

# Yacht Preparation

MITNA

7 January 2015

Matthew Wall, Scott Dynes

# Yacht Preparation Distilled

- Know what 'normal' is
- Know when to replace - how often?
- Bring spares - how many? which ones?
- Bring the right tools

# Yacht Preparation Distilled

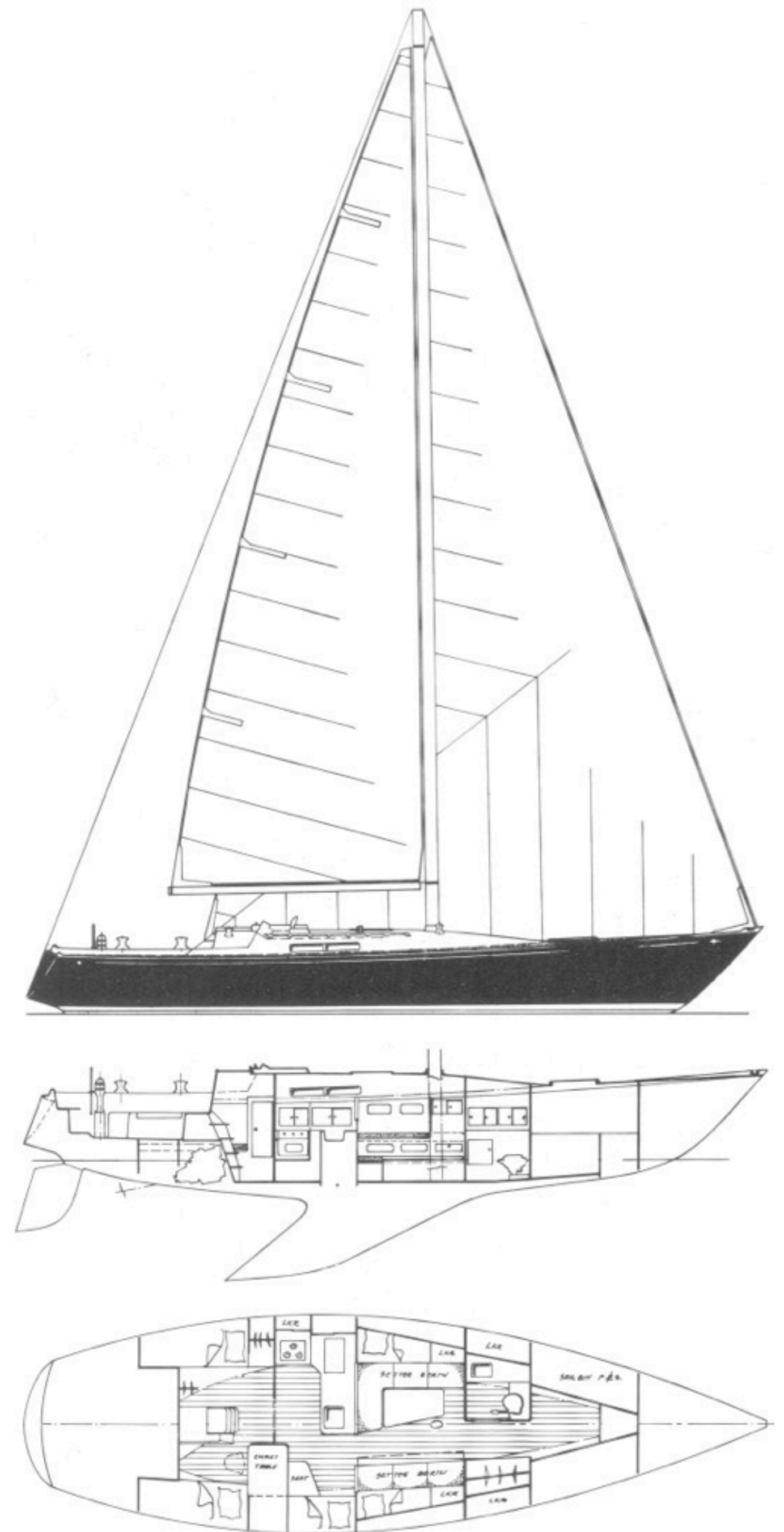
- Know what 'normal' is
- Know when to replace - how often?
- Bring spares - how many? which ones?
- Bring the right tools

## Why does this matter?

- Your friend asks you to crew
- Trips on X-Dimension or other club boat
- You want to charter a boat
- Day trip
- Overnight trip
- Winterizing/Dewinterizing

# Yacht Systems

- Standing Rigging
- Running Rigging
- Hardware
- Power-Train
- Steering
- Bilge
- Freshwater
- Blackwater
- Electrical
- Electronics





# Standing Rigging

- Mast and Boom
- Shrouds
- Backstay
- Forestay and Roller Furler



## Halyards

Boom vang

Reefing lines

Boom topping lift

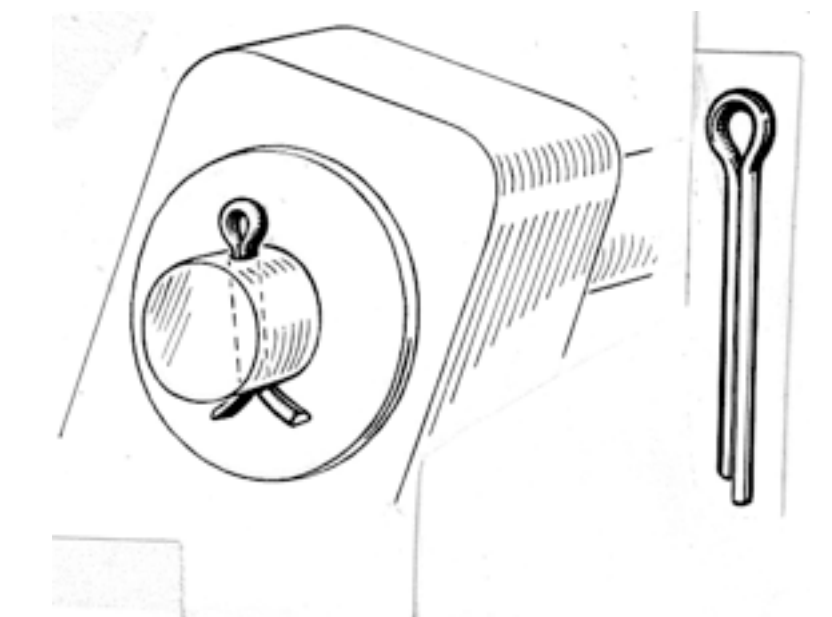
Getting to top of mast

Check for wear on halyards

Check pins and ringdings

Check for electrolysis

Check interface between hardware and hull/deck





# Standing Rigging

- Mast and Boom
- Shrouds
- Backstay
- Forestay and Roller Furler





# Standing Rigging

- Mast and Boom

- S
- B
- F





# Standing Rigging

- Mast and Boom
- Shrouds
- Backstay
- Forestay and Roller Furler





# Standing Rigging

- Mast and Boom
- Shrouds
- Backstay
- Forestay and Roller Furler



Solid vs Stranded  
Turnbuckles  
Clevis and Pin

Check interface between hardware and hull/deck  
Check for corrosion at fittings  
Check for missing/bent ringdings  
Check chainplates



# Standing Rigging

- Mast and Boom
- Shrouds
- **Backstay**
- Forestay and Roller Furler

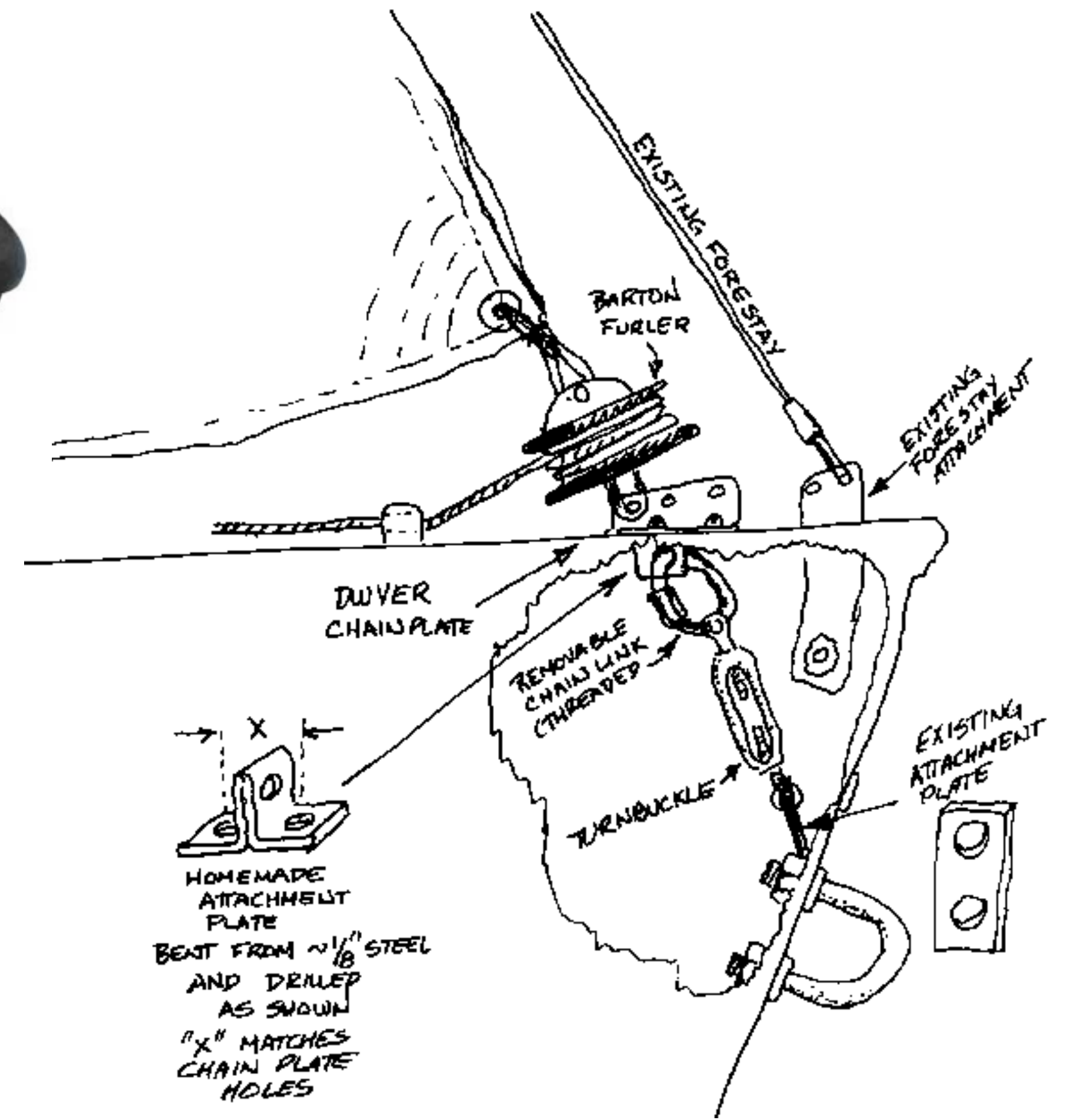
Blocks  
Hydraulic





# Standing Rigging

- Mast and Boom
- Shrouds
- Backstay
- Forestay and Roller Furler



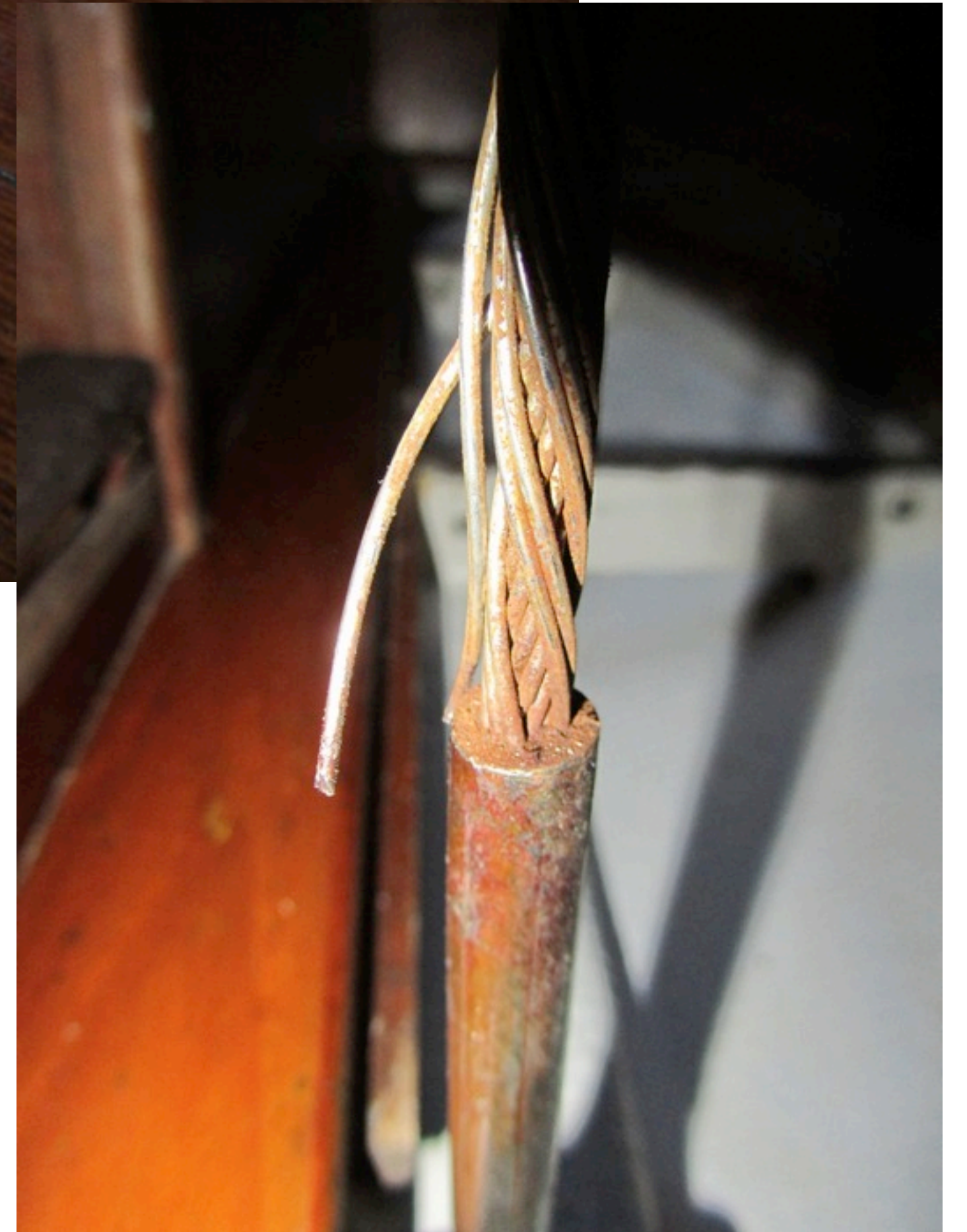
Forestay tuning  
Furler geometry  
Sail mounting



Check for missing screws  
Check for missing ringdings



# Standing Rigging





# Standing Rigging Howto

- Check cables for snarls and snaps
- Check ringdings and cotter pins
- Check for corrosion to structural elements
- Location of chainplates
- Hidden corrosion
- Look for missing screws and fasteners lying on deck/floor

# Structure

- Windows
- Deck
- Hull
- Topsides



Check for leaks with hose at dock  
Check for cracks  
Look for signs of rot (wet or dry)



# Structure

- Windows
- Deck
- Hull
- Topsides



Copyright 2015 Matthew Wall, all rights reserved

Stanchion bases

Toerail

Coamings

Wood/Glass interfaces

- Check for leaks with hose at dock
- Check for cracks
- Check for signs of hidden cracks
- Watch for rust stains
- Look for persistent mildew



# Structure

- Windows
- Deck
- Hull
- Topsides

Stanchion bases  
Toerail  
Coamings  
Wood/Glass interfaces



Check for leaks with hose at dock  
Check for cracks  
Check for signs of hidden cracks  
Watch for rust stains  
Look for persistent mildew





# Structure

- Windows
- Deck
- Hull
- Topsides



Check base of mast  
Check wood/steel/glass interfaces



# Structure

- Windows
- Deck
- Hull
- Topsides



Copyright 2015 Matthew Wall, all rights reserved

Waterline

Below waterline

Inside and outside

Integrity of prop skeg



# Structure

- Windows
- Deck
- Hull
- Topsides

Watch for blisters

Look for extreme critter growth

Look for signs of leaks/seeps





# Structure

- Windows
- Deck
- Hull
- Topsides





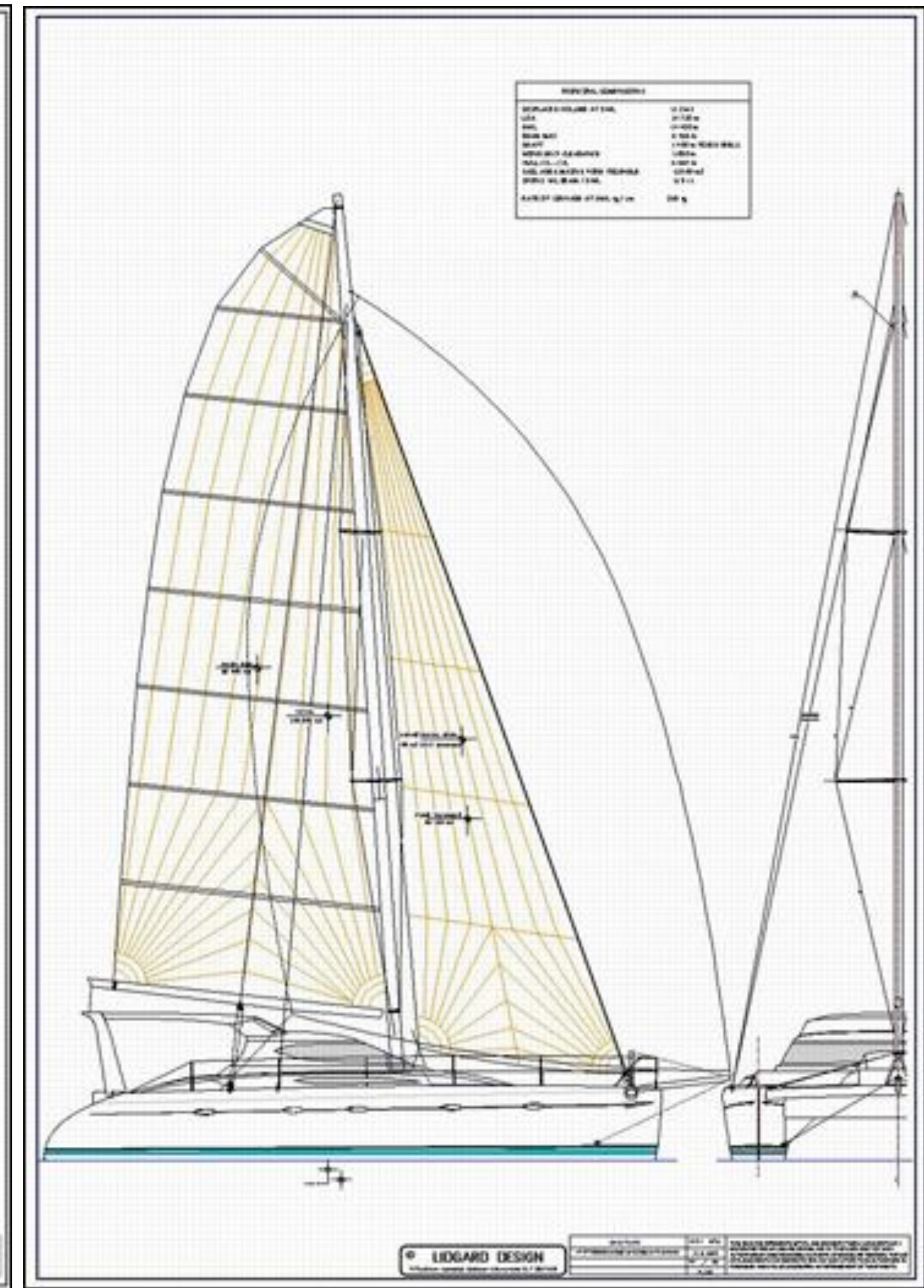
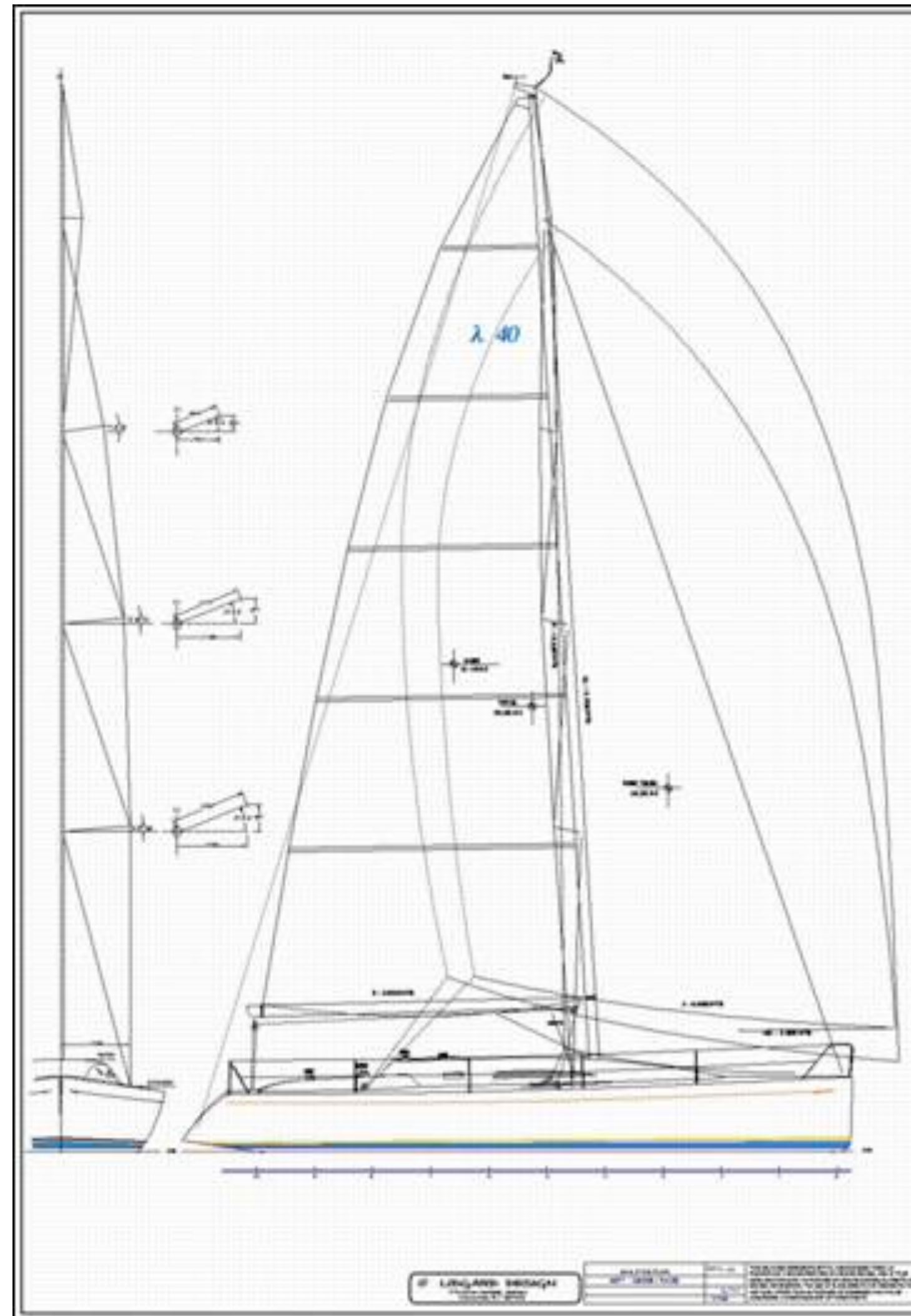
# Structure Howto

- Use your nose - mildew, rot
- Feel for soft spots
- Look for signs of water ingress
- Look for cracks and patches
- Beware of fresh paint

# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer

Main Sail  
Jib/Genoa  
Spinnaker  
Sail attachment  
Sail controls

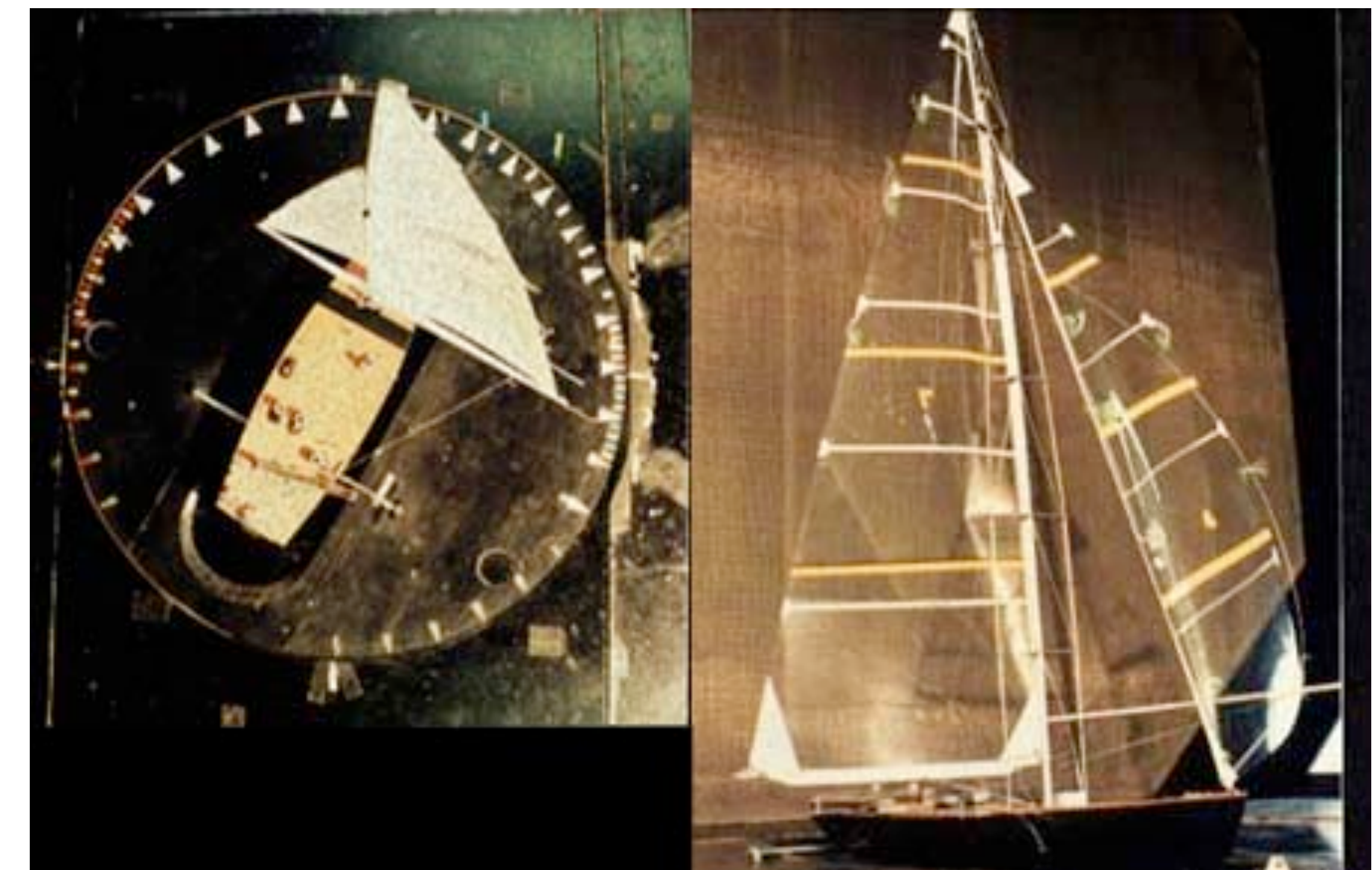




# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer

Main Sail  
Jib/Genoa  
Spinnaker  
Sail attachment  
Sail controls





# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer

Main Sail

Jib/Genoa

Spinnaker

Sail attachment

Sail controls

Check for sail wear

Tape tears/wear until proper repair





# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer

Single vs Split for Jib  
Direct vs blocks





# Running Rigging

- Sails
- Sheets
- **Blocks**
- Winches
- Traveler
- Preventer



Stand-up  
Cheek  
Floating

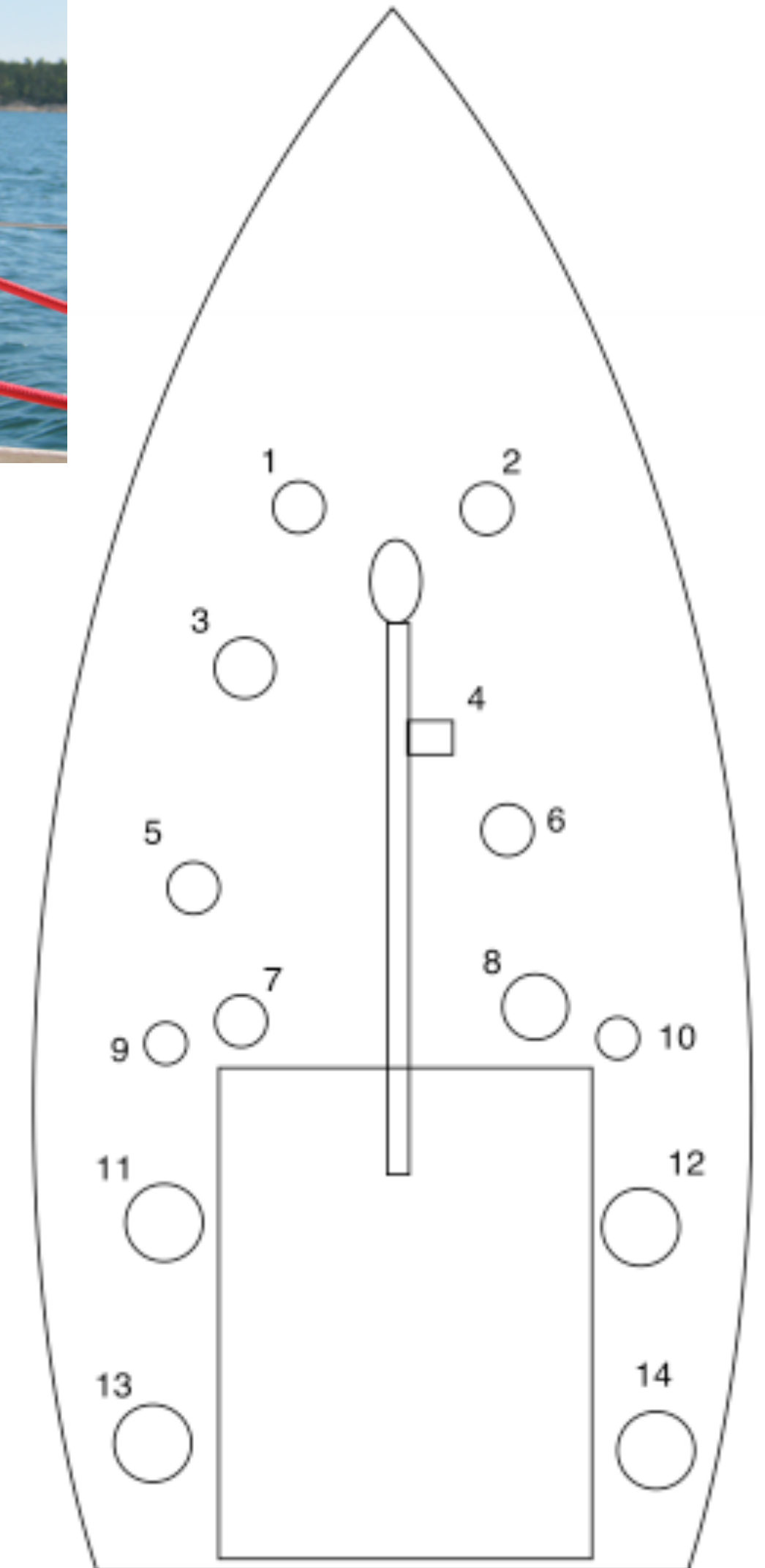
Check for jammed bearings  
Check for wear on shiv



# Running Rigging

- Sails
- Sheets
- Blocks
- **Winches**
- Traveler
- Preventer

Mast/Boom vs Deck  
Size, Speed  
Rachets, Self-tailing  
Winch Handles



Clean annually  
Check for wear  
Check tailer feed  
Dispose of worn winch handles



# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer

Cockpit bench  
Transom  
Companionway



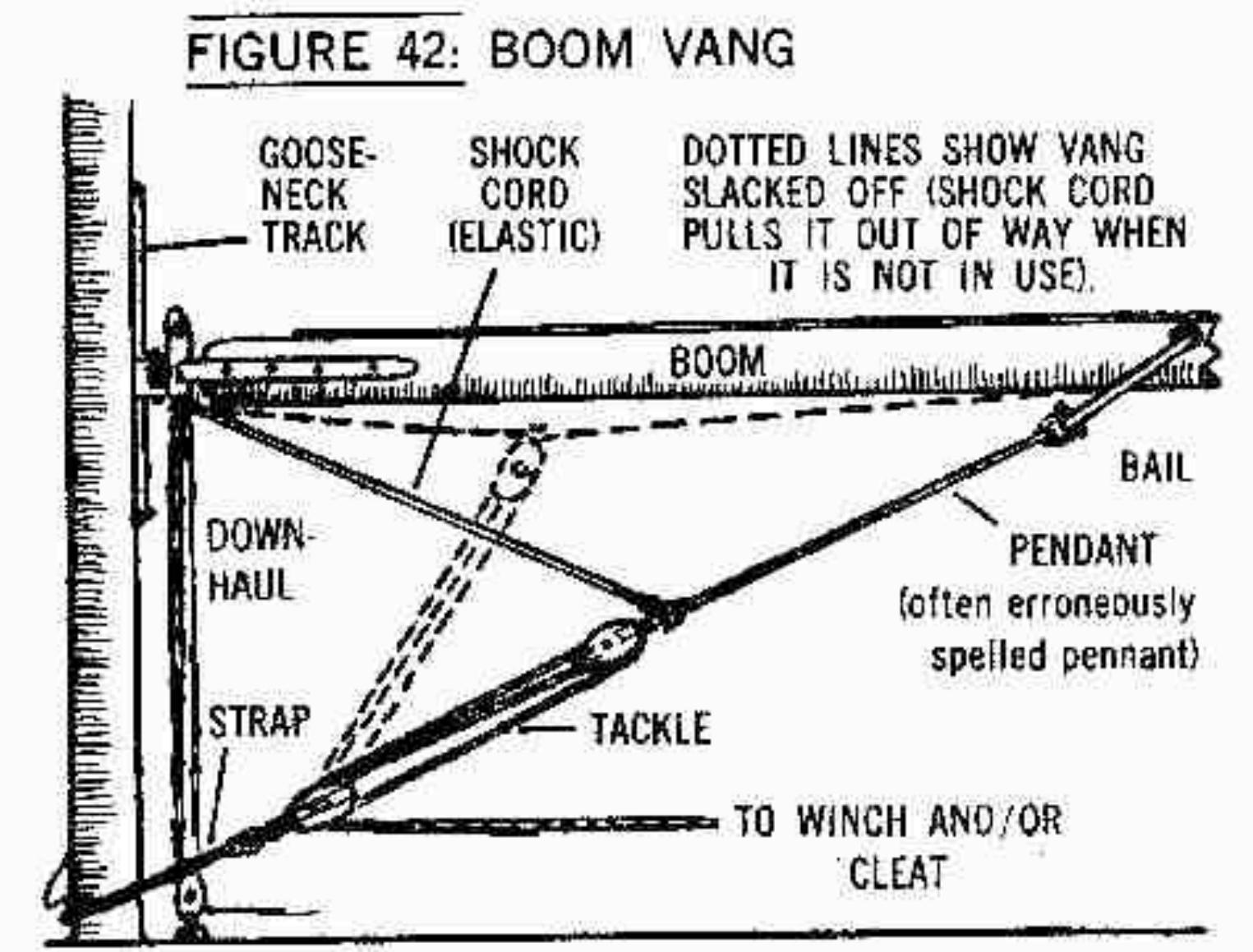
Check for worn cleats  
Check blocks and line  
Check mounting points





# Running Rigging

- Sails
- Sheets
- Blocks
- Winches
- Traveler
- Preventer



NOTE: THIS TYPE OF VANG REQUIRES A VERY STRONG GOOSENECK WHOSE TRACK SHOULD BE BOLTED TO MAST. BOATS WITH LIGHT ALUMINUM BOOMS REQUIRE GREATER USE OF THE VANG.

Preventer  
Vang  
Come-Along



- Check for wear
- Check for bent cheeks
- Check for broken springs and worn grips



# Running Rigging: Spinnaker Pole





# Rigging Howto

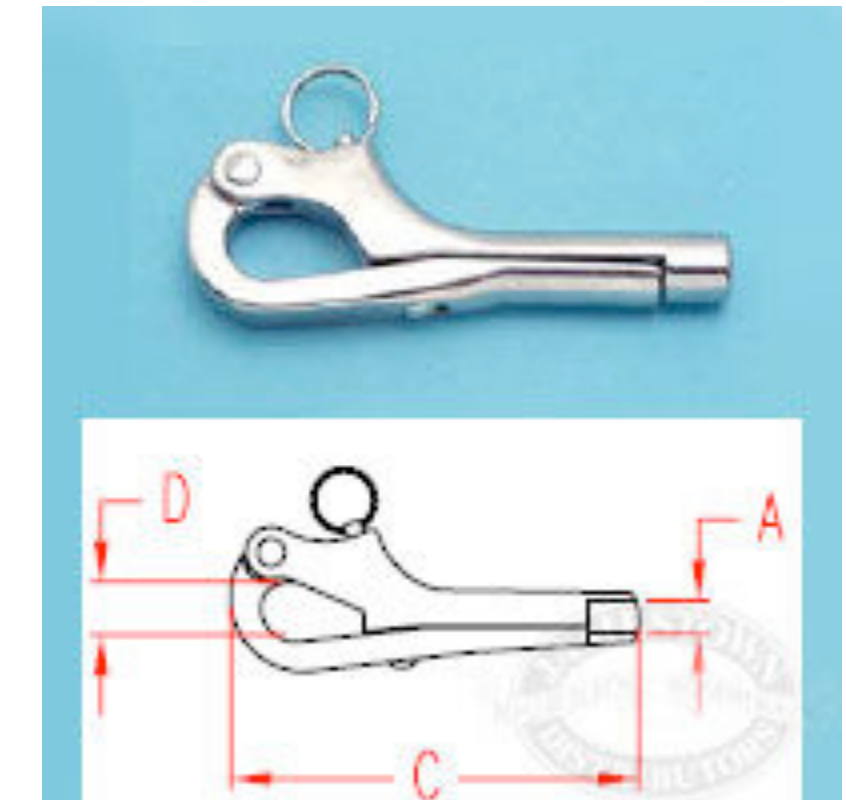
- Trim the sails
- Tune the sails
- Tune the rig
- Reef the main
- Adjust the backstay
- Adjust the boom vang

# Hardware

- Stanchions and Life Lines
- Hatches
- Companionway Boards
- Anchor
- Shackles
- Cleats



Solid vs Stranded  
Coated vs Bare  
Thu-hull vs Toe-Rail  
Aluminum vs Stainless  
Gate hardware  
Turnbuckles  
Tethers

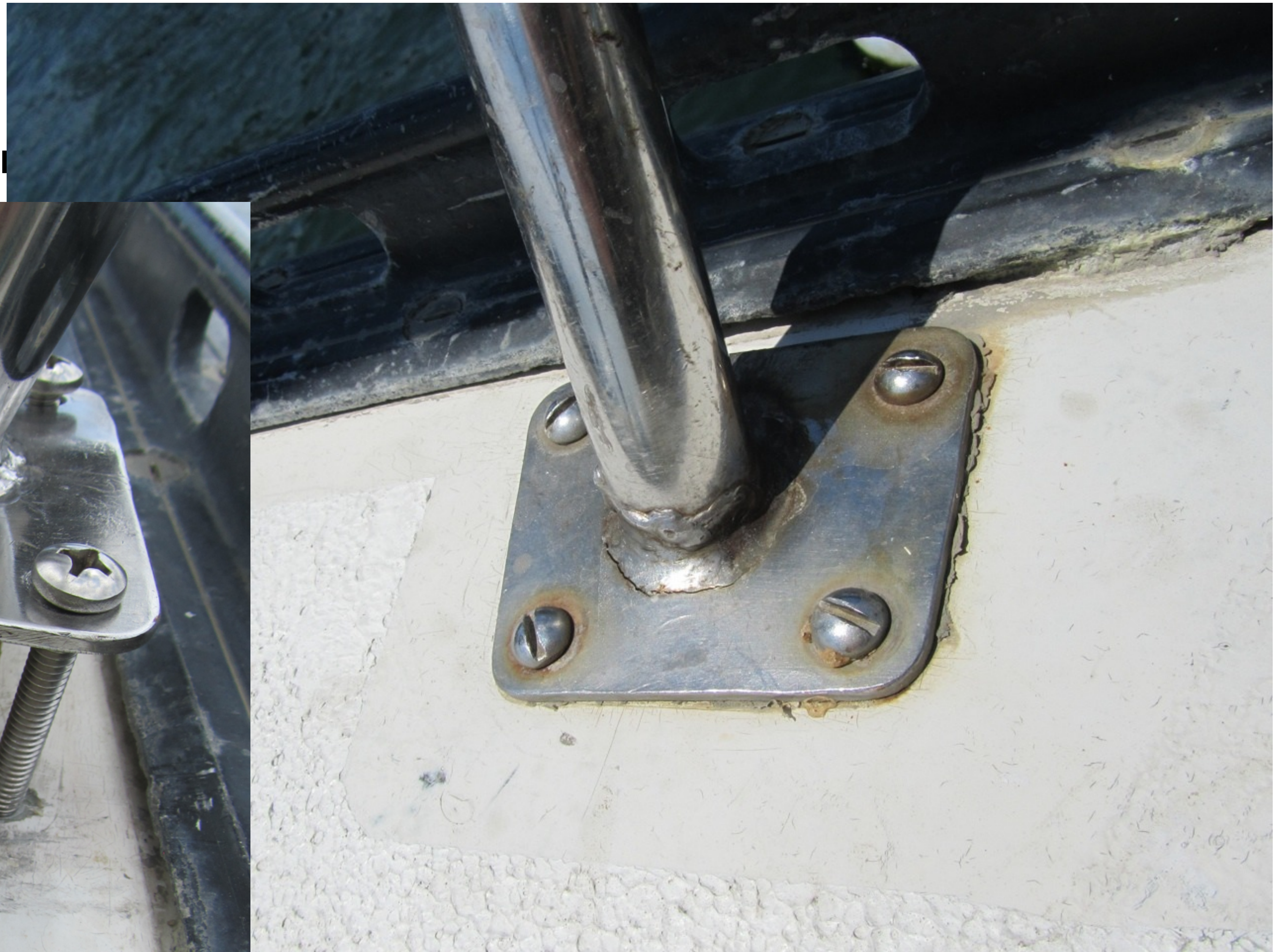


Check for missing ring-dings  
Check tension  
Check stanchion bases



# Hardware

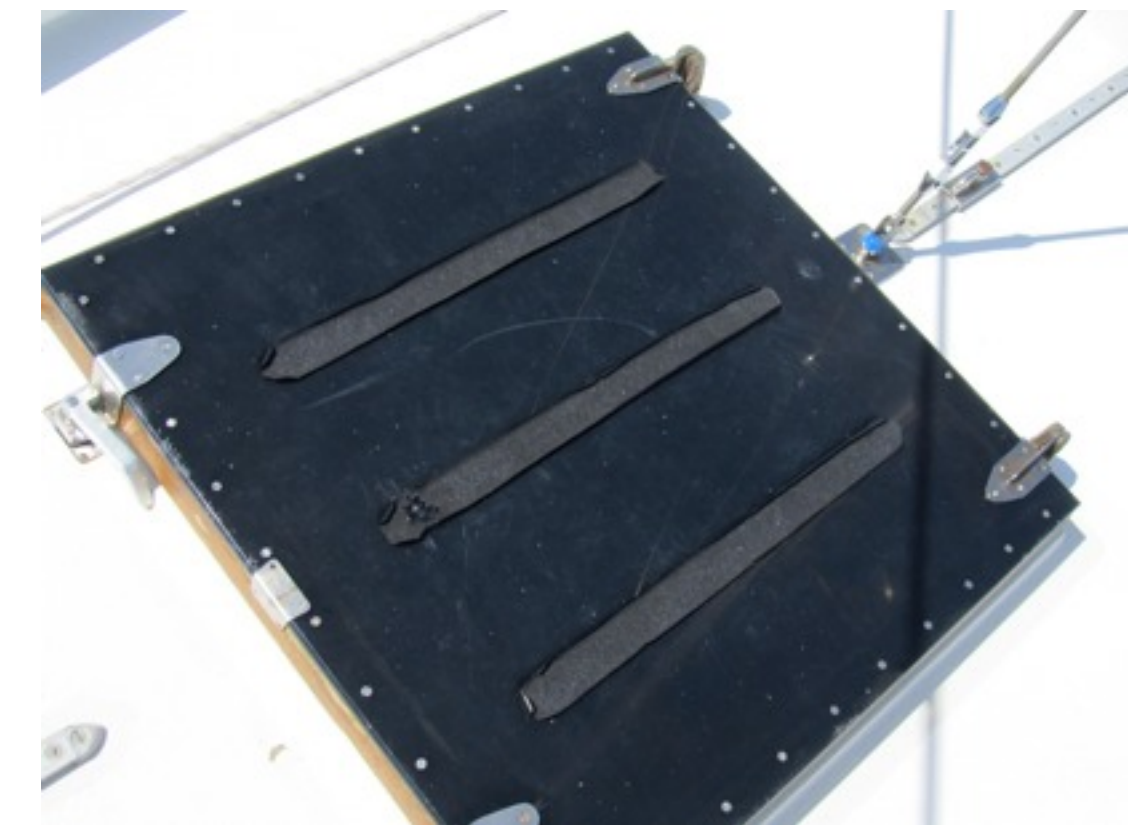
- Stanchions and





# Hardware

- Stanchions and Life Lines
- Hatches
- Companionway Boards
- Anchor
- Shackles
- Cleats



## Closures

Props

Seals

Screen attachment

Locking mechanism

Check for wear  
Check seals  
Crackle

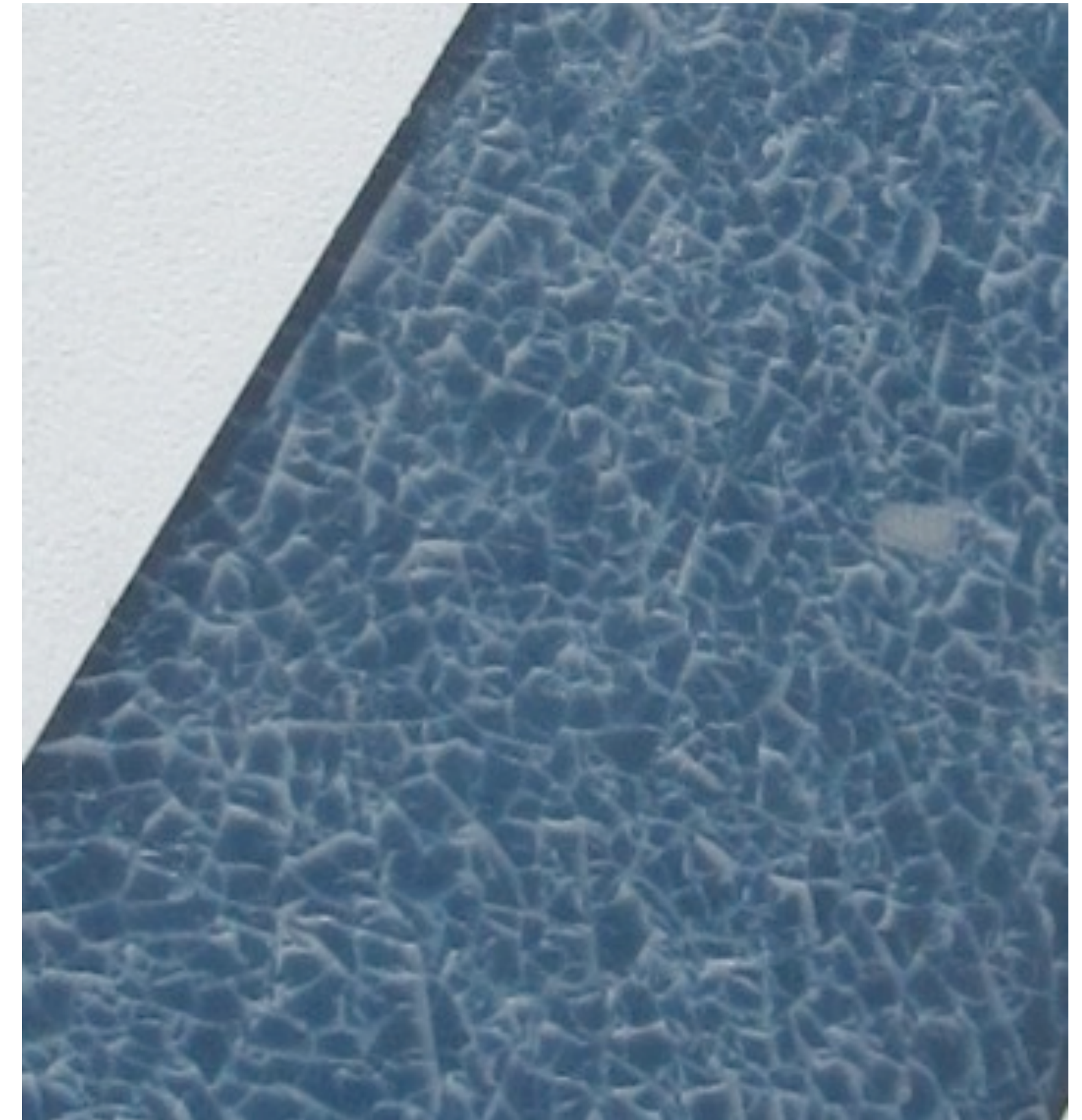


# Hardware

- Stanchions and Life Lines
- Hatches
- **Companionway Boards**
- Anchor
- Shackles
- Cleats



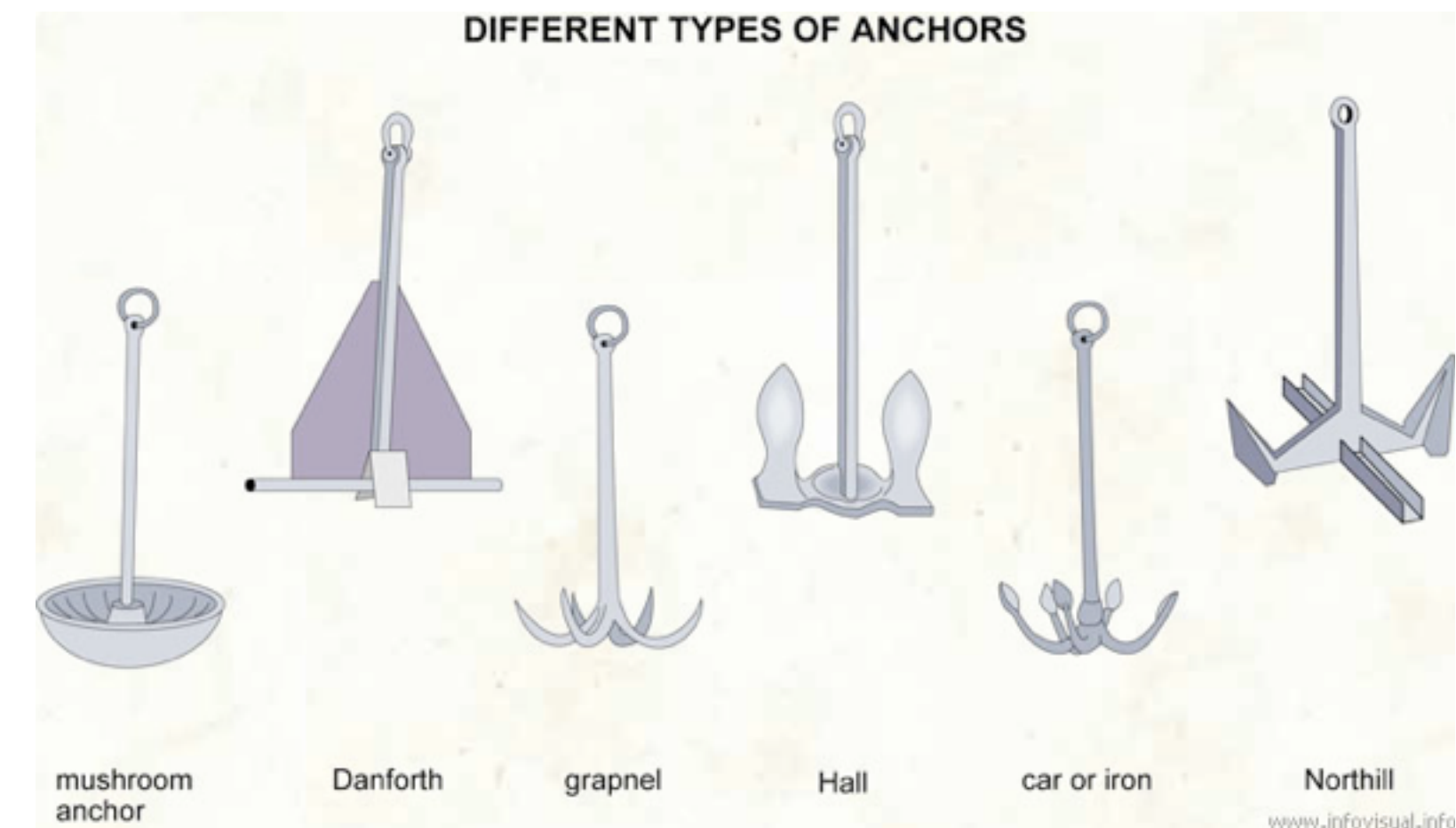
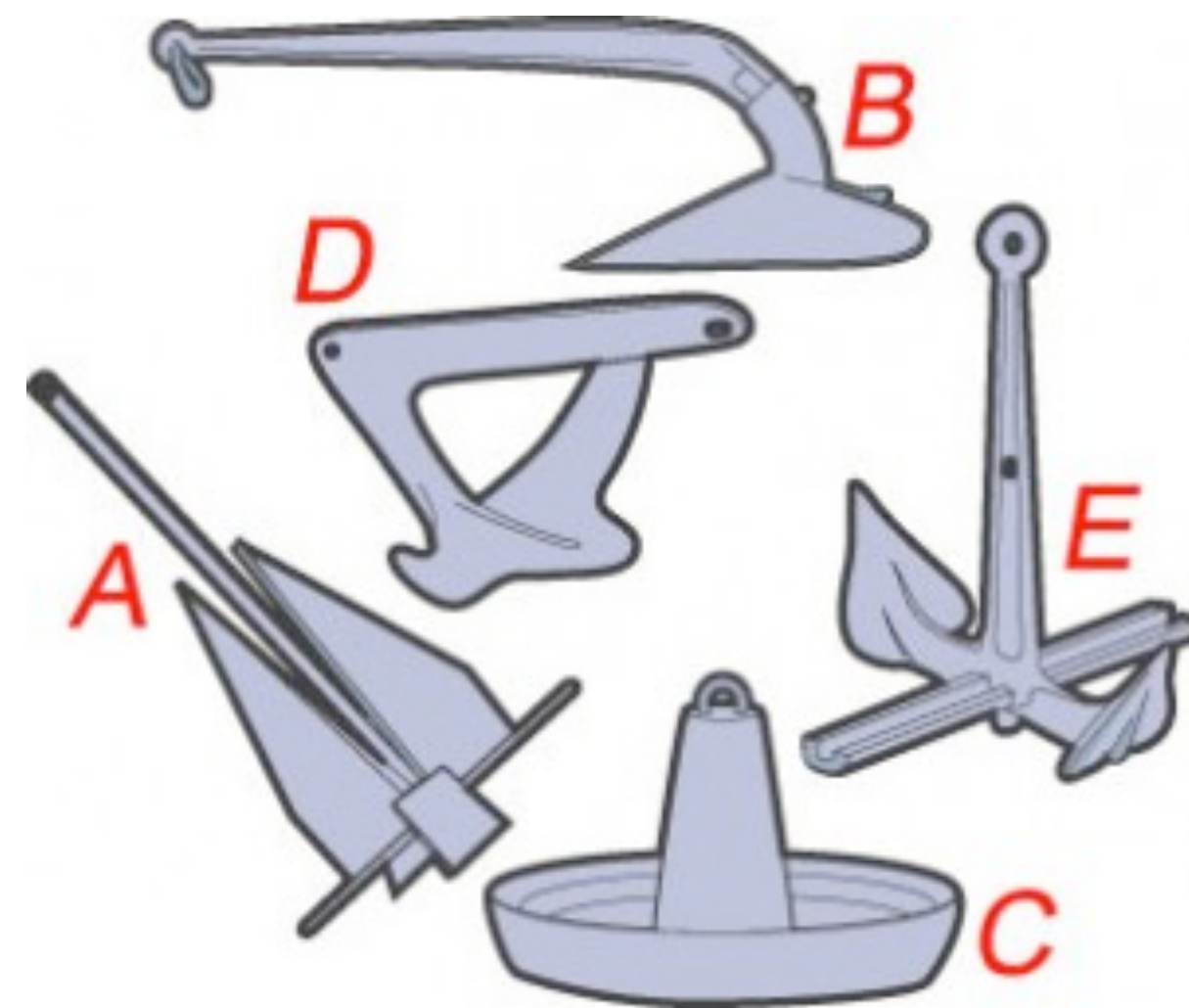
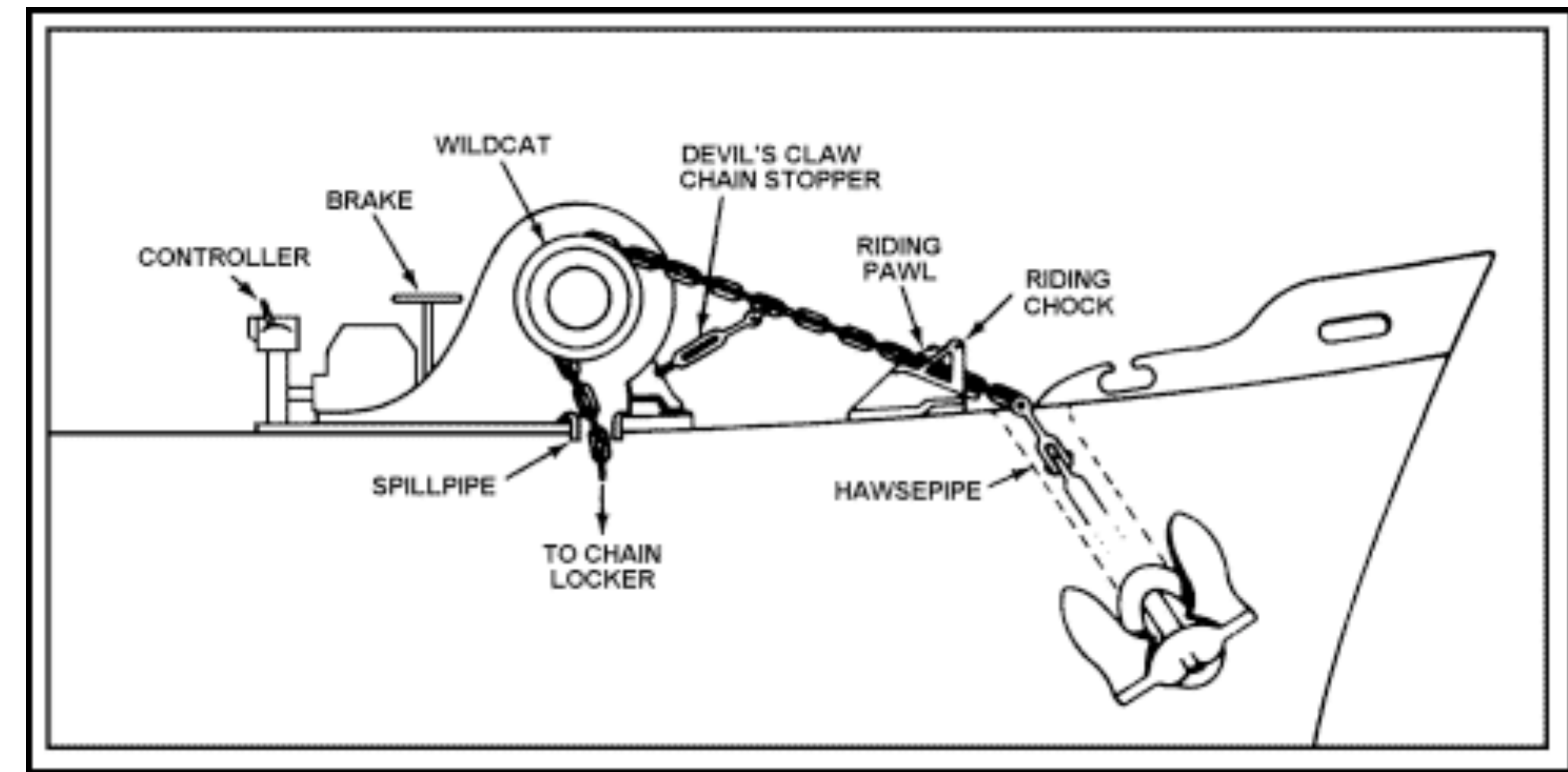
Screen  
Locking





# Hardware

- Stanchions and Life Lines
- Hatches
- Companionway Boards
- Anchor
- Shackles
- Cleats



- Types
- Location
- Deployment
- Configurations
- Windlass

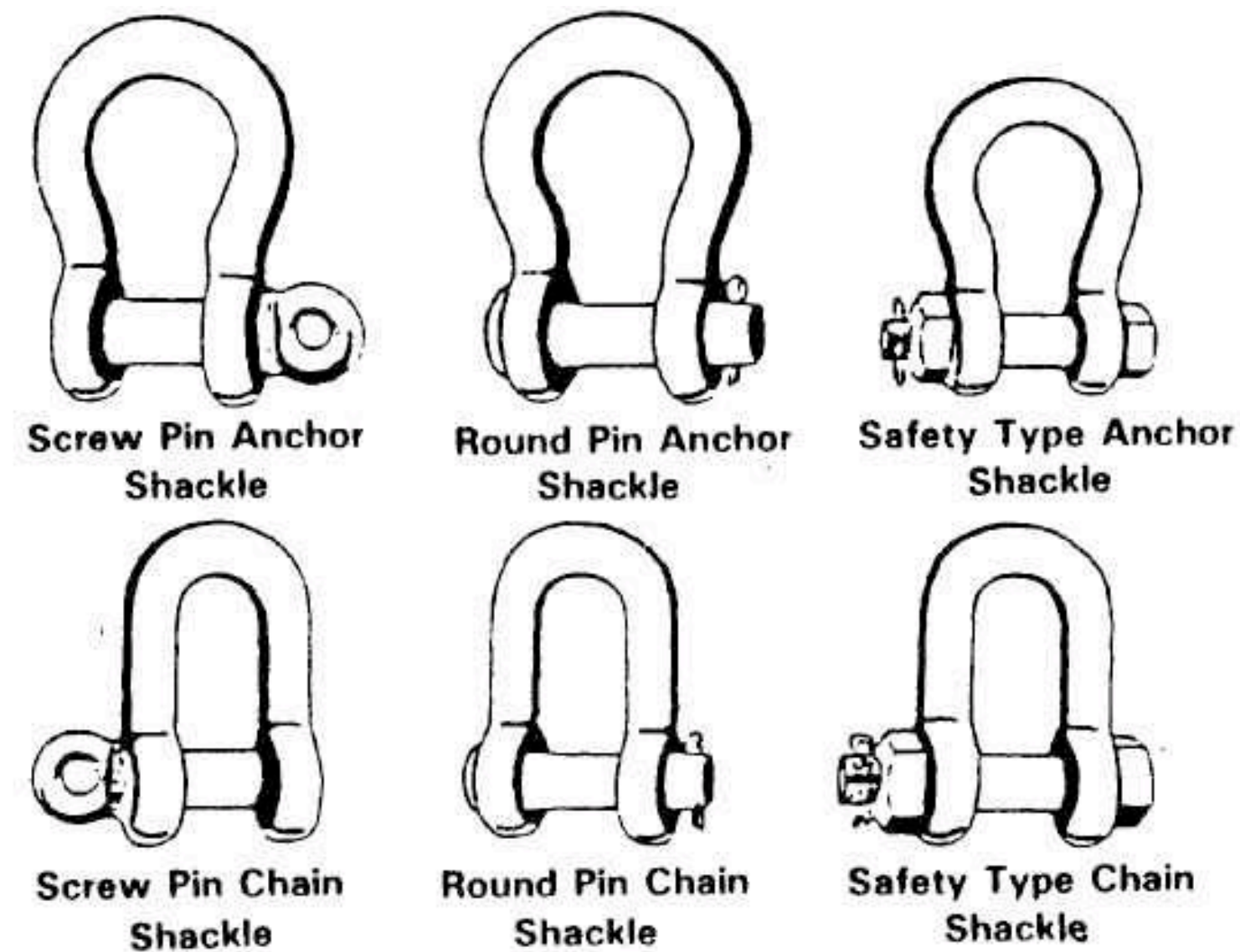
Service shackles  
 Ensure rode is attached  
 Ensure marks along rode  
 Ensure multiple anchors  
 Windlass breaker and location



# Hardware

- Stanchions and Life Lines
- Hatches
- Companionway Boards
- Anchor
- Shackles
- Cleats

Screw-in  
Snap Shackle  
180 degree turn  
Pin and Ringding

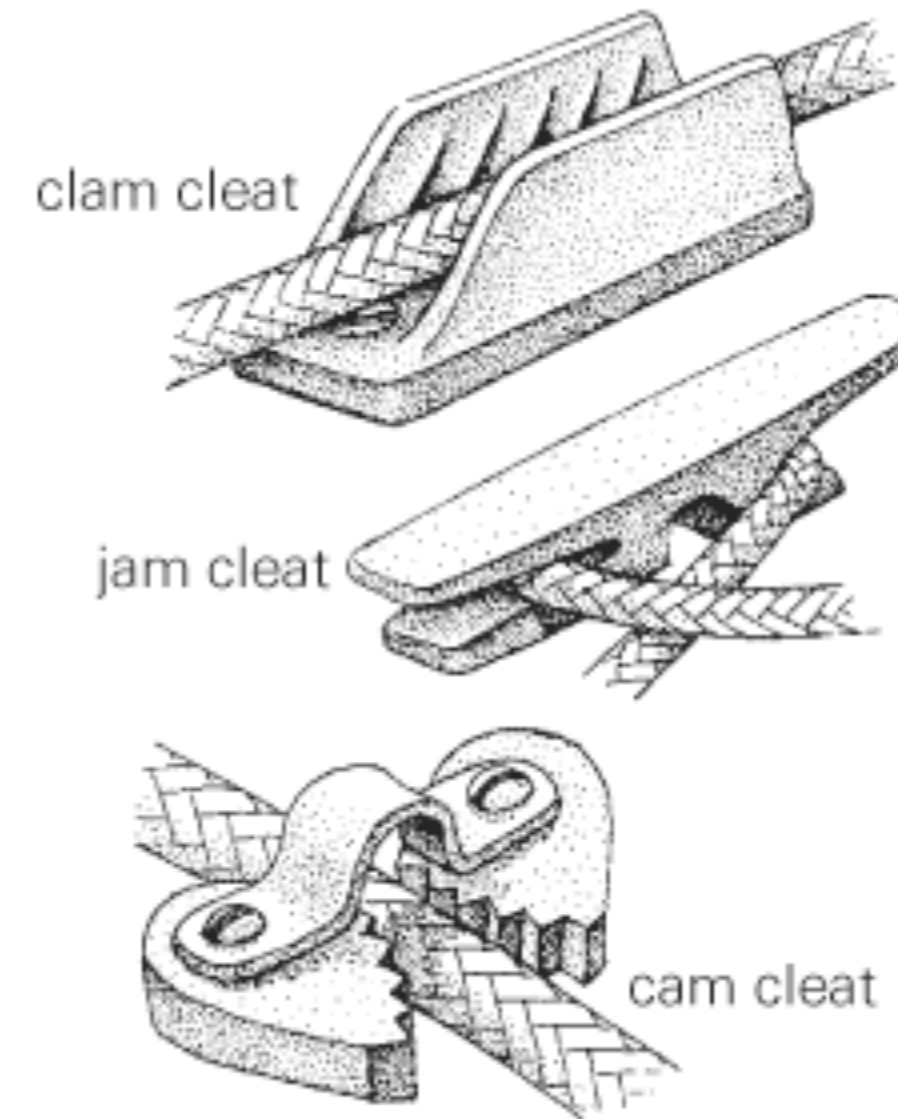




# Hardware

- Stanchions and Life Lines
- Hatches
- Companionway Boards
- Anchor
- Shackles
- Cleats

Horn  
Cam  
Clam  
Jam  
Chocks



Check cam cleat springs  
Check cam/jam grips



# Hardware

- Thru-hulls



Types  
Locations



Ensure that thru-hull valves work  
Ensure wood plugs near each thru-hull  
Ensure mallet/hammer is aboard

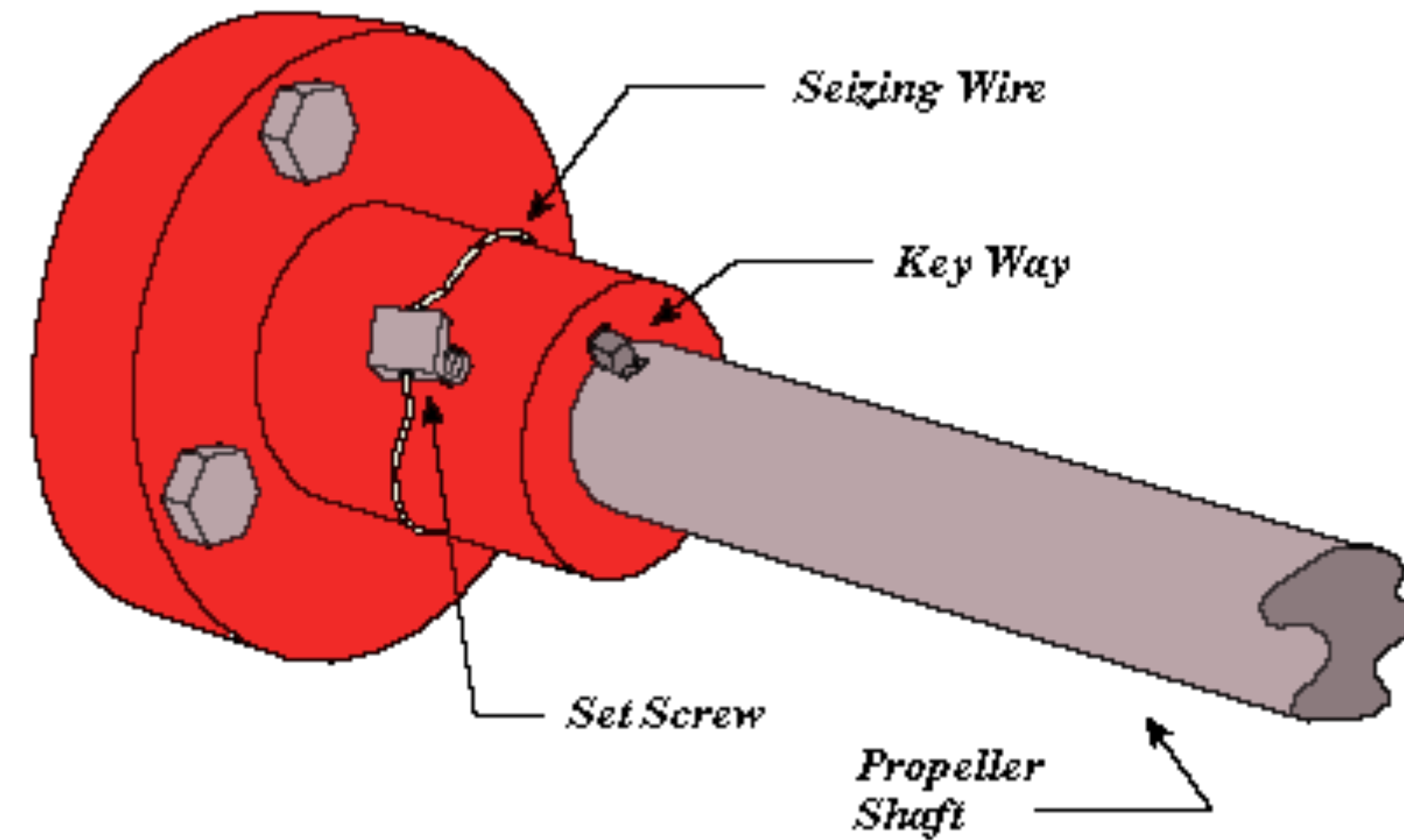


# Hardware Howto

- Tune life lines
- Deploy fenders
- Deploy tethers
- Deploy anchor - single, double, bow-stern
- Splice eye in rode end
- Rebuild cam cleat
  
- Check for cracks



# Power-train Schematic



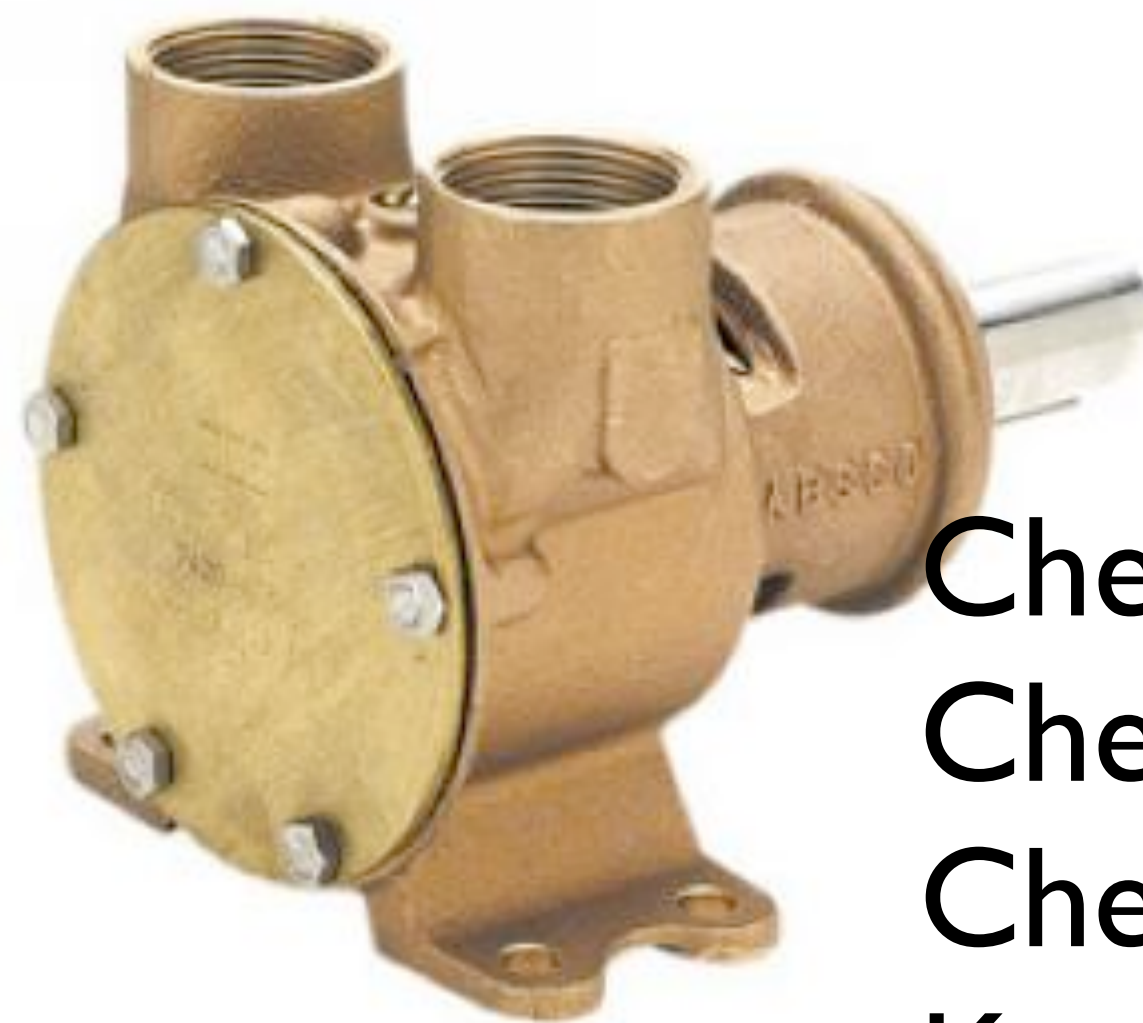
*Fig. 1 The coupler is attached to the rear of the transmission*



# Power-train

- Engine
- Transmission
- Exhaust
- Alternator
- Batteries

- Coolant
- Oil
- Fuel
- Stop Cable
- Seawater Strainer
- Oil Filter
- Water Separator
- Fuel Filter



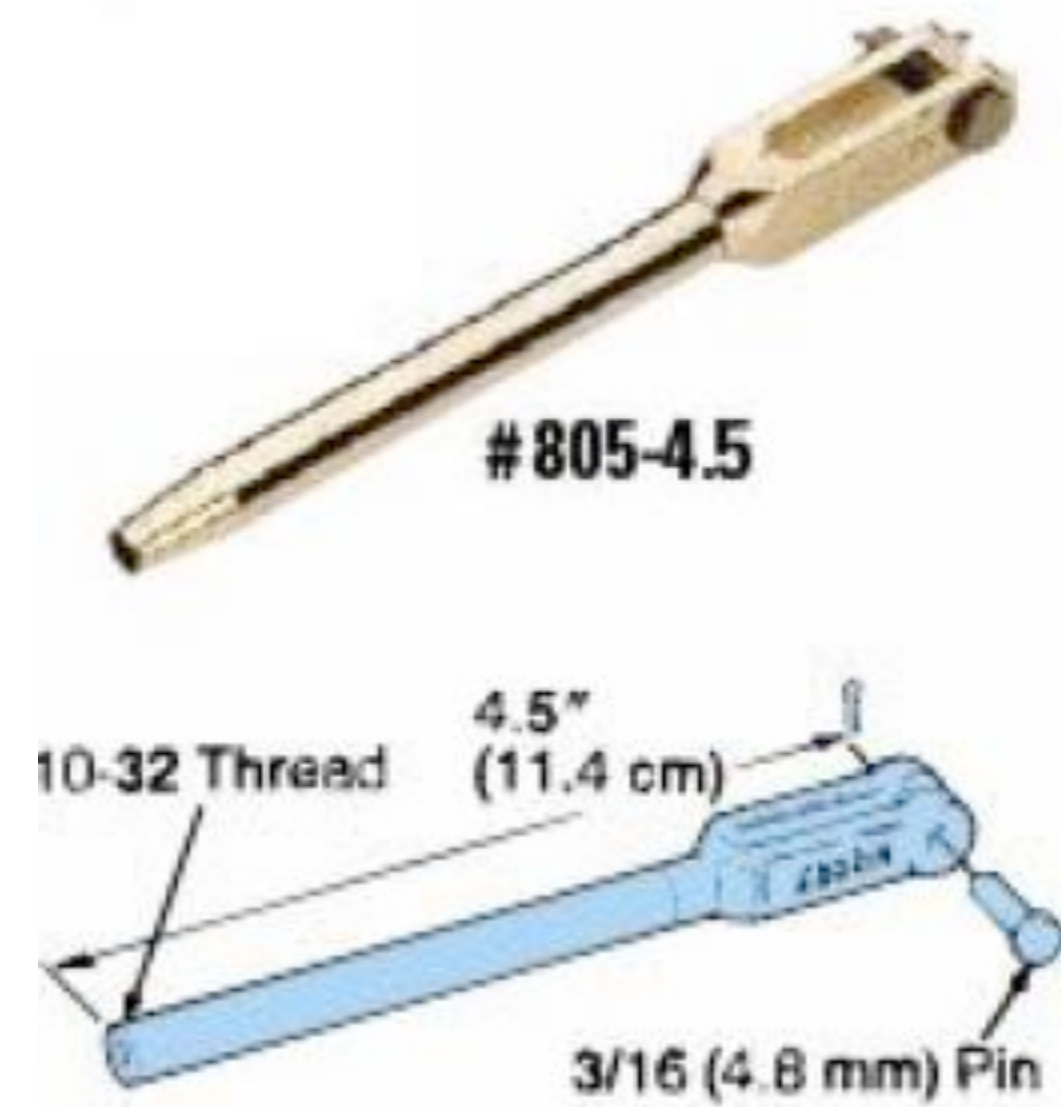
Check coolant levels  
Check oil before starting  
Check strainers  
Keep a service log  
Spare parts - impeller, belts,  
wire, clamps, filters, strainers



# Power-train

- Engine
- Transmission
- Exhaust
- Alternator
- Batteries

- Coupling
- Stuffing Box
- Cutlass Bearing
- Propeller
- Transmission Fluid
- Control Cable



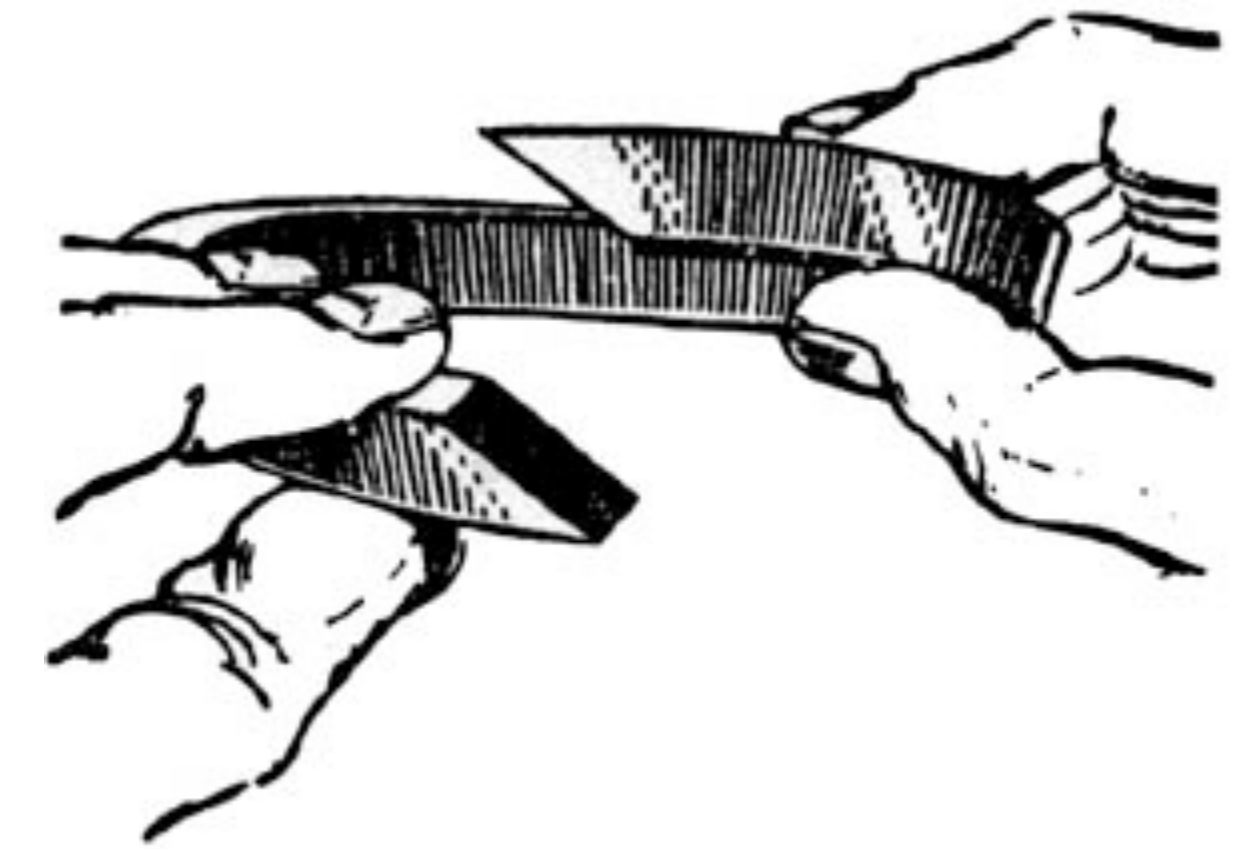
One drip per minute when idle is ok  
Less than 1/32" shaft play at cutlass  
Antifouling for prop  
Feathering props



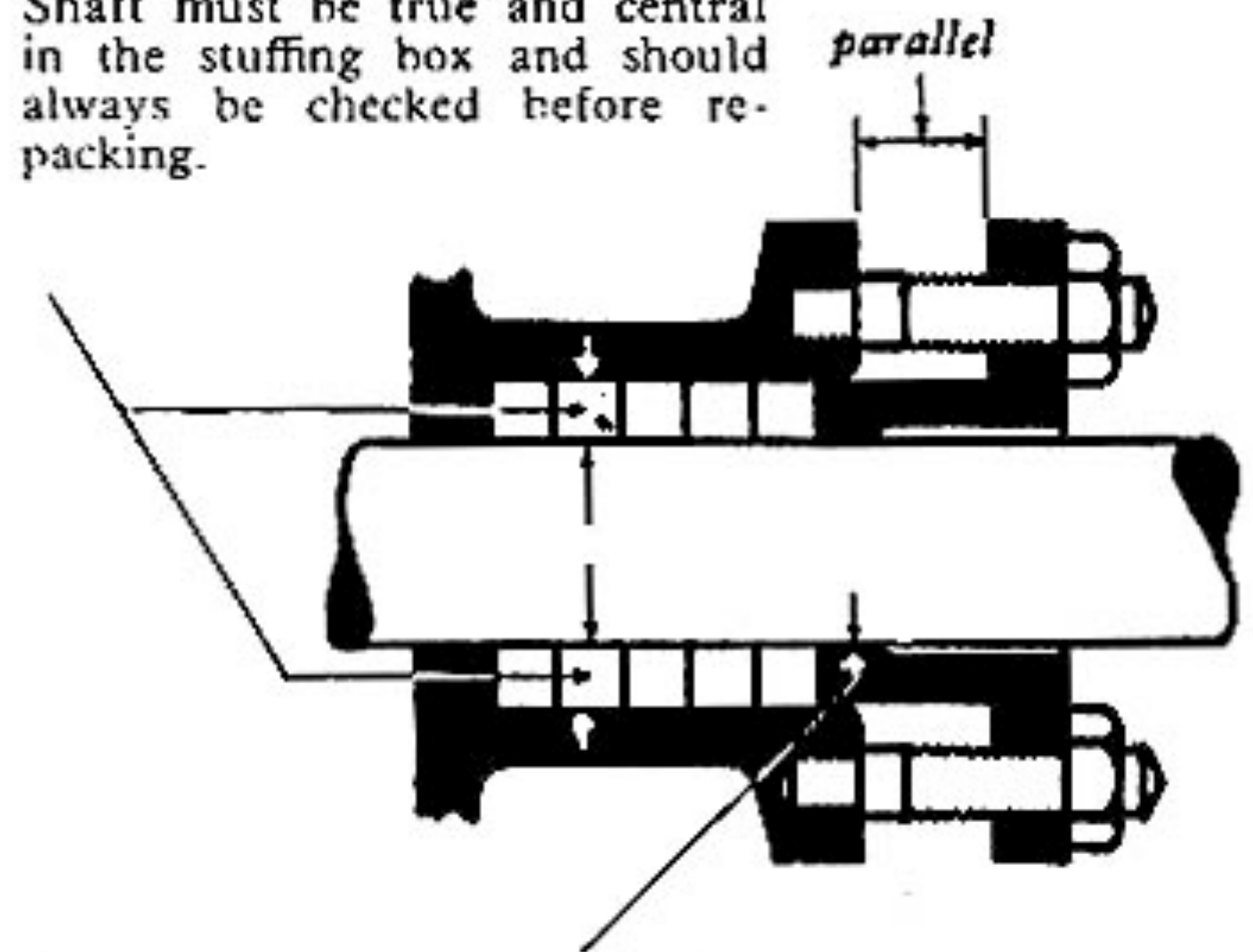
# Power-train

- Engine
- Transmission
- Exhaust
- Alternator
- Batteries

Coupling  
Stuffing Box  
Cutlass Bearing  
Propeller  
Transmission Fluid  
Control Cable



Shaft must be true and central in the stuffing box and should always be checked before re-packing.



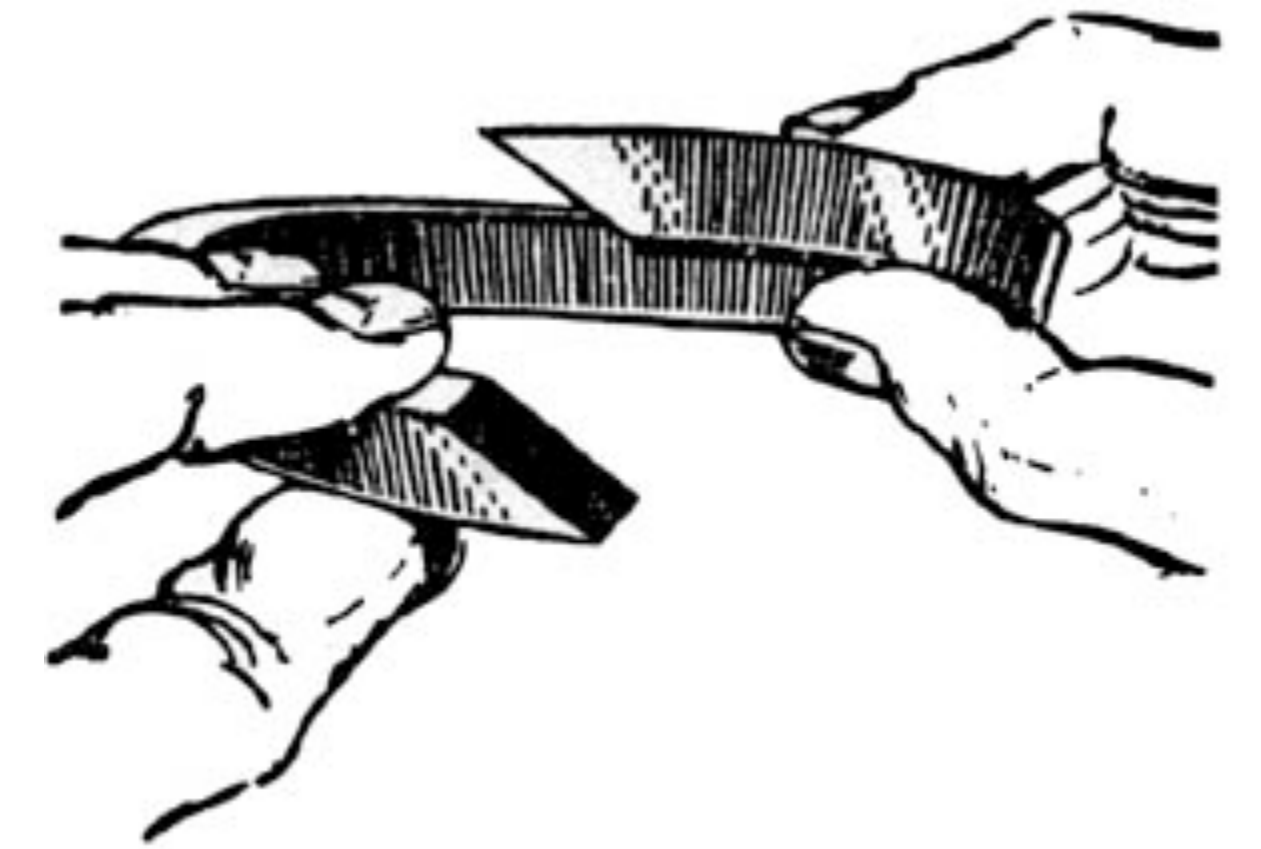
Equal clearance all round the shaft should be checked with feelers. The diametrical clearance in the gland bore should be not less than 1/32" (1/64" all round).



# Power-train

- Engine
- **Transmission**
- Exhaust
- Alternator
- Batteries

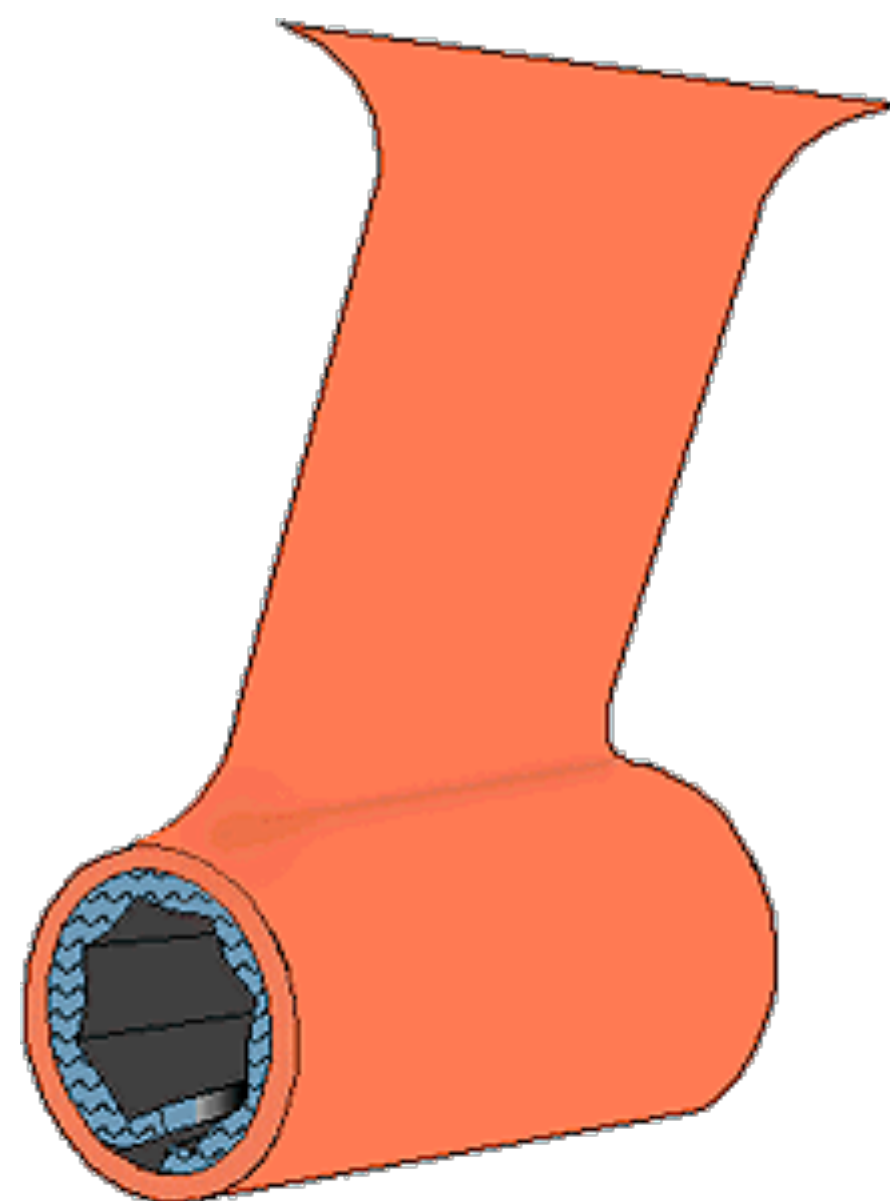
Coupling  
**Stuffing Box**  
Cutlass Bearing  
Propeller  
Transmission Fluid  
Control Cable



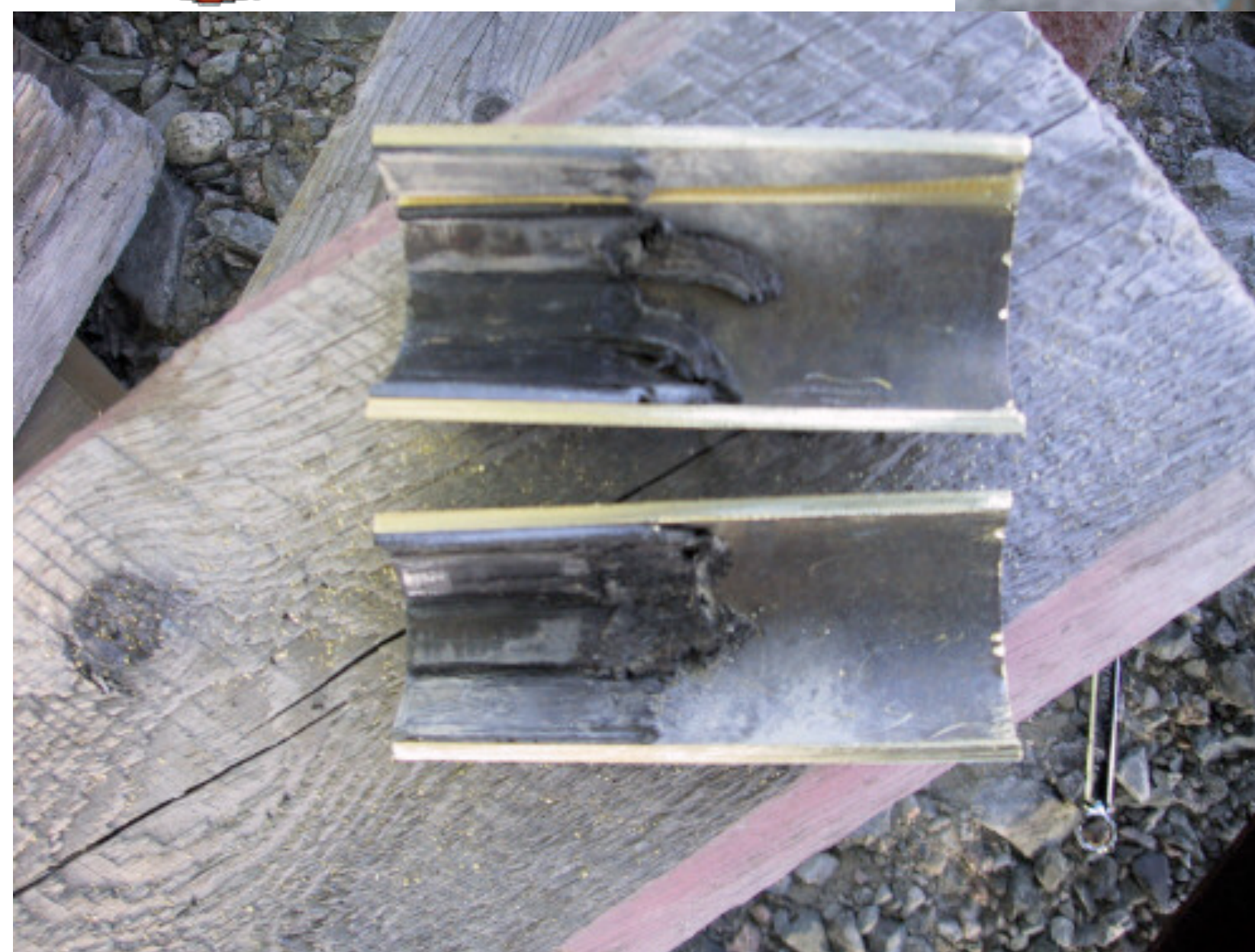


# Power-train

- Engine
- Transmission
- Exhaust
- Alternator
- Batteries



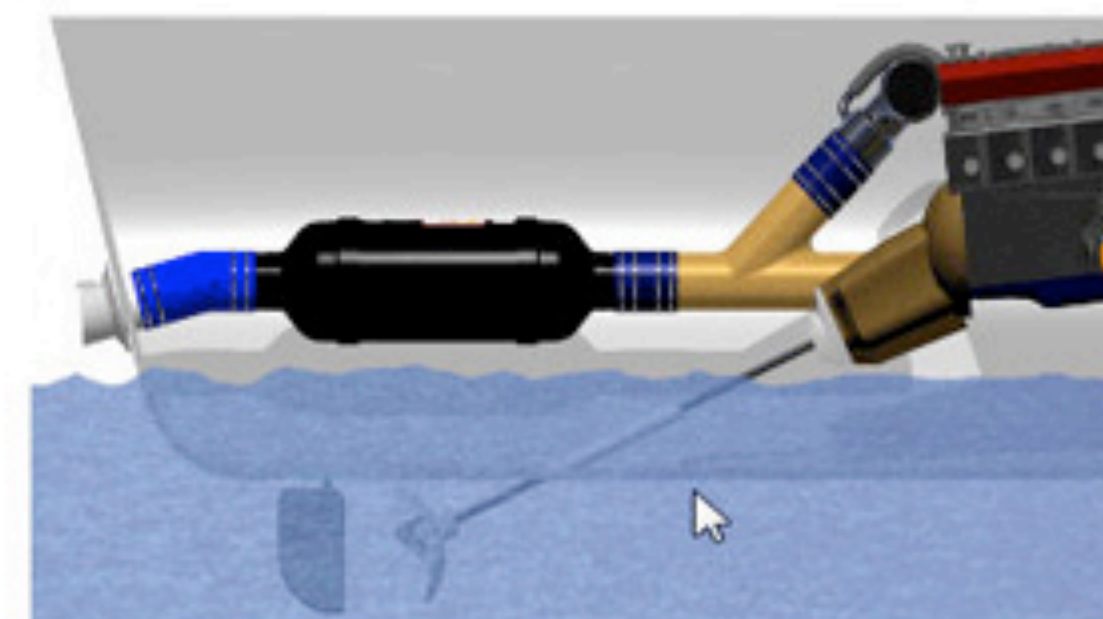
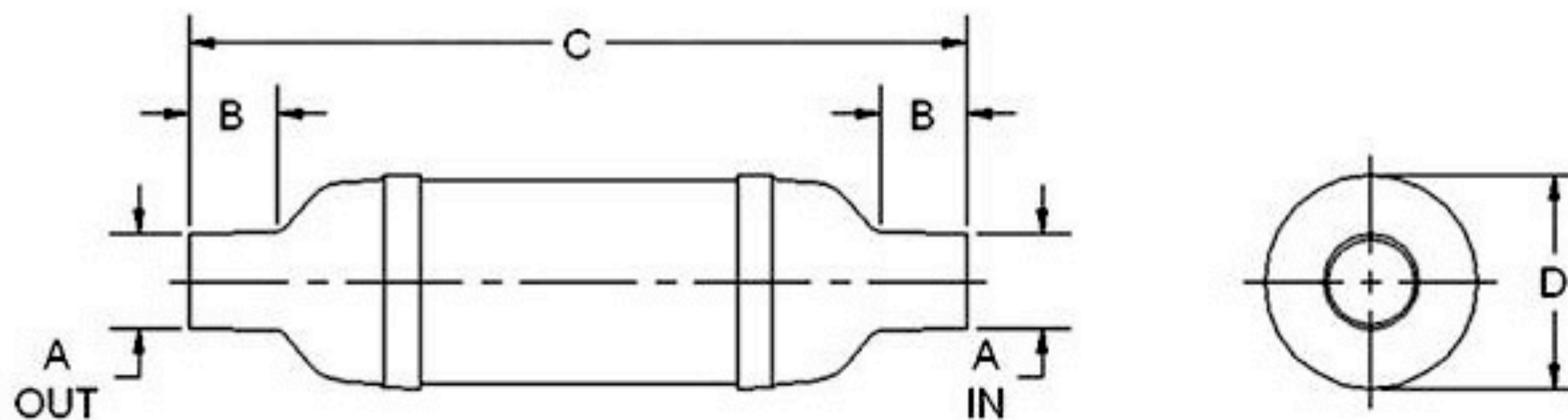
Coupling  
Stuffing Box  
Cutlass Bearing  
Propeller  
Transmission Fluid  
Control Cable





# Power-train

- Engine
- Transmission
- **Exhaust**
- Alternator
- Batteries



Thru-Hulls  
Seacocks  
Insulation  
Obstructions  
Backpressure

Check thru-hulls (in and out)  
Check for water at engine startup  
When engine does not start, do not keep trying



# Power-train

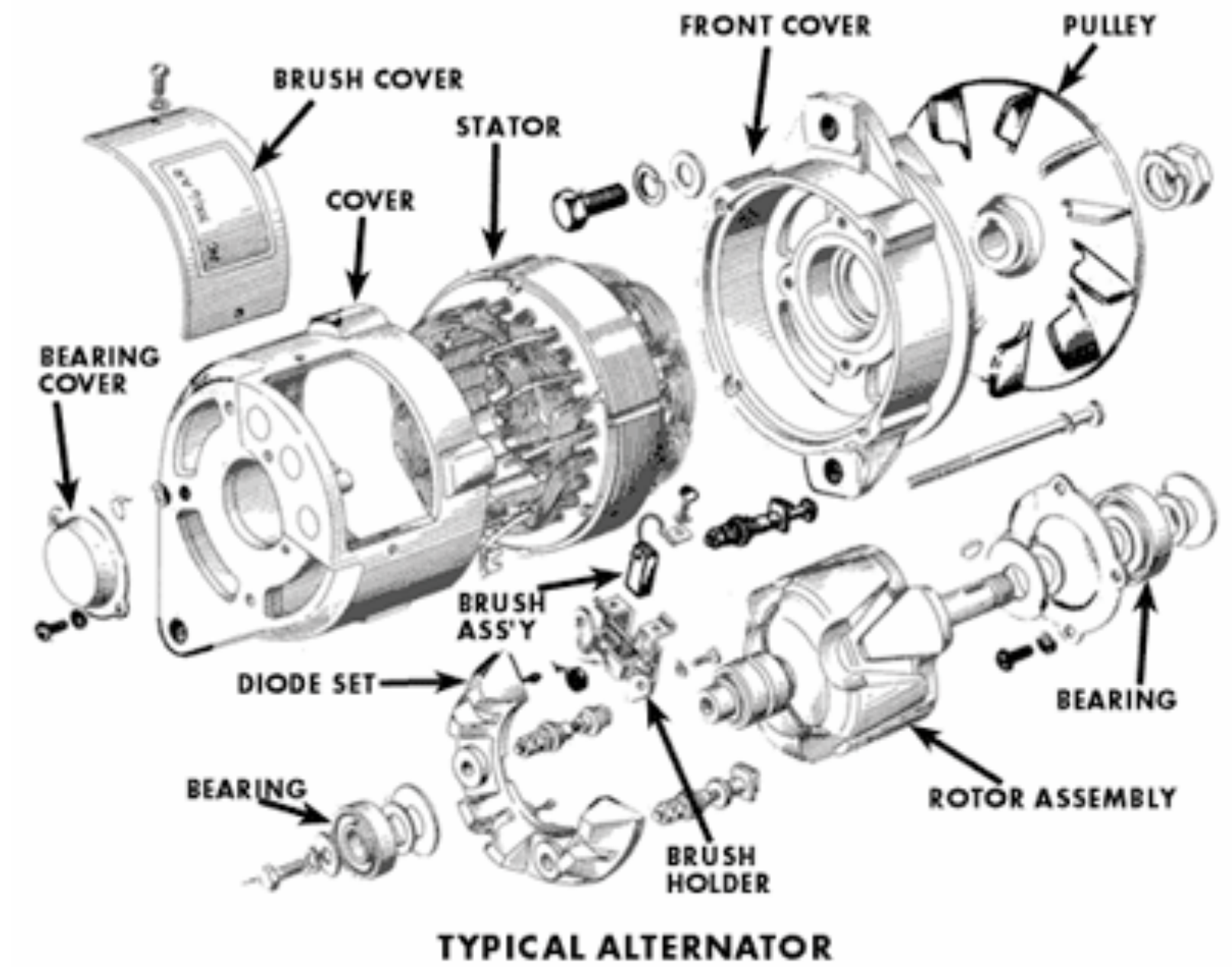
- Engine
- Transmission
- Exhaust
- Alternator
- Batteries





# Power-train

- Engine
- Transmission
- Exhaust
- **Alternator**
- Batteries





# Power-train

- Engine
- Transmission
- Exhaust
- Alternator
- **Batteries**

Wiring  
Temperatures  
Types



# Power-train Howto

- Start/Stop engine
- Transmission forward/neutral/reverse
- Check oil/coolant
- Check exhaust and seawater cooling
- Check seawater strainer
- Check impeller
- Adjust stuffing box compression
  
- Charge batteries/refrigeration
- Start/Stop generator



# Steering

- Helm
- Rudder
- Auto-pilot



Wheel  
Tiller  
Dual Wheel

Test for backlash  
On catamarans check tie bar and rod-ends



# Steering

- Helm
- Rudder
- Auto-pilot





# Steering

- Helm
- Rudder
- Auto-pilot



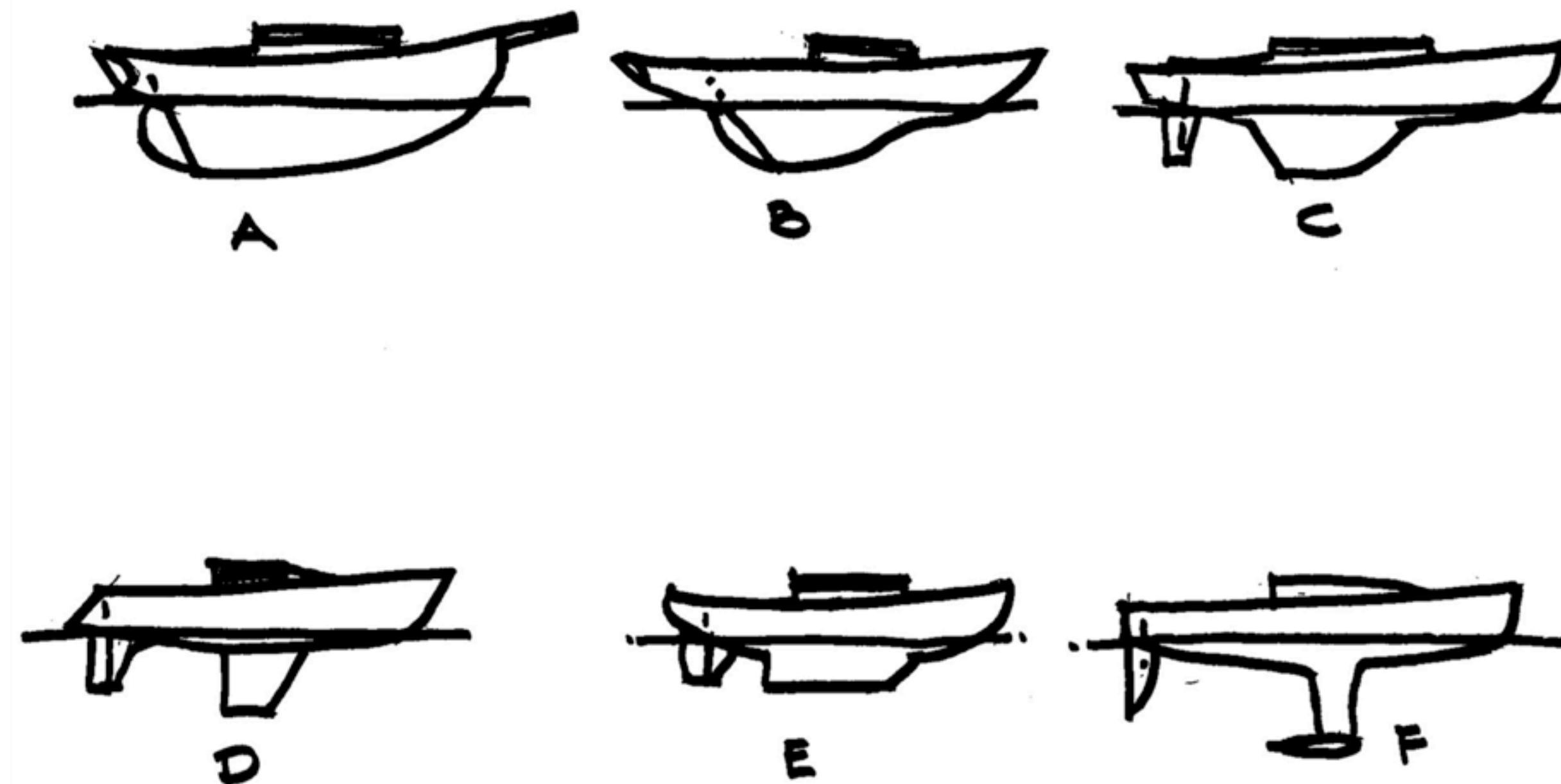
Look for broken wires  
Check for improper wear on pulleys



# Steering

- Helm
- Rudder
- Auto-pilot

Fin  
Fin-with-strut  
Keel

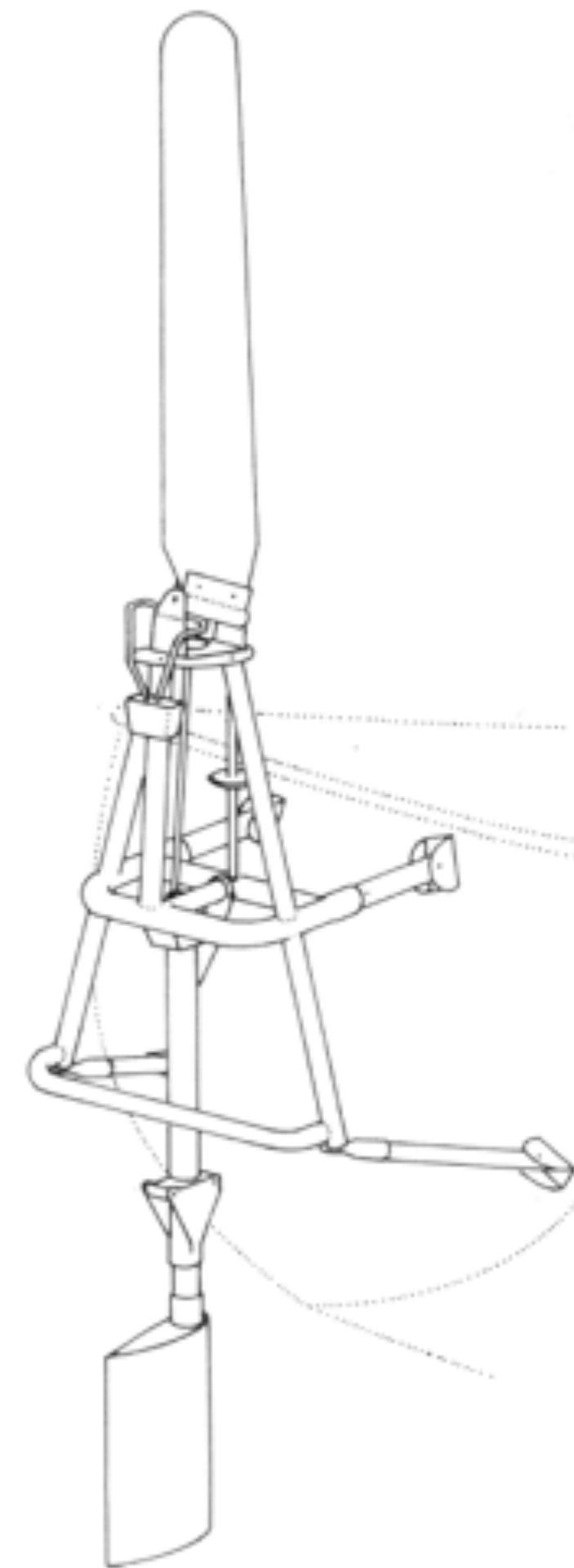


Know what is below the waterline  
Practice driving backwards  
Practice maneuvering at low speeds clear of obstructions

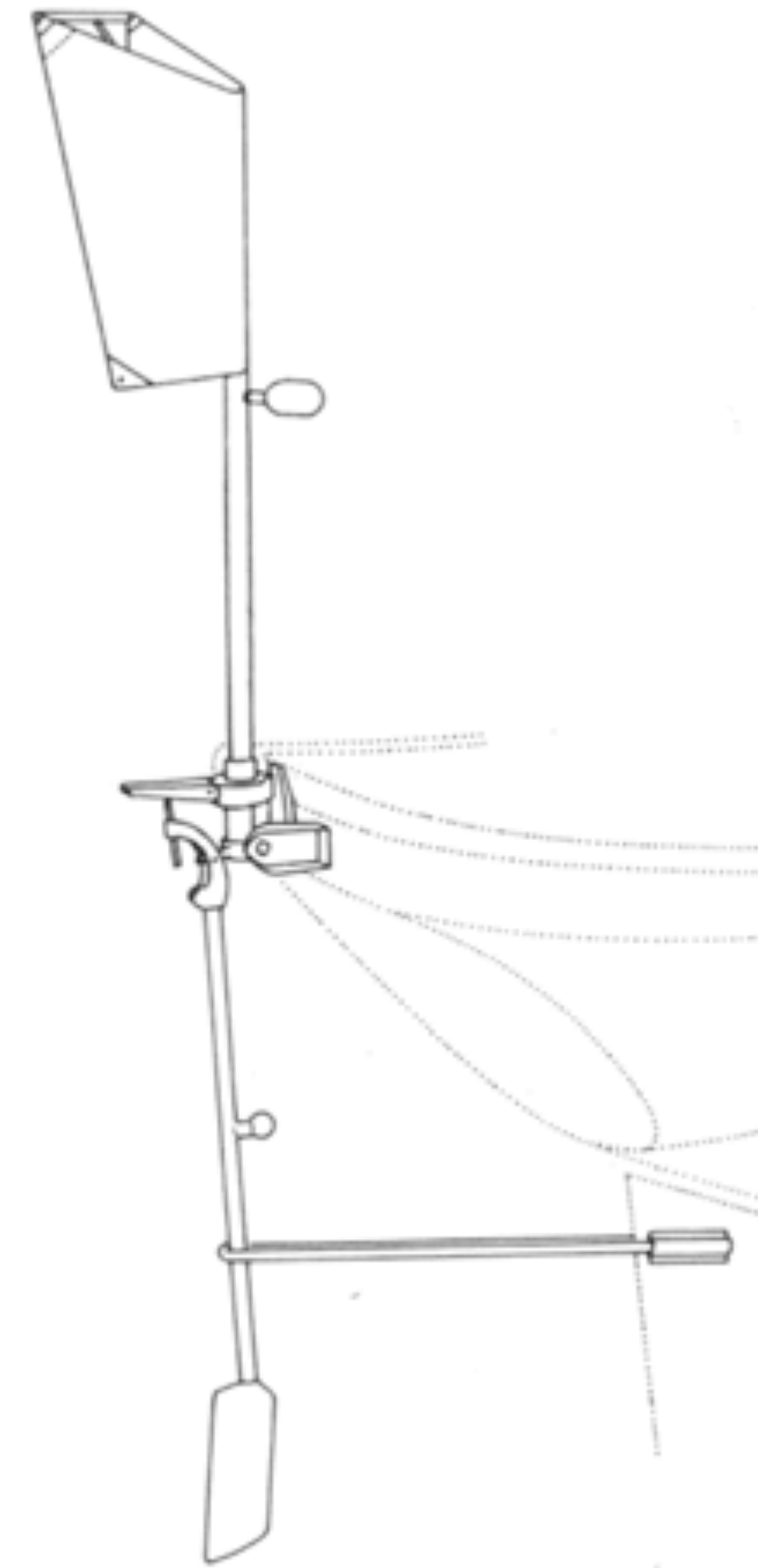


# Steering

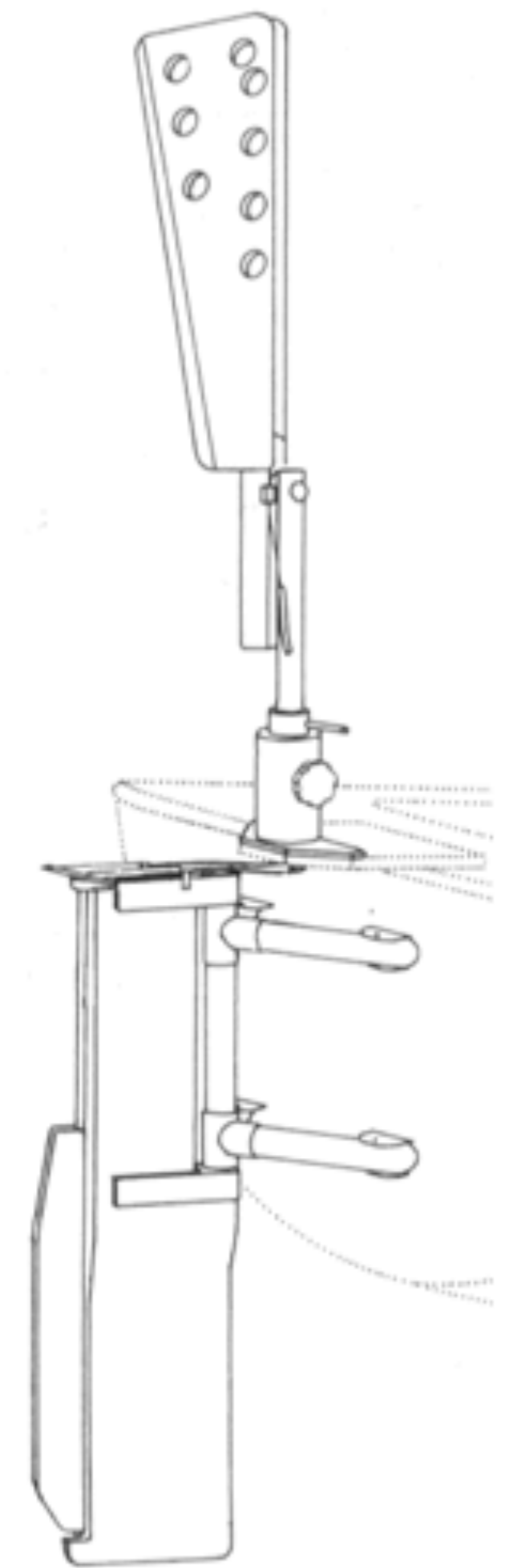
- Helm
- Rudder
- Auto-pilot



Servopendulum to Main Rudder



Pendulum/Trim Tab on Main Rudder



Trim Tab on Auxiliary Rudder

Electro-mechanical  
Mechanical

Keep backup hardware aboard  
Breaker and location  
Know the wave/wind limits

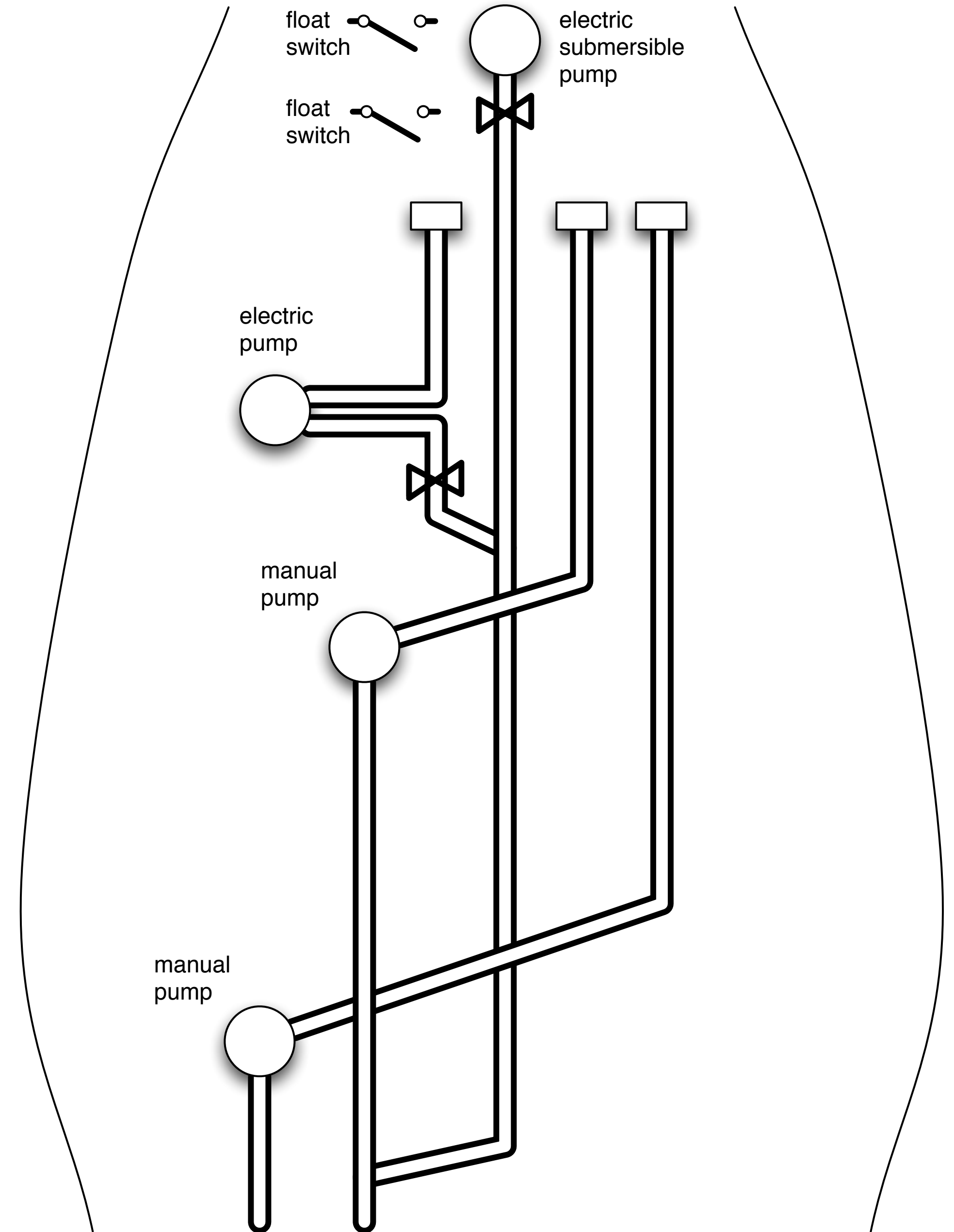


# Steering Howto

- Check rudder and wheel/tiller integrity
- Check hysteresis and slop
- Check steering cables/chains/linkage - blood is bad
- Check auto-pilot

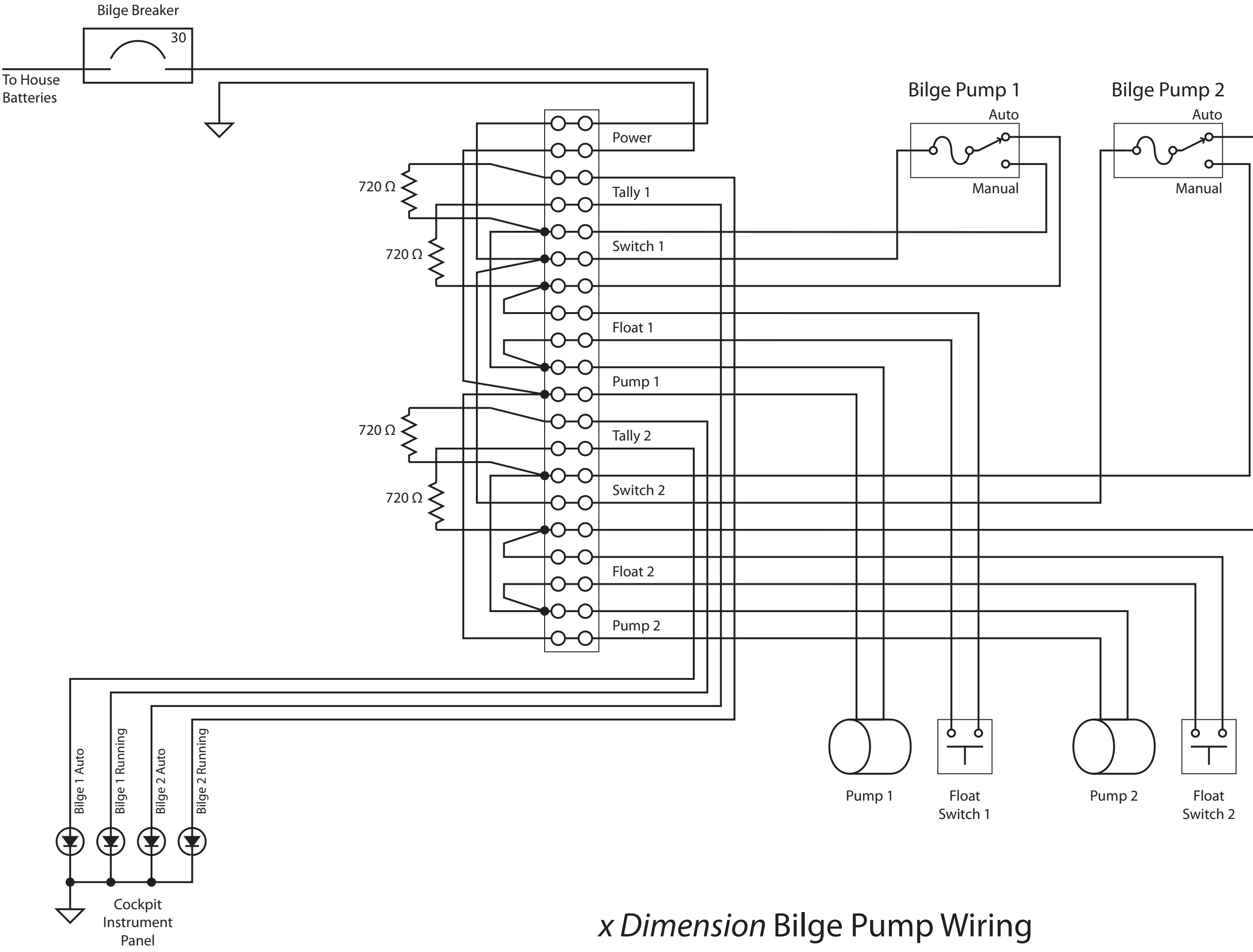


# Bilge Schematic

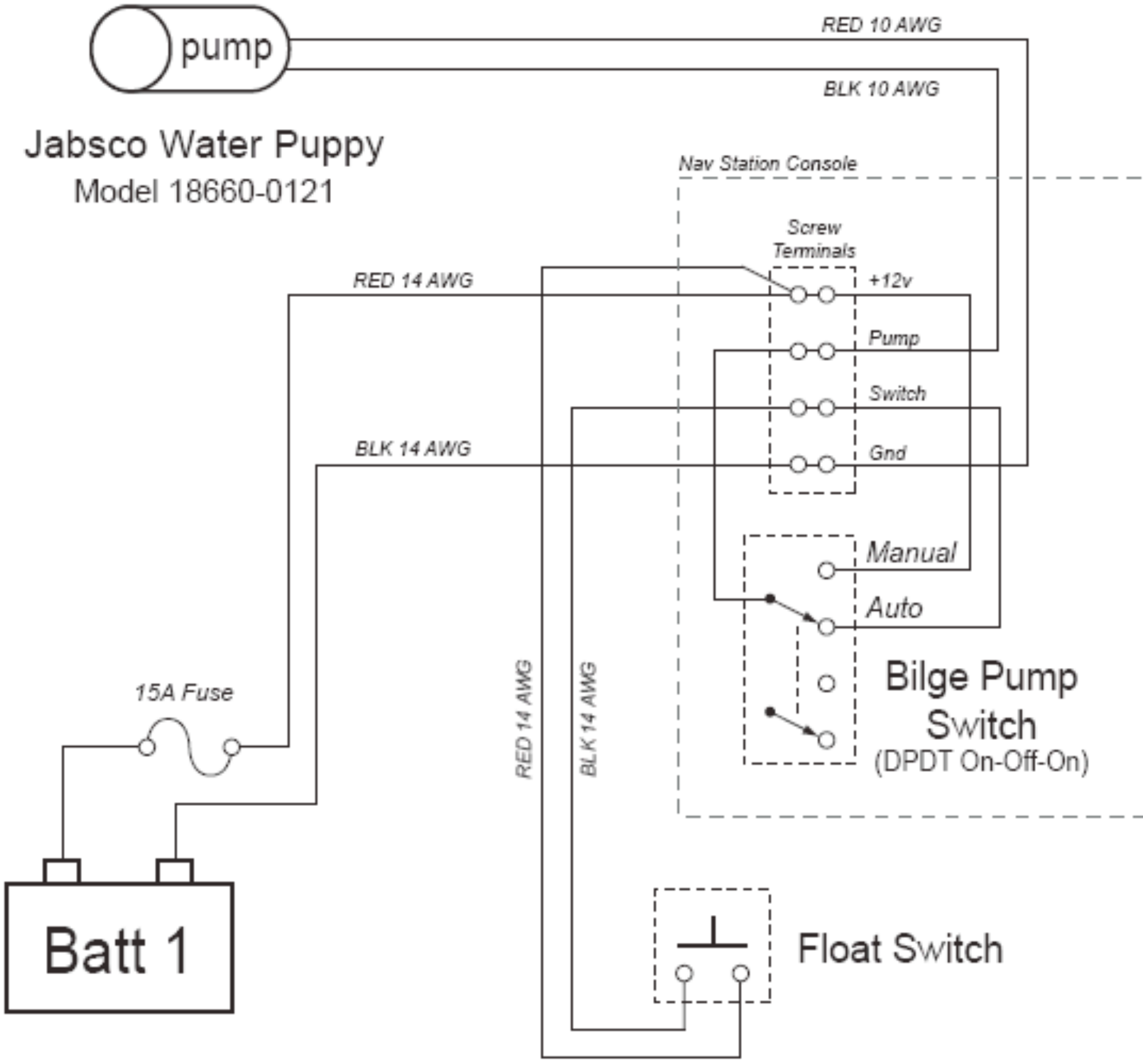




# Bilge Schematic



*x Dimension Bilge Pump Wiring*



Nevermore Bilge Pump Circuit  
Sep 17 2007



# Bilge

- Electric Pumps
- Manual Pumps
- Plumbing
- Controls





# Bilge

- Electric Pumps
- **Manual Pumps**
- Plumbing
- Controls





# Bilge

- Electric Pumps
- Manual Pumps
- Plumbing
- Controls





# Bilge

- Electric Pumps
- Manual Pumps
- Plumbing
- Controls



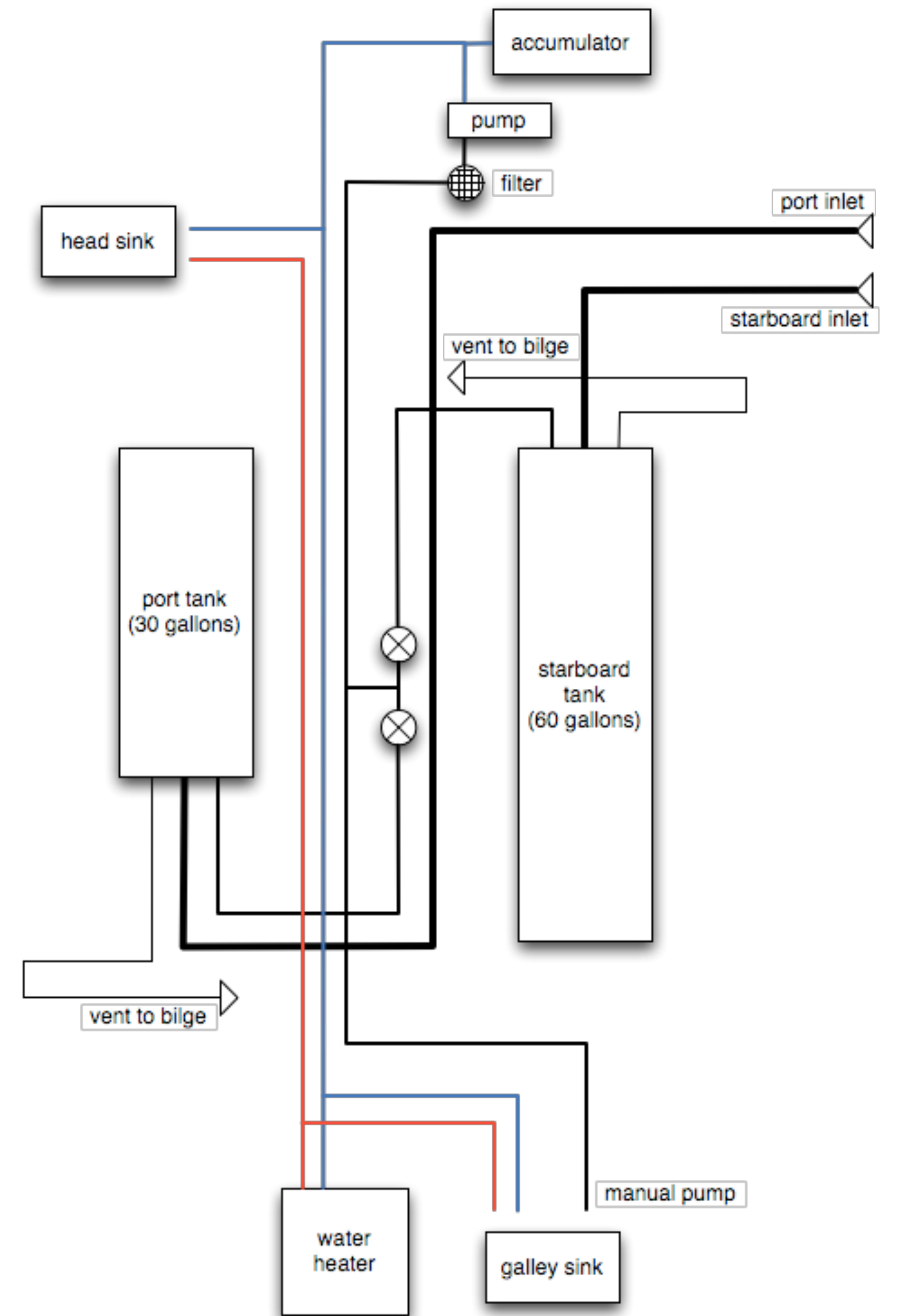


# Bilge Howto

- Verify electric pump auto and manual
- Verify float switch operation
- Verify manual pump operation
- Know how leaky the boat is under normal conditions
- What drains into the bilge?



# Freshwater Schematic





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- Fixtures





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- Fixtures





# Freshwater

- Strainer
- Pump
- **Accumulator**
- Tank
- Fixtures





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- Fixtures





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- Fixtures





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- **Fixtures**





# Freshwater

- Strainer
- Pump
- Accumulator
- Tank
- Fixtures
- Watermaker



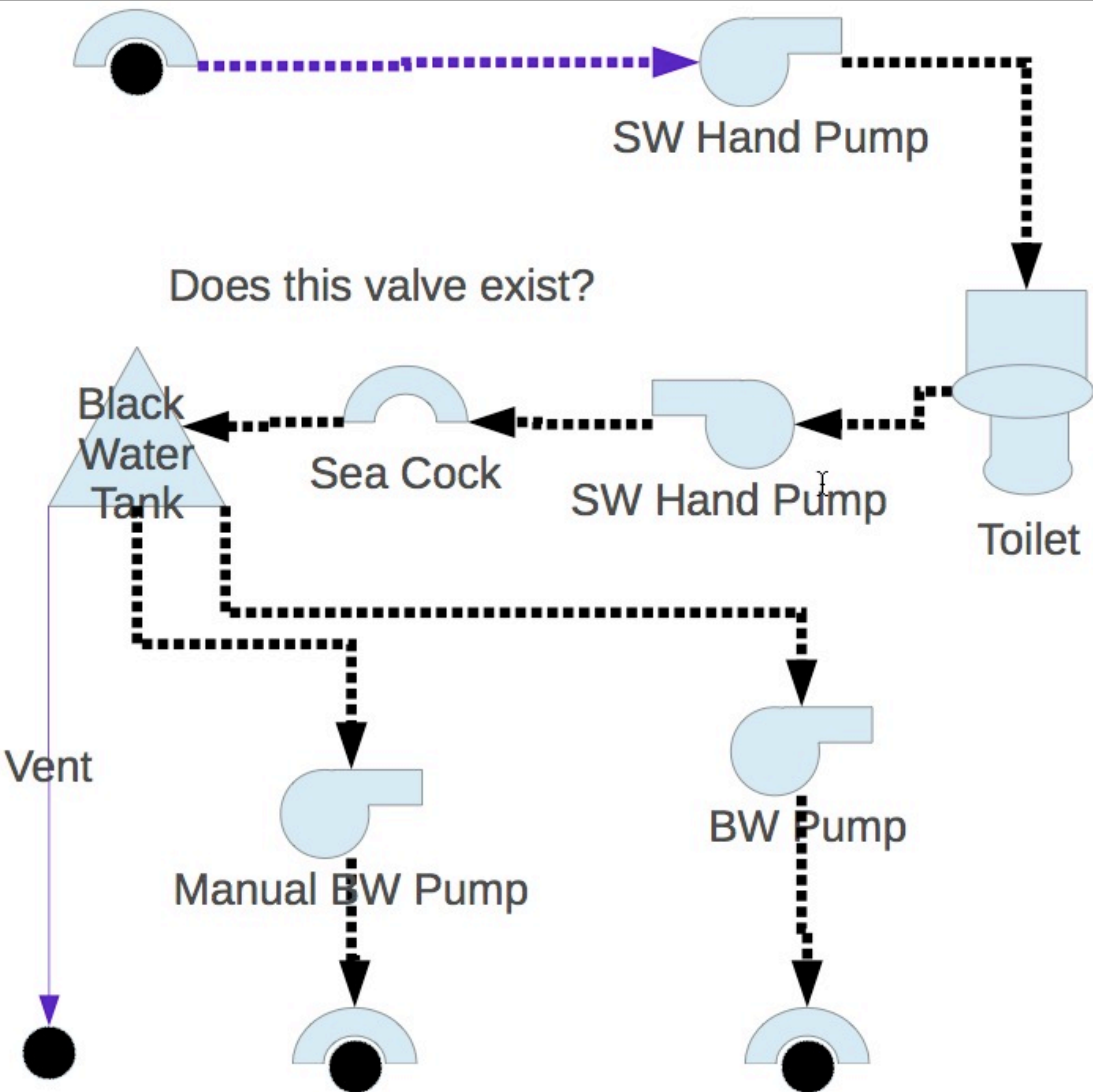


# Freshwater Howto

- Fill/Drain the tank
- Know location of fill hole(s)
- Inspect inside of tank(s)
- Know the tank volume
- Know location(s) of shutoff valves
- Bring bottled water, store in secure location



# Blackwater Schematic





# Blackwater

- Strainer
- Toilet
- Holding Tank
- Pump
- Macerator



# Blackwater

- Strainer
- Toilet
- Holding Tank
- Pump
- Macerator





# Blackwater

- Strainer
- Toilet
- Holding Tank
- Pump
- Macerator





# Blackwater

- Strainer
- Toilet
- Holding Tank
- **Pump**
- Macerator



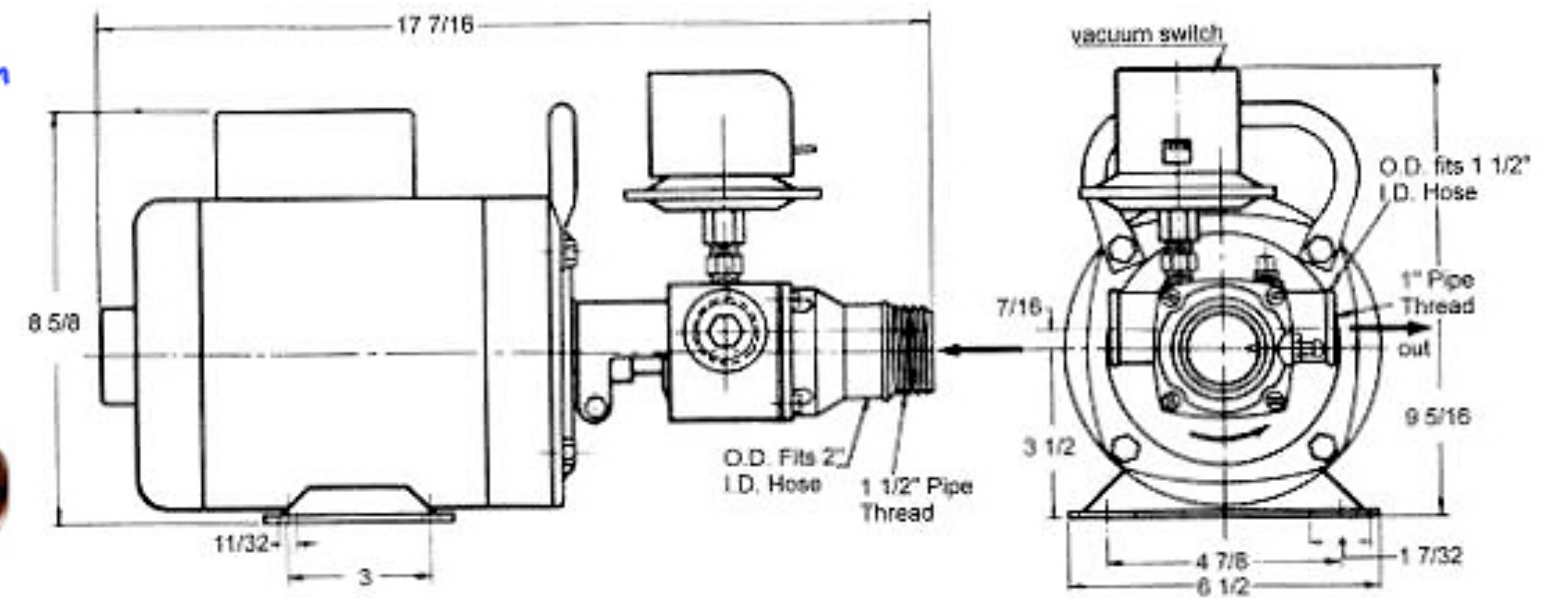


# Blackwater

- Strainer
- Toilet
- Holding Tank
- Pump
- Macerator



Pump in photo is shown with pressure switch that is not included





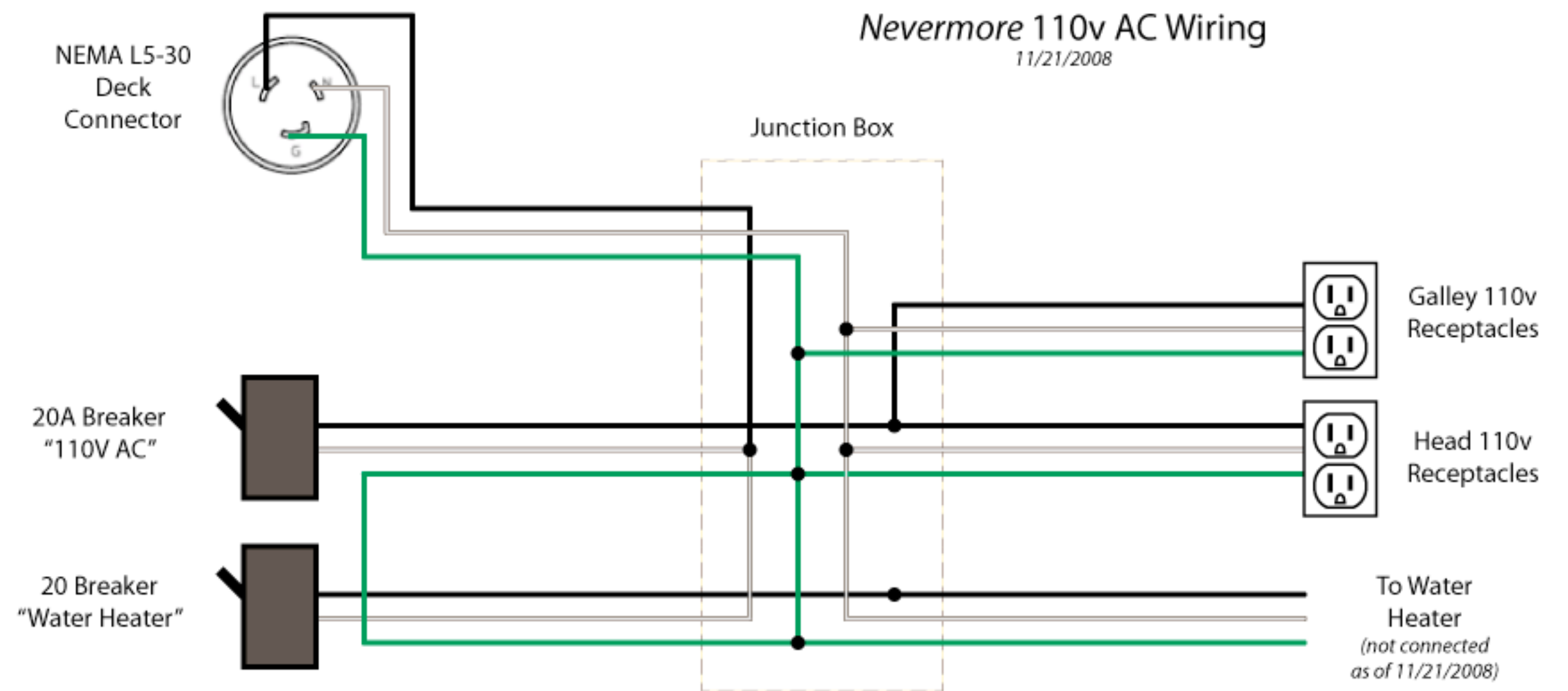
# Blackwater Howto

- Know vent location(s)
- Know pump location(s)
- Know volume of holding tank
- Know the volume(s) of the crew
- Pump out before tank is full



# Electrical

- 12v vs 110v
- Breakers
- Batteries
- Navigation Lights, Cabin Lights, Blower
- Anti-Electrolysis
- Lightning Dissipation





# Electrical

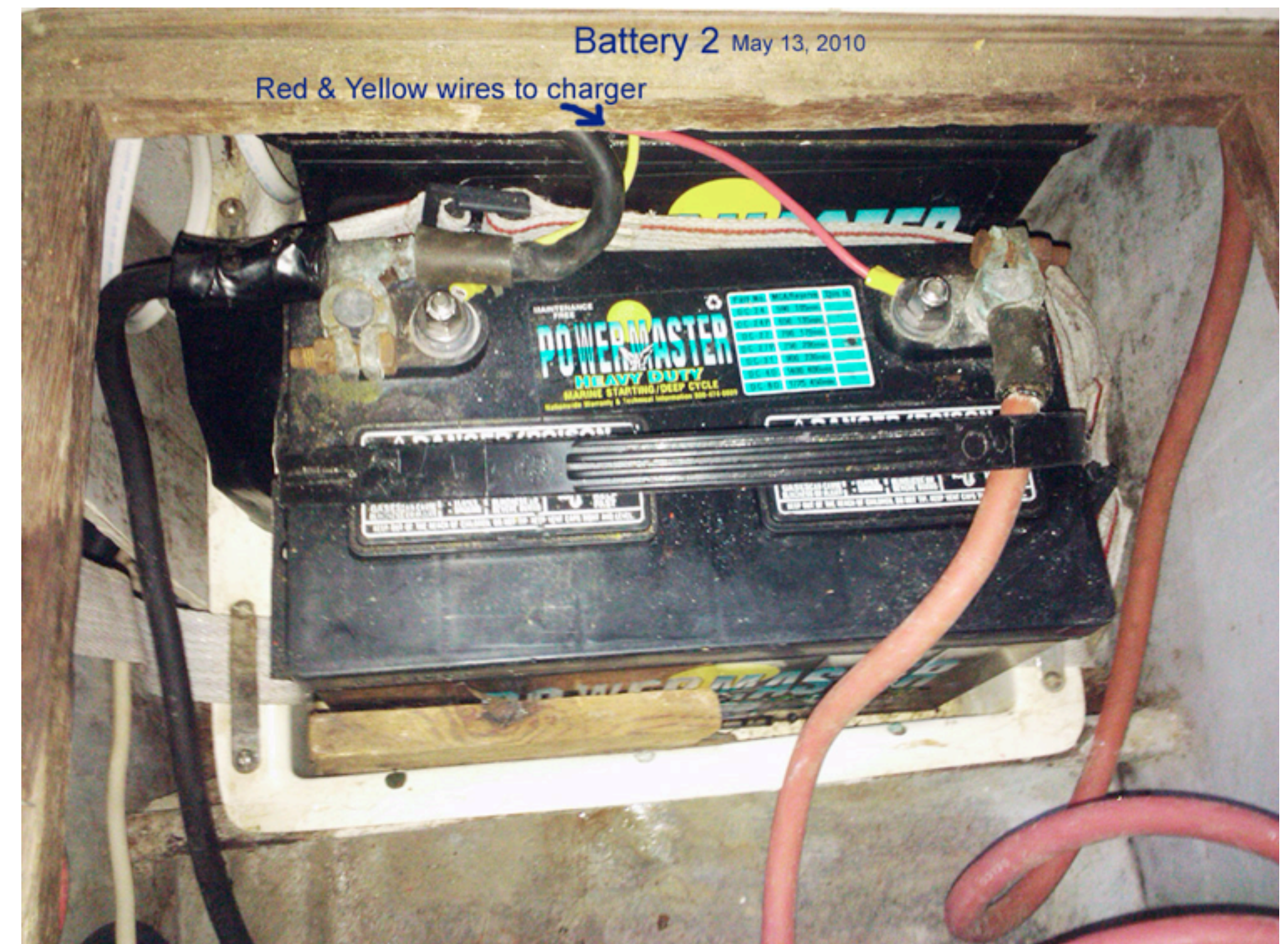
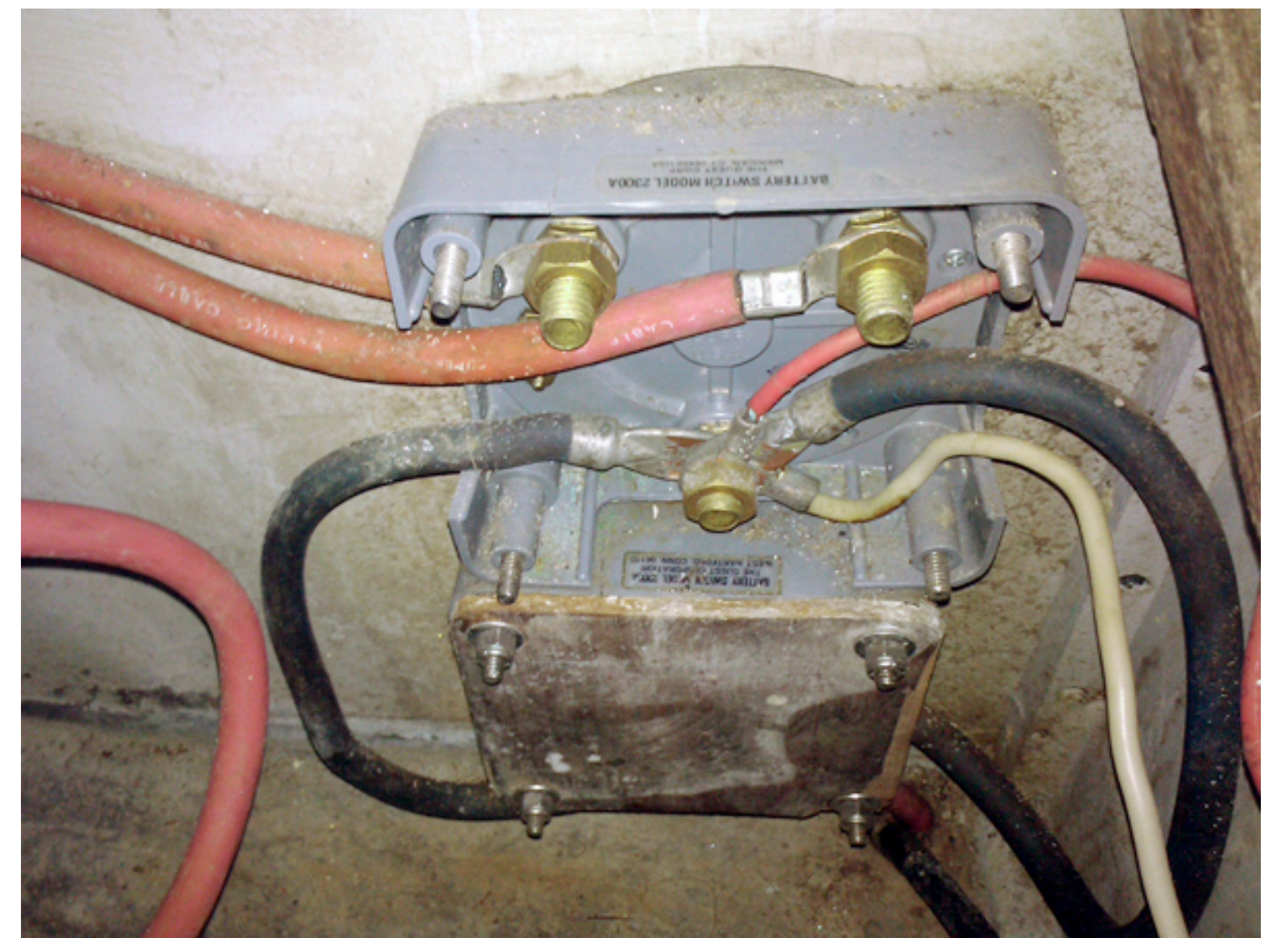
- 12v vs 110v
- Breakers
- Batteries
- Navigation Lights, Cabin Lights, Blower
- Anti-Electrolysis
- Lightning Dissipation





# Electrical

- 12v vs 110v
- Breakers
- **Batteries**
- Navigation Lights, Cabin Lights, Blower
- Anti-Electrolysis
- Lightning Dissipation





# Electrical

- 12v vs 110v
- Breakers
- Batteries
- Navigation Lights, Cabin Lights, Blower
- Anti-Electrolysis
- Lightning Dissipation



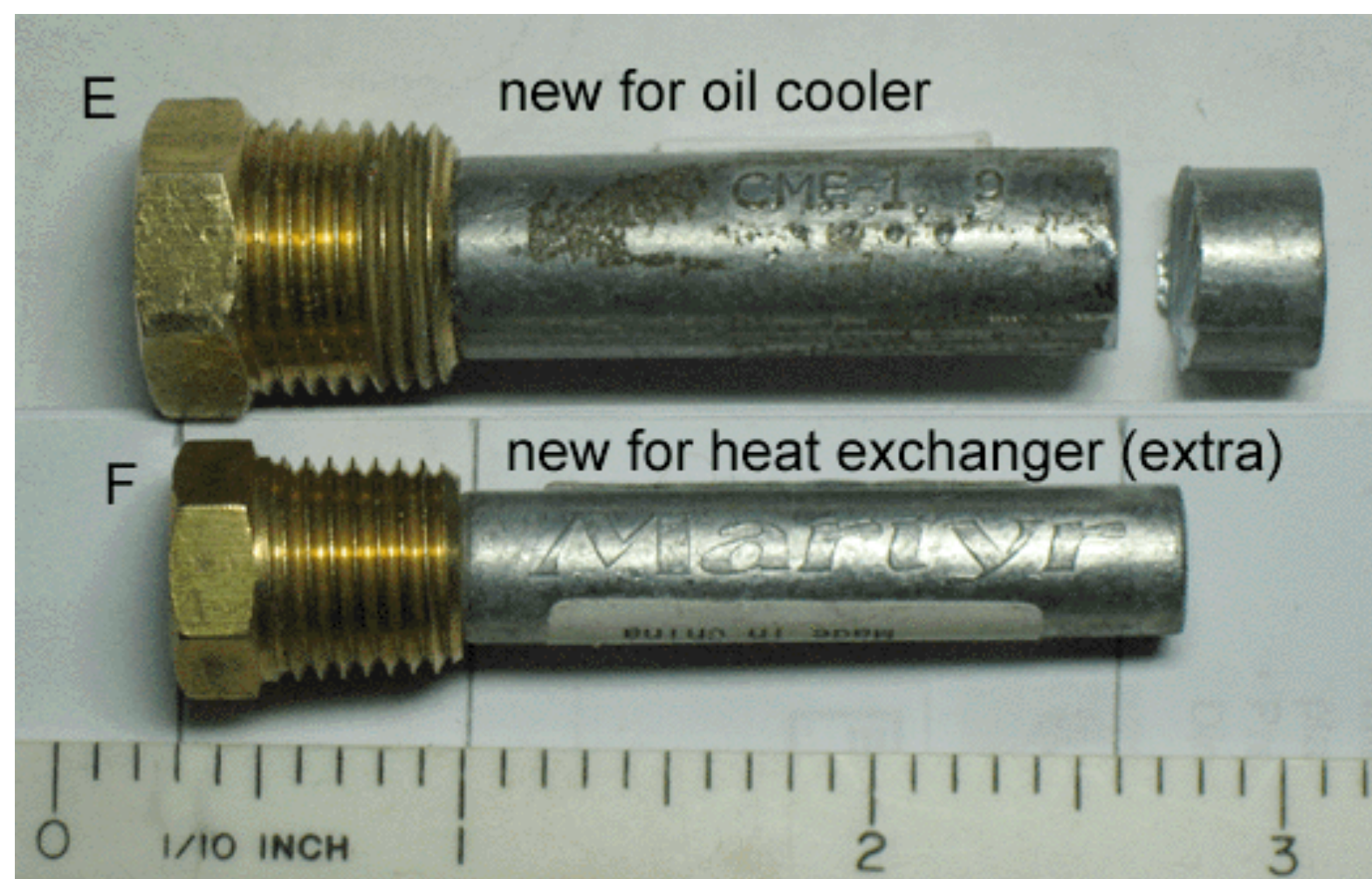


# Electrical

- 12v vs 110v
- Breakers
- Batteries
- Navigation Lights, Cabin Lights, Blower
- **Anti-Electrolysis**
- Lightning Dissipation



Copyright 2015 Matthew Wall, all rights reserved





# Electrical

- 12v vs 110v
- Breakers
- Batteries
- Navigation Lights, Cabin Lights, Blower
- **Anti-Electrolysis**
- Lightning Dissipation





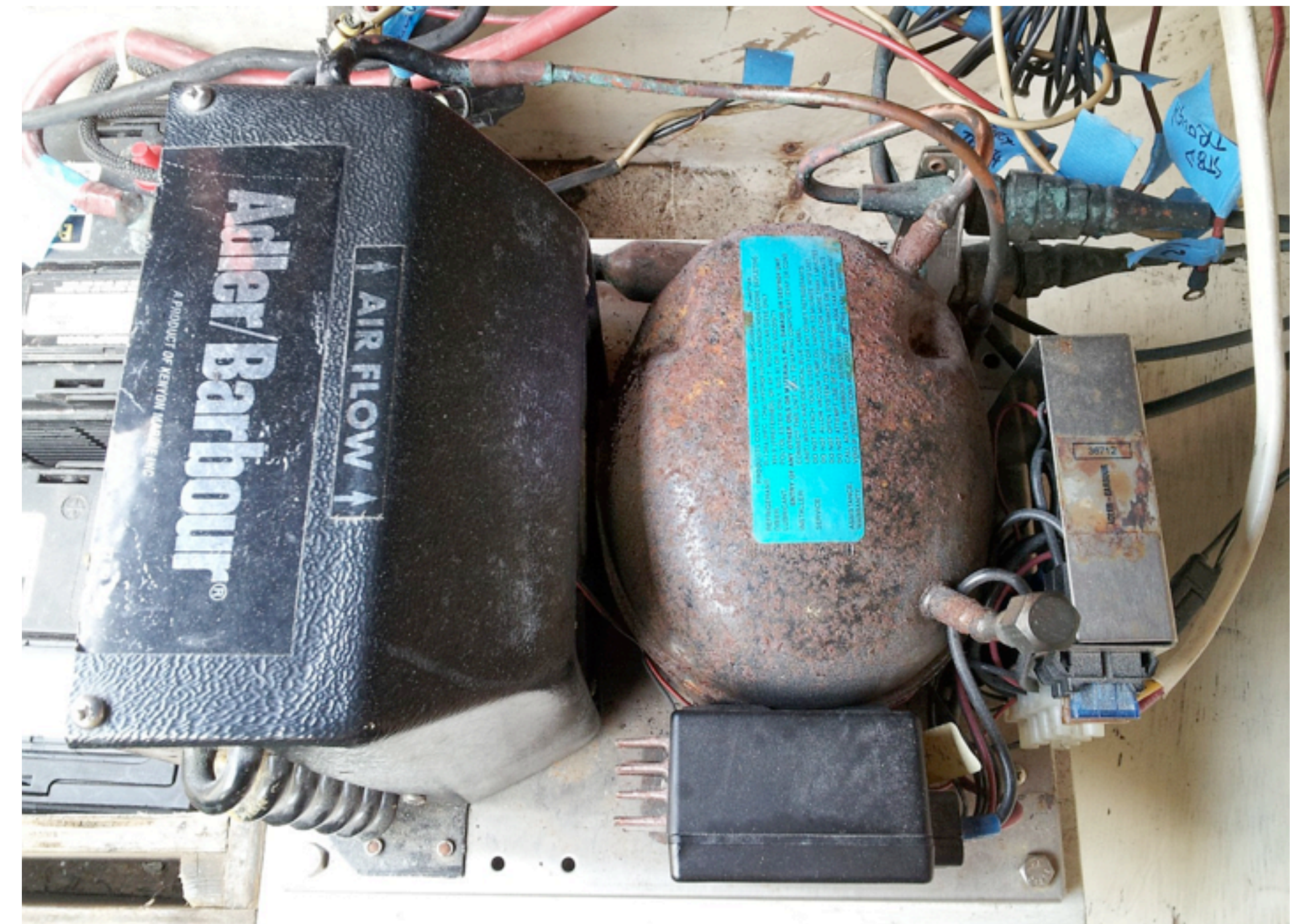
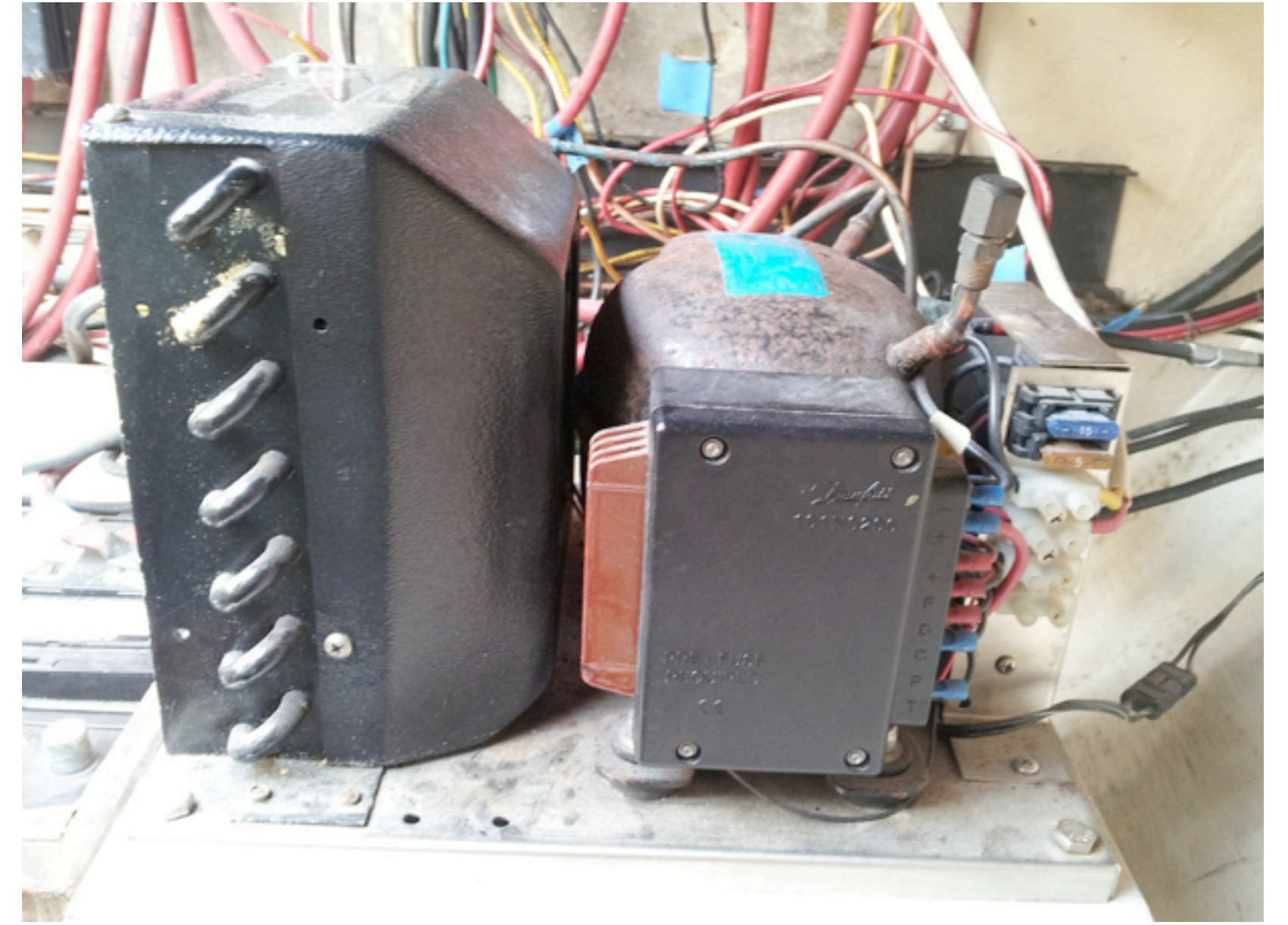
# Electrical Howto

- Know battery location(s)
- Know switch/breaker/control locations
- Know battery charging system
- Know what sucks power
- Use the guppy



# Galley

- Stove
- Ice Box
- Refrigerator





# Galley Howto

- Keep it clean - sick crew is useless
- Gas solenoid location and operation
- Know the refrigeration capabilities and volumes



# Electronics

- Wind Sensors
- Depth Sensors
- GPS
- Radar
- Radio





# Safety Equipment

- PFDs
- Foulies
- Tether/Harness
- Life Raft
- Knife
- Strobe/Smoke/Flares
- First Aid Kit
- Sunblock



# Dinghy





# Dinghy Howto

- Operate an outboard
- How to assist passengers
- Keep it clean
- Know how to patch
- Avoid sunshine, avoid seawater



# Tools

Quality Multi-tool (e.g. leatherman)

Mirror on a Stick

Magnet on a Stick

Head Lamp with Red Filter

Lighter / Butane Torch

Ballpoint Pen

Log Book

Socket Set

Wrench Set

Adjustable Wrenches

Vise Grips

Allen Wrenches

Screw Drivers - Slot and Phillips

Pliers - Needle-Nose and Regular

Pipe Wrench

Hammer, Rubber Mallet

Manual Drill + Bits

12v/110v Light

Sail Tape

Needles and Waxed String



# Yacht Preparation Distilled

- Know what 'normal' is
- Check for wear
- Bring spares
- Bring the right tools

## Why does this matter?

- Your friend asks you to crew
- Trips on X-Dimension or other club boat
- You want to charter a boat
- Day trip
- Overnight trip
- Winterizing/Dewinterizing



# Yacht Preparation Distilled

	<b>Club Sail</b> Day or Overnight	<b>Charter</b> Days to Week	<b>Delivery</b> Days or Weeks
<b>Responsibility</b>	low (?)	medium (?)	high
<b>Risk</b>	low	medium	high
<b>What to Check</b>	sunblock	dive mask	everything
<b>What to Bring</b>	lunch	camera	tools
<b>Responsibility for Others</b>	high	high	low

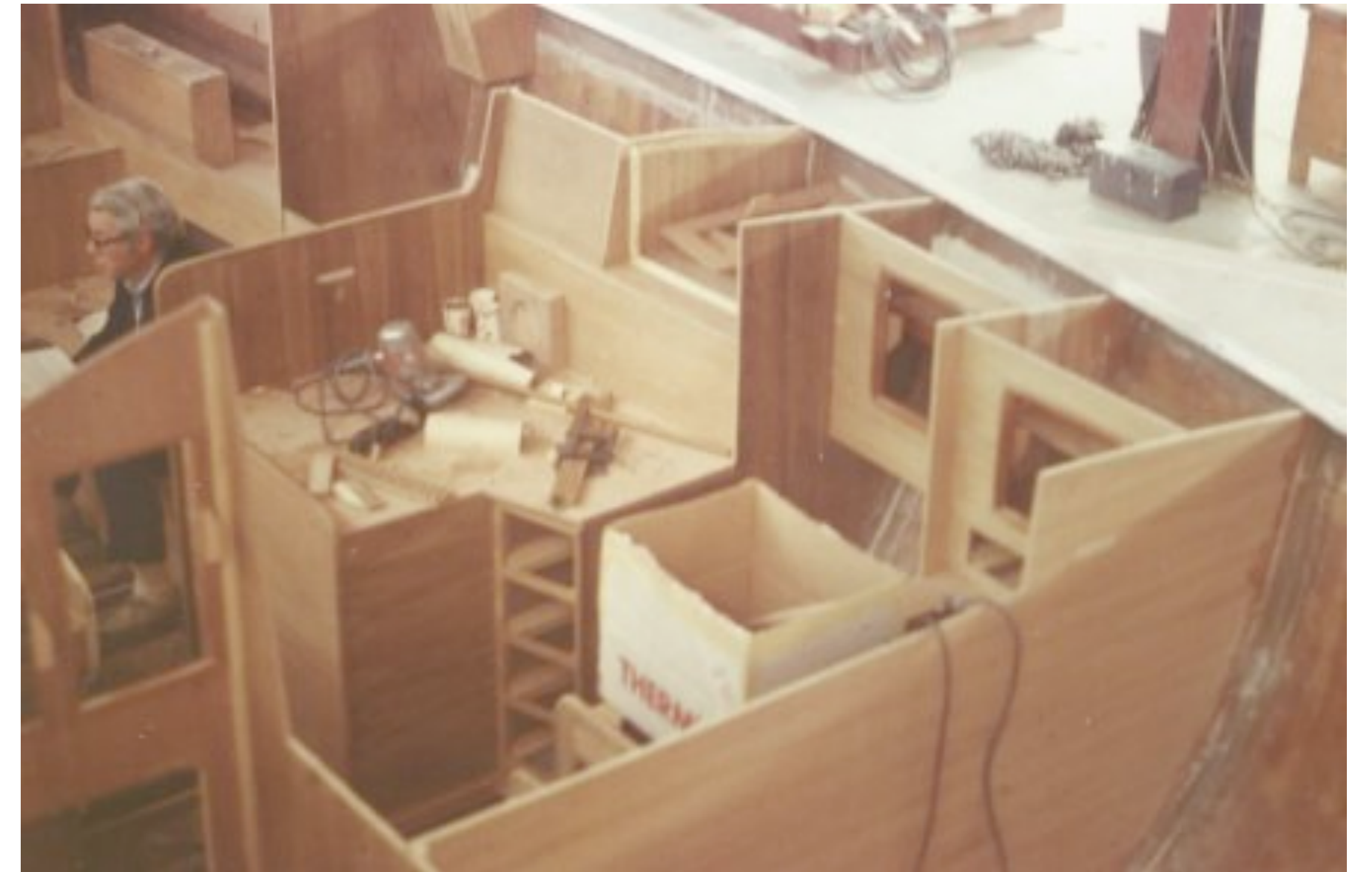


# X-Dimension Projects

- Replace holding tank
- Fix engine oil and fuel leaks
- Design and implement a battery charging system
- Repair leak in freshwater tank
- Design electronic navigation system
- Install LED lighting in cabin and lockers
  
- Replace rudder post bushing
- Install new main sheet blocks
- Fair keel
- Build dams at companionway
- Recore deck under radar mast
- Recore deck over head
- Restitch steering wheel leather
- Repair sail cover
  
- Install indicator lamps for propane and pumps
- Rebuild winches
- Install hardware for anchor under boom
- Design chocks for aft docklines
- Counterbore motor mount bolts
- Repair floor stringers
- Re-refinish binnacle table
- Repair binnacle table fittings
- Re-bed chain plates
- Install new companionway latch mechanism
- Fabricate plastic labels for all electronics
- Strip and refinish teak



# X-Dimension Construction





# Before/After





# Before/After





# Before/After





# Before/After





# Before/After



Copyright 2015 Matthew Wall, all rights reserved



# Before/After





# Before/After





# Before/After





# Crew

