

Ref: Belle's Engine Maintenance Instructions: Oil, Coolant, and Filters

Top-Off both fuel tanks; Add Bio-Guard & Star-Tron Stabilizer prior to fueling.

Air Conditioner; Run Heat and Cool air check while boat is in the water.

Switch Bilge Pumps Off at large Perko Rotary Battery Switch Panel.

Lower Mast Light. Remove **Antenna** & install plastic cap.

Place a gutter screen over mini drain scupper in cockpit trough.

Drain Sea Water from Engine while still hot from oil change; **Close** Sea water strainer **Sea Cock.**

Drain sea water strainer and clean (7/16 hex drain plug) Attach ¼" clear tubing to the port & starboard

red, ½" hex petcocks and drain to bilge. (the tubes are usually attached and cable tied together in the bilge) Remove 7/16" hex plug from ZF oil cooler. Blow **60 psi** thru Port drain tube to clear cooler and place tube back in bilge, *not in oil pan*. Replace oil cooler plug and **close petcocks.** *ref: illus. manual*

Remove ½ hex drain plug from muffler in lazaret. (*nut runner*) Drain and Replace plug.

Remove **sea water 1¾" hose** from pump. *Mouth* blow water back to strainer. Attach **black suction hose** to pump with hose coupling. Fill the **6 Gal. yellow poly container** with 3gls anti-freeze (*Sea-Fit, -100 ° F*) Place on port side of engine keeping bung hole high. Add 3 gals more (*7" red cut-off funnel*) Insert spout end of **black suction hose**. Run Engine until container is empty. Reattach **sea water hose** to pump. Leave cap off strainer and replace 7/16 hex drain plug. Replace **Oil Sock** under engine.

Raise Boat to sea wall. Set up aluminum ladder with plank.

Remove Skeg Drain Plug; 1/2" npt-3/8" socket head. Attach lanyard to long Allen wrench

Drain muffler in lazaret and stow ½ hex plug for winter.

Plug Exhaust Port with foam sponge.

Fresh Water System; Open sink faucets and water heater drain valve. Drain water tank, (*7/8" hex plug fwd*) After tank has drained, run pump for 10 sec. to drain remaining water. Close all faucets and valves.

Connect **3/8" air hose w/adaptor** to shore water inlet. (**60psi**) Attach a *drain* G-hose to **cockpit faucet.**

Open Faucets *individually*: Galley sink first, until dry. Then head sink, cockpit, water heater, cockpit and head showers. Repeat several times. Disconnect accumulator tank and strainer from water pump by removing black wedges. (*¼" screwdriver*) Remove Strainer thumb nut to clean. *Replace wedges only.*

Run pump for ten seconds to clear water. *Mouth Blow* galley and head sink traps. Add Red-Pop. Open Faucets; Galley, Head, Cockpit, Water Heater. *Stuff a sponge into Port Side Scupper.*

Air Conditioner ; Blow 60 psi air thru transom discharge to seacock intake. (air gun w/crutch tip. Clean and remove water from **Sea Water Strainer** using battery syringe w/tube extension. Replace strainer cap and blow out AC again. Dry strainer and leave open for winter. **Close Seacock.** *Mouth* blow water from AC drain to bilge. Use ¼" tube w/brass elbow in AC pan)

Blow out; Cockpit Cooler and under Seat drains. (sink stopper!) *Air gun w/crutch tip*

Hand Pump water from Aft Bilge Pump and Sump Box transom discharge cocks.

(Omit if Sump Box is dry) *Brass pump w/orange-grey pick up tube.*

Head ; Empty holding tank. Disconnect **black** intake hose from bowl pump. *Mouth* blow out to seacock using ½" *green hose*. Reconnect and close seacock. Flush a 1/2 gal. Red Pop down the toilet. If holding tank is clean, open macerator seacock and run at 15 second intervals. Close Head and Macerator Sea-cocks. Blow shower drain to Sump Box. Drain Sump Box with battery syringe and Clean Strainer.

Batteries ; Set both battery switches to OFF for winter.

Top off both batteries with distilled water. (*Optional*; Remove **G-31** battery and case, 9/16" hex lug nuts. Clean and lube terminals & cables. Cap + cable w/foam pouch)

Battery Charger ; Remove and stow terminal cover plate if **G-31** battery is removed, connect red link from terminal #2 to terminal #1. 7/16" **HOT** hex nuts.

When **G-31** battery is installed: Remove link from terminal #1, leave attached to terminal #2

Replace charger terminal cover plate. *ref: photo illustration*

Remove; Batteries and Flash Lights, Arm & Strobe Lights, Clock, Megaphone, Radio remote control, Spot Light w/Spare Battery & Charger,

Remove ; TV/converter, 7" DVD player, Wireless Headphones, Noise Cancel Headphones, Remotes & manuals, CC Radio, Portable VHS, Compass, Binoculars, Air Horn, Volt Meter, Sea Sick Bands, First Aid Kit, Charts, Books, Binders, Food, Cans, Cleaners, Liquids, Toilet Kits, Pillows, Blankets, Towels, Clothes, Inflatable PFD's, Green lighted Arm Bands.

Clear cockpit trough and mini scupper. Place gutter screen over mini scupper drain.

Sponge or Towel bilge crevices and clean. Pump liquid from Engine bilge

Remove Skeg Drain plug for the winter. Install Frame, Cover and Safety Chains.

Port	<u>Transom Discharge Sea Cocks</u>		Starboard	
0	0	0	0	0
Cooler & Starb. Seat	Shower Sump	Port Seat	Trough Mini Scupper	AC Aft Bilge Pump

SPRING LAUNCH

10/09

Remove Hoist Chains, Remove tie downs to skeg. Remove Winter Cover and Frame

Install Skeg drain plug. Remove Exhaust and Port Scupper sponges.

Replace muffler drain plug 1/2 hex 5/16-18 x 1"

Teflon Spray sea water pump hose inlet housing if hose is off. Connect hose.

Fill Engine Seawater Strainer and hose with river water. (check 7/16" hex drain plug)

Teflon Cap Gasket and secure. Open Seacock

AC: Teflon Cap Gasket and secure. (Check drain plug) Open Seacock

Blow River water thru transom drain cock to prime system.

Teflon Spray fresh water pump wedges and "O" rings before installing

Connect Fresh Water Pump elbow to expansion tank with wedges.

Connect Fresh Water Filter to water pump with wedges. Tighten thumb nut.

Close Faucets: Galley sink, Head sink & shower, Cockpit faucet & shower, Water Heater

Fresh Water Tank: install 7/8 hex drain plug. Add 1oz. Clorox Bleach to 70 Gals. of water.

Head; add Vinegar & Bleach. Open Toilet & Macerator Seacocks.

Check Macerator motor bolts.

Install Aux. Battery and remove red terminal link at charger. (see photo illustration)

Top Off Batteries with distilled water. Check battery acid with Hydrometer.

Engine Rm. Main Distribution Panel; switch ON all but the Shower Pump and Oil Changer.

To supply DC Volts to Cabin MDP; Turn large Perko Rotary switch to ON, then turn Aux Rotary switch ON either #1 (4D) or #2 (G-30) #2 is independent of Perko Rotary Sw.

Helm DC supply is independent of Aux Rotary Switch. Breaker on Perko Rotary Sw. Panel

Engine DC supply is independent of Engine Room Perko Rotary Sw. Panel ???

Check Oil and Coolant levels; Check Fire extinguishers: Halon - p/n and expiration date?

*Install VHS antenna *Raise Mast Light Pole. *Check Running Lights

“Plexus” Spray Eisinglass Cockpit and Side Curtains. *Rain X Windshield.

Yanmar 6LYA-STP “Belle’s Engine Maintenance Instructions”

9/02/09

Racor 900 series Fuel Filter/Water Separator; Shut off both fuel tanks. Close yellow mini valve on the side of vacuum gauge before removing Gauge & Cap.(turn 180 °) Loosen vacuum gauge handle to break vacuum. The heat shield bowl is only to collect the overflow fuel from the top of the canister. Remove 1/4 npt x 9/16” hex drain plug while restraining the bowl 1 ¼” hex retaining nut. Release fuel slowly into Malt Tub. Remove dirty element with the attached straps and install Racor 30 micron Fuel Filter #2040 PM-OR and gaskets. Replace Teflon taped drain plug. Allow fuel to flow into canister by regulating the starboard fuel tank valve. Replace cap and Top-Off to “vacuum gauge orifice and secure. Open yellow mini valve on gauge. **Open fuel valves.**

Racor Bucket Kit aboard. Bucket for draining diesel fuel. Wood wedge to hold bucket in place. ZF 5” aluminum funnel and clear tub. *Install Racor drain valve.*

Fuel Filter ; Shut off both fuel tanks. Remove Fuel line strap (12mm hex) Remove drain plug (13mm hex) and drain into a round poly cut-off jug. Remove bottom bolt (7/8 hex) and canister into a container. Remove element and Pick to remove gasket. Install Yan #41650-502330 fuel filter and replace canister. Bleed air from system; **Open fuel tank valves.** Release the priming pump knob counter clockwise and pump fuel to the fuel filter canister. Loosen the top ball joint bolt (19mm hex) to bleed air from the canister. Tighten ball joint bolt and secure priming pump clockwise.

Oil: 5.28 gals. (21.13qts.) SAE 15w-40w Shell Rotella T. **Filter;** yan #119593-35100

Check Coolant level, **Cold then Hot.** Run engine to 150° +.

Remove filler cap and drain **Oil** via X-CHANGE system. Use six anti-freeze jugs to catch oil.

Oil Filter: Place a *grape jug* under clear drain tube. Place towels and 6”x10” bent alum. sheet under filter area. Loosen filter enough to allow oil to drain thru drain tube. When oil stops draining, gently unscrew filter until free of threads. **But** hold filter against threads to allow a ½ ounce of oil to drain. Have blue towels handy. Keep a pill bottle under the oil filter drain tube. *If installing a new oil filter, use the hammer and punch method.*

Install Filter and Oil. (7” red cut-off funnel) Replace **filler cap**

Run engine to circulate oil. STOP. Check oil level at oil pan Dip Stick and top Dip Stick with notches.

ZF Transmission ; 4.5 qts. SAE 30 Shell Rotella T. Pump oil from *loop* dip stick orifice using Brass pump/grey pick up tube. two anti-freeze jugs. Drain the remainder from the 1-7/16 hex filter nut into a poly pan. Clean filter and replace. Add oil thru the dip stick orifice using 5” alum funnel & clear tube.

Change Coolant and both Preheater Plugs every two years

Coolant; 5.7 gls. Texaco Dex-Cool Havoline Extended Life. 50/50 Distilled water.(Buy Ready-Mix)

Engine capacity; 5.28 gls. (21.13qts.) **Reservoir; 1.59 qts.**

Drain Engine via port **blue petcock** into 2.5 gal. jugs. Drain balance from starboard **serrated poly plug** into engine bilge. (*splash shield*) Pump out bilge w/brass hand pump. Remove coolant reservoir after popping cap. Drain & Clean. Replace reservoir empty, since it may overflow with coolant installed.

Engine Coolant: Use 4”alum funnel. Pour 2 gls. *Slow*, 2 1/2 gls. *Slower*. Using *epoxy pump*, top off engine and fill reservoir midway between hot and cold labels. **Run Engine** to circulate coolant. Try using a drill motor and mini impeller pump to top off engine and reservoir.

Two Preheater Plugs; Plug P/N is 119575-77050. Washer P/N is 23414-200000.

Both located on top right-rear of engine casting, forward of the oil filter. Near the plugs is a decal

"Change Every Two Years" Lift the rubber boots to expose two Preheaters similar to spark plugs. .

The plug's have a spring type two inch coil element which heats the incoming air for five minutes after the engine starts. If an element becomes brittle with age and breaks, it can damage the engine valves.

Yanmar 6LYA-STP

Replace Sea Water Impeller #119594-42550

Impeller replacement tools

Jabsco impeller puller p/n 50070-0040 (modified)

Piston ring compressor - modified to 3-1/2"ID x 3"lg

SS hose clamp, smooth ID @ 2-9/16"ID, 5/16 hex drive

PVC 3/4" pipe, 1-1/16" OD x 3/4" ID x 1-5/8"lg



4" Piston Ring Compressor

Harbor Freight item #97709



Remove cover. Teflon spray impeller and housing.
Crank engine one second. Attach puller and pull.
Remove puller. Crank engine again. Attach puller.
Repeat many times. Then use pliers or channel locks.
May have to insert a slug into spline for puller to function.

Teflon spray new impeller. Wrap SS clamp around leading end,
Followed by the ring compressor.

Scrunch Impeller in spiral direction and work into housing.

May have to tap with a mallet and wood cheek or 3/4" pvc pipe.

