

LIVE LOAD

Quarterly Newsletter from
Valley Forge & Bolt Mfg. Co.



Welcome to the first edition of the Valley Forge newsletter, "Live Load". We chose this name for the passion we have in load indicating fasteners and to represent the constant load information that can be captured on all fastener products Valley Forge & Bolt supplies, from our patented Maxbolts™ to the

Clarkester™ system built to test for application loading with standard bolts.

We plan for this to be our outlet to bring you interesting articles about load indicating fastener applications, technical updates on fasteners, upcoming events at Valley Forge and new developments in our Load Indicating Fasteners.

In 1974, Ron Clarke started Valley Forge & Bolt to service the mining industry. Through the years we have listened to our customers and what they have needed to make their bolted joint applications less problematic. In this way we have developed many patents which have become standard in industry. Listening to the customer is one of our most important precepts. We focus on customer needs, their problems needing to be solved in bolting, and supply them with the best quality American made fastener. Throughout this time, we have been a small family owned business with Philomena Clarke running the sales department and Ron Clarke running engineering and production.

Now 40 years later, our second generation of bolt manufacturers is expanding operations and growing markets. We still have the same purpose: listen to the customer, find out what they need and supply them with the best. We have assembled a team of bolting professionals at Valley Forge with the same family ideals that Ron and Philomena instilled. In the months to come we will share information from many of these individuals and interesting application solutions. We hope you find this newsletter interesting and useful as you get to know Valley Forge and our capabilities.

- Michele, Bret, Byron and Ron

Wind Systems Magazine Load Indicating Fasteners Article

ISRI Convention & Exposition 2015

21 - 25 April, 2015
Vancouver Convention Center
Vancouver, BC, Canada
BOOTH 1216

The 20th North Sea Offshore Cranes & Lifting Conference

21 - 23 April, 2015
Stavanger Forum
Stavanger, Norway
BOOTH 17

OTC2015 Offshore Technology Conference

4 - 7 May, 2015
NRG Park
Houston, Texas
BOOTH 2258

Elko Mining Expo
1 - 5 June, 2015
Elko Convention Center
Elko, Nevada

**UPCOMING
EVENTS**

Q2

Anecdotes

from the
President



by Ron Clarke

I don't know if our editor will print this. But she's Canadian....

'OSHA' AHOY. Where were you when I never heard of you, and after I heard I wish I hadn't?

Firsts of anything tend to stay in our memory forever. So let me bore you with an anecdote of mine. Way back in my misspent youth I ran away from my apprenticeship at India's largest steam locomotive workshop in Jamalpur to join the 'boats'. Boats was a word used by us apprentices to widely mean the then, merchant navy. Word was out that steam engineers were needed, adventure called and I answered with all the unspoiled naivety of a teenage idiot.

Calcutta was the port, the SS DUMOSA was the ship, and I was signed on as the extra 5th engineer. Old man Punchard who hired this skinny looking runt, must have been seeing double during our interview, but I prefer to think he foresaw the makings of a great engineer happening before his bleary eyes.

The DUMOSA was an Aussie Tub with significant similarities to the ARK. It floated and was close to the same age. It had been bought by a group of Boorie's and had "cargoes" (is that a word?), to Calcutta and if it survived the voyage, it was to proceed light ship to the port of Karachi, in the newly formed nation of Pakistan, to be broken up for scrap. Nobody told me about all this or that most of the crew had deserted at Calcutta when I signed the articles. Maybe Punchard was not so drunk after all. Looking back I think there must have been many, better informed, no takers.

First working day loomed and it fell to me, the extra 5th to supervise the lascars unloading cargo at the lone steam winch on deck. I knew winches lifted things and I'd seen them on Hollywood, ship movies and stuff, but had never worked anywhere near one before. Undaunted by my supreme ignorance and with steam snorting and leaking everywhere, things went fine until they didn't, and the dam winch went nuts. A shackle pin fell out of a lifting clevis and a bundle of something came apart and hit the deck from what seemed the height of Mount Everest. To put the chaos that ensued in nautical terms, after all I was a sailor now, buggers were running to port, starboard and all points of the compass to escape the rain of errant cargo with me in the vanguard. I make no apologies but at that tender age, self-preservation and visions of life after the winch

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came to the fore, and aren't you glad I survived to tell the tale. Notwithstanding my winch crews best efforts to the contrary, there were no casualties, though is those days, who the hell was counting. Lots of glowering and not so nice comments for the winch crew even though we protested our part in the incident as being just collateral damage. I didn't know it then, but I think we

might have invented the phrase collateral damage that is so glibly thrown around by politicians today.

Somebody important, turned out to be a cabin boy, suggested the captain be informed of all disasters and other things.

Someone else reminded him that, there was no captain. Seems like Captain Bratton, jolly old tar that he was, had sailed his last voyage on the SS DUMOSA.

Passing into the ghost ocean a few days previous and a new captain was on his way. Also seems like the unfortunate chap lay dead in his cabin for awhile before being noticed and like all jolly captains had to be winched off the boat after great difficulty in getting his great size out the cabin door. I got this information on good authority and with great detail, because cabin boys know everything.

What has this got to do with bolting you say? And I say I'm getting to it, so give me a break. After sixty five years I think I'm still traumatized by almost being collateral damage at the incident of the winch.

I hadn't met the Chief Engineer yet. My source, yup, the cabin boy informed me that his name was Reynolds, and that he was so old that he looked like he'd escaped before the embalming was completed. He also confided that he was irreverently called Rundu, behind his back when not politely addressed as Chief. The 3rd engineer arranges the day to day operation in the engine room and it was Ghose, a Bengali engineer, who finally appeared on the scene.

With all the bright minds around it wasn't long to diagnose stripped threads with the nut falling off the end of the shackle pin. Of course, at that time, I didn't know a shackle pin from the Queen Mary but I did recognize the problem with the threads. (Unknown to me I was already fulfilling Punchard's bleary vision of greatness).

When it was discovered that there were no shackle spares on board and no way to procure the hardware without idling the winch for hours, Ghose, who was

also newly signed, went ballistic, muttering all kinds of disbelief in Bengali, which is a very suitable language to express frustrations and can be easily mistaken for French after a few drinks. Somebody found the nut, no it wasn't the cabin boy, but the ANSI standards committee would have had significant problems classifying the fit or lack thereof.

Enter Chief Reynolds. He had shuffled alongside unnoticed. One look at him confirmed the suspicions of the cabin boy. I later heard that he was an old man even before 1941 when he was sailing with Atlantic convoys in oil tankers. There were not many engineers with the courage to stay below in oil tanker engine rooms on U boat waters. Evidently Reynolds was one of them, a survivor and a legend in his time, but now a wizened up shaky old relic of the past, who wouldn't leave the sea. Or so I thought in my young wisdom.

***Never judge a book
by its cover, be-
casue maybe, just
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was right.***

Ghose explains the situation to Reynolds who peers at the hardware using a magnifying glass. Ghose leaves but returns with a steel shim and a pair of tin snips. Reynolds surprises me by skillfully cutting and shaping a strip off the shim and then inserting it into the nut. Ghose then threads on the nut and, Voila! The remaining threads develop enough torque to permit the shackle to operate safely for a few hours. We cautiously begin unloading again. My crew are winching again but lascars maintain a safe distance.

So I put it to you my readers, if any, as a popular though never published author, was this my first bolting lesson or a larger one where the ends justifies the means or, always find a cabin boy for information because they know more than the NSA.

My shaving mirror frightens me every morning because I'm starting to resemble Reynolds. But the final lesson for y'all out there is, never judge a book by its cover because maybe, just maybe, Punchard was right.

For more on my voyage to Karachi check in on the next newsletter if the editor agrees to go to print, that is.

-Mr. Bolt
(AKA by my competitors as Mr. Nut)





MAXBOLT™ Application: America's Cup USA 76

VFB interview with Brad Webb of AC Sailing SF

"It all started when Bengt Blenduf, the well-known, international bolting Guru and educator was approached for his design recommendations by the Oracle/BMW racing team for their keel bolts. He thought it would be a great application for our load indicating technology, so he called me and directed me to their engineering. Valley Forge designed the hardware for the Maxbolt™ with the Oracle engineers, as you see it today." -RON CLARKE

VFB: How long you have been racing boats Brad?

BW: I started sailing when I was 12, in just a little dingy, in Wellington, NZ. I used to enjoy sailing on my own but for whatever reason, I enjoyed sailing with other people more and as I got further into it, I realized as much as I was quite a good driver, a Helmsman, I was a better crewmember, especially on the bow at the front of the boat. And then, my career happened more by accident then by good management. I decided to take a couple years off just to figure out what I wanted to do with my life: that was 20 years ago. I grew up looking at the big glossy magazines, with nice boats and sun drenched ports, and that seemed to me like a pretty good way to spend a couple of years. I wanted to go and sail the big blue water events, I wanted to

sail on big fast boats, so I did. I had this drive to be better, I wanted to do things better every day I went out. I started sailing on the match racing circuits around the world, with some different skippers and my first America's Cup was in 1995 in San Diego. Again it was more by accident than good management. Between 1995 and 2000, which was the next American's Cup in New Zealand, I went sailing around the world, and sailed in a lot of different places. I think there was 140 events in 16 different countries over four and a half years. I did a lot of sailing, and sailed with a lot of people, in a lot of different situations and gained a lot of experience. When my second America's Cup came around in 2000 with America True, the San Francisco team, I was pretty well prepared. Later that year I was picked up by Oracle Racing for the 2003 America's cup,

and I've been with Oracle Racing ever since, 5 campaigns and over 14 years.

VFB: How large would those boats you started on (dinghies) be, compared to what you sail in now?

BW: The first dinghy I started sailing was called a P Class, which was 7 feet long. That's a boat for a little kid, but it's not sailed anywhere else in the world except New Zealand. It's kind of a quintessential New Zealand boat, where if you can sail a P Class, you can pretty much sail anything. It's overpowered and a tough little boat to sail. Pretty much all the legends that came out of New Zealand started in a P Class. From there I moved into a laser, which is an Olympic class. I did reasonably well on that, on a national level,(continued on page 5)

(continued from page 4) but never really went to the international level. Then I started sailing a jave-lin, which is a 14 foot skiff. That's where I really found that I liked sailing fast and I liked sailing with friends. After that, I started sailing on keel boats, which were about 36 feet, and my first international Regatta was in Hawaii in 1994, on a boat that was 55 feet. Then, the America's Cup boats are 82 feet, and our trimaran in 2010 was 115 feet. So you can see the progression. Quite a difference from start to now.

VFB: Tell us about USA 76, the boat that has Valley Forge Max-bolts™ in the keel?

BW: I sailed in the International America's Cup Class (IACC) for four America's Cups, from 1992 to 2007. That is what USA 76 is. The IACC, and the USA 76, was a great, great class, for 15 years, they built 100 boats. They are all sequential, so USA 76 is the 76th boat built. We were never successful winning the Cup in that class, but they were just a great boat to sail. We sailed with 17 people on those. Everyone had very, very specific roles, and the choreography that needed to happen on board to get the boat around the course, changing sails and sail it well, was quite detailed. If you got it right, you could have a great day out. And if you got it wrong, it was a bad day. The boats were very fast. We would sail around in those boats at 10 to 15 knots. Then we transitioned into the big T Hulls, and now we have transitioned into foiling catamarans, which are now sailing around at 45 knots. Quite a big jump in

just a few years! But I bought USA 76 because I thought San Francisco needed some kind of connection to the America's Cup. It's a great boat, I know it well, and we put it together here in 2011, and we have been running it as a charter business out of Pier 39, coming up on 4 years now.

VFB: What distances did USA 76 race?

BW: We used to sail the IACC on a course that was effectively 12 miles, although you cover a lot more distance when you're zigzagging up. Those races were about an hour to an hour and half long. We are now doing the same distance for the last America's Cup in 2013, in San Francisco, doing the same distance in about 25 minutes in the catamarans. Still kind of doing the same distance but screaming around the race course.

VFB: What about the conditions of the race? What variation is there that the boats sail in?

BW: It really depends on the venue. The America's Cup was held for a long, long time in Newport, Rhode Island, which was fairly benign. It would be 10-15 knots and fair-

ly flat water, but quite consistent. When Australia won in 1983, they broke the longest winning streak in history and took the event down to Perth. The Regatta was held off-shore there, and it was extremely windy with big waves. For those who watched, like me as a kid, it was extremely exciting because it was wet 'n wild with thrills and spills. Then it was won again by the American's and taken to San Diego which is inherently light, so the yachting there wasn't all that exciting. New Zealand won it in 1995 and took it to New Zealand. That really showed what sort of range these boats can go through. We would have very light winds or very heavy, in fact in 2000 it was extremely windy. But again, you can have days that were light and then

(continued on page 6)



(continued from page 5) days that were wet 'n wild and great TV viewing. They generally stop racing the boats at about 30 knots of true wind. For a couple of reasons, safety primarily, but after that, it's tough to even watch and it's even tougher for the race committee to set a fair course. At that point, it gets pretty extreme, boats are dragging anchors and it gets a little brutal. But that has generally been the range, from about 7 to 27 knots, so there is a significant amount of variation in the sailing conditions.

VFB: How much are the boats sailing? In terms of the years that the Maxbolts™ have been in the keel?

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BW: For the IACC [USA 76 class] we used to do a lot of sailing, we

would set up at a venue, or different venues around the world and do a lot of sailing. Once you had them together, they were an easy boat to put in the water and go sailing. The catamarans are logistically a little bit harder, because you have to put the wing and platform in everyday, and you have to use a crane. Just logistically they are a lot tougher. The cut boats we used to sail a lot, especially when we were based in Valencia. We sailed probably every other day for three years. That was a lot of sailing. Then, when we weren't sailing, we were off sailing some other

boats. So the USA 76 has been all over the world sailing far and wide; Auckland, Australia, all around Europe, lots of sailing in Europe, and both coasts of the USA.

VFB: How was USA 76 designed?

It's a very complicated puzzle that needs to be just about perfect to work. There's no room for error.

BW: It's generally started using CSD analysis and making a hull shape, that is as fast as it can be built. And then the next part is engineering a structure that is as light, but as strong as it can be built. That then

becomes part of the keel equation. But then you have to build everything else around it; the sails and the systems on board. Again, the lighter (continued on page 7)



(continued from page 6) that you can make everything in the hull, and everything above the wood line, the more lead you could put in the bulb, because it was an overall weight that was part of the rule. Which basically makes the boat more powerful, which made the boat faster. If you could make the boat more powerful, it basically meant you were putting more lead in the bulb, but it then also meant that your keel, keel structure and all your fastenings needed to be engineered to take all that extra load. It's a very complicated puzzle that needs to be just about perfect to work. There's no room for error.

VFB: Where there bolting issues being encountered when you first came to Valley Forge for fasteners?

BW: There wasn't necessarily a bolting issue, the Maxbolts where just the right product and application because you can see what the loading was. You can see that you were getting the numbers that the designers were asking for. We rely HEAVILY on analytics and engineering and design numbers, not only to build it, but to maintain it and monitor the boat, day in and day out. [When racing] we would take the keel on and off of this boat, probably once a month just to check it and make sure nothing was going wrong. For me it's just all about reliability. Reliability was a HUGE thing for us when we were racing this boat because we had to finish races. We have to have faith in our gear. My mentality now is on a commercial operation, inspected by the coast guard, and I have paying passengers onboard.

My liability is huge. Keels have fallen off and broken off America's Cup boats in the past. Generally not because of the bolts, but for other reasons through fatigue and poor engineering. That still doesn't mean that I want to risk sitting back and not doing anything. I have a lot of faith in how this keel was engineered. On these boats, the keel is just a huge, huge deal. If you engineered the

hull and the rig and everything else light, there was more lead you could put downstairs. But it also meant the keel bolts were going to be working a lot harder, so the keel bolts were a huge part of the equation when these boats were being built, the way they're engineered and the way the whole structure was engineered around the keel. Everything else doesn't see that kind of load. I am quite close to the guy that designed the keel in the first place. We constantly talk about cycles and fatigue that the boat is going through. We took a

We have to have faith in our gear.

lot of lead out of the bulb when we put it back in the water [commercially] and took some sailing rear off. So the bolts aren't under what they were designed for, they aren't seeing the design load they originally engineered for. It would be quite a lot lower. However, they are seeing a lot more cycles than they were originally engineered for. Which is why we ha-

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ven't had a lot of concern, because we think there have been some tradeoffs. Now that it's been four years, we think the prudent thing is to take them out, check them, have themw tested, put new ones in and see where we stand and ensure that we have confidence in the boat forward.

VF: Tell us more about the Maxbolts™ in USA 76?

BW: The first set, they used to go in and out every month. That was when we were racing. Since I have bought the boat, and have a commercial license, we put a new set of bolts in the boat in 2011 and haven't touched them since. We originally put them up to about 80% of their max loading, which we were happy with, and they haven't moved. We have made sure that we have kept them nice and greased because they are in a pretty harsh environment, so we try to look after them as best we can. Now we are taking them out and putting a brand new set in. We are going to send them back to Valley Forge for testing and that will give us an accurate picture of life and the environment that these bolts have been in. What we are going to learn when the new bolts come and we swap them out, is if there has been any fatigue on them, or excessive amounts of corrosion, just what's going on. For a number of things, but mainly we can learn what kind of long term environment they can go into. For us, it gives us (continued on page 8)

(continued from page 7) an idea of where we are in the cycle of these bolts. When we put these brand new ones in and send the other back and we find that they are absolutely pristine, then we know the least amount of time we can get out of them, without any concerns.

Post interview update: The USA 76 was taken out of the water on March 18th at the KKMI Marine Facility in Port Richmond, a first class boat yard in San Francisco and AC Sailing's first choice for haul out and maintenance needs. They removed the in service Max-bolts™, and installed the brand new set. The photos show her out of the water with her 14 foot long keel and 40,000 pounds of lead attached at the bottom. You can see the installation using the VF hydraulic wrench and the new bolts in position and tensioned. The bolts were fully lubricated, then painted with an epoxy protective coating after install. The head of the bolt is sealed with a cap that has a window allowing gauge monitoring.



LAST QUARTER AT VFB

Last quarter, (and then some, to catch everyone up...) was very busy at Valley Forge! Most memorable, we celebrated our 40th Anniversary, what a milestone that was. At the same time our founder, president and bolting Guru, Ron Clarke, turned a wonderful 84 years old! Some other happenings included, publications in the American Fastener Journal, a wildly hilarious Christmas at VFB, January Quarterly Meeting, our new website launch and the SME Conference in Denver, Co.

40th Anniversary and Ron's 84th Birthday!

In November we celebrated 40 years of innovative bolting! We invited everyone to come to the new Valley Forge building in Phoenix and take a great tour, see a seminar or two, have a big lunch and some birthday cake with Ron. There were over 150 people who came out and we had a great day. Here's to another 40 years!



Christmas

Christmas is always a busy but joyous time of year. This year, Christmas at VFB was slightly different than Christmas' past. Our silly new marketing coordinator dreamt up the VFB Christmas Gameapalooza, which we were all forced to participate in before the Christmas Luncheon feast. Adorned in team Santa/Elf hats, we played games and had a laugh before having a wonderful holiday meal together.

To watch the Christmas at VFB video, please visit the website page! <http://www.vfbolts.com/lastquarter.html>

New Website Launch

A much needed overhaul of our old website was finally completed and the new site launched on February 1st. We hope everyone likes the finished product and we look forward to continually growing and growing online. A special thanks goes to [BX3 Interactive](#) in Scottsdale for helping us straighten everything out and make it all look amazing. Please let us know if there is anything you would like to see on VFBOLTS.com!

SME Conference

The third week in February, The Society of Mining Engineers hosted their annual conference in Denver at the Denver Convention Center. Michele, Bret and Lana went to the show and got to catch up with everyone they knew from before and meet a bunch of great new contacts. A successful show and pretty great winter weather in Denver. We are already booked in for next year!



LAST QUARTER Continued

January Quarterly Meeting

Each quarter, Valley Forge gathers together for a meal and to share how everything went the quarter before. The January quarterly meeting featured a meal of Barro's Pizza and salad, despite the fact that one of the topics of discussion was staying healthy. We will try and coordinate that better next time.... Other topics included: safety improvements accomplished, software upgrades, new equipment, forge improvements and new customers.



VFB Fun Facts:

1. How many labor hours did VFB work in 2014? A: 141,928.30
2. How does VFB heat up the steel for forging?
A: Instead of traditional gas stoves, we use state-of-the-art induction heaters.
3. How red does Barry Thomas' head get after 6 days in the sun?
A: This was yet to be determined at the time of publishing, we will let you know in the next issue....

New Instructional Videos

We filmed multiple new instructional videos this quarter. To view them, visit the website and click on the "[Instructional Videos](#)" tab.

**See you in the
next newsletter,
July 2015!**