



News, views and discussions on Lyle Hess Yachts,
focussed primarily on the Bristol Channel Cutter

BCC Forum : Sam L. Morse Forums

Goto: [Forum List](#) • [Message List](#) • [New Topic](#) • [Search](#) • [Log In](#) Goto Thread: [Previous](#) • [Next](#)

Yanmar 3GM30F gear case gasket

Posted by: tunruh (IP Logged)

Date: June 28, 2007 02:21 PM

Category: Engine and propeller

Galatea (#117) just got a new timing gear case gasket, due to an oil leak caused by a broken and protruding gasket. Replacing the gasket required removing the main pulley, raw water pump, holding the alternator out of the way, and disconnecting and partially removing the fuel injector pump. I was ready to do it myself, except for the fuel injection stuff, which was just beyond my budding diesel mechanic skills. I was charged for 5.25 hours, plus AU\$129 for parts.

However, if this happens to your boat and you want to try it yourself, Bil on Zygote found a tech tip on this very problem on yanmarhelp.com, which you can view at [www.freeboards.net]. The hook is that the mechanic who wrote it had done 25 of these in one year for a charter company in the UK. Surprisingly, he indicated the exact position of the break in the gasket, which matched ours! It broke right on a bolt hole in the gasket on the lower port side of the gear case cover. At some point, Yanmar developed a new steel reinforced gasket to address the problem.

FWIW, we have 980 hours on the engine commissioned 2001, and I don't know of any way to predict or prevent this failure. I am glad that it happened one day from Cairns, and not after, when we would have had to decide about sailing back against the trades to get it fixed! I'm pretty sure that we motored less than 4 hours after the break, and lost about a tablespoon of oil in that time, so if it had stayed about the same, we could have limped along for a ways til we could make repairs, though for us, the next stop down wind with a diesel mechanic would probably have been Gove, about 500 miles. It's a big country down under!

Fair winds,

Tom Unruh
Galatea

Options: [Reply To This Message](#) • [Quote This Message](#) • [Report This Message](#)

Re: Yanmar 3GM30F gear case gasket

Posted by: Bil (IP Logged)

Date: June 29, 2007 09:57 AM

Category: Engine and propeller

In the spirit of forewarned is forearmed, here's more detail to follow Tom and Jill's alert to other members of the BCC-28 fleet with Yanmar 3GM30F engines.

The problem with the gasket at the timing cover exhibits by two signs: black engine oil in the oil pan under the engine; and protusion of the gasket from the lower port side (at about 5 o'clock, looking at the front of the engine). See Tom and Jill's photo [timinggearcovergasketfailure.JPG](#) (75 KB).

The problem is not a one-off. As Tom and Jill noted, one UK Yanmar dealer (Marine Power Ltd.; Dave Swain, a marine engineer at Marine Power Ltd. runs an informative website and forum for Yanmar owners at [\[www.yanmarhelp.com\]](http://www.yanmarhelp.com) that was originally started by Dick Tucker, who had been Service Manager for a NZ Yanmar distributor) repaired 25 engines with the exact same problem from the Sunsail (UK) charter fleet.

The symptom of the problem can be dealt with by replacing the gasket with the steel-reinforced gasket, Yanmar part number 121575-01512. Do NOT use a gasket with part number 121575-01511 – that's the gasket that was used when assembling the engine and is part of the reason for the failure.

As a result of their experience replacing the timing gear cover gasket on 25 engines, Marine Power Ltd posted, on their internet forum, notes on their repair procedure. I've included a slightly modified version of Marine Power Ltd's repair procedure here, because Tom and Jill found it valuable (it reduced the hours of repair time).

For speculation about the cause of the problem, see section B at the end of this post.

A. Repair Procedure

Parts list: (** see late addition below**)

119305-35151 Oil Filter 19.56
121575-01861 Gasket 6.43
121450-01801 Seal 11.02
128270-01820 Seal 12.14
121575-01512 Gasket 57.79

Total Parts inc GST 117.63

Labor 5.25 hours (2.7 hours working on the engine, 2.8 hours cleaning up the timing gear cover, general clean-up, checking engine operation)

Total 470.00 Cash

(prices in \$Aus in June 2007, when \$A1 = US\$0.84)

1. Shut off fuel cock and batteries (no need to drain fuel or crankcase oil, but it's an opportunity to change the oil and the oil filter – a new filter is already included in the parts list).

2. Remove the throttle and stop cables.

3. Remove all v-belts, the water hose running from the flexible impeller water pump to the front of the heat exchanger, and the flexible impeller water pump. Loosen the alternator (you'll be moving it out of the way a few times).

4. Remove the high pressure fuel injector pipes and the fuel supply pipe.

5. Loosen and then raise the high pressure fuel injector pump (F.I.) pump. Marine Power Ltd noted that this step saves considerable time compared to removing the F.I. pump. Remove the idle adjuster assembly and the small plate beneath. This allows you to see the fuel rack on the F.I. pump, which has to be in the mid position for removal. Undo the four F.I. pump securing nuts and set the stop lever to the vertical position – this will put the pin on the fuel rack in the mid position. Split the pump from the timing cover using a fox wedge or chisel, being careful not to damage the shims (the shims set the timing of the injection events). Pry and wiggle the pump and raise it high enough for the rack to be visible above the timing cover and then place a suitably sized spacer (eg a hand tool) to hold it in place.

6. Remove the 27 mm nut and then the main crank pulley wheel. The ideal way is to use a pulley wheel puller. But it can be done without a puller (crudely but carefully) if you screw a couple of 8mm bolts into the pulley so you can lock it with a bar/screwdriver and stop it turning. Then tap around the circumference of the pulley wheel with a leather, wooden or plastic hammer/mallet.

7. Remove timing cover. It will likely come off halfway and then stick on the crank bearing; additional wiggling will free it. See Tom and Jill's photos [timinggears.JPG \(81 KB \)](#) and [timinggearcover.JPG \(76 KB \)](#).

8. Clean up, remove old gasket.

****late addition****

8a. replace the 2 o-rings, part number 24311-0001002, on the oil channels between cover & block & gasket, on the port side.

**** end late addition****

9. Install new gasket

10. Reinstall cover, making sure that the oil channel o-rings on the port side are properly located.

11. The most important part of the job is to ensure that the F.I. pump fuel rack pin locates correctly in the governor arm fork when you lower the F.I. pump back into place and tighten down. Set the rack to the mid position and the stop lever vertical and visibly check through the side inspection plate aperture that it is correctly located. If not, repeat until successful. If the rack does not locate, the engine will either not start or will start and run away, uncontrolled.

12. Reinstall ancillary parts, pump, and belts.

13. Add oil (if removed).

14. Bleed fuel lines.

15. Start engine. Check and re-set idle speed (the range 825 – 875 rpm if using an accurate handheld tachometer; if using the boat's tacho, aim for the higher end of the range). An idle speed at the higher end of the range helps prevent excessive 'death rattle' vibration and reduces stress on the reduction gear (ie the gearbox).

B. Speculation about the cause of the problem

The protruding gasket implicates excessive internal pressure, from combustion gases leaking out the combustion chamber. The steel-reinforced gasket will likely prevent it happening again. But the newer gasket does not cure whatever is the cause of the excessive pressure.

A compression check on each of the three cylinders will show if any major problem exists. But simply pulling out the oil dipstick and covering the dipstick aperture with a thumb, while the engine is running, will show if combustion gases are blowing by the piston rings (you can do a similar simple test for combustion gas leaking past the valve seats by unscrewing the oil filler cap and covering the aperture with the palm of your hand).

Cruisers (in contrast to day sailors making a sortie from a harbor) tend to idle diesel engines too much (eg when charging batteries) and to run the engine at low speeds (eg around 2200 rpm) to get good fuel economy. Both practices can lead to carbon glaze forming around the piston rings and gluing the rings to the piston, stopping combustion gases getting underneath the rings and forcing them against the cylinder wall to form a good seal.

The glazing problem can be avoided easily: aim to run the engine at higher speeds (2700 – 2900 rpm is not too high; you're trading off increased bearing wear with reduced carbon deposits). And if running for a long time at low engine speeds, punctuate the low speeds with say 5 minutes at higher speed every hour. Similarly, if you have to idle the engine for any time, give it a 30-second burst at 3,000 rpm before allowing it to cool down again at lower rpm.

If piston rings do glaze and stick, running at higher speeds may free them. In extreme cases, removing the head and physically cleaning the rings and pistons may be required.

Associating carbon deposits around the piston rings with the problem of the timing gear cover gasket is speculation so far! I'm interested in learning more from anyone with greater experience (Marty Chin, where are you?).

Cheers

Bil (with edits to remove typos and make late additions)

BCC 116 Zygote,
Scarborough Marina, Moreton Bay, Queensland, Australia

Edited 7 times. Last edit at 07/06/07 12:09AM by Bil.

Attachments: timinggearcovergasket failure.JPG (74kB) timinggears.JPG (81kB)

timinggearcover.JPG (75kB)

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: Yanmar 3GM30F gear case gasket

Posted by: tharrer (IP Logged)

Date: June 29, 2007 07:19PM

Category: Engine and propeller

Great, I'm leaving for 5 weeks on Sunday and suspect I won't have time to replace a gasket. If Bil or Tom sees this in time to answer by about 1400, 30 June, my question is...does the leak get progressively worse or, if I'm willing to clean up the oil daily, can I live with it for 50 hours or less?

I see a little oil under the engine but it appears to be blow-by from the vynil tubes hanging down below the engine.

Thanks much T

Tom Harrer
White Wings III

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: Yanmar 3GM30F gear case gasket

Posted by: Bil (IP Logged)

Date: June 29, 2007 08:16PM

Category: Engine and propeller

Living with the problem (ie topping up the oil level and cleaning up the drips in the oil pan) is quite sustainable, as long as you have a jug of oil and oil absorbent material on board.

Make sure no oil gets into the bilge and keep an eye on your local environmental-regulation enforcement officials!

BCC 116 Zygote,
Scarborough Marina, Moreton Bay, Queensland, Australia

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: Yanmar 3GM30F gear case gasket

Posted by: Bil (IP Logged)

Date: June 29, 2007 08:44PM

Category: Engine and propeller

Took me a few minutes ...

?vinyl hoses hanging down from the engine?

The clear small diameter vinyl hoses are for draining coolant from the engine and heat exchanger,

no? Engine oil should NOT be able to drip from them.

If you've black engine oil in the oil pan, it has to be from the oil filter, the timing gear cover gasket, etc. You should see a trail of black showing from where it comes (see Tom and Jill's photo showing the protruding gasket: you can see the typical show where black engine oil has leaked).

Cheers

Bil

BCC 116 Zygote,
Scarborough Marina, Moreton Bay, Queensland, Australia

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: Yanmar 3GM30F gear case gasket

Posted by: Bil (IP Logged)

Date: July 1, 2007 12:20AM

Category: Engine and propeller

So we now know of two Yanmar 3GM30F engines in the BCC fleet with failure of the timing gear cover gasket; two North American boaters (not BCCs) reported to other fora (see [forums.torresen.com] and [www.marineengine.com]); and the 25 engines in the Sunsail (UK) charter fleet. I guess many more failures are out there (and perhaps more waiting to happen?).

All the reports, seen by me, of failure of the timing gear cover gasket involve Yanmar 3GM30 engines built in 1999 – 2002 in Europe by Yanmar Marine Engines B.V. (ie the engines have serial numbers starting with the letter E).

The Yanmar 3GM30 engine is solid and widely used – while we have the marinized version, quite a large number are in use in East Asia powering agricultural machinery (rice paddy harrowers and planters etc).

The discussion on the www.marineengine.com forum included a post reporting that the steel-reinforced gasket is used in the industrial/agricultural engines (so why wasn't it used in the marine engines?).

Cheers

Bil

BCC 116 Zygote,
Scarborough Marina, Moreton Bay, Queensland, Australia

Edited 3 times. Last edit at 07/06/07 12:13AM by Bil.

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Goto: [Forum List](#) • [Message List](#) • [Search](#) • [Log In](#)

Sorry, only registered users may post in this forum.

copyright Coledata, Inc. 2008