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Surface Drive Owners Manual

Please read the owners manual and the engine manual before operating the motor.

Notice: The engine is shipped without oil. Please fill with oil before starting the engine. We recommend using synthetic oil for optimum performance. A high quality SAE 10W-30 oil may also be used. The 35 and 40hp motors will take about 80oz (2 1/2qts) and the 27hp will take about 64oz (2qts).

WARRANTY
FOR VANGUARD 35
KOHLER 27 & 40

Two years: the engine manufacturer provides a warranty on the engine, as stipulated in the owners manual. If you need service, locate an engine mfg service center in your community or contact the engine mfg for a service center location.

Beavertail warrants that the frame and drive is free from defects in material and workmanship, assuming normal use, for a period of one year from the date of purchase. Warranty does not cover lack of lubrication, normal wear, collision, abuse or mistreatment, or lack of maintenance.

If a defect occurs during this period, contact your nearest dealer or Beavertail with a dated proof of purchase. You will be directed where and when to take your equipment for inspection and or service. It is the customers responsibility to present the equipment to the repair center for repair. Repair sequence and completion dates are set by the service center. If frame or drive parts are required to complete authorized warranty work, Beavertail will ship them at no charge. Expedited shipping is the responsibility of the customer. If warranty work is denied due to lack of lubrication or maintenance, collision, abuse or mistreatment, the customer may appeal to Beavertail for review. We will do everything reasonable to assist the customer.

Except for the expressed warranty of Beavertail set forth above, Beavertail grants no other warranties, expressed or implied, by statue or otherwise, regarding the Beavertail surface drive motor, its fitness for any particular purpose, its quality, its merchantability, or otherwise. The liability of Beavertail under the warranty set forth above shall be limited to the fair market value of the product at time of warranty claim. In no event, shall Beavertail Manufacturing be liable for any special, consequential, or other damages for breach of warranty. Beavertail has the right to change the product design at anytime without any obligation under this warranty.

Your Beavertail motor is designed to last you many years with proper care and use. Warranty items are repaired by authorized Honda, Vanguard, or Kohler engine repair centers and the drive/frame by Beavertail service centers. You are important to us, so call whenever you have questions or need assistance. Many owners prefer to repair their own mud motors and we will promptly send parts by regular ground when needed .Express shipping is also available, but this expense is the responsibility of the owner.

THANK YOU FOR PURCHASING A BEAVERTAIL PRODUCT.

This owner's manual contains the necessary information you will need to unpack, install, operate and maintain your Beavertail backwater motor. Safety is key to operating any motorized equipment. READ THE WARNINGS IN THIS OWNERS MANUAL, THE CAUTION LABELS ON THE ENGINE AND ITS MANUAL BEFORE RUNNING YOUR BEAVERTAIL MOTOR.

SAFETY

-Read these safety precautions before operating your Beavertail boat and motor.
-Always attach the safety lanyard to your self while operating the Beavertail motor. Unclip the safety lanyard from the switch or depress the red button each time you run the engine to ensure it is working properly. The engine should stop immediately when the red button is depressed, or the safety clip is removed from switch.
-The Beavertail boat and motor can be operated from the sitting position. If you stand, use a stand-up bar to maintain your balance. Protect the safety of passengers.
-Always wear a coast guard approved flotation device.
-Keep body parts and clothing clear of all moving engine components, the drive shaft, and propeller.
-Do not operate your Beavertail boat or motor while others are standing near the out drive.

-Use extreme caution while operating your motor particularly when it is out of the water and on the boat or on a storage stand. Never clean the engine or frame while the engine is running.
-The engine and muffler can become extremely hot and cause severe burns. Do not operate the engine in an enclosed area. Exhaust gases can cause sever injury and death.
-Our video DVD shows professionals running Beavertail boats and motors. Do not attempt to run your boat and motor in this manner without the proper training and experience.

OPERATION AND BREAK-IN

-Prepare the engine for starting: read your engine owner's manual. Observe break-in precautions. Do not over-rev the engine during the first couple hours. Do not break-in the engine on the trailer. The drive bearings and seals should be run in the water for the first couple hours. However, you can start the engine and let it warm up a few minutes out of the water during the break-in period.
-Starting the engine: READ THE SAFETY PRECAUTIONS IN THIS OWNER'S MANUAL BEFORE STARTING.
-First, pull out the choke. Put the clutch switch in the center position for starting if equipped with an electric clutch. Ensure everyone is clear of the engine and propeller. DO NOT LEAVE A RUNNING ENGINE UNATTENDED.
-On the water: This is where your fun begins. Even though the motor is built tough, it is the owner's responsibility to know its limits and protect the drive from severe impacts. Also, we want you to enjoy yourself, but ask that you be safe, courteous to others and environmentally sensitive. Some waterways are protected by environmental laws, so know these before you go. The Beavertail boats and motors will go places other boats cannot, so make sure you let others know your destinations, and when you will return. Carry a mobile phone and travel with others whenever possible. Bring a push pole in case you get stuck.
-Caution: never place the propeller in the water at high engine speeds with clutch engaged, particularly when the drive shaft is off to the side of the boat. This is true of any outboard motor. The boat can lurch forward or spin and expel the operator and passengers.
-Our website and DVD's show mud motors running in different conditions. The operators in our videos are professionals. Do not operate your mud motor in this manner without the proper training and experience-be careful and protect your passengers.
-With the engine set at idle, either engage the clutch, or lift the handle and or use the power tilt and trim to lower the propeller in the water directly behind the boat. You will now be moving forward.
-Start off slowly and soon you will learn new ways of using the motor to propel your boat in and out of places you never dreamed possible.
-Steering the boat is made easy by pushing or pulling the handle. You can also lift and place the propeller in and out of the water as needed to maneuver through vegetation and mud.
-The power tilt and trim is used to set the optimum drive angle when running. Through experience, you will find the best trim angle for your boat, motor and load. Normally, the propeller blade is slightly out of the water when running full speed for best performance. A small rooster tail will be present when running near the surface. This is usually the best position for running full throttle. Be careful when trimming up so that the propeller does not come too far out of the water which can cause the propeller to run across the water surface and cause excessive push on the handle. If the handle pushes into you while running full throttle, you can reduce prop torque by moving the engine one inch away from you. If this does not remedy the prop torque, bend the lower end of the skeg in the direction it is bent. Do this with a rubber hammer or wood block and hammer. Do not over bend or bend back and forth which can cause weld failure. Bend ¼" at a time for best results. After adjustment, use the bolts provided to bolt the motor to the transom.
-When operated at high speeds, the normal operating RPM is 3800 to 4000 RPM.

Maintenance

You will need a hand held grease gun, filled with a good quality marine-grade wheel bearing grease. You can find the grease at any major auto parts store.
Every 5 hours grease the frame pivot.
First 10 hours- check belt tension. Grease the frame swivel points. Grease both ends of throttle cable. Tighten prop nut.

First 50 hours- Grease the out drive assembly and swivel points. (see instructions below)
Every 100 hours or once per year- Grease the drive assembly.
The drive tube is filled with grease from the factory. In addition to the above lubrication schedule, every two years or 200 hours, remove the propeller and lower bearing cap. (Note: the bearing cap is left-hand threaded. Turn clockwise to loosen.)
Throttle: Lubricate the throttle cable with WD-40 or non-freeze silicone available at most Napa stores. Coat the throttle cable with grease near the engine and throttle cable and deters freezing. Elevate the throttle cable near the throttle by securing with two wire ties. The elevated cable will keep water from entering. This is very important.
Engine oil and filter should be replaced according to the engine manufacture's instructions. Change the oil and filter at the end of the season. Acids accumulate in the oil and if not drained, can cause internal pitting if left in the crankcase for extended periods. Cover the engine when in storage. This keeps the engine, wiring and mechanical parts dry, and prevents oxidation and corrosion.

IF YOU OPERATE IN SALT WATER; WASH DOWN THE DRIVE AND ENGINE AFTER EVERY TRIP.

The frame is coated with a marine grade powder coating and easily cleaned with soap and water. If you use a high-pressure washer, do not direct the spray at any area containing a seal such as the propeller, upper drive between engine and out drive, throttle or switches. The pressure will drive dirt and grime into the seals and parts and cause premature failure.
Storage: At the end of the season, and for extended periods of storage beyond one month, the fuel should be run out of the carburetor, and treated with a gas stabilizer. THE MOST COMMON CARBURETOR PROBLEMS OCCUR BECAUSE THIS SIMPLE PROCEDURE ISN'T FOLLOWED. NOTE. ALL ENGINE MANUFACTURERS DO NOT WARRANTY FUEL RELATED PROBLEMS. USE A GOOD GRADE OF FUEL, 87 OCTANE OR BETTER.
Ensure the vent screw located on the fuel gas cap is open. If closed, pressure can build which causes fuel to be pushed through the carburetor into the crankcase. Over time, this dilutes the oil and can cause engine failure. Do not add a fuel tank quick disconnect, which can restrict fuel and cause poor top end performance. You may add a primer bulb but turn the ignition switch on before pumping to avoid damaging the carburetor electronic shut off valve.

PROPELLER INSPECTION AND REMOVAL

Notice: The hex prop can be at times difficult to remove. Do not use excessive force to remove the propeller. Tap slightly with a block of wood or hammer, and you can heat to 200 degrees with propane torch. Do not pry with a screw driver because this can cause drive damage. If it does not budge, call us for a hex prop removal tool.

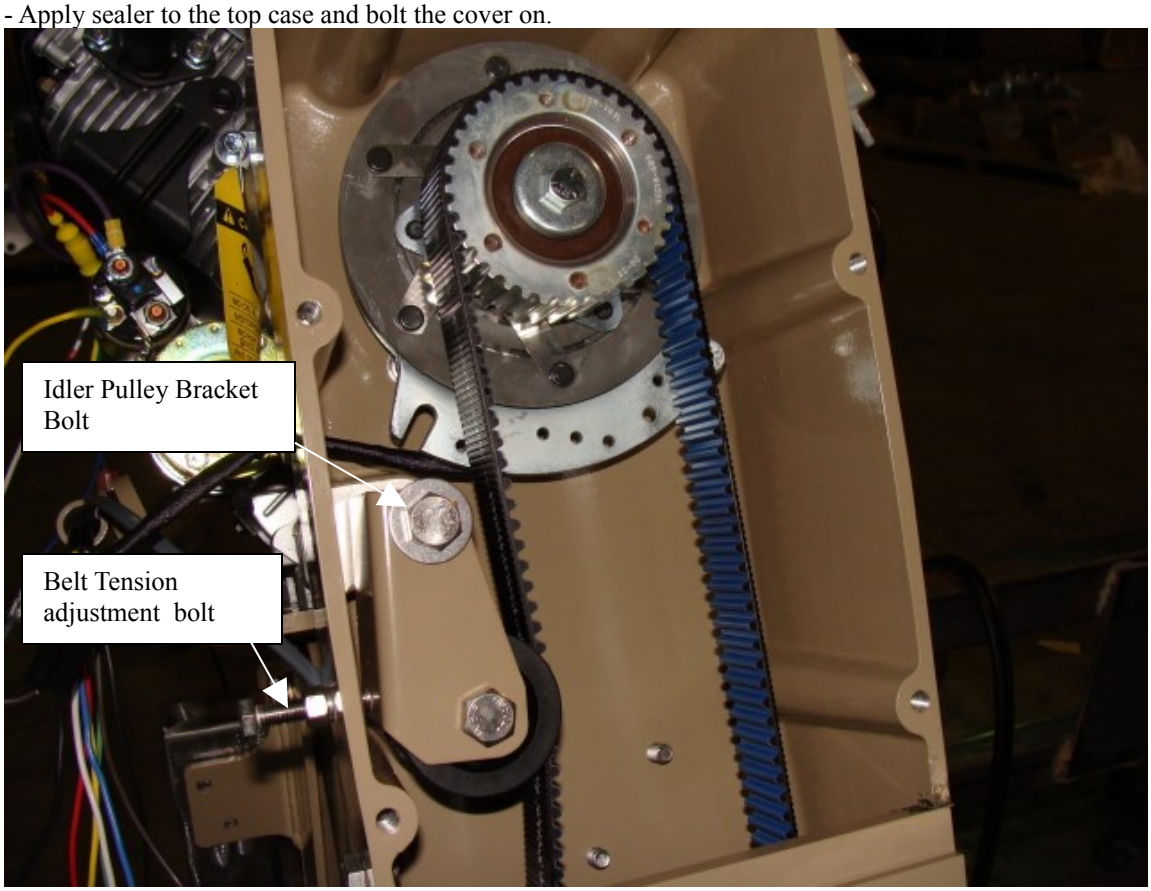
CAUTION- PROPELLER CONDITION: The most common reason for drive failure is a damaged propeller. Worn or bent props will decrease performance, and can also damage the drive unit. Your prop is 12.25" new. If 11 ½ or smaller, replace the propeller for best performance. Replace and or repair the propeller when it shows signs of damage or excessive wear. Lack of power or reduced thrust in mud is an indication of prop wear. We do not straighten or rebuild props. Some shops do, we suggest you use factory fresh new propellers.
-Check the prop by first warming the engine, then run the engine at full speed out of water and observe the skeg. BE SAFE AND CAREFUL. If it vibrates excessively, or turns into a blur, replace the prop immediately to prevent drive and frame damage. If the problem persists with a new propeller, you may have a bent drive shaft. Do not run without further service. Check the shaft when you remove the propeller. Again, BE CAREFUL. Run the engine at an idle checking the shaft for straightness. notice the small gap between the bearing cap and drive shaft. Watch the shaft as it rotates. If the shaft is bent, it will wobble from side to side. If bent, have the drive inspected by a service center and replaced immediately. NOTE: BENT DRIVE SHAFTS ARE CAUSED BY SEVERE IMPACTS AND NOT COVERED BY WARRANTY.
-Be careful when removing a worn prop, the edges can be very sharp.
-Clean the hex shaft or threads with a wire brush and coat with marine grease or never seize prior to

installing a new prop. Install the nut carefully to 240 inch pounds.

BELT TENSION OR BELT REPLACEMENT

You can check the belt tension without removing the clutch cover. Simply remove the side access plug on the right side of the casting. With the tool inserted into the access hole, and tension tool in the palm, observe the scale alongside the tension gauge and pick a point on the casting for reference. The objective is to depress the belt in its center : (not along the edge of belt because this will twist the belt rather than push the center) and then note how many pounds, as indicated by how far the small o ring moved, it took to move the belt the ¼". new belts are tensioned at 16 to 20 pounds, used belts should measure 12 to 16 pounds. If less than 12 pounds, tension the belt.

Belt Tension:
The Gates belt is tightened by adjusting the bolt on the belt tension idler pulley. The belt tension adjustment bolt is located on the left side of the case. We highly recommend you place thread penetrating oil on the adjustment bolts threads 24 hours prior to adjusting the belt. A corroded bolt (especially if run in salt water) can jam and even break off.
NOTICE: We use the highest quality stainless bolts. However, we do not warranty bolts that are corroded and break off. This is a customer maintenance item.
-Remove the face bolts from the upper drive cover
-Loosen the idler pulley bracket bolt.
-Now, tighten the belt by turning the adjustment bolt. Check tension each time you turn the bolt one turn. It does not take much to tension the belt. Once adjusted to the correct tension tighten the idler pulley bracket bolt.
 -Run the engine a couple minutes and recheck the belt tension. Tension again if needed.
- Apply sealer to the top case and bolt the cover on.



BELT REPLACEMENT

-REMOVE THE UPPER CASE COVER AND LOWER DRIVE CASE BOLTS WITH A 5/8” WRENCH.

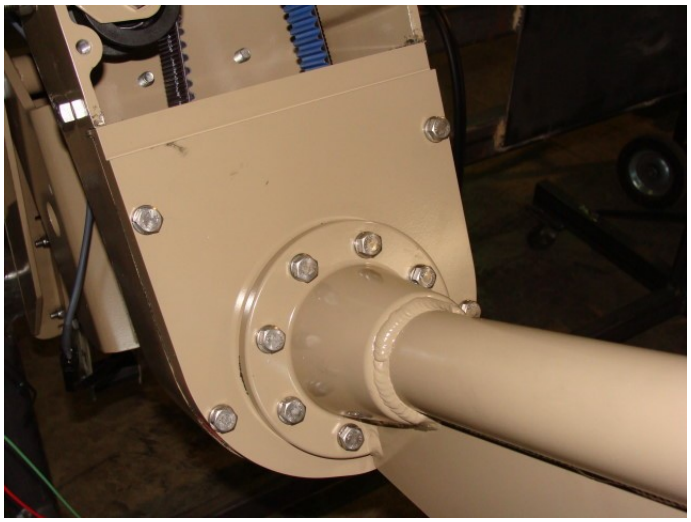
-Clean the silicone sealer off the covers . Do not scrape it is not necessary to remove all the silicone, just the large and thicker pieces. Put new sealer on the bottom case first which will fill any gaps. Wait to place sealer on the top case until the new belt is in place and the bottom cover is installed.

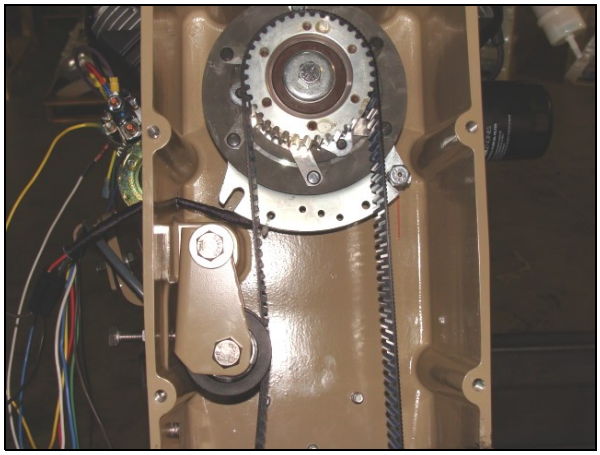
-Place a new belt on the lower sprocket and slip the belt up and over the top sprocket, being careful so you don’t wipe the silicone sealer from the bottom of the case.

-Insert bolts and tighten the bottom cover. Now tension the belt by tightening the idler pulley adjustment bolt as described above. Turn the propeller to ensure the belt and sprockets are engaged before tensioning the belt completely.

-When the belt tension is between 16-20 lbs check the belt alignment by rotating the prop several times. The belt should be aligned on the clutch pulley. If it is either too far out or in, the bottom sprocket will need to be adjusted in or out on the shaft. This is done by removing the two allen head bolts and then inserting one into the third empty hole and tightening into the hole. The pulley will then be able to be moved on the shaft. Once the pulley is adjusted the allen head bolts should be inserted back into the taper lock and tightened.

-The drive should be waterproof. We recommend putting sealer on any bolts that are removed.





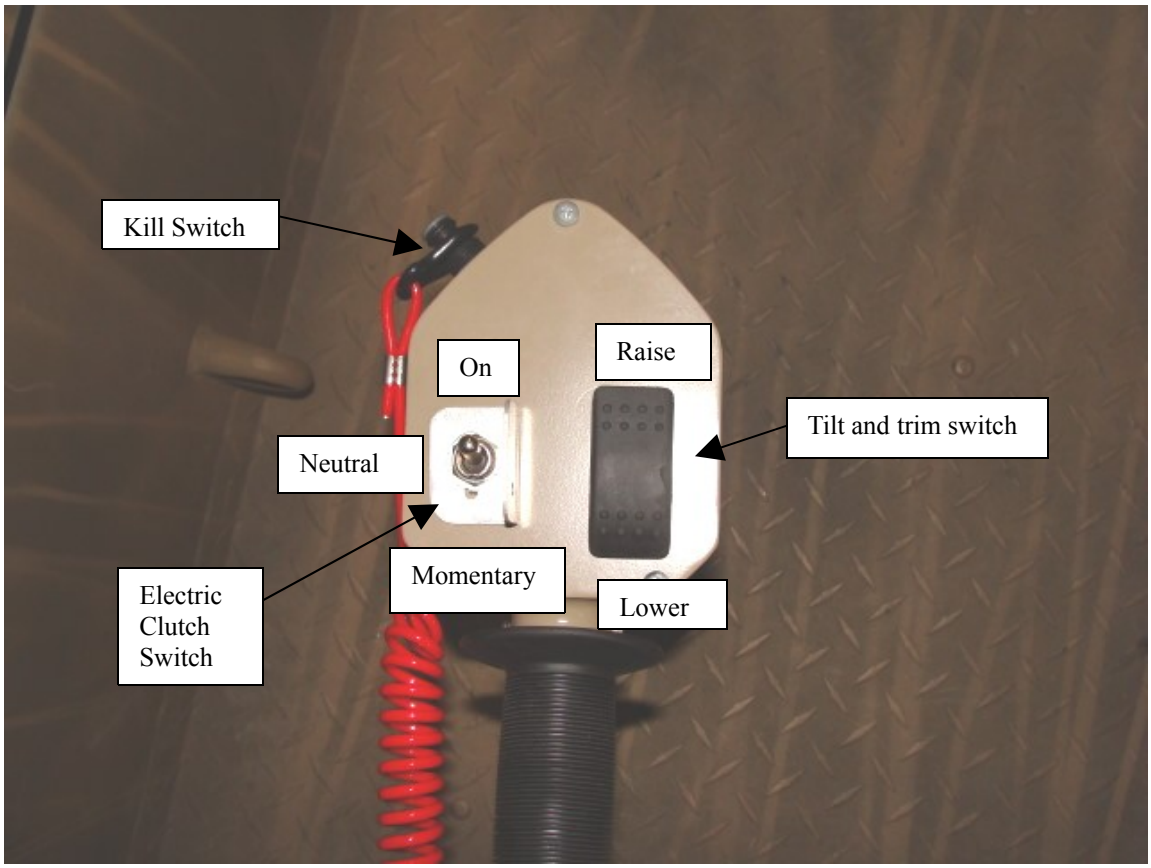
Operation

- Before starting the engine, be sure the area around the prop is clear and the clutch is in neutral. The clutch and engine are wired so that the engine cannot start if the clutch is engaged or in the on position.

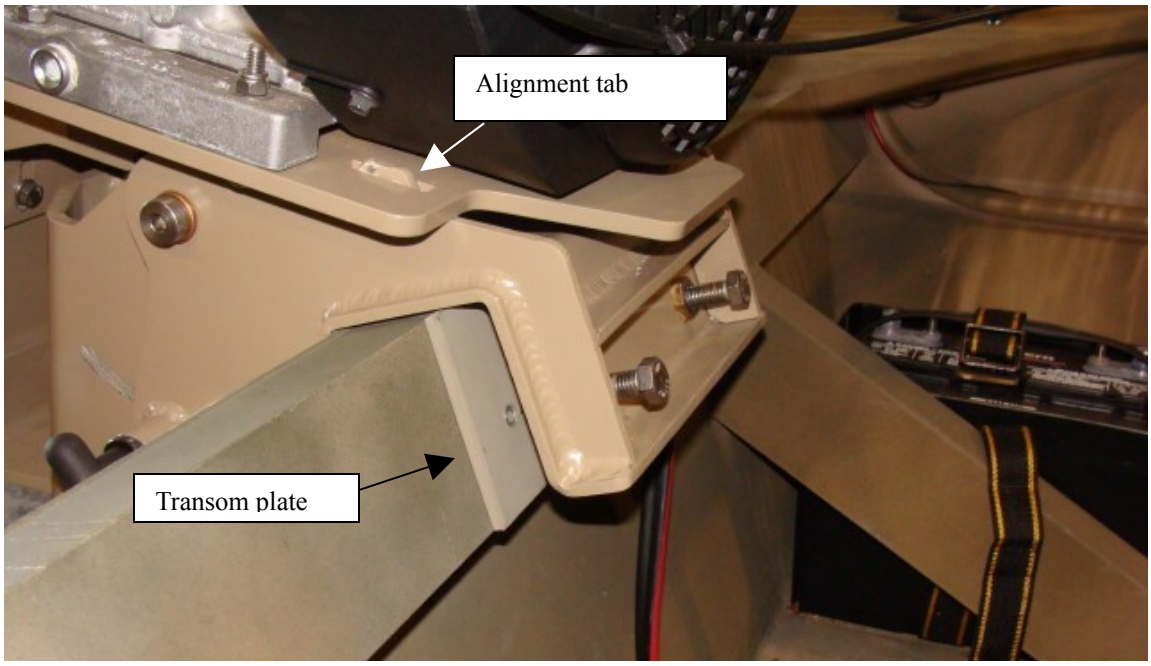
-The momentary clutch position is useful when maneuvering to load the boat, coming up to dock, motoring in tight quarters, etc.

- When starting out the prop should be slightly below the water and the engine should be at an idle. Do not engage the clutch at higher rpm's as this can damage the clutch and is not covered under warranty.

-The engine governor should be adjusted to run between 3800 and 4000 full throttle rpm under no load for peak performance on the water.

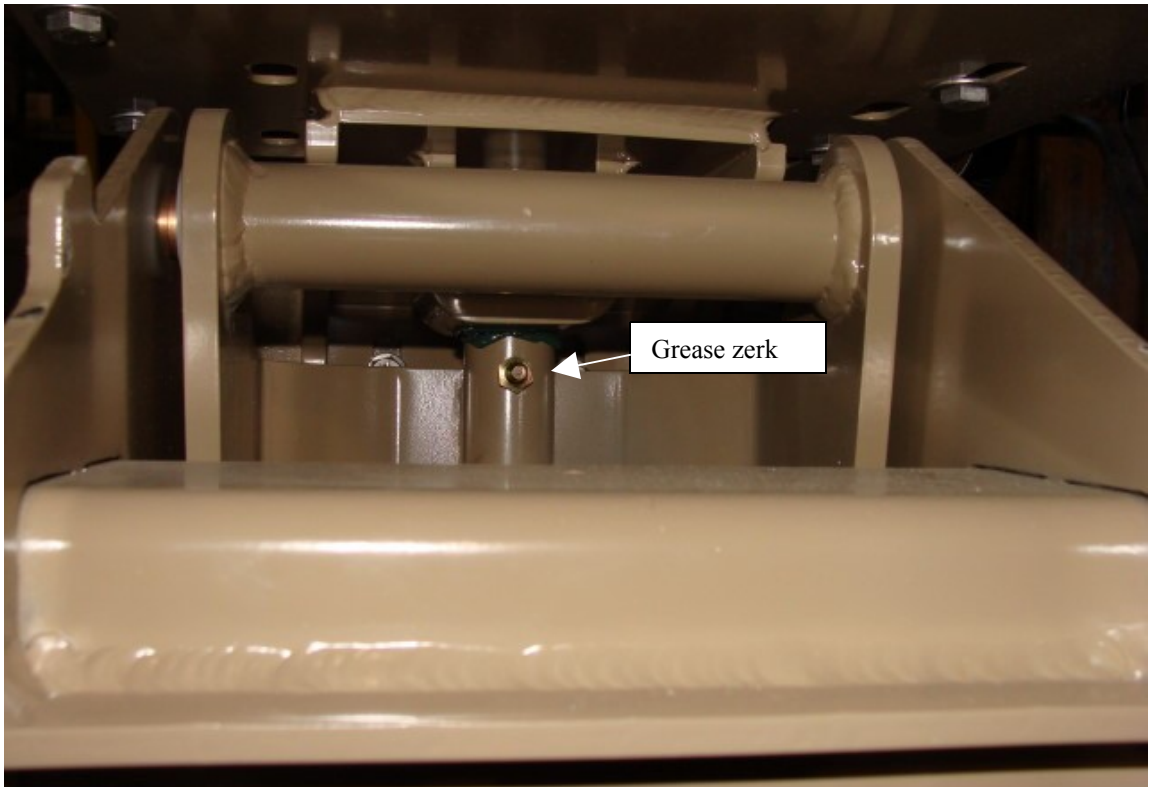


When trailering the motor make sure it is trimmed all the way up and the travel lock is locked into place. There should be no movement in the motor. The tilt and trim should be in the up position when trailering to avoid any movement of the motor. Failure to do so can result in severe damage to the frame and is not covered under warranty.

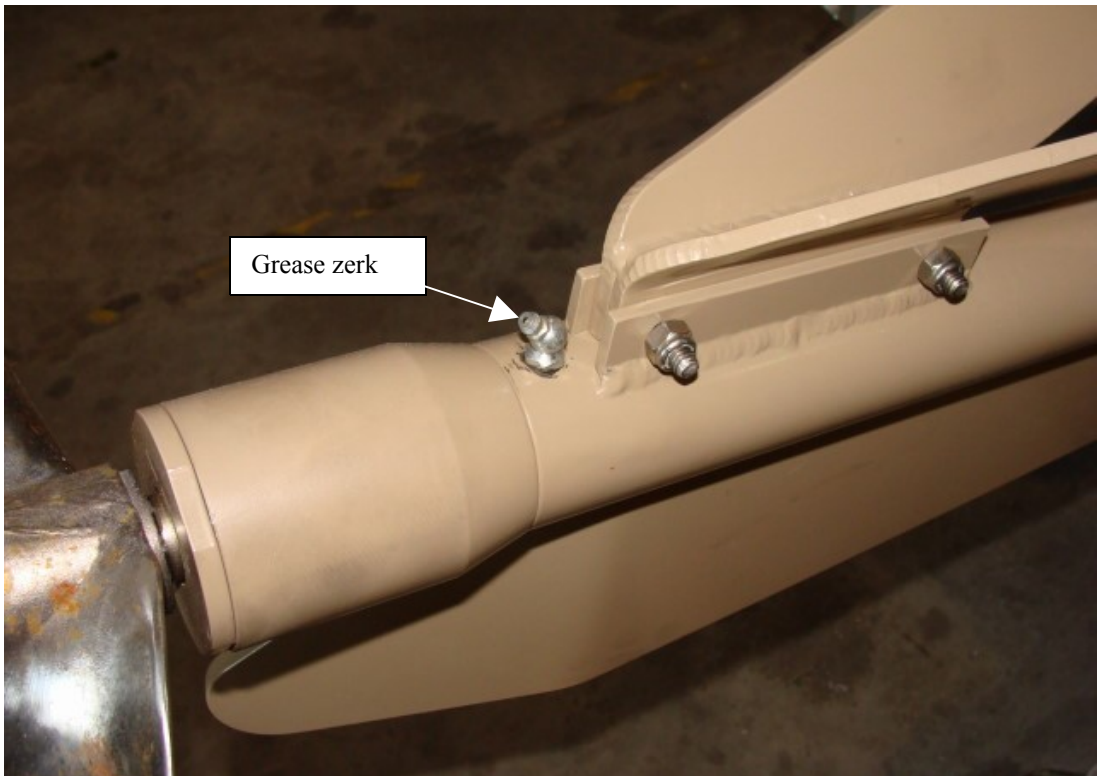


When installing the motor on the boat the transom plate should be installed between the boats transom and the transom bolts.

Install handle on the motor with the three bolts, nuts and washers as shown above. The bolts should be snug but allow the handle some movement up and down. This helps to absorb the shock from hitting obstructions.



Lubricate motor pivot every 5 hours of operation using a quality marine grease.



Lubricate the prop drive every 100 hours or once per year. Fill the tube until the grease comes out of the inspection hole.