

## Sail Drive Diaphragm Change Lessons Learned

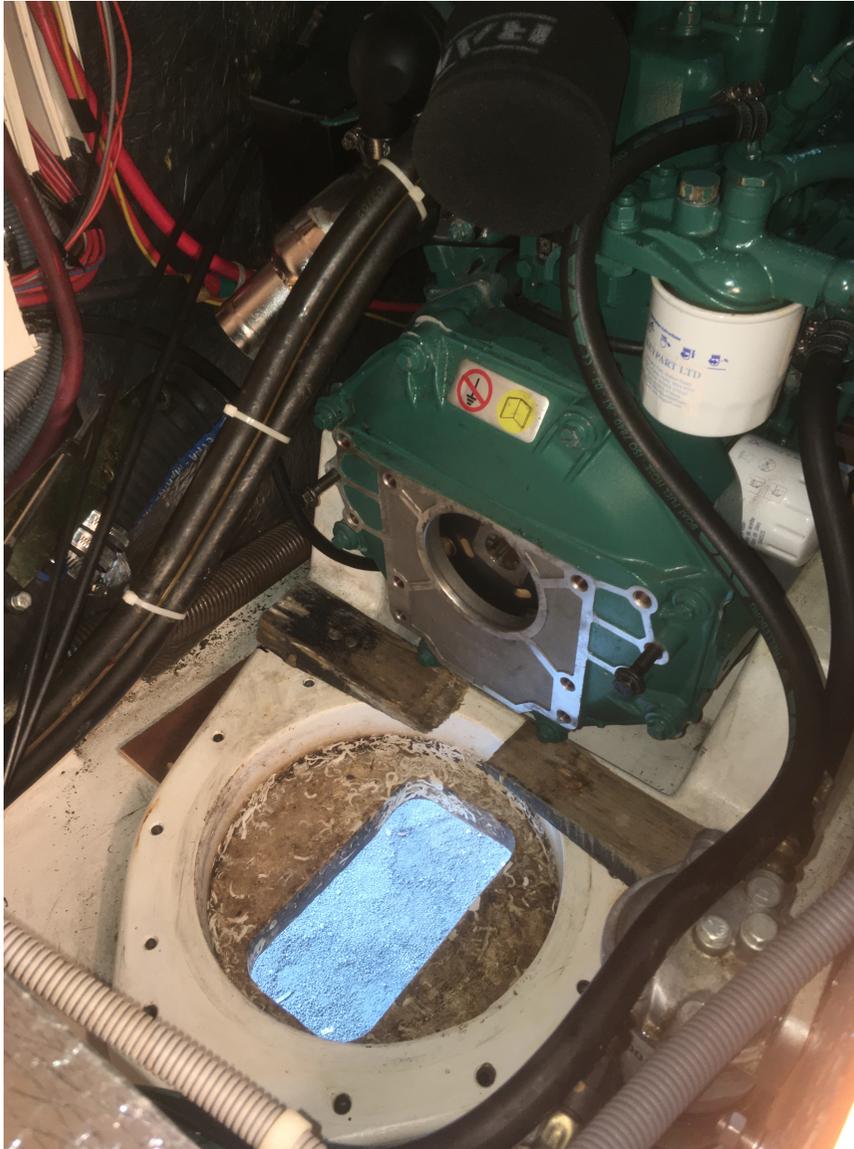
Volvo MD 2030 with MS25s saildrive fitted to Maxi 1100

- Not a particularly difficult job, depends on access and installation. I was doing this in France so had to plan well and take everything I needed.
- Hardest parts were supporting engine whilst moved forward and still allow access to the clamping ring. I can only support the front of the engine from boom, rear lifting eye is under the cockpit floor
- It was hard lifting the saildrive into the boat to remove it, I estimate saildrive is 30kg.
- I tried to do it without taking prop-shaft out, but I couldn't lift it far enough to swing backwards, through the hull. There is a bulkhead behind the engine bay. I then had to remove shaft from the saildrive which was then loose in the boat.
- The repair instructions are misleading and suggest a 12mm dia bar to support gearbox, there are in fact two 12 mm holes on either side of gearbox so two short bars about 100mm long can be inserted in each side of the gearbox onto 100mm blocks.
- Once out, dismantling is easy, follow Volvo manual and repair kit instructions.
- There was a fair amount of white salt/aluminium deposit in the screw holes. It also looks as though the first few threads are corroded or stripped, they are not. Once cleaned out and inspected there are helicoil inserts correctly installed so the first few loaded threads are well below the joint face.
- All the bolts were galled (stainless screws into stainless helicoil inserts), and the initial threads were larger than those further up the bolt such that an M8 nut would not fit. I had to run a die down the first 1 cm to clean up the threads. I would plan to replace if doing it again. There are 3 off M8x30 for inner plate, 8 off M8 x 40 (4 with heads drilled for wiring) and two off M8 x 50 all in A4 stainless.
- Volvo are clear the bolts need to be greased with Molybdenum disulphide grease (Amazon £4.92), mine weren't.
- The saildrive leg had oval holes for the two long bolts which had occurred due to galvanic corrosion. I filled these with JB Weld marine epoxy metal and re drilled. The inner plate with the remaining 8 screws dropped in makes a good guide to get drill centred.
- The design is not great in that seawater gets between the aluminium body and the stainless screws. I wrapped gas PTFE tape around each screw (not the thread) to try to provide a seal but also to provide an inert barrier.
- I had minor corrosion on saildrive near the bolts which I cleaned and painted with Hammerite special metals primer, then hammerite paint.
- The leg should be pressure tested. I didn't know the thread size of the drain plug but guessed at M10 from recollection. I made up drilled threaded studs. I discovered when I removed the drain plug that the thread is 3/8" UNC. I had made a large soft silicon plug for the filler plug with a drilled clamping bolt, this sealed perfectly. I tested this before dismantling the saildrive. After reassembly I tested to 9psi which held for over 1 hour and probably would have for ever.
- Pressure test kit was a 6mm Tee, a small pressure gauge and a old car tyre valve soldered to a fitting.
- I bought some wood and made a simple A frame to lower saildrive back in using a handy billy.
- I used two of the M12 gearbox bolts with a rope stop to support the rear of the engine
- I used a ratchet strap around keel and saildrive to stop the saildrive swinging back when disconnected from engine. I also had made a prop and used wedges to hold saildrive when back in the boat.
- Whilst access is easy, check exhaust elbow for blockage.

Things I decided to remove to ease access and allow engine to move.

- For access: Throttle cable, stop cable, gear cable, fuel primary filter but didn't have to undo fuel lines.
- To allow engine to move forward: Exhaust, pipes to anti-syphon valve, inlet to raw water pump, water connection on sail drive, connecting cable to engine black box above exhaust. Everything other than the exhaust hose, I discovered when moving the engine forward.

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Saildrive removed, two gearbox bolts placed in outer holes and used to support engine on reassembly



Bulkhead behind engine bay with sound proofing prevented saildrive being tipped back to get shaft through hull

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Wooden A frame, handy billy used to lower saildrive. Red ratchet strap supporting engine off two bolts



Cockpit floor covered in polythene and mdf sheet used as a bench. Saved carrying saildrive down ladder

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M10 stud drilled for pressure test. Discovered it was 3/8" UNC. Back up plan was a drilled coach screw with a soft rubber bung I made from silicon sealant, a bit like an expanding wine bottle stopper.

Pressure test kit is an old car tyre Schrader valve soldered into a hose tail, a Tee and a pressure gauge. Bicycle pump was awkward so I used 12v tyre pump from my car.