

# A Tale of Two Gear Companies

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**Experiencing a Dickensian dilemma in its essence, a Los Angeles based manufacturing company was faced with the good fortune of ever increasing orders for steel gears from a good customer with a new recreational product in very high demand. Confronting the possibility of an untold number of lonely late nights tending to the whims of a 1950s era manual hobber was an unpalatable prospect no one desired.**

Meanwhile, another company nearby had recently designed their first stainless steel helical gear set for a new compact fishing reel and they were having an unexpectedly difficult time producing gears of the quality they needed to make the reel a success.

One company desired greater throughput without losing quality. The other desired quality and consistency they'd never yet produced in order to make their product work. Both companies were doing their best to utilize older, manually operated equipment that had always been well-kept, loyal companions. The possibility of sourcing suitable gear sets from outside vendors in a timely fashion was a bleak prospect as demand and resulting lead times everywhere were high at the time.

Both of these family-owned manufacturing companies have been in the Los Angeles valley for three generations. Brothers Glenn and Sean Eberlein had been visiting their family-owned machine shop Mercury Broach Company, Inc. of South El Monte, CA since they were mere urchins. Founded in 1961 as a production broaching company, Mercury Broach branched into gear production in 1988 when Mark Eberlein took over the business from his father, Leo. The seeds of this latest revolution were planted in the mid 2010s when the young brothers arrived to gain knowledge of manufacturing under the watchful eye of Mark. Serving a long list of customers with unique needs the brothers learned the business from the inside out.

Twin brothers David and Douglas Nilsen of Accurate Fishing Products of Corona, CA incubated their business from within Accurate Grinding & Manufacturing Corporation, owned by their father, Jack Nilsen. Founded in 1950 by Jack's father-in-law, Michael DeMarco, the AS9100C certified company serves the aerospace and defense industry with extremely tight-tolerance turned, milled and ground workpieces using state-of-the-art machine tools and an outstanding, experienced and talented production staff. Revolution from within the company actually started in the 1990s during the brothers' college years after Jack came up with an idea to produce a 'gaff', a bloody big fish handling hook, out of aerospace materials so it wouldn't bend or deform under load. Jack tasked his young sons whilst on summer break with refining the design and manufacture of this unique gaff. Not only did the Nilsen brothers find a receptive sport fishing industry at local fishing shows whilst selling the gaff, but in conversations with customers they identified other needs as well; which they eventually developed into their own line of *Accurate Fishing* branded reels.



**David and Douglas Nilsen of Accurate Fishing Products, with the company's first fishing reels, in 1997.**

Both companies independently found a solution to their respective plights using what could now be called an "old-school" method: They phoned up a few experienced local gear makers, who directed them to take a closer look at the Mitsubishi line of gear machine tools. Mercury and Accurate each chose the 150 mm/6" diameter Mitsubishi model GE15A 5-Axis Hobbing Machine with skiving and robot integration for eventual lights-out operations. Both companies wanted an immediate solution to the bottlenecks in their shops, but did not wish to be guillotined with a machine tool that would limit their future plans. Each company produced or adapted their own workholding tools to suit their immediate needs in time for the arrival of their new hobbers, for which delivery, installation and training only required a few short weeks.

Up and running within hours of installation, Mercury Broach requested training on helical, spur and stacked gear changeovers. Within a few short days, they had not only learned how to operate the machine, but they had managed to eliminate their backlog of gear orders as well. Short work was made of all the jobs by quickly modifying or adding programs through a machine programming interface easily learned and understood. Having been 'voluntold' to work the prior



## “It was the best of times, it was the worst of times.”

thirty days in a row with 10 to 12 hour days and over a beautiful Labor Day holiday weekend as well, to say the Eberlein brothers were quite pleased to have quelled rebellion in their shop would be a vast understatement.

Accurate Fishing Products experienced a similarly short machine installation timeline but were primarily concerned with having complete control of and to be able to produce the best possible stainless steel helical gears they could for their new fishing reel design in time for Christmas deliveries. Apparently there are few consumers as finicky as sport and charter fishermen who demand both zero backlash **and** smooth action in their fishing reels and are quite willing to invest in high quality fishing tackle to realize this. After a few trial parts and assembly of a few ‘TERN’ reels; imagine the surprise and delight of the quality department who were very pleased to report the reels just produced were unlike any others before seen and precisely what they had been pursuing for months!

With more than 2,000 machines in the field, the Mitsubishi ‘G’ series hobbing machines are a well executed, extremely refined and flexible machine tool honed by more than 30 years of kaizen manufacturing techniques. With a suite of standard features including a straightforward and easy-to-understand interface, wet or dry operation, flexible workholding options and a fully adjustable tailstock; Aristocrat, Bourgeois, and Jacobin alike will be able to quickly and accurately produce billable workpieces in a job, batch or production machine shop environment.

A machine delivered from Mitsubishi’s stock machine program can be gainfully employed in your village almost as

rapidly as Madame Defarge’s ire. While the machines were sought after by each company for different reasons, both companies expected immense reductions in cycle times, which were realized. But the real shock was in the ease of changeover and the exceptional first article inspection results. The fear factor from the establishment within each shop simply vanished once everyone had their turn with the new hobbing machine.

It was found during an initial meeting between the two companies for this profile that the first generation of ownership more than likely did business with one another in the 1960s as there were very few precision machine shops like theirs in the valley at that time — so a lost connection has been restored. Accurate Fishing Products is now configuring a collaborative robot to their new hobber and broadening the scope of work to include their legacy spur gears. Mercury Broach continues to serve an ever expanding list of customers at the same address since 1961. They are still growing their family, having recently welcomed a Mitsubishi Programmable Helical CNC Shaping machine to their portfolio and more importantly, welcoming Sean’s new bride Nicole to the company this past September. She keeps the Eberlein rebels of the production department in line by knitting her administrative skillset into the operation... ⚙️

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Ross Wegryn-Jones (center) with Glenn Eberlein (left) and Sean Eberlein (right) of Mercury Broach & Machine standing in front of their new 5-axis hobbing machine

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**Ross Wegryn-Jones** is a 29-year manufacturing sector veteran with sales, marketing, engineering, and project management responsibilities and has been working exclusively with gears & splines since 2009. With a “how does it work” philosophy, hands-on approach and a voracious appetite for reading, Ross finds himself involved in lots of different interests from sailing to Unmanned Aerial Vehicles (UAVs). A lifelong manufacturing enthusiast & resident of Michigan, Ross is a husband of 22 years (& counting) and father to 4 daughters, 1 dog and 6 chickens. Ross finds his joy in those moments when a well thought-out plan comes together.

