

Stainless Steel Propeller Installation Instructions

SAVE THESE INSTRUCTIONS

! WARNING

- To avoid accidental engine starting while servicing propeller, it is recommended to set the gear selector to neutral and to disconnect all spark plug wires before any propeller service procedure. Refer to Engine Owner's Manual for important safety precautions when installing propeller.
- Do not operate the boat if you experience an unmanageable "steering pull" or loss of steering control.
- Ignoring the above conditions can result in loss of control, personal injury, or death.

! WARNING

High-powered engines and high-pitch propellers (23" of pitch and higher) are designed to give stable boat performance on most boats with appropriate horsepower ratings. The degree of stability will vary with different boat-propeller-motor combinations. If your boat has a tendency to be unstable ("fishtail" or "chine walk") at high speed or in turns, it may require optional motor mounts and/or twin cable steering. Reference your engine manual for recommended corrective action or consult your dealer for the necessary mounts and/or steering kits to correct this condition of boat-propeller-motor.

FEATURES

Your new Michigan Wheel Marine propeller is constructed of high-quality stainless steel. It is designed and built for performance and lasting durability. Michigan Wheel Marine propellers are compatible with most major engine models. Refer to the most current Michigan Wheel Marine propeller applications catalog for specific fit information.

If your engine is a Mercury built prior to 1978, additional parts may be needed for installation. For 4-Blade Evinrude®/Johnson® installations, use Michigan Wheel Marine thrust washer 9500-140, available through your Michigan Wheel Marine products dealer.

Steering pull is the force or load experienced at the steering wheel. It is effected by one or a combination of variables, such as steering system type, engine type, engine or lower unit installation (i.e. transom height), power trim setting, hull design, and the specific propeller design.

Each propeller, operating at inclined angles piercing the water surface, produces different forces and moments relative to the steering axis. Therefore, when operating the boat after changing propellers, always keep a firm grip on the steering wheel and make certain steering loads have remained unchanged and manageable.

If steering pull has become unmanageable, lower speed and stop boat operation immediately. Consult either the boat owner's manual or customer/technical service of the boat, or steering system for instructions on the proper corrective action. For propeller information contact your local dealer or Michigan Wheel Marine customer service at (616) 452-6941 for a dealer near you.

Limited Warranty

Michigan Wheel Marine warrants to the original consumer purchaser and original motor fitted, that for a period of one year from the date of purchase, the body of the Michigan Match®, Vortex®, Apollo® or Ballistic® propeller will be free of any defect in material or workmanship that results in blade or hub fracture or failure under normal pleasure boat usage. Michigan Wheel Marine also warrants to the original consumer purchaser, under the same parameters of use described above, that the propeller bushing, including XHS®/XHS II™ hub kit components, will be free from any defect in material or workmanship for a period of one year from the date of purchase. Proof of purchase required for all warranty claims.

Some surface discoloration of propellers and hardware is unavoidable, and will not be covered by this warranty. This warranty also does not cover normal wear, accidental damage, modification, improper installation, improper maintenance, or other circumstances that are not the direct result of a defect in the material or workmanship of the propeller.

The sole obligation of Michigan Wheel Marine under this warranty is to repair or replace the propeller, in the sole discretion of Michigan Wheel Marine, and at its expense. In order to make a replacement claim, please contact the Michigan Wheel Marine Customer Service Department, at (616) 452-6941, for a "Return Materials Authorization" number (RMA#), and shipping instructions. The RMA# is to be indicated along with our given address on the label, and the shipping carton should include your return shipping address, your phone number, and a copy of your original purchase receipt. The warranty will not cover any expense of propeller removal, shipping, or reinstallation of the propeller.

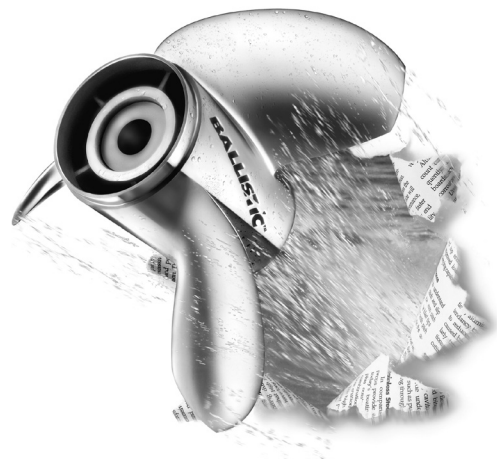
The above warranty is Michigan Wheel Marine's sole warranty for the Michigan Match®, Vortex®, Apollo® or Ballistic® propellers as well as XHS®/XHS II™ hub kits. Michigan Wheel Marine expressly disclaims all other warranties, expressed or implied, including, without limitation, the warranties of merchantability and fitness for a particular purpose and excludes all liability for incidental or consequential damages, loss of use of the propeller, costs, and expenses.

Any actions arising out of this warranty and the sale of this product shall be governed by Michigan law and may only be brought, heard and decided in Kent County Circuit Court, in the State of Michigan, U.S.A., or in the United States District Court for the Western District of Michigan.

Michigan Wheel Marine
1501 Buchanan Avenue S.W.
Grand Rapids, MI 49507
Phone: (616) 452-6941

Warranty 991010-A

GO BALLISTIC!



Michigan Wheel Marine®

(Attach sales receipt to this document and file for future reference.)

Upgrading to a higher performance propeller can also cause an increase in motor vibration. Your boat may require stronger motor mounts to accommodate the added stress.

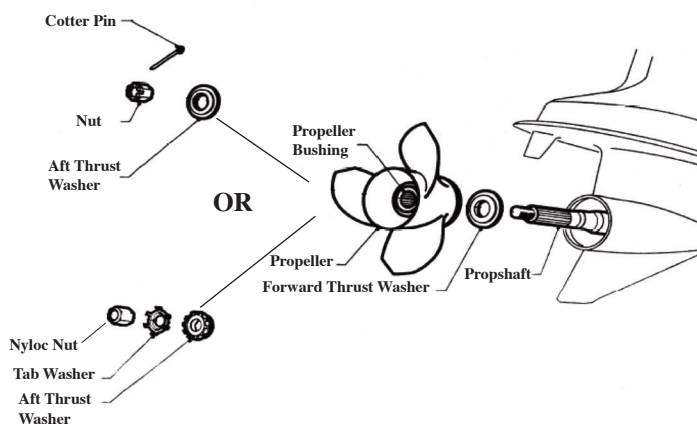
REQUIRED FOR INSTALLATION

- Wrench.
- Pliers or tabbed washer removal tool.
- Marine-grade white grease.

IMPORTANT: The new propeller does not include installation hardware. All parts from the existing propeller must be re-used to install the new propeller. In some cases, new hardware must be purchased. It is recommended that you record their sequence of removal and orientation to make certain they are correctly re-installed. (See Figure 1)

Images are for reference only. Actual components may vary depending on application. Please consult owner's manual as necessary.

Figure 1



REMOVE OLD PROPELLER

1. Use block of wood between gearcase and propeller to hold propeller during propeller nut removal, if necessary. If propeller is retained by a nyloc nut and a tab washer, bend tabs out of locked position then remove nut and washer. If nut and cotter pin are used, remove cotter pin then remove nut.
2. Remove the aft thrust washer.
3. Remove the old propeller. Use caution in forcing prop free if propeller bushing splines are corroded to the propshaft splines.
4. Remove the forward thrust washer. If washer is not on propshaft, it may have come off with the propeller.
5. Inspect all hardware for damage or excessive wear. Replace parts where needed.

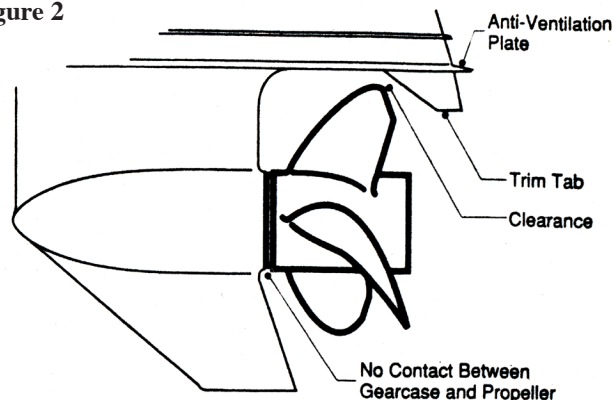
BEFORE INSTALLING NEW PROPELLER

1. Inspect propeller shaft and seal for damage. Check for monofilament line or debris which may have wrapped around the shaft and damaged seal.
2. Clean propeller shaft.
3. Apply marine grease to propeller shaft to aid future removal of propeller and hardware.

INSTALL MICHIGAN WHEEL PROPELLER

1. Fully install forward thrust washer on propshaft. If washer has a "step" side, it should face aft.
2. Align splines in propeller with propshaft splines. Prop will slide on easily - do not force.
3. Place aft thrust washer on propshaft, mating female splines with male splines on shaft, as required.
4. Place tab washer on shaft with nut indent down. Do not bend tabs.
5. Place retaining nut on shaft and use block of wood snug-tighten. Do not torque to spec here.
6. Rotate propeller to ensure there is no contact between the gearcase and propeller. Also ensure there is clearance between propeller blades and the trim tab and anti-ventilation plate. If there is contact between gearcase and propeller (for example, rubbing), contact Michigan Wheel Marine Customer Service. If there is contact between the propeller and trim tab, a high-performance trim tab may be necessary. (See Figure 2)
6. Use block of wood between gearcase and propeller and torque propeller nut (consult engine owner's manual for proper torque specifications).
7. Bend tabs down into locking position. Where required, insert cotter pin.

Figure 2



CLEANING

To maintain the mirror finish on your Ballistic prop, clean with soap and water or glass cleaner after use, especially if used in salt water. Remove rust spots as soon as possible with brass, silver, or chrome polish/cleaner. Irreversible pitting will develop under rust that remains for extended periods. Never use coarse abrasive, steel wool or sandpaper.

NOTE: Remove mineral deposits with household cleaning products such as vinegar or Lime-Away™. Be sure to follow the manufacturers' directions carefully when using these products, and clean the entire propeller thoroughly when done.

MAINTENANCE

Inspect and lubricate propeller several times per season, using high-quality marine-grade white grease only. Do this more often if operating in salt water.

INSPECTION/REPAIR

Damage to the blade or leading edge of your propeller can result in blade failure if not properly repaired. Damage at the leading edges creates stresses that can lead to cracks and possible blade loss. Inspect the blade and leading edge for nicks, gouges, and damage. Damage which goes undetected and not repaired can reduce performance and lead to blade failure.



CAUTION

Consult a professional prop repair facility for all repairs.

Michigan Wheel Marine