

Water in the Gear Lube: Causes, Diagnosis, and What to Do Next

How to read what your gear oil is telling you — and determine whether you need a seal job, a new drive, or something else entirely.

You pull the gear lube drain plug, catch the oil in a white container, and it comes out milky white. Or gray. Or full of silver glitter. That moment — usually during a routine service or a pre-season inspection — is one of the most important diagnostic opportunities a boat owner has. What's in that container tells you a lot about what's happened inside your sterndrive, and it's worth knowing how to read it before you start making decisions about repair or replacement.

This document covers the most common gear lube findings on MerCruiser sterndrives, what each one means, the typical causes, and how to decide what comes next.

Why Water Gets In: The Short Version

A sterndrive lives in a uniquely hostile environment. It's submerged, it's spinning, it transitions between hot and cold with every use, and it's sealed against water by a system of rubber bellows, O-rings, and lip seals — all of which have a finite service life.

Water typically enters the gear lube through one of four paths:

- Prop shaft seal failure — the most common entry point. The lip seals around the prop shaft wear over time and eventually allow water to migrate in during operation.
- Input shaft seal failure — where the driveshaft from the engine meets the top of the sterndrive. A failed seal here allows water in from the bellows area.
- Bellows failure — the rubber bellows that protect the U-joint and shift cable can crack, tear, or delaminate, flooding the bellows area with water that then finds its way past seals.
- O-ring failure at the mating surfaces — the upper and lower housings seal against each other with O-rings. Age, improper installation, or impact damage can compromise these.

In most cases, water contamination doesn't happen overnight. It's a slow seep that accumulates over a season. By the time you see milky oil, the contamination has usually been building for a while — which is exactly why regular gear lube checks (at minimum every season, ideally every 50 hours) matter.

Reading the Oil: What Each Finding Means

Pull the drain plug slowly and catch the full discharge in a clean, light-colored container. Here's how to interpret what you see:

Milky, white, or creamy oil: Water contamination is present. The oil has emulsified with water, turning it opaque and light-colored. This is the most common finding after a seal failure. The severity depends on how long it's been running this way — a small amount of

moisture from condensation can cause slight discoloration, but true milky oil almost always means an active leak path.

Gray or black oil with a burnt smell: The gear lube has overheated. This usually happens when the oil level has dropped due to a slow leak and the gears have been running with insufficient lubrication. The oil darkens and develops a distinctive burnt or sulfur-like odor. This is a more serious finding than simple water contamination because it suggests the gears themselves may have been damaged by heat and friction.

Silver glitter or metallic flakes: Internal damage. Metal particles in the oil mean something inside the drive has been wearing abnormally — gears, bearings, or both. This is the finding that most often points to a drive that needs replacement rather than a seal job. A small amount of very fine metallic sheen can be normal on a new or rebuilt drive during break-in, but visible flakes or a heavy metallic suspension are not.

Dark but clean oil, no smell or contamination: Normal end-of-season oil. Gear lube darkens with heat cycling over a season, but dark color alone isn't a problem. If the oil is dark, has no unusual smell, shows no water emulsification, and the level is correct, the drive is likely in good shape. Change the oil, inspect the seals, and you're ready for next season.

Quick-Reference Diagnosis Chart

What you see	What it means	Likely cause	Action
Milky / white / creamy oil	Water contamination	Failed seal, O-ring, or bellows	Inspect all seals; replace drive if gears show wear
Gray or black oil, burnt smell	Overheated gears	Low lube level or prolonged high-load operation	Check for leaks; inspect gears for scoring
Silver glitter / metal flakes	Internal gear or bearing damage	Impact, wear, or water-contaminated lube	Drive teardown or replacement required
Dark but clean, no smell	Normal end-of-season oil	Age and heat cycling	Normal — change oil, reinspect seals
Oil level low with no visible leak	Slow seep at prop shaft or input seal	Worn lip seals	Pressure-test drive; replace seals or drive

How Bad Is the Water Contamination?

Not all water contamination is equally serious. The key variable is how long the drive has been running with water in the oil — and whether that water has caused secondary damage to the gears and bearings.

- Recent contamination, no gear noise, no metallic particles: The damage may be limited to the seals. A seal replacement or new drive is likely the fix, and the internal components may be salvageable.
- Extended contamination, some gear noise: Water-contaminated lube is a poor lubricant. If the drive has been run with milky oil for a full season or more, the gears and bearings have been running with degraded lubrication and may show accelerated wear. A teardown inspection is needed before deciding on repair vs. replacement.
- Metallic particles present alongside water: This combination means the contamination has already caused measurable internal damage. A seal-only repair won't restore the drive — replacement is the practical path.

Important: Running a drive with water-contaminated gear lube even for a short time significantly accelerates wear. If you find milky oil mid-season, don't just change the lube and keep going — find and fix the leak source before putting the boat back in the water.

Locating the Leak Source

Once you've confirmed water contamination, the next step is identifying where the water is coming from. A few checks:

- Inspect the bellows: With the drive off, visually inspect the U-joint bellows and shift cable bellows for cracks, tears, or separation from the clamps. Soft spots, swelling, or any visible cracking means the bellows need replacement immediately.
- Check the prop shaft area: Look for oil seeping from behind the propeller. A wet, oily residue around the prop shaft seal area (behind the prop, forward of the skeg) is a clear sign of prop shaft seal failure.
- Inspect the gimbal bearing area: Water in the bellows area can also enter through a worn gimbal bearing seal. Check for play in the gimbal bearing while the drive is off.
- Pressure-test the drive: A proper leak-down test using a gear lube pressure tester will identify seal failure more definitively than visual inspection alone. Many marine shops offer this as a standalone service.

Repair vs. Replace: Making the Call

This is the decision most boat owners are trying to get to. Here's a practical framework:

- Seal failure only, gears and bearings intact, housing in good condition: A seal replacement is a legitimate option if done by an experienced marine shop. Factor in labor cost and the 90-day warranty most shops offer on seal work vs. the cost of a replacement drive with a multi-year warranty.
- Gear or bearing damage present: Replacement is almost always the better financial decision. Rebuilding a drive with damaged gears requires expensive new parts, precision reassembly, and specialized tooling. The labor cost typically approaches or exceeds the cost of a new SEI replacement unit.
- Drive has high hours or the housing shows corrosion: Even if the immediate failure is just a seal, a high-hour drive with a corroded housing is likely to develop additional problems. A new drive resets the clock.
- Drive is an Alpha One Gen I or Bravo with recirculation-era compatibility: SEI replacement units are direct bolt-on replacements. No modifications, no adapters. If the

decision is close, the bolt-on nature and SEI's 3-year fault-free warranty often tip it toward replacement.

SEI's warranty covers real-world failures: Unlike most OEM and aftermarket warranties, SEI's 3-year fault-free warranty covers failures from impact, lack of lubrication, fishing line, and other real-world causes — not just manufacturing defects. That coverage is worth factoring into the repair-vs-replace math.

Preventive Steps Going Forward

Whether you repair or replace the drive, a few habits will catch water contamination before it causes expensive damage:

- Check gear lube at the start and end of every season. It takes five minutes and gives you an early warning on any leak developing.
- Inspect bellows every two years or 200 hours, whichever comes first. Bellows are inexpensive; replacing them on schedule is far cheaper than the damage a failed bellows causes.
- Any time the drive comes off for any reason, inspect the gimbal bearing and all seals before reinstalling. You're already there — it's the lowest-cost moment to catch a problem.
- After impact (hitting bottom, debris, or a hard grounding), check the gear lube before the next use. Impact can unseat seals or cause housing cracks that allow immediate water entry.

Bottom Line

Milky gear lube is a warning, not a verdict. What matters is catching it early, reading what the oil is actually telling you, and making a clear-eyed decision about repair vs. replacement based on the full picture — not just the seal condition in isolation. If you're finding water, metal, or overheated oil and aren't sure what the right next step is, SEI's support team can help you work through it before you commit to a repair path.

Have Questions or Ready to Order?

SEI Marine Products sells direct to dealers and retail customers. Our team can help you determine the right replacement unit for your application.

Shop at WWW.sterndrive.cc

Call or text: 813-925-7127 (Mon–Fri, 8am–5pm ET)

MerCruiser® and Alpha One® are trademarks of the Brunswick Corporation. SEI Marine Products is not affiliated with the Brunswick Corporation. All product references are for compatibility purposes only.