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Yamaha outboard motor service manual

To keep your outboard motor in top shape from year to year, prepare it carefully for winter storage.Tools: owner's manual, freshwater flushing unit, garden hose, screwdriver, adjustable wrench, coffee can or other container, tarp, piece of scrap wood.Materials: fuel conditioner, rust-preventive oil, lower-unit lubricant, soft cloths, replacement nuts and bolts as required, touch-up paint, car wax. Buy lubricant, oil, and fuel conditioner at a marine store.Time: about 2 hours.Whatever brand or size outboard motor you have, follow the specific recommendations and instructions given in your owner's manual. Use only specified lubricants and replacement parts; if you use different ones you'll void your warranty.If you operate your motor in salt water, it must be thoroughly flushed to prevent corrosion. To flush the motor, use a freshwater flushing unit made to fit your motor. Attach the unit's fitting to the motor's cooling system as directed by the manufacturer; attach the coupling at the other end of the unit to a garden hose. Run the motor for several minutes at less than half throttle, exactly as directed, to remove all salt from the motor.Whether you operate the motor in salt water or in fresh, you must protect it from corrosion. The last time you use the motor before storing it, add to the fuel tank 1 ounce of fuel conditioner for each gallon of fuel in the tank. Operate the motor for about 5 minutes to make sure the fuel conditioner has reached the carburetor. Then disconnect the fuel line or turn off the fuel, and squirt a liberal amount of rust-preventive oil into the air intake of the carburetor; use the type of oil recommended by your motor's manufacturer. The engine should sputter, smoke, and die. If it doesn't, squirt in more oil; then shut the motor off and shift it into neutral gear. Dismount the motor and let it cool.With the motor disconnected, drain the fuel from the carburetor. Remove the cowlng and disconnect the spark plug wires; be careful to note their location exactly so you'll be able to replace them correctly. Using an adjustable wrench, remove the spark plugs. Inject about 1 ounce of rust-preventive oil into each cylinder, and slowly crank the flywheel on the top of the motor to spread the oil over the entire cylinder surface. Then replace and hand-tighten the spark plugs; leave the ignition wires disconnected.If your owner's manual recommends periodic lubricant changes for your motor's lower unit, remove the unit's top and bottom fill plugs and let the lubricant drain into a coffee can or other container. Replace the lubricant with the type recommended for your motor. Insert the lubricant applicator's nozzle into the bottom fill hole and squirt the lubricant into the gear case. When the lubricant starts to come out the top fill hole, replace the top plug; then remove the applicator nozzle and replace the bottom plug. Remove excess lubricant with a soft cloth.Inspect the lower unit for loose or missing nuts or bolts; consult the drawings and follow the precise instructions provided in your owner's manual. Tighten loose screws, nuts, and bolts; replace missing hardware with the exact type recommended for use in your motor.After lubricating and inspecting the motor, soak a soft cloth in rust-preventive oil and squeeze it out. Rub the cloth over all exposed parts of the motor to coat them with oil and prevent corrosion. Then replace the cowlng.Inspect the cowlng for chipped or peeling paint; touch up bad spots with matching paint. Use a touch-up kit made for your motor, or any good enamel; follow the manufacturer's instructions for application and drying. When the motor is completely dry, apply a coat of car wax to the cowlng, as directed by the manufacturer. For further protection, rub the cowlng with an oil-soaked cloth to coat it lightly with oil.Store the motor in a dry, dust-free place; cover it with a tarp to protect it from dirt. If the motor has a battery, remove the battery and store it separately; set it off the floor on a piece of scrap wood. Make sure the case is clean and the water in the cell is at the correct level.During the winter, work the throttle control every few weeks to keep the moving parts from corroding; twist the hand throttle or move the control lever the throttle control cable is attached to. Gently pull the starter cord to engage the gears. If the motor has a battery, check the water level in the cell and add water as necessary to maintain the charge.Storing your boat in an enclosed area is the best way to protect it from the elements. If you store your boat outside, a well-made cover can keep your boat from aging prematurely. Find out how to make a protective boat cover in the next section.For tips on caring for and repairing other types of sports equipment, try the following links: The propeller on a boat, whether an outboard or inboard, creates an effect often termed wheel-walk when it spins. As the boat moves through the water the total pressure of the water on the prop is less at the top than the bottom, causing a right handed prop-which rotates clockwise when looking at it from behind the boat-to swing the stern of the boat to starboard, resulting in the boat turning to port. This effect cannot be eliminated in a single prop boat; it can only be compensated for. Tilt the motor and locate the small trim tab located just above the propeller. It will probably be mounted on a circular plate with a nut in the center locking it in place. Different manufacturers have slightly different arrangements, but all are simple and obvious. If you don't have a trim tab fitted, either it is an old motor that never had one, or the fitted one has broken or fallen off. You will have to buy a replacement from the dealer for lost or broken tabs, or buy a retrofit tab from a marine chandler such as basspro.com or thmarine.com in their boating/outboard motor accessories section.Locate the mounting bolt(s) and get your socket wrench of the appropriate size ready. While you are still at the dock or on land, make sure the bolt is free and not rusted in place. Use a little WD40 if necessary until you can loosen and tighten the bolt easily.Take the boat out and run it up to the speed you normally cruise at, on a calm day with a helper on the boat with you, heading directly into any waves so they don't push the boat off course. See which way the boat turns when you loosen your grip on the steering wheel. The swing of the boat will vary with its speed, so adjusting it to track straight at cruising speed makes the most sense.Stop the boat and motor and tilt the motor. Make sure:1) You are in a clear area away from other boats or hazards 2), you are wearing your life-jacket and 3) you have a line attached to the socket wrench and your wrist.Slacken the mounting bolt and turn the trim tab a little; then tighten the bolt. If you have a right-hand prop and the boat was turning left, turn the tab to the left. You will have to judge how much to turn the tab, and you probably won't get it exactly right the first time.Run the boat up to speed again and see how much difference the adjustment made. If it still isn't running straight, repeat the above step, adjusting the tab appropriately.Mount an add-on tab if necessary. Add-on trim tabs are designed to attach to the skeg of an outboard motor when no factory-installed tab is available. They are inexpensive, usually under \$20, at 2010 prices, and can be purchased from most outboard motor dealers or marine chandlers. They come with instructions for mounting and adjusting. You will need more tools, including an electric drill, to mount the tab. If you are uncomfortable adjusting the tab out on the water, bring the boat back to the dock and do it there. You are vulnerable to sudden waves or wakes from passing boats when leaning over the stern, so make sure the helper you have with you can grab you if you start to fall and is capable of running the boat and picking you up should you fall in. It's a good idea to attach yourself to the boat with a safety line while you are performing this adjustment. SHUT THE MOTOR OFF each time you make an adjustment-you are working right next to the propeller. Jupiterimages/Photos.com/Getty Images Boat owners should routinely inspect and perform service maintenance on their Johnson outboard motors at frequent intervals. Doing so insures proper start-up and hours of pleasurable boating. Heat, friction and chemical pollutants in water can quickly compromise fuel and electrical systems. Since outboard motors have to work so hard all the time under constant torque, regular maintenance becomes all the more important in insuring smooth running and proper performance. Trailer the boat to a convenient work location, and stabilize the trailer against movement. Place the outboard motor in the full tilt down position. Inspect the propeller for nicks, cracks and bent blade tips. Pull the prop shaft back and forth and from side to side. Any excessive movement indicates wear or gap in the propeller shaft thrust bearing. Remove all debris from the propeller shaft, including wound fishing line or kelp. Cut the line or kelp away with wire cutters. Use a hydrometer or multimeter to check the charge of your auxiliary battery, if so equipped. Remove the plastic cell caps from the battery top and dip a hydrometer into one cell at a time. The hydrometer floats should read in the green for all cells. Yellow or red floats indicate a battery discharge or weak cell. Place the positive lead of a multimeter on the positive terminal of the battery and the multimeter negative lead on the negative battery terminal. It should read at least 12 volts, preferably 12.5 volts. Add distilled water to any low cell, up to the case neck. Charge the battery to its maximum standing volts. Hook up a flush device and garden hose to the lower unit fresh water intake ports. Use a piece of wire to probe the water intake ports on both sides of the lower unit, as well as the upper exhaust port. Clean all debris away from the intake and exhaust ports. Turn the hose on, and start the engine. Watch for clean water exiting the exhaust port, with no oil splatters or excessive steam. Flush the engine for at least 10 minutes to remove salt water and algae. Disconnect the flush device. Unclasp the engine top case cowl, and set it aside. Inspect the plug wire (or plug wires) for breaks and loose connections at the spark plug tip. The rubber plug wire boot should be free of cracks and fit firmly overly the plug tip. If your top engine case contains a pull rope ratchet for the recoil starter, examine it for free movement and dab some marine grease under the ratchet spacer. Examine the pull rope for frays and cuts. Clear any debris away from the flywheel. Use a plug socket to remove the spark plug. Check the electrode for excessive wear or carbon buildup. Use a wire brush to clean the electrode tip. Refer to your repair manual for the correct spark plug gap for your engine. Many Johnson plugs require 0.20, for example. Bend the electrode tang closer together by tapping it with a ratchet wrench, or use pliers to open it up. Screw the plug into the head and tighten it with a socket. Locate the lower gear case oil plug and remove it with a socket or screwdriver. Let the gear oil drain into a pan. Remove the gear case filler plug. Insert the hose of a hand pump oil bottle into the drain plug and pump in gear oil until it seeps from the top filler plug. Replace the filler plug and tighten it with a socket or screwdriver. Quickly remove the pump bottle hose and replace the gear oil drain plug. Tighten it with a socket or screwdriver. Remove the engine crankcase oil plug with a socket or screwdriver and let the engine oil drain into a pan. Replace the drain plug and tighten it with a socket or screwdriver. Remove the dipstick. Refer to your owner's manual for the proper oil volume of your crankcase. Fill the crankcase with new oil, using a hand pump oil bottle or funnel. Check the oil level with the dipstick. Locate the grease zerks (nipples) on your motor mount swivel bracket and the steering linkage rods. Use a hand pump grease gun to inject grease into each zerk fitting. Check your repair manual for all your fitting locations, especially if you have electric trim tilt. Wipe away excess grease with a rag. If your motor has hydraulic trim, check the fluid reservoir for the correct level. Examine the hydraulic lines for leaks and tight fittings. Mercury outboards are one of the most popular outboards on the water. They are dependable, powerful and relatively quiet. They make high-quality, high-performance one and two-stroke engines. However, they don't always fire right up when you try to start them. There's a few things you need to know before they'll turn over. Ensure there is plenty of gas in the boat fuel tanks. Check your oil level and battery levels by looking at the console gauges. If either one is low, replace as needed. Squeeze the primer bulbs on the hose that leads up to the outboard engines. Give them about five solid pumps. This sends fuel into the engine so it will take a spark. Put the boat into neutral and insert your key into the ignition. Then push forward on the key several times. Turn the key until the outboard turns over. You might notice that it chokes or is slow in starting. If it has trouble like this, move to step five. Add ethanol treatment for outboard engines. This helps the engine deal with gasoline that has high ethanol content (up to 10 percent). Ethanol is an alcohol and a solvent that doesn't react well with outboard engines due to the fact that there is more moisture allowed into an outboard. It can also create sludge and deposits in outboards. By Mary Dowd Updated June 17, 2021 If you're mechanically inclined and passionate about boating, you may wish to consider marine mechanic career training and certification. Certified marine mechanics install electronics equipment on boats, troubleshoot misfiring engines and make repairs on all types of watercraft. Outboard motor mechanics must be certified to work on engines and parts covered under manufacturers' warranties. A high school diploma or a GED is needed for admission to outboard motor mechanic training programs. Some employers hire entry-level mechanics and send them to a manufacturer's marine mechanic school. You must then pass a certification exam that tests your knowledge of boat maintenance and repair. Online marine mechanic certification courses can also be helpful in preparing for exams. Mercury Outboard Motors is a manufacturer of boat propulsion systems with more than 5,000 dealerships. Mercury dealers send newly hired technicians to outboard motor school called Mercury University. The goal is to ensure that technicians are expertly trained to work on controls, gauges and propellers in accord with the manufacturer's specifications. Following training, a certification test is administered. Technicians can be certified for entry-level jobs or as master technicians on product lines. Two additional courses must be taken within 24 months to maintain certification. Outboard motor repair training online is available through the well-known American Boat & Yacht Council (ABYC) that offers multiple certification courses and technician certifications. Ninety-minute online classes are taught live three days a week over the course of three weeks. You also have the option of purchasing a self-paced study guide to learn on your own. Examples of nationally accredited technician certifications available through ABYC include marine systems, marine electrical, advanced marine electrical and gasoline engines. After learning the course material, you could sit for a proctored certification exam if you have a computer with a webcam and microphone. Along with a passing score, you would need to document two years of related work experience to obtain ABYC initial technician certification. If you complete three or more certificates, you can pursue an ABYC Master Technician credential. Many public and private two-year schools offer associate degrees in marine technology. Courses cover mechanical, electrical and hydraulic systems. Students also gain hands-on practice in the installation, maintenance and repair of mechanical and electrical systems used in recreational boats and commercial vessels. At schools like New England Institute of Technology, graduates of the A.A.S. in Marine Technology program qualify for Volvo Penta and Yamaha propulsion systems certifications along with membership in the American Boat & Yacht Council (ABYC) that has more than 4,500 certified members. At the Marine Mechanics Institute (MMI) in Orlando, Florida, students spend 51 weeks learning up-to-date techniques for boat maintenance and repair. Marine mechanic classes cover subjects such as electrical diagnostics, diesel engines, fuel systems and service operations. Students also gain hands-on training to help prepare them to work on a wide variety of boats with complex mechanical and electrical systems. They also receive three-weeks of manufacturer-specific instruction on each brand. Training helps prepare students for technician certification on Yamaha, Honda, Mercury, Suzuki and Volvo Penta engines. The U.S. Bureau of Labor Statistics (BLS), indicates that marine mechanics earned a median annual salary of \$43,320 as of May 2020. This means that half of the marine mechanics included in the BLS salary report earned more, and half earned less than the median salary. The highest paid 10 percent earned more than \$66,230 per year. Job demand for this occupation is projected to remain steady or increase slightly through 2029, BLS further noted. Opportunities will be best for those with post-secondary training because the advanced electrical and mechanical systems in small engines require cutting-edge skills to diagnose and make repairs.

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