

On the front of the engine is the timing gear cover housing all the gears to drive pumps and pullies... now ready to come off. Then I can just remove the injector pump drive gear with seized shaft attached! BUT WHEN?

DUD Fuel injector pump number 3... stuck fast on the gear.

Access hole to fuel injection pump drive gear. Injection pump shaft fits into taper in gear like a prop shaft on a propeller with backing nut. Gear is captivated behind timing cover.

Crankshaft oil seal and wear sleeve stuck in timing gear cover... need special JD tool to remove it...

Engine plate between gear and injector pump. Pump shaft fits through a hole in this plate into gear.

Here's Don and he is Not Happy.

BATTLE FOR TARAWA

Engine woes have Don and crew marooned on Tarawa Atoll in the Pacific. Sadly, it's not that idyllic a place...



Bill's "Super Pusher" tool on the left, my "homemade" tool in the middle and the official "white" JD tool on the right... all useless! at pushing the seized injector pump shaft out of the gear.

Unbelievably, it is happening to me on *ICE* right now. If you Google that line, you will read about the grim, heroic, WWII history of this island. In three bloody days, the 4500 Japanese defenders were virtually wiped out by 6000 US marines with 1600 dead. All this, on an Island only 1.6 miles long and less than half-a-mile wide. As I write, I am trapped in Tarawa, Republic of Kiribati. I am struggling with one of the most frustrating battles of my entire sailing life, with no solution in sight?

We are on passage from the Philippines to Tonga, hoping to commence a really interesting wreck-diving project. Well, we were, until two injector pumps failed at sea on

our John Deere engine, forcing us to sail under a "get home" rig, 300nm to Tarawa (see last month's *Ocean Adventure* column or visit www.blutreasure.me blog).

Seahorse Yachts (the Chinese boatbuilder of *ICE*) sent a new pump and bought me another spare from the Taiwan JD agent. They arrived three days later, but we couldn't remove the dud pump? That was four weeks ago and it's still stuck.

Now John Deere have effectively put us on notice that we may not get it off for about three months! If you own a diesel engine, read on.

BEST LAID PLANS...

When I set to sea on any boat, I try to plan for all contingencies and I consider myself reasonably



Top: Looks like Paradise with a sad history but those little brown piles in the sand are human. Above: With time on their side, Don and crew plan to show the locals what beach cleaning can do.

resourceful, with 40 years broad-based boating/engineering experience. I carry an amazing amount of spares, all the tools and have satellite comms for advice at sea, but this time I am completely stuffed and very frustrated.

Tarawa (1.21° North, 172.56° East) is not the place to be stranded. Close to third world, the people are really beautiful, helpful and always happy, but the anchorage is littered with wrecks and not safe. The beaches are covered in rubbish (also sadly used as a toilet by most) and the cost of limited supplies about three times that of Australia. So how did it all happen?

Twenty hours into sea trials — before taking delivery of my new McIntyre 50MS in China (see www.mcintyre50MS.com — the injector pump failed on the engine. The Taiwan agent, who supplied the engine, sent a replacement, which was then fitted by the builder. When I asked for it to be tuned by a JD engineer (as the engine sounded "different"), one came out to Hong Kong, looked at it for just five minutes without touching it, then declared it okay? I was worried, so asked the agent for a spare injector pump. Now, 880 engine hours later, the second injector pump failed (we don't know why yet, but there may have been some fuel issues).

I have the engine manuals onboard, but when I came to fit the spare pump at sea, I didn't have the special fuel-system manuals describing the process. I rang Bill Kimley at Seahorse Yachts in China late that night. He immediately went online, standing by all night!

He downloaded the info and walked me through it on the phone as we drifted "dead ship" towards a reef. To my horror, we found we needed a special "JD pusher tool" to remove the dead pump! (So why didn't the agent tell me about that when I bought the spare pump?)

THE PERSUADERS

Fortunately, we got it off after an epic struggle using a BIG HAMMER to bang the tapered pump shaft out of the engine gear. It took eight hours to swap the pump... which unbelievably failed 21 hours later and no one knows why? Do you carry a spare injector pump?

When the fourth injector pump arrived in Tarawa, I tried the "hammer" again. No luck this time. I then found some 10mm steel plate and spent a day making my copy of the JD pusher tool. Tried that, but

[THE ART OF ADVENTURE]

Given to me on a card by my mother for my 21st birthday. I live with it always....
Create mental pictures of your goals then work to make those pictures become realities.
Exercise your God-given power to choose your own direction and influence your own destiny and try to decide wisely and well.
Have the daring to open doors to new experiences and to step boldly forth to explore strange horizons.
Be unafraid of new ideas, new theories and new philosophies. Have the curiosity to experiment, to test and try new ways of living and thinking.
Recognise that the only ceiling life has is the one you give it and come to realise that you are surrounded by infinite possibilities for growth and achievement.
 Keep your heart young and your expectations high and never allow your dreams to die.

by Wilfred A. Peterson

AS I WRITE, I AM TRAPPED IN TARAWA. I AM STRUGGLING WITH ONE OF THE MOST FRUSTRATING BATTLES OF MY ENTIRE SAILING LIFE, WITH NO SOLUTION IN SIGHT?



Happier days! Jane learning to surf the Kiribati waves after just learning to swim! But beware the beaches!

kept breaking the 6mm holding bolts.

I then bought a 12lb sledge hammer. It was still stuck. Bill made a “super” copy of the JD tool in China and rushed it in by DHL, but I still kept breaking the holding bolts. I had Margie in Hobart chase some 12.9 high-tensile 6mm holding bolts and rush them in by DHL.

Meanwhile, the Taiwan agent sent me the “official” JD tool, but using that I broke the 12mm pusher bolt! The 12.9 tensile bolts broke, too. I tried “ice and fire” heating and shock cooling the shaft and resonance tapping to vibrate it off. Still stuck. People following the blog from all over the world sent advice, including aerospace and old-time engineers.

The best advice came from Bob Senter (the International Lugger/Northern Lights service guru) and Steve Shale, the Australian John Deere agent, who always makes himself available.

Why is the shaft taper and keyway seized in the gear? No one knows, but it could be that the pump shaft was room temperature when it went into a warm gear on the engine, then expanded, or that we missed the instruction “NOT” to oil the tapered shaft when fitting it into the gear.

Five weeks and five DHL shipments later, Bill flew in from China himself with more ideas and experience. It was just a pissy little shaft, stuck in a little gear, right! Unfortunately,

between the pump and the gear, is a big piece of engine captivating the two. You cannot cut the shaft out, drill it out, nor get to the gear, because it is behind the timing gear cover on the front of the engine.

LAST ASSAULT

One last, all-out, massive assault with Bill pulled the shaft out of the pump... but not the gear. Game over. We now have to pull the front of the engine off to remove the gear with shaft attached.

Shale was prepared to fly out and help, but even with his fair labour rates, the accommodation, travel costs and limited flights into the island made it a nine-day, \$8000 affair, plus parts? I ordered a new gear, all gaskets and sets of special JD tools I needed to do this new job.

To save time, I attempted the job without the JD tools, hoping one of the seals may just pop off the cover. So, 12 hours later, I had dropped the engine sump, removed alternators, pumps, pullies, etc., and a bunch of bolts to release the timing gear cover. It moved and was free... but no, the front crankshaft oil seal and wear sleeve was stuck, so it too would not come off. I would need the JD tools to remove the seal and fit a new one and then time all the gears again.

Now for the bombshell! A direct hit in the Battle at Tarawa! John Deere informed me that the tools would *not*

be available for about three months!

Even if available today, this whole saga has cost us an eight-week delay. Will we have to add another three months to that? I really do not know.

One crew just flew out and the three left are making the most of it. We are planning a beach clean-up to show the locals what a clean beach looks like. Mel is teaching English at a local school, Jane is learning to surf without touching the beach and Mark can have fun anywhere.

Me? Well, I am reflecting on the *Art of Adventure*. Lessons learned, tough call? I had all the spares onboard but not the Fuel System Workshop Manual. They still don't mention in that manual about having the pump shaft at the same temperature as the gear when fitting it in an emergency? So it may well not have saved us.

Most of my boating friends don't even carry spare injectors, let alone a spare pump, as they usually last about 20,000 hours. I am trying to fit my fourth and have a fifth under my bunk, work that out? When we remove the “third” pump, we will have that checked for answers.

If there is one thing I know, at the end of the day you can have the best-prepared boat, with the best crew, but if your luck runs out? 🍀