

PERKINS 4108

Fitting new rear oil seal and crank case gaskets

Near the end of this summer the 24 year old Perkins on my Morgan 384 decided to misbehave. First the solenoid on the starter motor, then the starter itself, leaking water pumps and then the coupler between the gear box and the flywheel. In addition for the last 10 years there have been some nasty oil leaks that this year have got worse. \$85 - \$100 an hour charges from the marine engine "shop" was just too much to pay, so I decided to do the work myself. I have always dreaded working seriously on the engine, this time there was no option.

Actually the job turned out easier than I thought and I actually enjoyed the task. I thought I would share through photographs the steps that I took, so that others of you might want to do a similar job.

The engine itself has always run well and it was not pumping out much smoke. So there was no need to do a piston job. However I serviced and replaced practically all the periphery, including:

1. Rebuilt starter motor and new solenoid (\$250)
2. Serviced alternator (\$50)
3. New fresh water pump and new salt water pump (\$550)
4. Cleaned heat exchange unit (\$100)
5. Replaced all hoses (\$200)
6. New coupler (\$280)
7. New front and rear oil seals and crankcase gaskets (\$100)
8. New fuel lift pump (\$60)
9. Injectors tested (\$80)
10. Batteries Group 29 gel (\$450)
11. New tools off set wrenches and torque rench (\$180)
12. Spin on secondary fuel filter adapter and filters (\$80)
13. Clean up materials, gasket seal, oil remover (\$80)

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The job took me about 60 hours and I spent about \$2500 in parts. I did it all by myself - no help

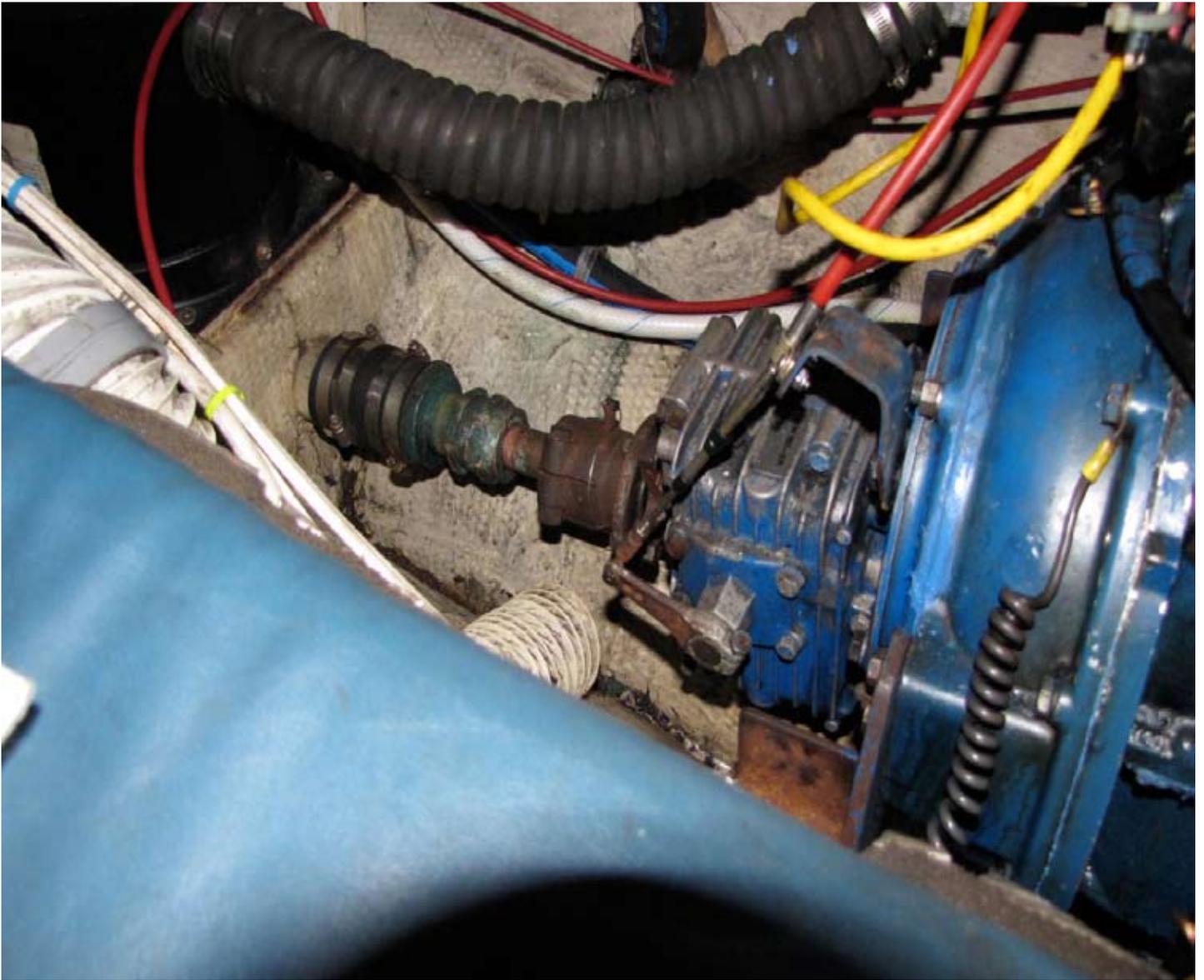
The key to the job was to get as much off the engine as possible, thus providing more room to work. 90% of the access to the engine was through the front and the quarter birth access port.

The following describes the steps. Note I took the photos when I was putting the engine together again, but in this presentation I am showing it in reverse as though I was taking it apart.

I did not recondition the Hurth gear box, I could have done. Not difficult (and a new clutch costs \$280).



Rear of engine before dismantling. I started at the rear first



Rear view of gear box and stuffing box



Step 1: Disconnect propshaft from engine, and push as far back as possible. This leaves a gap of 1.5" - sufficient to remove gearbox



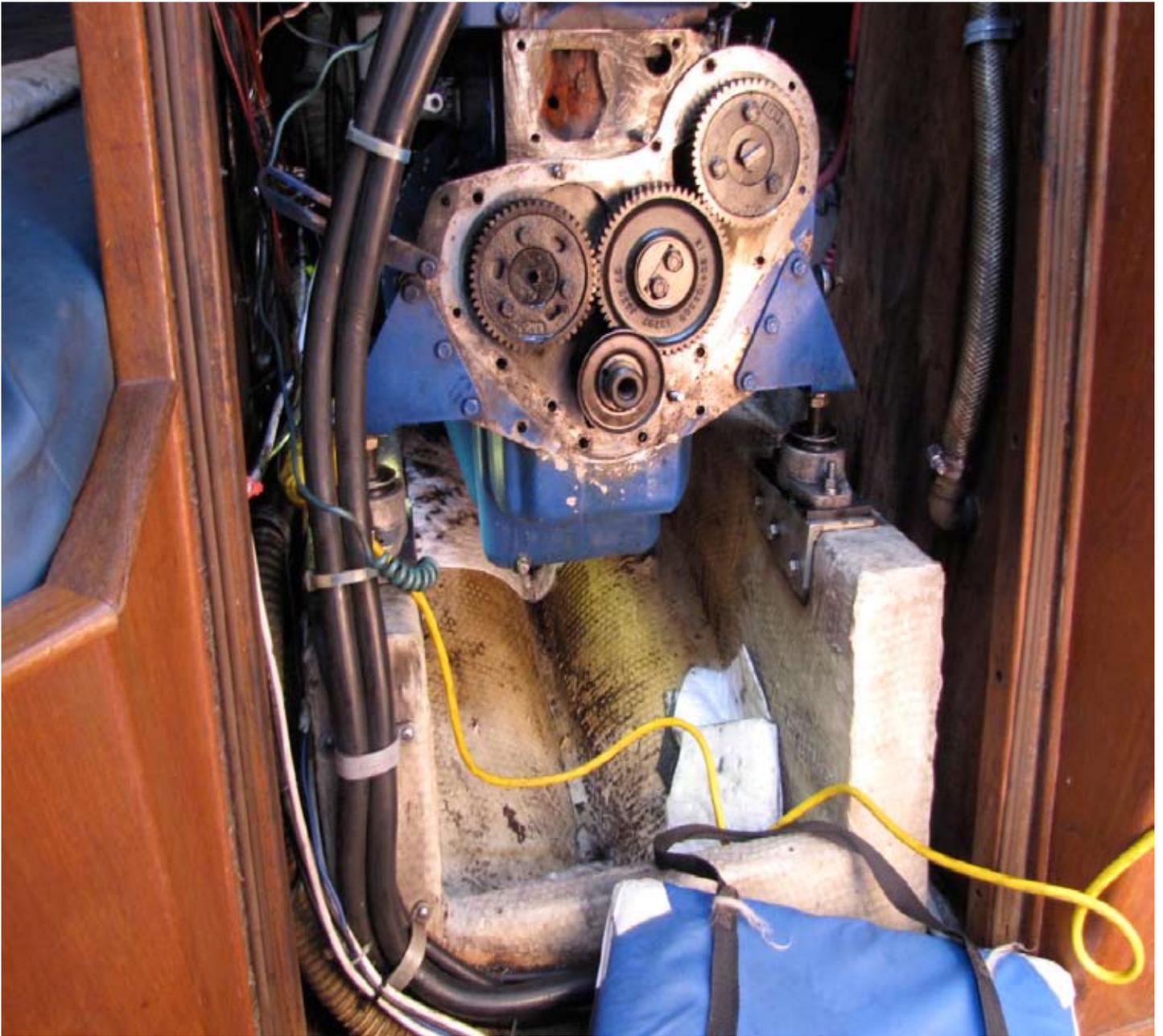
Front of engine. The rubber fitting on the end of the heat exchanger (top right) costs \$60!



Remove injectors and heat exchanger (right). Remove all hoses



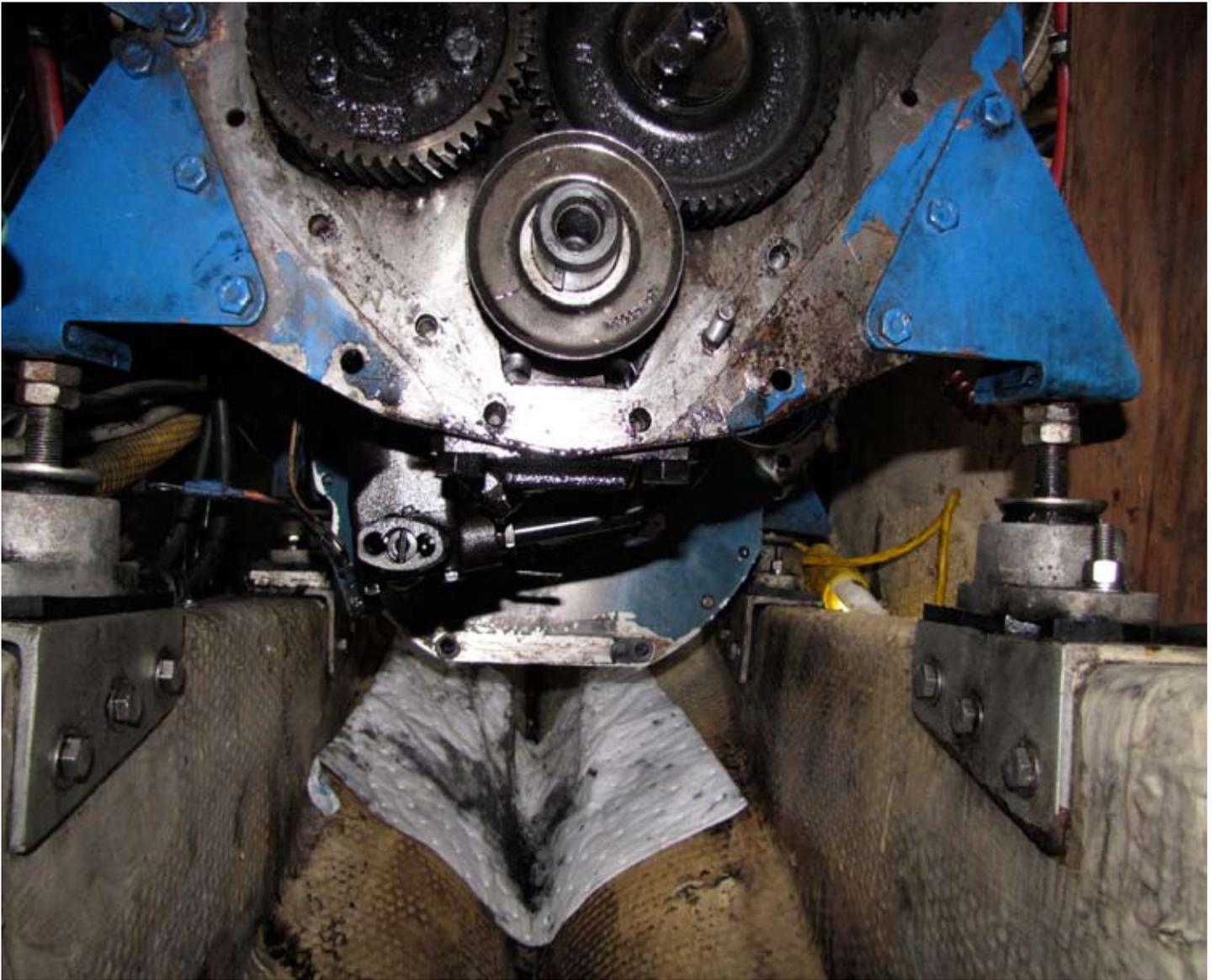
Remove raw water pump



Remove fresh water pump and timing case. Clean surfaces



Remove crankcase oil pan (view from front to rear)



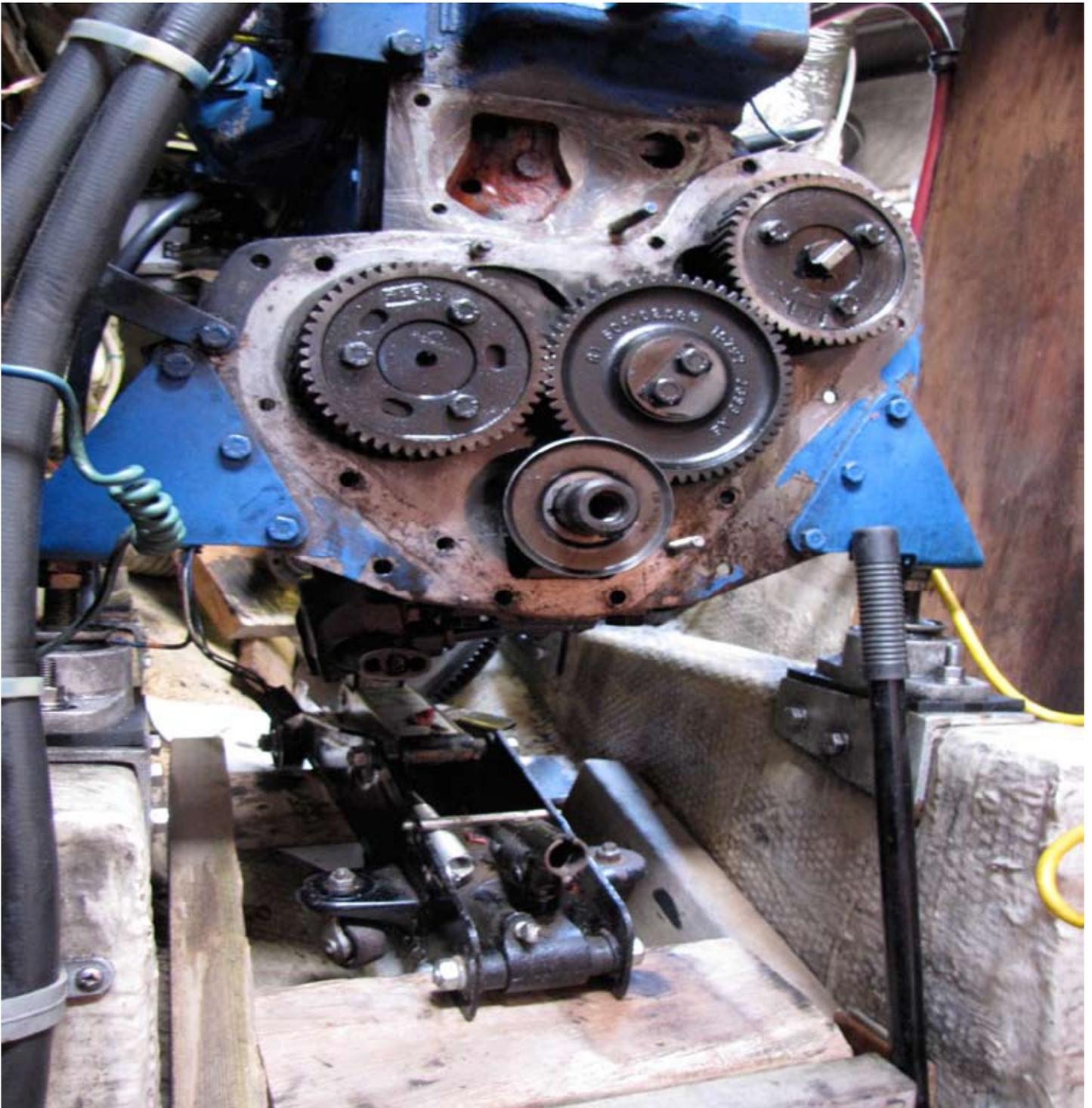
In order to use the jack to jack up engine I removed crankcase oil pan oil filter



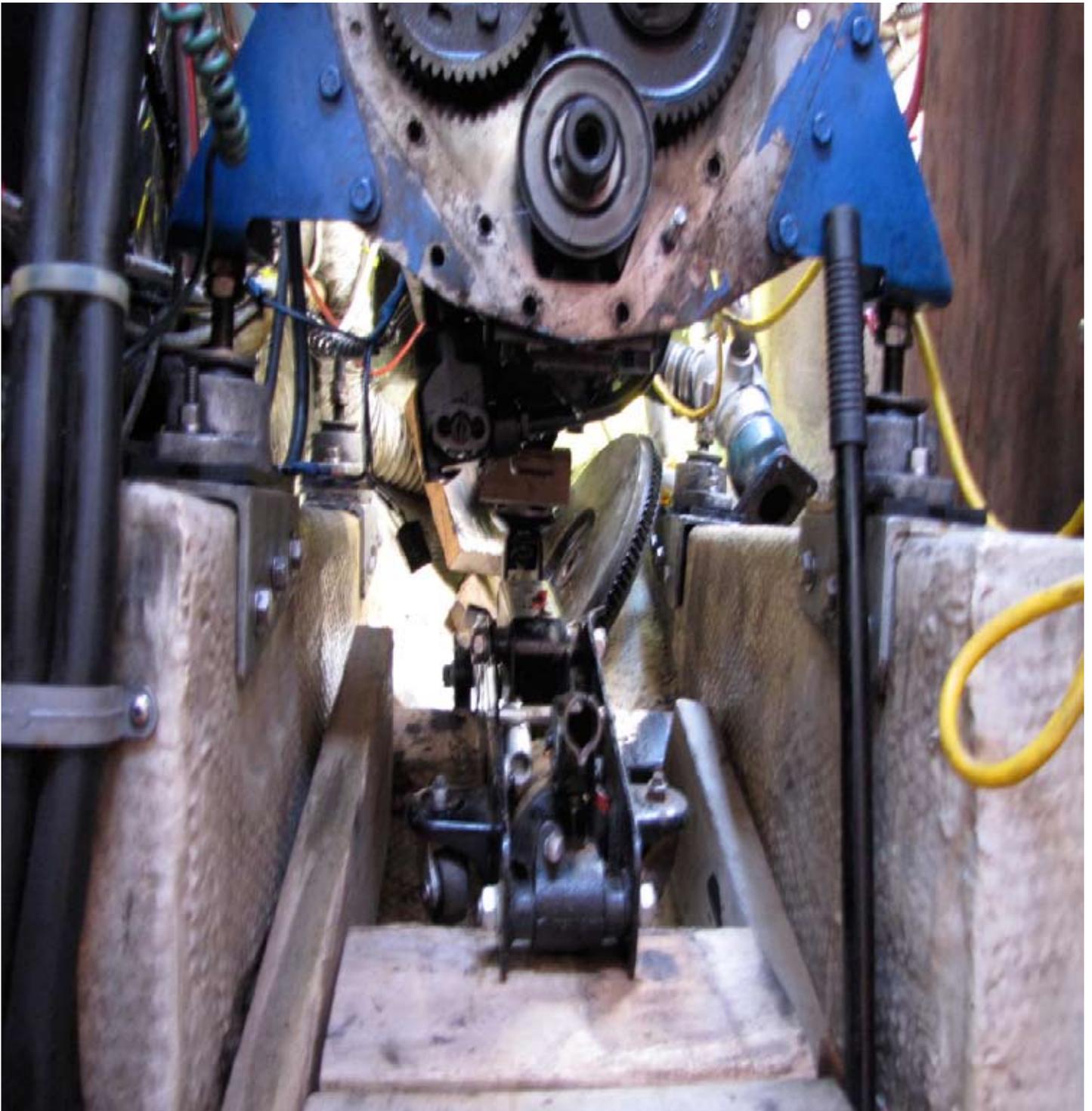
It took me a bit of time to work out how to jack up the engine and at the same time maintain stability and engine alignment. One has to jack up the engine in order to take the weight off the rear engine mounts so that the flywheel bell housing can be removed.

Loosen the top nuts associated with the vertical engine mounting bolts. One only needs to jack up the rear of the engine 0.25 inches - just enough to take the weight of the engine off the rear mounts.

I used a dolly type car jack which I supported on two by fours as shown in the picture. The frame of the jack sat on the two by fours. This proved very solid. Using a piece of wood on the top of the jack I raised the engine - with the load and contact on the rear piston "big end". This proved very stable (the front mounts still attached to the engine prevented any sideways engine movement).



another view of jack set up



and another view - get this step right and the job becomes quite easy!! Note engine still attached to front mounts



Gear box removed, showing bell housing and coupler.



with the engine raised it is possible to easily unbolt the bracket shown in this image that attaches engine to engine mount. Remove both port and starboard bracket



Both brackets removed leaving bell housing and engine supported by jack



Coupler is attached by five small bolts to flywheel



Coupler removed showing five bigger bolts attaching flywheel to engine drive shaft



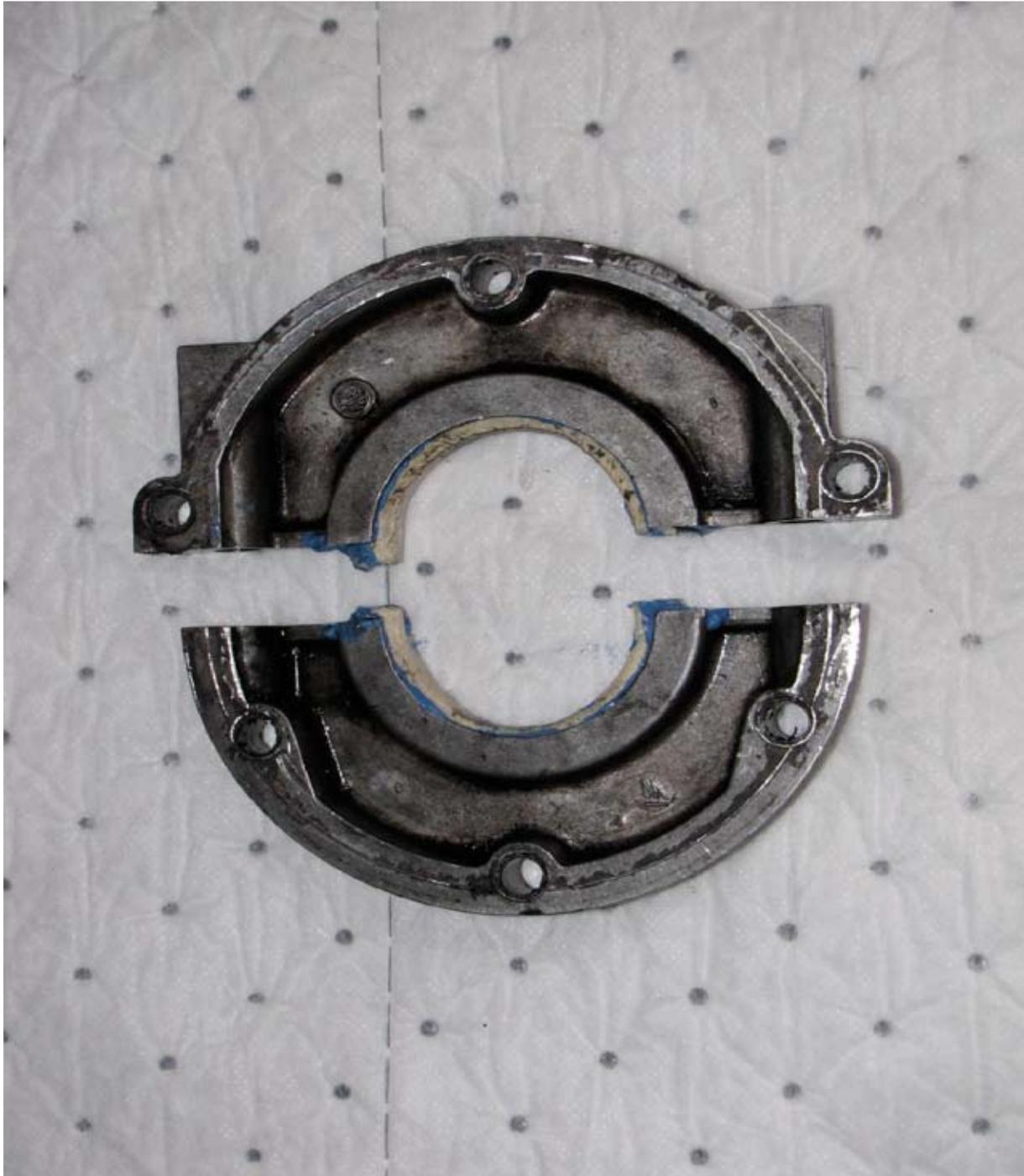
Remove bellhousing - showing flywheel. Note the wood under flywheel was placed there to assist in the attachment of the flywheel when putting everything together again. The flywheel is heavy (30lbs) - not easy to pick up and position by oneself - a helper would be handy!



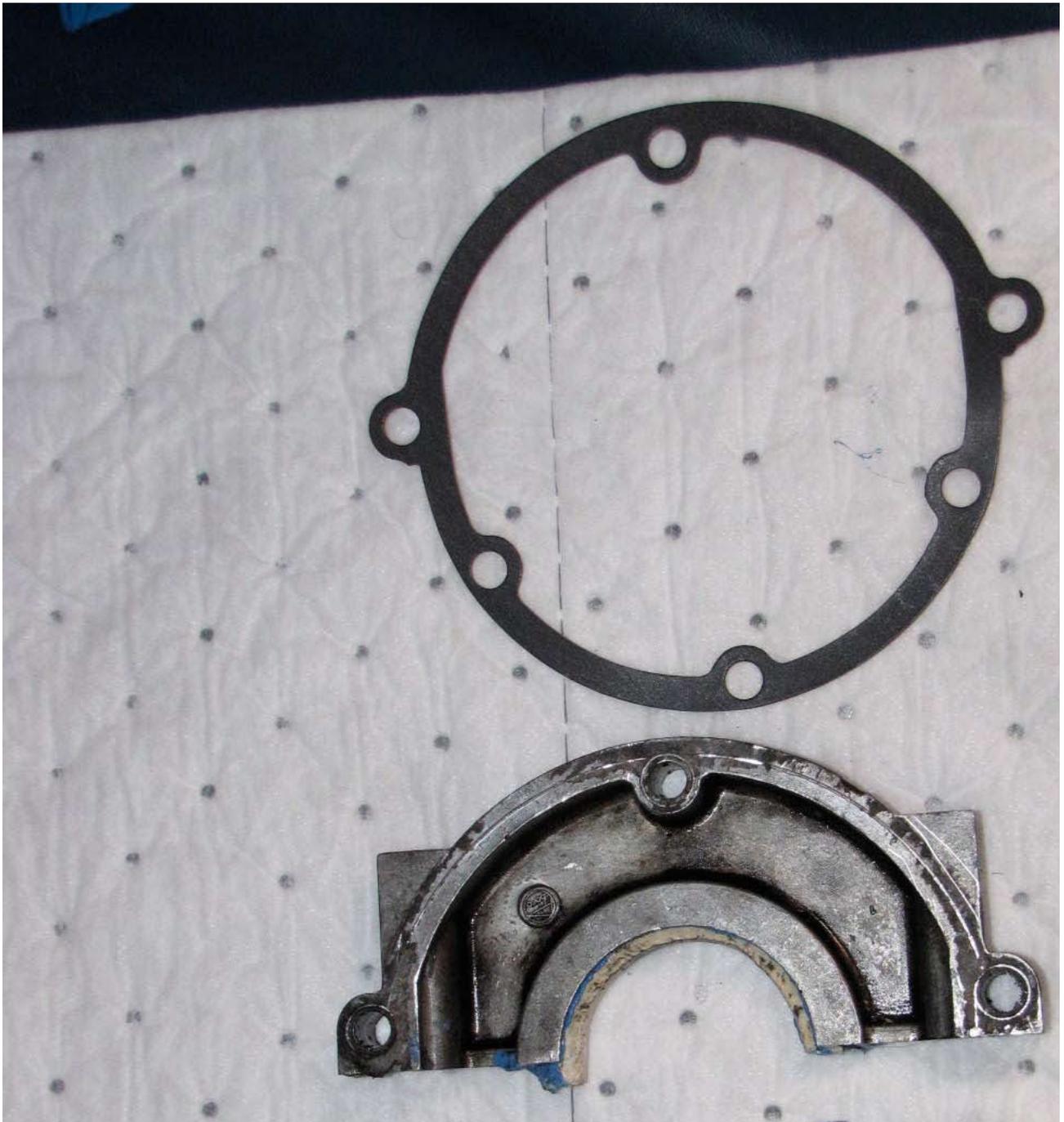
Remove flywheel, exposing engine shaft coupler. Note the oil seal housing immediately behind the mounting flange,



engine shaft coupler flange. The groove immediately behind flange is where the oil seal housing fits. Note how I have positioned the jack



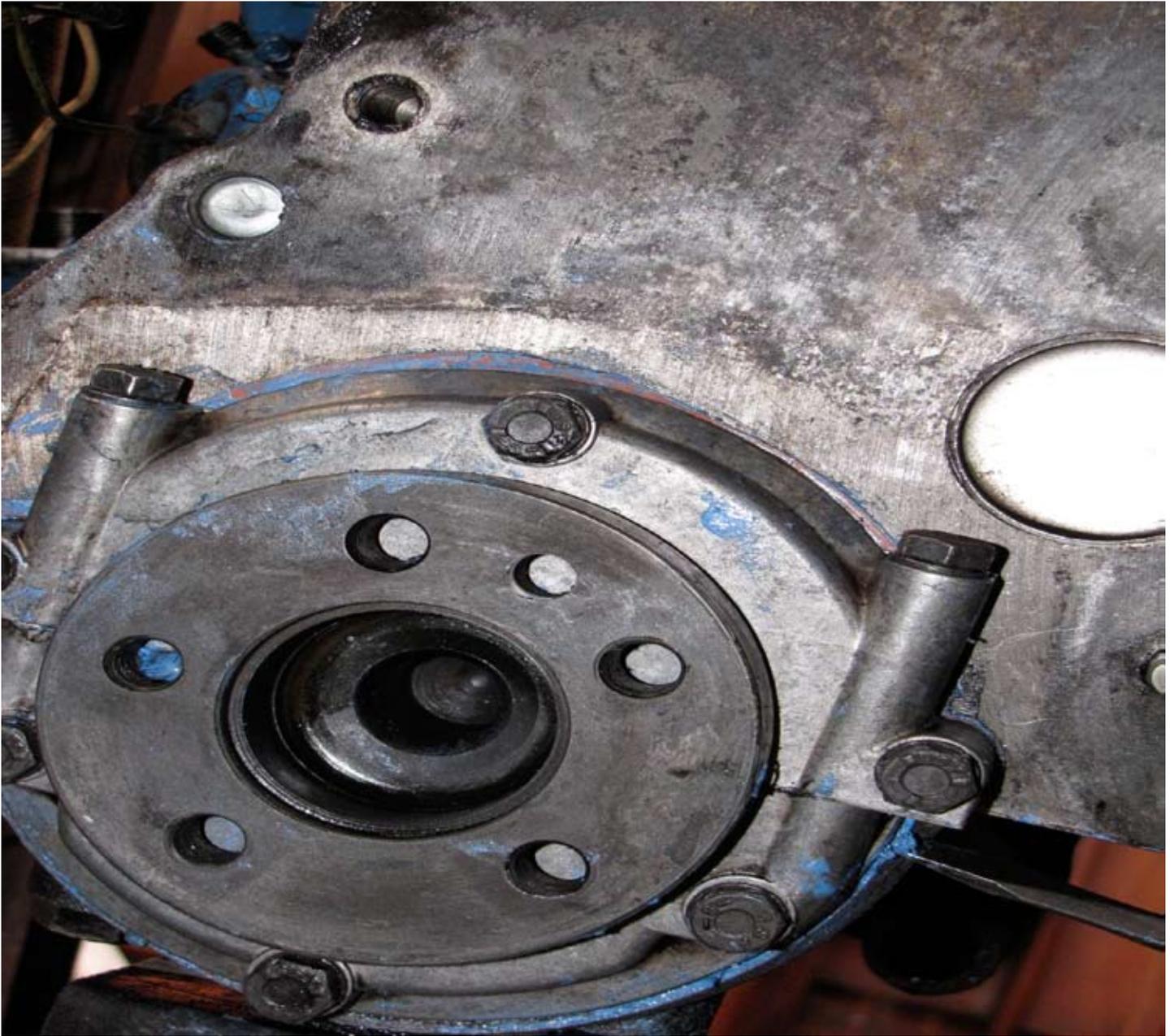
oil seal mount with near oil seal fitted. It is a good idea to soak the oil seal in oil for 24 hours before fitting.



Oil seal gasket and upper half of oil seal. The oil seal gasket is positioned between the oil seal housing and the rear engine casting. First place the gasket loosely on shaft, then join the oil seal half mounts and bolt together around shaft. Then bolt the oil seal housing to back of engine with the oil seal gasket in the correct position.



two halves of oil seal mount ready for positioning



New oil seal and mount bolted to engine casting; Face view



New oil seal and mount bolted to engine casting; oblique view.

Once the oil seal is positioned, it is a good time to fit the rear cork crankcase gasket. Much easier to get at when there is no flywheel in the way!

Then start the process of putting the whole thing together again. Once you have the bell house and rear engine mount brackets in place, you can remove the jack, and after replacing the crankcase oil pan filter and placing the front cork crankcase oil pan gasket, you can then place the remaining crank case gaskets and bolt the crankcase oil pan together. Use plenty of BLUE gasket seal as you put everything together



Just about finished. Front view: new freshwater and raw water pumps, new hoses and best of all not a single drop of leaking oil.

You have to realign the engine as a final step, but this is not difficult, the engine had hardly moved a millimeter!!

Last of all bleed the fuel system and commission.

Dick Grimshaw

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