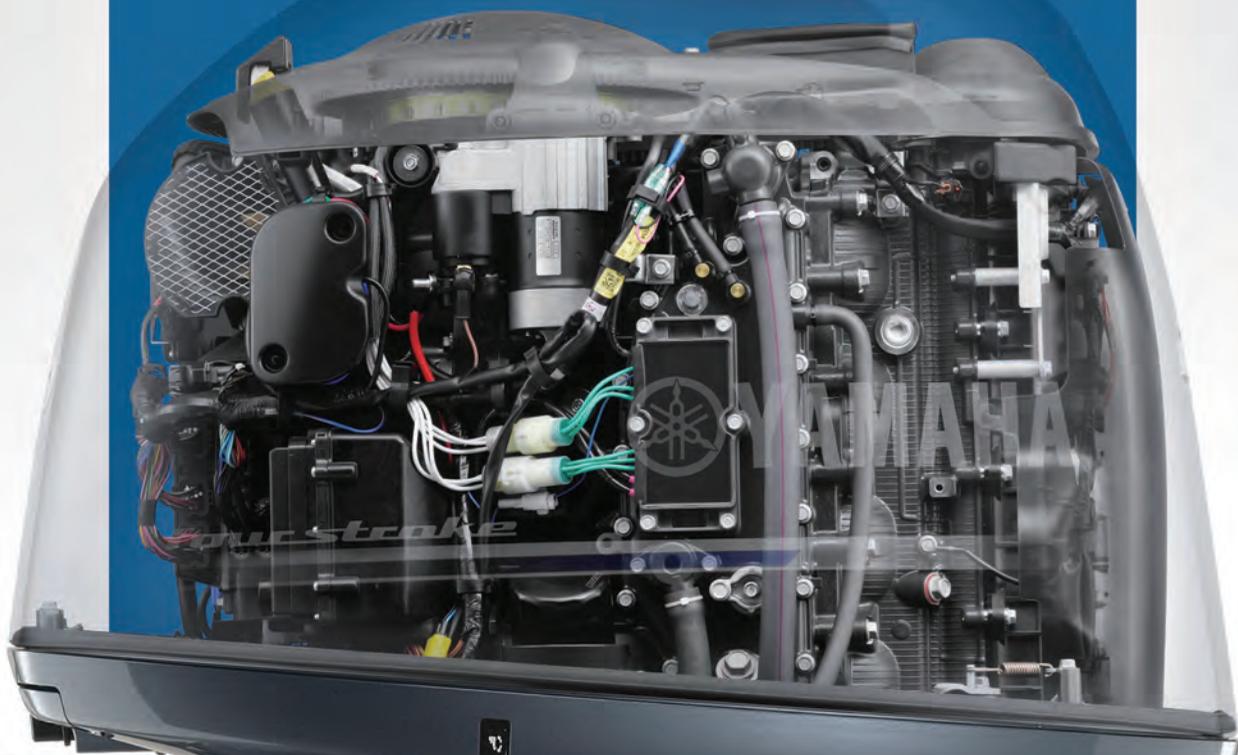


MAINTENANCE MATTERS™

A SIMPLE GUIDE FOR THE LONGEVITY OF YOUR OUTBOARD



EFFECTIVE MAY 2015 VOLUME 5

Reliability Starts Here.®



PROTECTION AND PEACE OF MIND WHY MAINTENANCE?



Yamaha wants you to have an outstanding ownership experience. Maintenance plays a big part in that. We've learned a lot about caring for outboards during our many years as an outboard manufacturer; so here's some knowledge and simple tips on the subject.



From their painstaking design to their meticulous construction, Yamaha outboards are manufactured to provide you with years of enjoyment. However, they live in one of the harshest environments imaginable. High load, high-RPM operation, extreme temperatures and humidity, saltwater, sun, even long periods of non-use can all exact a heavy toll. And it's not just Yamaha outboards. All outboards face these same

challenges. Regular maintenance is important in helping your outboard meet the demands of these challenging environments, and only you can make sure it happens.

Spending a relatively small amount of time making sure your outboard's in proper condition is simple to do, and:

- You'll have more hours of trouble-free enjoyment on the water.
- You'll preserve your investment with a higher resale value.
- Your boat will be ready when you are.
- It's easier and costs less to maintain than repair.
- Yamaha dealers stand ready to help.



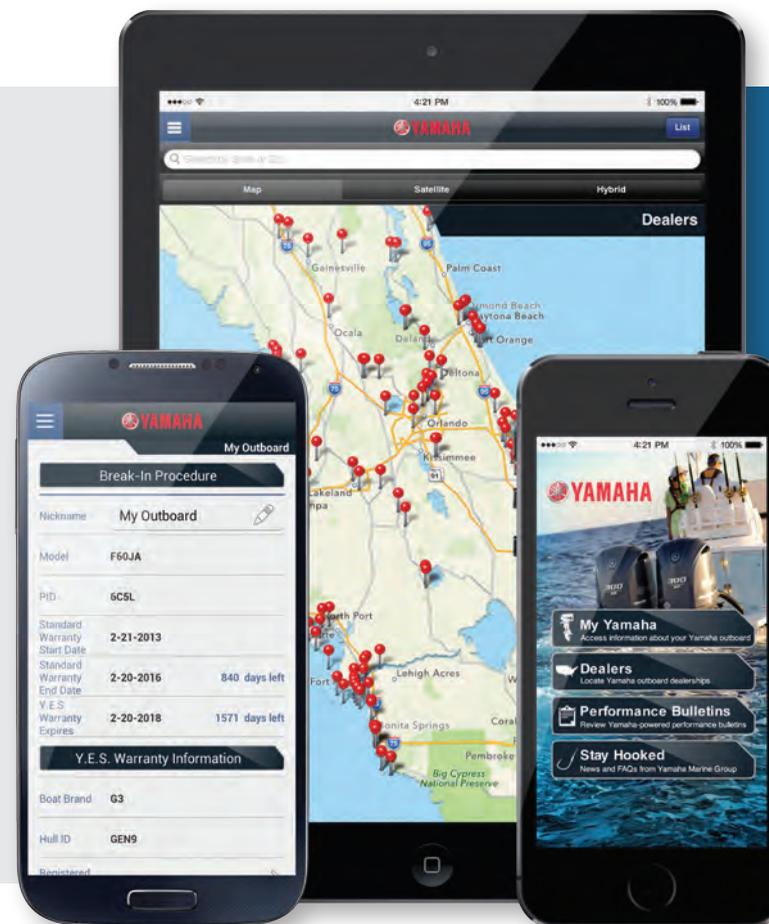
What are the basics? Keep your outboard ready to run with basic maintenance like:

- Changing engine and lower unit oils every 100 hours
- Flushing regularly
- Replacing fuel filters periodically
- Helping to prevent corrosion

This simple guide will walk you through all of these items and more using:

- **Information**—in an easy-to-read-and-understand format
- **Maintenance charts**—with service intervals
- **Links and QR Codes**®—to expanded information and short “why/how-to” videos
- **Checklists**—to help make sure you've covered it all, until it becomes second-nature
- **Referrals**—to the Yamaha smartphone app and/or **Maintenance.YamahaOutboards.com** for helpful information and maintenance-related technology

Outboard maintenance doesn't need to be difficult or expensive. Whether you do it all yourself or have one of approximately 2,000 authorized Yamaha Marine dealers do parts of it for you, we're committed to helping you maintain your outboard in a way that's easy to do and easy to understand. Let's get started.



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Yamaha is the only outboard manufacturer to receive the coveted CSI® award for customer satisfaction from the National Marine Manufacturers Association (NMMA®) every year since its inception (2002).

FIRST THINGS FIRST LET'S GET STARTED



We boaters can take a lesson from pilots, who perform a simple walkaround of their craft before each and every use. They know taking a few short minutes to do this every time is key to safety and enjoyment. Each time before you go boating, you should do the same.

In the pre-launch checklist below, you'll find information that you can use to help make sure you fully enjoy your day on the water. It's regular attention to these basic items that will help make boating the safe and enjoyable experience it's meant to be.

PRE-LAUNCH CHECKLIST

1. Inspect dock and heaving lines
2. Check navigation lights
3. Check anchor and tackle
4. Inspect trailer winch
5. Care for rear wheels of your tow vehicle the same as trailer wheels (see #9)
6. Ensure registration numbers are properly displayed, plus current registration and other necessary documentation is onboard
7. Ensure trailer hitch and safety chains are secure, and inspect trailer wires and connections
8. Check hull for damage, soft spots or blistering
9. Grease bearings, ensure lug nuts are tight and not rusting, check tire tread and pressure
10. Test bilge pump
11. Check gauges



- Check and/or prepare fire extinguisher, first aid kit, visual and audible distress signals

- Check for throwable type IV PFD and ensure all passengers have properly fitted PFDs

- Check the weather and file a float plan with a friend

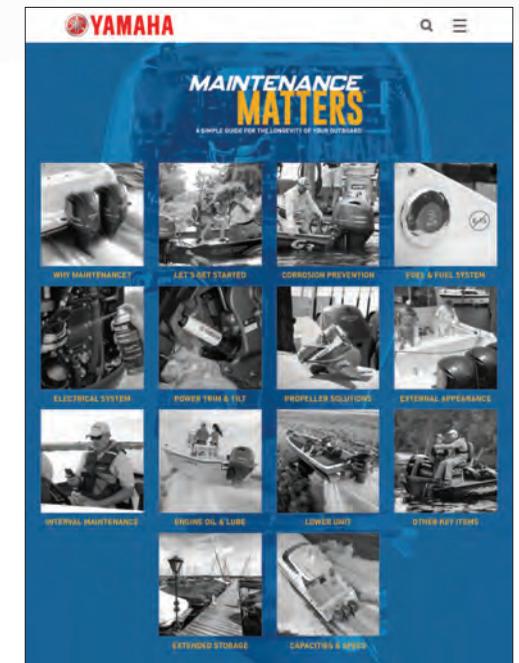
- Check load of vessel and secure gear from shifting

- Prepare tool kit with extra wire, spare fuses, spark plugs, prop and nut, hoses and clamps, etc.

- Verify your vessel is in compliance with all applicable boating laws

Keep in mind you're never alone.

- **Yamaha dealers stand ready to help.** With approximately 2,000 authorized Yamaha Marine dealers nationwide, one can assist you with proper maintenance of your Yamaha outboard. From regular maintenance to installation of parts and accessories, they have the tools and the training to do the job right. And they feature Genuine Yamaha and Yamalube® maintenance and care products. That's important.
- **Yamaha website.** For additional information on why "Maintenance Matters," including helpful "how to" information and a complete list of Genuine Yamaha and Yamalube® maintenance and care products and accessories, please visit Maintenance.YamahaOutboards.com.



DEFEND AGAINST THE ELEMENTS CORROSION PREVENTION



While your Yamaha Marine dealer can help you with, or even do, most of your general and preventative maintenance, corrosion mitigation is something you can only do yourself—and time is of the essence.



Regardless of where you boat, corrosion attacks both the inside and the outside of your outboard—every day, all the time. Some forms you can see, some you can't, and it can take only a short time for the damage to begin. Even those boating in freshwater have corrosion-mitigation duties to attend to. Why, even rainwater can have corrosive effects that can be damaging to your outboard. So it's vital to be diligent in your anti-corrosion defense.

Your dealer can help provide the right products to help prevent some forms of corrosion, but their regular and diligent use is strictly up to you. The following are answers to common questions about how to mitigate the presence and damage of corrosion.



Where do I need to concentrate my fight against corrosion?

Corrosion can happen pretty much anywhere on or in your outboard: inside, in your fuel system or in the internal cooling water passages, and on the outside, in various electrical connections and exposed metal components. But don't worry, you have a lot of allies on your side, and we're here to help by teaching you where to look and what to look for.

What's so important about flushing my outboard? I boat exclusively in freshwater, do I still need to?

Your Yamaha outboard is raw-water cooled, meaning it uses the water it's operating on as cooling water. All water, fresh or salt, contains contaminants that will eventually build up in the cooling passages over time. Additionally, saltwater is naturally corrosive and any remaining in those cooling water passages after use is left there to do its worst, unabated. Saltwater can also experience crystallization when exposed to heat above 170 degrees, which causes deposits to form and potentially restrict cooling water passages. For these reasons, it's a must that you flush your engine thoroughly with fresh, clean water after every use.

Scan here to learn more about outboard flushing.*



How do I go about flushing my outboard?

Use one of these three basic methods to flush after each trip.



- **Use the built-in flush attachment.** This is a great procedure to follow, especially if you can't remove your boat from the water, or if your outboard has dual water inlets and you don't have the special adapter. Simply connect a garden hose to the inlet side of your non-running outboard's built-in flush attachment, turn the spigot on full blast, and let the hose's water pressure do the work. Let the water run for 15 minutes to ensure it fully circulates through the entire cooling system several times. If your boat's out of the water, like on a trailer or a lift, the fresh water will also trickle down and adequately clean the water pump and the lower unit's cooling water passages.



- **The flush muff method.** This is the most common and often-used fresh water flushing method. Simply connect a garden hose to clean fresh water on one end and a "flush muff" attachment, which slides around the lower unit to provide water to both sides of the raw water inlet, to the other end. Turn on the water until you see water squirting out the sides of the flush muff, then start your outboard in neutral. Set the outboard to no more than a fast idle (900-RPM max) and allow to run for 15 minutes in neutral. Increase hose water pressure enough to maintain a bit of squirting out from under the flush muffs at all times while the outboard is running. This helps ensure it gets fed enough cooling water.

Note: Outboards utilizing two cooling water inlets require a special adapter to use this method. Check with your outboard's manufacturer.

Note: Increasing engine speed may cause water demand to exceed supply. If you notice the hose becoming flat while the outboard is running using this procedure, increase the water flow and/or decrease the engine RPM.

Warning: For safety, we suggest you remove the propeller before you begin. Accidental engagement of the outboard into gear with the outboard running will cause an exposed propeller to spin rapidly, possibly resulting in serious injury or death.



- **The flush bag method.** This method can be used for a boat on a trailer or when moored. A flush bag, when filled with water, simulates the outboard idling in its normal state but immerses the lower unit in fresh, clean tap water. Simply place the bag around the outboard, attach the hose, and fill the bag. Ensure the water level reaches the height of the outboard's water pump (about 1" above the lower unit separation seam). Start the engine, and run for 15 minutes in neutral. Leave the hose running during this entire procedure. When complete, stop the outboard, then the hose, and then drain the bag.

Note: Thoroughly dry the bag before storage.

Scan here to see a video about the three flushing methods.*



What is “dry corrosion”?
What causes it and what can I do about it?

Dry corrosion occurs in areas not in direct contact with water—exhaust systems, for example. The outside of most exhaust system components is cooled by raw water to prevent overheating. When today’s ethanol-enhanced fuel is burned, it creates by-products known as sulfate salts. These salts are highly corrosive, especially when exposed to very hot temperatures. If the outboard’s cooling water passages are not kept clean by regular flushing (the exhaust area in this example), hot spots can form on the interior of the exhaust components, concentrating the sulfate salts’ corrosive effects. In effect, it’s corrosion from the inside out. That’s why flushing your engine with fresh, clean water for 15 minutes after each trip is a vital part of preventing even dry corrosion. It helps the cooling system run at maximum efficiency by keeping the cooling water passages clean and clear, which helps minimize the heat inside the engine, making it less susceptible to dry corrosion.



How can I fight corrosion on the outside of my outboard?

It’s a good practice to set up a regular schedule and stick to it. There are quick and simple things you should do after every use if you boat in saltwater, and periodically if freshwater is your game. These include visual inspections you should do every time. If you’re unsure about what to do and when, your authorized Yamaha Marine dealer can help.

Scan here to see a video about corrosion prevention.*



- 1 • Rinse it.** Don’t spare the hose when returning from a trip, particularly in saltwater. Rinse the entire outside of the outboard with clean water. Give it a once over with some mild soap like Yamalube® Wash & Wax Concentrate and a soft cloth while you’re at it (do not use liquid dish detergent—it can strip off important protectants). Go ahead and wash the whole boat and trailer. Wiping it down with a good quality chamois afterward helps keep it all looking sharp.

Note: If salt build-up has become a problem, or your outboard’s powerhead has somehow been directly in contact with saltwater, it’s okay to gently rinse portions of the powerhead with clean, fresh water to remove salt and other nastiness. Just use a hose on low pressure—not a spray attachment—and don’t rinse around the air intake area. Rinse out the inside of the cowling, too. Make absolutely sure both the powerhead and the cowling are completely air-dry before re-installing the cowling.

- 2 • Spray it.** Liberally spray the entire dry powerhead with a protectant like Yamashield™. It’s a lubricant, a water displacement agent and a corrosion preventative all rolled into one. A high-quality silicone spray works well here, too. Spray all external powerhead surfaces and the electrical connections to help keep them corrosion-free, and the rubber cowling sealing gaskets to help keep them supple and effective at sealing out harmful water.



- Check it.** Do a quick visual inspection of your boat and your Yamaha outboard(s) every time you use them. Look for anything out of the ordinary and investigate if need be.

Keep a special eye on:

Anodes: Anodes intentionally corrode before your outboard does, in order to help protect it. Better known as “sacrificial anodes,” they are typically dull grey in color. On Yamaha outboards, they’re usually located on the lower unit just above the prop and on the bottom of the engine bracket. As corrosion occurs over time, they begin to “dissolve.” Replace them when they are about 50% gone with only high-quality, factory-recommended replacements. Don’t be fooled by lesser-quality imitations. There’s too much at stake here to risk it. Yamaha sacrificial anodes are made of a blend of high-quality alloys specifically designed to help protect your Yamaha outboard.



Caution: Never paint or cover anodes in any way, as they must be in direct contact with the water in order to perform correctly. When exposed to the water (especially freshwater), they can become covered with a layer of organic growth (often referred to as “scum”). This is often so thin you won’t even notice it, but it can prevent an anode from doing its job. Therefore, during your regular washdown procedure, make sure to take a brush and some soap to the anodes to keep them clean and in direct contact with the water. This will help keep them working properly.

Propellers: Even stainless steel propellers can get corrosion on them. Although most often attributable to external forces like stray voltage in the water, which is not in any way attributable to the prop itself, it nonetheless detracts from the shiny finish you expect it to have. If your props do get surface discoloration on them (which often appears as a flat grey or light rusty color), there are simple methods by which to clean and protect them using readily available materials.

Electrical systems: Not just your outboard’s, but your boat’s. Look under the console and in the bilge areas for electrical connection blocks. Also, check the battery terminals. If corrosion appears on either, Yamalube® Battery Terminal Cleaner & Protector will do the trick. Spray it on to clean the affected areas (heavily corroded connections will first need to be disconnected and thoroughly cleaned). When it dries, it leaves a protective waxy film that will help keep corrosion from re-forming.



Scan here to see a video about cleaning and caring for propellers.*



KEEPING YOUR MACHINE CLEAN FUEL & FUEL SYSTEM



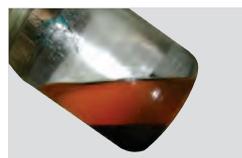
The largest source of trouble with marine engines these days lies with the fuel and fuel system. Paying regular attention to both can help prevent major headaches down the road. From hoses and connections to proper filtration and even fuel additives, time spent maintaining your fuel system helps keep you safe and your boat ready for action.



What is ethanol and why is it so bad for marine engines?

Ethanol has been added to the majority of today's fuel supply as an oxygenate to help reduce emissions. It's also used to extend domestic fuel supplies.

Ethanol is alcohol, and alcohol is "hygroscopic," which means it attracts water molecules. Since nearly all boat fuel tanks are vented to the atmosphere, water can (and will) collect in your fuel. When the concentration of water molecules in your fuel tank reaches just 1/2 of 1%, the water molecules will bond with the alcohol and sink to the bottom, where your fuel pick up is. Depending on the amount of water ingested into your outboard, this can result in everything from running problems to catastrophic damage.



Ethanol, being alcohol, is also a powerful solvent that can loosen debris in your fuel tank and all the tanks and lines it was in before it got to you. Once in your outboard, this debris can cause everything from running issues to a no-start, no-run condition. That's no fun.



Scan here to learn more about ethanol and how to combat it.*



What can I do to protect myself from the potentially damaging effects of ethanol?

Fortunately, there are simple procedures that can help, but it's important that you do your part. This is one part of maintenance you must proactively do for yourself. As you read, scan the QR Codes® for more information.

- 1 • **Install a 10-micron fuel/water separating filter** in the fuel line between your fuel tank and your outboard. It filters the gas and allows any water (which is heavier than gas) to safely sink to the bottom of the filter and out of the fuel. Yamaha's spin-on 10-micron filter traps impurities down to 10 microns in size (1/20th of the diameter of a human hair), to keep your fuel clean, and has an extra-large water-retention area. And since it's a spin-on, it's very easy to replace.

Scan to learn more about the importance of fuel/water separating filters.*



Tip: Carefully filling a new replacement filter about 3/4 full with fresh, stabilized fuel before installation will make priming the fuel system afterward much quicker and easier.

Tip: Apply a thin film of clean engine oil to the gasket when installing the filter. That will make it much easier to remove when it's time.

- 2 • **Add fuel stabilizer and conditioner to every tank of fuel.** Make sure to add a quality, marine-specific non-alcohol-based formula, like Yamalube® Fuel Stabilizer & Conditioner PLUS. These formulations are specifically designed to work effectively in the moisture-rich environments common to boats. And don't believe some of the claims you see today; no matter what you add to bad gas, it's still bad gas. No additive will restore stale fuel, remove water, or cure ethanol-related issues.



Tip: Today's gasoline can begin to break down in a matter of weeks, not months. Make sure to treat every tank of fuel, not just for extended storage. It's cheap protection against a world of hurt.

- 3 • **Add Ring Free PLUS internal engine cleaner to every tank of fuel.**

The cleansing additives in the majority of today's gas are a great start, but they're formulated for automobiles, so they may not work as well on your outboard. Do them one better. Ring Free PLUS makes performance-robbing carbon chemically unable to stick to internal engine components. The "PLUS" is a proprietary blend of synthetic anti-corrosion additives that helps protect the "yellow metals" in your fuel system (copper, brass and silver solder) from corrosion. These are key components to proper fuel system operation. This helps maintain their performance and reliability. Ring Free PLUS also cleans gums and deposits off of internal engine and fuel system components.

Scan to learn more about the power of Ring Free PLUS.*



- 4 • **Buy your gas where they sell a lot of it.** The goal is to keep your boat's fuel fresh and potent at all times. Why buy gas that's already been sitting around untreated? Buy the freshest fuel you can find, and at fill up, treat each tank with Yamalube Fuel Stabilizer & Conditioner PLUS and Ring Free PLUS. Add these before adding the fuel so they mix up well. It's an easy, proactive and protective habit to get into.

Are there any other fuel filters, and where are they located?

Your Yamaha outboard has a system of fuel filters on the engine, as well. It's important to know the location of these filters and to clean or replace them at the recommended intervals. You can find this information in your service manual or through your authorized Yamaha Marine dealer. As an example, here's a general guide using a modern Yamaha fuel-injected four stroke.

- 1 • **Primary On-Engine Filter.** This is typically on the front, side, or rear of the powerhead, and is usually made of plastic you can see through. It filters fuel coming into the outboard. This "primary" filter usually features a small water trap at the bottom of the cup. This is the first filter after the 10-micron filter; so if there's water in here, it's time to change your 10-micron. On Yamaha outboards, there may be a red ring visible inside this filter. Don't ever remove it. If it's floating, you've got water in this filter's trap. Time for a change.
- 2 • **Vapor Separator Tank (VST) Filter.** Attached to the electric fuel pump in the Vapor Separator Tank (VST), this filters gas again just before it's pressurized into the fuel injection rail(s). The VST is a prime spot in your fuel system where deposits and gum can form, particularly if fuel is untreated, and the VST filter is the most difficult to access and usually the most expensive to replace. Help protect it by consistently treating every tank of fuel, and regularly inspecting and servicing the first two filters in the fuel line.
- 3 • **In-Line Filter.** Some models have an in-line filter between the primary fuel pump and the VST (vapor separator tank) and/or in the fuel line between the VST and the fuel rail, located along the top of the outboard. Refer to your service manual or contact your dealer for the exact location for your model.
- 4 • **Fuel Injector Screen.** These are built into each fuel injector. They're very fine-mesh screens and are not user-serviceable. If debris somehow makes it here, the fuel injectors must be removed and professionally cleaned, or replaced—reason enough to inspect and/or change your fuel filters regularly.

FUEL FILTER COMPARISON	
YAMAHA FUEL/WATER SEPARATING FILTER	AFTERMARKET FUEL FILTER
<ul style="list-style-type: none"> 10-micron filtration at 95% nominal efficiency Tall filter element cleans 90 gallons per hour Sealed metal bottom Large water reservoir Sealed can 	<ul style="list-style-type: none"> Shorter filter element Plastic base Screw-on bottom



How often should I change my fuel filters?

- **10-micron filters** should be replaced every fifty hours of engine operation. Keeping this filter clean and fresh will help protect the other fuel filters on the engine and extend their service life. And always carry a spare on board, just in case you get a load of bad gas and the filter gets overwhelmed.

Tip: Do not simply remove and dump the fuel and re-install the filter, as captured debris and water could enter the "clean" side of the filter and be released into your fuel system.

- **Primary and in-line filters** should be replaced after every 100 hours of engine operation. These are easy to get to and simple to replace.
- **VST filters** should be inspected and/or replaced after every 300 hours of engine operation, provided that the 10-micron external and initial on-engine filters have been serviced and maintained properly. Properly treated fuel will also extend the life of these filters.

What are some other tips I need to know about my fuel system?

- **Check fuel system components before each trip.** It's important to visually and physically check the condition of the fuel hoses and connections for any signs of leaks or cracking each time you use your boat. Give everything the "sniff test". You should also check your primer bulb. If the bulb does not become firm when squeezed prior to starting the engine, check for a possible fuel system leak. If none, replace the primer bulb.

- **Get rid of carbon and keep it out.** Yamaha Internal Engine Cleaner is a dealer-only applied product that is the strongest and most effective way to clean out carbon and other build-up from the inside of your outboard. Once done, be sure to use Ring Free PLUS regularly to help keep it that way.

- **Carburetors need love, too.** Late-model carburetors run very lean, with very small passages that can clog with gum and varnish. Use Yamalube® Carburetor Cleaner Dip full strength, or diluted using warm, soapy water, to help clean them up.

Note: Be sure to follow directions. If yours is a two-stroke carburetor, don't immerse it in solvent for long periods of time; the special sealant used on it will be removed, resulting in damage and possible negative running issues.

- **Gas containers.** Be sure to add Fuel Stabilizer & Conditioner PLUS and Ring Free PLUS before filling them up, and keep them in a cool, dark place if possible. Containers available through Yamaha feature a "Spill-Proof Spout" which shuts off automatically when the container reaches capacity. This helps prevent spills and helps them comply with emissions requirements.



All the items in this catalog are available through your local authorized Yamaha Marine dealer. More information can be found at Maintenance.YamahaOutboards.com.

TAKE CHARGE OF YOUR ELECTRICAL SYSTEM



Today's modern outboards and onboard electronics require juice to run. That's why your electrical system is one of the most important systems on your boat. Because boats constantly operate on or are near water, electrical system care is even more important, especially in highly corrosive saltwater environments. Make sure your electrical system is always ready to perform with these simple checks and procedures.

Check the wiring and connections.

The electrical system's job is to carry voltage from one place to another. If the voltage can't make the journey, or if it's diminished when it gets there, the receiving device will not function properly, if at all. The goal is to have as much voltage (or electrical energy) arrive at Point B as left Point A. As electricity passes through a device, some parasitic loss is normal. However, corrosion impedes electricity's ability to travel, which can cause significant voltage loss or intermittent voltage. Either can wreck the good times, but with simple visual inspections and physical actions these scenarios can usually be avoided.



Some electrical corrosion can be easy to see, such as corrosion on battery posts or electrical panel connections. But some damage can be more difficult to see, such as internal corrosion that has rotted some or all of the individual strands inside a wire's cover. You can use an ohmmeter to check electrical connections and wires for excessive resistance. There should be no more than 0.1-0.2 ohm resistance between electrical connectors on each end of a wire. Any more than that and you should investigate further.



Don't forget the batteries.

Make sure to use the right size and type recommended in your owner's or service manual (see chart on next page for general specifications). If there's any question about a battery's performance, have it load tested. Any auto parts store can do this for you, or you can do it yourself with the right equipment.

Caution: Make sure that there are no fuel fumes present when making, breaking, or checking battery connections and condition. Give the area the "sniff test" to check for fumes. If in an enclosed area, run the blower or thoroughly air out the space, or take the battery outside to test it. Please plan and protect accordingly.

All battery cable connections must be clean, tight and use hex nuts and lock washers (not old-fashioned wing nuts). Loose connections can cause frustrating intermittent issues or a full-time "no run" condition. A dirty or corroded connection can impede electricity's ability to travel, and a battery terminal connection may be corroded, yet appear clean. To avoid any doubt, always remove the terminal connection and clean both sides of the connecting materials down to bare, shiny metal, then re-install and tighten the connection properly. For regular maintenance, use Yamalube® Battery Terminal Cleaner & Protector. Simply spray it on and watch for the foam to change color, indicating that the corrosion (acid) has been neutralized. It then dries into a thin, waxy film, preventing the build-up of additional corrosion.

Consider "house batteries."

Consider "house batteries" to power accessories. Most large Yamaha outboards (150hp and up) have separate battery isolator/charging leads specifically for this purpose. The outboard's Dual Charge Monitoring System, with proper wiring, will first send charging voltage from the stator to the starting battery/batteries to help keep the voltage up and ready to go. Once fully charged, the outboard will automatically "switch" the charge to the house battery/batteries.

Check the electrical connections.

Corrosion often occurs where wires meet. Visually check electrical blocks under the dash and/or in the bilge. Also, check any connections on gauges or add-on electrical equipment like battery switches, plotters, or fish-finders. Wiggle wires and connections to check for looseness. If either is found, disconnect and clean the connection with emery cloth or fine-grit sand paper, then re-install and tighten properly. Finally, spray all electrical connections with a product like Yamashield™ which puts down an anti-corrosive layer and leaves behind a protective film that helps prevent corrosion going forward.



YAMALUBE®



Don't spare the spray.

If you haven't already sprayed connections with Yamashield or Yamalube® Silicone Protectant & Lubricant, remove the outboard cowl and liberally spray the entire powerhead. Not only will it help prevent corrosion, but it will help keep rubber parts (like your cowl seal) supple and able to do their job effectively.



Note: Do not spray silicone on any oxygen (O₂) sensors that your outboard may have.



We've got the goods.

Yamaha offers a complete range of electrical system care products, including original-equipment NGK® spark plugs, Yamalube Yamashield Protectant and Lubricant, Yamalube Battery Terminal Cleaner & Protector, Yamalube Silicone Protectant & Lubricant, and Yamalube Contact Cleaner. They're the best you can get for your outboard, and they're all available through your local authorized Yamaha Marine dealer.

Scan to see a video on proper battery and electrical system care.*



YAMAHA US/CA MODELS	CHARGING VOLTS	UNIT	SPECIFICATIONS	
			MIN.	MAX.
F8A	15.0V	CCA/SAE	245 A	433 A
F9.9/T9.9		MCA/ABYC	323 A	520 A
F15/F20		RC/SAE	52 min	NA
F25/T25	15.0V			
F30/F40				
F50/T50/F60/T60/F70		CCA/SAE	380 A	1150 A
F75/F90		MCA/ABYC	502 A	1370 A
F/LF115		RC/SAE	124 min	NA
VF115	14.5V			
F/LF150		CCA/SAE	512 A	1150 A
3.3L F/LF200		MCA/ABYC	675 A	1370 A
3.3L F/LF225		RC/SAE	124 min	NA
3.3L F/LF250	14.5V			
2.8L VF150, F175, F/LF200				
4.2L VF200/225/250		CCA/SAE	680 A	1150 A
4.2L F/LF225		MCA/ABYC	770 A	1370 A
4.2L F/LF250		RC/SAE	160 min	NA
4.2L F/LF300	14.7V			
F/LF350		CCA/SAE	700 A	1150 A
		MCA/ABYC	900 A	1370 A
HPDI	14.5V	RC/SAE	160 min	NA
		CCA/SAE	512 A	690 A
		MCA/ABYC	675 A	840 A
		RC/SAE	182 min	NA



STAY AT PEAK PERFORMANCE POWER TRIM & TILT



Your outboard's Power Trim and Tilt unit changes the outboard's thrust angle during operation for maximum performance of both your outboard and your boat. It's electro-hydraulic, meaning an electric pump moves hydraulic fluid upon command from the operator, tilting the thrust angle out or in. It's positioned inside the engine bracket, meaning almost constant contact with water, and, depending on where you boat, that can mean saltwater. Still, under normal conditions, this system needs only minimal care in order to function properly.

Scan to see a video about power trim and tilt maintenance.*



Remember to rinse. Make sure to include the PT&T unit in your routine post-trip flushing and wash down procedure. For best effect, first run over it gently with a sponge or a soft cloth soaped up with mild detergent like Yamaclean®. Then, spray the whole unit down with fresh, clean water.

Look and listen. Periodically grease the top of the trim rams on your PT&T unit to help keep them safe from corrosion and to eliminate those annoying, but harmless, squeaking and popping noises. Be sure to use a high-quality marine-formula grease, like Yamalube® Marine Grease, so it won't wash off so fast.

Act and Retract. Keep the trim rams fully retracted when not in use to prevent corrosion build-up. Engage the tilt lock mechanism built into the outboard's bracket, or install a Yamaha engine support to hold the engine in the tilt-up position. Then, withdraw the tilt rams into the unit by pressing the PT&T down button until they are fully retracted. This keeps all but the very tip of the ram immersed in a bath of PT&T fluid and safe from corrosion. Liberally apply Marine Grease to the ram tips to help keep them corrosion free, too.

Tip: The built-in tilt lock mechanism is for maintaining tilt for storage or periods of non-use only, such as when mooring. Do not trailer using only this mechanism to support the tilted outboard.

Fill it up with the good stuff. The fluid in your PT&T system is under extreme pressure that can cause molecular shear, which tears apart the fluid's molecules, resulting in a drastic loss of lubricity. Don't use substitute oils like motor oil or power steering fluid. Yamaha Performance Power Trim & Tilt Fluid is specially formulated to tolerate a specific amount of water ingestion and still maintain proper operation, all while withstanding extreme pressures. It also contains special anti-foaming agents the others don't, to maintain critical lubricity.

Check the valves and seals. If you see fluid on the outside of the PT&T unit, or if your outboard won't stay tilted up (or stay tilted out when running), it may mean that the seals or internal valves are in need of inspection. Have the unit inspected by an authorized Yamaha Marine dealer and, if necessary, disassembled and repaired.

Note: All the items in this catalog are available through your local authorized Yamaha Marine dealer. More information can be found at Maintenance.YamahaOutboards.com.

PROPER PERFORMANCE NEEDS PROPELLER SOLUTIONS



Your propeller is a key factor in your boat's performance, and your satisfaction; so don't overlook it. Maintain it for peak power, performance and efficiency. Consult YamahaOutboards.com/Propellers or your authorized Yamaha Marine dealer for more information.

It's all in the eyes. Give your prop a good look as part of your pre-launch checklist. Are there any bends, nicks, cuts or cracks? Any of these will rob performance and potentially cause damaging vibration to your outboard. If found, get the prop examined and repaired by a qualified propeller repair facility. Your local Yamaha Marine dealer is a great place to start.

Something missing? If you've noticed a decrease in your boat's performance, but your outboard checks out fine, you'd do well to suspect your prop. Suspended grit, sand and silt in the water slowly eat away at your propeller's edges. When this happens, your prop may look perfect, but the worn edges can seriously degrade performance.

Scan to see a video about propeller care.*



Beware corrosion. Even stainless steel props can experience surface discoloration. But it's easy to clean and protect most props. Try these simple tips:

- **Rough Cast Mag Wheel Cleaner.** Spray on (use caution near painted surfaces), do not let dry or sit more than 30 seconds, agitate with dish sponge, rinse thoroughly, dry, apply paste wax.
- **Toilet Bowl Cleaner, Hydrogen Peroxide, or Calcium Lime & Rust Remover.** For spot cleaning: spray on or put on a rag and wipe over stained area (do not allow to dry). Rinse thoroughly, dry, and follow up with paste wax.
- **Mild Rubbing Compound or Metal Polishing Paste.** For difficult stains: apply to pad and rub in a circular motion until stain is diminished. Buff with a clean cloth, apply paste wax.

Scan to read more about cleaning in Yamaha's Prop Shop publication.*



Protect the propshaft.

Periodically remove your propeller(s), check for fishing line wrapped around the prop shaft, then grease the prop shaft with a high-quality, high-pressure marine-formula grease like Yamalube® Marine Grease or Molybdenum Grease. This will help make it easier to get the prop off next time, especially in saltwater. When re-installing your propeller, make sure to torque the prop nut to the manufacturer's specification, and always use a new cotter pin rather than re-using the old one.

Be prepared.

Just like a spare tire, you may need more than one prop. Whether you demand different levels of performance or just want a spare for emergencies; having a second propeller is a very wise choice.



BABY YOUR BABY EXTERNAL APPEARANCE



Nothing matches the pride you feel in your clean, well-maintained boat. Keeping your rig looking and performing like new has longevity benefits, too. Here are some tips and easy procedures you should perform regularly to help protect and preserve your baby.

Scan here to see a video about helpful boat cleaning tips.*



Make it easy on yourself. Just like you clean the inside of your outboard by fresh water flushing after each trip, thoroughly spray down your boat and the outside of your outboard with fresh, clean water. Use a soft cloth and a mild, marine-specific cleaning agent, like Yamaclean®, then rinse it again. A Yamalube® Marine Detailing Kit is a handy way to get the goods you need to help protect and beautify the exterior; so you can take pride in your ride while you're preserving it.

Note: Don't use liquid dish soap or ordinary household detergents when washing your boat. They remove waxes and other protective coatings your boat needs.

To protect and preserve. Don't be afraid to spray the entire powerhead liberally with Yamalube® Yamashield™. It not only helps give your powerhead that just-detailed look, but also helps prevent the effects of corrosion. While you're at it, protect and preserve the rubber seal between the cowl and the engine pan with a high-quality silicone spray, like Yamalube Silicone Protectant & Lubricant. This helps keep it supple to prevent water from entering this area.

Look out below. Keep things sharp and protected below deck. Use Yamaclean® Bilge Cleaner as necessary, and spray your battery terminals with Yamalube Battery Terminal Cleaner & Protector. Keep a clean hull for good looks and maximum performance, too. You'll find commercially available anti-fouling paints, coatings and materials to help get, and keep, your hull clean and free of marine growth. There are Yamalube cleaners for that annoying waterline, too.

Keep it covered. Protect your outboard from the elements when not in use or when trailering by using a custom-fit Yamaha engine cover. If your boat sits outside, a custom-fit boat cover is a worthwhile investment. Even a tightly pulled tarp will help to a degree in this regard.

Whether washing, waxing, caring for your upholstery, cleaning isinglass, polishing stainless steel, cleaning carpet or deodorizing life jackets and wet storage areas, you'll find the marine-specific formulas to make it easy and to do it right at your local Yamaha Marine dealer. Just look for the yellow stripe on the Yamalube label.

Tip: If the products you need are not currently in stock, ask that they be ordered, and accept no substitutions. Insist on killer clean. Insist on Genuine Yamalube cleaners and care products.

Scan to see a video about external care.*



TIMING IS EVERYTHING INTERVAL MAINTENANCE



Some maintenance steps, like visual inspections, are best done every day, while others, such as oil changes, are set up at certain intervals.



Yamaha provides easy-to-understand information about how, and when, to perform proper maintenance. Yamaha also offers approximately 2,000 authorized Yamaha Marine dealers from coast-to-coast, specially trained and equipped to handle most of your outboard's maintenance needs. So whether you get the parts from your Yamaha Marine dealer and do it yourself or have them do the work for you, you'll rest assured knowing you're doing your part to help protect and preserve your Yamaha outboard.

Getting started.

The most accurate and specific maintenance interval information for your particular outboard will be found in your owner's manual (YamahaOutboards.com/OwnersManuals). We've also included a basic chart (at left) to help give you an overview of what needs doing, and when (indicated by yellow boxes). To determine when service is due, keep your eye on your hour meter. If you don't have an hour meter, it's easy and inexpensive to install one. Or, many Yamaha gauges already have this functionality built in, allowing you to set reminders at various intervals, and helping to keep you on schedule. You can also utilize the Yamaha Outboards Mobile App on your smartphone.

■ = YES

+++ Clean (if applicable) or replace

- Please refer to your owner's manual or consult with your authorized Yamaha Marine dealer for specific requirements of your engine.
- After each use, especially in salt or brackish water

	REPLACEMENT SCHEDULE				
	Two Stroke	Four Stroke	Continuous Use	After First 20 Hours (New Outboard)	Annually or 100 Hours Every 50 Hours Winterization/Lay-up
YAMALUBE® 4M FC-W®					•
YAMALUBE® 2M TC-W3®					•
YAMAHA 10-MICRON FUEL/WATER SEPARATING FILTER					•
YAMAHA ON-ENGINE FUEL FILTERS+++					•
YAMALUBE® RING FREE PLUS FUEL ADDITIVE					•
YAMALUBE® FUEL STABILIZER & CONDITIONER PLUS					•
NGK® SPARK PLUGS+++					•
YAMALUBE® GEARCASE LUBE					•
YAMAHA OIL FILTER					•
YAMAHA IMPELLER/WATER PUMP ASSEMBLY					•
YAMALUBE® POWER TRIM & TILT FLUID					•
YAMALUBE® YAMASHIELD™					•
YAMALUBE® BATTERY CLEANER & PROTECTOR					•
YAMALUBE® STOR-RITE ENGINE FOGGING OIL					•
ENGINE FLUSH PROCEDURE	••				

LET'S BEGIN WITH CHOOSING THE OIL ENGINE OIL & LUBE



You've heard the expression "choose wisely." When it comes to choosing an engine oil and filter to protect your Yamaha, this couldn't be more true. Using the correct oil and filter at the recommended intervals is the single most important thing you can do for your outboard.

Checking your oil level.

The oil level check procedure for your Yamaha four-stroke outboard is a bit different than the procedure for your car. It's easy to get an accurate reading if you follow this procedure:

- Start and warm the outboard to normal operating temperature, then shut it off. Stop the outboard.
- Tilt engine up halfway and allow to rest for 5 minutes to thoroughly drain the oil back into your outboard's crankcase.
- Trim the outboard back down to level.
Tip: You can place a small level on top of the anti-ventilation plate to help you determine when to stop.
- Pull the dipstick, wipe the oil from it, and re-insert it in the crankcase. Then pull the stick again and check the oil level. This helps ensure proper venting for accurate indication.
- At the proper oil level, the oil should be halfway up crosshatch pattern on the dipstick.

Note: The top and bottom of the crosshatch pattern on the dipstick do not represent "high" and "low." The correct oil level indication is at the mid-point of the pattern. Use caution when filling or adding oil. Yamaha four-stroke outboards have a tapered oil sump design (smaller at the top than the bottom), so the closer the oil level is to full, the faster it fills. Therefore, add oil slowly and in small amounts, and do not attempt to "top off." Do not allow the oil level to surpass the upper portion of the crosshatch pattern. Doing so may result in aeration of the oil, reducing lubricity and oil pressure, and may cause eventual engine damage.



What oil should I use?

Your Yamaha outboard is vastly different from your automotive engine; so avoid regular automotive engine oils. Use a motor oil specifically formulated for the rigors of the marine environment, like Yamalube® 4M for four-stroke outboards, and Yamalube® 2M for two-stroke outboards.



Let's look at a few reasons why:

- 1 Engine load.** The typical loads placed on your outboard are much heavier than on your automobile, having to overcome a much greater amount of drag to create performance. This means your outboard is working much harder than your automobile's engine. Yamalube 4M and 2M marine engine oils contain specific anti-wear additives to account for this.
- 2 Engine speed.** Your outboard operates at a much higher RPM than your automobile's engine. It must rev higher to create higher speeds, rather than just changing gears like your car. That means your outboard may run all day long at 4500-6000 RPM, rather than the 2500 RPM your car reaches at highway speeds. That's tough on your oil, and can literally shear (or split) the molecules in ordinary automotive oil, reducing lubricity. Yamalube 4M and 2M have special shear-stable polymers to combat this and provide superior lubrication at all times.
- 3 Operating temperature.** Outboards are cooled using raw water, which is often cool to very cold. On the other hand, saltwater will begin to crystallize if its temperature is raised above 170° F, potentially causing blockage in the cooling passages and leading to engine overheat and possible damage. Because of these two factors, your outboard operates full-time at a temperature much lower than your automobile, and requires very different qualities in its lubricating oil. Yamalube marine oils have detergents, dispersants and viscosity index improvers to meet these marine-specific challenges head-on.
- 4 Operating environment.** Your outboard is constantly near water, sucking in very humid air directly off the water's surface in order to operate. This humid air also gets inside combustion chambers through open valves when it's not in use. And in a saltwater environment, that air is even more corrosive. It's one of the harshest environments imaginable for an engine. Yamalube 4M and 2M are purposely formulated with special anti-corrosion agents to help combat and prevent the corrosive effects of this environment.

Yamalube outboard engine oils provide specific protection other oils don't, using a proprietary blend of marine-specific anti-wear additives, shear-stable polymers, corrosion inhibitors, detergents, dispersants and viscosity index improvers. In short, they're far superior to automotive engine oils in their strength of protection, durability and corrosion resistance.



Scan to see a video about choosing engine oil.*

Want proof?

Marine engine oils are so different in their requirements that special levels of certification exist: FC-W® (four stroke) and TC-W3® (two stroke). These represent the minimum standards of the National Marine Manufacturer's Association (NMMA®) for marine engines. With their high quality and advanced formulations, all Yamalube 4M and 2M oils meet or surpass all of these requirements. Using Yamalube is best for your Yamaha outboard, but whatever oil you choose, make sure it is the correct type and viscosity and that it carries either the NMMA® FC-W® or TC-W3® label.



Aren't all oil filters pretty much the same?

Outwardly, perhaps. But it's what's on the inside that counts most. Yamaha oil filters are manufactured specifically to protect Yamaha engines, using only the finest components and construction methods available. This includes a special filter media and metal filter media bases (instead of cardboard), to help them achieve a level of durability and filtration far superior than most "off-the-shelf" oil filters. From the quality of the materials used to their high-quality construction, they simply outperform and out-protect most aftermarket alternatives.

What Yamalube oils are right for my outboard?

Yamalube 4M FC-W® Reformulated to better protect your investment from the harsh effects of cold starts, hours of trolling and high-load, high-speed operation, its special anti-corrosive additives are particularly suited for the harsh marine environment.



- **5W-30 Full-Synthetic**—great for high-performance outboards like our VMAX SHO® models
- **10W-30 Mineral Base** (conventional)—ideal for all Yamaha outboards and environments
- **20W-40 Mineral Base** (conventional)—suited for large outboards in consistently warm climates
Note: 20W-40 weight is not for use in 4.2L VMAX SHO models.
Tip: Your Owner's Manual is the best place to look for your recommended viscosity.

Yamalube 2M TC-W3® Yamaha-formulated and NMMA®-approved, it provides outstanding protection for two-stroke, water-cooled outboards, with its special blend of additives that help combat ring stick, corrosion, varnish and wear. It's a standard by which other two-stroke oils are judged.

Can I change my own oil?

Absolutely, but you don't have to. If you'd rather leave it to your Yamaha Marine dealer, they will be happy to take care of it for you in their specially trained and properly equipped service department. That also means you won't have to dispose of the used oil yourself. But if you prefer to do it yourself, your Yamaha Marine dealer can set you up with a Genuine Yamalube Oil Change Kit, specific to your Yamaha outboard. It includes the right type and amount of Yamalube marine oil, a Genuine Yamaha oil filter and a drain gasket. Everything you'll need to do the job right. Kits are available in Yamalube 4M 10W-30 and 20W-40 weights.

KEEP THE GEARS IN MOTION LOWER UNIT

The lower unit converts the power of your outboard's engine to rotation of the prop shaft, which moves the propeller, which moves your boat. Without it, you go nowhere. Its internal mechanical workings put tremendous pressure on the lubricant inside. This hardworking device just needs some simple, regular maintenance to help it stay that way.

Scan here to see a video about lower unit care.*



Lubricate it right.

The gears inside your lower unit are constantly turning, and the only protection they have is the lower unit lubricant you use. Its job is to form a micro-thin film between the metal component parts to keep them from actually touching. Under the large loads these gears exert, proper lubrication requires extreme

resistance to pressure, foaming and molecular shear. And, since the lower unit operates underwater, its lubricant also has to be capable of maintaining necessary lubricity even when a significant amount of water is present, should some leak inside. Ordinary gear lubricant can't do all of this; so always avoid automotive or tractor gear oils. Use a quality, marine-based formula, like Yamalube® Marine Gearcase Lube. It can perform all of these required protection and lubrication duties, even with a full 10% of water present. There's even an HD formula, to meet the special needs of Yamaha's top-of-the-line V MAX SHO®, 4.2L V6 Offshore and 5.3L F350 V8 outboard lower units.



Check it out.

Visually inspect the exterior of your lower unit for any signs of damage every time before you go out. If you fish, it's a good idea, every fifty hours or so (or when necessary whichever occurs first), to remove the propeller and check for any fishing line or other debris that may be wrapped around the propeller shaft, which can cut into prop shaft seals and potentially allow water to enter the gearcase. If found, visually inspect the propshaft seals for damage or leakage. Then check the color of your lower unit lubricant by cracking the "drain screw" on the bottom of the bullet and the "vent screw" on the side of the lower unit. Allow a small amount to drain into a clean container. If the lubricant is milky in color, you've got water in the lubricant. Have the lower unit seals inspected by your Yamaha Marine dealer through a pressure test, and if necessary, have the seals replaced. Pressure testing a lower unit is best performed by an authorized Yamaha Marine dealer, because depending on findings, it may be necessary to disassemble the lower unit for further inspection.



Note: It's best not to run the outboard right before checking the lower unit lubricant, as this will agitate the oil with whatever air is trapped inside. The resulting fine bubbles might be confused with the milky appearance that occurs with water ingestion.

Change it out.

Yamaha recommends replacing your lower unit lubricant after the first 20 hours for a new outboard, then every 100 hours after that. Also, if it's milky in color or smells or looks burnt when you're checking it, it's time for a change. To do it yourself, place a pan under the bottom drain screw, remove the screw, and then remove the upper vent screw on the side of the lower unit. Allow all of the lubricant to drain into the pan. While you're waiting, check the drain screw. It's magnetic; so any metal particles or shavings present in the lubricant will be attracted to it. Fine metallic dust is normal, but if you find larger chips of metal on the screw or in the pan as the lubricant drains, have your local Yamaha Marine dealer check for possible internal damage. Also at this time, replace the small crush washer present on each screw (commonly known as "drain plug gaskets"). If you don't see one, it may still be adhering to the outboard. Use a pick to pull it free, as these must be located, discarded, and replaced each time these screws are removed.

Note: These drain screw crush washers serve as gaskets and are not reuseable. They are a main source of protection against water intrusion into the lower unit, which can cause catastrophic dilution of the lubricant. Do NOT try to save a few pennies here. Lower units are very expensive. It's best to always have some extra drain plug gaskets on hand.

Once all the lube has drained, refill the lower unit by threading the appropriate fitting into the lower unit drain screw opening (on the bottom of the bullet) and slowly pumping in fresh Yamalube Marine Gearcase Lube or Lubricant HD. Once you see this new fluid seeping out of the upper vent screw hole, stop and wait 5 minutes, then very slowly continue pumping until it seeps from the vent screw again. At this point, replace the vent screw with a new crush washer installed, and tighten according to manufacturer specifications. Remove the fitting attached to the drain screw opening, and quickly re-install the drain screw with the new crush washer installed. Tighten to factory specifications.

You may choose to do these procedures yourself, or you can have your authorized Yamaha Marine dealer do them for you. Either way, performing them is important for proper continued operation and your continued satisfaction and enjoyment.

Note: All the items in this catalog are available through your local authorized Yamaha Marine dealer. More information can be found at Maintenance.YamahaOutboards.com.



ODDS AND ENDS OTHER KEY ITEMS



There are a few other important things to keep an eye on. Check your owner's manual for your particular outboard's schedule, and keep note of when to check on them by watching your hour meter, or by using the Yamaha Outboards app on your smartphone.



Water Pump.

Your water pump is responsible for keeping your engine cool. It's a simple system that works very well. Cooling water is drawn in through the intake grates on your lower unit, up to and through a rubber impeller keyed to the drive shaft on top of the lower unit, and pumped up into the powerhead of your outboard. There it circulates and eventually exits back down through the propeller to help keep it cool from the outboard's exhaust.

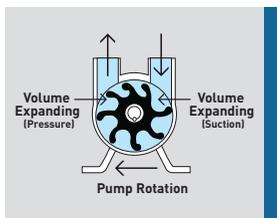
A telltale hole emits a small, visible stream of water after it has passed through the powerhead, to help indicate that cooling water is flowing.

Tip: If water should stop flowing from the telltale hole on your outboard, or if the stream becomes weak, carefully check the outlet tubing for obstructions. Mud daubers and other insects love to call these places home, especially during periods of extended storage.

Tip: Not all outboards will emit waterflow from the telltale hole at idle speed, even when operating normally. Once RPM increases a bit, however, you should see it. If you don't, keep a close watch on your temperature gauge and listen for a warning horn. Additionally, Yamaha outboards have an RPM reduction mode (as do most brands) which will limit the engine RPM if an overheat condition is detected.

Tip: The rubber impeller is located inside a stainless steel cup, and uses the water for lubrication. If this water is not present, the friction of the rubber on stainless steel will very rapidly overheat and destroy the rubber impeller. This is why it's imperative NOT to operate, or even turn over, your outboard without there being a proper supply of water to the outboard beforehand.

Time without use can lead to the impeller "taking a set", or becoming permanently deformed, due to its off-center positioning inside the cup. This condition makes water flow much weaker. Additionally, periods of non-use can cause the rubber to become more brittle, perhaps even breaking pieces off and sending them into the cooling system. For these reasons, it's best to replace your water pump impeller or the entire water pump assembly when servicing these items, and never rotate your outboard's crankshaft or driveshaft in a counterclockwise direction.



As a general rule, inspect the impeller and water pump assembly every year if operating in salt, brackish or turbid water, and replace if necessary. The debris in these waters acts like sandpaper. If operating in freshwater that is clear and clean, this interval may likely stretch to two seasons, provided no dry operation has occurred. Be sure to check your particular owner's manual for your outboard's specific service interval.

Note: If you're at all uneasy about performing impeller/water pump inspection and replacement procedures, have your local Yamaha Marine dealer do the work. They have the tools, materials and training to do it right, for your peace of mind.

Belts and Hoses.

Any belts and hoses your outboard has have to operate in the brutally harsh marine environment. Give them a glance once in a while, and heed the manufacturer's schedule for their replacement. If you find cracking or fraying, be safe and replace. Do not attempt to "flip" a belt in order to extend its life, nor handle the belt with lubricant of any kind on your fingers. Keep these safe from spray-on lubricants, too.

Tip: Yamaha four-stroke outboard timing belts and HPDI® two-stroke outboard high-pressure fuel pump belts are cogged and Kevlar®-impregnated, making them super-tough and non-stretchable. Still, Yamaha recommends they be changed every five years or 1000 hours.

Spark Plugs.

As a general rule, pull four-stroke outboard spark plugs every two hundred hours or every other season and check for proper color and wear. They should be a light brownish color and have relatively sharp edges. When necessary, replace with the exact manufacturer and part number that your outboard's manufacturer stipulates. The brand type and style of spark plugs used in your outboard are by design. They contain specific performance attributes that are engineered into your outboard. Those little markings and numbers on your spark plugs contain a wealth of information about heat range, thread depth, etc.; so don't second-guess or try to cross-reference here. Your outboard's performance depends on it.



Thermostats and Pop-Off Valves.

These are responsible for regulating the operating temperature of your outboard. Simple and effective, they're best observed through any signs of change in the engine's operating temperature. Operating in saltwater can cause deposits to build up, causing the valves to stick open, which can over-cool the outboard and prevent it from reaching proper operating temperature. Small bits of debris in the cooling water can get lodged between mating surfaces and cause the same condition. If this happens, removal and cleaning is most often the fix. Check your owner's manual for specific replacement recommendations.

Air Intake Passages.

Be sure to check the air intake passages for any obstructions such as bird nests and other debris brought in by various critters. Look under your cowling, too. It doesn't take long for your outboard or boat to become home to local birds and bugs, and it can be a real headscratcher when it comes to performance-loss diagnosis.



NOW'S THE TIME TO THINK ABOUT EXTENDED STORAGE



Preparing for extended storage efficiently and effectively means you'll have a worry- and hassle-free experience when you return to using your Yamaha outboard.

Whether it's returning your boat to a canal behind a Florida vacation home or hitting the water the first warm day after ice-out, you want to get in and go, not spend time performing tasks that should have already been done. Or worse, fixing damage created in the offseason. Take proper precautions. This is not the time to hurry or compromise. Your Yamaha dealer has the goods if you prefer to DIY. Otherwise, they will be happy to take care of these procedures for you.

Tip: Don't wait to call your dealer about winterization. The threat of the season's first freeze is too late!

- **Look it over.** Few things are more important than the visual inspection you do before extended storage. Start at the top of the cowling and work your way down to the skeg. Be sure to pull the cowling and the propeller off, too. Look for anything that appears damaged, missing or out of place, and repair or replace as needed.

Scan here to read Yamaha's Prop Shop publication.*



- **Replace it now.** Your outboard's engine oil has been working hard to suspend and carry away debris and potential corrosives resulting from the combustion process. Don't wait for spring to change it. Get rid of this nasty oil and the oil filter before you lay up for storage. Change your onboard 10-micron fuel filter, too. It's been helping to catch all the debris and filter out any water in your fuel, a fact that can be compounded by having run ethanol-laced fuels. You don't want either left sitting there waiting for you next spring, and any water may freeze inside the canister.

Tip: Be sure to lube all grease zerks with the correct grease stipulated in your owner's manual to help force out any water that may be residing there.

Tip: Charge batteries fully before storage, and have them load tested to make sure they're going to be up to the task come spring. It's best to check the charge monthly and keep them topped off if you can. If your outboard's stored outside during the cold winter months, don't risk them freezing. Bring your batteries indoors to a cool, dry place.

- **Fog it down.** Fogging oil helps protect vital internal engine components during periods of inactivity by coating them with a thick petroleum-based lubricant. This helps prevent rust and corrosion from forming and protects during start-up. For most modern fuel-injected four strokes, use Yamalube® EFI Fogging Oil. This is an additive you put in a small tank of fuel and run through the outboard to properly lubricate the internal components. For two-stroke EFI and conventionally carbureted outboards, an excellent choice is Yamalube Stor-Rite Engine Fogging Oil. Just spray it through the warm intakes a few times until the exhaust turns white, then spray equally into all intakes continuously until the engine stalls. Both products are easy to use and highly effective.

Note: As always, be sure to read and heed all product instructions for proper application procedures.

Scan to see a video about fogging your outboard.*



- **Keep it dry.** Water can form in the fuel system during extended storage periods, due to natural condensation. In addition, ethanol fuels can draw water directly from the atmosphere through the tank's vent. Make doubly sure to run the proper storage amount of Yamalube Fuel Stabilizer & Conditioner PLUS in your fuel, and thoroughly course it through the entire fuel system prior to shut down. Always store with the tank 7/8 full of fuel to help prevent over-accumulation of condensation. Also, never plug or cap the fuel tank vent, as the vent allows for natural expansion and contraction within the fuel system. Plugging the vent may potentially cause damage to fuel tanks and fittings.

Tip: If your outboard's stored outside during the cold winter months, make sure to trim it to a full-in, negative trim angle or place a tightly sealed plastic bag over the lower unit once it's thoroughly dry inside. This will help keep moisture from collecting in the lower unit, which could potentially freeze and crack it.

- **Clean it up.** Give your boat, and your outboard, a thorough cleaning before extended storage. Always make sure that any item or area in your boat is bone-dry before closing it up or sealing it off. Where applicable, a coat of sealant or wax will serve as a well-worth-it protectant.

Tip: This may be the best time to pull the boat out of the water and clean the hull as necessary. Remove any marine growth or barnacles with a thorough washing or sanding. If appropriate for your boating locale, now would be an excellent time for a new coat of bottom paint, too. Make certain to adhere to local legal and environmental requirements and appropriate safety precautions during these procedures.

- **Get it ready.** Just prior to extended lay-up is an excellent time to perform routine annual maintenance, and to take care of any outstanding service issues. Check the anchor, chains, dock lines and fenders too. Replace any worn or damaged items now so you'll be ready to hit the water when it's time. Also, check the boat for any loose items that need repair. If needed, one of our exclusive Yamalube Yamabond® formulas will hold things tight.

- **Trailers, lifts, and lights.** This is a great time to check your trailer or your boat house. Any loose, sagging or rotted bunks, lift straps or rollers should be replaced. Check trailer wheel bearings for signs of water intrusion and repair as necessary. Grease trailer bearings and lift roller assemblies using Yamalube Marine Grease. Its corrosion-resistant formula resists wash-off. Yamalube Yamashield™ is an excellent choice for lubricating winch cables, and Yamalube Brake & Contact Cleaner will help clean and restore proper taillight and dock light connections, while helping keep your trailer's brakes clean and in good working order, too (if applicable).

- **Wrap it up.** Many Yamaha Marine dealers offer shrink-wrapping services. This encapsulates your boat and helps protect it from the elements until you're ready to resume the good times. It also keeps your boat looking as good as it did when you wrapped it. Be sure to ask your local Yamaha Marine dealer about it.

- **Make it fun. Make it easy.** Seem overwhelming? It's really not. It's just learning a few procedures and taking time to do them right. Try dividing the chores up among members of your crew. It'll be less work for each of those involved, and the whole process will go faster. Got kids? Give them each a few appropriate tasks to perform and help them understand the importance of their contribution. This will help create a sense of pride and belonging when they're out on the boat next season. Still too much? No worries. Just contact your local Yamaha Marine dealer. They'll be glad to take care of all this for you.



DON'T FORGET THINGS TO REMEMBER



Over the years, Yamaha has learned a thing or two about keeping boating fun and enjoyable — not to mention safe. And proper maintenance plays a big role in this. Here are a few related thoughts to carry with you when preparing for good times out on the water.

Keep it simple.

Always be prepared, especially from a maintenance angle, and don't let an easy-to-fix problem spoil your fun. Remember to carry these simple items onboard at all times. Your local Yamaha Marine dealer can help put this all together.

- A small tool kit with basic hand tools.
- An electrical repair kit, with electrical tape, fuses, and electrical repair items like connectors, crimping pliers and extra wire.
- An extra 10-micron fuel/water separating filter.
- A spare propeller and a floating propeller wrench. A spare prop nut and cotter pin are also good choices.



Trailers need love, too.

Your trailer takes the good times to the water, but it is an often-neglected item when it comes to maintenance. It's not difficult to do, and it's important. Here are a few tips:

- **Lug nuts and a jack.** Check the torque on your trailer's lug nuts regularly. Carry the appropriate tools in your tow vehicle, and make sure you always have the correct jack should a flat trailer tire occur. It's easiest to just put the proper tools in your tow vehicle and leave them there.
- **Carry a spare.** If your trailer doesn't have a spare tire, get one and mount it to the frame. Then, make sure to air it up and check it regularly for the proper pressure. You want it ready and capable to help if it's ever needed.
- **Bunks and rollers.** Anything loose should be tightened, and anything sagging or rotted should be replaced. Make sure all bunks or rollers maintain proper contact with the bottom of the boat to prevent development of hooks or rockers in the hull's surface over time.
- **Hubs and wheels.** Check trailer wheel bearings for signs of water intrusion. Repair as necessary. Periodically grease trailer bearings using a high-quality, corrosion- and water-resistant formula like Yamalube® Marine Grease and a Yamalube Marine Grease Gun.
- **Cables and winches.** Carefully monitor the condition of your trailer's winch cable, particularly if it's made of metal. Replace the cable if there are any signs of cuts, abrasion or chaffing to prevent possible injury that could occur if it were to break under load. Make sure the winch handle is free of bends or cracks and is tightened down properly, too. Yamalube Yamashield™ is an excellent choice for lubricating and helping protect winch cables and assemblies from the damaging effects of corrosion.
- **Lights.** Help prevent frustrating trailer light issues with simple care and maintenance. Yamalube Brake & Contact Cleaner will help clean, dry and restore proper taillight connections. It's great for dock lights, too.
- **Brakes.** Whether your trailer's brakes are electrically operated or surge, proper periodic attention is required, particularly in saltwater environments. Make sure to rinse your wheels and brakes thoroughly with fresh, clean water after every dunking. That Yamalube Brake & Contact Cleaner you were just using on the lights is great for helping keep your trailer's brakes clean, too. Imagine that.

Scan here to see a video about proper trailer care.*



You can't take it with you. Seriously.

Many areas of the country are experiencing the rampant spread of invasive species like zebra mussels and hydrilla. These "hitchhikers" can easily be transported from waterway to waterway by unsuspecting boaters through trailering. To help prevent their spread, visually inspect your trailer every time you pull out of the water and remove any you find. Make this part of your regular routine after trailering your boat. The waterway you're headed to next will thank you for it!

CONFIDENCE YOU CAN COUNT ON WHY YAMAHA?



No one knows your Yamaha outboard better than Yamaha, including how to care for and maintain it. That's why the engineers that designed and built your outboard are some of the same engineers that assist in the formulation of specific products designed to help you care for it. And we offer comprehensive, easy-to-understand information about what to do and when, and what to use and where.



We have the products.

Yamalube.® It's the brand behind our reliable motors, and for good reason. They're the only products built around the unique demands, operating characteristics, and applications of Yamaha outboards. Using the proper maintenance products is as important as proper maintenance itself, and Yamaha is committed to helping outboards last. Yamalube products are all specifically

designed and manufactured to help maintain the performance and value of your outboard for many years to come. It's all about your satisfaction.

YAMALUBE®

Why is using Genuine Yamaha maintenance and care products important?

- **Factory-approved products versus generic.** The same engineers who designed your outboard test and approve Yamalube products; so you know they're right for the job.
- **Engineered to work better.** Yamaha formulates its products to meet the specific needs of your outboard. Aftermarket product manufacturers use a one-size-fits-all approach that may not fully protect your outboard.
- **Helps protect your investment.** Ultimately, you are solely responsible for the proper maintenance of your outboard; so do it right. Whether you choose to do the work or have your authorized Yamaha Marine dealer do it, insist on Genuine Yamaha and Yamalube maintenance and care products in order to maximize your performance and best maintain the value of your outboard.
- **They're the right tools for the job.** Using Genuine Yamaha maintenance and care products means never having to guess if your investment is adequately or properly protected. That's powerful peace of mind.

We have the information.

Let's face it, the best products in the world do you no good if you don't know how, when, and where to use them. From easy-to-understand maintenance charts, to instructional how-to videos, to on-site seminars with some of our professional staff, Yamaha makes it easy to know what procedures need to be done, and when. This Maintenance Matters book is proof, and it's just the start.



We have the dealers.

With a nationwide network of approximately 2,000 authorized Yamaha Marine dealers, there's sure to be one nearby that can help. If you choose to do the maintenance yourself, your local dealer has the Genuine Yamaha and Yamalube products, parts and materials you'll need. Or they can do much of your maintenance for you. They have access to all of the maintenance schedules and proper materials for Yamaha outboards, and the experience and the tools to do the job right. Either way, Yamaha has you covered.

Note: All the items in this catalog are available through your local authorized Yamaha Marine dealer. More information can be found at Maintenance.YamahaOutboards.com.



CAPACITIES & SPECIFICATIONS (CURRENT ENGINES ONLY)

Four-Stroke and VMAX SHO® Four-Stroke Outboards



VMAX SHO®
FOUR STROKE
JET DRIVE

OUTBOARD	Displacement	Yamalube® 4M-FC-W**	Oil Capacity w/ Filter	Oil Filter Part #	Primary On-Engine Fuel Filter Element †	External Fuel/Water Separating Filter	Spark Plug #	Lower Unit Capacity Right-Hand Rotation	Lower Unit Capacity Left-Hand Rotation
VF250/VF250X	4.2L	YES***	7.1qt	N26-13440-0000	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	36oz/35.1oz	NA
VF200/VF225	4.2L	YES***	7.1qt	N26-13440-0000	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	36oz	NA
VF175	2.8L	YES	4.8qt	69J-13440-0300	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	33.1oz	NA
VF150/VF150X	2.8L	YES	4.8qt	69J-13440-0300	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	33.1oz/33.1oz	NA
VF115	1.8L	YES	3.4qt	5GH-13440-0300	6D8-24563-00-00	Yamaha 10-Micron†	LKR-6E	25.7oz	NA
F350	5.3L	YES	6.9qt	N26-13440-0000	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	51.4oz HD only	44.3oz HD only
F225/F250/F300	4.2L	YES	6.7qt	N26-13440-0000	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	35.1oz HD only	35.1oz HD only
F200/F225/F250	3.3L	YES	5.0qt	69J-13440-0300	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	39oz	33.8oz
F175/F200	2.8L	YES	4.8qt	69J-13440-0300	6P3-24563-01-00	Yamaha 10-Micron	LFR6A-11	33.1oz	33.1oz (F200)
F150	2.7L	YES	4.8qt	69J-13440-0100	6P3-24563-01-00	Yamaha 10-Micron	LFR5A-11	33.1oz	29.4oz
F115	1.8L	YES	3.4qt	5GH-13440-0300	6D8-24563-00-00	Yamaha 10-Micron†	LKR-6E	25.7oz	24.2oz
F75/F90	1.6L	YES	3.9qt	5GH-13440-0300	6D8-24563-00-00	Yamaha 10-Micron†	LFR5A-11	22.7oz	NA
F70	1.0L	YES	2.2qt	5GH-13440-5000	6D8-24563-00-00	Yamaha 10-Micron†	LKR-7E	22.7oz	NA
F50/F60	1.0L	YES	2.2qt	5GH-13440-5000	6D8-24563-00-00	Yamaha 10-Micron†	DPR6EB-9	14.5oz	NA
F30/F40	747cc	YES	1.8qt	5GH-13440-5000	6D8-24563-00-00	Yamaha mini-10™†	DPR6EB-9	15oz	NA
F25	498cc	YES	1.7qt	5GH-13440-5000	61N-24563-10-00	Yamaha mini-10™†	DPR6EB-9	11oz	NA
F15/F20	362cc	YES	1.9qt	5GH-13440-5000	61N-24563-10-00	Yamaha mini-10™	DPR6EB-9	8.5oz	NA
F8/F9.9	212cc	YES	27 fl oz	NA	68T-24251-01-00	Yamaha mini-10™	BR6HS-10	5.1oz	NA
F4/F6	139cc	YES	20.3 fl oz	NA	68T-24251-01-00	NA	CR6HSB	4oz	NA
F2.5	72cc	YES	11.8 fl oz	NA	NA	NA	BR6HS	2.5oz	NA
T50/T60	1.0L	YES	2.2qt	5GH-13440-5000	6D8-24563-00-00	Yamaha 10-Micron†	DPR6EB-9	22.7oz	NA
T25	498cc	YES	1.7qt	5GH-13440-5000	61N-24563-10-00	Yamaha mini-10™	DPR6EB-9	15oz	NA
T9.9	212cc	YES	27 fl oz	NA	68T-24251-01-00	Yamaha mini-10™	BR6HS-10	12.5oz	NA
F150 (105)	2.7L	YES	4.8qt	69J-13440-0100	6P3-24563-01-00	Yamaha 10-Micron	LFR5A-11	NA	NA
F115 (80)	1.8L	YES	3.4qt	5GH-13440-3000	6D8-24563-00-00	Yamaha 10-Micron†	LKR6E	NA	NA
F90 (65)	1.6L	YES	3.9qt	5GH-13440-3000	6D8-24563-00-00	Yamaha 10-Micron†	LFR5A-11	NA	NA
F60 (40)	1.0L	YES	2.2qt	5GH-13440-5000	6D8-24563-00-00	Yamaha 10-Micron†	DPR6EB-9	NA	NA
F40 (30)	747cc	YES	1.8qt	5GH-13440-5000	6D8-24563-00-00	Yamaha mini-10™	DPR6EB-9	NA	NA

** 5W-30 and 10W-30 are correct for all climates. 20W-40 is for consistently warm climates.

*** 10W-30 weight oil maximum

† Other fuel filters may be present on this engine. Consult your authorized Yamaha Marine dealer or go to "Parts Lookup" under "Care & Maintenance" on YamahaOutboards.com for complete details.

‡ These motors can use either Yamaha mini-10 or Yamaha 10 Micron.

Note: All numbers listed are subject to change without notice.

Please verify all listings with your owners manual or check with your local Yamaha Marine Dealer.

NGK is a registered trademark of NGK Spark Plug Co., Ltd.



YAMALUBE®



Reliability Starts Here.®

When it comes to boats and outboards, you get out of them what you put into them. That's why proper maintenance and care is so very important, and you are a big part of making sure it's done and done right. It helps maintain the value of your investment and provide years of trouble-free fun on the water.

Proper maintenance isn't expensive or overly difficult to do. Yamaha's Maintenance Matters contains simple, easy-to-understand information about what to do, how to do it, when to do it and the proper materials to do it with. Additional information and assistance are as close as **Maintenance.YamahaOutboards.com** and/or your local authorized Yamaha Marine dealer. Do it yourself, or enlist the highly trained services of your Yamaha dealer to help.

Either way, you'll know that by insisting on Genuine Yamaha maintenance and care products, and by following Yamaha-recommended guidelines, your outboard will be receiving the best of care. In return, it will reward you with year after year of relaxation and enjoyment.

Insist on Yamaha, and only Yamaha.

*Message and data rates may apply. May not be available on all devices.

For the name of your Yamaha Marine dealer or for more information on our complete line of Yamaha Outboards, call 1-800-88-YAMAHA or visit us at YamahaOutboards.com.

REMEMBER to always observe all applicable boating laws. Never drink and drive. Dress properly with a USCG-approved personal flotation device and protective gear. This document contains many of Yamaha's valuable trademarks. It may also contain trademarks belonging to other companies. Any references to other companies or their products are for identification purposes only, and are not intended to be an endorsement.

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