

## **Stern Drive Maintenance**

Taking the time to properly maintain a marine engine will increase the performance and chances for a long life span for the powertrain. The steering and shifting mechanisms should also be maintained to keep them operating freely. In a perfect world the engine should be maintained on a regular basis, but for most, boating is a weekend-only pleasure. Any time spent repairing them takes away from the pleasure of boating.

Why is maintenance so important? A small amount of time spent maintaining boats will return optimum performance, increased longevity, and greatly reduced expenses over the life of the boat. Maintenance procedures aimed at prevention of wear on the engine and stern drive involve inspection, cleaning, lubrication, and adjustment. This is a general guideline for maintaining your stern drive. If the guidelines differ from those stated in your owner's manual, defer to the manufacturer's instructions.

### **Make a Checklist**

Before starting, make a list of what services have been performed and what needs to be done. This list should serve as a guide to a thorough maintenance job now and set the standard for regular maintenance in the future.

### **Check Fluid Levels**

One of the easiest and most forgotten forms of maintenance is routine inspection of fluid levels. Checking the engine and stern-drive lubricant levels regularly allow you to spot problems before they become disasters.

If a milky white liquid is found on the dipstick when checking the engine or stern drive lubricant, water is in the system. Investigate immediately.

### **Fill the Fuel Tank**

The quality of fuel you use is very important. In some cases, this fuel will be in the system for a long time, so if possible, avoid oxygenated fuels which use alcohol. Alcohol readily absorbs water, and may promote corrosion in the fuel system. If you can't avoid oxygenated fuels, be sure to top off the fuel tank to minimize the amount of air (and therefore moisture) that is present in the tank.

### **Bring the Engine Up to Temperature**

Start the engine and allow it to run until normal operating temperature is reached. In general this will mean taking the boat out for a short cruise (or running it with a water hookup in dry dock) to bring the engine oil and stern drive lubricant up to temperature. There are two important reasons for wanting the oil hot prior to

draining. First, hot oil flows better than cold oil, so by keeping the oil hot, you will ensure a more complete oil change. Second, and most importantly, heating and agitating the oil allows dirt and other contaminants in the oil to be suspended and subsequently removed when the oil is changed. CAUTION: Water must circulate through the lower unit and engine anytime the engine is operating. Just a few seconds without water will severely damage the water pump impeller.

### **Change the Engine and Stern Drive Lubricant**

There is a good reason to change your lubricants on a regular basis-lubricants fight corrosion. In the engine, normal combustion produces corrosive acids which attack and damage bearing surfaces. If moisture and contaminants accumulate in lubricants, the emulsified lubricant has little lubricating qualities and almost no corrosion protection.

Normally, these impurities do not affect the internal components because they are burned off when the unit is brought up to normal operating temperature. However, any contaminants left in the lubricating fluids will have a detrimental effect on the engine and stern drive when the boat is idle for a period of time.

One note on stern drive lubrication: Always fill stern drive units from the bottom hole until the lubricant just starts flowing from the fluid level plug. By filling the unit in this manner, you can insure that there will be no air bubbles preventing a full fill.

### **Lubricate All Greasable Points**

There are several lubrication points on a stern-drive boat. The most notable are the gimbal housing, drive shaft, and tilt/trim mechanism. Lubrication reduces friction between moving components thus to prevent wear and provides a measure of water resistance to prevent corrosion. NOTE: When lubricating greasable points, always use a marine type waterproof grease.

Non-Teflon(r) lined control cables should be lubricated several times during the year. It is important to keep these cables well lubricated to prevent corrosion from forming inside the casing. If corrosion forms, it is almost impossible to remove and the cable must be replaced. Some control cables have a Teflon(r) lining and should not be lubricated. Check with the manufacturer of your control cables if you are unsure.

### **Replace the Fuel Filter Elements**

Most boats have at least two fuel filters. The first filter should be mounted between the fuel tank and the engine. This unit may be a combustion fuel filter and water trap. The second unit should be an inline filter mounted on or near the

engine. These are usually similar to automotive style filters, consisting of a filter element in a housing with nipples on either end to attach the fuel lines.

### **Inspect Hoses and Belts**

A burst hose or a slipping belt can strand you on the water quickly. Each time the hatch is open, inspect hoses for signs of softening, cracking, or bulging, especially those routinely exposed to high heat. Check hose clamps for tightness and corrosion. Inspect belts for signs of slipping, burning, or cracking. Replace belts and hoses that show signs of wear immediately. It's also a good idea to carry spares for emergencies.

### **Fully Charge the Batteries**

Batteries provide most of the electric power on boats. But, the most important component the battery powers is also the one which draws the most power—the engine starter. If not properly maintained, batteries can quickly discharge and leave you stranded.

### **Check and Replace Anodes**

Most stern drives have at least one anode attached to the exterior of the lower unit. Other anodes are attached to the engine so they protrude into the cooling system. The proper amount of zinc attached to a boat is extremely important. The use of too much zinc can cause burning (by placing the metals close together, they become hot). Not using enough zinc will cause more rapid deterioration of the metal parts of your boat you are trying to protect. If in doubt, it is far better to replace the zinc than to replace expensive metal parts.

### **Drain and Flush the Raw Water Cooling Circuit**

The majority of stern-drive equipped boats use a raw water cooling system to cool the engine and stern drive unit. When used in saltwater conditions, this system is particularly susceptible to corrosion.

The cooling circuit should be flushed with fresh, clean water to remove salts from the passages. If you are maintaining a trailer boat, this is an easy proposition. Simply hook up a source of freshwater to the flushing device on the engine (or use a flushing kit).

At least once a year, remove the raw water pump impeller. Give it a squeeze to see if the vanes are hardening. If the vanes have lost their elasticity, replace the impeller. For reusable impellers, grease the vanes lightly with petroleum jelly and replace. Some boaters replace the impeller with a new one each season.

## **Drain, Flush, and Refill the Freshwater Cooling Circuit**

On boats equipped with a heat exchanger, additional cooling system maintenance is required. The freshwater cooling system is similar to those used in automobiles and should be tested to ensure the proper level of coolant protection is maintained. Use any commonly available tester.

If coolant protection is inadequate or the coolant is several years old, the system should be drained, flushed, and refilled with fresh coolant. The coolant, or antifreeze, does not wear out quickly, but it does wear out. Various additives that fight corrosion lose their effectiveness over time and should be replaced to ensure optimum protection. Backflush the freshwater circuit to remove sediment. Replace the coolant with a clean, fresh, 50/50 mixture of water and antifreeze. Always mix the antifreeze and water mixture prior to pouring it into the engine.

Maintaining a marine engine is a matter of common sense. Most topics covered in this article should be well within the reach of even the most modest do-it-yourselfer. If you are in doubt about any aspect of maintenance, ask a knowledgeable marina or dealer. If you are completely in doubt, you may want to consider having your engine professionally maintained. Improper maintenance can be costly. Even worse, you will lose precious boating time.