mjm yachts

43z OWNERS GUIDE

“Believe me, my young friend, said the water rat solemnly, there is nothing, absolutely nothing, half so much worth doing as simply messing about in boats. Simply messing...nothing seems really to matter. That's the charm of it. Whether you get away, or whether you don't, whether you arrive at your destination or whether you reach somewhere else, or whether you never get anywhere at all, you're always busy, and you never do anything in particular...”

…The Wind in the Willows by Kenneth Grahame

Dear 43z Owner,

Congratulations on becoming an owner of an MJM 43z. We're dedicated to making it the world's best in class. As you read this guide and share cruising adventures, we hope you'll discover our mission has been accomplished.

MJMs are built of the highest quality materials, a composite of epoxy, Eglass and Corecell. That contributes to MJMs being most fuel-efficient yachts of their type by a wide margin. The same is true in the selecting of equipment suppliers and cabinetmakers. 43z is built to structural scantlings of certified ISO Category B Offshore.

43z leads the outboard market with unusually complete standard specifications and amenities. The boats are safe, reliable, easy to handle by one person, and high performers. Last but not least, and our number one design mandate, they turn heads everywhere they go.

In addition to this Owner's Guide, and primary terms of authority, are two large binders with equipment supplier owner manuals and warranties. These documents contain an enormous amount of important information. Please keep them accessible for reference when you have an issue or question not covered in sufficient detail by this guide. You can download most from supplier websites or install them on your display.

This guide reflects our experience from building over 300 MJMs. I personally have spent more than 6000 hours cruising on MJM yachts so want to impart some advice and background information along with the "how to do it." See comments in the blue sidebars. As you enjoy your new boat, remember that much of the equipment contains computer chips that can sometime have glitches, which are often corrected with a re-boot.

With proper safety precautions and good weather planning, you will spend many enjoyable hours on your new vessel!

Peter L. Johnstone
Chairman
(252) 599-0223
peterj@mjmyachts.com

Boat Information

MODEL 43z Downeast

HIN NUMBER EOU43z

DESIGN PATENT US D475 338S (3 June 2003)

DELIVERY DATE _____

AIS MMSI NO. _____

REGISTRATION NO. _____

ENGINES MERCURY Outboards or VOLVO-PENTA Inboards

MODEL _____

SERIAL NUMBERS _____

PROPELLORS _____

MJM YACHTS LLC	Peter L. Johnstone or Peter Truslow
Phone	(252) 599-0223 or (386) 678-7584
Email	info@mjmyachts.com
ZURN YACHT DESIGN	Doug Zurn
Phone	(781) 639-0678
Email	doug@zurnyachts.com
BOSTON BOATWORKS	Scott Smith or Rafael Silva
Phone	(207) 252-7190 or (978) 589-4519
Email	scotts@bostonboatworks.com I rafaels@bostonboatworks.com
Address	333 Terminal St., Charlestown MA 02129
BBW SERVICE CONTACT	John Clermont
Phone	(207) 400-7182
Email	jonc@bostonboatworks.com

DEALER _____

BROKER _____

PHONE _____

EMAIL _____

QUICK START GUIDE

Here's a reminder checklist for an experienced captain, familiar with operation of triple Mercury Verado outboards equipped with Joystick Piloting and information in this guide and accompanying binders.

Check Systems

☐ CHECK to see that raw water strainers of the GENERATOR, SEAKEEPER and AIR CONDITIONING units are clear.

Change AC Power Source - Shore Power to Inverter

☐ Turn OFF the two SHORE POWER breakers at the top of 120V AC panels. Then:

1. If planning to use the GENERATOR to power the SEAKEEPER or AIR CONDITIONER underway, start the GENERATOR and turn on the TRANSFER switch (there's a 2-minute delay until panel lights up active).
2. Otherwise flip the PHOENIX CONTROL toggle to ON to activate the INVERTER to sustain power to 120V AC circuits.

☐ Turn OFF the Dock Pedestal breaker first, then disconnect 30amp cord(s) or retract the optional 50amp power cord with Glendinning reel. The 50amp input splits to 2-30amp circuits inside the boat to power the two AC Panels.

Activate 12 Volt Equipment

☐ With HOUSE BATTERY switch ON, check for at least 12.2V on the electrical panel. Turn ON TRIM TABS, ELECTRONICS, HORN, WIPERS, FW PUMP, HEAD, BOW THRUSTER, GYRO and other breakers for equipment used underway… such as NAVIGATION LIGHTS and SEARCHLIGHT if at night.

☐ Turn ON red ENGINE BATTERY switch (turns on all 3 engines) at the top of the 120V AC panel.

☐ Insert TPS key fob (Theft Prevention System) into its slot above the electrical panels.

☐ Insert and turn ON ENGINE KEYS (ignore START position as that happens on deck). Listen for acknowledging beep and look for Green "Systems OK" Light on Vesselview.

☐ SELECT "Engine Page" on VesselView and check engine battery voltage in top center.

CAUTION If batteries are low, don't leave the dock until you diagnose and correct the problem.

☐ LOWER engines using rocker switch on port control handle, confirmed by trim bars in lower center on VesselView.

CAUTION Ensure people, equipment, lines and hoses are clear and not in the water before starting.

Start Your Engines

☐ Momentarily TOUCH engine start buttons to starboard of wheel. Don't hold them in. It's automatic.

☐ TAP JOYSTICK lightly in any direction to insure it is functioning. The rim lights up GREEN.

Cast Off

CAUTION Confirm that no one is on the foredeck or in the water.

☐ If everything is in order, cast off dock lines. When maneuvering with the JOYSTICK, minimize going back to center to avoid shifting of outboard gears. If moving sideways to clear a float: You can move the bow to catch up with the stern by twisting the knob at the same time while held sideways… likewise with moving the boat slightly forward or aft by leaning the joystick forward or aft while still leaning the joystick in the sideways direction desired.

☐ Move the SHIFT LEVER forward out of neutral normal operation to automatically disengage the JOYSTICK. The JOYSTICK is automatically ready for use (Green Lighted Rim) when SHIFT is in neutral.

CE CERTIFICATION

CERTIFICATE NO.	BBBW005
AUTHORITY: ADDRESS:	International Marine Certification Institute
	Rue Abbe Cuypers 3
	B-1040 Bruxelles. Belgique
PHONE	+32-2-741-2418
WEBSITE	www.imci.org
CLASSIFICATION	ISO CE Mark Design Category B Offshore (EC Directive 94/25/EC) for craft designed for offshore voyages (1) where the vessel is correctly handled in the sense of good seamanship and operated at a speed appropriate to the prevailing sea state and (2) with significant wave heights above 4 m (calculations are based on 7 m) and wind speeds in excess of Beaufort Force 8, but excluding abnormal conditions, e.g. hurricanes.

CAPACITY

	Maximum 15 Persons
PERSONS	Maximum Load 3518 kg
PERSONS/GEAR	Maximum Load 3518 kg

RECEIPT BY OWNER In compliance with ISO 10240:1995(E) the owner hereby certifies receipt of this manual and has read and agrees to the terms of the Builder's Limited Warranty included herein.

NAME

Signature

Printed Name(s) and Date

BOAT

Boat Name and Hull Number

CONTACT INFORMATION

Street Address

City, State, Zip

Mobile Phone

e-Mail

Please sign one of the two copies of this page and return it in the attached stamped envelope to MJM Yachts, 39 Washington Street. Newport, RI 02840.

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Purpose and Limitations 1
1.2 Standard Specifications 1
1.3 Conventions 1

2 SAFETY and some USCG REQUIREMENTS 2

2.1 Binder Manuals 2
2.2 Standard Equipment 2
2.3 Commissioning Package Safety Items 3
2.4 USCG required equipment 3
2.5 Additional Safety Equipment 3
2.6 Some Additional USCG Requirements 4
2.7 Fuel Shut-off Valves 4
2.8 Fire Suppression 4
2.9 Notices 4
2.10 Emergency and Thru Hull Diagram 5

3 PROPULSION 6

3.1 Engines 6
3.2 Engine Checks 6
3. Five Steps to Start 7
3.3 Stopping the Engines 7
3.4 New Engine Break-in 8
3.5 Operating Parameters 8
3.6 Leaving the Boat 8
3.7 Mercury Verado 350 HP Engine 10

4 INSTRUMENTS AND CONTROLS 11

4.1 Mercury Features and Controls (pages 56 -77) 12
4.2 Joystick Piloting 12
4.3 DISPLAYS 13
4.4 Compass Heading and Calibration 13
4.5 Trimming the 43z 13
4.6.1 Engine Trim 13
4.6.2 Mercury Active Trim 14
4.6.3 Lectrotab Auto Leveling 14
4.6 Searchlight 14
4.7 MultiFunction Dislay (MFD) 14
4.8 Console Switch Panel 14
4.9 Windshield Operation 15

5 ELECTRICAL SYSTEMS 16

5.1 Electrical Safety 16
5.2 Electrical Power 16
5.3 Shore Power 17
5.4 Fuse Locations 17
5.5 24-Hour Circuits 17
5.6 The 12V DC Panel 19
5.7 The 120V AC Panel 20
5.8 Westerbeke 6.5 MCG Generator (Option) 21
5.9 Generator Component Locations 22
5.10 Victron Inverter/Charger 23
5.11 Bonding 23

6 WATER SYSTEMS 24

6.1 Fresh Water 24
6.2 Hot Water 24
6.3 Gray Water 25
6.4 Raw Water 25

7 SEAKEEPER GYROSTABILIZER (Option) 26

8 EQUIPMENT, APPLIANCES and FINISHES 27

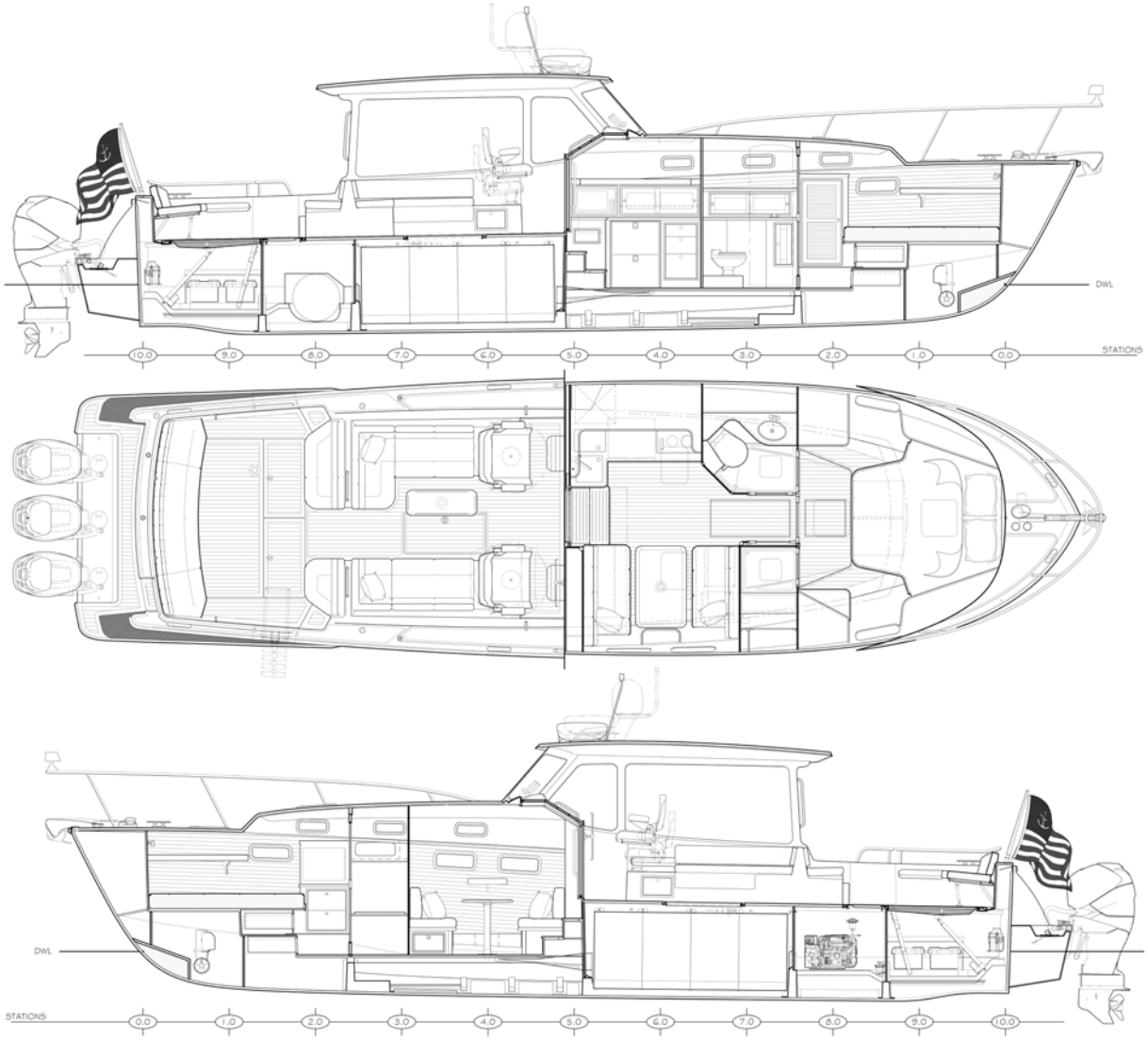
8.1 Anchor Windlass 27
8.2 Anchor Washdown 27
8.3 Fusion Multi-media Player 27
8.4 Privacy/Sunscreen Curtains (Option) 28
8.5 Vacuum Cleaner 28
8.6 Cooktop 29
8.7 Microwave 29
8.8 Refrigerator 29
8.9 Freezer 29
8.10 TVs (optional) 29
8.11 Vacuum Flush Head System 30
8.12 Air Conditioning (Optional) 30
8.13 Finishes 31

9 APPENDIX 32

9.1 The Top 10 Causes of Engine Failure 32
9.2 Diesel Operation 33
9.3 Starting with Low Batteries 35
9.4 Winter Storage 36
9.5 Spring Commissioning 37
9.6 Hauling Out and Blocking 37
9.7 Trailer Loading Checklist 37
9.8 Fuel Consumption 38
9.9 Routine Maintenance 39
9.10 Boat Lift and Bunk Offsets 40
9.11 Systems Location Plan 41
9.12 Systems Key 42
9.13 Wiring Diagrams 43
9.14 Fuse Locations & Specifications 44
9.15 Fuel Consumption Log 45
9.16 Boston Boatworks Limited Warranty 46

10 THE MJM TEAM 50

10.1 Bob Johnstone 50
10.2 Peter Johnstone 50
10.3 Doug Zurn 50
10.4 Scott Smith 51
10.5 Mark Lindsay 51
10.6 Steve Burke 51



MJM 43z

LOA: Length Over-All including engines down & bow roller ..... 46.3 ft.

LOD: Length on deck (LOD)..... 42.6 ft.

Beam (Maximum width on trailer) ..... 12.0 ft.

Maximum Lift weight (full tanks, no crew).....23,520 lbs.

Draft with Engines (Up) Down .....(1.8 ft.) 3.1 ft.

Displacement (1/2 Load).....18,960 lbs.

Fuel tank.....540 gal.

Fresh water tankage (including hot water tank).....113 gal.

Holding tank .....30 gal.

Air height above water to top of radar dome mounted on hard top ..... 10.0 ft.

1 INTRODUCTION

1.1 PURPOSE AND LIMITATIONS

This purpose of this *Owners Guide* and the equipment suppliers' manuals in the accompanying binders is to provide you with an overview of the yacht's equipment, operation, systems and maintenance. The people at MJM and Boston BoatWorks have taken pains to edit this guide for accuracy in good faith. Most of these topical require further study and learning by the captain of a vessel who assumes extensive responsibilities for safe operation of the vessel and for safety of the crew.

This summary guide of yacht equipment and operation will never be complete or accurate in all respects. And, since we frequently make improvements, we assume no responsibility for missing information or errors contained herein. This document doesn't replace common sense nor qualify the reader in safety practices, boat handling or navigational skills. Mastering these systems and the skills of seamanship is each owner's/captain's responsibility. If this is your first yacht, or if you're changing from a different type of yacht, please get instruction and experience before assuming command. Your dealer, yacht club, marina or the US Power Squadron https://www.usps.org are all good resources that can recommend licensed captains, schools or other instructional entities.

Although this guide and the accompanying binders describe systems on the boat, they don't qualify you to work on them. When they need attention, please use qualified and certified trades personnel. If you question the information or are unsure about an action, check with the equipment supplier, a qualified person or us.

The *Appendix* includes other useful information. And there's a chapter on the people who create MJM yachts you can contact if you need help. Study these resources to understand how to operate your yacht safely.

DANGER The operation of a powerboat can be dangerous. Pay careful attention to safety notices in this guide and in the manuals in the binders.

Keep this guide in a secure place on the boat. If you sell the yacht, please give this copy to the new owner.

This guide is published in accordance with ISO standard 10240:1995E Small Craft - Owner's Manual.
Please contact us if you have a question about the material in this book, if you find a conflict between this material and the material in the binders or if you find an error or important omission on the following pages please contact Customer Service at Boston Boat Works.

…R.I.J.

1.2 STANDARD SPECIFICATIONS

You may download the latest version of this guide and the standard specifications for a MJM43z from http://www.mjmyachts.com/43z to install on your computer, an iPad or navigational display.

1.3 CONVENTIONS

When we reference a specific device or item of equipment on the boat, it will be in all caps, such as HOUSE BATTERY.

As we describe each device we often use the following order.

1. BREAKER PANEL settings
2. Function, what it does
3. Directions for use
4. Advice or comments in a sidebar
5. The URL for the manual if available

2 SAFETY and some USCG REQUIREMENTS

2.1 BINDER MANUALS

The equipment suppliers' manuals in the accompanying binders have many safety notices that relate to their products, their operation and maintenance and their use in the boat. Ensure that you understand this essential information before you operate the boat. Spend time reviewing the safety procedures, how safety equipment works and where It's stowed. Instruct guests in safety procedures.

2.2 STANDARD EQUIPMENT

To send a distress call (without specifying its nature) press and hold the red distress key for 3 seconds. See Ray218E/Ray55E Installation and Operation Instructions.

VHF Radio BREAKER PANEL settings: ELECTRONICS breaker on. The VHF RADIO may be used for receiving weather broadcasts, communicating with harbors, locks (ch13), bridges (ch 9), marinas, the U.S. Coast Guard (USCG), rescue services boats and other boats. The USCG monitors channel 16. If you normally have your radio tuned to channel 16 you can listen for emergency calls from nearby boats or be able to make an emergency call quickly. Don't use Channel 16 for a private conversation.

MMSI Number The radio has Digital Selective Calling (DSC). It's arguably the most important piece of safety equipment on the boat. There's a one-button emergency transmit button that sends a Maritime Mobile Service Identity (MMSI) number to the USCG. The signal identifies the boat. It's interfaced with GPS so your position will be sent with the emergency message. The Automatic Identification System (AIS) will report your MMSI number to other vessels and you will see their MMSI number. If you sell your boat, log onto your account to cancel the MMSI number, so the new owner can register, acquiring a new MMSI.

In addition to the safety function, an MMSI number is like a phone number. You can make a call to another DSC-equipped vessel if you know its MMSI number. Only the vessel being called will receive the hail.

BoatUS http://www.boatus.com/MMSI/ is authorized by the Federal Communications Commission and the USCG to assign MMSI numbers. The *Installation and Operation Instructions* for the VHF RADIO included in the binder explains how to install the MMSI number in your radio. It also explains how to use the VHF RADIO. It may be downloaded at:
https://raymarine.app.box.com/s/grwg60669c5sozf6iolq/1/2757682985

The Horn BREAKER PANEL settings: HORN breaker on. The USCG requires a "Sound Producing Device" for signals under many circumstances. The HORN is operated from a switch on the CONSOLE SWITCH PANEL at the helm. The adjacent UNDERWAY HORN/ANCHOR switch has programmed signals. (See page 14.)

CAUTION Electronics fail. It's wise to have a portable VHF radio, GPS receiver, SEARCHLIGHT and HORN that are battery operated and hand held.

Fire Extinguishers See *EMERGENCY DIAGRAM* page 5 for Fire Extinguisher locations when the boat is delivered.

Carbon Monoxide Detector See *EMERGENCY DIAGRAM* page 5.

Companionway Hatch Board or Closure A companionway board with the label *"DON'T REMOVE WHILE UNDERWAY"* is provided to comply with ISO requirements for cockpit draining and to prevent large waves from crashing down into the cockpit, running forward and entering the interior of the boat if the companionway door is not securely closed.

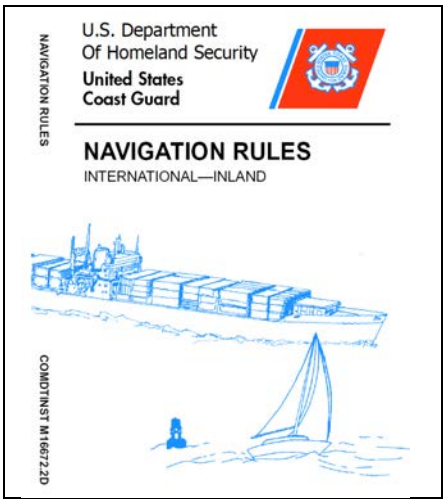
Better to just secure the companionway slider and lid. It's quieter, prevents someone from being pitched below and provides a Chart Kit navigation surface.
---R.I.J.

Going Onto the Foredeck in Rough Weather. Primary access to the foredeck is intended to be via the forward cabin hatch… for instance to secure an anchor that has come loose from the windlass and poses a hazard. ISO requires that a Jackstay be fitted to access the foredeck in heavy weather. The jackstay should be secured to a foredeck cleat prior to entering rough seas then led aft port or starboard inside the bowrail stanchions and anchored to a secure point aft of the pilothouse. A proper offshore harness with lifejacket should be worn to secure yourself to the jackstay.

2.3 Commissioning Package Safety Items

The Commissioning Package Option, if purchased with your boat, will have:

- A copy of the *U.S. Department of Homeland Security United States Coast Guard Navigation Rules* to be on board. It also may be downloaded at: http://www.navcen.uscg.gov/pdf/navrules/navrules.pdf
- A First Aid Kit
- Twelve wearable USCG approved personal flotation devices (life-jackets) and one type IV throwable PFD
- A 12-Gauge Flare Kit
- A Hand-held Bilge Pump
- A Hand-held LED Flashlight
- Paper Charts



2.4 USCG required equipment

A Boater's Guide to the Federal Requirements for Recreational Boats, published by the USCG, lists required safety items. The Guide may be downloaded at: http://www.uscgboating.org/images/420.PDF. Check state regulations where you cruise for other requirements.

2.5 Additional Safety Equipment

There are many other items of safety equipment to consider such as:

EPIRB (Emergency Position Indicating Radio Beacon) alerts search and rescue services by transmitting a coded message and is detectable by satellite anywhere in the world. Although the USCG doesn't require them, EPIRBs are essential offshore and desirable anywhere.

Inflatable Life Raft isn't required but prudent. Rafts come in compact sizes that can be stored in a cockpit locker. A dinghy isn't a substitute for a life raft.

Heaving Line is handy to have for emergency or to simply trail behind the boat (if the engines are off) attached to one of the stern cleats when people are swimming. Polypropylene is good because it floats.

A Storm Anchor is useful as a back up and for situations when two anchors are prudent or necessary.

2.6 Some Additional USCG Requirements

In addition to the above safety equipment, the USCG requires:

Ships Registration and Documentation Carry the Vessel Registration, either the state-issued Certificate of Number or Vessel Documentation if federally documented with the USCG. It's wise to have your insurance as well.

Pollution Regulation Plaques You are required to post three visible placards in the boat that stipulate that waste must be managed; that oil discharge is prohibited and deposit of any refuse matter of any kind into the waters of the US is prohibited. West Marine has such plastic placards with adhesive backs that are available at little or no cost.

2.7 Fuel Shut-off Valves

The first thing to do if there is a fuel fire or leak is stop engines, turn off ignition and engine battery switches and close fuel shut-off valves by turning them perpendicular to the hose. They are located under the cockpit sole hatch. If there is fuel in the bilges, close valves, find the source of the leak and then clean bilges.

2.8 Fire Suppression

An automatic, heat-activated, fire suppression system is installed in the generator compartment. It can be activated manually at the helm station. To prevent the engines from evacuating the fire suppression agent when it discharges, the system will shut off blowers and generator. Refer to the manual for maintenance instruction. (

Hand-held fire extinguishers (see *Emergency Diagram* following for locations) are rated to fight type A, B & C fires. To extinguish a fire, first cut the source of fuel to the fire. In a fuel fire, turn off the fuel tank valves. In an electrical fire, turn off the BATTERY switches.

Fire safety begins with prevention. Reduce fire risk with these guidelines:

- Don't allow debris or oily rags to collect anywhere.
- Check bilges for oil or fuel regularly.
- Shut down unnecessary circuits when leaving the boat.
- Don't leave heat-producing appliances or equipment unattended.
- Inspect fire suppression equipment regularly and learn how to use it.

DANGER Exhaust gas contains carbon monoxide. It's colorless, odorless and lethal. Avoid inhaling. Inspect the exhaust system regularly. Idling engines at a mooring or at a dock isn't good for the engine and may allow gasses to accumulate in the cockpit or cabin.

DANGER Don't work on any mechanical or electrical equipment unless you're qualified. Electrical current and moving parts are dangerous and can be lethal.

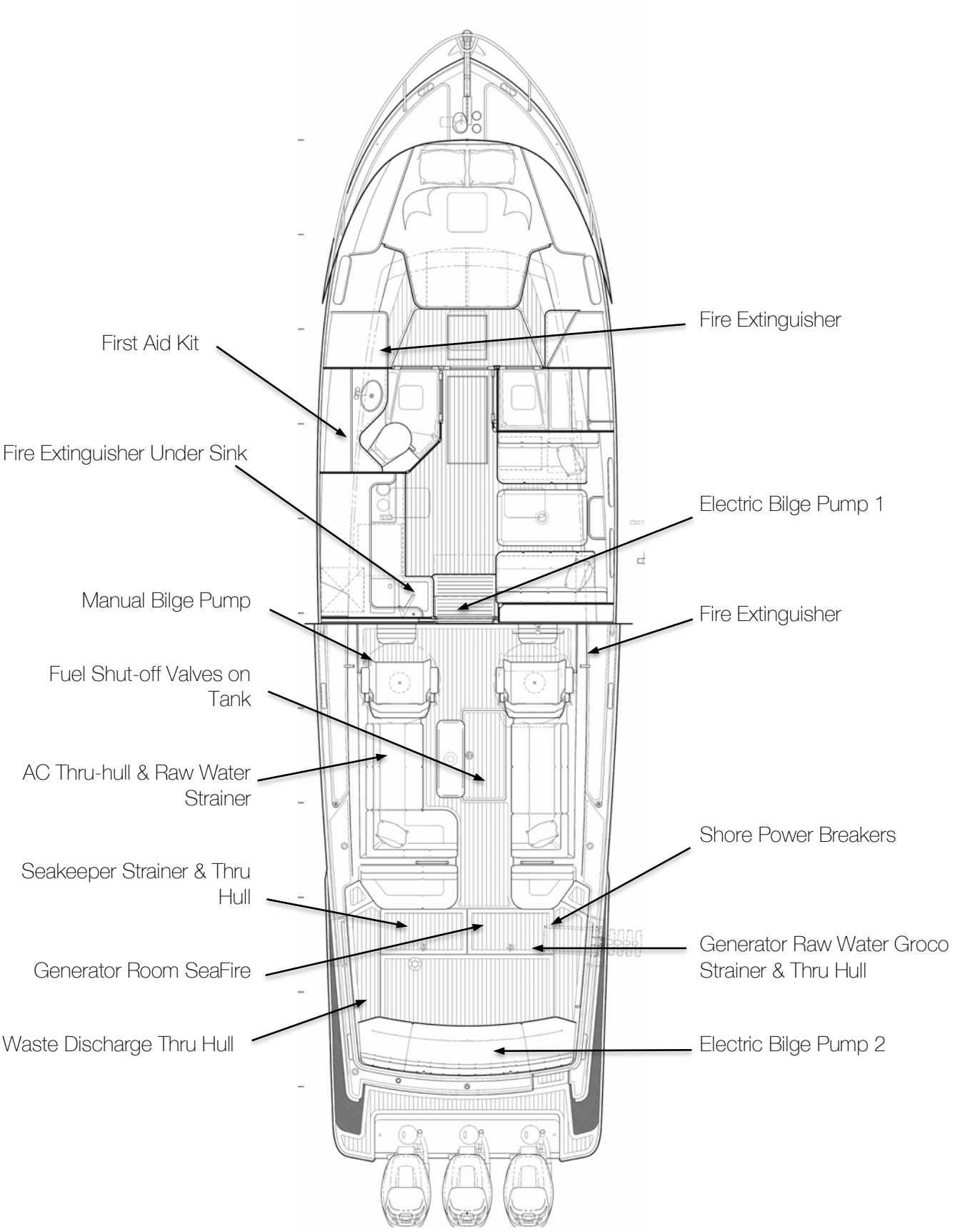
2.9 Notices

CAUTION Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components.

WARNING Denotes a hazard that exists which can result in injury or death if proper precautions aren't taken.

DANGER Denotes an existing extreme intrinsic hazard that would result in high probability of death or irreparable injury if proper precautions aren't taken.

2.10 EMERGENCY AND THRU HULL DIAGRAM



3 PROPULSION

3.1 ENGINES

The MJM 43z is propelled by triple Mercury Verado 350 HP 4-stroke, 6-cylinder in-line outboard engines with HD heavy duty drives having either 3 blade Enertia-ECO 3-Blade or 4-blade Evolution-4 stainless steel propellers. When raised, engines are out of the water.

3.2 ENGINE CHECKS

See "Mercury Operation & Maintenance Manual (MOMM") provided with your MJM. Before long trips, checki hydraulic steering fluid level under the rear cockpit seat and engine oil level by removing the top cowl.

Top Cowl Removal to access most maintenance points. To tilt the engine closer, making this easier, use the small black AUXILIARY TILT SWITCH on the port side of the engine just below the top cowl.

Pull up on the top cowl latch on the back of the engine.

Pull the top cowl forward and lift off.

Remove dipstick on port side of engine to check oil, then securely reinserti.

Putting the top cowl back on is a bit tricky. Position the top cowl loosely in place over the engine, being sure it fits on top of the rubber seal all the way around. (MOMM says front first)..

Push down on the cowl, MOMM says back half first, then front half until it clicks into place. Make sure it's secure by pulling up on the back of the cowl. Don't want this flying off underway!

Carbon Streaks rub off with a swipe of the hand when hosing down boat.

Mercury FUEL FILTERS & Fuel Shut Offs

Water Separating Fuel Filters should be replaced every 100 hours or annually. They are located on bulkheads outboard of the generator and aft of the fuel shut-off valves on top of tank. Shown here on a 35z.

The wire out of the fuel the bottom of the filter bowl is the sensor to alert that water is

in

the filter. This is not usually of an urgent nature, but rather a “change at next opportunity” event.

In-Line Fuel Filter under the engine cowl should also be replaced every 100 hours or annually. This pencil like deviice primarily capturres fabrication debris picked up by the fuel in the tanks or hoses. Rarely does fuel clog it. (See MOMM pg 76)

Check Fuel Level The primary cause of engine failure is running out of fuel. There’s a fuel level sensor in the 530 gallon tank and read out on VESSEL VIEW.

3. Five Steps to Start

CAUTION Ensure there are no lines and hoses in the water near the props.

1. Turn on the MASTER ENGINE BATTERY rocker switch at the upper right of the AC (120v) breaker panel.

2. Insert the TPS fob into it’s independent slot above the electrical panels.

3. Turn on the 3 engine ignition keys over the AC Panel. You will hear an acknowledging beep and the VesselView panel will become activated.

DANGER Don’t start the engine if people are in the water nearby.

4. Lower engines using the rocker switch on the port control handle. Ensure the ENGINE/SHIFT CONTROL LEVERS are in neutral. The engines won’t start if either lever is in gear.

5. Start Engines, push and immediately release the engine start button for each engine to starboard of the wheel. Do not hold them in as process is automatic until engine starts. If you don’t hear the engines (these are quiet boats) look at the VESSEL VIEW DISPLAY panel to see they read 500-600 rpm idle. Also check to see if the Joystick base rim lights up GREEN indicating that it is active. See JOYSTICK PILOTING

Engine START/STOP Buttons to starboard under wheel. .

CAUTION The boat may move abruptly when the gear is engaged. Ensure the boat is clear of all obstacles forward and aft. Cautiously shift to the IDLE FORWARD position then quickly back to NEUTRAL position. Observe whether the boat moves as you expect.

WARNING If a warning light or buzzer activates, stop the engine immediately. Determine the cause and repair the problem before continuing to operate.

3.3 Stopping the Engines

Put ENGINE/SHIFT CONTROL LEVERS in neutral. Push the lower STOP buttons on START/STOP Panel. The green base of the Joystick goes out and RPMs go to “0”. Once the engines have been raised, Reverse the Start process by turning of Ignition Keys, pulling out the TPS fob (and hiding it) then truning off the two ENGIINE BATTERY SWITCHES.

It is unnecessary to remove the ignition keys, since they are below and the TPS fob is hidden ENGINE BATTERY SWITCHES are off and the cabin is locked.

A reboot can solve mysterious issues and even obvious ones like after wrapping a stern line around a prop. after which the joystick control starts acting crazy. Electronic engine controls are computers. Mysterious problems may be caused by unusual switching sequence. They can often be fixed with a reboot. Stop the engines. Turn everything off—shut down the entire boat. Wait at least 10 seconds. (My printer and router call for 25 seconds.) Then turn HOUSE BATTERY and ENGINE BATTERY switches on (but not the ENGINE EMERGENCY, PARALLEL switch). Go on deck. Turn Ignition switches on at the helm. Wait until the Vessel View shows data and has gone through its initial warm up. Then start the engines and check the Joystick Control functions.
…R.I.J

WARNING Engine work should not be done with the engine running unless specified by the manufacturer for a specific reason and done by a qualified marine mechanic. Stop engines before opening engine hatch.

3.4 New Engine Break-in

When running the engine for the first time, frequently check oil pressure, coolant temperature (normal is 145°), exhaust color, engine vibration, sounds and the operation of indicators and gauges. Don't run the engine at a constant RPM for long periods of time or apply full throttle for more than about 30 seconds.

Lubrication During the first 10 hours of operation, high oil consumption is typical. Change oil between 50 and 100 hours. Consult the *MOMM* for the proper oils for the climate where the boat will be operating.

3.5 Operating Parameters

Pay attention to the engine data on the VESSEL VIEW or displayed on the Raymarine gS165 data bar. A significant change in oil pressure, coolant temperature or pressure, or voltage drop should be quickly investigated before the engine is damaged. Data should read approximately:

- Oil Pressure: 50 psi at 3000 RPM or more.
- Coolant Temperature: 145° F to 165 ° F
- Coolnant Pressure over 3000 RPM: 15-25 psi.
- Charging: 13-14 Volts underway

While Mercury has run their engines for 300 hours straight at max RPM without damage, a good fast cruising speed is 35-37 knots. Or about 90% of max RPM at about 5200 RPM. Listen and feel for sweet spots. If you hear abnormal sounds, stop the engine and inspect.

3.6 Leaving the Boat

With SHOREPOWER connected - Leave 12v HOUSE BATTERY switch on, as well as REFRIGERATOR breaker. And, on AC Panel: leave AIR CONDITIONER and ARI CONDITIONER PUMP breakers on.

Check that BILGE PUMP switches are set to AUTO

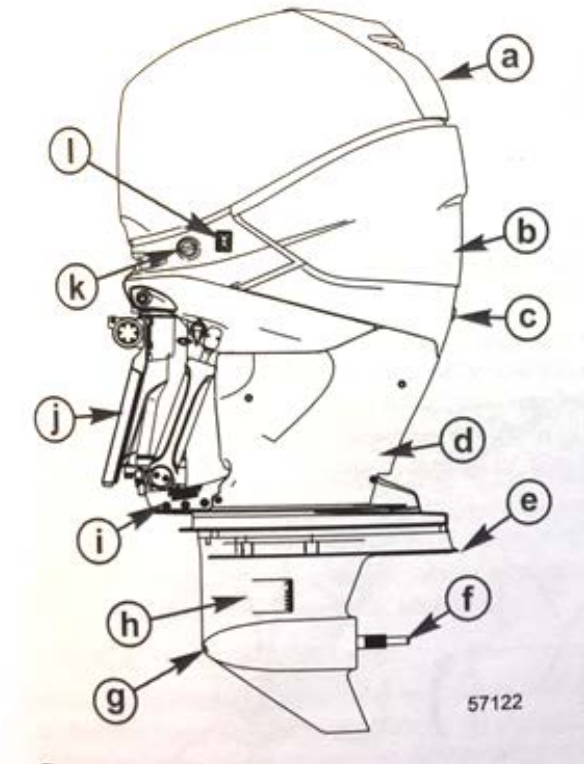
Turn INVERTER toggle switch on PHOENIX CONTROL to "Charge Only"

If moored or with no shore power, If gone for more than a week, it's best to turn everything off, including the MAIN INVERTER UNIT itself under the starboard pilothouse settee, to avoid the risk of having dead batteries when you return.

Or, take advantage of the optional156W SOLBIIEN SOLAR PANEL. With INVERTER on It is designed to keep REFRIGERATOR and FREEZER going with a trickle charge to the HOUSE BATTERIES if not connected to Shore Power.

Flushing the Engines If you plan to let the boat sit for more than a few days, MOMM advises to flush the engines by hooking up a dock hose to the flush connectior on the port side of the engines next to the auxiliary lift button and lettig it run for about 15 minutes. See MOMM page 70.

3.7 MERCURY VERADO 350 HP ENGINE



a. Top Cowl
b. Rear Cowl
c. Idle Relief Exhaust
d. Lower Cowl Chaps
e. Anti-Ventilation Plate
f. Propeller Shaft
g. Low Water Intake Holes
h. Water Intake Holes
i. Trim Guide Plates
j. Pedestal
k. Engine Flush
l. Auxiliary Lift Switch

4 INSTRUMENTS AND CONTROLS

The following material includes selected summaries of Mercury *Operator's Manual (MOM)* included in the binders. Please read the entire manual for safety instructions.

43z power steering rotates outboards through a 20° arc. The steering is more positive and immediate than deflecting prop wash off a rudder from a propeller on a straight shaft and far more positive than directing a jet of water at water passing the hull..

…R.I.J.

Helm Station

Most of the boat's controls and instruments are at the helm station. Below is the layout on ZINNIA #1. The respective circuit breakers must be <u>on</u> for the equipment to operate.

1 Ritchie Compass
2 Raymarine gS165 MFD
3 Mercury VesselView
4 Console Switch Panel
5 Raymarine MFD Control Pad
6 Raymarine Multi-display with Depth
7 Seakeeper Control Panel
8 Searchlight Control
9 Mercury Joystick Piloting
10 Autopilot Button
11 ZipWake Auto Trim
12 Engine/Shift Control Levers
13 Flip Down Drink Holder
14 PH Light Switches (uncer 13)
15 Bilge Pump Controls (2)
16 Not Shown
17 Engine Start/Stop
18 Windlass Up/Down
19 Mercury Active Trim
20 Engine Up/Down Rocker Switch
21 Bow Thruster.

Esthec Riser (Option) This 4" high removable riser improves visibility for someone shorter than 5'5". It locks into place with a barrel bolt and can be stored in one of the settee lockers.

4.1 MERCURY FEATURES AND CONTROLS (PAGES 56 -77)

4.2 JOYSTICK PILOTING

The Mercury Joystick Piloting functions very much like the Volvo Penta IPS, except it's more automatic.

MOVE Engine Controls to Nuetral. The ring at the base of the JOYSTICK lights up Green to show that it's active.

TWIST Joystick to turn the boat or LEAN Joystick in direction desired or do both at same time While PUSHING Joystick forward or aft… without going back to center.

PUSH ADJUST "+" for 100% torque (shows 2 lights). PUSH "-" for 50% torque (1 light). "+" is recommended.

ENGAGE Engine Controls to deactivate.

4.3.1 AUTOPILOT Press boat outline button (Lower Left of Joystick) to engage Autopilot.

TAP Joystick port or starboard to alter course by 1 degree increments. Beep confirms.

TWIST and RELEASE to alter AP Course in 10 degree increments.

In an emergency, you can forcibly TURN the wheel to disengage the autopilot

4.3.2 WAYPOINT TRACK Press "Tri-circle" diagram on starboard side of joystick to set course to WP-1 of course plotted on Raymarine display. Upon arrival at WP-1, there will be an audible beep. Push "Tri-circle" button again to set course to WP-2, etc.

4.3.3 SKYHOOK PUSH "SKYHOOK" button to hold heading and GPS position. GREEN necklace turns BLUE to indicate it is active. Seakeeper gyro helps greatly here, too, so waves don't readily throw the bow around.

4.3.4 BOWHOOK With SKYHOOK activated, PUSH "Bowhook" on Vessel View screen to hold GPS position, but unlock compass heading allowing boat to point into direction of wind/current so engines don't have to work so hard to keep boat in position. See illustration at right.

4.3 DISPLAYS

The Mercury VESSELVIEW 702 DISPLAY panel allows the operator to perform settings and choose information to be displayed. (Refer to the adjacent *VessleView 702 Quick Guide)* This panel is activated when the engine ignition keys are turned on.

Modern marine navigation electronics are subjects beyond the scope of this guide. Extensive manuals are in the binders. The Lighthouse Operating Instructions are also available on the RAYMARINE MFD. You may also download it at: https://raymarine.app.box.com/s/rb0rjilwkwla2h16k4d9iuf7tzbw2bs7 if you aren't familiar with navigation, please learn. Electronic equipment can fail. Have paper chart back-ups and learn dead-reckoning skills.

…R.I.J.

RAYMARINE gS165 DilSPLAY, MULTIFUNCTION DEPTH DISPLAY and VHF are activated by turning on the ELECTRONICS breaker on the 12V ELECTRICAL PANEL. Turn on any other iequipment that you plan to use that have independent switches. Verify that all the navigation instruments are functioning as expected before you leave the dock.

Boat Speed over ground (SOG) imay be displayed in the bar at the top of the Raymarine *MULTI FUNCTION DISPLAY (MFD*). Or on VESSELVIEW. SOG is derived from tracking GPS positions rather than a paddle wheel or sonic device. SOG from the same source may be chosen for display in large digits on the MULTIFUNCTION display. Wind and current affect speed over ground and SOG isn't the same as speed through the water. If you learn to approximate speed through the water from RPM on the tachometer, you can compare it to SOG to determine the effect of wind and current.

4.4 COMPASS HEADING AND CALIBRATION

The yacht is equipped with three devices that display bearing:

1. The RITCHIE COMPASS on the dash
2. A DiGITAL COMPASS
3. The GPS COG (Course Over Ground) on the MFD or VESSELVIEW

When you are underway, these three sources should agree within a degree or so. If they don't, employ a professional compass adjuster. The DIGITAL COMPASS SENSOR is located aft (a puck) on the hard top.

CAUTION Don't store ferrous items such as tools near the DIGITAL COMPASS SENSOR or on the dash by the RITCHIE COMPASS.

4.5 TRIMMING THE 43Z

Trimming a 43z is somewhat of an art form as there are 3 WAYS to do so and they are inter-related. The boat seems to run fine just trimming the outboards with the auto tirim systems off.

4.6.1 ENGINE TRIM With no side wind or leaning of the boat to port or starboard, there's not much more necessary than adjusting a comfortable bow up or down angle using the buttons on the ENGINE CONTROL LEVERS to change the angle of the outboards.

4.6.2 MERCURY ACTIVE TRIM (can automatically do the same, adjusting the outboards to your boats loading and your ride preference. SEE DETAIL FOLLOWING

4.6.3 LECTROTAB AUTO LEVELING On the 12v BREAKER PANEL, Turn TRIM TAB breaker on. This activates the LECTROTAB automatic or manual leveling system. The degree to which the tabs are lowered is shown by the two rows of lights. SEE DETAIIL FOLLOWING

CAUTION It's possible to have dueling trim systems. If the boat is running level, and the LECTROTAB does not respond to raise the bow higher in seas, you'll note that blades are fully retracted, so engines must be raised to correct trim.

4.6 SEARCHLIGHT

BREAKER PANEL settings: SEARCHLIGHT breaker on. Turn on the light by depressing the on/off button.

SEARCHLIGHT CONTROL

The SEARCHLIGHT is a powerful LED appliance that may be operated with a joystick from the helm. The LEDs draw less power (only 2.8 amps at 13.8V) than previous incandescent devices.

With the joystick on the dash control, rotate your light to the desired location.

The speed of the light rotation can be controlled by depressing the fast/slow button once and by depressing it again to restore the original speed. The hard-wired dash control will be backlit when the bulb is illuminated.

4.7 MULTIFUNCTION DISLAY (MFD)

BREAKER PANEL settings: Turn INSTRUMENTS breaker on.

The primary purpose of the MULTI FUNCTION DISPLAY (MFD) is to show depth in big numbers. The depth transducer is installed on the hull under the companionway steps. Depending on loading, speed and wave action It's about 1.3 feet below the waterline.

The MFD may be calibrated to show the water depth from the boat's waterline or from the bottom of the propeller. However, we do not recalibrate depth settings during sea trails and recommend keeping the 1.5 foot safety margin rather than recalibrating. The bottom can come up fast and it's helpful to buy seconds to react.

4.8 CONSOLE SWITCH PANEL

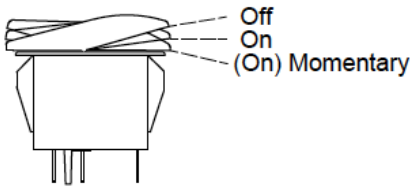
BREAKER PANEL settings: Turn on breakers for the CONSOLE switch panel functions you plan to use. Turn on the WINDLASS breaker and the FRESH WATER PUMP breaker to enable the ANCHOR WASHDOWN and the WINDSHIELD WIPER/WASHER.

Windshield Actuators Three switches operate the electric synchronous actuators that open the windshields (option).

Horn Press to sound the horn.

Underway Horn / Anchor Press forward end of rocker switch to automatically sound a one prolonged blast every 2 minutes when operating in low or restricted visibility. When at anchor or stopped and making no way through the water, press the aft end of the rocker switch to sound 2 prolonged blasts every 2 minutes.

Windshield Wipers



WINDSHIELD WIPER switch

- One push to the on position will start three motors in synchronized interval.
- One more push to momentary will run three motors slow speed synchronized. One more push will run three motors fast speed synchronized.
- One more push starts from interval and so on.

- One long push from off to momentary will start one motor in interval (wiper 1). One more push will run one motor slow speed.
- One more push will run one motor fast speed.
- One more push starts one motor from interval and so on.

When running, push switch to momentary more than one second and washer will start. If the wiper motors get overloaded the power automatically breaks. Push switch to off, then to on and motor will start again.

For improved ventilation or visibility, you can travel comfortably at 14-15 knots without being blasted by the wind if you open the starboard windshield and move slightly toward the centerline of the boat to get out of direct wind flow …R.I.J.

CAUTION If the wiper's washer system is to be used in sub-freezing temperatures, a separate system must be installed which uses anti-freeze.

NAV/ANC Press the forward end of rocker switch to turn on the RED and GREEN NAVIGATION LIGHTS and the STEAMING LIGHT on the hard top over the pilothouse. Press the aft end of rocker switch to turn on the ANCHOR LIGHTS.

Anchor Washdown With windlass switch on, press switch to spray fresh water on the anchor rode when retrieving anchor.

4.9 WINDSHIELD OPERATION

Manual Front Windshield While the double manual windshield design creates individual windows that are easy to lift, a stick with a rubber tip is a handy way to raise or lower the windows without having to stretch over the console.


POWER OPERATING WINDSHIELD

Power Opening Windshield (option) BREAKER PANEL settings: ELECTRIC WINDOWS breaker on. Lineal actuators open the windshields.

CAUTION Be sure to open all the dogs (securing levers) prior to raising the windows, otherwise you will snap off the dogs. The lifters are that powerful!

The optional power windows may be opened to any angle by electric powered lineal actuators. If they are left closed for some time, they tend to stick and then pop up when opening. The remedy is to coat the gasket with Teflon grease, such as Snap & Zipper Lube. The windows shut with a solid thunk. It's not necessary to dog them down at the bottom except in the roughest weather, even when leaving the boat.

5 ELECTRICAL SYSTEMS

DANGER AC and DC electricity can be lethal. Don't work on the boat's electrical system if you aren't a qualified marine electrician..

AND BE SURE TO TURN OFF GENERATOR AND INVERTER THAT PROUCE 110 VOLT CURRENT WHEN SWIMMING FROM THE BOAT.

5.1 ELECTRICAL SAFETY

Please read and understand the safety precautions in the included National Marine Manufacturers Association (NMMA) publication, Sportfish, Cruisers, Yachts: Owner's Manual concerning electrical safety. For more reading, there is Boat Owner's Mechanical and Electrical Manual by Nigel Calder and Boat Owner's Illustrated Electrical Handbook by Charlie Wing.

5.2 ELECTRICAL POWER

The MJM 43z includes both 12-volt direct current (DC) and 120-volt alternating current (AC).

12-Volt DC Most of the boat's electrical devices use 12V DC. It's stored in up to 1002 amp-hours of capacity in AGM absorbed-glass mat no-maintenance batteries as follows:

- Two Group 8D, 245 amp-hour HOUSE BATTERIES
- Three Group 31, 105 amp-hour PORT and STBD ENGINE BATTERIES
- One Group 27, 92 amp-hour GENERATOR BATTERY (if optional generator is present)
- One Group 31 105 amp-hour BOW THRUSTER BATTERY (Optional)

The Victron INVERTER/CHARGER is factory set for AGM batteries.

CAUTION Don't try to open the batteries. Other than keeping them charged, stored and clean (especially between the terminals), there's no maintenance required.

CAUTION Don't let the voltage fall below 12 volts. Sensitive electronics may fail to function.

120-Volt AC Two different sources can provide 120V AC to the INVERTER/CHARGER to charge the batteries and provide power to the 120V AC circuits.

1. SHORE POWER
2. WESTERBEKE GENERATOR (option)

120-volt AC power provides power for the SEAKEEPER GYRO, COOKTOP, MICROWAVE, TV, AIR CONDITIONING, WATER HEATER and OUTLET/RECEPTACLES. There are SPARE BREAKERS that may be added for other devices. A 20-amp circuit with a ground fault circuit interrupter (GFCI) outlet/receptacle serves the AC OUTLET/RECEPTACALS.

The GENERATOR and SHORE POWER provide power to the INVERTER/CHARGER that charges the batteries and provides power to the 120V AC circuits at the left side of the 120V breaker panel.

Only one GFCI OUTLET/RECEPTACLE *is in the circuit with other non-GFCI outlet/receptacles. If the* 120-VOLT BREAKER *on the electrical panel is on and there is no power at the AC OUTLET/* RECEPTACLES, the circuit interrupter may have tripped. Press the reset button *on the* GFCI *OUTLET/* RECEPTACLE.

…R.I.J.

5.3 SHORE POWER

SHORE POWER & TV INLETS

Unless your boat has installed the optional Glendinning reel with single 50A 240V AC, which is then split into two 30Z 125V AC circuits inside the boat to feed the two AC Panels, there are two ways to provide shore power.

A single 30A 125V shore power cable plugged in to SHORE POWER INLET 1 in the transom (shown in the adjacent photograph) will provide power to breakers at the left side of the 120V AC panel.

Two 30A 125V shore power cables connected to 30A 125V volt sockets at the dock and plugged into SHORE POWER INLET 1 AND SHORE POWER INLET 2 will provide power to breakers on both sides of the 120V AC panel. The transfer switch should be off. Even if it is on, 120V AC won't be transferred to the left panel from the right panel.

Instead of two 30A 125V volt sockets at the dock, there may be a single 50A 225V socket. In that case, use a Y adapter that splits the power for two 30A 125V shore power cables. (See adjacent image.)

SHORE POWER BREAKER BOX *located on starboard hull over the GENERATOR. If no AC power showing on Panel, check to be sure the BREAKERS aren't tripped.*

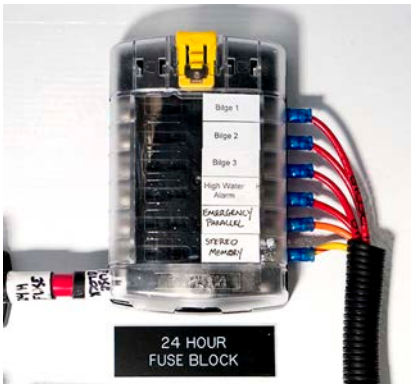
Charging The batteries will accept a charge from 120V shore power through the INVERTER/CHARGER if SHORE POWER 1 is on even if the HOUSE BATTERY switch is off.

Transfer Switch If SHORE POWER 2 isn't connected, the TRANSFER SWITCH transfers power from the left side of the 120V AC BREAKER panel to the right side. However, the circuits on the right side are for high amp loads. If you use the TRANSFER SWITCH with SHORE POWER 1 alone, the circuits that can be successfully powered are limited.

Circuits on the left side of the 120V AC panel can be also be supplied from the HOUSE BATTERIES with the INVERTER.

5.4 FUSE LOCATIONS

24-Hour (See the Appendix, Page 43.)



5.5 24-HOUR CIRCUITS

The connection block for the 24-hour circuits is forward in the starboard pilothouse settee locker. The 24-hour circuits (shown in the sidebar) bypass the breaker panel, HOUSE, ENGINE and GENERATOR switches and are connected directly to the HOUSE BATTERY. They are:

- BILGE PUMPS (3 connections)
- HIGH WATER ALARM
- EMERGENCY PARALLEL
- STEREO MEMORY

The EMERGENCY PARALLEL connection enables the EMERGENCY PARALLEL switch on the 12V DC panel. The STEREO MEMORY connection provides a trickle charge to maintain the clocks and user settings.

CAUTION Disconnecting shore power with INVERTER left on will discharge the HOUSE BATTERIES over time. When leaving the boat for more than a few days without shorepower connected, be sure to turn off the Inverter on the unit itself under the starboard settee

5.6 THE 12V DC PANEL

The 12V DC panel includes circuit breakers for all 12V DC equipment except the 24-hour circuits that are permanently connected to the HOUSE BATTERY. The breakers are lighted and labeled. Spares are available for future installations.

The TOGGLE switch below the digital display on the 12V DC panel shows volts or amps for the HOUSE BATTERIES in position 1 and the GENERATOR BATTERY in position 2. Position 3 is not connected.

ENGINE BATTERY volts and amps are displayed on the Mercury VesselView.

Press the > and < buttons under the display to show volts or amps.
The center button dims the display

The switch between the HOUSE BATTERY and the GEN BATTERY raises and lowers the dining table.

The HOUSE BATTERY switch and the GENERATOR BATTERY switch are at the upper right of the 12V DC panel. Turning on the HOUSE BATTERY switch provides power to the individual breakers at the panel. Turning on the GENERATOR BATTERY switch provides power to start the optional GENERATOR. The GEN. EMERG. PARALLEL switch combines the GENERATOR BATTERY with the HOUSE BATTERY BANK.

Turn on the FRESH WATER PUMP breaker to activate the gauge that indicates the fresh water level on the lower right of the 120V AC panel that is displayed on the next page.

5.7 THE 120V AC PANEL

The 120V AC panel receives power from the INVERTER/CHARGER or from SHORE 1 or from the Westerbeke GENERATOR. It also includes breakers for loads that can be handled by the HOUSE BATTERIES inverted to 120V AC by the Vitctron INVERTER/CHARGER.

When the SHORE POWER CABLE is connected:

1. Turn on the charger function on the PHOENIX CONTROL
2. Push the slider down and turn on the SHORE POWER breaker to supply 120V AC power to the circuit breakers of the AC panel.

WARNING Heavier Water Heater and Air Conditioning loads should only be turned on when Shore Power or Generator are used to source. 120v AC.

WARNING The 120V AC panel has reverse polarity indicators. If an AC supply is wired incorrectly, either aboard the boat or shore side, a dangerous shock situation could exist. If the reverse polarity lights are illuminated, disconnect that source of power and engage a qualified marine electrician and notify the marina dock master if in a slip.

The three buttons below the digital readout select volts, amps or watts for presentation on the digital display. The TOGGLE switch selects which side of the panel is reported in the digital display. Information from the left side of the panel is displayed in the up position, and information from the right side of the panel is displayed in the down position.

The PORT and STBD ENGINE BATTERY switches are at the upper right of the AC panel. Turning them on connects the battery to engine starter motors. The ENGINE EMERGENCY PARALLEL switch combines the PORT and STBD ENGINE BATTERIES. If the ACR switches are closed , the ENGINE BATTERIES are also combined with HOUSE BATTERIES.

The AUTO position is the same as off.

Notice the hinge at the bottom of each panel. The marquee at the top of each panel will pop off. There are screws that may be removed so a qualified electrician may hinge the panel down to add a new circuit for a new device or appliance at one of the SPARE positions.

Custom labels are available from customer service at Boston Boat Works.

5.8 WESTERBEKE 6.5 MCG GENERATOR (OPTION)

The *Westerbeke Operator's Manual is* included in the binders.

Pre-Start Check List The daily pre-start checklist :

1. Close seacock, clean the sea strainer (the cap should be hand tightened) and reopen the seacock.
2. Check the coolant. See diagram attached.
3. Check that the oil level is at the "FULL mark on the dipstick .
4. Look to see that there are no loose belts or wires and that there is no oil or fuel in the pan under the GENERATOR.

CAUTION Don't remove the coolant cap from a hot engine.

To Start Turn on the GENERATOR BATTERY switch at the upper right of the 12V DC panel. Push both SLIDING INTERLOCKS up on the 120V AC panel and turn on the GENERATOR breaker at the left side of the 120V AC panel to connect the left side of the panel to generator power.

The green LED run indicator light on the rocker switch will illuminate when the start circuit is energized. It will go dim as the engine cranks and will brighten as the engine starts, indicating the generator is running.

The LED fault shutdown display has six separate LED combinations that indicate to the operator the cause of the engine's automatic shutdown. The LED displays are: Check Engine, Oil Pressure, Engine Temperature, External Alarm, Exhaust Temperature, and Speed (Overspeed -LEDs and Underspeed-LEDs) flashing. ***Should the generator shutdown from one of these faults, the fault LED will remain illuminated. To reset the LED, the panel DC breaker must be cycled OFF then ON***

GENERATOR FUEL PRE-FILTER is behind the generator against the bulkhead

Press the Rocker switch to the start position and release. The engine will crank and start electronically after a brief delay. A GREEN LED on the switch will indicate that the engine is running. Approximately 120V should show on the digital display at the top left of the 120V AC panel. If the TRANSFER switch is pressed, there is a 2-minute delay before power is available on the right side of the panel.

Apply a light load until the generator warms up.

Keep the GENERATOR BATTERY switch on while the generator is running so its alternator will charge its battery. (Without a load on the alternator, the battery-charging regulator could be damaged.) Also, keep the GENERATOR breaker on while the generator is running. (It is not good for a diesel engine to run for an extended period with no load.)

If the generator starts but no AC voltage is seen at the panel, ensure that the SLIDING INTERLOCKS at the top of the 120V AC panel are up and that the GENERATOR breaker is on. If so, there is a possibility the generator was overloaded. See Westerbeke Manual.

To Stop Turn off breakers for 120V loads and run the generator for 2 or 3 minutes without a load to allow it to cool. Press the rocker switch and release. The Green light will go off.

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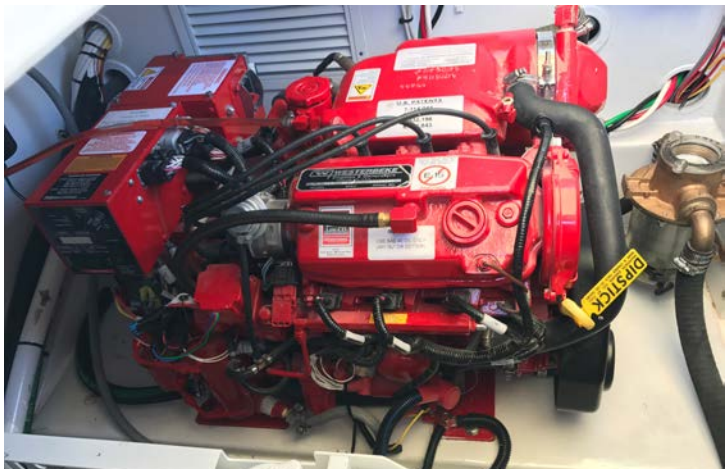
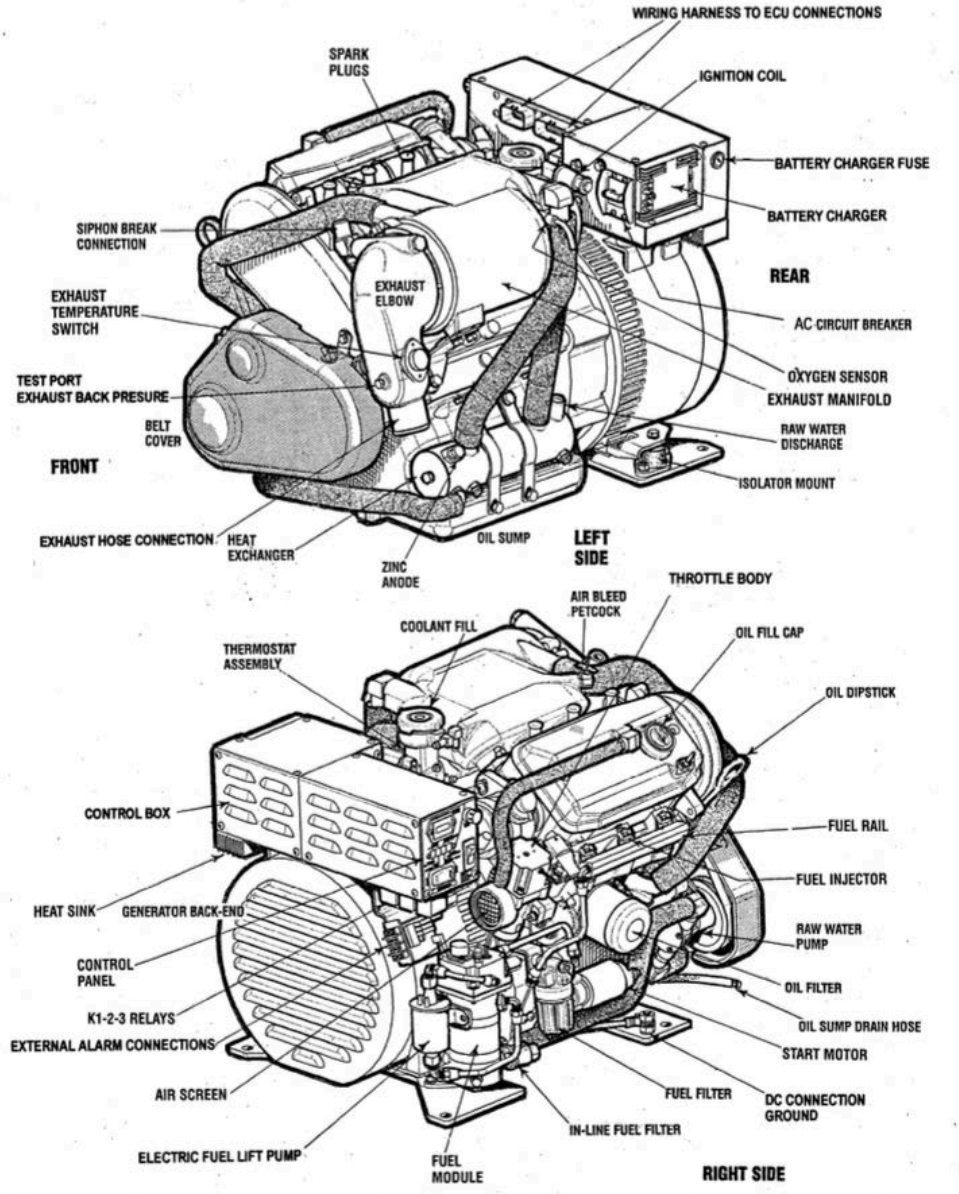
5.9 GENERATOR COMPONENT LOCATIONS





5.10 VICTRON INVERTER/CHARGER

Under normal circumstances there is no need for adjustment other than switching the INVERTER on at the AC Panel and the toggle at the PHOENIX CONTROL to on to invert 12v DC Battery power to 120V AC power…or to off when 120V is sourced from SHORE POWER or GENERATOR.

When off, it works in reverse when charging from a 120v source.

Charging When SHORE POWER is connectedor when the GENERATOR is on, the INVERTER charges the HOUSE BATTERIES, the ENGINE START BATTERIES, the THRUSTER (Option) BATTERY and the GENERATOR START BATTERY. Push the toggle switch to "charge only" to activate the charger.

Inverting The 120V AC panel operates accessories that require 120V AC, such as the COOKTOP, MICROWAVE, TV, and OUTLET/RECEPTACLES. To activate the inverter function: DO NOT activate the WATER HEATER and AIR CONDITIONING when investing. The loads are too great.

1. Turn on the switch at the INVERTER/CHARGER located over the STARBOARD FUEL TANK under the pilothouse settee.

2. Push the toggle switch at the DIGITAL MULTI CONTROL to on. 120V AC power will be supplied to the left side of the AC 120V panel.

CAUTION Although INVERTER/CHARGER specifications claim it will automatically shut off the inverting process if the battery voltage drops, it's unwise to count on it. If you leave the boat with the DIGITAL MULTI CONTROL switched to INVERTER on, it may draw amperage even if no AC device is turned on and discharge your batteries. When you leave the boat, keep the PHOENIX CONTROL units switched to "charge only".

LEFT SIDE,INVERTING STATUS

inverter on: *INVERTER is converting 12V DC to 120V AC for 120V loads on the left side of the 120V breaker panel and is draining the HOUSE BATTERIES.*

overload: *Load on the INVERTER is over 4000 amps.*

low battery: *The HOUSE BATTERY is low. INVERTER won't work.*

temperature *HOUSE BATTERY temperature is high.*

RIGHT SIDE, CHARGING STATUS

mains on: *SHORE POWER is connected.*

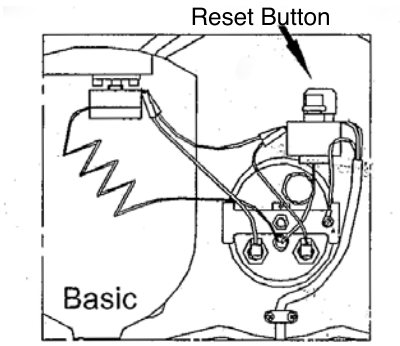
bulk: *Charging at maximum rate.*

5.11 BONDING

The boat's bonding system connects underwater metal fittings to the sacrificial anode and the boat's negative bus bar. For the anode to protect an underwater part, the connection must be clean and secure. The green wires that make up this system don't normally carry current.

DOCKSIDE HOSE INET with hose connected.

Johnson Aqua Jet WPS 10.4 Duo 12V FRESH WATER PUMP



6 WATER SYSTEMS

6.1 FRESH WATER

BREAKER PANEL settings: FRESH WATER PUMP breaker on.

Fresh water may be supplied from two sources:

1. A 100-gallon FRESH WATER TANK under the pilothouse sole is filled through a deck fill fitting on the starboard side near the helm labeled LWATER. Air is vented as the tank fills. The FRESH WATER GAUGE is located at the right bottom corner of the 120 V AC breaker panel.

2. A DOCKSIDE HOSE INLET at port in the cockpit (see sidebar) bypasses the FRESH WATER TANK and the FRESH WATER PUMP to provide dockside water and dockside pressure. Don't try to fill the tank with it; a check valve keeps the dock water supply from backing up into the FRESH WATER TANK.

CAUTION Don't leave the boat for any length of time with the DOCKSIDE HOSE INLET connected. If it were left on and a fitting failed, the boat's bilge pumps would work continuously to pump it out.

Fresh Water Pump

A JABSCO 42755-0092 12V FRESH WATER PUMP provides fresh water pressure. The pump is in the pilothouse port settee locker. It runs when a faucet, the head, anchor chain wash, wiper wash, showers, etc., are used. It has two switches to maintain pressure in a useable range so the pump doesn't switch on every time fresh water is used. When pressure drops below the minimum, the pressure switches turn the pumps on and build pressure to the maximum. The pumps have outlet check valves that maintain pressure when pumps are off. The pump is protected from sediment by an in-line strainer mounted adjacent to the pump. Check and clean the strainer periodically.

If the pump runs continuously, a faucet might be open. The transom shower valve is a frequent culprit. If nothing is on, check that the FRESH WATER TANK has water. Then look for leaks in the lines. An air bubble in the line may defeat a pressure switch and cause the pump to fail to operate. Opening a faucet and turning the FRESH WATER breaker off for a moment and on may fix it. If that doesn't work, attach a hose to the DOCKSIDE HOSE INLET and run water through various fresh water outlets.

6.2 HOT WATER

Water is heated in the 13-gallon INDEL ISOTEMPT HOT WATER TANK only via the 120V circuit powered by Shorepower or the GENERATOR.

The 13-gallon HOT WATER TANK is under the port pilothouse settee. It's part of the freshwater system and doesn't need separate filling.

There is no specified periodic maintenance, but it's wise to Inspect connections and clamps periodically.

If you don't get hot water from the immersion heater, press the reset button under the white cover at the right side of tank. See sidebar and the *Indel Isotemp Owner's Manual* in the binders.

Water Purifier
The General Ecology Seagull WATER PURIFIER in the galley is an excellent water purifier. It's used on many airlines and by the military.

General Ecology, Inc., states that Seagull IV purification systems meet the EPA guide standard protocol for microbiological purifiers for bacteria, cysts and viruses and excels at removing chemical and aesthetic contaminants, including herbicides, pesticides, chlorine and foul tastes, odors and colors.

The purifier has a cartridge in a stainless pressure vessel under the sink. Replace it if reduced water flow indicates that it's clogged, if any particulates are seen in the water, if there is any taste in the water or at least annually. The replacement cartridge is Seagull IV X-1 Residential Replacement Cartridge RS-1SG and can be bought online.

https://generalecology.com/category_products.php?category_name_url=in-home

CAUTION Clear the fresh water system of antifreeze before running water through the cartridge.

GENERAL ECOLOGY SEAGULL WATER PURIFIER

Mary and I credit our good health to using this system in all our boats and homes for the past 37 years.
…R.I.J

6.3 GRAY WATER

Sumps A GRAY WATER SUMP BOX collects water from the shower drain, sinks, the dish locker drain, and AIR CONDITIONER condensate. Gray water can be legally discharged overboard. The sump pump switch on the 12V DC panel provides power to a pump with a float switch to empty the tank. Remove the tank cover and clean tank and strainers periodically. It is located below the bottom companionway step.

GRAY WATER SUMP

Common Gray Water Drains To minimize through-hull penetrations, a common drain pipeline is used on port and starboard sides to drain SIDE DECK DRAINS and HATCH GUTTERS
at should be checked regularly.

Bilge Pumps There are two automatic ELECTRIC BILGE PUMPS

Located under the companionway steps and aft at the transom.
They are wired directly to the HOUSE BATTERY so they function even if all battery switches are off. (See *24-Hour Circuits*, page 17.) 3-way switches at the helm control the pumps. The pump will run in the AUTO position if water is present. The pump will run in the MANUAL position whether there is water in the bilge or not. The switches are wired so that the off position functions the same as the AUTO position.


Aft BILGE PUMP

The emergency MANUAL BILGE PUMP (delivered under the port pilot seat) Is a backup to the two automatic bilge pumps. You may operate it by opening the plastic cover, inserting the handle (supplied loose) and pumping up and down. There's a noticeable difference when the bilge runs dry. Its capacity is 15 gal/min.

BILGE PUMP SWITCH

6.4 RAW WATER

Raw Water (seawater) is used for heat exchange for the GENERATOR, optional SEAKEEPER and the AIR CONDITIONER

7 SEAKEEPER GYROSTABILIZER (Option)

The SEAKEEPER is a 790 lb. sphere that spins up to 10,700 RPM. It's anchored to a reinforced structure low in the boat to resist roll.

Following is a summary of the Seakeeper 5 Gyrostabilizer (GYRO) operation. Please review the details of operation and the safety notices in the Seakeeper Operation Manual in the binders. You can download a copy at:

http://www.seakeeper.com/technical-library.

Before you start the GYRO, Check its raw water strainer to ensure that the cooling water intake to the GYRO is clear.

The buttons left to right are POWER ON/OFF; GYRO ON/OFF; DISPLAY DAY/NIGHT; HOME SCREEN; SETTINGS.

7.1 To Start the Gyro

The GYRO requires 120V AC. The display requires 12V DC. (See the adjacent images.)

With SHORE POWER or the GENERATOR on (see page 22) turn on HOUSE BATTERY switch and the GYRO breaker at the 12V DC panel and the GYRO breaker on the left side of the 120V AC panel.

When the 12V DC GYRO breaker is turned on the display will initialize and the HOME screen will appear. (See adjacent image at top.) If a FAULT is present an ALARM screen will appear.

Press the POWER ON/OFF button once. The RED PROGRESS BAR turns green and the GYRO begins spinning. It takes about 40 minutes before the GYRO is ready for stabilizing.

To start, press the POWER ON/OFF. A RED PROGRESS BAR will appear. When the GYRO reaches operating speed the PROGRESS BAR will turn GREEN. The GYRO is available for stabilization.

7.2 Activate/De-activate

Press GYRO ON/OFF (the lock turns green). It takes 5-10 seconds to activate. The GREEN PROGRESS BAR disappears and the GYRO Graphic starts rolling when MAX stabilizing is in effect.

Press GYRO ON/OFF button (the lock turns red) to deactivate the GYRO.

Press GYRO ON/OFF. Stabilization takes 5-10 seconds to reach full effectiveness.

CAUTION There is a large amount of torque about the gimbal axis when the GYRO is processing. Cover panels protect the GYRO while it's in operation. Don't stand on them or put anything on top. The covers should always be in place during operation. No maintenance should be attempted unless the gyro is locked and the flywheel has stopped spinning.

8 EQUIPMENT, APPLIANCES and FINISHES

8.1 ANCHOR WINDLASS

BREAKER PANEL settings: HOUSE BATTERY switch, FRESH WATER PUMP and WINDLASS breaker on.

It's prudent to have the engine or GENERATOR running when using the windlass; it draws considerable battery power from the HOUSE BATTERIES.

To retrieve the anchor, use the engine to move the boat over the anchor, not the windlass; it's sized to retrieve the anchor and rode, not pull the boat. If the anchor is lodged, motor over the anchor to break it loose, then retrieve it with the windlass.

Stop the windlass before reversing its rotation, otherwise the windlass fuse may blow or the breaker may trip. Refer to the windlass manual in your binders for specific operating instructions.

The WINDLASS can be operated from the WINDLASS CONTROL panel at the helm.

http://www.muir.com.au/product-page/6145c752-d6cb-2bea-5d0e-6d4ab1547832

CAUTION When anchoring, don't rely on the windlass to hold the anchor rode. Remove the rode from the anchor chute and feed it through a bow chock to a bow mooring cleat to avoid chafe on the anchor rode and to avoid damaging the windlass gears.

CAUTION When underway or when leaving the boat, secure the anchor and chain with the retainer clamp. This prevents the anchor and rode from running free and fouling the props. If the anchor chain slips, use the winch handle in the top of the windlass to tighten.

MUIR Anchor Windlass

WINDLASS control panel at helm

8.2 ANCHOR WASHDOWN

BREAKER PANEL settings: ENGINE START BATTERY switches on, HOUSE BATTERY switch, WINDLASS breaker and FRESH WATER PUMP breaker on.

A spray nozzle under the anchor roller washes salt water and mud from the anchor rode and chain as the anchor is raised when the rocker switch at the CONSOLE SWITCH PANEL is pressed. (See page 14.)

There is good advice on anchoring and retrieving lodged anchors at http://fortressanchors.com/resources/safe-anchoring-guide

…R.I.J.

8.3 FUSION MULTI-MEDIA PLAYER

BREAKER PANEL settings: STERO breaker on.

The Fusion multi-media player has a single slot to play audio CDs and video DVDs on the TV. It has a SiriusXM receiver. You may install a Pandora app, tune in DAB stations and pair up to eight Bluetooth media devices.

See the instruction manual in the binders for operating instructions and for connecting to Internet media services.

https://www.fusionentertainment.com

FUSION MULTI-MEDIA PLAYER

8.4 PRIVACY/SUNSCREEN CURTAINS (OPTION)

PRIVACY/SUNSCREEN CURTAINS

The optional PRIVACY/SUNSCREEN CURTAINS provide privacy so the pilothouse can serve as an additional stateroom.

The two large side curtains roll up in place. The other curtains roll up in a carry bag. The aft and windshield curtains hook up inside. An advantage of inside curtains is that they don't get dirty or need storage when wet from dew when departing in the morning.

One good way to roll up the curtains is to lay them over the top of the pilothouse table. Roll all sections up together and put them in the storage tube. Don't fold them.

8.5 VACUUM CLEANER

BREAKER PANEL settings: VACUUM breaker on,

Dirt Devil states that the HEPA filter bags capture particles that cover common allergens, from mold and animal dander to dust mites and pollen, along with some small particles from smoke and pollution.

The vacuum hose is stored in a companionway step.

Change the filter bag frequently in the beginning to determine the proper interval. The filter bag canister is located forward under the starboard pilothouse seat locker. Lift the lid and pull bag collar off connector. Open new bag and expand pleats and slide collar onto the inlet connector. To reorder bags, check bag for instructions or go to www.rvbags.com.

The VACUUM CLEANER has a thermal protector to prevent overheating. If it doesn't operate, turn the VACUUM breaker off, let it cool and turn it back on.

If the motor brushes or bearings are worn, the thermal protector will trip after a short period. An authorized representative should perform service.

See the Dirt Devil Owner's Manual in the binders for safety notices and detailed operating instructions.

8.6 COOKTOP

BREAKER PANEL settings: COOKTOP breaker on. The COOKTOP in the galley requires 120V AC from SHORE POWER 1, the GENERATOR or the INVERTER. The COOKTOP has flush-mount, pop-up, heat-resistant rubber potholders. You must push on them for several seconds for them to respond. Refer to the *Installation Guide & Operation Manual* included in the binders. **CAUTION** Don't leave an unattended cooktop on.

COOKTOP

8.7 MICROWAVE

BREAKER PANEL settings: MICROWAVE breaker on. The MICROWAVE in the galley requires 120V AC from shore power connected to SHORE POWER 1, the GENERATOR or the INVERTER.

MICROWAVE

8.8 REFRIGERATOR

12v DC BREAKER PANEL settings: REFRIGERATOR breaker on..

The thermostat has an on/off button and a temperature adjustment button. Each time the temperature adjustment button is pressed, the LED indicator advances from left to right indicating a cooler setting.

It can take a while for temperature to stabilize, particularly after initial stocking with food and beverages.

REFRIGERATOR

8.9 FREEZER

12v DC BREAKER PANEL settings: REFRIGERATOR breaker on.

The FREEZER in the galley requires 12V DC stainless steel inner lining, plastic bottom section, wire basket and interior light. It has a range of 0 °C to -20 °C. https://www.indelwebastomarine.com:

FREEZER

8.10 TVS (OPTIONAL)

BREAKER PANEL settings: GENERATOR on, or SHORE POWER 1 on, or INVERTER on and TV breaker on.

See the manual in the binders. The picture in the upper sidebar is of an optional TV installation in the forward cabin. The cabinet behind the TV holds the "entertainment center" with a CD changer, DVD player or satellite TV receiver. The second picture is of a TV in the pilothouse that hinges up against the overhead.

Video signals may be acquired from the Fusion DVD player, from a dockside cable TV outlet, from the optional Glomax TV antenna that will receive local HD stations, from the optional KVH satellite dish system or from other devices you choose. Antenna breakers need to be activated for reception.

Depending on options you select, Surround-Sound may be achieved using the AUX function at the FUSION MULTI-MEDIA RECEIVER to integrate both TV Audio and the six-speaker stereo audio. Or kids can watch TV with dedicated audio below decks while parents are listening to jazz, with the "Fade" function directing sound to the two cockpit speakers.

DROP DOWN 32" TV

.

VACUUM FLUSH HEAD AND WASTE DISCHARGE control panels

8.11 VACUUM FLUSH HEAD SYSTEM

BREAKER PANEL settings: FRESH WATER PMP and HEAD beakers on.

Press the ADD WATER switch until desired water level is achieved. (It will shut off automatically to avoid overflow.)

Press the FLUSH switch down for a moment, then release it. It activates a macerator pump that siphons water and waste from the bowl, macerates, and propels the effluent to a 20-gallon waste tank. The capacity is generous since, unlike conventional marine heads that use several quarts of seawater, each flush uses about a cup of fresh water.

Toilet can flush when the green "OK TO FLUSH" light is on. If the red "DO NOT FLUSH" light is on, the system is either recharging the vacuum, or the holding tank is full.

See the Sealand Vacuum toilet system Instruction manual for instructions on safety, changing flush modes, service mode, cleaning, maintenance, spare parts, clearing hoses during extended periods of non-use, clearing blockage, locating leaks, winterizing and more.

The lights on the DISCHARGE PUMP control panel (see adjacent image) indicate the level of waste in the holding tank. The level can be double-checked by looking at the semi-transparent holding tank. Waste is discharged in one of two ways:

1. Pumped out at an authorized pumping facility from the WASTE deck fitting. To remove all the waste, turn off the vacuum pump system and press the SERVICE BUTTON to remove the vacuum.
2. Discharged overboard with the DISCHARGE PUMP. Open the large through-hull discharge waste valve, accessible under the cockpit hatch, aft and starboard. Then insert the key in the WASTE DISCHARGE control panel (see sidebar). Turn and hold the switch clockwise to activate overboard pumping using the macerator pump.

Don't leave the key in the switch. Waste discharge regulations vary by location. And, don't lose it either. May be worth making a duplicate.

CAUTION Ensure compliance with federal, state and local regulations before discharging.

WARNING Normal household toilet tissues don't dissolve or flow well in low water consumption toilets. These tissues build up in a tank and eventually the toilet system fails. Use rapidly dissolving single ply Scott tissue. To determine that a tissue will dissolve, immerse a square of tissue in a jar of water and shake five times. It should disintegrate.

8.12 AIR CONDITIONING (OPTIONAL)

BREAKER PANEL settings: AIR CONDITIONER breakers on, and 12V SUMP PUMP breaker on. You must have the GENERATOR on, SHORE POWER on

There is a 16,000 BTU heat pump that heats or cools the interior and pilothouse as all one or separate zones, if AC grates are closed off ito direct air flow into one zone or the other. They use raw water (seawater) much like the engines, for heat exchange. The heat exchangers extract heat from the refrigerant for the cooling cycle, and by reversing the flow of refrigerant they extract heat from seawater for heating. The heating cycle is effective if the sea temperature is above 35 degrees.

There's an intake seacock, RAW WATER strainer and pump located in the cockpit seat locker and port cockpit sole locker aft. They should be checked frequently and are the first things to check if the unit fails to deliver heat or cooling.

Programming Procedure There's a wide range of options for controlling the AC system. You can set it to heat mode, cool mode or automatic mode; set it to cycle on and off for humidity control when the boat is unused; control fan speeds, view service history and hour meter and set many more options. For a full explanation of the options, controls and the programing procedure, see the users manual.

Programmable Parameters The default parameters may be changed. Once new values are entered and memorized, the factory defaults are overwritten and the new parameters become the default values. You can restore the original factory default parameters manually. A summary of the parameters, the permitted values and original factory default settings are listed in Table 2, page 12 of the manual in the binders. When used with optional electric heat, the fan remains on for four minutes after the heater cycles off even if fan is set to cycled operation.

8.13 FINISHES

Hull paint The 43z hull is painted with Awlcraft 2000 color and three coats of clear Awlcraft. Awlgrip states that while it doesn't hurt to wax it, it doesn't help and can create a maintenance problem.

The interior cabin sole and cabinetwork are finished in clear Awlgrip. See the Awlgrip website for care and maintenance advice.

http://www.awlgrip.com

Corian Instructions for maintaining Corian counter tops are in the binders.

Strataglass Don't use chemicals or brushes to clean; use only mild soap and a sponge or a soft rag. If the curtains are scratched a mild polishing compound (a white cream similar to what is used on Awlgrip) can be hand applied to remove them. Test a small, unobtrusive area first. (See the Strataglass Care and Maintenance website.)

http://www.strataglass.com/strataglass-care-and-maintenance

It's best to leave the curtains in place, even when trucking. If they're removed, store them flat or rolled together with towels or paper between layers. To avoid creases, don't fold.

Gull droppings on the hardtop that drizzle down the side curtains after a rain or heavy dew have an acid that can, over time, etch the Strataglass curtains. Be sure to clean frequently. There is one known instance with a 36z that was moored in Chilmark on Martha's Vineyard.

…R.I.J.

UltraLeather Upholstery The standard UltraLeather upholstery is water resistant, but don't use chemicals or brushes to clean, only mild soap and a sponge or a soft rag.

Stidd Seats See http://stidd.com/support/ for maintenance recommendations. The Stidd seats swivel and lower for a sociable setting. Slide the seats forward before swiveling so the seat doesn't jam into the pilothouse walls.

9 APPENDIX

9.1 THE TOP 10 CAUSES OF ENGINE FAILURE

It doesn't happen often and if you're familiar with the common causes of engine failure you can cut down on the chances of a breakdown. We want to familiarize you with this list, compiled by *Motorboating Magazine* (February 2006) and embellished with a few MJM incidents. Here are the Top Ten.

…R.I.J.

No Fuel This is probably less of a problem on a fuel-efficient MJM than on other boats, but lack of owner attention to fuel consumption is the primary culprit for engine failure. A boat's fuel tank can be nearly dry – even when the gauge claims there's 1/4 of a tank left. This makes sense when you realize that at cruising speed, the gauge shows the tanks reading higher than when the boat is at rest. A good rule is to not pass a fuel dock (no matter the price) if your gauge shows less than 1/3 full.

Air in Fuel Line If air gets drawn into the fuel lines because of either a small leak in a fuel line connection or the Racor Filter lid gasket/filter basket tabs have interfered with the lid being secured fully, you may find the engine will turn over, but won't start. Check the Racor to ensure the fuel level is within an inch of the top. Check the engine owner manual for the location of a manual primer pump.

Dirty Fuel Engine problems are caused by dirt and water in the fuel. Debris, stirred up from the bottom of the tank by wave action, is drawn into the fuel line and clogs the fuel filter element. Starved for fuel, the engine begins to run poorly, or won't reach proper RPMs. Water in the fuel can drive you mad. Moisture condenses out of the highly humid air on the inside walls of a fuel tank, then runs down into the fuel. Water can also be introduced at the fuel dock from a contaminated fuel supply. Fuel floats on top of water and the fuel pick ups are near the bottom of the tank. A Racor fuel/water separator protects against this by handily extracting the water. Check the bowl daily and drain off the accumulated water. For severe contamination, use a fuel-drying additive or have a diesel service "polish" the fuel.

Fuel Bugs Diesel engines suffer from microbial bugs growing in the fuel. If left unchecked, these critters clog filters. If you leave the same diesel fuel in the tank for any length of time, a fuel conditioner similar to that supplied with your boat by the builder will kill the bugs and break up any hydrocarbon residue into particles that will burn completely in the combustion process.

Tired or Damaged Water Pump Impeller As boats age or if an engine isn't operated for a long period of time, a worn-out circulating water pump is another engine killer. Impeller blades are commonly made of a rubberized material that stiffens or distorts over time and can break off entirely, reducing coolant flow and clogging the heat exchanger. Periodic engine maintenance procedures can prevent this problem. A spare is provided in the engine spares kit. Shown below is an MJM 29z impeller that would have soon failed. It was replaced during the 50-hour inspection on a boat that had not been run for 11 months.

Another cause for impeller disintegration is running the engine with the raw water intake shut off. By the time that the overheating is discovered and you shut down the engine, the impeller may already have been destroyed or damaged. This happened on a 34z when the operator forgot to be sure that the raw water intake valve was in the proper position.

Hard Hose Another issue to be concerned about with older boats. As water intake hoses age, they lose their resiliency and collapse under suction, causing a restriction in the flow of engine coolant. This results in over-heating. Prevention is easy: Visually inspect cooling hoses and squeeze them to be sure they retain shape and set.

Clogged Raw Water Intake The first clue may be high or erratic Coolant Temperature readings on one engine. This happened on a 50z when it picked up a crab pot in Florida and the warp and trap wrapped around the drive. Amazingly the

RPMs weren't affected nor the IPS function (a wonderfully resilient system!). Subsequently all new MJMs are being equipped with warp cutters.

Things like discarded plastic Baggies, weeds, etc., can also plug up the raw-water intake on the drives. You can avoid this problem by visually inspecting the strainer basket. Good water flow should exist without evidence of lots of air. When removing debris, be sure to properly replace the seal, otherwise the pump will lose suction. Smearing the seal with Vaseline or another marine-grade grease helps.

No Water Circulation If upon starting the engine at idle you don't see water circulating in the strainer: (1) Stop the engine, (2) Check to see that both intake and raw water outgo valves are open at the drives, (3) Fill the strainer basket container with water, re-seal the strainer and turn on the engine again to deal with a possible air lock, (4) race the engine in neutral momentarily, (5) dive over the side to see if a plastic bag or other debris is covering the intake, (6) Inspect the impeller which pumps water through the engine.

Hard Knocks Collision with an underwater obstacle that damages the propulsion system. Often you can still operate the boat at low RPM to return to port, being careful to avoid excessive vibration that might otherwise compound the damage by damaging the drives. The problem may be corrected in a day or so without hauling by an experienced diver who has access to a prop shop where the blades can be repaired and the prop re-balanced and recoated with PropSpeed, then re-installed.

Bad Battery Marine starting batteries die from old age and neglect. Keep the terminals and posts clean from that green corrosion that builds up, restricting the flow of current – preventing them from fully charging. Periodically have your batteries tested to determine their condition and expected longevity. The 40z is equipped with a "parallel" switch, which can be turned on to employ the 400 ampere-hour house banks in starting the engine.

Stale Gasoline Not applicable

Sagging Belt As V-belts wear, they stretch and begin to slip. Consequently, alternators and water pumps don't spin to their full speed. Batteries may not fully charge and coolant circulates sluggishly. The solution is to check belt tension regularly and tighten belts when necessary. Drive belts can also snap. The only way to avoid this malady is to replace them once they begin to show wear. Some spare belts are provided in the engine spares kit.

9.2 DIESEL OPERATION

What Diesel Mechanics Wish Every Boat Owner Knew

The following is edited from an article by Captain Bernie Weiss at www.AtlanticYachtDelivery.com.

To run well, a diesel engine requires only clean fuel, clean lubricating oil, coolant, and lots of air. Below are ten important maintenance issues that diesel mechanics wish their customers knew:

Don't baby the engine Diesels don't like to idle in neutral, or even in gear at low speeds; they do like to work hard under load. Generally, 10% less than the maximum RPM is the best cruising RPM. Excessive idling leads to gradual build-up of detrimental varnish on the cylinders, and deposits of soot and carbon on the engine's valves and in the exhaust system, particularly at the manifold injection elbow where raw cooling water exiting the engine mates with the exhaust gases. Run it hard. However, after running at cruising RPM for several hours, a brief cool-down at idle speed, with no load, is beneficial. A few minutes is enough.

Give your engine clean fuel Fuel is contaminated when it contains water, sediment, other solids, or biological organisms, some of which thrive in diesel fuel. To minimize contamination, don't store your boat for the winter or let it sit around for weeks at a time with fuel tanks only partly full. A full tank minimizes condensation of water vapor on the tank's interior and the growth of microorganisms. Fuel filters trap sediment, sludge, water and organic material and should be changed at periodic intervals.

Be conservative in your estimate of fuel consumption When underway, don't delay refueling to the point where you have expended nearly all the fuel in the tank. The last 20% should be held in reserve. To suck up the last few gallons is to chance sucking up water (tank condensate), sludge, and other contaminants - perhaps even air - into your fuel lines.

Know how to vent ("bleed") the air out of your fuel system Air locks in diesel fuel systems are a fact of life. The typical diesel fuel system operates with a lift pump (a vacuum pump) that lifts or sucks fuel out of the tank, draws it through the pump,

then sends it to the filters and injectors, where the injector pump sends fuel to the individual cylinders for combustion. Whenever you open the fuel line between the tank and the engine (for example, to change a filter element) air enters the line. Air may also be sucked into the fuel line through cracked seals and gaskets, poorly fitted connectors and clamps, via the pick-up tube in the fuel tank, etc. This air must be removed, because even a tiny air bubble in the fuel line will block the flow of fuel, and without fuel, the engine won't start; if running, air in the fuel line will cause it to stop. To clear your fuel line of air, you must vent or "bleed" it out. Consult your engine's manual to identify the bleeding nuts; paint them with white nail polish so you can easily find them again, in the dark, at sea. Given decent access to the engine, bleeding or venting air is a simple procedure that everyone should be able to perform. Using the engine manual, teach yourself how to do this.

Be diligent about checking your lube oil and oil filter Diesel engines are rough on oil and usually require more frequent oil and oil filter changes than comparable gasoline engines. Follow the engine manual's recommendation for service intervals. Carry spares on board. Between oil changes, use the dipstick to check the oil level. Top it off as necessary from your on-board lube oil inventory, but don't exceed the "full" mark on the dipstick; more isn't better. If you get erratic RPM readings or can't reach high RPMs, most likely you need to replace one or both Racor fuel filters.

Minimize risk of fire Diesel engines vibrate a lot, and the typical marine diesel has a lot of wiring and hoses attached to it, crossing it, behind it and near it. Over time, as the engine vibrates, the fasteners may loosen and fail, the wiring and hoses droop or fall. One hates to see a loose hose or wire (such as the primary wiring harness, or the power supply to your fuel pump, or a hose to the hydraulic pump) cross and contact a hot exhaust manifold, for example; this could be a prescription for fire due to abrasion of insulation around wire, or chafing through the wall of a hose. From time to time, inspect your engine compartment for these potential risks. Add chafing protection, replace worn insulation, and supplement the fasteners if necessary. Consider rerouting wires and hoses where appropriate

Know how to trouble-shoot the cooling system Since overheating is a common problem, familiarize yourself with engine's cooling systems: the raw water (sea-water) system, as well as the fresh water (internal circulating coolant) system. The most likely causes of overheating are:

- Raw-water valve closed.
- Raw-water through-hull blocked externally. Check for a plastic bag, or a clump of sea grass or other material, covering or plugging the inlet.
- Cover of Raw Water Strainer improperly secured allowing air in**.**
- Momentary air pocket preventing ingest of air under boat. Reverse engine or stop and restart.
- Raw-water filter / strainer clogged with sediment, sand, goo, grass, or living critters such as barnacles, jellyfish, and algae.
- Defective or destroyed impeller in raw water pump. The impeller should be replaced every year or two, as the rubber vanes become brittle with age and may snap off.
- Heat exchanger dirty or clogged up with sediment and other deposits. The entire raw water-cooling system should be flushed periodically to remove salt and sediment deposits.
- Exhaust elbow restricted by carbon deposits or other solids, reducing discharge of cooling water and exhaust gases. Routinely run the boat at high RPM for several minutes to clear.
- Thermostat stuck closed; likely will require removal or replacement. (Note: Some diesel engines operate OK - temporarily - without a thermostat.) Coolant temperature of 170-180° F is normal.
- Low level of coolant (50-50 mix of antifreeze-water). Coolant levels should be checked routinely at the expansion tank, adding more as needed. Don't overfill (coolant). Alarm usually sounds if coolant level is too low.
- Broken or slipping V-belt, which drives the water pumps and the alternator. Even a new belt deserves re-tensioning and inspection. Suspect slippage or wear if you see dark "belt dust" settling at the engine's base. Belt tension is OK if pressure deflects the belt by about 1/2 inch.
- Overloading of the engine: Rope wrapped around propeller shaft, dirty bottom, fouled propeller, or air leaks in the raw water-cooling

system. Cracked or collapsed hose? Hose clamps tight?

Know your fuel additives When crude oil is refined as diesel fuel, it acquires additives to reduce smoke, prevent pre-ignition ("knocking"), improve its cetane rating, etc. Few additives further enhance fuel. Some diesel mechanics actually recommend biocides, such as Killem and Biobor; lubricants, such as Lubricity and Stanadyne Performance Formula; and fuel stabilizers, such as Sta-Bil and Pri-D. But, 1) Follow the instructions on the container. 2) Routinely, a little bit is better than a lot and 3) Be guided by your mechanic's advice.

Monitor for exhaust leaks From time to time, when the engine is operating, inspect the complete exhaust system from the engine to the through-hull and overboard discharge. Look for leaks, both exhaust (air) and water. Major leaks will be obvious, but early signs of leaks due to hairline cracks in hoses and water pot muffler systems may not be. Diesel exhaust contains acidic sulfur and other gasses that may poison the air within the boat. To detect air leaks, look for telltale traces of black soot. Water leaks should also be immediately repaired. Leaks never resolve spontaneously; they must be addressed as quickly as possible.

Properly dispose of hazardous waste Be sure to properly dispose of used coolant, used engine oil and transmission fluid, contaminated fuel, old filters soaked with fuel and oil, etc. These fluids are generally poisonous to people, pets, wildlife and the environment, and some of them can be recycled.

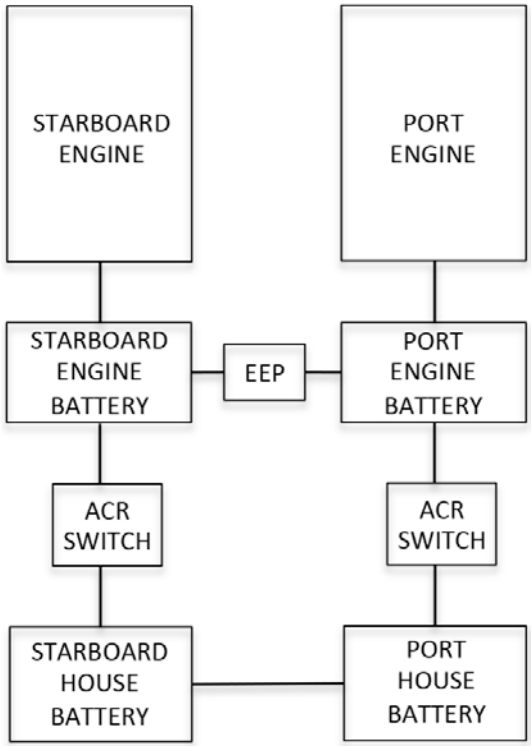
9.3 STARTING WITH LOW BATTERIES

Each engine has a dedicated ENGINE BATTERY. They may be connected with the ENGINE EMERGENCY PARALLEL (EEP) switch. (Normally the EEP switch should be off.) Each ENGINE ALTERNATOR provides 12V DC current to charge its battery.

The ENGINE BATTERIES are also connected by the AUTOMATIC CHARGER RELAY (ACR) switch to the HOUSE BATTERIES. When an ENGINE BATTERY reaches 13.2V the ACR switch closes and the ENGINE BATTERY shares charging current with both HOUSE BATTERIES and the other ENGINE BATTERY, connected by its ACR switch. This 4-battery bank, charged by both alternators has a total reservoir of 595-amp hrs. (See wiring diagrams, page 43, and the adjacent concept diagram.) The GENERATOR BATTERY is separate and dedicated to the generator only.

Normally when underway, both the ENGINE ALTERNATORS and the GENERATOR (if running) provide charging current to both ENGINE BATTERIES and both HOUSE BATTERIES. However, if a battery falls below 12.3V, the ACR switch opens to separate it from the rest of the bank. That prevents a low or shorted battery from draining the entire battery bank. For instance:

- If the PORT ENGINE BATTERY drops below 12.3V, the port ACR switch opens and disconnects the port ENGINE BATTERY from both HOUSE BATTERIES and the STARBOARD ENGINE BATTERY.
- If the HOUSE BATTERIES drop below 12.3V, both ACR switches would open to protect the ENGINE BATTERIES.



Concept diagram of HOUSE and ENGINE BATTERY connections with ACR and EEP switches

Starting engines with one low engine battery If you're not connected to shore power and if the PORT ENGINE BATTERY is depleted and the PORT ENGINE doesn't start, start the STARBOARD ENGINE to boost the STARBOARD ENGINE BATTERY. (Since the PORT ENGINE BATTERY is depleted, the ACR switch has disconnected the PORT ENGINE BATTERY from the house batteries to prevent draining them.)

With the STARBOARD ENGINE ALTERNATOR now charging the STARBOARD ENGINE BATTERY, as evidenced by voltage climbing, push the PORT ENGINE BATTERY switch and the ENGINE EMERGENCY PARALLEL switch on. Then on deck, turn the PORT ENGINE IGNITION switch on. Check to see that the voltage on each engine display reads above 12 volts. If so, start the PORT ENGINE. After the engine starts, turn off the ENGINE EMERGENCY PARALLEL switch.

The port ACR switch will need to be manually reset because the voltage was below 10.8V. It will return to normal automatic functions 10 minutes after manual resetting.

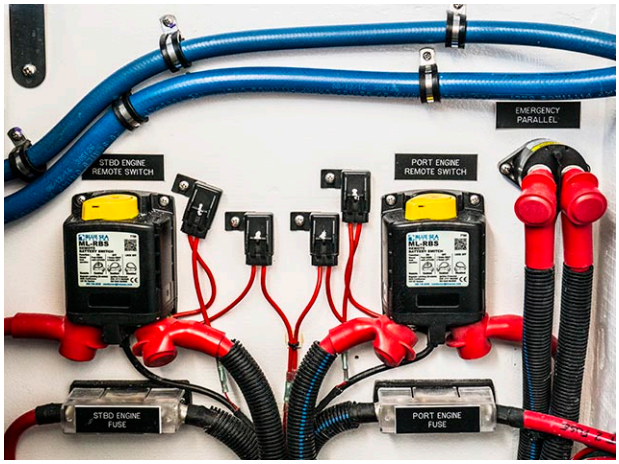
Starting engines with two low engine batteries If you aren't connected to shore power and if both engines fail to start, start the GENERATOR. (See page 16.) Ensure the GENERATOR breaker is on and the INVERTER is set to CHARGE. Ensure the GENERATOR is showing a charge on the voltage display on the 12V DC breaker panel. Normally, the GENERATOR would provide charging current to both HOUSE BATTERIES and both ENGINE BATTERIES. However, if the ENGINE BATTERIES have failed to start the engines, they have likely dropped below 12.3V and tripped their ACR switches so the GENERATOR'S charging current is charging the HOUSE BATTERIES but current will not flow to the ENGINE BATTERIES.

To reconnect the HOUSE BATTERIES to the PORT ENGINE BATTERY, push the yellow button labeled PORT ENGINE REMOTE SWITCH on top of a small black box located on the aft bulkhead under the starboard pilothouse hatch (see adjacent illustration). Then turn on the PORT ENGINE BATTERY switch and up on deck turn on the PORT ENGINE IGNITION switch. Check to see that the voltage on the port ENGINE CONTROL DISPLAY is reading above 12 volts. If so, start the PORT ENGINE.

When it starts, check voltage and when adequate, use the ENGINE EMERGENCY PARALLEL switch to start the STARBORD ENGINE following the procedure similar to the above paragraph, *Starting Engines With One Low Engine Battery*. (However, you will interchange the port and starboard functions because you are starting the PORT ENGINE first.)

Resetting the ACR switch If the voltage on a battery falls below 12.3V but not below 10.8V, the ACR switch will open and separate the batteries. When the voltage returns above 12.3V in either of the batteries it will automatically reconnect and share charge. However, If the voltage falls below 10.8V in either battery, the ACR switch will lock open and will not reconnect the batteries even if the voltage returns above 12.3V. You must reset it manually by pushing the yellow button as described above. It will return to normal automatic function 10 minutes after manual resetting.

CAUTION These procedures are for emergencies. If a battery is low, determine the cause. See if there is a charger or battery problem or if a device or the INVERTER was left on. (Leaving the INVERTER on over a period of a week or so causes 95% of dead batteries.) If you are at the dock, don't leave until you diagnose and correct the problem. If you are at anchor or underway, you should return home or to a nearby marina if you haven't corrected the problem.



The ACR switches are in the black housing under the yellow buttons and are labeled PORT ENGINE REMOTE SWITCH and STRBD ENGINE REMOTE SWITCH. They are on the aft bulkhead in the pilothouse starboard seat locker.

9.4 WINTER STORAGE

Most facilities won't require information before hauling the boat with a Travelift or crane, but if they need advice, refer to lift points on page 40 *Boat Lift and Bunk Offsets,* and *Hauling Out and Blocking* page 37.

Review the manuals in the accompanying binders, and in particular, refer to "Short Term Storage" and "Long Term Storage" in the VPOM and consult the manuals for the GENERATOR, AIR CONDITIONING, SEAKEEPER and WATER HEATER. Check manuals for all areas needing lubrication.

Underwater hardware Power-wash the bottom and check thru hulls and seacocks for growth. (Inspection of underwater hardware may avoid a problem in the future.) Replace anodes if necessary.

Drain water Flush the engines and the generator engine and the heat exchangers with fresh water. Remove engine drain plugs to prevent freezing water from damaging the engine.

Drain the FRESH WATER TANK, WINDSHIELD WASHER, WATER HEATER, HOLDING TANK, GRAY WATER TANK, ANCHOR WASHDOWN, AIR CONDITIONER, HEAD, ICE MAKER and the plumbing lines and run non-toxic antifreeze, through the systems to purge water that could freeze.

Replace oil Drain and replace oil in engines, generator IPS Drives, and Seakeeper and change filters.

Engine oil drains away in storage, leaving engine components exposed and vulnerable to corrosion. Moisture and acids in old oil pit bearings and internal engine parts. Use a fogging oil to coat internal components. Warm up the engine to 185° before draining oil so heavier metal particles are picked up and flushed out.

Lubrication Find grease fittings and service them with marine grease. Most fittings are in the steering mechanism area.

Fuel Fill the fuel tank (a full tank prevents water condensation). Add fuel stabilizer to prevent deterioration.

Batteries Set a trickle charge to keep batteries topped off.

9.5 Spring Commissioning

Commission engines and drives Review the manuals in the accompanying binders and in particular, refer to the VPOM and consult the manuals for the GENERATOR, AIR CONDITIONING and SEAKEEPER.

Fresh water system Commission the fresh water system: the FRESH WATER TANK, WINDSHIELD WASHER, WATER HEATER, HOLDING TANK, GRAY WATER TANK, ANCHOR WASHDOWN, AIR CONDITIONER, HEAD and ICE MAKER. Check pumps, operate the systems and check for leaks.

Paint Apply anti-fouling paint to the IPS drives, the props and the bottom if needed.

9.6 Hauling Out and Blocking

Refer to the illustration titled *Boat Lift & Bunk Offsets* in *the Appendix* page 40 before lifting the boat with a Travelift or a crane with straps.

The fore and aft lift points are approximately abeam of the windshield and the aft end of the hard top respectively. Weight-bearing supports should be at the keel (centerline of the boat) and chines (edges).

CAUTION Point-loading flat areas other than centerline and chine or setting the weight of the hull on supports of insufficient area may damage the hull. A 6-8 ft. metal "V" Channel should be placed under the keel forward of the transom on top of a trailer support point between the drives to avoid point-loading the laminate.

9.7 Trailer Loading Checklist

1. Place cockpit & pilothouse cushions below on island berth.
2. Remove canvas from bimini, detach aft legs and hinge the main hoop forward against the hardtop. Secure the short legs, pad the main hoop where it touches the hardtop (AC hose), secure the hoop to handrails with fender whips.
3. Hinge down VHF antenna and reverse tape it to starboard handrail. Hinge down running light and tighten.
4. Remove KVH or FLIR tower and seal hardtop openings and wire connections. Wrap domes and strut in blanket. Park it in a pilothouse locker, or shower, braced with throw pillows.
5. Max height over road is 13'6" if standard radar dome is bolted to hardtop without strut.
6. Wrap plastic around horn trumpets.
7. Face searchlight aft and secure the anchor chain grabber.
8. Latch all cabinet doors, drawers and fridge.
9. Don't apply adhesive tape to any surface, particularly ultra leather.
10. Turn off all battery switches and make sure the INVERTER is off.
11. Never permit the boat to be loaded stern first or you will spend a lifetime cleaning the boat!
12. Shrink-wrapping isn't recommended. It can do damage if it breaks loose.
13. Exchange contact information with the driver and the destination yard so you may maintain contact.

14. In addition to aft and midship supports in locations seen on the previous page, support the boat under the bow, forward of any straps.
15. Leaving side and aft pilothouse curtains in place best protects the boat interior.
16. Lock companionway door. Advise driver and receiving yard on the combination.

9.8 Fuel Consumption

The data in the adjacent chart was obtained in Jan-Feb 2009 from three separate runs in three separate locations: Boston Harbor, near Captiva FL, and near Miami during the Boat Show. Volvo-Penta technicians conducted two of the runs.

Displacement Assuming similar hull designs, fuel efficiency is a function of the power-to-weight ratios. Less weight equals less fuel for a given HP. Dry and empty weight of the boat was 16,000 lbs. Each run was made with the boat at approximately 21,000 lbs. that included approximately 3/4 full tanks, 1400 lbs. of cruising gear and 2-4 people.

Propulsion System Test runs were done on 40z #1 powered with an IPS 500 propulsion system consisting of twin D6 370 HP diesel engines and stern drives.

Range of Efficient Operation Nautical miles per gallon remain fairly constant from 9 to 27 knots.

Cruising Speed Volvo Penta suggests that in suitable conditions, 10% below open throttle (about 3200 RPM at 30 knots) is optimum cruising speed. The data below would indicate that 2900-3000 RPM at 28-knots would be more efficient.

Sour Spot The 40z seems to have a huge "Sweet Spot" and one small "Sour Spot" at about 1700 rpm at just over 10 knots where the most power is applied to overcome resistance before the boat achieves a plane. Notice that the boat is no more efficient at that point than at 30 knots.

CAUTION When underway fuel may run back in the tank where the fuel level sensor is located. It may then indicate more fuel than is actually there; it's wise to fill up when you get down to 1/3 tank.

FUEL EFFICIENCY			RANGE		TIME
RPM	GPH	KTS	NMPG	NMRANGE	Secs *
600	0.6	4.8	7.6	2392	
1000	2.3	6.7	3.0	937	
1200	3.5	7.6	2.2	684	
1300	3.9	8.0	2.1	646	
1400	4.7	8.2	1.8	555	
1500	6.8	9.3	1.4	428	
1600	7.8	9.5	1.2	384	
1700	9.5	10.0	1.1	333	2.5*
1800	9.7	13.1	1.4	425	
1900	10.6	14.3	1.3	425	
2000	12.7	15.1	1.2	374	
2200	14.8	17.9	1.2	380	
2400	17.6	20.9	1.2	374	5.3*
2600	20.5	24.0	1.2	370	
2800	22.9	26.9	1.2	370	
3000	26.4	30.0	1.1	357	9.5*
3200	30.5	32.8	1.1	339	
3400	35.7	36.1	1.0	319	
3500	38.5	37.7	1.0	308	

*Seconds required to reach the indicated speed.

Volvo technicians said, "*This is a Ferrari!*" as I mashed the throttles forward to hit 20 knots in 5.3 seconds from a standstill. No wonder, that's on a par with some "*thunder*" boats and about what it takes a Mercedes SL550 to hit 60 mph (52 knots).

…R.I.J.

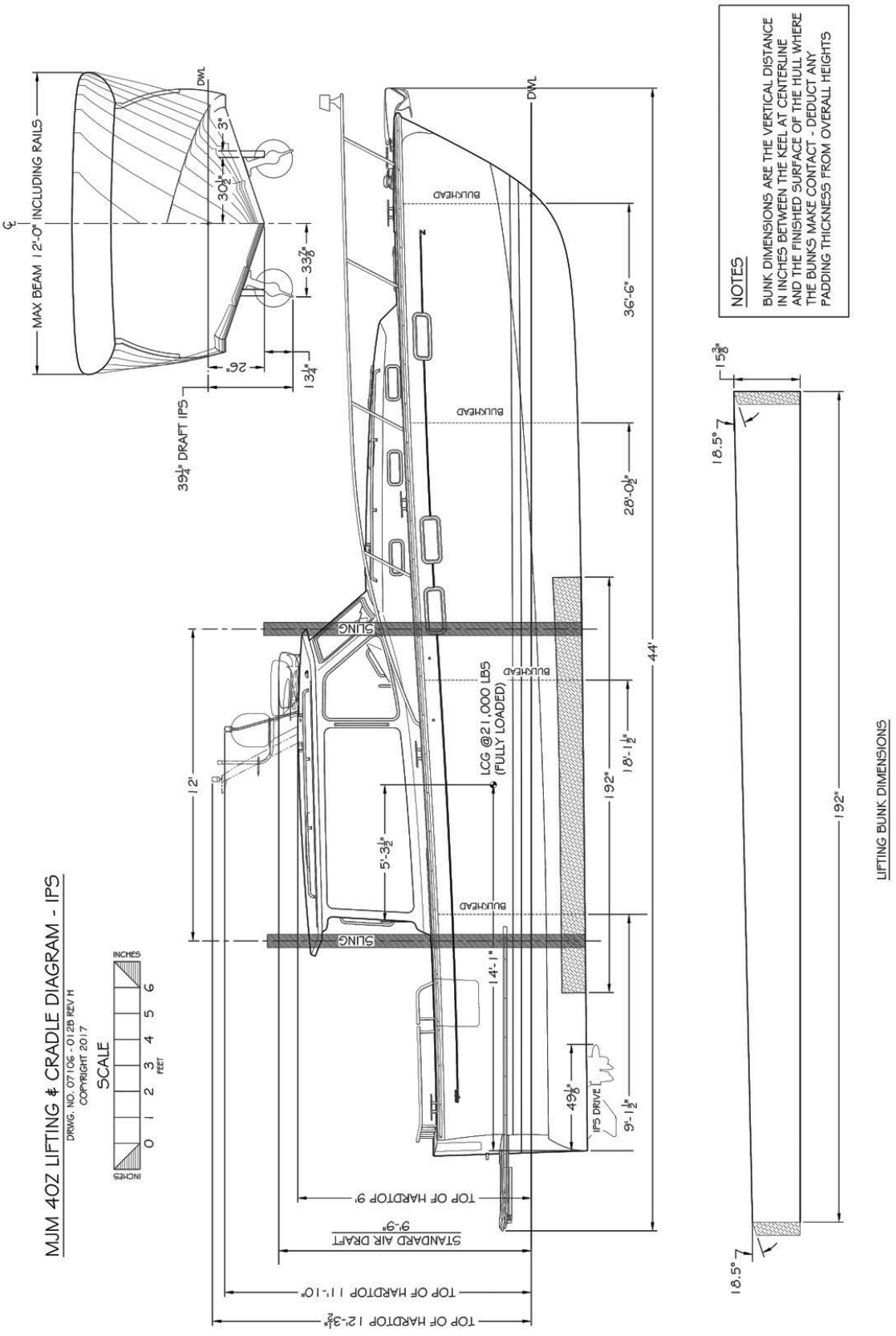
9.9 ROUTINE MAINTENANCE

ENGINE		
Oil level	Check Daily	Change after 1st 100 hrs., then ea. 200 hrs. or annually
Engine oil filters	50/200 hrs.	Replace after 1st 50 hrs., then ea. 200 hrs.
Air cleaner	Check each 50 hrs.	Clean if necessary and replace oil???
Drive belt tension/wear	Check each 14 days	Tension if necessary
Remove anodes & check	Every 100 hrs.	At each oil change or 6 months
Check valve clearances	Check 50/500	Check after 1st 50 hrs. then 3a. 500 hrs.
Turbo charger	Every 200 hrs.	Clean blower
Mounts	Annually	Tighten
Coolant level	Check daily	Add if necessary. Don't overfill
Drive unit oil level	Check weekly	Add if necessary. Don't overfill
Valve clearance & injectors	Check	500 hrs. Adjust if necessary?
Oil in bilge	Check daily	Identify source. Correct. Clean-up
Engine area & leakage	Check daily	Identify source. Correct. Clean-up
FUEL SYSTEM		
Tanks/valves/connections	Monthly	Inspect for leaks and ease of valve operation
Racor Primary Fuel Filter	Check daily	Clean if necessary. Change ea. 200 hrs.
Secondary engine filter		Change ea. 200 hrs. or when necessary
Fuel system	When necessary	Bleed
Injectors	Check ea. 500 hrs.	Adjust if necessary?
Fuel injection pump	Check	Every 2400 hrs. Adjust if necessary?
GENERATOR		
Oil level	Check daily or 8 hrs.	Add if necessary
Oil	100 hrs.	Change after 1st 50 hrs. then ea. 100 hrs.
Fuel Filter/water separator	Daily or ea. 8 hrs.	Check for contamination and clean
Fuel filter	Ea. 100 HRS.	Check drain and replace filter ea. 100 hrs.
Engine hoses	Weekly	Tighten and secure if necessary
Exhaust system	Weekly	Inspect for leaks. Check anti-siphon
RAW WATER COOLING		
Heat exchanger	Check ea. 2400	Clean
Sea Water strainers	Daily	Clean screen & bowl if necessary
Cooling System	Every 500 hrs.	Check & flush
FRESH WATER SUPPLY		
Water tank	Annually	Flush & clean
Water pump strainer	Monthly or less	Remove & clean
Hoses and valves	Daily	Observe leaks or note recycling of pressure system
Seagull purifier cartridge	Annually	Replace cartridge more frequently if reduced flow
GRAY WATER SYSTEM		
Sumps	Annually	In main cabin floor hatch & systems room
Automatic bilge pumps (3)	Check daily	Test with manual switch
Manual bilge pump	Monthly	Check operation
Bilge area	Check daily	Clean as needed
ELECTRICAL SYSTEM		
Batteries	Monthly	Remove lids, check for loose cables, clean
House and Engine batteries	Check voltage daily	???
Connections	Inspect annually	Clean, tighten or repair
Transom & drive anodes	Inspect quarterly	Replace if 50% eroded
MISCELLANEOUS		
Fire Suppression system	Mon/Bi-anly/5yrs	Check gauge, canister weight, replace canister
Trim tabs	Check	Remove barnacles
Bottom Paint	Monthly/annually	Repaint

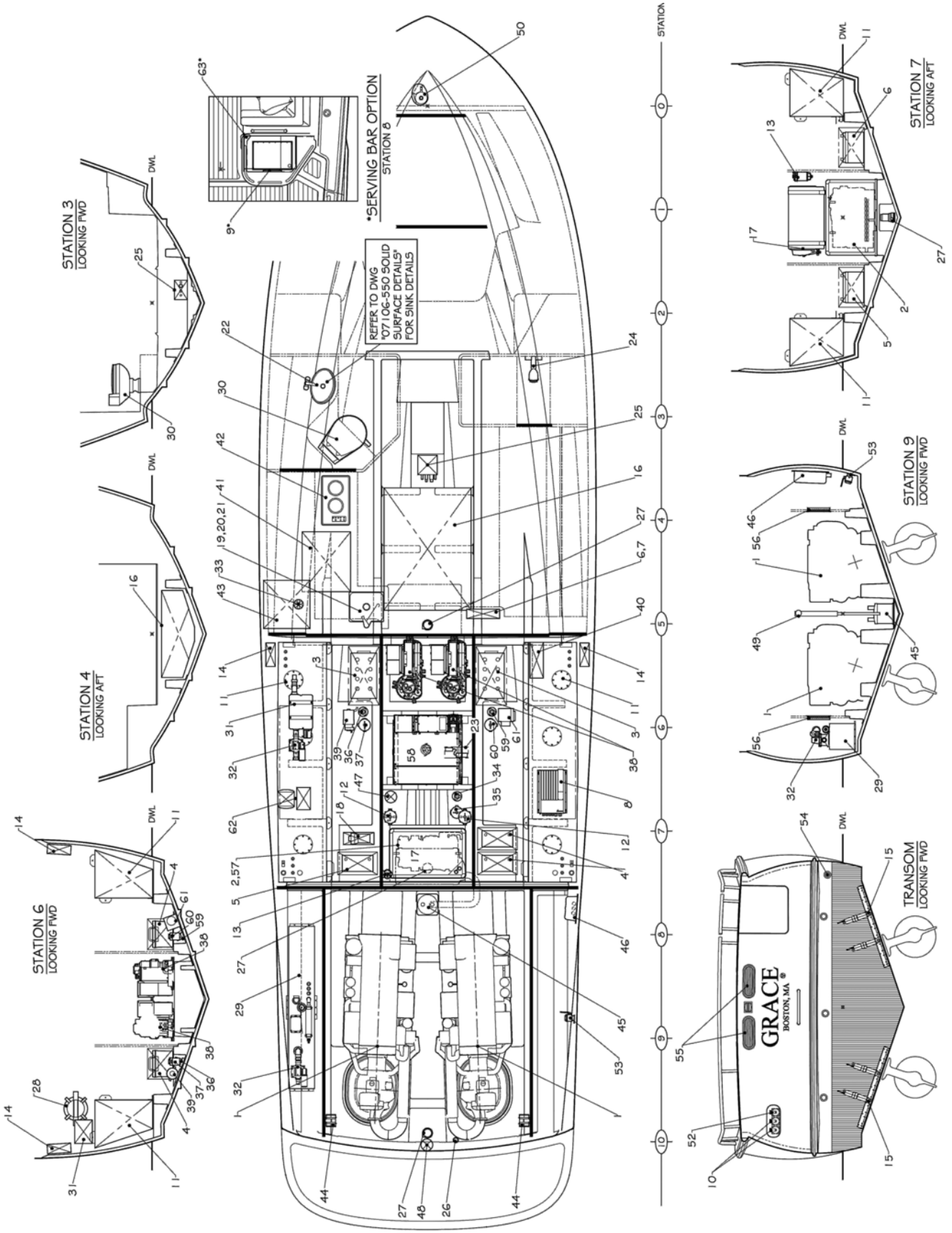
The chart above is an approximation. Refer to the equipment manuals for specific instructions. Perform most maintenance items annually even if hour levels aren't reached. You may choose to do many yourself, But. its a wise to have a qualified mechanic check on the engine, generator, and other key equipment. Volvo Penta & Northern Lights engines are assumed. Check the respective manuals if your brands differ.

9.10 Boat Lift and Bunk Offsets

A boat bunk (the shaded gray area tine drawing below) is a support shaped in three dimensions to fit and support the boat. The length and cross section dimensions to make boat bunks for an MJM 40z, are below.



9.11 SYSTEMS LOCATION PLAN



9.12 SYSTEMS KEY

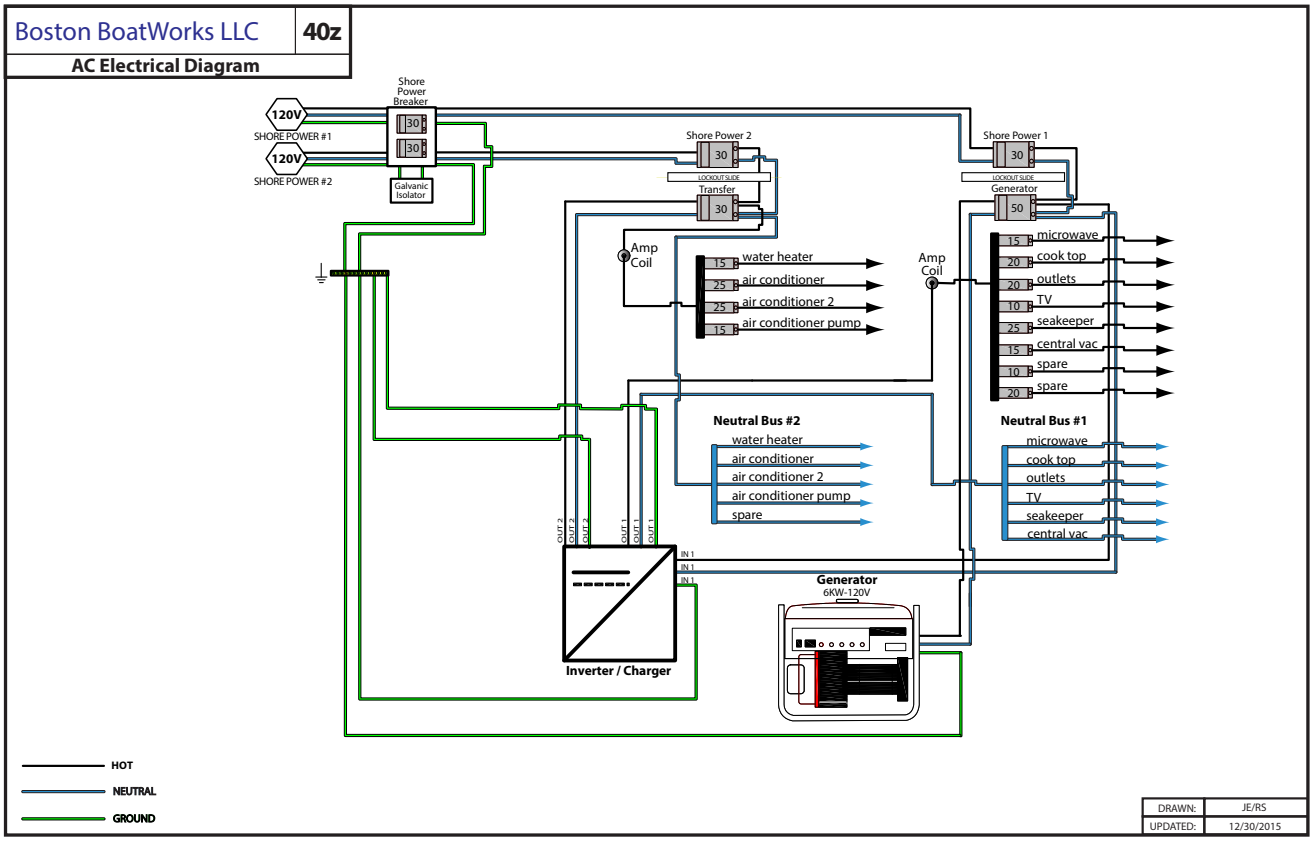
The System Location Plan (above) and the System Key are the baseline configuration for the MJM40z. There are modifications due to continuous improvement and individual customization. Your boat will have some differences.

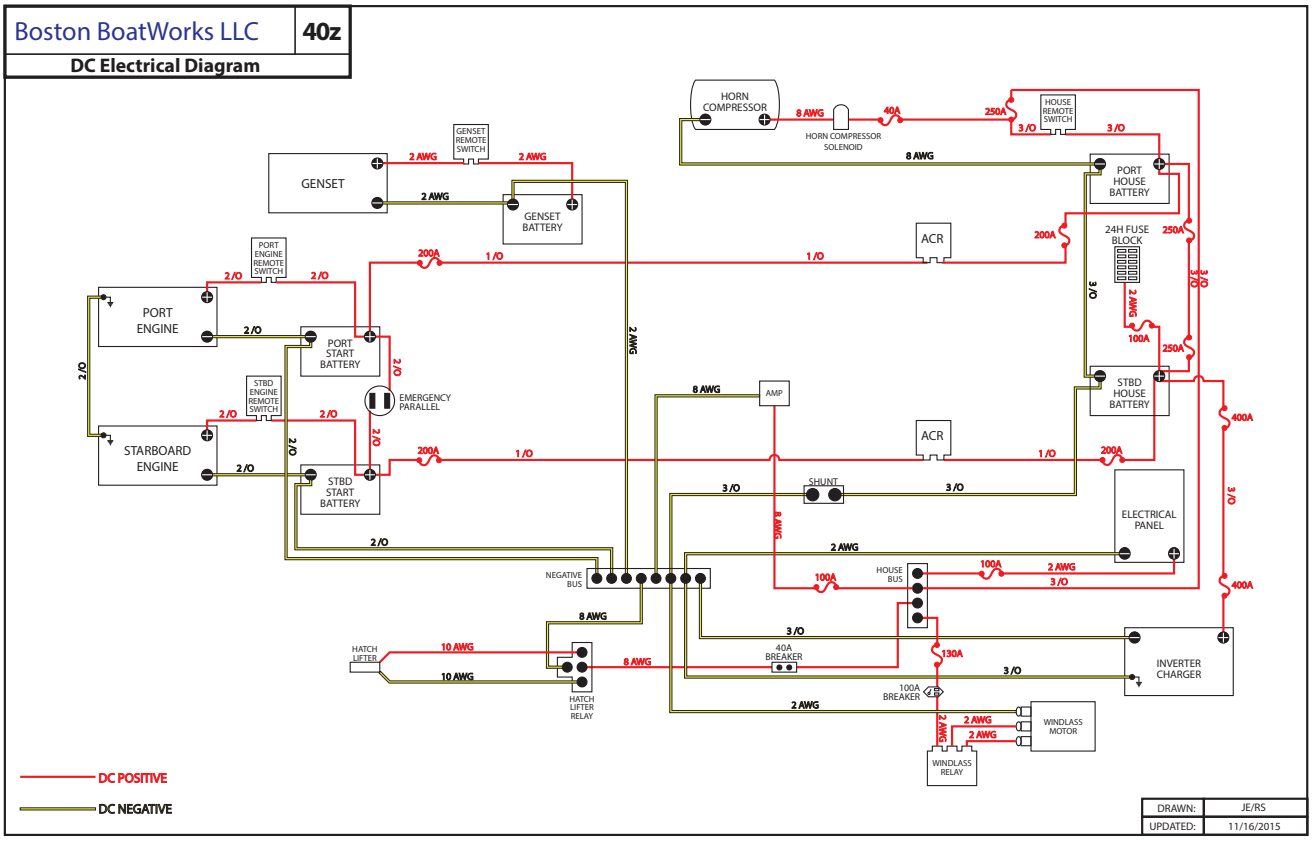
REF	QTY	DESCRIPTION	MAKE / MODEL
1	2	MAIN ENGINE	VOLVO IPS 500
2*	1	GENERATOR (6kW)	NORTHERN LIGHTS M673L3
3	2	HOUSE BATTERY	EAST PENN 8A8D
4	2	START BATTERY (ENGINE)	EAST PENN 8A31DT
5*	1	START BATTERY (GENSET)	EAST PENN 8A27M
6	1	ELECTRICAL PANEL AC	BLUE SEA 3602914
7	1	ELECTRICAL PANEL DC	BLUE SEA 3602915
8	1	CHARGER/INVERTER	VITCRON QUA 12502 1100
9*	1	GRILL - SERVICE BAR	KENYON FRONTIER B70057
10	2	SHORE POWER	HUBBELL HBL30355
11	2	FUEL TANK (175 GAL)	REFER TO DWG 07106-655
12	2	FUEL FILTER (ENGINE)	RACOR MA500-10 MICRON
13	1	FUEL FILTER (GENSET)	RACOR 230RMAM30 30 M.
14	2	FUEL/AIR SEPARATOR	RACOR LG100
15	2	TRIM CONTROL SYSTEM (IPS)	LECTROTAB CKA5B16X36-8353
16	1	F.W. TANK (100 GAL)	RONCO B400
17	1	F.W. HEATER (13 GAL)	ISOTHERM BASIC 50L #605021B-000003
18	1	F.W. PRESSURE PUMP	JOHNSON 10-13409-01
19	1	F.W. PURIFICATION SYSTEM	G. ECOLOGY SEAGULL IV
20	1	GALLEY FAUCET	SCANDVIK 10480
21	1	GALLEY SINK	SCANDVIK 10220
22	1	HEAD FAUCET	SCANDVIK 46010
23*	1	SUMP PUMP (GYRO OPTION)	ASPEN ASP-MO-115
24	1	SHOWER/MIXER	SCANDVIK 10763/10813
25*	1*	SUMP PUMP (2x W/O GYRO)	RULE 98A
26	1	COCKPIT SHOWER/MIXER	SCANDVIK 12144
27	3	BILGE PUMP (AUTO)	JABSCO RM1100AM
28	1	BILGE PUMP (MAN)	BOSWORTH GH-M500D (M5V)
29	1	B.W. TANK (32 GAL)	SEALAND
30	1	TOILET	DOMETIC VACUFLUSH 506+3178506 01

CONTINUED AT RIGHT...

REF	QTY	DESCRIPTION	MAKE / MODEL
31	1	VACUUM GENERATOR	SEALAND
32	2	MACERATOR PUMP	SEALAND
33	1	GALLEY DISCHARGE FAN	INDEL SBE00108AA
34	1	SEACOCK (GENSET)	FORESPAR 93 1143
35	1	STRAINER (GENSET)	GROCO ARG-755-P
36	1	SEACOCK (A/C)	FORESPAR 93 1264
37	1	STRAINER (A/C)	SHERWOOD 18005-1 W/ 14239 BRACKET
38	2	A/C UNIT	MARINE AIR VTD16K-HV
39	1	A/C PUMP	MARINE AIR PMA1000/225-5-00065
40	3	HEATER	WALLAS 40DT
41	1	FRIDGE/FREEZER - GALLEY	VITRIFRFRIGO SEA DRAWER DW180 FLANGE MOUNT
42	1	COOK TOP	KENYON B40575LPUPS
43	1	MICROWAVE	SHARP R-331Z5
44	2	EXHAUST FAN (BLOWER)	DELTA T 500-304121 1P
45*	1	GENSET MUFFLER	CENTEK 1500060 VERNALIFT
46*	1	GAS/WATER SEPARATOR	CENTEK 1020150
47	1	FIRE SUPPRESSION (FWD)	SEA-FIRE FG100A
48	1	FIRE SUPPRESSION (AFT)	SEA-FIRE FG125A
49	1	HATCH LIFT	THOMSON ELECTRAK 10
50	1	WINDLASS	MUIR VR 1250
51	2	POWERTRAIN CONTROL UNIT	VOLVO 88997
52	1	TV INLET	HUBBELL HBLTV55
53	1	GENSET WET EXHAUST SEACOCK	FORESPAR 93 1155
54*	1	GENSET DRY EXHAUST OUTLET	SOUTHCO 9005310
55	2	LOUVERED VENT	VETUS ASV 30
56	2	ENGINE AIR INTAKE GRILLES	DTS #800-095537-01
57	1	GENERATOR SOUND SHIELD	NORTHERN LIGHTS 05-78010
58*	1	GYRO STABILIZER	SEAKEEPER 5
59*	1	SEACOCK (GYRO)	FORESPAR 1" 931264
60*	1	STRAINER (GYRO)	GROCO ARG-755-P
61*	1	GYRO SEAWATER PUMP	MARINE AIR PML500L
62	1	AIR HORN COMPRESSOR/TANK KIT	KAHLENBERG P449-17
63*	1	FRIDGE - SERVICE BAR	INDEL DR 49

9.13 WIRING DIAGRAMS





9.14 Fuse Locations & Specifications

In-Line and Fuse Block

#	Description	Size	Type	Location
1	Bilge Pump 1 Switch	5	AGC	In the BILGE PUMP SWITCH at the dash
2	Bilge Pump 2 Switch	5	AGC	In the BILGE PUMP SWITCH at the dash
3	Bilge Pump 3 Switch	5	AGC	In the BILGE PUMP SWITCH at the dash
4	Bilge Pump 1	7.5	ATC	Fuse Block next to House Battery 1 starboard settee hatch
5	Bilge Pump 2	7.5	ATC	Fuse Block next to HOUSE BATTERY 1 starboard settee hatch
6	Bilge Pump 3	7.5	ATC	Fuse Block next to HOUSE BATTERY 1 starboard settee hatch
7	Stereo Memory	15	ATC	Fuse Block next to HOUSE BATTERY 1 starboard settee hatch
8	Emergency Parallel Supply	15	ATC	Fuse Block next to HOUSE BATTERY 1 starboard settee hatch
9	High Water Alarm	5	ATC	Fuse Block next to HOUSE BATTERY 1 starboard settee hatch
10	House Switch Supply	15	ATC	Remote Battery Switch next to House Battery 2 port settee hatch)
11	House Remote Supply	5	ATC	Remote battery switch next to HOUSE BATTERY 2 port settee hatch
12	Start 1 Switch Supply	15	ATC	Remote battery switch next to START BATTERY 1 starboard settee hatch
13	Start 1 Remote Supply	5	ATC	Remote battery switch next to START BATTERY 1 starboard settee hatch
14	Start 2 Switch Supply	15	ATC	Remote battery switch next to START BATTERY 2 starboard settee hatch
15	Start 2 Remote Supply	5	ATC	Remote battery switch next to START BATTERY 2 starboard settee hatch
16	Generator Switch Supply	15	ATC	Remote battery switch next to GENERATOR BATTERY port settee hatch
17	Generator Remote Supply	5	ATC	Remote battery switch next to GENERATOR BATTERY port settee hatch
18	Combiner 1 Negative	15	ATC	Battery combiner next to AIR CONDITIONER control bridge deck hatch
19	Combiner 2 Negative	15	ATC	Battery combiner next to AIR CONDITIONER control bridge deck hatch
20	Engine Room Blower	20	ATC	HOUSE BUS starboard settee hatch
21	VacuFlush	3	ATC	Top of the HOLDING TANK port aft hatch
22	Echo-Charge	25	ATC	Inverter / Charger starboard settee hatch
23	Trim Tab Retract Wire	30	ATC	Inside Electrical Panel (line side of the DC Panel)
24	Generator Voltage Sense	2	ATC	Next to GENERATOR BATTERY port settee hatch
25	Power Windows	10	ATC	POWER WINDOWS fuse block behind dash

ANL Fuses

#	Description	Size	Type	Location
1	Horn Fuse	40	ANL	Next to HORN COMPRESSOR port settee hatch
2	24H Fuse Block	100	ANL	Next to HOUSE BATTERY 1 starboard settee hatch
3	Main Panel Fuse	100	ANL	Wall above FUEL TANK starboard settee hatch
4	Windlass Fuse	130	ANL	Wall above FUEL TANK starboard settee hatch
5	Start Battery 1 Fuse	200	ANL	Above START BATTERY 1 starboard settee hatch
6	House Battery 1 Fuse	200	ANL	Next to HOUSE BATTERY 1 starboard settee hatch
7	Start Battery 2 Fuse	200	ANL	Above START BATTERY 2 starboard settee hatch
8	House Battery 2 Fuse	200	ANL	Next to HOUSE BATTERY 2 port settee hatch
9	House Bank Fuse	250	ANL	Next to HOUSE BATTERY 2 port settee hatch
10	House Parallel Fuse Stbd.	250	ANL	Next to HOUSE BATTERY 1 starboard settee hatch
11	House Parallel Fuse Port	250	ANL	Next to HOUSE BATTERY 2 port settee hatch
12	Inverter Charger Fuse	400	ANL	Wall above FUEL TANK starboard settee hatch
13	Inverter Fuse	400	ANL	Next to HOUSE BATTERY 1 starboard settee hatch
14	Amplifier	100	ANL	Wall above FUEL TANK starboard settee hatch

AGC fuses are a glass, ATC fuses are plastic, ANL fuses for main circuit protection can take a brief overload.

9.15 Fuel Consumption Log.

Date	Location	Engine Hours	Hours Since Last Fill	Gals To Fill	GPH	Comment

9.16 BOSTON BOATWORKS LIMITED WARRANTY

Manufacturer's Sole and Limited Warranty for Pleasurecraft

A. General. This document sets forth the sole and limited warranty, which Boston BoatWorks, LLC ("The Manufacturer") is giving you in connection with the "Vessel" which you are acquiring. It is the only warranty being given by the Manufacturer and should be reviewed carefully together with manuals and other instructional material provided by the Manufacturer before you take delivery of the Vessel.

B. Basic Warranty. The Manufacturer warrants that the Vessel (except for Excluded items described below and when Properly Used, will be free of defects in material and workmanship for a period of twelve (12) months from delivery of the Vessel to you by an Authorized Dealer. If you sell the Vessel during this period, your buyer may receive the benefit of the balance of the warranty by agreeing to be bound by its terms.

c. Extended Warranty for Structure. In addition to the foregoing warranty, the Manufacturer warrants that the stringer systems, structural bulkheads and composite laminates of the Vessel (except for Excluded items) and when the Vessel is Properly *Used and Maintained, will be free of defects in material and workmanship for a period of five (5) years from delivery date by an Authorized Dealer. This warranty may be transferred to your buyer in the same manner as the Basic Warranty. *Improper over-the-road trucking of the vessel can cause local damage to the centerline of the boat requiring a localized FRP repair. Use authorized MJM trucking companies for moving your boat or contact Boston Boat Works' customer service managers for proper trucking information PRIOR to engaging with another trucking provider for boat transport.

D. Extended Warranty Against Osmotic Blistering. In addition to the foregoing warranties, the Manufacturer warrants that any gelcoat surfaces of the Vessel below the waterline won't blister when the Vessel is Properly Used for a period often (10) years from delivery date by an Authorized Dealer. This warranty may be transferred to your buyer on the same manner as the Basic Warranty.

E. Dealers. The name and address of Authorized Dealers is available from the Manufacturer. The Manufacturer doesn't authorize the Dealer, or any other person, to assume for the Manufacturer any liability in connection herewith or any liability or expense incurred in the repairing of its products other than those expressly authorized by the Manufacturer in writing.

F. Excluded Items. The Manufacturer gives no warranty as to:

a. Paints, varnishes, gelcoats (except where included in paragraph D above) exterior wood, vinyls, fabrics, glass, chrome plating or anodized or other finishes or surface coatings because of the varying quality of these items manufactured by others and the effect resulting from different climactic and use conditions

b. Engines, mechanical equipment, pumps, batteries, heating, plumbing, refrigeration, electronic components, masts, or other components manufactured by other than the Manufacturer, or the cost of removal or re-installment of the part and disassembly, or reassembly of the unit of which it is a component.

c. All items not installed by the Manufacturer or altered after their installation, and items installed or altered by Authorized Dealers.

d. Other than upon first being delivered, leaks in or around hatches, companionways, deck hardware or other leaks which are above the waterline.

e. Damage to the Vessel (including, but not limited to, wet core) caused by leakage around decks, hardware or other accessories attached to, or incorporated into, the Vessel.

f. Speed, fuel consumption or other performance characteristics, because they are estimated and not guaranteed.

G. Proper Use. The warranties contained herein are expressly conditioned upon your Proper Use of the Vessel. This means that you must use the Vessel solely as a pleasure craft (no commercial use) and operate it as directed in and after reviewing the manuals provided by the original equipment manufacturer and the Manufacturer, and perform maintenance to the Vessel as recommended in the manuals and as required by periodic inspections by an Authorized Dealer or Service Center.

H. Warranty Claims. To make a claim under this warranty you must do the following a. Report the defect to the Manufacturer or Authorized Dealer within 48 hours after discovery, and when possible prior to incurring any expense, identifying the Vessel and submitting photographs (email digital preferred).

b. Make the Vessel available for inspection by the Manufacturer or Authorized Dealer when requested.

c. Make the vessel available for repairs, if required, by the Manufacturer or Authorized Dealer.

d. Major components, such as engines, generators, air-conditioners, electronics, and appliances, for example, are warranted by the manufacturer of the component. They have authorized service dealers in most major boating markets. The Manufacturer or Dealer will identify such service dealers upon request.

I. Repair or Replacement. The manufacturer shall perform its obligations under this warranty by, at its option, repairing or replacing (at Manufacturer's expense) the defective part or component. Parts or components replaced will become the property of the Manufacturer. The replacement of parts o components won't extend the warranty but the replacement parts and components will be covered for the balance of the warranty period. You shall be responsible for returning the Vessel to Manufacturer at its plant or at a marina or to such other repair facility that the Manufacturer shall designate, at your sole expense.

J. Specification Changes. The manufacturer reserves the right to make changes in design, equipment, layout or construction without notice or being obligated to incorporate such changes in previous products.

K. Registration Cards. The Manufacturer recommends that you immediately fill out and return the Warranty Registration Card for the Vessel. Cards should be sent to:

Boston BoatWorks, LLC
333 Terminal Street
Charlestown, MA 02129
ATTN: Customer Service

L. The information contained on this card will enable the Manufacturer to more quickly process any warranty claims and to comply with the Federal Boating Safety Act. Should you sell the Vessel, the Manufacturer recommends that your buyer also fill or a Warranty Registration Card.

M. Exclusion of Implied Warranties. The foregoing warranty is intended to be in lieu of all other warranties, express or implied. In part, due to the hazardous, life-threatening environment, capable of overwhelming vessels of any size, that the Vessel will operate in, THE MANUFACTURER OR ITS DEALER DISCLAIMS ALL IMPLIED WARRRANTIES INCLUDING WARANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE. In some jurisdictions, the Manufacturer is prohibited from excluding or limiting implied warranties. In those jurisdictions, the Manufacturer expressly limits any implied warranties to the greatest extent and to the shortest duration allowed by law.

N. Limitation of Damages. THE MANUFACTUER OR ITS DEALER DISCLAIMS ANY LIABILITY TO YOU FOR INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES TO YOU, including loss of use, loss of revenue, travel expenses, transportation charges, food or lodging charges or loss of personal property. In some jurisdictions, the Manufacturer is prohibited from excluding or limiting implied warranties. In those jurisdictions, the Manufacturer expressly limits any implied warranties to the greatest extent and to the shortest duration allowed by law.

o. Whole Agreement. This warranty is the sole warranty given to you by the Manufacturer. Authorized Dealers aren't authorized to make changes to this warranty. Any questions about the warranty should be directed to the Manufacturer. If you do bring a claim against the Manufacturer that is related to the Vessel, you must bring it in the Courts for the State of Massachusetts.

Limited Warranty Registration Card

Within 30 days after delivery or transfer to new owner, this form must be sent to:

Boston BoatWorks, LLC
333 Terminal Street
Charlestown, MA 02129
ATTN: Customer Service

_____ _____ _____ _____/_____/_____
MJM Model Hull # (HIN) US-EOU Authorized Dealer Date Purchased

Owner{s):

_____ _____
First name Last name

_____ _____
First name Last name

_____ _____ _____ _____
Address City State Zip

_____ _____ _____
Primary phone Mobile phone email

_____ _____ _____
Boat Name Hailing Port

I have read and agree to the conditions outlined in the Limited Warranty, which was attached hereto:

_____ _____/_____/_____
Owner(s) Signature(s) Date

Warranty Claim Application Form

Boston Boat Works, LLC This form has the same info as the Pre-Approval form.
256 Marginal Street, East Boston MA 02128
Phone: (617) 561-9111 Fax: (617) 561-9222

Date:

Boat name

Hull #

Dealer/service

Boat Owner

Address

Address

Address continued

Address Continued

Phone # & email

Phone Number & e-mail

Fax

Boat Location

Contact person

Delivery Date

Description of Defect (please attach photos)

Description of Corrective Action (please attach invoices)

Labor hrs

Labor rate

Labor cost

Material cost

Total Cost

All claims require prior approval by BBW Customer Service using the Pre-Approval Form

Date Approved

Amount Approved

Approved by

10 THE MJM TEAM

Before we end, we'd like you to know the remarkable people, recognized throughout the yachting world, who create MJM Yachts. It's a team that has, in its young life, received many awards.

10.1 BOB JOHNSTONE

Bob is the founder and CEO of MJM Yachts. A Princeton graduate, he co-founded J/Boats in 1977 with his brother Rod. J/Boats is the leading performance sailboat brand worldwide with 20 Boat-of-the-Year awards, a Harvard Business School case study, five International Classes, and over 14,000 J Boats produced, Leaving J/Boats to the next generation in 2002, Bob and his wife, Mary, sought a boat for more comfortable cruising. Bob, true to form, figured that innovation was required to get the performance and solo handling ease comparable in power to what J/Boats achieved in sail. Such a boat did not exist. That was the start of MJM Yachts—the acronym MJM informally honors the inspiration: *Mary Johnstone's Motorboat*. The tradition of excellence continues. In 2016 Bob received the Mystic Seaport's *America and the Sea* Award was inducted into the National Sailing Hall of Fame and was cited by *Yachting Magazine* as one of 7 key Innovators in the marine industry.

10.2 PETER JOHNSTONE

Peter is a Partner and Director of Product Development at MJM Yachts. He also serves as the the dealer for MJM Yachts in the Southeast from the Carolinas to New Orleans as well as North Florida. He is a USSailing Youth Champ in boardsailing, a collegiate All-American and member of the Connecticut College Athletic Hall of Fame. He launched his first business while still an undergraduate: Johnstone One-Design, which introduced the retractable bowsprit and asymmetric spinnaker to production sailboats with the One-Design 14 dinghy. He involved in the acquisition of Sunfish-Laser with North Sails to become it's President & CEO…holding that position later with Escape Sailboats. He was the Founder and CEO of the 55-90 ft. peformance Gunboat Catamaran Company and still retains an interest in sail with his ownership of Alerion Yachts.

10.3 DOUG ZURN

Doug grew up sailing on Lake Erie in his family's boats. He absorbed Skene's Elements of Yacht Design and made drawings and boat models in high school. He graduated with honors from The Westlawn School of Yacht Design in 1993 and promptly established Zurn Yacht Design. He is a member of the Society of Naval Architects and Marine Engineers, the American Boat and Yacht Council and the Yacht Brokers Association of America. Doug believes that It is very clear that form and function need to work together when designing a yacht. The attention given to each detail, several times throughout the design process, is the number one key element of any successful design. Not a single detail can be left alone. With over 350 power and sailboats built in the last 20 years it's difficult not to recognize a Zurn Design as she passes in the water.

10.4 Scott Smith

Scott is a founder of Boston BoatWorks. He studied bio-medical engineering at Boston University and worked in the financial industry at Boston Financial Data Services and Shawmut Bank. He formed Boston BoatWorks with Mark Lindsay to combine his passions as a life-long sailor, sailing competitor, technophile and entrepreneur. BBW has brought boatbuilding back to the place where famous clipper ships were built. Scott's active interest in contributing to community, harbor and business issues has led him to participate over the years as a Director of the East Boston Chamber of Commerce, Chairman of the East Boston Economic Development Council, Founder and trustee of East Boston's not-for-profit sailing program, Piers Park Sailing, Inc., Member of the Boston Redevelopment Authority's Municipal Harbor Planning Advisory Committee and Trustee of The Boston Harbor Association.

10.5 Mark Lindsay

Mark is a founder of Boston BoatWorks. He spent much of his youth in an old boat shop watching a septuagenarian build lobster boats. At 14 he built a Sunfish and two years later won a Sunfish championship. He studied architecture at the U of Penn and MIT and began his boat-building career. One of the first to realize the strength-to-weight characteristic of vacuum bagged epoxy, carbon fiber and Kevlar, he made boats lighter, stronger and faster. His boats provided championships for many competitors—including himself. With technological support from Sikorsky Aircraft, DuPont and Hexcel Corporations, Mark pushed the envelope, building many exotic yachts with storied naval architects and yachtsmen. He provided specialized components for boats from Optimist prams to America's Cup boats. He teaches boatbuilding to 9th graders, is chief measurer for the Sonar Class, and Chairman of the Management Committee for the New Hampshire Appalachian Mountain Club Camp.

10.6 Steve Burke

Steve is the structural engineer for MJM boats. He graduated from the University of Michigan department of Naval Architecture and Marine Engineering. He began his career as a Naval Architect with hull design and structural engineering for hydrofoils, ships and submarines for General Dynamics and Boeing. In 1990, Steve turned to composite materials for the aerospace, naval, oceanographic and offshore energy communities. As the marine composites engineer at TPI, Steve was responsible for structural and project management for J/Boats where he worked with Bob Johnstone. Steve has also been a key consulting structural engineer for Seakeeper in redesigning gyro retrofits. He serves as MJM's primary contact with the International Marine Certification Institute in Brussels which is charged with implementation of the International Standards Organizations (ISO) program for yacht construction.