANUFACTURER COMMENTS

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A corrosion-resistant nameplate must be permanently affixed to the hull near the bow. The following must be permanently marked on the nameplate:

- (1) Name and address of the manufacturer.
- (2) Serial number of the boat.
- (3) U.S. Coast Guard approval number.
- (4) Year of manufacture.
- (5) Material of hull construction.
- (6) Number of persons for which the boat is approved.
- (7) Condition A and Condition B weight.
- (8) The word "SOLAS".

Illustrated operating instruction plate or placard, showing the release and recovery procedures must be posted so that it is visible and legible from the helmsman's normal operating position. The plate or placard must be of a corrosion resistant and weather proof material and must be marked with the signal word DANGER.

The release gear and its components must be labeled, as required, to aid in understanding and operation also of the system.

Drawings of "Hazard" and "Instruction" signs, showing actual inscription, format, color, size, and location.

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The fuel shut-off valve must be clearly labeled.

- The position of the valve must be clearly indicated by a permanent marking inside the rescue boat.
- Suitable marking must be an arrow pointing in the direction of the valve, and the words such as "FUEL VALVE" in a color that contrasts with its background. (rev 031208)
- The marking must be legible to a person within the vicinity of the engine.

Weatherproof equipment list must be permanently mounted in a conspicuous and prominent location on a stowage locker or compartment, or on inside of canopy. The list must include a stowage plan, oriented such that the stowage location of each item of loose equipment is readily apparent.

The position of each drain plug must be clearly indicated by a permanent marking inside the rescue boat. The marking must be an arrow pointing in the direction of the plug, and the words "DRAIN PLUG" in 75 mm (3 in) high letters of a color that contrasts with their background. The marking must be clearly visible to a person within the vicinity of the drain plug.

Procedure to change over from remote to local steering must be clearly posted.

The painter quick-release control must be clearly identified by a label.

Water-resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

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Each control, gage, or display must be identified by a marking, posted on, above, or adjacent to the respective item.

Each gage must be marked with the normal operating range and also indicate danger or abnormal conditions. Each marking must be permanent and weatherproof.

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### RETROREFLECTIVE MATERIAL INSTALLATION

Approved under 164.018

IMO Resolution A.658(16) arrangement

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### OTHER UNIQUE SYSTEMS

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### MANUALS

The manufacturer shall make an operation, maintenance and training manual available to purchasers of approved rescue boats to enable vessel operators to meet Regulations III/18.2, 19.3, 51, and 52 of SOLAS 74/83.

The material must include a complete discussion of operation, maintenance, and safety procedures to be followed in the use of rescue boats and associated components and equipment.

- operation of engine out of water





## REQUIREMENTS

## MANUFACTURER COMMENTS

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The material presented must be clear, sufficiently detailed, and unambiguous. The material must be in English though additional languages are acceptable. Wherever possible, the material must be

- Explained with the help of diagrams
- Presented in short numbered paragraphs
- Written in the active voice.

The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the lifesaving appliances provided in the ship and on the best methods of survival. Any part of such information may be provided in the form of audiovisual aids in lieu of the manual. The following shall be explained in detail:

boarding, launching, and clearing the survival craft and rescue boats;  
method of launching from within the survival craft;  
release from launching appliances;  
use of all survival equipment;  
use of all detection equipment;  
use of drogues;  
use of engine and accessories;  
recovery of survival craft and rescue boats including stowage and securing;  
best use of the survival craft facilities in order to survive;  
instructions for emergency repair of the lifesaving appliances.

Instructions for onboard maintenance of lifesaving appliances shall be easily understood, illustrated wherever possible, and, as appropriate, shall include the following for each appliance:

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

a checklist for use when carrying out the inspections required by regulation 19.7;

maintenance and repair instructions;

schedule of periodic maintenance;

diagram of lubrication points with the recommended lubricants;

list of replaceable parts;

list of sources of spare parts;

log for records of inspections and maintenance.

If the boat uses a web lifting sling, as the component most critical to the life safety of the boat crew, include a periodic check of the sling in the maintenance section of the manual. It should recommend replacement of the sling whenever there is evidence of cut, broken, or frayed webbing or stitching. Severe color fading may also indicate reduced strength from exposure to weather.

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## QUALITY SYSTEM

## REQUIREMENTS

## MANUFACTURER COMMENTS

## COAST GUARD REVIEW

The manufacturer shall:

- Institute a quality control procedure to ensure that all production rescue boats are produced to the same standard, and in the same manner as the prototype boat approved. The manufacturer's quality control personnel shall not work directly under the department or person responsible for either production or sales.

- Ensure that all required tests are performed.

Quality control procedures

- inspections / quality teams
- inventory control
- welding inspection/control

Record keeping

- material certifications