CUTTERBOAT – OVER THE HORIZON (CB-OTH) MK III OPERATOR'S HANDBOOK

U.S. Department of Homeland Security

United States Coast Guard

COMDTINST M16114.39

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U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: CG-731
Phone: (202) 372-2465

COMDTINST M16114.39
JANUARY 18, 2008

COMMANDANT INSTRUCTION M16114.39

Subj: CUTTERBOAT–OVER THE HORIZON MK III BOAT OPERATOR'S HANDBOOK

1. PURPOSE. This manual provides technical orientation, performance characteristics, and basic operating procedures for the Cutterboat–Over the Horizon (CB-OTH) MK III. It also standardizes boat outfit, storage and equipment layout.

2. ACTION. Area, district, and sector commanders, commanders of maintenance and logistics commands, commander deployable operations group, commanding officers of headquarters units, assistant commandants for directorates, Judge Advocate General, and special staff offices at headquarters shall ensure shall ensure that the provisions of this manual are followed. To ensure standardization, there is no command requirement with regard to the type or location of equipment carried except as noted. All design or structural alterations are prohibited unless specifically authorized in accordance with this manual. Internet release authorized.

3. DIRECTIVES AFFECTED. None

4. DISCUSSION. This manual contains information necessary to safely and efficiently operate the CB–OTH MK III. The operational capabilities, limitations, and emergency procedures are clearly stipulated. The fittings, outfit list, and physical characteristics of the boat are described in detail.

5. PROCEDURE. Operational commanders and unit commanders with a CB-OTH MK III shall ensure the procedures and limitations detailed within this manual are followed. Forward any comments, corrections, recommendations, and questions regarding this manual to the Cutterboat Facility Manager in accordance with Chapter 1, Section C.1 of this manual. Design and structural change requests shall be submitted as outlined in the Naval Engineering Manual, COMDTINST M9000.6 (series).

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6. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS. Environmental considerations were examined in the development of this manual and have been determined to be not applicable.

7. FORMS/REPORTS. None.

ROBERT C. PARKER /s/
Rear Admiral, U. S. Coast Guard
Assistant Commandant for Capability

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RECORD OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	DATE ENTERED	ENTERED BY

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Chapter 1 Introduction

Introduction

This handbook contains information necessary for the safe and effective operation of the Cutterboat – Over the Horizon (CB-OTH) MK III. It defines operational capabilities, limitations, and emergency procedures. In addition, it shows or describes the fittings, outfit list, and physical characteristics of the boat.

In this chapter

This chapter contains the following sections:

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Section A. Warnings, Cautions, and Notes

Introduction

The following definitions apply to Warnings, Cautions, and Notes found throughout the handbook.

A.1. Warning

WARNING

Operating procedures or techniques that must be carefully followed to avoid personal injury or loss of life.

A.2. Caution

CAUTION!

Operating procedures or techniques that must be carefully followed to avoid equipment damage.

A.3. Note

NOTE

An operating procedure or technique essential to emphasize.

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Section B. Facility Manager

Introduction

Commandant (CG-731) is the facility manager for the CB-OTH MK III. The CB-OTH MK III is a standard boat as defined by the *Boat Management Manual*, COMDTINST M16114.4 (series). Configuration control, for these boats is critical for the standardization of equipment and safety of operations.

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Section C. Changes

Introduction

Commandant (CG-731) promulgates this handbook and its changes. Submit recommendations for changes to CG-731 via standard memo or electronic mail. For more information, contact CG-731, Cutterboat Facility Manager at (202) 372-2465.

The address for CG-731 is:

Commandant (CG-731)
U.S. Coast Guard Headquarters
2100 Second Street S.W.
Washington, D.C. 20593-0001

Attn: Cutterboat Facility Manager

C.1. Engineering Changes (ECs)

All Engineering Changes (ECs) issued since the CB-OTH MK III has been in service are provided in *Appendix B*. ECs issued after the date of this revision supersede information in this handbook where applicable.

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Section D. Action

Introduction

Operating and supervisory commands and boat crews will comply with the procedures and limitations specified in this publication and any duly issued changes.

D.1. Configuration control

Configuration control for the CB-OTH MK III is critical for standardization of equipment and safety of operations.

NOTE

To maintain fleet wide standardization, unit commanders shall not change or vary the type or location of equipment carried except where noted. Design or structural alterations are prohibited unless specifically authorized by CG-45 and CG-731.

NOTE

Prototype testing of the SPC-LE configuration changes may only be carried out with the specific authorization of CG-45 and CG-731.

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Chapter 2
Boat Characteristics

Introduction

This chapter describes standard CB-OTH MK III features. The general location of the major hull and system components is presented in this chapter. Detailed information about hull and system components is provided in *Chapter 3*, *Boat Systems*.

NOTE

All illustrations in this operator's handbook are for familiarization only. The location of hull fittings and system components in these illustrations may not accurately reflect proper placement and installation on all hulls. Any discrepancies between the Operator's Handbook and the CB-OTH MK III shall be clarified by contacting the CB-OTH MK III Type Desk.

In this chapter

This chapter contains the following sections:

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Section A. General Description

A.1. Design	The CB-OTH MK III is an aluminum boat.
A.1.a. Construction	Hull, deck and transverse bulkheads of the CB-OTH MK III are fabricated using 5086 marine grade aluminum.
A.1.b. Walking surfaces	All walking surfaces on the CB-OTH MK III are covered with non-skid.
A.1.c. Inflatable collar	An inflatable collar is mechanically attached to the hull structure. The inflatable collar is constructed from fabric which consists of an external layer of hypalon.

A.2. Manufacturer

The CB-OTH MK III (**Figure 2-1**) was designed by:

Zodiac Hurricane Technologies Inc.
7830 Vantage Way
Delta B.C. Canada V4G 1A7

The base model for the CB-OTH MK III is the Zodiac 733 I/O Interceptor.

Figure 2-1
CB-OTH MK III

A.3. Missions

The CB-OTH MK III is deployed on the 378 FT HAMILTON Class High Endurance Cutter (WHEC), the 270 FT FAMOUS Class Medium Endurance Cutter (WMEC), and the 210 FT RELIANCE Class Medium Endurance Cutter (WMEC). The boat is designed for purposes of identifying, interrogating, tracking, and executing non-compliant vessel pursuit tactics to intercept fast moving targets of interest that fail to make contact with or attempt to elude U.S. Coast Guard, Customs and Border Protection (CBP), or other law enforcement vessels.

A.4. Boat specifications

The following provides a list of all CB-OTH MK III specifications.

A.4.a. Physical Characteristics	Length Overall (LOA)	24 FT 9 inches (7.54 meters)
	Length of Rigid Hull (transom to top of bow)	21 FT 1 inch (6.43 meters)
	Beam (Maximum)	9 FT (2.74 meters)
	Inflatable Collar Diameter	22 inches (0.56 meters)
	Draft (outdrive tilted up)	21 inches (0.53 meters)
	Freeboard Amidship (maximum weight, no crew)	27 inches (0.69 meters)
	Hoisting Weight (fully outfitted, no crew)	5415 lbs (2456 kg)
	Propulsion Machinery	Single Yanmar 6LP-STZP/STZP2 diesel engine, 315 HP with Mercruiser Bravo 1X Outdrive
	Fuel Tank Capacity	85 gallons (322 liters)
	Speed	42+ KTS
	Fixed Height Above the Waterline (to the Blue Light on the Mast)	7 FT 4.5 inches (2.25 meters)

A.4.b. Operational Characteristics and Parameters

Crew Capacity (seated)	5
Maximum Personnel (including crew)	13
Maximum Seas	8 FT (2.4 meters)
Maximum Winds	30 KTS
Range (NM) (Cruising RPM in calm water)	250 NM (463 kilometers)
Maximum Operating Distance from the cutter	30 NM (55.5 kilometers)
Top RPM and Speed	42+ KTS at 3800 RPM
Cruise Speed	26 KTS at 2700 RPM
Towing Capacity (Urgent SAR only)	2 GWT or 25 FT
Ice Breaking Capability	None

Section B. Basic Hull and Deck Construction (Interior and Exterior)

Introduction	The hull and deck of the CB-OTH MK III is constructed from marine aluminum alloy.
B.1. Hull construction	The CB-OTH MK III hull is plated with $^{1}/_{4}$ inch thick aluminum.
B.1.a. Hull	The CB-OTH MK III aluminum hull has a single planing strake, port and starboard, and an aluminum transom.
B.1.b. Transverse bulkheads	Transverse bulkheads in the CB-OTH MK III are aluminum.
B.1.c. Inflatable collar	The inflatable collar cradle on the CB-OTH MK III is welded to the aluminum hull.
B.2. Deck construction	The CB-OTH MK III deck is $^{5}/_{32}$ inch thick aluminum.
B.2.a. Fuel fill	The fuel fill access station is mounted on the foredeck.

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Section C. Location of Interior and Exterior Hull Fittings (Structural)

Introduction

This section describes the location of all interior and exterior hull fittings of the CB-OTH MK III.

WARNING

Only the lift points described in C.1 and C.2 shall be used when lifting or hoisting the boat. Tie-down fixtures described in C.3 shall not be used.

C.1. Single-point davit sling attachment points

The boat is equipped with four sling attachment points. Two are located on the inside of the hull, port and starboard on the foredeck (**Figure 2-2**). Two are bolted on the inboard face of the transom; port and starboard (**Figure 2-3**).

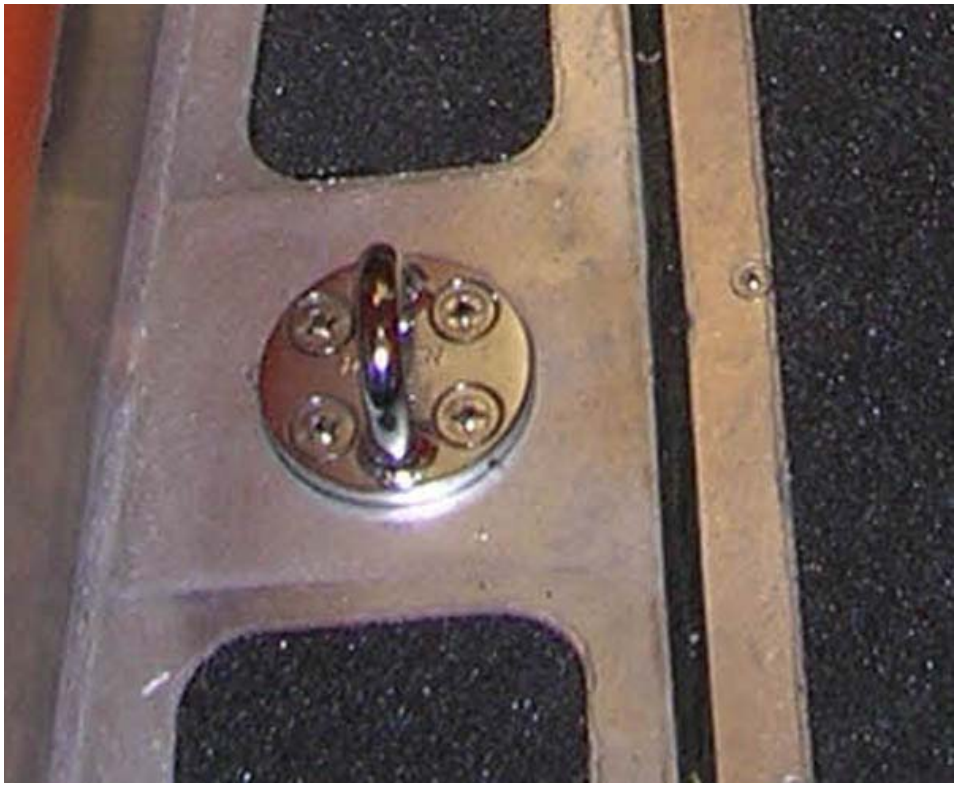

Figure 2-2
Forward Single-Point Davit Sling Attachment Point

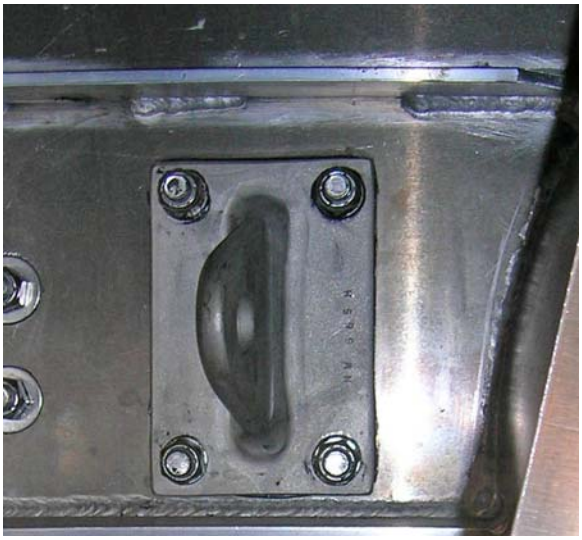

Figure 2-3
Aft Single-Point Davit Sling Attachment Point

C.2. Dual-point davit lift points

Two dual-point davit lift points are mounted on the hull of the CB-OTH MK III. One is located on the foredeck forward of the fuel tank fill (**Figure 2-4**). One is bolted to the transom (**Figure 2-5**).

C.3. Equipment tie-downs

Four flush deck equipment tie-downs (**Figure 2-6**) are located forward of the single-point davit sling attachment points on the foredeck.

C.4. Transom

The transom is equipped with:

- Two mooring cleats (**Figure 2-7**) mounted on the top, port and starboard,
- Two transom tie-downs located on the aft face of the transom, and
- Two inflatable collar attaching eye straps, mounted fore and aft on the transom, port and starboard.

Figure 2-4
Forward Dual-Point Davit Lift Point

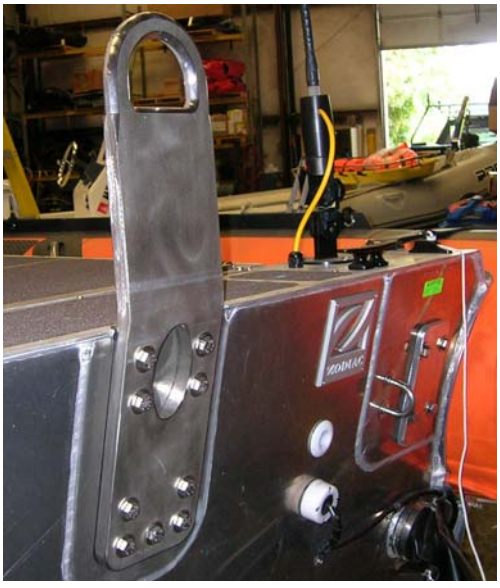

Figure 2-5
Aft Dual-Point Davit Lift Point

Figure 2-6
Equipment Tie-Downs

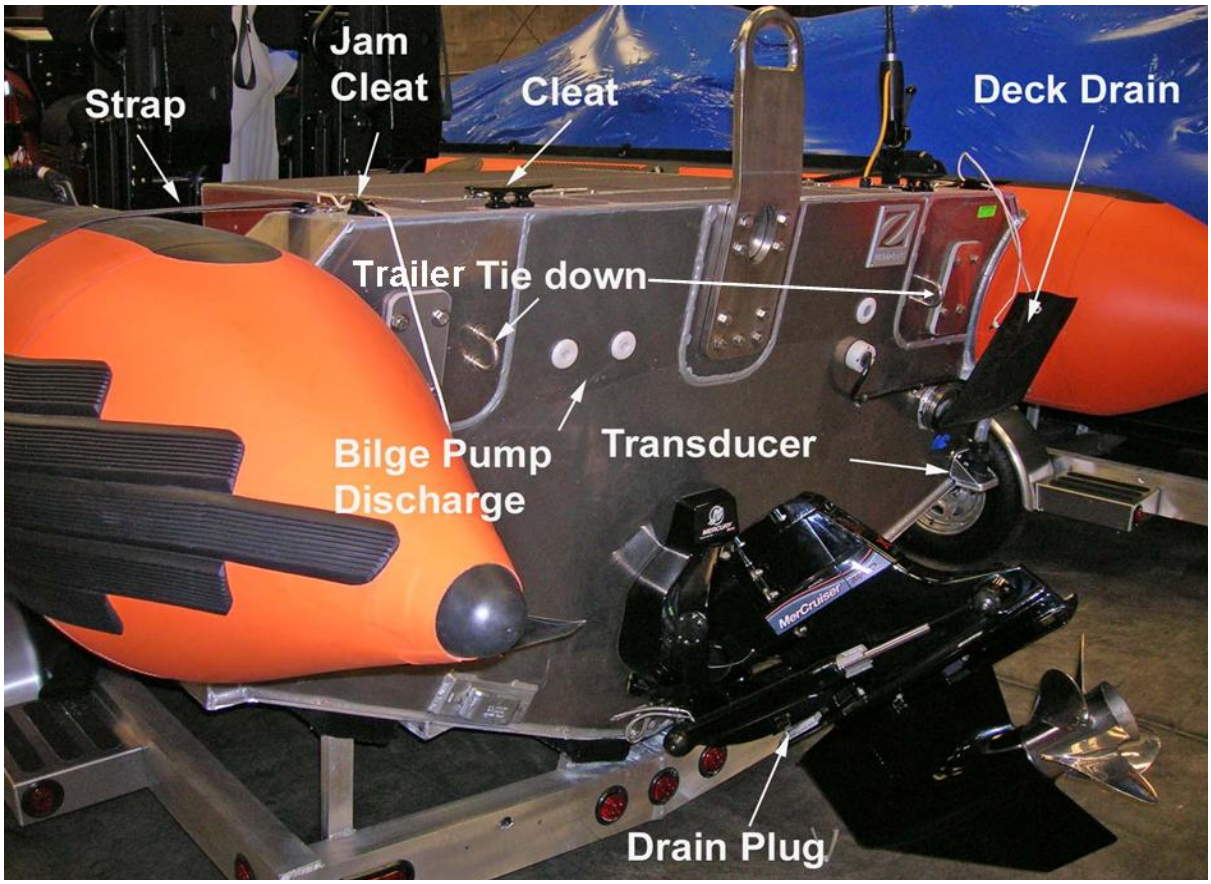

Figure 2-7
Transom Fittings

C.4.a. Deck drains	Two self-bailing deck drains (**Figure 2-7**) through one-way scuppers are mounted on the transom and are equipped with jam cleats, so the scupper trunks can be hoisted above the waterline and secured.
C.4.b. Hull drain plug	A threaded hull drain plug (**Figure 2-7**) is installed at the bottom of the transom/hull interface.
C.4.c. Discharges	The electric bilge pump discharges (**Figure 2-7**) are located on the aft face of the transom, port side of the centerline. The turbocharger raw water discharge is located on the aft face of the transom, starboard side of centerline.
C.5. Antenna arch	The CB-OTH MK III incorporates a folding antenna arch (**Figure 2-8**) that lays forward of the Coxswain's console on the foredeck. The antenna arch can be quickly erected and lowered as necessary. Hinged type fittings with ball-lock pins, and deck fittings (**Figure 2-9**) with Teflon inserts and ball-lock pins facilitate raising and securing the antenna arch.

Figure 2-8
Antenna arch (Lowered on Foredeck)

Figure 2-9
Antenna Arch Deck Fitting

C.6. Crew seats	Five modified Shockwave type seats are provided for the crew (**Figure 2-10**): Coxswain seat (1) Crewmember seats (2) Other crewmember seats (2) To ensure safety of the crewmembers, grabrails and seatbelts are provided. Stirrups are provided for the Coxswain only.
C.6.a. Coxswain seat	The forward seat is for the Coxswain and is mounted on the centerline.
C.6.b. Crew-member seats	Two seats with waterproof communications and navigation consoles are mounted amidship in the boat, port and starboard of the centerline.
C.6.c. Other crewmember seats	Boat crew seats are jump seats attached to the navigation and communications console seats.

Figure 2-10
CB-OTH MK III Seating

C.6.d. Grabrails	Grabrails are mounted forward of the crewmember seats for crew safety.
C.6.e. Stirrups	Outboard of the Coxswain's seat, stirrups (**Figure 2-11**) are mounted to the deck to provide the Coxswain with a physical restraint during boat operations in rough seas.

Figure 2-11
Stirrup

C.7. HF antenna

The HF antenna is mounted on top of the transom. (**Figure 2-12**)

Figure 2-12
HF Antenna Mount

C.8. Deck Plates

The CB-OTH MK III has watertight deck fittings providing access to cables, hose connections and equipment located in the bilge.

C.8.a. Forward deck plate

The flush mounted, forward deck plate (**Figure 2-13**) is located just aft of the fuel fill station in the bow. It provides access to the hose clamp and hose connecting the fuel fill pipe to the fuel tank.

Figure 2-13
Forward Deck Plate

C.8.b. Aft deck plate

A flush mounted, aft deck plate (**Figure 2-14**) is located just forward of the engine compartment cover. It provides access to PG-1000 heading sensor for the electronic compass.

Figure 2-14
Aft Deck Plate Access to Heading Sensor

C.9. Seachest Strainer	The engine seawater strainer on the CB-OTH MK III (**Figure 2-15**) is located on the aft quarter, starboard side hull and is made of aluminum.
C.10. Portable fire extinguisher	A portable, five lbs, dry chemical agent, fire extinguisher (**Figure 2-16**) is located on the port side of the Coxswain's console.

Figure 2-15
Seawater Suction Seachest Strainer

Figure 2-16
Portable Fire Extinguisher

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Section D. Location of Major Hull Systems and Components

Introduction

This section describes the location of the major hull systems and components installed on the CB-OTH MK III.

D.1. Batteries

Two 12 VDC marine grade batteries are installed inside the Coxswain's console (**Figure 2-17**). Low or high battery charge is shown on the alarm lamp unit on the Coxswain console dash panel.

Figure 2-17
Battery Holder (inside Coxswain's Console)

D.2. Engine and outdrive

A single Yanmar six-cylinder diesel engine coupled with a Mercruiser Bravo 1X outdrive (**Figures 2-18** and **2-19**) is installed. The engine is mounted inside the hull and the outdrive is bolted to the transom.

D.3. Fuel system A single 85 gallon fuel tank is installed inside the hull beneath the foredeck. The fuel fill port is located on the forward deck in the fuel fill station.

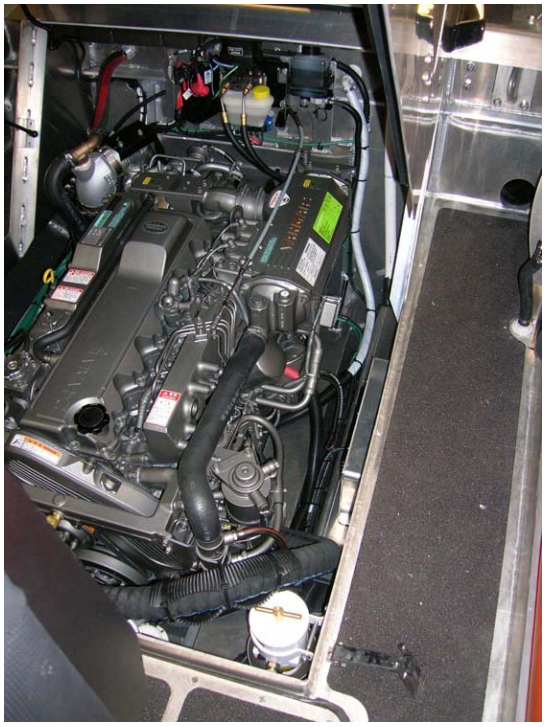

Figure 2-18
Diesel Engine

Figure 2-19
Outdrive

D.4. Coxswain's console

The Coxswain's console (**Figure 2-20**) is located forward on the centerline of the hull. The console provides for engine and steering operation, boat systems control and monitoring, and communications and navigation equipment (depth finder) control.

Figure 2-20
Coxswain's Console

D.5. Steering system

Hydraulic steering (**Figure 2-21**) for the outdrive consists of the following components:

Steering wheel
Helm pump
Interconnecting hoses
Steering actuator

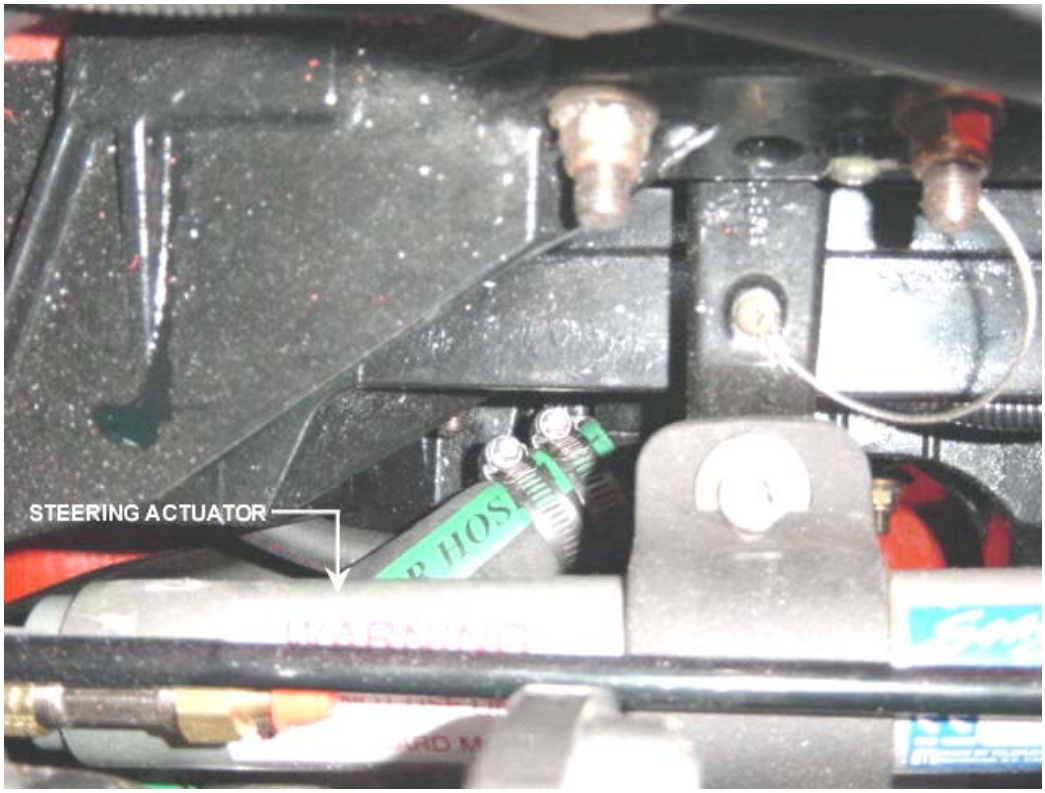

Figure 2-21
Steering System

D.6. Antenna arch

A folding antenna arch (**Figure 2-8**) is mounted amidships and can be laid forward on the foredeck to facilitate boat davit operations. The antenna arch mounts the following components:

VHF-FM antenna
GPS antenna
24 inch Radome
Blue strobe light
All-around white navigation light
Two floodlights
Red/green navigation lights
Loudhailer speaker

D.7. Crew seats

Crew seats (**Figure 2-10**) are located inside the hull. One Coxswain seat is mounted in the center of the hull on the centerline, two crewmember seats are located forward of the engine compartment cover. The aft crew seats on the CB-OTH MK III are jump seats attached to the center crew sets.

D.8. Navigation and Communications

The navigation and communications components are located:

On the Coxswain's Console,
On the Port Communications Console, and
On the Starboard Navigation Console.

D.8.a. Integrated Crew Communications System (ICCS)

The ICCS is equipped with six stations, which interface with the VHF-FM/HF radio systems, and are located at each of the five crew positions. An additional station, located on the upper port side of the Coxswain's console, provides an access point for the gunner position headset. A Push to Talk switch is mounted on the throttle for the Coxswain.

D.8.b. Coxswain's console.

The Coxswain's console contains the SINS remote display.

D.8.c. Communications (port) console

The communications (port console) contains the VHF-FM transceiver control head, the loudhailer control, and the HF radio enclosed in the flip-top housing.

D.8.d. Navigation (starboard) console

The navigation (starboard console) contains the Furuno Scalable Integrated Navigation System (SINS).

WARNING

The HF antenna in the folded position is a stepping hazard.

D.9. HF antenna

The HF antenna (**Figure 2-12**) is mounted on the starboard top of the transom.

D.10. VHF-FM Antenna

The VHF-FM antenna is mounted on the radar arch, to port of the radome (**Figure 3-36**).

D.11. Loudhailer speaker

The loudhailer speaker is mounted on the antenna/radar arch (**Figure 2-22**).

Figure 2-22
Loudhailer

D.12. Depth sounder transducer	The depth sounder transducer is mounted at the bottom of the transom, starboard of the centerline (**Figure 2-7**).
D.13. Bilge pumps	The bilge pumps (electric) (**Figure 2-23**) are located on the bilge centerline just forward and aft of the engine.
D.14. Auto Inflation System	The auto inflation system (**Figure 2-24**) is used for automatic inflation of the inflatable collar and is located in the engine compartment, port side, under an aluminum cover. The collar inflation hose extends up from the air pump, through the deck, into the port tube.

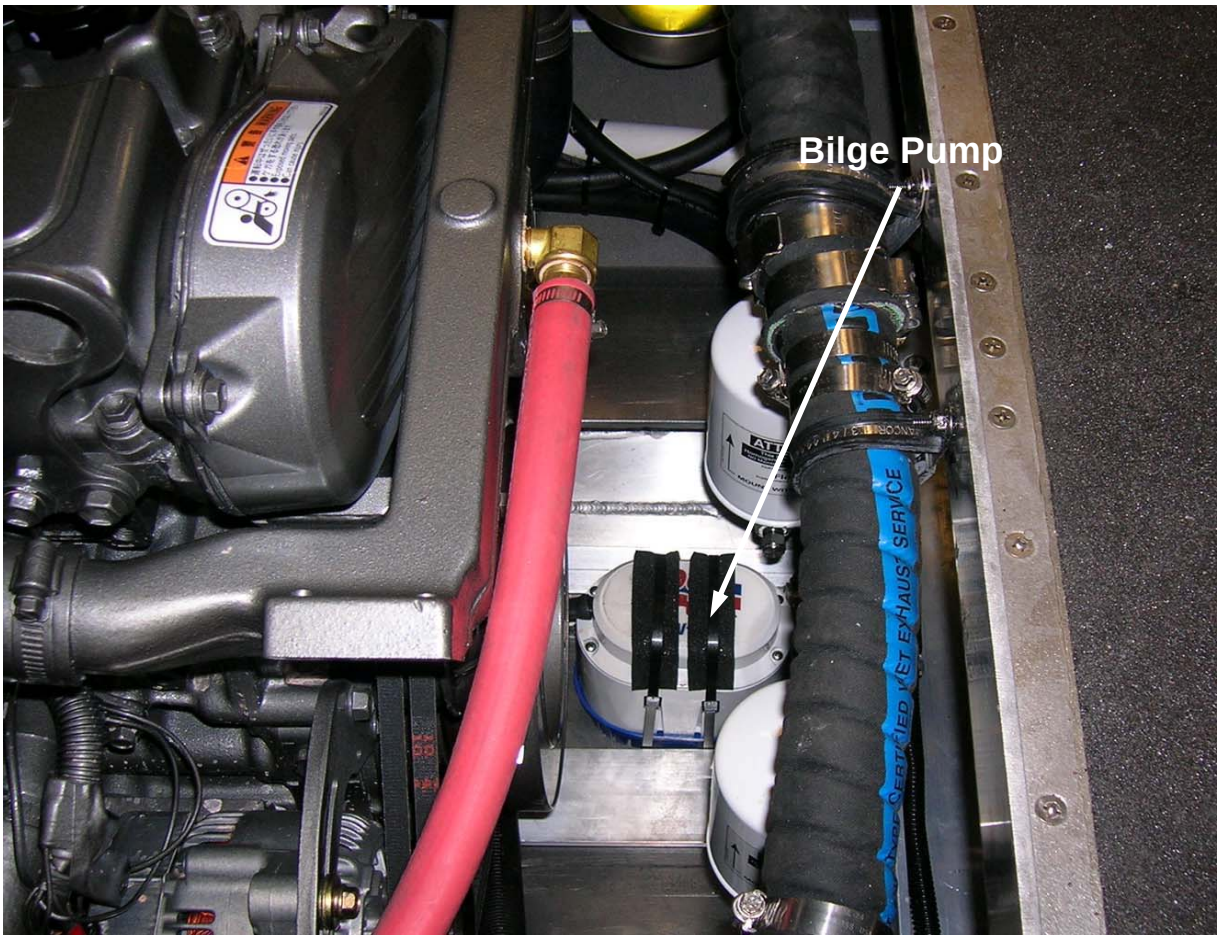

Figure 2-23
2000 GPH Bilge Pump (with Automatic Float Switch)

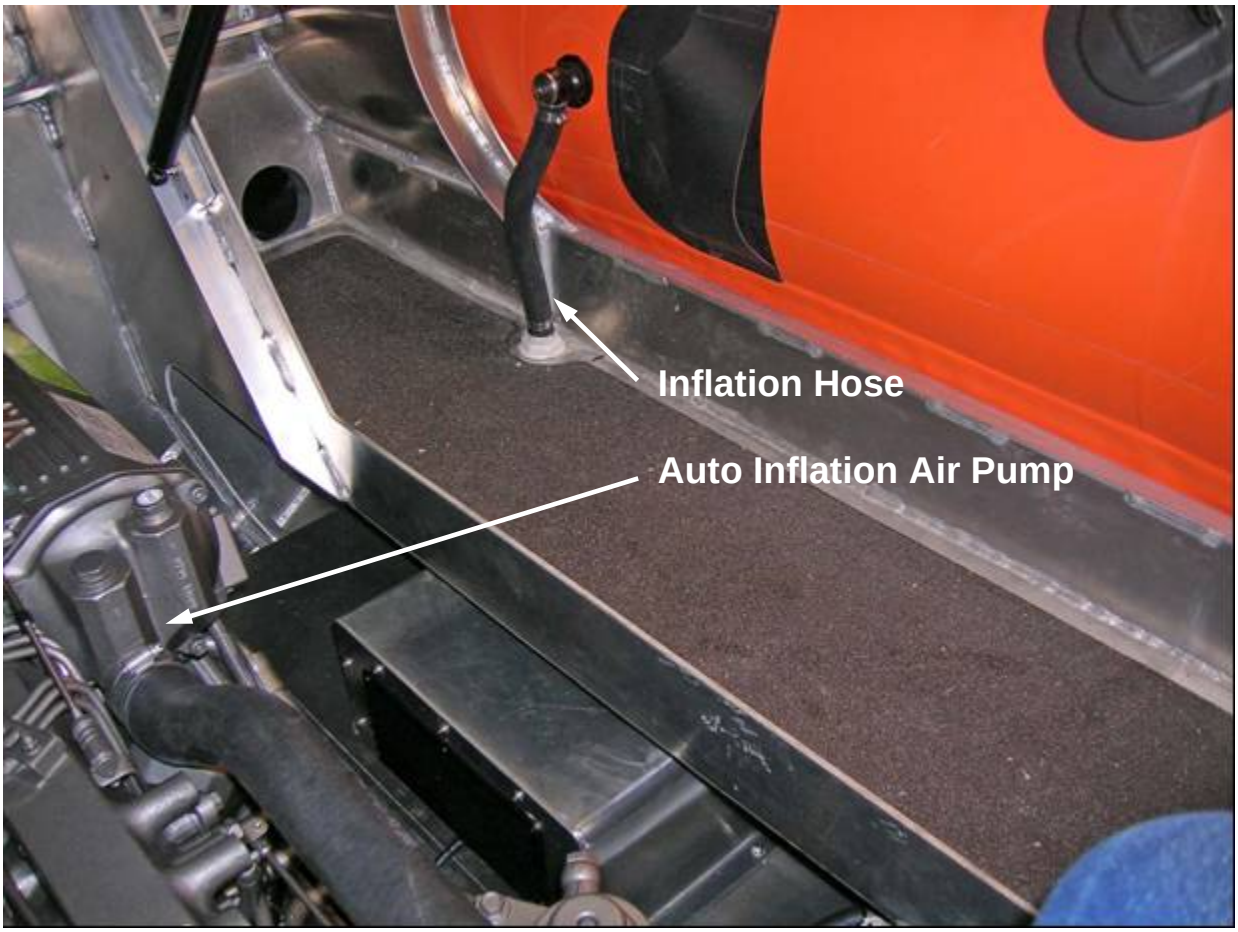

Figure 2-24
Auto Inflation System

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Chapter 3
Boat Systems

Introduction

This chapter discusses the boat's mechanical, electrical and communications/navigation systems. It describes basic characteristics and provides information to allow the boat's crew to operate safely and effectively.

In this chapter

This chapter contains the following sections:

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Section A. Propulsion System

Introduction

The CB-OTH MK III is powered by a single, six-cylinder diesel engine and attached outdrive. This section provides a brief description of the subsystems and equipment comprising the propulsion system.

A.1. Yanmar diesel engine

The engine (**Figure 3-1**) is a vertical, six-cylinder, water-cooled, four-cycle diesel engine with a continuous rating output of 255 HP at 3600 RPM and a maximum rating output of 315 HP at 3800 RPM.

A.1.a. Speed

The low idle speed is 750 +/-25 RPM.

A.1.b. Fuel injection

The engine incorporates a water-cooled turbocharger, direct fuel injection system, and rotates *counter-clockwise* as viewed from the flywheel.

Figure 3-1
Yanmar Diesel Engine

A.1.c. Location

The engine is mounted to the hull using rubber isolator mounts (**Figure 3-2**) attached to the forward, port and starboard sides of the engine. It is supported by the engine-to-outdrive interface at the rear of the engine.

Figure 3-2
Engine Mount

A.2. Engine fuel system

The engine fuel system incorporates a Bosch distributor type fuel injection pump (**Figure 3-3**) mounted below and aft of the cartridge type, disposable, fuel filter on the port side of the engine.

A.2.a. Fuel priming pump

A manual fuel priming pump on top of the fuel filter is used to bleed air from the system.

A.2.b. Drain

A drain is provided at the bottom of the fuel filter to remove small amounts of water.

A.2.c. Injection nozzles

The fuel from the injection pump is delivered to six dual-spring type, pinhole injection nozzles.

A.2.d. Fuel oil cooler

A fuel oil cooler is incorporated into the system and uses seawater as the cooling medium.

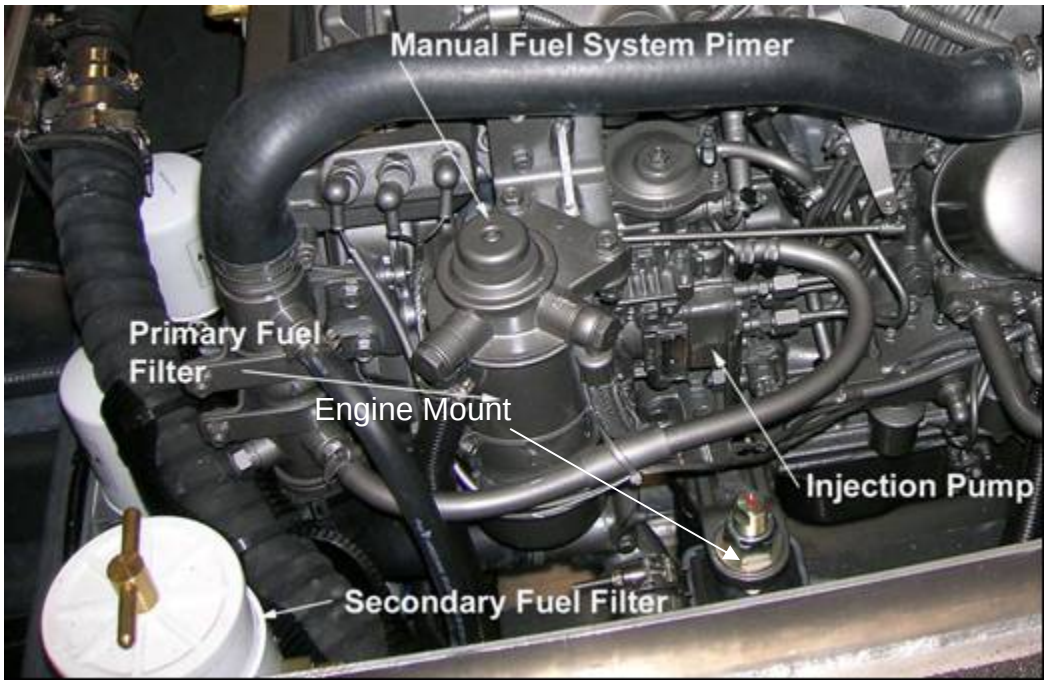

Figure 3-3
Engine Mounted Fuel Filter

A.3. Engine cooling water system	The engine cooling water system (**Figure 3-4**) uses seawater to cool jacket water in order to maintain engine operating temperatures.
A.3.a. Jacket water pump	The jacket water pump is belt driven and is mounted inboard of the alternator and above the main crankshaft pulley.
A.3.b. Seawater cooling pump	The seawater cooling pump is mechanically driven and is mounted on the starboard, forward side of the engine below the fuel filter.
A.3.c. Seawater strainer	An in-line seawater strainer is mounted inside the engine compartment on the starboard side and filters the seawater to the inlet side of the seawater pump.

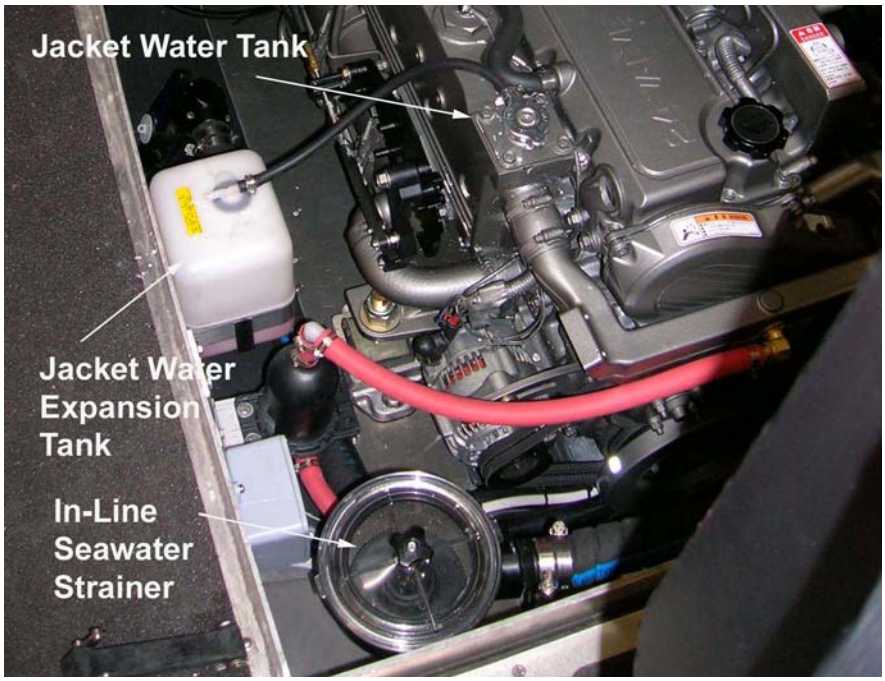

Figure 3-4
Engine Jacket Water System

A.3.d. Jacket water cooler	The jacket water cooler is a shell and tube type cooler, and functions as follows: Seawater is used as a cooling medium and is circulated through the tubes. Jacket water is circulated around the tubes of the cooler. An anti-corrosive zinc is installed in the jacket water cooler to inhibit corrosion. The jacket water from the cooler is circulated by the jacket water pump throughout the engine to cool the engine cylinders, turbocharger and engine oil.
A.3.e. Jacket water tank	An engine mounted jacket water tank with a pressure actuated filler cap is located on the top, starboard side of the engine. The jacket water tank has a capacity of 3.57 gallons (13.5 liters).
A.3.f. Expansion tank	An expansion tank (sub-tank), mounted in the engine compartment on the starboard, forward bulkhead and allows for the collection of hot water. The expansion tank has a capacity of 0.42 gallons (1.6 liters).

A.4. Lubrication system

The engine oil lubrication system is a wet-sump, pressure type system. It utilizes:

An integral gear oil pump mounted on the front of the engine,
A spin-off cartridge type oil filter (**Figure 3-5**) mounted on the port side of the engine, forward of the intercooler, and
Two engine oil coolers, utilizing jacket water as a cooling medium, mounted adjacent to the oil filter on the port side of the engine.

Figure 3-5
Engine Oil Filter

A.4.a. Oil fill cap

The oil fill cap (**Figure 3-6**) is forward, on top of the engine valve cover.

A.4.b. Dipstick

A dipstick (**Figure 3-7**) to check the engine oil level is located on the starboard side of the engine. The engine oil capacity is 2.77 gallons (10.5 liters).

Figure 3-6
Oil Fill Cap

Figure 3-7
Oil Level Dipstick

A.4.c. Lube oil	Engine lube oil with the API Classification of CD and an SAE 15W40 viscosity is specified for this engine.
A.5. Turbocharger and intercooler	A turbocharger (**Figure 3-8**), mounted on the rear of the engine and driven by exhaust gases, takes air through a pre-cleaner and air inlet assembly, boosts the air pressure and directs it through a seawater cooled intercooler to the cylinder intake valves.
A.5.a. Anti-corrosive zinc	An anti-corrosive zinc is provided in the oil cooler and freshwater cooler to inhibit corrosion.
A.6. Engine instrument panel	The Coxswain's console contains all of the instruments (**Figure 3-9**) that monitor engine performance. The following instruments are located on top of the console: Lube oil pressure gauge Cooling water temperature gauge Engine tachometer with hour-meter Alarm lamp unit
A.6.a. Alarm lamp unit	The alarm lamp unit provides the following indications: Battery Charge – low or high battery charge. Cooling Water Temp – cooling water temperature above 203º F (95º C). Lube Oil Pressure – lube oil pressure below normal. Cooling Water Level – water level in engine mounted water tank is low. Gear Oil – oil level in the outdrive is low. Boost – suction pressure to turbocharger is excessive. Fuel Filter – drain in fuel filter water separator needs cleaning. Exhaust – insufficient cooling water being discharged with the exhaust. Diesel Preheat – diesel glow plug system is activated.

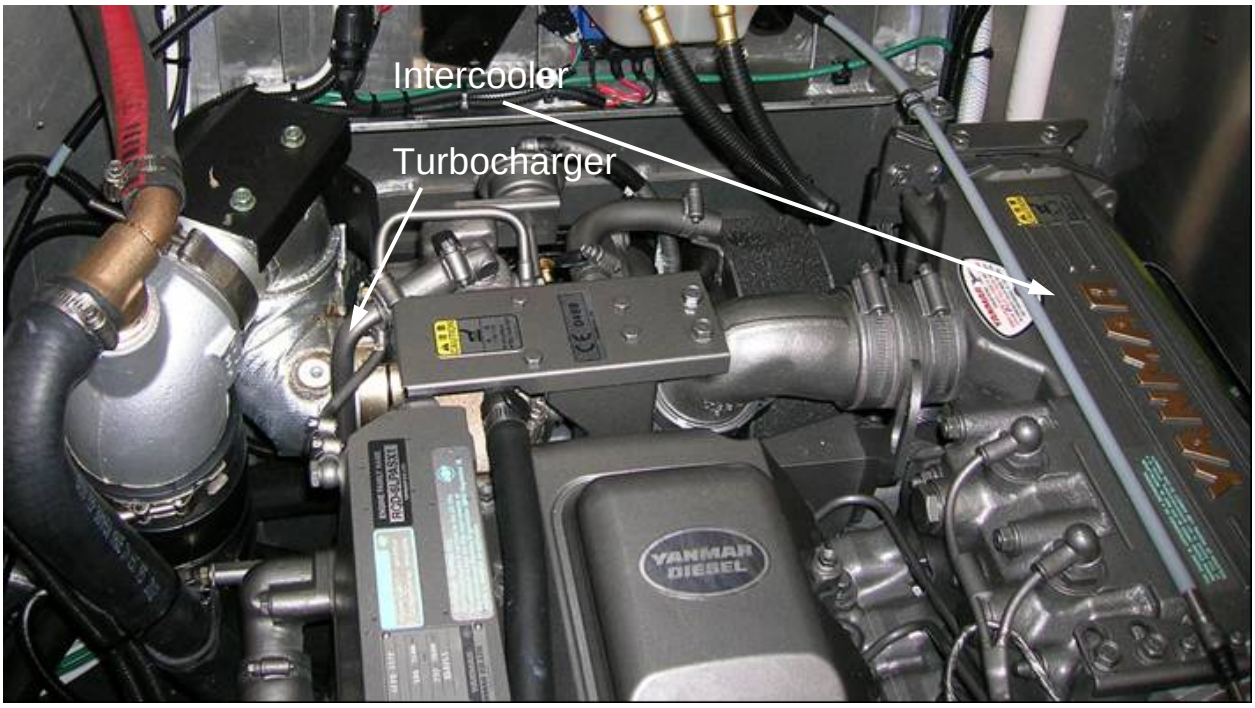

Figure 3-8
Turbocharger and Intercooler

Figure 3-9
Engine Instrument Panel

CAUTION !

The ALARM SILENCE switch on the start/stop and alarm annunciator panel must be in the SET position during normal operations.

A.7. Start/stop and alarm annunciator

The start/stop and alarm annunciator panel (**Figure 3-10**) for the engine is located on the starboard side of the Coxswain's console.

Figure 3-10
Start/Stop and Alarm Annunciator Panel

A.8. Cold weather start system

The engine is provided with a Kim Hotstart system to enhance starting when the temperature is below 32º F (0º C). The Kim Hotstart system is connected to the cutter via the Marinco 75 FT 30 amps shore power cable.

A.9. Engine exhaust system

The engine exhaust is used to drive the turbocharger. The exhaust gases are mixed with seawater from the jacket water cooler, then discharged overboard via a rubber collar in the transom outdrive unit that directs the exhaust around and out the outdrive propeller shaft and fairing.

A.10. Mercruiser Bravo 1X outdrive

The outdrive (**Figure 3-11**) is coupled to the engine using a splined drive shaft and universal joint.

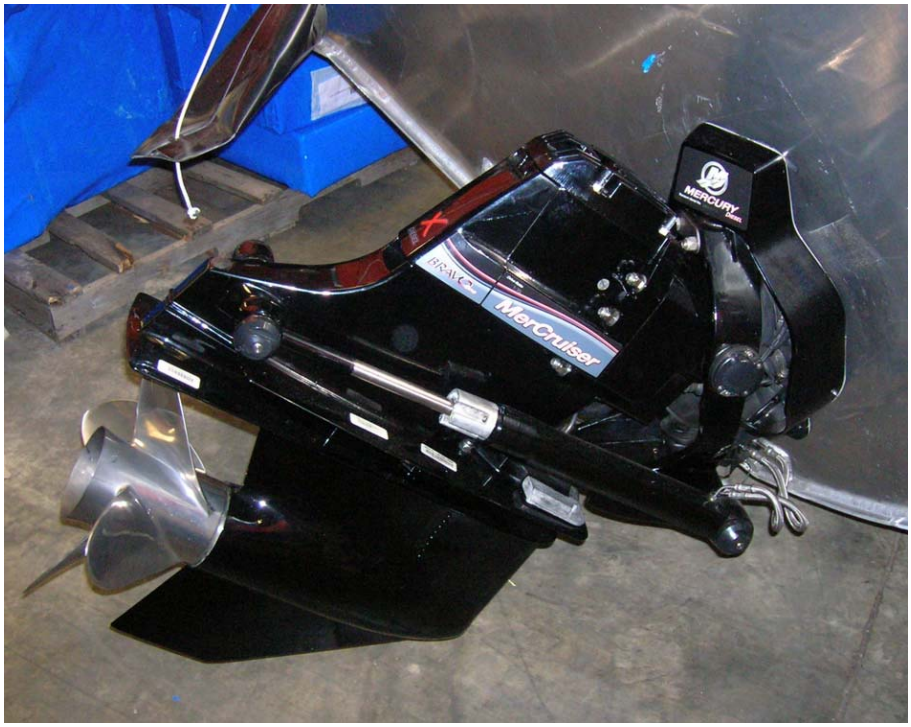

Figure 3-11
Mercruiser Bravo 1X Outdrive

A.10.a. Hydraulic trim actuators

Two hydraulic trim actuators connect the stern drive unit to the transom mounting fixture. Control of the trim actuators is accomplished using a switch on the control handle. This switch is used for trimming the outdrive unit while underway. A trim indicator is located on the Coxswain's console adjacent to the depth sounder display and the fuel gauge.

A.10.b. Electro-hydraulic trim pump

The electro-hydraulic trim pump (**Figure 3-12**) is mounted on the centerline of the transom. The pump has an integral reservoir for the trim hydraulic systems and must be serviced with Quicksilver Power Trim and Steering Fluid or SAE 10W30 or SAE 10W40 oil.

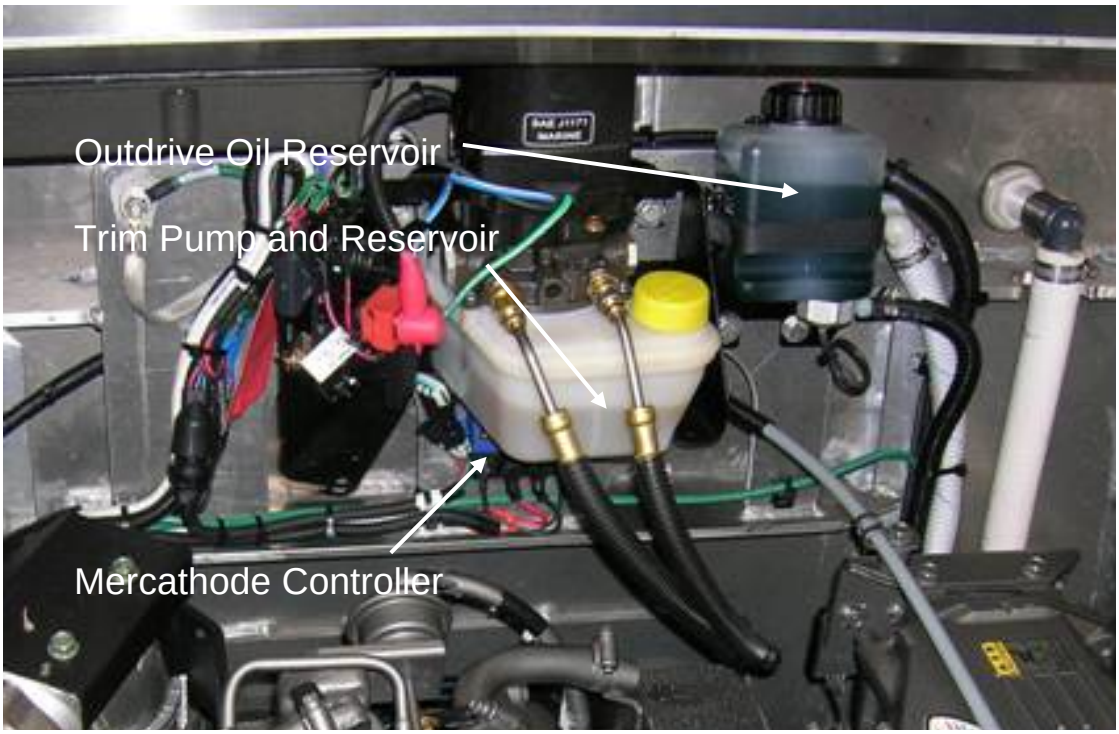

Figure 3-12
Outdrive System Components

A.10.c. Outdrive oil system

The outdrive oil system capacity is 88 ounces (2603 milliliters) of Quicksilver Hi-Performance Gear Lube. A drive lube monitor/reservoir is mounted on the transom in the engine compartment. The monitor provides a small amount of additional gear lube for the system to account for small fluid losses or evaporation. A level switch in the reservoir will provide a gear oil low alarm at the alarm lamp unit on the Coxswain's console. Cooling water intake holes located on the forward, leading edge of the lower outdrive unit provide for conduction cooling of outdrive lubricating oil.

A.10.d. Mercathode controller

The Mercathode controller on the CB-OTH MK III is located on the inner transom below the power trim reservoir. The controller uses 12 VDC to provide a small amount of current to a cathodic protection electrode mounted on the underside of the gimbal housing. The Mercathode system is designed to retard galvanic corrosion on the outdrive unit. Additional sacrificial anodes (zincs) are mounted on the aft end of the trim cylinder actuators, in front of the propeller on the drive shaft bearing carrier and on top of the horizontal plane of the outdrive unit to deter corrosion.

A.10.e. Propeller

The CB-OTH MK III utilizes a Bravo 1 stainless steel, four-bladed propeller, mounted to the splined output shaft of the outdrive and retained by a lockwasher and nut. The propeller on the CB-OTH MK III has a 15¼ inch diameter and 24 inch pitch.

A.11. Engine controls

The start/stop and alarm annunciator panel (**Figure 3-10**), located on the starboard side of the Coxswain's console, facilitates engine startup and shutdown. An engine kill switch is located below the engine throttle control handle (**Figure 3-13**).

Figure 3-13
Engine Throttle Control Handle

A.11.a. Starter

A key switch on this panel actuates a 12 VDC, 2.5 kW starter mounted on the starboard aft side of the engine below the intercooler.

NOTE

The *red* STOP button will only work with the key in the *on* position.

A.11.b. Red stop button

The *red* STOP button on this panel actuates the solenoid valve on the fuel injection pump to cut off the fuel supply to the engine. The *red* STOP button should be held in until the engine comes to a complete stop.

A.11.c. Engine kill switch

The engine kill switch (**Figure 3-14**) is located aft and below the throttle control handle mount. The red capped switch is a normally open circuit with the activation clip installed. The clip MUST be installed prior to engine start. The 36 inch lanyard for the kill switch MUST be attached to the Coxswain's PFD or survival vest.

The kill switch will immediately shut down the engine (close the circuit, actuate the solenoid valve and stop fuel flow to the engine) if the Coxswain is ejected from the boat.

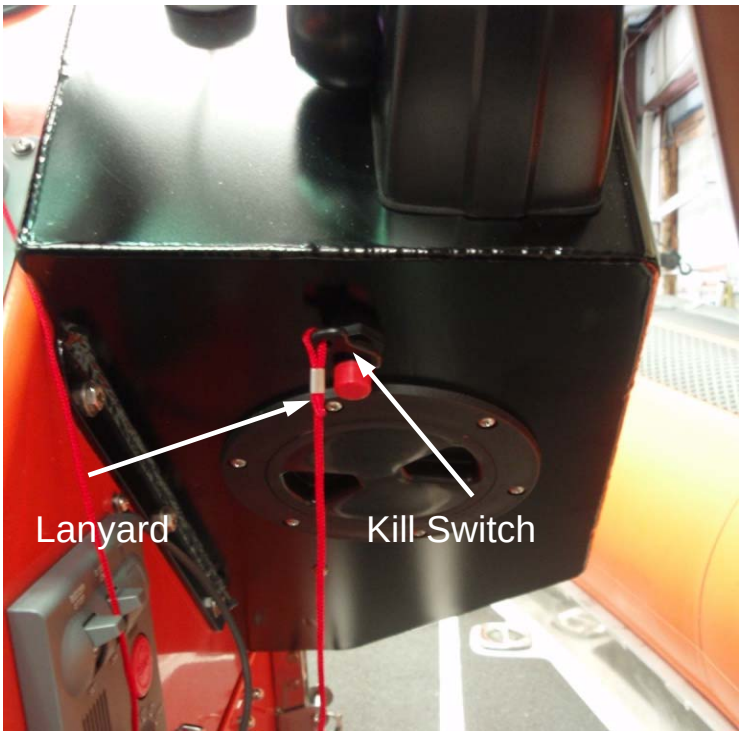

Figure 3-14
Engine Kill Switch

A.12. Engine Throttle control handle

The engine throttle control handle on the Coxswain's console (**Figure 3-13**) is connected to the engine by two cables. It operates the outdrive to *neutral*, *forward* and *reverse*, and controls the engine speed. A switch on the control handle actuates the outdrive hydraulic trim actuators. Flexible cable assemblies and bellcranks (**Figure 3-15**) mounted on the engine transmit the Coxswain throttle movements to the engine throttle and ahead and astern controls.

Figure 3-15
Engine/Outdrive Control

A.13. Steering system

The steering system consists of:

Steering wheel (**Figure 3-16**),
Helm pump (**Figure 3-16**),
Interconnecting hoses, and
Steering actuator (**Figure 3-17**).

The CB-OTH MK III uses a Sea Star 2 helm system with a single steering wheel and helm pump mounted on the Coxswain's console.

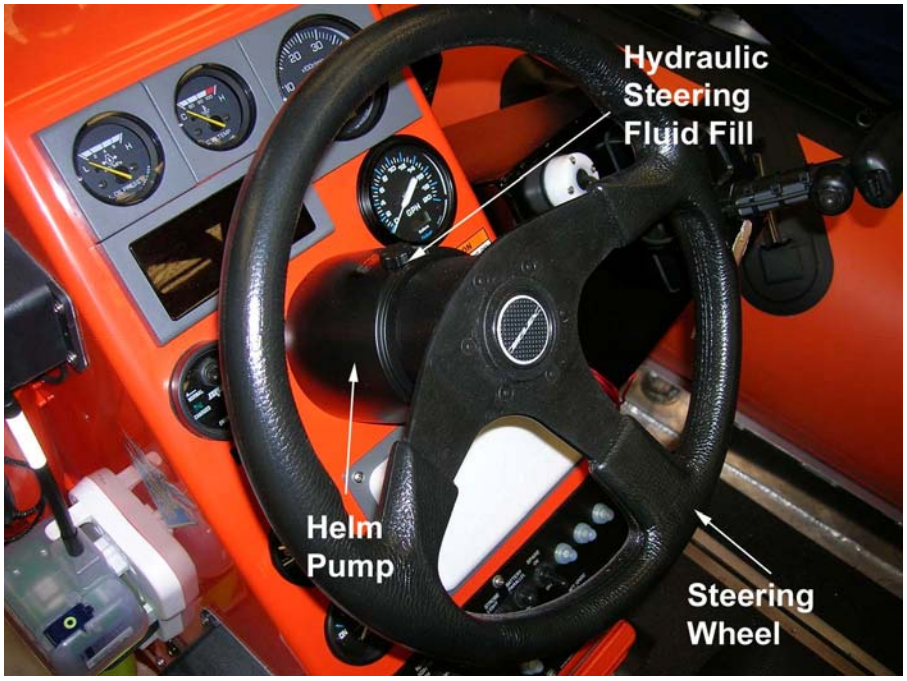

Figure 3-16
Steering Wheel and Helm Pump

A.13.a. Steering actuator

A single steering actuator (**Figure 3-17**) attaches to the steering lever of the outdrive unit using a clevis pin retained by a cotter pin. The steering actuator is located inside the engine compartment forward of the transom.

NOTE

The CB-OTH MK III does not incorporate any power steering or auto-pilot system.

Figure 3-17
Steering Actuator

A.13.b. Steering system servicing

The steering system (2 quart capacity) should only be serviced with the following type hydraulic fluids:

Seastar Hydraulic Fluid HA 5430
Texaco H015
Shell Aero 4
Esso Univis N15 or J13
Chevron Aviation Fluid A
Mobil Aero HFA
Fluids meeting MIL-H-5606C

Section B. Hull Fuel System

Introduction

The fuel tank for the CB-OTH MK III is an 85 gallon polyethylene tank with an integral fuel gauge sending unit, mounted amidships in the hull. Access to the fuel tank level sensor is accomplished through an access plate located under the batteries in the Coxswain's console. A FloScan® system is installed to provide the Coxswain with an accurate indication of the boat's fuel consumption.

B.1. Principles of operation

Fuel is transported to the fuel tank from the fuel fill station (**Figure 3-18**) on the bow using 1½ inch fire retardant hose.

B.1.a. Tank vent fitting

A tank vent fitting is located on the bow forward of the deck fill. The fuel tank is vented through a rubber hose (**Figure 3-18**) and vent fitting located on the port side of the bow.

Figure 3-18
Fuel Fill Station

B.1.b. Fuel supply and return lines

The fuel supply and return lines are ⅜ inch fire retardant hoses.

Figure 3-19
Secondary Fuel Filter

B.2. FloScan® system

The FloScan® system (**Figure 3-20**) provides the Coxswain with an accurate indication of the boat's fuel consumption. The system consists of a FloScan® meter, supply and return fuel flow sensors, pulsation damper and reset switch.

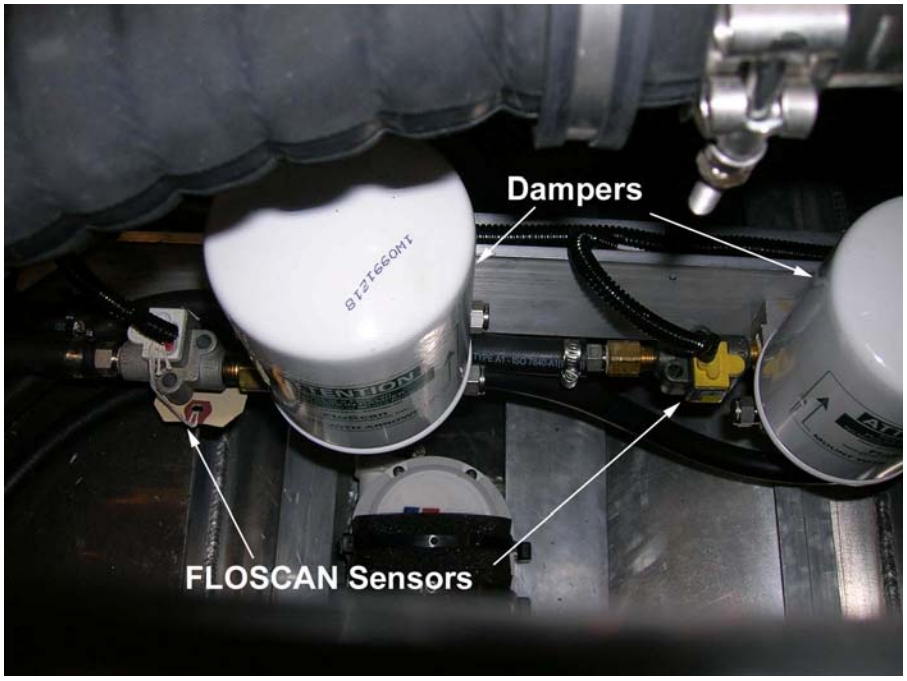

Figure 3-20
FloScan® System

B.2.a. Supply fuel flow sensor	The supply flow sensor on the CB-OTH MK III, is located on the forward bulkhead of the engine compartment, near the centerline.
B.2.b. Pulsation damper	The pulsation damper (**Figure 3-20**) on the CB-OTH MK III, two dampers are located on the forward bulkhead of the engine compartment, near the centerline The pulsation damper is designed to remove fuel pulsations to enhance the FloScan® meter's accuracy.

B.2.c. Return fuel flow sensor

The return flow sensor is located inside the engine compartment, port side forward, directly forward of the secondary fuel filter. The sensor is located in the return fuel line between the engine fuel injection pump and the fuel oil tank. The sensor provides an electronic input to the FloScan® meter (fuel totalizer).

B.2.d. FloScan® meter

The FloScan® meter (**Figure 3-21**) is mounted on the Coxswain's console The meter provides an indication of the fuel being consumed in gallons per hour, and also contains an Liquid Crystal Display (LCD) of the total gallons of fuel consumed. The meter utilizes the inputs of the supply fuel and return fuel flow sensors.

B.2.e. FloScan® reset switch

The FLOSCAN® RESET switch (**Figure 3-22**) is located inside the Coxswain's console. After refueling the boat and with DC power available, the switch should be actuated to reset the LCD display on the FloScan® meter.

Figure 3-21
FloScan® Meter

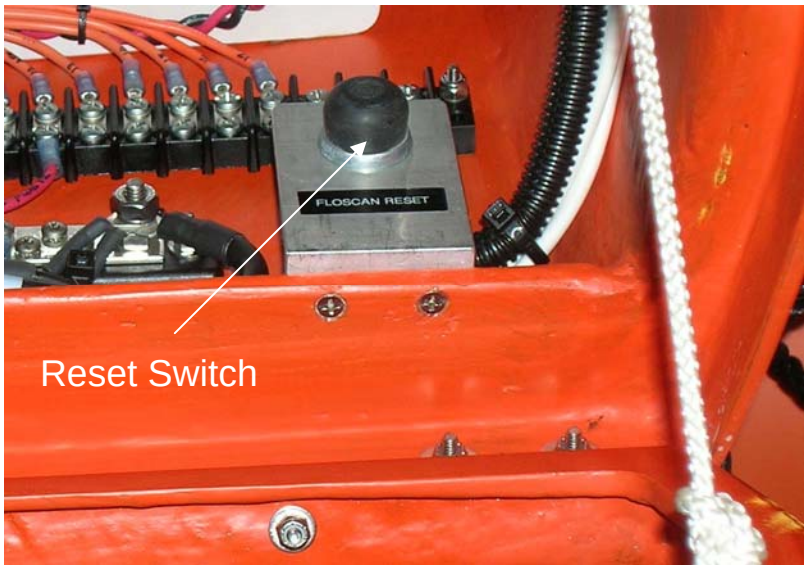

Figure 3-22
FloScan® Reset Switch

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Section C. Hull System

Introduction

The hull of the CB-OTH MK III is fabricated from 5086 marine aluminum with an attached inflatable collar.

C.1. Transom

The transom (**Figure 3-23**) of the CB-OTH MK III is 5086 marine aluminum.

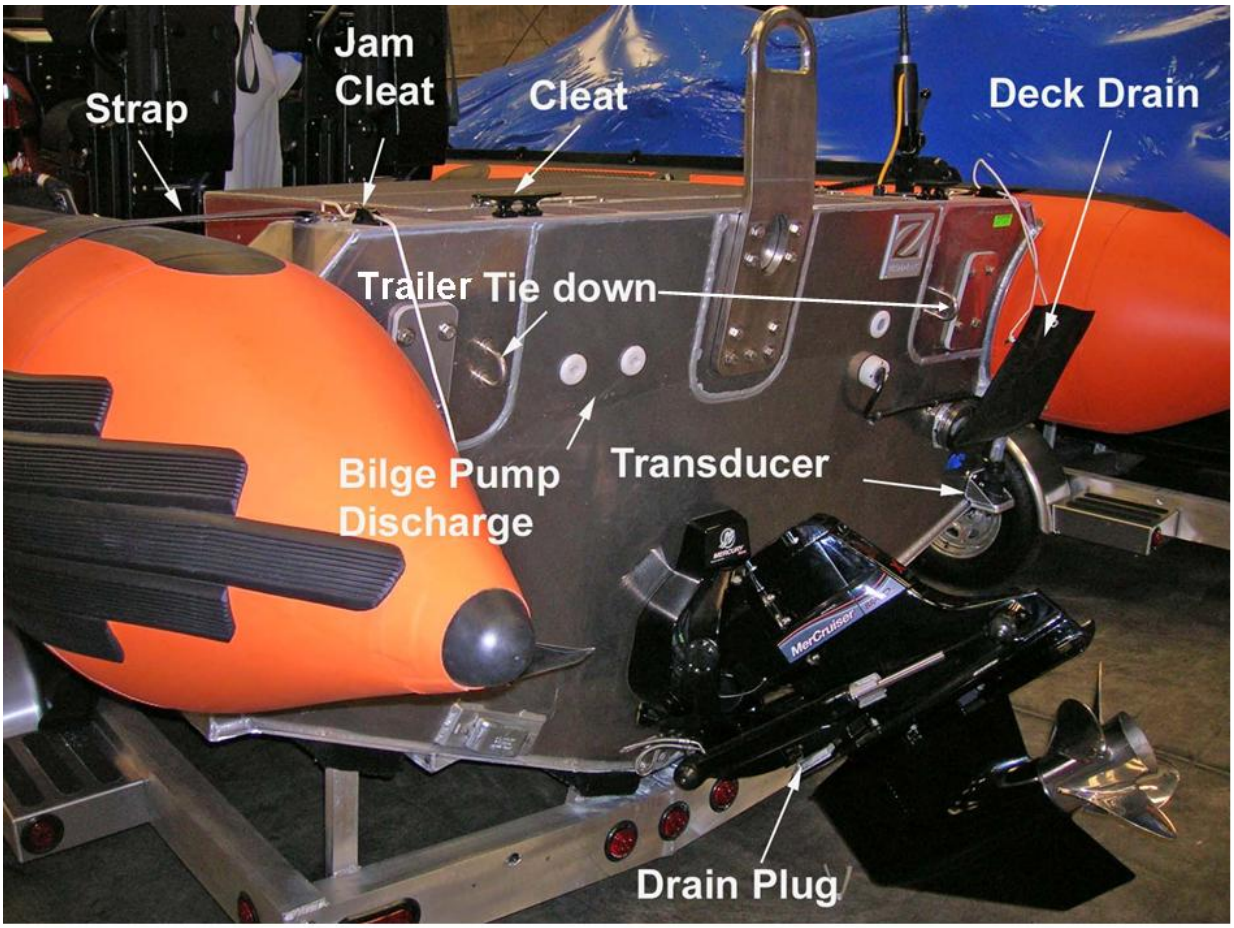

Figure 3-23
Transom

C.2. Engine cover

The cover (**Figure 3-24**) is made of aluminum plate with aluminum stiffeners. The cover is supported by gas-filled lifting cylinders, and has ventilation openings on the port and starboard sides.

Figure 3-24
Engine Cover

C.3. Hull and deck	The hull and deck of the CB-OTH MK III is fabricated from 5086 marine aluminum alloy.
C.4. Transverse bulkheads	The CB-OTH MK III has aluminum bulkheads.
C.5. Mooring cleats	Mooring cleats (**Figure 3-25**) are mounted atop the transom on the port and starboard side.
C.6. Self-bailing deck drains	Two self-bailing deck drains (**Figure 3-25**) penetrate the transom on the port and starboard sides. The deck drains are one-way scuppers and the drain tubes can be hoisted above the waterline and secured using a line and jam cleat.
C.7. Jam cleats	The jam cleats (**Figure 3-25**) are located outboard, atop the transom and are used to secure the nylon line for the self-bailing deck drains.

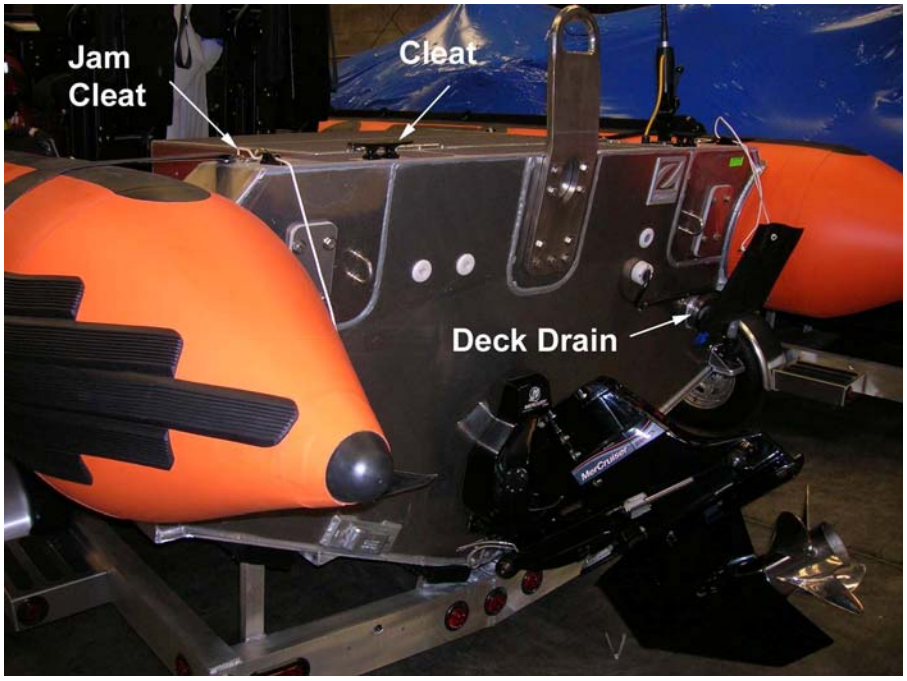

Figure 3-25
Transom Fittings

C.8. Inflatable collar	The inflatable collar (**Figure 3-26**) is constructed of layered fabric consisting of an external layer of hypalon, a core of nylon or polyester fabric, and an internal layer of neoprene rubber. The collar material is fuel-resistant, abrasion-resistant and suitable for use in temperatures from -45° F to +125° F.
C.8.a. Rubbing strakes	Five rubbing strakes adhere to and protect the outboard surface of the collar.
C.8.b. Life line	A life line runs the length of the inflatable collar.

C.8.c. Chambers	The inflatable collar is made up of five chambers. Each chamber is equipped with a manual fill valve, isolating or joining the five chambers together.
C.8.d. Inter-communicating fill valves	The CB-OTH MK III inflatable collar incorporates intercommunicating fill valves. This allows for filling the entire inflatable collar to approximately 3.5 PSI from one location.

Figure 3-26
Inflatable Collar

C.8.e. Pressure relief valves	Pressure relief valves are provided in the collar to relieve excess pressure.
C.8.f. Molded cradle	The inflatable collar system rests in a molded cradle formed by the perimeter of the deck and is bolted to the hull on the inside and outside.
C.8.g. 12 VDC pump	A 12 VDC pump (**Figure 3-27**), is located in the engine compartment, aft, port side on the CB-OTH MK III. A toggle switch labeled AUTO INFLATE is located on the inboard side of the navigation console. The pump operation is automatic and controlled by a pressure switch with the toggle switch in the *on* position.

C.8.i. Main auto-inflation hose

The main auto-inflation hose (**Figure 3-28**) connects to the inflatable collar system in the port aft section of the collar.

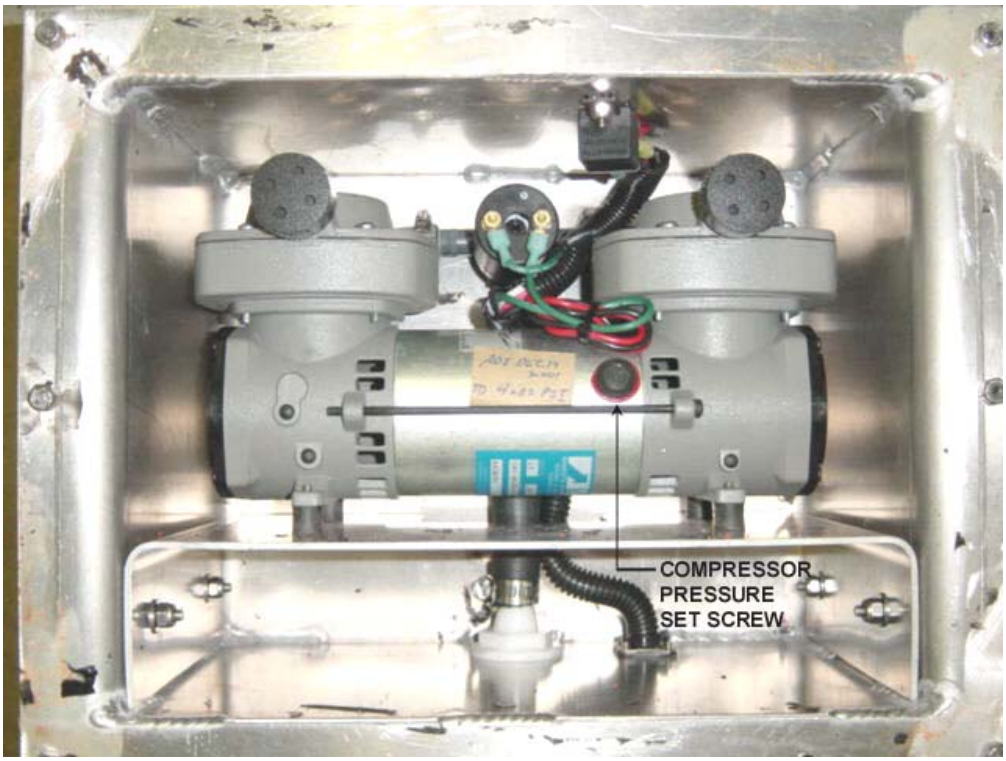

Figure 3-27
Auto Inflation Pump

Figure 3-28
Main Auto Inflation Hose

C.9. Crew seats Five Shockwave seats (**Figure 3-29**) in a modified delta configuration are installed in the CB-OTH MK III.

C.9.a. Coxswain The forward position on the centerline is for the Coxswain in both the Delta and Shockwave seating configurations.

C.9.b. Crew-members Aft of the Coxswain, port and starboard of the centerline, are two seats for the crewmembers.

C.9.c. Other crewmembers In the Shockwave configuration on the CB-OTH MK III, jumpseats are attached to seats 2 & 3.

WARNING When operating the boat above cruising speed, no one shall be seated on the inflatable collar system.

Figure 3-29
Crew Seats and Consoles

C.9.d. Additional passengers

If additional passengers are embarked, they should be seated on the deck, forward of the Coxswain's console. They should be evenly distributed port and starboard of the centerline. Full function communication station (FFCS) #6 can be utilized for passenger communications. It is located on the port side of the coxswains console on the CB-OTH MK III.

C.10. Consoles

All consoles (**Figure 3-29**) are water resistant. Each console has an FFCS with headset access. Grab rails are provided on the sides of the crewmember consoles.

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Section D. Electrical System

Introduction

The electrical system consists of the following components:

Alternator
Two marine grade batteries
Starter
Shore power connector
Galvanic isolator
Battery switch
Battery charge switch
Battery condition indicator
Battery charger
AC breaker panel
Navigation lights
DC-DC converter
Circuit breaker panel

D.1. Alternator

The alternator (**Figure 3-30**) is mounted on the starboard, forward side of the engine and is belt driven by a pulley mounted on the main crankshaft. The alternator is rated at 12 VDC, 80 amps.

D.2. Batteries

Two 12 VDC, marine grade, lead-acid batteries (**Figure 3-31**) are mounted under the Coxswain's console and seat in corrosion resistant battery trays. Louvered vents on the Coxswain's console sub-base allows for ventilating the battery area.

D.3. Starter

The starter is mounted on the port side of the engine, aft of the fuel injection pump and below the intercooler. The starter is rated at 12 VDC, 2.5 kW and engages the engine flywheel to start the engine.

Figure 3-30
Alternator

Figure 3-31
Batteries

D.4. Shore power connector

The shore power connector (**Figure 3-32**) is located on the port side of the Coxswain's console adjacent to the battery switch. The connector is rated at 30 amps, 125 VAC. The connector supplies power from the cutter's 115 VAC system through the AC breaker panel.

Figure 3-32
Battery Switch and Shore Power Connection

CAUTION!

During normal operations, the battery switch shall be in the ON position.

D.5. Battery switch

The CB-OTH MK III has two battery switches (**Figure 3-32**) one for the engine starting battery and one for the house battery. The switches have an OFF and ON position. The batteries can be paralleled using a toggle switch on the Coxswain's console switch panel.

D.6. Battery charge switch and battery condition indicator

On the CB-OTH MK III low or high battery charge is shown on the alarm lamp panel on the Coxswain's console.

D.7. Battery charger

The battery charger (**Figure 3-33**) on the CB-OTH MK III is located inside the console base on the forward bulkhead. The charger receives 110 VAC from the shore power receptacle and provides an output to maintain the charge in the starting batteries at 13.3 VDC.

D.8. AC breaker panel

The AC breaker panel (**Figure 3-34**) is mounted inside the Coxswain's console and provides breaker protection for the AC voltage source from shore power. The four installed breakers on this panel are labeled as follows.

On the CB-OTH MK III:

Main 30 Amp
Battery Charger
Block Heater
Spare

Figure 3-33
Battery Charger

Figure 3-34
AC Breaker Panel

D.9. Navigation lights

The following lights, requiring a source of 12 VDC power, are mounted on the CB-OTH MK III:

Red/Green side lights on antenna arch (**Figure 3-35**)

White Light (All-Around Navigation) on antenna arch (**Figure 3-36**)

D.10. Law enforcement light

Blue Light (Strobe) is mounted on the antenna arch (**Figure 3-36**)

D.11. DC-DC converter

The 12 VDC to 24 VDC step-up converter is located in the navigation console (starboard side) and is designed to power the transceivers and other SINS components that require a 24 VDC input.

Figure 3-35
Port Sidelight

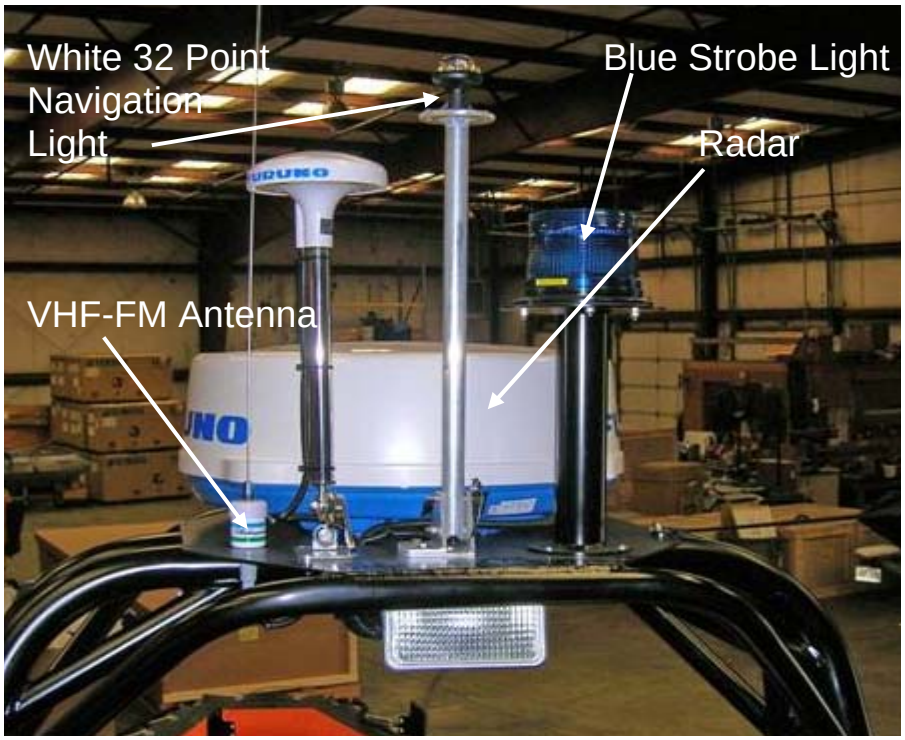

Figure 3-36
Blue Strobe Light and White All-Around Navigation Light

D.12. Coxswain's console switches and circuit breakers

The following switches with corresponding circuit breakers for electrical/electronic system components are located on the bottom of the Coxswain's console, under the steering wheel (**Figure 3-37**):

Bilge Pump
Horn
Nav Lights/Anchor Light
Flood Lights
Strobe Lights
Battery Parallel
Aft 12 VDC Plug

Figure 3-37
Switches and Circuit Breakers (Coxswain's Console)

D.13. CB-OTH MK III Fuse Locations

Fuses for electrical components on the CB-OTH MK III are located in the Coxswain's console and in the navigation console.

D.13.a. Coxswain's console fuses

The following in-line fuses are located inside the Coxswain's console:

Auto Inflation	20 amp
Starting Battery Charger	14 amp
House Battery Charger	14 amp
Mercathode	20 amp
Floscan (two fuses)	0.5 amp
Bilge Pump	30 amp

The Coxswain's console also contains three circuit breakers. The 100 amp breakers protect the switch and fuse panel. The 25 amp breakers protect the bilge pumps.

D.13.b. Navigation console fuses

The navigation console contains a fuse panel with the following fuses:

Hailer	5 amp	Converter	5 amp
Heading Sensor	1 amp	VHF-FM Brain	20 amp
RD 30	1 amp	VHF-FM Head	3 amp
GPS	1 amp	VHF-FM Head	3 amp
Radar	10 amp	MOBAT HF	30 amp
Intercom	5 amp	MOBAT HF	7.5 amp

Section E. Communications/Navigation System

Introduction

Most of the standard marine communications equipment is contained in the port crewmember console (communications console) and the navigation equipment is contained in the starboard crewmember console (navigation console).

E.1. Starboard operator's (navigation) console

The navigation console (**Figure 3-38**) on the CB-OTH MK III contains the radar and the Furuno GP-37 GPS display and each console has an FFCS on the inboard side. Crewmembers using this equipment shall be certified in accordance with *BOAT Manual Vol. II,* COMDTINST M16114.33 (series).

Figure 3-38
Navigation (Starboard) Console

E.1.a. FURUNO NAVnet

The FURUNO NAVnet is a multi-function display. It displays radar information and can also display chart and GPS data, heading and depth data.

E.1.b. FURUNO DGPS system/chart plotter

The FURUNO DGPS system/chart plotter, GP-37, is mounted in the navigation console of the CB-OTH MK III. It utilizes a GPA-019 antenna mounted on top of the antenna arch. The FURUNO GP37 can use the following navigational signals:

Standard GPS
Ground-based differential GPS
Satellite differential GPS

E.2. Port operator's (comms) console

The console on the CB-OTH MK III (**Figure 3-39**) contains the following equipment, from top to bottom:

Motorola VHF-FM Radio Control Head
MICOM 3T HF Radio Control Head
FURUNO Loudhailer/Siren/Automatic Sound Signal

The console has an FFCS on the side.

Figure 3-39
Communications (Port) Console

E.2.a. Motorola VHF-FM XTL-5000 transceiver control head

The Motorola VHF-FM XTL 5000 transceiver control head is installed at the top of the port operator's console. This transceiver is used for communicating on all VHF-FM marine band frequencies. The Motorola VHF-FM radio meets the latest digital encryption standard (DES) requirements. The radio requires a 12 VDC power input. A 36 inch Shakespeare VHF-FM antenna (5215) is mounted atop the antenna arch for the XTL-5000 VHF-FM radio.

E.2.b. Loudhailer

The Furuno LH-3000 loudhailer is a 30 watt loudhailer with listening capability. The loudhailer can provide the following audible signals:

Yelp Siren Capability
UNWY - Vessel Underway in reduced visibility
SAIL - Vessel Under Sail in reduced visibility
TOW - Vessel Under Tow in reduced visibility
STOP - Stationary Vessel in reduced visibility
ANCH - Vessel at Anchor in reduced visibility
AGND- Vessel Aground in reduced Visibility

E.3. FURUNO RD30 depth sounder

The FURUNO RD30 depth sounder (**Figure 3-39**) is mounted on the Coxswain's console with the depth sounder transducer (**Figure 3-40**), mounted on the bottom of the transom, starboard side of the centerline.

When first turned on, the display will show the current depth. The depth sounder memorizes the minimum and maximum depth while it is turned on and these quantities can be recalled and displayed.

The depth sounder also employs a depth trend indicator to indicate a rising or lowering sea bed. Deep and shallow threshold limits can be programmed into the depth sounder to activate deep and shallow depth alarms.

Figure 3-40
Depth Sounder Display

Figure 3-41
Depth Sounder Transducer

E.4. Graytronics Intercom system

The CB-OTH MK III intercom stations are located at each crew seat. An additional station is located on the port side of the Coxswain's console for additional personnel seated on the deck forward of the Coxswain's console. Each full function communication station (FFCS) has a jack to plug in a headset (**Figure 3-41**) and a separate volume control.

The six FFCS provide for intercom capabilities as well as radio interface capabilities. The FFCS can select and monitor the on-line transceiver as programmed from the Master Control Station (MCS).

Figure 3-42
Headset (for FFCS)

E.5. Master control station

A master communications control station is located inside the drop-down panel on the forward side of the communications console.

E.6. Radio Systems

The CB-OTH MK III is equipped with VHF-FM and HF radio systems with encryption capability.

E.6.a. Motorola Micom 3T HF radio

The Motorola Micom 3T HF radio is a fully capable HF, single side band (SSB) transceiver covering the frequency range from 1.6 to 30 MHz. The unit is designed with built-in self-test features to permit the operator or maintenance personnel to check the transceiver performance.

The RF output of the HF transceiver is boosted to 125 watts by the RF-5032-125E power amplifier located inside the seat locker of the communications console. This amplifier also supplies the input power to the Micom 3T.

E.6.b. KY-99A COMSEC (secure speech)

The MINTERM KY-99A COMSEC Secure Speech device is designed for use over the half-duplex, narrowband and wideband communications channels. It is a secure voice and data encryption device. It can be used with narrowband communications channels provided by HF, VHF-FM, UHF and SATCOM radios. It is utilized primarily for HF communications in the CB-OTH MK III. Secure stowage for the device is provided behind the drop-down panel on the forward side of the navigation console

E.6.c. Tactical VHF-FM spectra RT

The Tactical VHF-FM Spectra RT provides three communication modes:

Normal analog (clear voice)
Secure-net digital (coded voice)
Both clear and coded voice

The modes of operation are programmed on a channel-by-channel basis. The Spectra is capable of either 25 or 50 watt output and 146 to 174 MHz frequency range. The receiver/transmitter unit is located in the control head located in the portside pod. The Shakespeare 5241-R VHF-FM antenna is mounted on top of the antenna arch.

E.7. HF antenna system

The HF Antenna System for the AN/PRC 138 Tactical HF Radio consists of a Shakespeare AT-1011/U antenna (**Figure 3-45**) mounted on the port aft side atop of the transom and an SG-230 antenna coupler (**Figure 3-46**) mounted inside the engine compartment cover.

The antenna is made up of two separate sections. The antenna coupler has a frequency range from 1.8 to 30 MHz and a power range from 10 to 150 watts.

E.8. Vicor DC-DC converter

The Vicor DC-DC Converter converts 12 VDC to 24 VDC, 25 amps to power communications equipment and transceivers located on the CB-OTH MK III. The converter is located behind the drop-down panel on the forward side of the navigation console.

WARNING

In the event of a mishap, the EPIRB may not automatically activate. If this is the case, the EPIRB must be manually activated.

E.9. 406 MHz Emergency Position Indicating Radio Beacon

A Category 1, Class 2, 406 MHz Emergency Position Indicating Radio Beacon (EPIRB) (**Figure 3-47**) is mounted on the port side of the Coxswain's console and provides a distress alert signal through a global satellite communications signal. The unit is designed to float free and can be automatically or manually activated.

Figure 3-43
HF Antenna

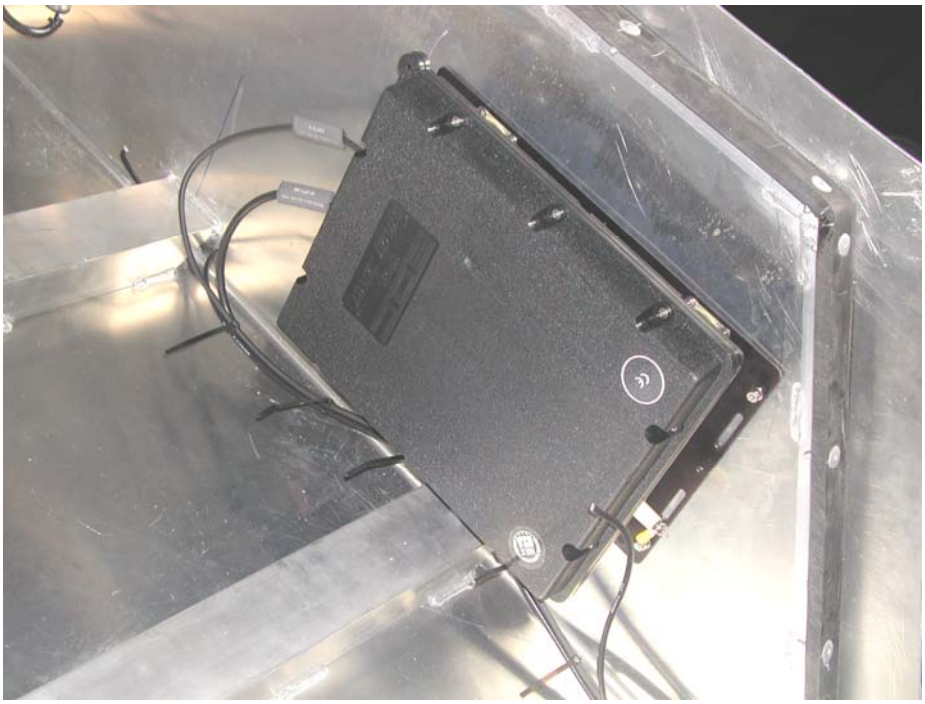

Figure 3-44
Antenna Coupler

Figure 3-45
Emergency Position Indicating Radio Beacon (EPIRB)

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Section F. Fire Suppression System

Introduction

The CB-OTH MK III is equipped with a fire suppression system in the engine compartment. The system can be monitored from a panel on the Coxswain's console dash.

F.1. Xintex Fireboy Fire Suppression System

The Xintex Fireboy system consists of a gas cylinder mounted on the engine compartment cover, an electronic relay module to shut down the engine, and an alarm/status panel located on the Coxswain's console dash panel.

F.1.a. Fireboy gas cylinder

The Fireboy gas cylinder contains FE-241, chlorotetraflouroethane, an EPA-approved substitute for Halon in spaces which are not occupied. The cylinder will discharge at a temperature of 175° F.

F.1.b. Engine shutdown module

The gas used in the system will not stall a diesel engine. The engine must be shut down for the system to effectively extinguish a fire. Engine shutdown is accomplished by an electronic relay module, which actuates when the cylinder discharges.

F.1.c. System display unit

The system display unit (**Figure 3-46**) is located on the Coxswain's console dash panel. The display unit lights indicate the charged/discharged status of the system. A toggle switch on the display unit allows the operator to override the automatic shutdown of the engine.

WARNING

The Coxswain must ensure that the display toggle switch remains in the "Normal" position.

Figure 3-46
Fireboy System Status Indicator

Section G. Trailering

Introduction

The trailer (**Figure 3-47 and 48**) that accompanies CB-OTH MK III is custom built by MYCO Trailers. It is designed to transport the CB-OTH MK III on roadways and allows the trailer and boat to be loaded onto a HC-130 aircraft for worldwide deployment.

Figure 3-47
Boat Trailer

G.1. General

The boat trailer and associated equipment are an important part of your boat's readiness. All too often, the trailer and tow vehicle do not receive the attention required to ensure proper operation. Proper maintenance and continual care of all trailering equipment is necessary.

NOTE

The only trailer authorized for the CB-OTH MK III is the MYCO Trailer designed for this class of boat.

WARNING

Lack of preventative maintenance contributes to a significant amount of trailering mishaps each year. CB-OTH MK III PMS requirements for the boat's trailer is contained in the CB-OTH MK III Preventative Maintenance Manual. It is imperative that PMS is completed in accordance with this manual. If care and maintenance of the trailer is neglected, you may be endangering the safety of your boat, your crew, yourself, and the public.

Figure 3-48
CB-OTH MK III and Trailer

G.2. Tow Vehicle

The tow vehicle must be capable of handling the weight of the trailer (with boat and equipment), as well as the weight of the passengers and equipment carried inside the vehicle. This may require that the tow vehicle be specially equipped with the following:

- Engine of adequate power.
- Transmission and rear-end designed for towing.
- Larger cooling systems for the engine and transmission.
- Heavy-duty brakes.
- Load bearing hitch attached to the frame, not the bumper.
- Heavy duty suspension.

NOTE

The towing vehicle must be rated at the combined weight of the boat and trailer. The vehicle's towing limitations can be found in the owner's manual.

NOTE

If the combined weight of the boat, trailer, personnel, and equipment is too close to the tow vehicle's rating, consider using a second vehicle to transport some of the personnel and equipment to provide an additional safety margin.

G.3. Hitch

The trailer hitch is attached to the tow vehicle's frame providing a secure fitting from which to attach the receiver and ball mount.

The hitch shall be at a minimum a Class V hitch capable of carrying 7,000 lbs or greater. The hitch **must** be stamped (by the manufacturer) or have a sticker affixed from the manufacturer stating the class and the rated towing capacity (7,000 lbs or greater).

G.4. Ball Mount and Ball

The ball mount attaches to the trailer hitch providing a secure fitting to mount the trailer ball.

The ball mount must be capable of carrying trailer weight of 7,000 lbs or greater. The ball mount **must** be stamped (by the manufacture) or have a sticker affixed from the manufacture stating the rated towing capacity (7,000 lbs or greater). If using a ball mount that requires the hardware (bolts and nuts), hardware must have a rating of 7,000 lbs or greater.

The ball **must** be $2^{5}/_{16}$ inches, and have a rating of 7,000 lbs or greater. It shall be stamped and **clearly** legible. The ball should be inspected often for cracks, abnormal wear, and proper lubrication. (**Figure 3-49**)

The height of the ball mount should be positioned so that the trailer will be pulled level. The tongue weight should be 800 lbs or less when the trailer is level. Adjusting the height of the ball mount is critical to ensure this condition is met.

Figure 3-49
Hitch, Ball Mount, and Ball Assembly

G.5. Trailer Coupler, Safety Chains and Hydraulic Brake Actuator

The trailer coupler attaches to the ball of the tow vehicle. The coupler engages the ball and provides a positive mechanical lock between the trailer and the tow vehicle. The coupler **must** be $2^{5}/_{16}$ inches and have a rating of 7,000 lbs or greater.

Two safety chains attached to the trailer provide trailer retention to the vehicle should the coupler disengage from the ball. The safety chains **must** be $^{1}/_{2}$ inch galvanized steel. One end of the safety chains are bolted directly to the trailer. The bitter ends are to be attached to the tow vehicle's hitch with $^{1}/_{2}$ inch galvanized screw pin shackles that are rated at 2 tons.

The breakaway lever actuating chain (Hydraulic Brake Actuator) is attached to the vehicle during towing operations. Should the coupler disengage from the ball, the breakaway lever actuating chain will be pulled forward actuating the breakaway lever automatically applying the trailer's brakes. The hydraulic brake actuator safety chain **must** be attached to the hitch using $^{1}/_{4}$ inch shackle and an additional $^{1}/_{2}$ inch shackle. The breakaway lever actuating chain is a standard length and should not be altered in any way. **(Figure 3-50)**

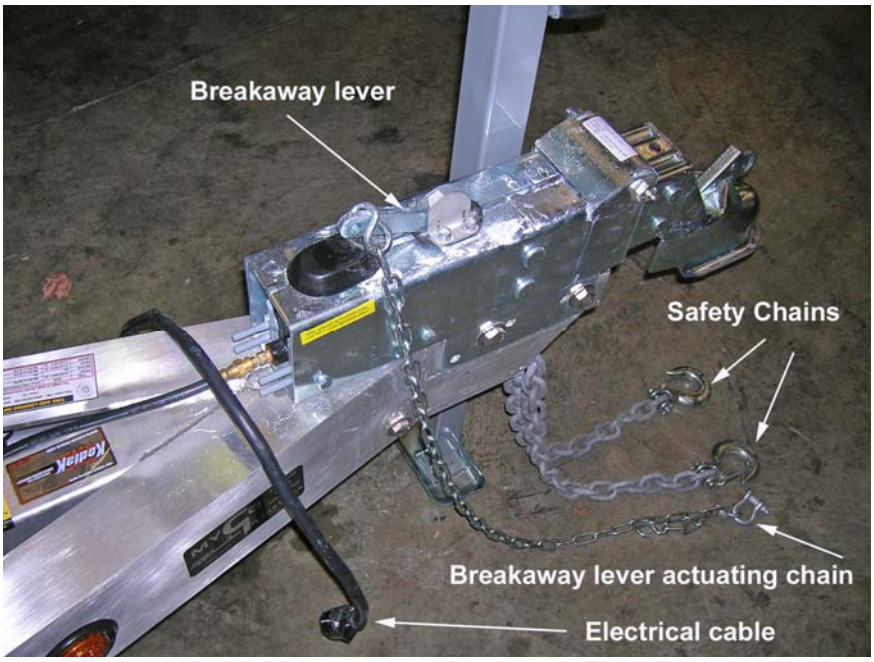

Figure 3-50
Trailer Coupling Assembly

NOTE

Always use a designated "spotter" when hooking up the trailer. The spotter can provide detailed instructions to the tow vehicle operator when backing up which will prevent damage to both the tow vehicle and trailer.

G.6. Pintle Hook and Lunette Eye Configuration for MSSTs

Because of their unique operating requirements, MSSTs are authorized to use a pintle hook and lunette eye hitch system when deploying with Department of Defense, aviation units, or at the discretion of the unit's commanding officer. The pintle hook and lunette eye components must have a rating of 7,000 lbs or greater, and be installed in accordance with the manufacturer's instructions. It shall be stamped and **clearly** legible. The pintle hook and lunette eye should be inspected often for cracks and abnormal wear. When the pintle hook is in use, the ball and coupler assembly must be carried in the outfit kit. **(Figure 3-51)**

Figure 3-51
Pintle Hook

G.7. Trailer Construction and Equipment

The primary frame of the trailer is made up of $^{1}/_{4}$ inch X $3^{1}/_{4}$ inch X 6 inch aluminum C Channel. The suspension is a torsion axle system. The trailer is a four-wheel configuration (two on each side) with one spare. The wheels are attached to the hub system.

The MYCO trailer uses LEDs for the brake, tail, and clearance lights.

G.8. Hooking up the Trailer

When hooking the tow vehicle up to the trailer, the same procedures should be done every time. Whether your transiting to a local boat ramp just down the road or going on a long trip, the trailer should always be completely attached to the tow vehicle. **(Figure 3-52)**

Follow these steps for attaching the trailer to the tow vehicle:

Step	Procedure
1	Using a spotter, carefully back the tow vehicle so that the trailer ball is aligned under the trailer's coupler.
2	Using the hand-crank jack, lower the trailer coupler until it is completely seated on the trailer ball.
3	Engage the coupler latch and insert the coupler latch pin to ensure it does not come undone during transit. NOTE: The coupler latch pin should have a lanyard long enough to facilitate insertion and removal.
4	Attach the safety chains. They shall be crisscrossed and have enough slack to allow for sharp turns in both directions yet short enough to not drag on the ground.
5	Attach the breakaway level actuating chain ensuring there is enough slack to allow for sharp turns in both directions.
6	Connect the wiring harness to the tow vehicle. The wiring harness (pig tail) should have enough slack to allow sharp turns in both directions and short enough as to not drag on the ground.
7	Check trailer lights to ensure they are operating properly.

NOTE

The wiring on the trailer's wiring harness should be a 7-4-2 configuration.

CAUTION !

Once connected to the tow vehicle, ensure the trailer is being towed level to the ground. If the trailer is not level to the ground, a drop bar/ball mount of a different height may be necessary and/or the trailer coupler may need adjustment.

WARNING

Do not exceed the maximum weight rating on the trailer. Exceeding the maximum rating voids the manufacturer's warranty and may lead to failure of the trailer causing damage to the boat and creating an unsafe towing condition.

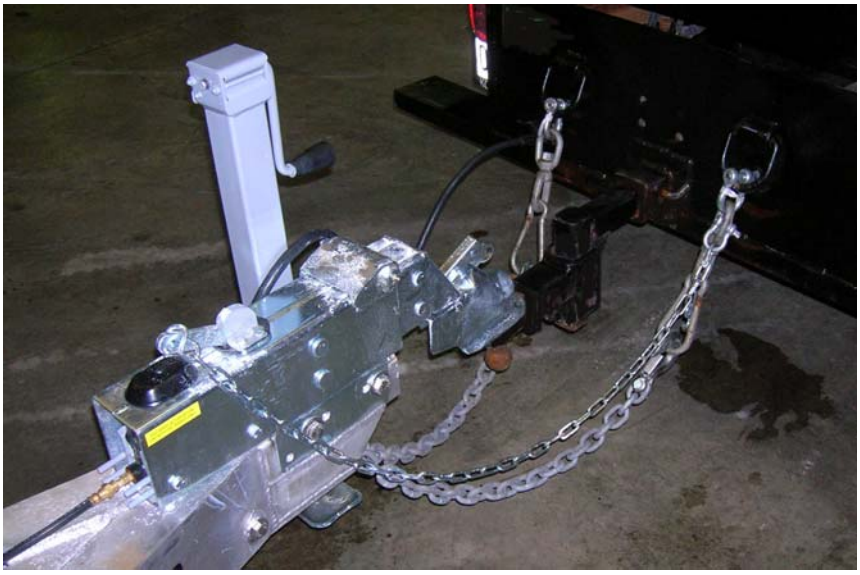

Figure 3-52
Trailer Hook-Up

G.9. Securing the Boat to the Trailer

Before taking the trailer and boat into tow, you must first ensure that the boat is properly secured to the trailer. **Damage to the boat and trailer could result if the two are not connected.**

Tie-down straps must be attached and tightened between the U-bolts found on the boat's transom and the trailer prior to transporting the boat. Placement is as follows:

- One on each side of the transom **(Figure 3-53)**

Tie-downs shall be rated for at least 6,000 lbs.

NOTE

Trailer chafing skids or "Bunk" must be kept in good condition to prevent scratching and gouging of the hull.

The bow of the CB-OTH MK III must be held snug against the bow stops by the winch cable (**Figure 3-54**).

Figure 3-53
Trailer to Transom Tie Down

Figure 3-54
Boat Trailer, Bow Tie Down

G.10. Towing Precautions

Pulling a trailer presents several problems: more time is required to brake, accelerate, pass, and stop. The presence of the boat on the trailer will increase the size of the vehicle's blind spots, especially when using rear view mirrors for backing. The turning radius is also much greater; curbs and roadside barriers must be given a wide berth when negotiating corners.

Prior to operating on the open road, the vehicle operator should practice turning, backing up, and other maneuvers on a level, non-congested parking area. Backing a trailer is a challenge even to the most experienced drivers and requires considerable practice.

CAUTION!

Use a spotter when backing or maneuvering in tight quarters. The boat and trailer will hinder the driver's ability to judge distances and negotiate turns.

The CB-OTH MK III boat and trailer is closely matched to the minimum trailer-truck-hitch requirements. Safe trailering requires that the trailer be properly balanced and loaded. Overloading a trailer on the highway is as dangerous as overloading your boat on the water. Carrying additional equipment (beyond the boat outfit) or personal gear on the boat may add substantially to the trailer's gross weight and play havoc with the load distribution.

WARNING

Do not overload the trailer by carrying additional equipment or personal gear in the boat.

NOTE

Many units require tow vehicle operators to complete a unit generated Performance Qualification Standard (PQS) before they tow a trailer.

G.11. Trailering Checklist

Before your trip, ensure the following items have been checked:

- Check intended routes for restrictions on bridges and tunnels, and low overhead clearances. Rotate the antenna arch to the down position.
- Ensure the tow ball and coupler are the same size and bolts with washers are tightly secured. (The vibration of road travel can loosen them.)
- Confirm the coupler is completely over the ball and the latching mechanism is locked down and secured with locking pin. If using a pintle/lunette eye, ensure the pintle is properly engaged.
- Ensure the safety chains are securely attached, crisscrossing under the coupler, to the hitch of the tow vehicle. If the ball were to break, the trailer's tongue would be held up by the chains allowing the trailer to follow in a straight line and prevent the coupler from dragging on the road.
- Ensure the hydraulic brake actuator safety chain is attached to the hitch.
- Ensure the jack is fully cranked up.
- The side-view mirrors of towing vehicles should be large enough and adjusted to provide an unobstructed rear view on both sides of the vehicle.
- Check that the wiring is properly connected - not touching the road, but loose enough to make turns without disconnecting or damaging the wires. Make sure all trailer running lights, brake lights, turn signals, and hazard lights are working on both the tow vehicle and trailer. When trailer lights are submerged during launching/recovery they have a greater chance of failure and should be serviced more frequently. Always disconnect the trailer-wiring harness from tow vehicle before submerging the trailers lights.
- Check the brakes. Lightly test before getting on a major road. On a level parking area, roll forward and apply the brakes several times at increased speeds to determine a safe stopping distance.
- Check tires, including the trailer's spare tire and towing vehicle tires for condition and proper inflation. Improper inflation may cause difficulty in steering. Read the tire sidewall to determine tire pressure required. Also check for tire wear, cracks, bubbles, or foreign objects imbedded in the tire. When trailer wheels are immersed in water (especially salt water) the bearings should be inspected and greased on a regular basis in accordance with PMS procedures. Make sure the wheel lug nuts/bolts on the tow vehicle and trailer are tightened to the correct torque.

- Check all spaces for standing water (rainwater or water from cleaning). Standing water is undesirable for many reasons, but mainly because a collection of it can rapidly increase weight on the trailer, often beyond its capacity. Furthermore, the extra weight may shift with the movement of the trailer and cause a dangerous situation.
- Check load distribution to make sure the tow vehicle and trailer are properly balanced front and back and side to side. Too much weight on the hitch will cause the rear of the tow vehicle to sag and may make steering more difficult. This can also cause your headlights to shine into the eyes of oncoming traffic.
- Use wheel chocks when parking the trailer.
- Double check all connections, safety chains, breakaway lever actuating chain, wiring harness, and tie down straps are properly secured/connected.

WARNING

Do not tow any trailer faster than 55 MPH – some states speed limit for towing is 45 MPH.

G.12. Launching the Boat

Once at the boat ramp, use the following procedures to launch the boat:

Step	Procedure
1	Using a spotter, carefully back the trailer down the boat ramp to the water's edge. Set parking break.
2	Remove all of the tie-down straps that secure the boat to the trailer. **DO NOT disconnect the trailer winch connection.**
3	Disconnect trailer-wiring harness from tow vehicle.
4	Visually inspect the boat's hull and engines for any damage that may have occurred during transit.
5	Place crew onboard the boat and have crewmember stand-by to release the trailer winch connection.
6	Carefully back the trailer into the water until approximately three-quarters of the boat is floating free of the trailer. Set the towing vehicle's parking break.
7	Check spaces for flooding.
8	Lower outdrive into the water and start. Ensure the water level in the vicinity of the outdrive is sufficient for operation and clear of hazards.
9	If crew is satisfied with condition of boat/engine and is ready to get underway, release the trailer winch connection and carefully push/power the boat back off the trailer.
10	Carefully pull tow vehicle forward clear of boat ramp.

NOTE

After launching or recovering the boat, always rinse down the trailer with fresh water and check the trailer lights for proper operation.

CAUTION !

During recovery, ensure 1 to 2 inches of space remains between the bow and the bow stops. This will ensure proper loading and weight distribution.

CAUTION !

Always use a spotter when backing a trailer! Windows should be open and radio should be off.

G.13. Recovering the Boat

When finished with boat operations, use the following procedures to recover the boat:

Step	Procedure
1	Disconnect trailer-wiring harness from tow vehicle. Set parking brake.
2	Using a spotter, carefully back trailer down the ramp until approximately three-quarters of the trailer is submerged.
3	Align the center of the boat with the center of the trailer and carefully maneuver the boat onto the trailer. **Check water level in the vicinity of the trailer and trim outdrive up or secure as needed.**
4	Attach trailer winch to bow of boat and pull boat forward onto the trailer. **Always ensure boat stays centered on trailer.**
5	Secure engine on boat (if still running).
6	Slowly pull the tow vehicle forward until the trailer is clear of the water.
7	Attach all tie-down straps securing the boat to the trailer. Lower antenna arch before transporting on roadways.
8	Ensure trailer lighting is operating properly.
9	Do a complete visual inspection of the tow vehicle, trailer, and boat before transiting on highway.

Chapter 4
Crew Requirements

Introduction

The *BOAT Manual, Volume II,* COMDTINST M16114.33 (series) provides minimum standards and guidelines for competence on board the CB-OTH MK III. Each crewmember should be familiar with the duties of the other crewmembers in addition to his/her own duties. It is important for a crewmember to know and commit to memory all important characteristics of the boat and its equipment, and which procedures to follow in the event of a casualty. Each crewmember should mentally rehearse the procedures each member of the crew would follow during any operational casualty. Teamwork is the common thread that allows the crew to succeed. Whenever the opportunity is available, the crew should get the boat underway to practice operational and emergency procedures.

In this chapter

This chapter contains the following sections:

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Section A. Minimum Crew

Introduction

Units shall comply with the minimum boat crew requirements prescribed in the *BOAT Manual*, *Volume I*, COMDTINST M16114.32 (series).

A.1. Certified crewmembers

All crewmembers shall meet the qualification requirements prescribed in the *BOAT Manual, Volume II,* COMDTINST M16114.33 (series).

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Section B. Coxswain

Introduction

The U.S. Coast Guard places great trust in each Coxswain and his or her ability to accomplish the assigned missions in a safe and professional manner even under adverse conditions. The position of Coxswain is one of high regard and great responsibility.

The Coxswain is responsible for the boat, its crew, and passengers during every mission. The Coxswain assigns and directs all onboard functions during each operation.

B.1. Authority and responsibility

The extent of the authority and responsibility of the Coxswain is specified in *United States Coast Guard Regulations,* COMDTINST M5000.3 (series), as follows:

"The Coxswain shall be responsible, in order of precedence, for the safety and conduct of passengers and crew; the safe operation and navigation of the boat assigned; and the completion of the sortie or mission(s) assigned or undertaken pursuant to USCG policy and regulations. An underway Coxswain will at all times respond, within the limits of capabilities and legal authority to observed hazards to life or property, and violations of law or regulations."

The Coxswain is the direct representative of the Commanding Officer or Officer-in-Charge and as such, (subject to *Articles 88-89* of the *UCMJ*) has the authority and responsibilities that are independent of rank or seniority in relation to other personnel embarked. The authority and responsibility of the Coxswain exist only when the boat is engaged on a specific sortie or mission.

B.2. Relief of responsibility

The only person embarked in the boat who may relieve the Coxswain of the responsibility as described above is:

The Commanding Officer, Officer-in-Charge, Executive Officer, or Executive Petty Officer.
A senior officer at the scene of a distress emergency, or other abnormal situation, who exercises authority under the provisions of *USCG Regulations*, whether or not other units are involved.

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Section C. Engineer

Introduction

The position of Engineer is one of great responsibility. The knowledge and skill of the Engineer can make the difference in completing the mission under adverse conditions.

C.1. Qualifications

The Engineer must be a certified Boat Crew Member prior to obtaining certification as an Engineer since this individual is required to perform duties in both capacities.

C.2. Responsibilities

The primary responsibilities of this position include operational and underway maintenance of the propulsion and auxiliary systems.

The Engineer may also serve as:

senior crewmember
safety observer
boarding officer
line handler
helmsman
surface swimmer
emergency medical technician
or other such duties as may be assigned by the coxswain in support of operational and training sorties or missions.

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Section D. Boat Crew Members

Introduction

Under direct supervision of the Coxswain, the crew is responsible for line handling, acting as lookout, and assisting the Coxswain as required during all evolutions or maneuvers.

D.1. Certified Boat Crew Member

The Boat Crew Member must be certified in accordance with the *BOAT Manual, Volume I,* COMDTINST M16114.32 (series) and *BOAT Manual, Volume II,* COMDTINST M16114.33 (series).

Additionally, the Boat Crew Member may be responsible for operating the communications/navigation equipment when directed by the Coxswain.

D.2. Additional Crewmembers

Additional crewmembers are assigned by the Coxswain and certified by the CO/OIC based upon mission requirements.

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Section E. Passengers

Introduction

The CB-OTH MK III is designed to carry a Coxswain, Engineer, and up to 3 additional crew or passengers while carrying out high-speed mission activities. Additional passengers can be carried for other missions, not to exceed designed weight capacity (see *Chapter 2, A.4.*). Passengers shall be seated as directed by the Coxswain.

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Section F. Safety Equipment

F.1. Personal protective equipment

During all CB-OTH MK III operations, crewmembers shall wear personal protective equipment (PPE) as required by the *Rescue and Survival Systems Manual*, COMDTINST M10470.10 (series).

WARNING

The use of the kill switch is required whenever the boat is started or has way on. The kill switch is located below the throttle (**Figure 3-15**). The activation clip (with red plastic cap) for the kill switch MUST be inserted into the switch body to start the engine. The 36 inch lanyard MUST be properly attached to the Coxswain at all times during boat operation. A second kill switch lanyard with activation clip MUST be carried onboard to enable remaining crewmembers to operate the boat in the event the Coxswain is ejected.

NOTE

The Coxswain is responsible for ensuring that all required personal safety equipment is worn, and worn correctly.

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Chapter 5
Operational Guidelines

Introduction

This chapter describes how to use the CB-OTH MK III in the safest and most efficient manner. These policies and performance criteria should be used as guidelines for CB-OTH MK III operations. Within these guidelines, consider local operating conditions, district regulations and the skill of the crew to determine how the CB-OTH MK III's capability is to be used. These factors must be considered prior to each sortie or mission.

In this chapter

This chapter contains the following sections:

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Section A. Operating Parameters

Introduction

The readiness of the CB-OTH MK III shall be continuously monitored to ensure that it is capable of unrestricted operations. This monitoring is accomplished through a variety of programs, including daily boat checks, the boat PMS schedule, engineering inspections, and Ready for Operations (RFO) evaluations and Standardization Team inspections.

Operating parameters for the CB-OTH MK III and crewmembers include the following areas:

Disabling casualties
Restrictive discrepancies
Major discrepancies
Minor discrepancies
Responsibilities
Environmental limits

A.1. Disabling casualties

Disabling casualties are those that make the boat not serviceable. *Appendix D* contains a listing of disabling casualties. If a disabling casualty is identified, the boat shall not get underway until the casualty is corrected.

Disabling casualties shall be reported immediately to the Operational Commander. The boat shall be immediately placed in "Charlie" status and repaired. If the casualties cannot be repaired within 48 hours, a CASREP shall be sent within 24 hours of the casualty.

A.2. Restrictive discrepancies

Restrictive discrepancies are those which restrict the operations of the boat such that it can perform some missions, but not all missions safely. *Appendix E* contains a listing of restrictive discrepancies.

A.2.a. Reporting restrictive discrepancies

Restrictive discrepancies shall be reported to the Operational Commander if the discrepancy cannot be repaired within 1 hour. The boat shall be immediately placed in a "Charlie" status and shall not get underway until the discrepancy is corrected, or a waiver has been received. If the discrepancy cannot be repaired within 48 hours, a CASREP shall be sent within 24 hours of the discrepancy. The Operational Commander is responsible for monitoring the progress of repairs to these discrepancies.

A.2.b. Discrepancy underway

In the event the boat sustains a restrictive discrepancy while underway, the Coxswain should not normally proceed without authorization, unless aborting the mission would increase the level of risk. The situation and recommendations must be effectively communicated to the Operational Commander to allow for prudent risk assessment by all levels.

The reporting procedure is as follows:

Step	Procedure
1	The Coxswain shall immediately notify the Operational Commander with all pertinent information and a recommendation as to whether to continue or abort the mission.
2	The cutter's Operational Commander shall notify the CB-OTH MK III as to whether or not continuing the mission is authorized, and the conditions under which the boat may be operated.

A.3. Major discrepancies

Major discrepancies are those that degrade the effectiveness of the boat to perform one or more missions. *Appendix E* contains a listing of major discrepancies. The occurrence of major discrepancies shall be documented. A plan to correct these discrepancies shall be formulated and carried out. The Operational Commander is responsible for monitoring the status of repairs to these discrepancies.

A.4. Minor discrepancies

Minor discrepancies do not affect the operational readiness of the boat. However, a boat with minor discrepancies does not meet the standardization criteria established for the boat. The occurrence and repair of minor discrepancies shall be documented and monitored at the unit level.

In the event that the addition of portable equipment, not part of the standard boat outfit, is necessary to meet mission needs, units are authorized to temporarily carry this extra equipment. This authorization is on a case-by-case basis only, and care must be taken to properly secure any extra gear and to ensure it does not interfere with safe egress or the boat's standard outfit/systems. Under no circumstances shall permanent alterations be made to power, stow or in any way accommodate extra equipment.

A.5. Responsibilities

The Coxswain is always responsible for the safe operation of the boat. The Coxswain must decide if the mission warrants subjecting the crew and boat to the danger defined by the mission, weather and sea conditions anticipated.

A.5.a. Disabling casualty – underway

In the event that the boat sustains a disabling casualty while underway, the boat shall immediately contact the cutter or base and return to same, if possible.

A.5.b. Restrictive discrepancy – underway

In the event the boat sustains a restrictive discrepancy while underway, the Coxswain should not normally proceed without authorization, unless aborting the mission would increase the level of risk. The situation and recommendations must be effectively communicated to the Operational Commander to allow for prudent risk assessment by all levels. The following is the procedure for communicating the discrepancy while underway:

Step	Procedure
1	The Coxswain shall immediately notify the Operational Commander with all pertinent information and a recommendation as to whether to continue or abort the mission.
2	The Operational Commander shall notify the CB-OTH MK III as to whether or not continuing the mission is authorized, and the conditions under which the boat may be operated.

Casualty/Discrepancy	Consequence	Required Action
Disabling Casualty "Boat is not serviceable."	Not authorized to get underway. Notify the Operational Commander immediately.	Assign "Charlie" status to the boat, and commence repairs immediately. Submit CASREP if applicable.
Restrictive Discrepancy "Boat and crew cannot perform all missions safely."	Operations restricted. Notify Operational Commander if repairs cannot be made in 1 hour.	Create repair plan and set deadline for completion of repairs. Operational Commander shall monitor progress of repairs. Any operations before restrictive discrepancies are repaired require written waiver. Submit CASREP if applicable.
Major Discrepancy "Boat and crew can perform all missions but some degradation in effectiveness or readiness should be expected."	Operations unrestricted. Discrepancy occurrence and repair is documented.	Maintenance plan is carried out. Operational Commander shall monitor status of repairs to the discrepancies.
Minor Discrepancy "Boat and crew readiness not affected nor impaired. Boat does not meet standards."	Operations unrestricted. Discrepancy occurrence and repair is documented.	Maintenance plan is carried out. Operational Commander monitors completion of maintenance/repair.

A.6. Environmental limits

The following warnings apply to operation of the CB-OTH MK III.

WARNING

The following is a critical operational and environmental limitation:
A thorough risk assessment shall be conducted prior to employing the CB-OTH MK III in seas greater than specified in *Chapter 2, Section A* of this handbook.

WARNING

Do not operate in breaking seas or surf conditions.
A thorough risk assessment shall be conducted prior to employing the CB-OTH MK III in seas greater than specified in *Chapter 2, Section A* of this handbook.

Section B. Performance Data

B.1. Fuel consumption

Fuel consumption and operating range is affected by engine tuning, weather conditions, trim, type of evolution and operating area. **Figure 5-1** shows typical fuel consumption at full load condition.

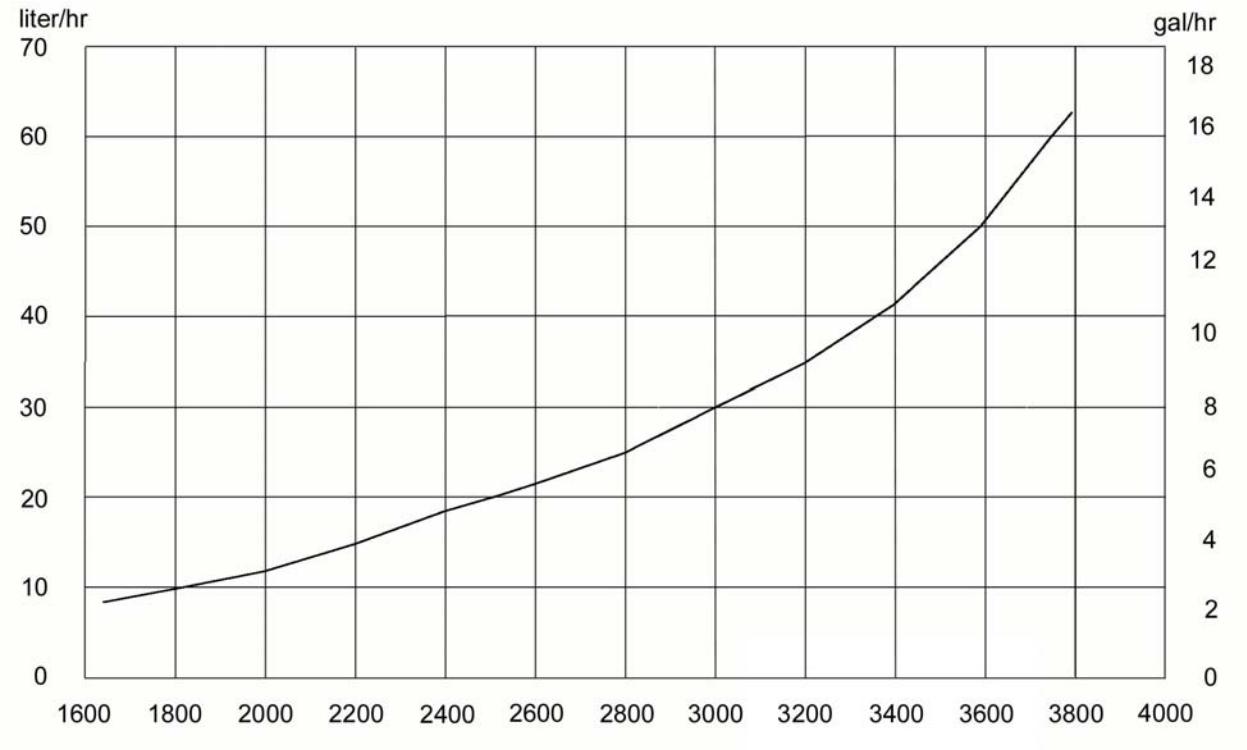

Figure 5-1
Fuel Consumption

B.2. Seakeeping Positioning the vessel with respect to the wind, seas, and other craft, is essential to prevent damage to the hull or injuries to the crew.

WARNING

The Coxswain is responsible for ensuring that all required personal safety equipment is worn, and worn correctly.

B.2.a. Operating in beam seas

Operating with the seas on the beam is more uncomfortable than dangerous when following basic small boat handling guidelines. Use the following techniques to minimize danger:

Tacking - With large seas on your beam, tack across the seas at a slight angle in a zigzag fashion. This prevents exposure of the beam to heavy swells.
Changing Course - To change course heading, allow the boat to lose headway, turn the wheel hard over, and apply power to come smartly to the new heading.

WARNING

The position of the boat in relation to a breaking wave crest is critical. Severe wave slap will occur in the area approximately two boat lengths in either direction of the breaking water, however, this area presents less danger of capsize.

CAUTION !

When operating in beam seas, do not allow the boat to become "dead-in-the-water" and be hit broadside by a wave.

B.2.b. Operating in following seas

Following seas present the greatest dangers to the CB-OTH MK III. The boat does not have the balanced buoyancy or ability to lay-to in a following sea. The operational limitations are the controlling guideline and must be followed at all times. Consider the following point and technique when operating under these conditions:

Do not power the boat over the crest of a wave and into the trough of the next wave or bury the bow into the back of the next wave.

B.3. Stability

By virtue of hull design and equipment placement, the CB-OTH MK III displays positive buoyancy. Ensuring the bilge areas are always free of water and eliminating the free surface affect of liquids in the bilges are essential to maintaining stability of the CB-OTH MK III.

B.4. Speed

The CB-OTH MK III achieves a maximum speed of approximately 42 KTS.

NOTE

Do not use rapid accelerations from dead-in-the-water (DIW) to full speed except when necessary. This conserves fuel and helps prolong engine life.

NOTE

Maximum speed/power should be used only when operationally necessary. Under non-urgent conditions, proceed at cruise speed.

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Chapter 6
Mission Performance

Introduction

The actions and techniques described in this chapter are products of field experience. They are intended to give boat crewmembers information on how the CB-OTH MK III performs and reacts in various mission scenarios. The information is not intended to provide the "only way" to perform an action or complete a mission. Boat crews should use effective communications and teamwork skills along with this general information to adapt their actions to each unique mission scenario.

Information in this section alone does not qualify a crewmember. Observe these procedures and apply skills developed through practice to effectively use the CB-OTH MK III to perform missions.

In this chapter

This chapter contains the following sections:

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Section A. Boat Davit Operations

Introduction

The CB-OTH MK III is equipped with a lifting eye located on reinforced sections of the transom and on the bow forward of the fuel station (dual-point davit). The single point davit (SPD) uses a four-legged sling, whereas the dual-point davit system utilizes 2 lift points, fore and aft.

NOTE

As built weight with boat outfit and full fluids is approximately 5415 lbs. Normal load condition with 500 lbs of gear and 5 POB at 185 lbs is approximately 6840 lbs. Full load condition of normal load condition plus additional 8 POB is approximately 8320 lbs.

WARNING

The boat davit and lifting fixture and fittings must have a safety factor of six (based on the ultimate strength of materials and a fully loaded boat).

NOTE

The subsequent procedures are general in nature and DO NOT replace specific U.S. Coast Guard instructions or shipboard standard operating procedures.

A.1. Launching

The following actions are recommended to be performed in sequence when preparing for launch:

Step	Action
1	Remove any storage covers and verify required equipment is onboard.
	WARNING Any time the boat is started or has way on, the Coxswain MUST have the lanyard of the engine kill switch clipped to his/her survival vest or PFD. A second kill switch activation clip and lanyard MUST be carried onboard to enable remaining crewmembers to operate the boat in the event the Coxswain is ejected. **NOTE** The number of crewmembers required onboard the CB-OTH MK III during hoisting and launching operations may be modified by the cutter's Commanding Officer based upon operational limits of installed boat davits.
2	Coxswain and crew, with all personnel equipment, board and take positions in the hull.
3	Take tension on the lift hook and inspect all connections for correct and secure attachment.

4	Coxswain ensure kill switch activation clip is installed and lanyard is attached to survival vest or PFD.
5	Release all gripes and tie-downs.
6	Lift the boat. The boat should assume a slight bow up attitude.
7	Swing davit outboard so the boat is clear of the cutter.
8	Tilt the outdrive down. This should be performed as the boat is being lowered into the water.
CAUTION!	The CB-OTH MK III must be equipped with a painter not less than three times the distance from the boat davit to the water.
9	Use the painter to maintain fore and aft alignment of the CB-OTH MK III.
10	Lower the boat.
CAUTION!	The outdrive unit must be in the water before starting the engine.
11	Upon contacting the water, immediately start the engine, deploy any remaining crewmembers from cutter to CB-OTH MK III using a rope or accommodation ladder, and then release all lift hooks.
12	Cutter's crew raise the lift hooks.
13	Boat crewmembers power up all electronic gear.
14	Boat Coxswain maneuvers away from the cutter, increases speed and gives command "release the sea painter" to the boat crewmember.
15	Cutter crew recovers the sea painter, which is brought aboard the cutter and stowed.
CAUTION!	The antenna arch and HF antenna should remain folded on the foredeck until the boat is maneuvered safely away from the cutter and from the cutter’s wake.
16	Coxswain maneuver the boat away from the cutter.
17	Boat crew raise the HF antenna.

A.2. Recovery

The following actions shall be performed in sequence when preparing for recovery:

NOTE

The side of the cutter with the davit determines the orientation of the ship with respect to wind and sea conditions.

NOTE

The cutter should be making headway and maintaining maneuverability at approximately 2-3 KTS.

NOTE

Ensure the tubes are properly inflated prior to coming alongside the cutter.

Step	Action
1	After receiving permission to come alongside, lower the HF antenna.
CAUTION!	The HF antenna is a stepping hazard.
2	Coxswain maneuver the CB-OTH MK III alongside the cutter forward of the davit location.
3	Cutter's crew throw a painter to the boat crew, which should be attached to the bow-eye.
4	If necessary, disembark passengers and non-essential crewmembers.
5	Swing out and lower the hook(s) on the boat davit. Dual-point davit - Boat crew securely attach davit hooks to fore and aft dual-point davit lift points.
CAUTION!	When conducting single-point davit hoisting evolution, lifting sling MUST be attached to single-point davit sling attachment points PRIOR to start of hoisting evolution.
WARNING	When conducting dual-point davit hoisting evolution, the forward fall MUST be connected to boat before aft fall is connected to boat.
CAUTION!	When raising the outdrive, Coxswain should use trailer switch on the side of the operator's console.
6	After davit cables are hooked to boat, secure the engine and raise the outdrive unit.

7	Boat crew stand clear of davit hook(s) and cables.
WARNING When conducting single-point davit hoisting evolution, only Coxswain shall be in boat. All other personnel MUST exit boat prior to putting load on davit.	
8	Signal davit operator to lift boat.
9	Raise boat and swing over stowage position in davit. Use sea painter to align boat fore and aft in davit.
10	Slowly lower boat until it is securely in storage cradle. Secure all tie-downs and gripes between boat and davit.
11	Ensure all electronic systems and components are secured.

Section B. Starting Procedures

Introduction

A number of checks and procedures must be performed prior to, during, and after engine start.

CAUTION!

The CB-OTH MK III should not be started until it is in the water or until water is provided to the water pump from another source. Serious damage to the engine will occur if no cooling water is provided.

B.1. Checking the boat while boat is in the davit

The following checks may be conducted with the boat in the boat davit:

Step	Action
1	Ensure bilge area is free of all liquids.
2	Check fuel tank level; 95% full is 81.5 gallons.
3	Check engine oil level.
4	If necessary, prime the fuel system using pump atop engine fuel filter.
5	Check jacket water/coolant level.
6	Check oil level in stern drive and power trim reservoirs.
7	Check the charge of both batteries using installed battery charge indicator.
8	Ensure valve on inlet side of seawater strainer is *open*.
9	Check inflatable collar for obvious damage and for proper inflation pressure.
10	Check all belts on engine for condition and proper tension.
11	Verify that all splash guards and covers for the FFCS stations, port and starboard consoles and SINS are installed and secure.

12	Check condition of hull and deck areas for obvious damage.
13	Turn battery switches to ON position.
14	Ensure the Coxswain has the engine kill switch activation clip and lanyard properly attached.
15	Ensure the fire suppression system toggle switch is in the "normal" mode.

B.2. Starting the engine while boat is in the water

NOTE The engine will not start unless the kill switch activation clip is installed.

Once the CB-OTH MK III is in the water, start the engine as follows:

Step	Action
1	Trim down the outdrive as directed.
2	Insert the activation clip in the engine kill switch.
3	Ensure that the throttle is in *neutral*.
4	If required, insert start key in start-stop-run panel and energize glow plugs (cold weather only).
5	Turn key to *start* position and release once engine is running.
6	Verify normal engine operating parameters on available gauges and indicators.

CAUTION! Do not raise the antenna arch or antennas until all hoisting lines are clear of the CB-OTH MK III.

B.3. Raising the antenna arch and HF antenna

When all engine operating conditions have been verified as normal, Coxswain can direct that the antenna arch and the HF antenna be raised.

B.4. Turning on communications/ navigation gear	Once antenna arch and antennas are erect and secure, the Coxswain may direct the crewmembers to turn on all required communications/navigation gear. Ensure all crewmembers are wearing communication headsets.
B.5. Establishing communication channels	At the discretion of the Coxswain, conduct checks of all essential electronic gear and establish required communication channels as directed.

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Section C. Underway

Introduction

After getting underway, observe all appropriate gauges and report status to the cutter as directed. The Coxswain using the interior communications system will keep the crew alert of any course or speed changes. If an abnormal condition occurs, take corrective action immediately to prevent further damage.

WARNING

The use of the kill switch is required whenever the boat is started or has way on. The kill switch is located below the throttle (**Figure 3-14**) The activation clip (with red plastic cap) for the kill switch MUST be inserted into the switch body to start the engine. The 36 inch lanyard MUST be properly attached to the Coxswain at all times during boat operation. A second kill switch lanyard with activation clip MUST be carried onboard to enable remaining crewmembers to operate the boat in the event the Coxswain is ejected.

C.1. Communication

Crew communications and coordination is the key to safe operations. All assigned crewmembers are provided with headsets that interface the Integrated Crew Communications Station.

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Section D. Going Alongside

Introduction

The following is a generic procedure for going alongside. The CB-OTH MK III crews must be familiar with the applicable U.S. Coast Guard instructions and the cutter's Standard Operating Procedures (SOP) for going alongside a vessel of interest.

Step	Action
1	Ensure that communications between the CB-OTH MK III and the cutter are established and reliable.
2	Attempt to make and establish contact with the vessel of interest on designated marine band frequencies.
3	Make approach preparations and inform the crew. Coxswain determine where to make contact with the vessel.

WARNING

Pick a contact point well clear of a larger vessel's propeller (including in the area of suction screw current), rudder, and quarter wave. Forces from these could cause loss of control.

4	Conditions permitting, match your speed to the other vessel, and then start closing in from the side.
5	Close at a 15° to 30° angle to the other vessel's heading. This should provide a safe rate of lateral closure at no more than one-half the forward speed.

NOTE

If your initial heading was parallel to the other vessel, you will have to increase speed slightly when you start to close at an angle.

WARNING

Applicable U.S. Coast Guard instructions and the cutters' SOP must be strictly adhered to when/if the CB-OTH MK III is in close proximity of any vessel that fails to identify itself.

6	If contact had been made with the vessel of interest, determine if a boarding ladder (if necessary) is available and rigged.

NOTE

As both the CB-OTH MK III and vessel of interest have headway, the pressure of the water on the boat's bow will cause it to sheer away from the ship. Use this force by touching on the helm to control sheer, in or out, by catching the current on one side of the bow or the other side.

NOTE

When sheering in or out, apply rudder slowly and be prepared to counteract the tendency of the boat to close or open quickly.

7	Come along side of the vessel, matching its course and speed.
8	Use helm to hold the boat at the desired position alongside or at some distance off the vessel.

CAUTION!

Use care when going alongside a vessel of interest so as not to damage the boat's hull

9	Make contact with the forward sections of your boat (about halfway between the bow and amidships). Use helm and power to hold the bow into the other vessel at the same forward speed. Do not use so much helm or power that you cause the other vessel to change course.
10	When alongside, do what has to be done. Ensure that communication with the cutter is established to update the status of the assigned mission. If personnel are to be embarked/disembarked on the vessel of interest, utilize a boarding ladder as provided. Minimize the time alongside. If necessary and following U.S. Coast Guard instructions and the cutter's SOP, "make-up" to the other vessel rather than relying on helm and power to maintain contact.
11	When the mission is complete, embark all personnel. Sheer the stern in with the helm to get the bow out. Avoid getting set toward the side or stern of the vessel.

CAUTION !

Never back down when clearing alongside, parallel to another vessel that is making way.

12	Apply gradual power to gain slight relative speed. Maneuver the CB-OTH MK III away from the vessel of interest. Continue to update position and status of the mission with the cutter.

Section E. Handling Characteristics

Introduction

Boat handling is a complex skill that requires knowledge and practical, underway experience to build confidence and skill level. Always use forethought and finesse when handling the CB-OTH MK III. Know the boat's handling features, monitor weather conditions and be aware of the operating limitations of the craft.

In this section

This section contains the following information:

E.1. Turning and Pivoting

E.1.a. Turning

Because the CB-OTH MK III incorporates an outdrive unit that uses propulsion thrust for directional control, the boat can make a much tighter turn than the same craft with a shaft, propeller and rudder.

Coxswains should become familiar with the fact that the stern of the CB-OTH MK III will have a tendency to skid outward more when making a turn than that of a conventionally driven craft. The Coxswain should practice steering and turning with one hand while the other hand is free to adjust the throttle.

The boat, due to the outdrive, develops a rotational torque that can cause a "pull" in steering or when negotiating a sharp starboard turn. Coxswains should be aware of this turning action and should overcome this torque-lock by immediately reducing the engine RPM and counter-steering.

E.1.b. Pivoting

The CB-OTH MK III rotates in a transverse direction about a vertical axis on its pivot point. The fore and aft location is slightly aft of amidship when the boat is at rest. As the boat moves ahead or astern, the pivot point moves either forward or aft, respectively. Excessive or unequal trim can cause the pivot point to be positioned where it can cause instability at high speeds and especially when negotiating turns.

NOTE

High speed maneuvers utilized in pursuit operations require advanced skills to perform safely. These skills are a requirement for the Non-Compliant Vessel Pursuit Coxswain Competency.

E.2. Head Seas

E.2.a. Limiting factors

Traveling into head seas does not present any problems to the CB-OTH MK III if the boat is properly trimmed and being operated within its operational parameters.

E.2.b. Buoyancy

The buoyancy of the hull enhanced by the buoyancy and stability provided by the inflatable collar makes the craft handle well in head seas. When operating at or near the maximum sea limiting factor, the Coxswain must use both hands to operate the steering and throttle to keep the bow from burying into the seas. CB-OTH MK III Coxswains shall avoid breaking seas.

E.3. Beam Seas and Following Seas

E.3.a. Beam seas	In large beam seas, the wave action will cause the boat to roll. The rolling of the hull will have a great affect on the steering response. The inflatable collar of the boat will greatly retard the rolling action of the craft.
E.3.b. Following seas	Keeping the CB-OTH MK III in control and stable is more challenging in a following sea. Due to the low transom of the CB-OTH MK III, even a small following wave can flood the hull and exceed the self-bailing capabilities of the craft. In large following seas, the boat can slip down the back of seas and heel strongly. Adjust the speed of the CB-OTH MK III to ensure that the boat is not over-run by following seas or that it does not drive into the back of the next wave ahead.

E.4. Effects of Wind

E.4.a. Afloat and properly trimmed	The CB-OTH MK III possesses approximately 27 inches of freeboard with the boat fully loaded. When afloat and properly trimmed, the bow of the boat is higher than the transom, and the boat will tend to ride stern to the wind.

E.5. Station Keeping

E.5.a. Navigational orientation	The CB-OTH MK III is capable of keeping station on an object or vessel utilizing the installed radar and GPS systems. However, the Coxswain of the craft must manage the effects of environmental forces to keep station. The Coxswain should be aware of: Maintaining distance, position and aspect with respect to another vessel or object. Formulating a technique for matching craft drift rate with other vessel and then over-coming that vessel. Developing a safe escape route to get clear of a vessel or object. Utilizing techniques to safely pace the CB-OTH MK III to another vessel and maneuver around it.

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Section F. Operating with Helicopters

Introduction

The CB-OTH MK III has installed communications and navigation equipment to operate with helicopters on assigned marine and aviation frequencies. The tactical mission of the CB-OTH MK III and its coordination with helicopter operations has been promulgated in the *U. S. Coast Guard Maritime Law Enforcement Manual* (MLEM) COMDTINST M16247.1 (series).

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Section G. Securing Procedures

Introduction

Upon returning from a mission and the boat is secured in its storage cradle. Take the following steps, in the given order, to secure the boat properly and to prepare it for the next mission:

Step	Procedure
1	Secure 12 VDC breaker panel.
2	Secure the battery switch.
3	Switch bilge pump to "AUTO".
4	Top off fuel level.
5	Conduct visual inspection of outdrive.
6	Stow all gear on boat.
7	Wash down boat with fresh water.
8	Complete underway Abstract of Operations Report and discrepancies to the Engineering Officer. **The mission is NOT complete until the boat is ready for the next mission**.

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Chapter 7
Emergency Procedures

Introduction

Responding to equipment casualties and emergencies aboard the CB-OTH MK III should be second nature to all members of the crew. The ability of crewmembers to take immediate action to control emergency situations is critical to prevent a bad situation from getting worse. While every event is different, step-by-step procedures help gain control of the casualty and aid in troubleshooting.

The first step in responding to all casualties is to protect the immediate safety of all crewmembers and to communicate the nature of the casualty to the crewmembers. It is the Coxswain's responsibility to keep the Operational Commander informed of all emergencies encountered during the operation of the boat.

The Coxswain and crew should work together to determine if equipment casualties can be safely repaired while underway. The Coxswain must decide whether a casualty has impacted the ability of the boat and crew to complete the mission. The Coxswain should not make the decision in a vacuum; input from other crewmembers, as well as communication with cutter personnel, should be used to determine whether to continue with the mission. The following factors should be considered:

	Factors
1	The safety and physical condition of the crew and boat.
2	Equipment limitations due to the casualty.
3	Current and forecasted weather and sea conditions.
4	The urgency of the mission.

In this chapter This chapter contains the following sections:

Section A. Capsizing

A.1. Symptom(s)

Because of the design of the CB-OTH MK III and the installed inflatable collar, it is most unlikely that the boat would capsize.

A.2. Actions

If the vessel is bottom side up, take the following actions:

Step	Action
1	Inflate personnel flotation device.
WARNING	Depending on the situation it may require a crewmember to get clear of the boat prior to inflating their PFD.
2	Swim clear of the boat.
3	If nighttime, activate strobe/PML.
4	Account for all crewmembers.
5	Try to determine if the EPIRB has floated clear of the hull and has deployed.
6	Stay as close to the boat as possible. If possible, climb back atop the capsized hull to aid in search and rescue efforts.
NOTE	After capsize, if possible climb atop the hull. Boat is inherently buoyant even after capsize. Boat is designed to remain afloat with crewmembers on it in capsize position.

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Section B. Collision With Submerged Object (or Bottom)

B.1. Symptom(s)

The boat strikes a submerged object or temporarily runs aground.

B.2. Actions

Take the following actions:

Step	Action
1	Reduce RPM on engine to neutral.
2	Notify crew of casualty.
3	Determine what was hit, where the object is located, and if it can still be seen.
4	Verify current position, depth of water, evaluate situation and notify the Operational Commander.
5	Crewmember checks engine space and outdrive for obvious flooding or damage.
6	Crewmember checks bilges for flooding or obvious damage.
7	Coxswain checks for steering system damage.
8	Crewman/Engineer checks for proper cooling water circulation or debris in the Raw Water (R/W) strainer.
9	Crewmember checks forward access plate for flooding or obvious damage.
10	Coxswain conducts steering checks for limitations.

Step	Action
11	Coxswain will check engine RPM in both neutral and engaged at various speeds while crewman/engineer is checking for vibration/flooding and to assess damage to propulsion system.
12	Return to unit at reduced speed, if warranted, to prevent additional damage or vibration.
13	Coxswain coordinates with the Operational Commander for tow or other assistance when risk assessment indicates crew or vessel safety will be jeopardized through continued operation.
NOTE	The boat should be hoisted to determine extent of damage; especially if there is a vibration.

Section C. Steering Casualty

C.1. Symptom(s)

The helm turns in either direction with no response (caused by a failure within the hydraulic system.)

C.2. Actions

When a partial or complete loss of steering control occurs, take the following actions.

Step	Action
1	Reduce engine RPM to clutch ahead. Notify crew of casualty.
2	Inspect for loss of fluid or obstruction to out drive. Secure engine if necessary.
3	Verify current position, evaluate situation and notify Operational Commander.
4	Crewmember rigs the anchor if applicable.
5	Check bilges and engine compartment for obvious leaks.
6	Coxswain coordinate with unit for tow or other assistance when risk assessment indicates crew or vessel safety will be jeopardized through continued operations.

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Section D. Outdrive Failure

D.1. Symptom(s)

Engine RPM increases but does not correspond to an increase in the hull's speed or direction.

D.2. Actions

When the outdrive fails, take the following action:

Step	Action
1	Coxswain bring engine to neutral.
2	Coxswain direct crewmembers to investigate for cause of casualty.
3	Coxswain report casualty to the Operational Commander.
4	Crewmembers should: Check outdrive fluid level in reservoir located on transom, Check the engine to outdrive interface, Check the sea aft of the transom for any visible oil sheen, and Report all findings to Coxswain.
5	Coxswain report status of casualty to the Operational Commander.

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Section E. Fire in the Engine Space

E.1. Symptom(s)

Smoke is sensed by sight or smell coming from the engine space.

E.2. Actions

When presence of fire is confirmed, take the following actions.

Step	Action
1	Reduce RPMs of engine to neutral.
2	Notify crew and Operational Commander of casualty.
3	Crewman checks engine space through engine room vents to assess situation.
4	Coxswain secure engine with engine stop at helm, verify position.
5	Coxswain pulls fuel stop located at helm.
6	Installed Fire Suppression System will activate at 175° F or assisted by portable extinguisher through access port.
7.	Crewmember secures all non essential electrical power breakers (all except VHF-FM radio) with Coxswain concurrence.
8	Crewmember to rig anchor. (If applicable)
9	Establish fire watch, with portable fire extinguisher.
10	Coxswain coordinate with Operational Commander for tow or other assistance, emphasizing crew safety.

WARNING

It is extremely dangerous to enter a space during or after a fire. After the engine room has been flooded with Fire Suppression System, extensive ventilation is necessary to ensure safety when entering; however, any introduction of oxygen into the compartment may ignite a fire re-flash. Keep the space sealed until moored and secured.

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Section F. Loss of Control of Engine RPM

F.1. Symptom(s)

Engine fails to respond properly to throttle control.

F.2. Actions

Identify the cause, prevent further damage, and take the following actions:

Step	Action
1	Place throttle control in clutch ahead position.
2	Notify crew of casualty, verify position and notify Operational Commander.
3	Open engine compartment, and attempt to control RPM's manually.
4	Use engine stop button (push and hold down) to secure engine.
5	If engine fails to secure, Coxswain proceeds to pull emergency fuel cutout for engine.

WARNING DO NOT use the Fire Suppression System to secure the engine. Depleting the fire fighting capabilities of the boat can be dangerous.

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Section G. Loss of Fuel Oil Pressure

G.1. Symptom(s)

The CB-OTH MK III experiences erratic or unstable RPMs or engine stops completely.

G.2. Actions

Take the following actions:

Step	Action
1	The Coxswain should reduce RPMs to clutch ahead.
2	Coxswain informs crew of casualty, verify position, evaluate situation and notify Operational Commander.
3	Crewmember to rig anchor. (If applicable)
4	Crewmember checks bilge for fuel oil.
5	Check the emergency fuel cutout valve to ensure that they are open.
6	Check the fuel filter for accumulated sediment and water in the bowls. Replace if suspect. Re-prime the system.
7	Check the entire fuel system for obvious leaks; check fuel tank level.
8	Identify and correct source of problem or request additional assistance from Operational Commander.

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Section H. Loss of Lube Oil Pressure

H.1. Symptom(s)

The alarm sounds and illuminates the Lube Oil Pressure Light on the Alarm Lamp Unit.

H.2. Actions

Take the following actions:

Step	Action
1	The Coxswain should reduce the engine to clutch ahead.
NOTE The lube oil alarm is variable, which means that at any given engine RPM, the oil pressure must be within a certain range or the alarm will sound. The lube oil alarm may be directly related to engine temperature; an overheating engine may set the lube oil alarm off.	
2	Coxswain immediately secure the engine, inform crewmembers of the casualty, verify position and notify Operational Commanders.
3	Crewmember to rig anchor. (If applicable)
4	Crewmember checks the bilge for oil and obvious lube oil leaks.
5	Crewmember checks the engine lube oil for quantity and quality.
6	If the cause is not correctable, do not restart the engine.

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Section I. Engine High Water Temperature

I.1. Symptom(s)

The alarm sounds and illuminates the cooling water temp light on the Alarm Lamp Unit when coolant water temperature reaches 203° F or 95° C.

I.2. Actions

Take the following actions:

Step	Action
1	Coxswain should reduce engine RPM to clutch ahead and determine that engine has overheated.
2	Coxswain notifies crew of casualty, verify position and contact operational commander.
3	Coxswain secure engine if temp exceeds 212° F.
4	Crewmember check engine temperature as indicated on gauge, check bilges and engine for obvious leaks.

WARNING If steam is flowing from the expansion tank vent, the engine should be secured and cooled naturally. If the pressure is released when extremely hot by removing the expansion tank cover, the coolant will either flash to steam or boil with a serious potential for injury.

I.3. Raw Water Systems Checks

Take the following actions to check the function of the raw water system:

Step	Action
1	Verify that the sea suction valve is open.
2	Check the strainer and clean the strainer as necessary.
3	If the strainer is clean, check the raw water pump cover lightly with the back of the hand for coolness.

I.4. Jacket Water System Checks

Take the following actions to check the function of the jacket water system:

Step	Action
1	Check the jacket water level. Check the engine and bilge for leakage. Correct casualty, and then replace fluid if necessary.
NOTE	Anti-freeze is poisonous. Do not inhale the fumes.
2	Inspect the jacket water pump for normal function.
3	Check lube oil for proper quantity and quality.
4	If jacket water leaks are found, the pump is inoperative, or temperatures continue to climb, secure the engine.
NOTE	Oil alarms and sensors are directly related to engine temperature. An overheating engine will often set off lube oil alarms.
CAUTION !	If after all efforts have been made at casualty control, including reducing the engine load, the engine temperatures do not decrease, secure the engine. The manufacturer recommends shutdown of the engine if the temperature exceeds 212° F.

Section J. Damage to Inflatable Collar

J.1. Symptom(s)

Sections of inflatable collar appear deflated.

Auto-inflation pump is operating continuously.

Obvious rips and tears to collar.

J.2. Actions

If damage to the inflatable collar occurs, take the following actions:

Step	Action
1	Coxswain notify the Operational Commander and continue to steer the boat on course as directed.
2	Coxswain direct the crew to check for obvious damage and report findings.
3	Crewmembers should: Check engine compartment for damage to flexible hose supplying air to the collar, Check collar air compressor for obvious damage, Determine if the collar air relief valve is venting air, Check the physical condition of the collar, Check the security of all manual inflation valves on the collar, and report all findings to Coxswain.
4	Coxswain report status of casualty to the Operational Commander.

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Section K. Hard Grounding

K.1. Symptom(s)

The CB-OTH MK III hits bottom and becomes hard aground (unable to initially float free).

K.2. Actions

Assess the resulting damages; take the following actions:

Step	Action
1	Reduce RPM to neutral.
2	Notify crew of casualty and assess condition of crew.
3	Evaluate the situation. Verify current position, depth of water, and notify Operational Commander.
4	Crewmember inspects engine space/deck access plates for obvious flooding or damage.
5	Crewmember check for proper cooling water circulation or debris in strainer. Secure engine if cooling is inadequate or excessive debris (especially sand) is observed.
6	Crewmember to rig anchor.
7	Crewmember takes depth sounding all around the vessel. Coxswain determines deepest water, extent of grounding, and potential for underwater damage.
8	Consider present and future state of tide, current or other weather conditions with regard to re-floating or salvage operations.
9	Coxswain determines safest direction to deep water and method for extracting vessel safely with least damage.
10	Conduct checks of propulsion system integrity prior to attempting re-floating or salvage. Take caution to reduce further damage.

Step	Action
11	Conduct checks of propulsion system integrity prior to attempting re-floating or salvage. Take caution to reduce further damage.
12	Conduct check of steering system integrity. Check for limitations. Take caution to reduce further damage.
13	Coxswain maneuver into safe water and conducts steering check. Identify limitations and isolate areas of damage.
14	Coxswain will check engine RPM in both neutral and engaged at various speeds.
15	Return to unit or appropriate haul-out facility at reduced speed to prevent additional damage, if necessary.
16	Coxswain coordinate with Operational Commander for tow or other assistance when risk assessment indicates crew or vessel safety will be jeopardized through continuous operation.

Section L. No Power/Insufficient Power to Communications/Navigation Equipment

L.1. Symptom(s)

HF, VHF-FM, Radar, or GPS system(s) fail to operate properly.

L.2. Actions

If there is no power to operate the communications/navigation equipment, take the following actions:

Step	Action
1	Coxswain, if able, notify the Operational Commander.
2	Coxswain direct crewmembers to investigate for cause of casualty.
3	Crewmembers check the engine compartment and verify the condition of the alternator belts and that the electrical connections to the alternator are secure.
4	Crewmembers verify battery voltage using gauge and switches on the port, forward side of the Coxswain's console.
5	Crewmembers ensure that all SINS switches are on and that no blown circuit breaker indicators are illuminated.
6	Crewmembers report all findings to Coxswain.
7	Coxswain report status of casualty to the Operational Commander.

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Appendix A. CB-OTH MK III Outfit List & Stowage Plan

Introduction

This appendix is the standard stowage plan for the CB-OTH MK III outfit. No deviation from this list is authorized, except in the event that the addition of portable equipment, not part of the standard boat outfit, is necessary to meet mission needs, units are authorized to temporarily carry this extra equipment.

This authorization is on a case-by-case basis only, and care must be taken to properly secure any extra gear and to ensure it does not interfere with safe egress or the boat's standard outfit/systems. Under no circumstances shall permanent alterations be made to power, stow or in any way accommodate extra equipment.

In this Appendix

This appendix will contain the outfit list and stowage plan for the boat when provided by the USCG.

WARNING

Any time the boat is started or has way on, the Coxswain MUST have the lanyard of the engine kill switch clipped to his/her survival vest or Personal Flotation Device (PFD). A second kill switch activation clip and lanyard MUST be carried onboard to enable remaining crewmembers to operate the boat in the event the Coxswain is ejected.

Item	Part Number	Quantity
Anchor bag containing: (Required Inland and Near Coastal only.)		
Fortress 7 lbs Anchor (installed to bracket on starboard side of engine box cover).	FX7	1 each
3/8 inch Galvanized Anchor Shackle.	147610	1 each
1/4 inch x 4 FT PVC Coated Anchor Chain	3112944	1 each
3/8 inch Galvanized Shackle (attached to swivel)	147610	1 each
3/8 inch Galvanized Swivel, (Eye to Eye)	Sea dog PN 181110	1 each
5/8 inch Galvanized Shackle (attached to thimble/swivel)	4030-00-149-5574	1 each
5/8 inch Anchor Line Thimble (spliced in eye)	Sea dog PN 172012	1 each
Anchor Line (5/8 inch circumference DBN x 200 feet)	30213-00119	1 each
Item	**Part Number**	**Quantity**
Main Deck		
Fire Extinguisher Type 1-A,10-B:C (Mounted to Coxswain's console, port side)	Kidde 466627	1 each
406 MHz Category II EPIRB with GPS (Mounted to Coxswain's console, port side)	ACR2744	1 each
Kill switch lanyard (Coxswain station)	2990-01-498-9733	1 each
Paddles (Port and starboard sponson's, inboard		2 each
Boat Hook (Mounted to port sponson)	4132	1 each
20 inch Throwable Life Ring (Forward of Coxswain's console)	244-R	1 each
Throw Line Bag (attached to Coxswain's console)	ACR SM-2	1 each
Life Ring Strobe Light (Mounted to Coxswain's console, port side)		1 each
Mooring Lines/frapping lines (1½ inch (Cir.) DBN)		2 each
National Ensign (Portside Mast)	8345-00-245-2040	1 each
CG Ensign (Starboard side Mast)	8345-00-242-0275	1 each
Headsets (stored at each station)		6 each
Sea painter harness (attached to the hull)		1 each
Sea painter (stored aboard cutter)		1 each
Gripes (stored aboard cutter)		3 each
Shore tie cable (stored aboard cutter)		1 each

Item	Part Number	Quantity
Nav Kit Containing: (Required Inland and Near Coastal only.)		1 kit
Briefcase With CG Logo	8460-01-411-8610	1 each
Charts (as required per AOR)		various
Pencils		1 min
China Markers (grease pencils)		1 min
Stop Watch		1 each
Search Pattern Slide Rule		1 each
Parallel Rule		1 each
Weems Plotter		1each
Anemometer		1 each
Gum Eraser	7510-00-323-8788	1 each
Pencil Lead Sharpening Pad		1 each
Tide Book (pages as required)		various
Coast Pilot (pages as required)		various
NAVRULS		1 each
Light List (pages as required)		various
Nautical Slide Rule		1 each
Chart One		1 each
Note Pad	7530-00-223-7939	1 each
Flashlight With Red Lens		1 each
Compass and Dividers		1 each

Item	Part Number	Quantity
Tool Kit Containing: stored starboard side pod lower console storage.		1 kit
Spare kill switch lanyard	2990-01-498-9733	1 each
Phillips/slotted screw drivers		1 each
Racor filter		1 each
Raw water Impeller	119773-42600	1 each
Impeller gasket	119773-42570	1 each
Wire ties		4 min
Various fuses 1 amp-30 amp		2 each
Flashlight (No larger than 2D cell in size)		1 each
Item	**Part Number**	**Quantity**
Starboard side pod lower console storage:		
Portable searchlight	Q1t100	1 each
Inflation foot pump	3010-01-330-6548	1 each
Collar repair kit, with pressure gauge	2090-01-347-8571	2 each
Binoculars		1 each
Fieldtex Small 6 person First Aid pack	81406	1 each
Reed mouth horn/Air Horn		1 each
Hand Bilge Pump	Thirsty Mate 118PF	1 each
Radar Reflector		As required
Dewatering Pump Straps		As required

Item	Part Number	Quantity
Miscellaneous		
MSST Pintle Hook/Lunette Eye (Pintle hooks/lunette eyes are authorized when deploying with Department of Defense, aviation units, or at the discretion of the unit's Commanding Officer. When using a Pintle hook/lunette eye, the ball, ball mount, and coupler must be kept in serviceable condition		
Buyers (http://www.buyersproducts.com)		
8 ton Buyers Pintle Hook	PH-8	
15 ton Buyers Pintle Hook	PH-15	
6 ton Buyers Pintle Eye	B16137PKGD	
Pintle Receiver Adapter	10033	
8 ton Buyers Ball Combination Hitch	BH82516	
Valley Pintle Mount	69992	
Putnam Hitches (http://www.putnamhitch.com)		
Putnam Mounting Plate	14003	

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Appendix B. CB-OTH MK III Engineering Changes (ECs)

Introduction This appendix contains a list of authorized ECs for the CB-OTH MK III.

NOTE For a complete breakdown of the Engineering Change Number, see the *Naval Engineering Manual, Chapter 41,* COMDTINST M9000.6 (series).

In this Appendix This appendix contains the ECs for the CB-OTH MK III.

Engineering Changes (ECs)

EC Number	Subject	Date
23OTH-B-001	23’ OTH Fast Lube Oil Change System	15 Jun 2007

Appendix C. CB-OTH MK III Materiel Inspection Checklist

Introduction

This appendix is meant to be a systematic means to inspect ANY CB-OTH MK III and to ensure the entire boat is prepared to meet mission demands.

This checklist may be locally reproduced.

In this appendix

This appendix contains the Materiel Inspection Checklist for the CB-OTH MK III. This inspection list covers the following areas of the boat:

Materiel Inspection Checklist

Boat number: _____

Station: _____

Date: _____

References:

- *CB-OTH MK III Operator's Handbook*, COMDTINST M16114.31
- *Naval Engineering Manual*, COMDTINST M9000.6 (series)
- *Coatings and Color Manual*, COMDTINST M10360.3 (series)
- *Coast Guard Rescue and Survival Systems Manual*, COMDTINST M10470.10 (series)

WARNING

The engine kill switch lanyard and activation clip MUST be inspected daily. Damaged, deteriorated or frayed lanyards must be replaced prior to engine start. Engine kill switch operation must be tested weekly.

Inspection standards:

The following inspection standards apply to the CB-OTH MK III's hull, machinery, equipment, outfit, and all installed systems and accessories:

- Operates smoothly and correctly.
- Free of grease, oil, rust, and corrosion.
- All fluid levels and pressure readings are within tolerances.
- Protective coatings applied correctly and neatly.
- Free of rips, tears, abrasions, and cracks.
- Outfit and equipment correctly installed, adjusted and stowed to specs and design (see *Appendix A*).
- Labels, test dates and placards properly indicated.
- Free of non-standard/unapproved installations or equipment.
- Maintained according to current manufacturer's guidelines and Commandant Directives.

Inspection guidelines:

Inspection requires a minimum of ***two*** personnel, preferably one Boatswain's Mate and one Machinery Technician, who possess extensive CB-OTH MK III experience and a strong working knowledge of the contents of all references listed above. This material inspection checklist is only applicable to boats in a "Bravo" or "Ready for Sea" condition. Each item on the checklist should be judged against applicable standards and references. Additional discrepancies, uninstalled engineering changes (ECs), etc. should be listed.

Inspected by: _____ **Date:** _____

Inspected by: _____ **Date:** _____

I. Hull

WARNING

Any time the boat is started or has way on, the Coxswain MUST have the lanyard of the engine kill switch clipped to his/her survival vest or PFD. A second kill switch activation clip and lanyard MUST be carried onboard to enable remaining crewmembers to operate the boat in the event the Coxswain is ejected.

ITEM	SAT	UNSAT	REMARKS
Hull (Visible Surfaces)			
Inflatable Collar			
Transom			
Cleats			
Tie-downs			
HF Antenna Mount			
Outdrive			
Trim Actuators			
Paint			
Lettering/Numbering/Decals			
Waterline			
Self-Bailing One Way Scuppers			
Navigation Light (Red/Green) on Radar Arch			

REMARKS:

II. Deck

ITEM	SAT	UNSAT	REMARKS
Antenna arch Attachment Fittings			
Lifting Eyes and Tie-downs			
Fuel Fill Station (Fill, Overflow, Vent)			
Console Foundations			
Deck Covering (Non-skid)			
Engine Compartment Cover (Antenna Coupler on inside)			
Water Proof Equipment Covers			
Port Console			
Starboard Console			
Integrated Crew Communications Station			
EPIRB			
Engine Kill Switch Lanyard and Activation Clip (2)			
Portable Fire Extinguisher			
Coxswain’s console and Windscreen			

ITEM	SAT	UNSAT	REMARKS
Antenna arch Components			
VHF-FM Antenna			
Radar Antenna			
White Light			
Blue Light			
Loudhailer Speaker			
Flood Lights			
Red/Green Lights			
Port Console			
VHF-FM Radio Control Head			
Loudhailer Control			
HF Transceiver			
Starboard Console (SINS)			

REMARKS:_____

III. Bilge Area

ITEM	SAT	UNSAT	REMARKS
Electric Bilge Pumps			
Sea Chest Cutout Valve			
Engine Mount Attaching Trusses			

REMARKS:_____

IV. Engine Compartment

ITEM	SAT	UNSAT	REMARKS
Engine			
Starter			
Alternator			
Engine Mounts			
Control Cables/Bellcrank			
Jacket Water Tank			
Expansion Tank			
Jacket Water Cooler			
Jacket Water Pump			
Engine Drive Belts			
Turbocharger			
Engine Mounted Fuel Filter			
Secondary Fuel Filter			
Lube Oil Filter			
Dipstick			
Lube Oil Cooler			

ITEM	SAT	UNSAT	REMARKS
Intercooler			
Glow Plugs			
Glow Plug Relay			
Outdrive Components			
Trim Pump and Reservoir			
Out Drive Oil Reservoir			
Mercathode Controller			
Steering Actuator and Hoses			
Seawater Strainer			
Engine-to-Outdrive Interface			
All Flexible Hoses			

REMARKS:_____

_____

_____

V. Boat Trailer

ITEM	SAT	UNSAT	REMARKS
Trailer Plug Connector			
Safety Chains			
Breakaway Lever Actuating Chain			
Brake Actuator Fluid Level			
Emergency Brake Latch			
Jack with Strap			
Tongue Jack			
Haul-in Winch			
Bow Stop			
Brake Lights			
Bearing Buddys			
Lug Nut(s)			
Tires			
Fenders			
Frame			
Bunks			

ITEM	SAT	UNSAT	REMARKS
Brakes			
Axle & Springs			
Wiring			

REMARKS:_____

Appendix D. CB-OTH MK III Disabling Casualties

Introduction

This appendix contains disabling casualties for the CB-OTH MK III. Refer to *Chapter 5, Section A* of this handbook for steps to follow if any of these casualties occur.

In this appendix

The disabling casualties list covers the following subject areas:

Disabling Casualty List

Engine Parameters

- Engine speed less than 2500 corrected RPM or greater than 4200 corrected RPM.
- Any Fuel oil or lube oil leak falling on a hot surface (hot surface is defined as a surface greater than 400° F or around turbocharger).
- Engine lube oil pressure less than any one of the following or alarm is activated:
  - At idle less than - 4.35 PSI.
  - At normal cruising speed less than - 35 PSI.
  - At 3800 RPM less than - 63.8 PSI.
- Engine jacket water temperature above 203° F or alarm is activated.
- Lube oil pressure alarm inoperative.
- Jacket water temperature alarm inoperative.
- Turbocharger suction pressure alarm inoperative.
- Exhaust cooling water alarm activated or alarm inoperative.
- Battery charge alarm activated or alarm inoperative.
- Jacket water level alarm activated or alarm inoperative.
- Gear oil level alarm activated or alarm inoperative.
- Fuel filter separator alarm activated or alarm inoperative.

Engineering System Components

- Engine fails to start.
- Metallic/non-metallic noise: metal on metal/fuel-knock/bearing/clicking.
- Excessive outdrive or engine vibration.
- Engine surging/ over speed (over 50 RPM).
- Loss of engine control.
- Engine oil level; empty (no oil on the dipstick).
- Water in engine lube oil (emulsified white milky oil).
- Lube oil in engine jacket water. More than a light sheen.
  - Floating unmixed lube oil separated from the water.
- Charging system faulty or inoperative.
- Continuous electrical breaker trip.
- Continuous failure of fuses.
- Steering system inoperative.
- Engine mounts hardware loose or missing.
- Missing propeller coupling nut/ cotter pin.
- Loose/disconnected engine control hardware.
- Loose/disconnected steering actuator hardware.

	• Missing fuel cap. • Lower unit oil level; empty (no oil on dipstick). • Tilt trim reservoir oil level; empty. • Any fuel oil or lube oil dripping on hot surface - hot surface is defined as anything greater than 400° F.
Boat Outfit	• Missing engine kill switch activation clip and lanyard. (includes spare) • Both portable fire extinguisher and installed fire extinguishing system missing or unserviceable.
Electronics/ Navigation	• No installed electronic means of signaling distress (i.e., radio and EPIRB not installed or unserviceable). • 12 VDC system will not energize.
Safety	• Davit out of date/ not rated. • Truck and complete hitch system (hitch, ball mount, and ball) not rated at 7,000 lbs or greater, rating must be marked by manufacturers sticker or stamp. • Any wiring insulation damaged or chafed resulting in an exposed conductor. • Electrical arcing and sparking. • Odor of insulation overheating.
General Material	• Hull/transom plate breach below the waterline. • Damage to inflatable collar/valves (unable to hold air).

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Appendix E. CB-OTH MK III Restrictive and Major Discrepancies

Introduction

This appendix contains restrictive and major discrepancies for the CB-OTH MK III. Refer to *Chapter 5* of this handbook for steps to follow if any of these casualties occur.

In this appendix

This appendix contains the following information:

Restrictive Discrepancies

Engine and boat systems	• Engine performance:
	  ➢ Engine speed less than 3500 corrected RPM.
	• Leaks more than 15 drops per minute:
	  ➢ Lube oil falling onto a surface which is not hot.
	  ➢ Jacket water.
	  ➢ Steering actuator.
	• Any fuel oil leak (piping/fittings/tank) falling onto a surface which is not hot.
	• Flexible hoses and gauge lines used for petroleum based products not either fire rated or fire sleeved (fire sleeve properly banded at both ends).
	• Any installed Bilge pump missing/inoperative.
	• Emulsified oil in lower unit.
	• Inoperative/ pressure/temperature gauges.
	• Inoperative fuel gauge.
	• Turbocharger suction pressure alarm activated.
	• Loose/missing/damaged/ fittings, nuts, bolts, brackets, etc.:
	  ➢ Engine outdrive interface.
	  ➢ Loose Propeller coupling nut.
	  ➢ Steering system, on the console
	  ➢ Steering actuator bell crank bolts/nuts/pins.
	• Sea chest valve inoperative
	• Inoperable tilt/trim system.

Boat outfit	• Antenna arc support bracket hardware loose/missing. • Missing anchor/line/shackles. • EPIRB not Installed or unserviceable. • Portable fire extinguisher missing or unserviceable/expired weight test. • Installed fire extinguisher system missing or unserviceable/expired weight test. • Both installed and manual inflatable collar pumps missing/inoperative.

Electronics/ navigation	• Magnetic compass missing • Deviation table missing. • Compass deviation table over 5°. • Electronic (Fluxgate) compass deviation greater than 5° and unit unable to calibrate compass. • Navigation/anchor lights extinguished or one or more extinguisher LEDs. • Electronics: ➢ VHF-FM radio inoperative. ➢ Depth sounder inoperative. ➢ DGPS inoperative. ➢ Radar inoperative. ➢ SSB-HF radio inoperative. • No means of signaling distress (i.e. loudhailer, horn, and reed mouth horn/air horn missing or inoperative).
General material and safety	• One or more grips damaged/ripped and or missing. • Portable fire extinguishers not secured in bracket. • Holes/cracks in the hull/transom plate above the waterline. • Missing non-skid section ($8^1/_2$ x 11 inches) in a working area.
Trailer	• Damage or disfigurement of the wheel rim flange which results in exposure of the tire bead (sealing surface) and/or damage or disfigurement which warps the circular shape of the rim. • Two or more Brake rotors damaged. • Tire air pressure below 20 PSI. • Two or more tires with air pressure below 40 PSI. • Tire treads depth less than ⅛ inch. • Brake/tail extinguished or one or more LEDs extinguished in the light. • Missing/loose lug nut(s). • Improper size tire(s). • Damage to the tire side wall exposing the inner belt. • Any brake fluid leak from the brake system. • Brake actuator or back up solenoid inoperative or no fluid. • Wheel bearings or brakes have excessive noise or play. • Structural cracks. • Missing safety chains or breakaway brake actuator safety chain. • Emergency brake latch improper Configuration or inoperative. • Missing tie down straps (4 required/not including winch strap).

Major Discrepancies

Engine and boat systems

- Engine speed greater than 4000 corrected RPM.
- Leaks less than 15 drops per minute:
  - Lube oil falling onto a surface which is not hot.
  - Jacket water.
  - Raw water.
  - Steering actuator.
- Engine jacket water temperature gauge indicates below 140° F.
- Bilge pump hoses missing hose clamps.
- Loose/missing/damaged fittings, nuts, bolts, brackets:
  - Hardware on the engines used for attaching equipment.
  - Battery terminals loose or corroded.
  - Battery not secured.
  - Engine control cables loose
  - Any loose wire terminal.
- Fluid levels below minimum required.
- Any wiring insulation damaged or chaffed, without exposing the conductor.
- Fuel consumption gauge inoperative.
- Zincs corroded more than 50%.
- Damaged/inoperative console latch/locks.
- Inoperative engine cover latch.
- Installed inflation pump missing/ inoperative.
- Any standard boat machinery, with the exception of those listed on the Disabling or restrictive list, not operating as designed.

Boat outfit	• Missing Life ring and/or distress light. • Missing throw line bag. • Missing/damaged headsets. • Missing one or more mooring lines. • Missing reed mouth horn/air horn. • Missing impeller/gasket. • Missing Racor filter. • Missing inoperative flashlight. • Missing/inoperative inflation foot pump. • Missing/inoperative boat hook. • Missing/inoperative manual bilge pump. • Missing/improperly outfitted/expired first aid kit. • Missing/improperly outfitted sponson patch kit • Fire Extinguisher PMS not recorded on equipment tag or improperly completed.
Electronics/ navigation	• Compass light inoperative. • Damaged/inoperative blue light. • Damaged/inoperative deck/flood light. • Expired deviation table. • Transducer bracket damaged or loose hardware. • Any standard boat electronics or system, with the exception of those listed on the disabling or restrictive list, not operating as designed.
General material and safety	• Improperly repaired damage to hull or inflatable collar. • Damage to antenna arc. • Loose/missing/damaged/ fittings, nuts, bolts, brackets. • Torn seat exposing metal creating a safety hazard. • Loose/missing/damaged hardware on seat brackets. • Inoperative/cut/torn seat belt. • Improperly stored gear (to included non-standard gear/additional gear.). Any standard boat machinery or system, with the exception of those listed on the disabling or restrictive lists, not operating as designed.

Trailer	• Loose/missing/damaged/ fittings, nuts, bolts, brackets. • Brake fluid level low. • Damage to brake lines. • Brake lines not properly installed. • Brakes remain locked during back up operations. • One/two brake rotors damaged. • Brake rotor locked. • Damaged/missing trailer jack. • Nonstandard type tie-down straps. • Missing section of DOT reflective tape. • Tire air pressure 20-39 PSI. • Tire air pressure above 50 PSI. • Clearance light/marker lights with one or more extinguished LEDs. • Bearing lubricator/ damaged or missing. • Damage to the tire side wall not exposing the inner belt. • Damage or disfigurement of the wheel rim flange which does not result in exposure of the tire bead (sealing surface). • Any standard trailer machinery or system, with the exception of those listed on the disabling or restrictive lists, not operating as designed.

Appendix F. RFO, STAN Team Inspection List

Boat on cutter inspection

NOTE

When the CB-OTH MK III is inspected in the cradle, any disabling or restrictive discrepancies found on the trailer will not affect the CB-OTH MK III from completing a full power trial.

Boat on trailer inspection

NOTE

When the CB-OTH MK III is inspected on the trailer, any disabling or restrictive discrepancies found on the cutter will not affect the CB-OTH MK III from completing a full power trial.

1. Ensure boat is on the trailer with truck and all safety chains hooked up.
2. Ensure all tie downs and outfit listed items are on the boat.
3. Energize the truck/trailer lights
4. Check the operation of the brake and turn signal lights.
5. Start the truck and take the truck and boat/trailer to an open area to perform the brake back up solenoid test. Inclined areas do not affect the results of the test.
6. Unplug canon plug from the truck.
7. Back up boat/trailer, back up solenoid will close and brakes will lock.
8. Pull forward to release the brakes.
9. Plug the canon plug back into the truck outlet.
10. Back up boat/trailer, back up solenoid should remain open and allow boat/trailer to back up freely.

Pre-U/W Trial

1. After completion of material inspection.
2. Hook up ears to the lower unit.
3. After water is being supplied to the lower unit, start-up the engine.
4. Check for overboard discharge.
5. Check the operation of all the gauges, note results.
6. Pull kill switch, engine should shutdown.
7. Place the kill switch back on and place throttles into gear.
8. Attempt to start while in gear. Engine should not start while in gear.

Underway Trial

After all disabling casualties are corrected and restrictive discrepancies either corrected or waived the boat may get underway for a power trial.

1. Put boat into the water.
2. Start the engine and energize all equipment and ensure the following:
   - Satisfactory radio checks.
   - GPS locks on.
   - Depth finder operated.
   - Radar transmits.
3. Get the boat underway, trim lower unit all the way down and bring it to a location where it can run full power for 10 minutes.
4. While U/W compare electronic compass with GPS. If there is more than 5° difference between electronic compass and GPS, electronic compass deviation can be determined by steering on a fixed range and known course. While steering on known course, compare course with electronic compass. If deviation is greater than 5° the electronic compass will need to be calibrated. After compass has been calibrated, complete a new test.
5. Bring the engines up to min 3600 RPM.
6. Check the boat for any vibrations.
7. Check the throttle handles to see if they hold 3600 RPM or creep back. If they creep back, have the operator hold the throttles at 3600 RPM for the 10 minute period
8. On the return trip, check full power, noting engine speed and RPM. Engine cannot run above 4000 RPM.

Once back at the pier, check the engines, fuel system, and steering system for evidence of leaks.

Appendix G. List of Acronyms

Introduction This appendix contains a list of the acronyms used throughout the handbook.

In this appendix This appendix contains the following information:

ACRONYM	DEFINITION
CB-OTH	Cutterboat – Over the Horizon
CBP	Customs and Border Patrol
DAMA	Demand Assigned Multiple Access
DBN	Double Braided Nylon
DGPS	Differential Global Positioning System
DIW	Dead-in-the-Water
EC	Engineering Changes
EPA	Environmental Protection Agency
EPIRB	Emergency Position Indicating Radio Beacon
FFCS	Full Function Crew Station
GPH	Gallons Per Hour
GPS	Global Positioning System
HF	High Frequency
HP	Horsepower
I/O	Inboard/Outdrive
ICCS	Integrated Crew Communications Systems
ICV	Intercommunicating Fill Valve
kW	Kilowatt
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LOA	Length Overall
LOS	Line of Sight
MCS	Master Control Station
MSST	Maritime Safety and Security Team
NM	Nautical Mile
NSN	National Stock Number
PFD	Personal Flotation Device
PMS	Planned Maintenance System

ACRONYM	DEFINITION
PPE	Personal Protective Equipment
PQS	Performance Qualification Standard
PSI	Pounds per Square Inch
RF	Radio Frequency
RFO	Ready for Operations
RPM	Revolutions per Minute
RT	Receiver/Transmitter
SINS	Scalable Integrated Navigation System
SOP	Standard Operating Procedure
SPD	Single Point Davit
SSB	Single Side Band
VAC	Volts Alternating Current
VDC	Volts Direct Current
VHF	Very High Frequency
WAAS	Wide Area Augmentation System

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