

# Electrical Apparatus

More than Motors

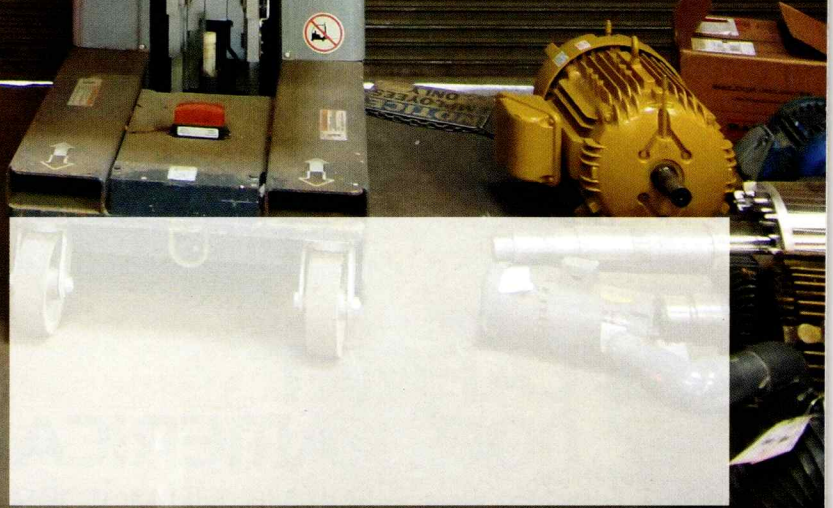
The Magazine of Electromechanical  
& Electronic Application & Maintenance



**Vallejo  
Electric  
Motors  
riding  
high**



**2017 international issue**  
**Worldwide standards**  
**European motor market**  
**Renewable energy today**  
**Plants and factories abroad**  
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**Fabtech preview**





# Electrical Apparatus

The Magazine of Electrical &  
Electronic Application & Maintenance

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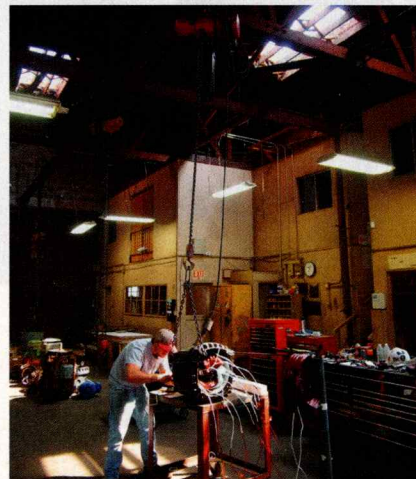
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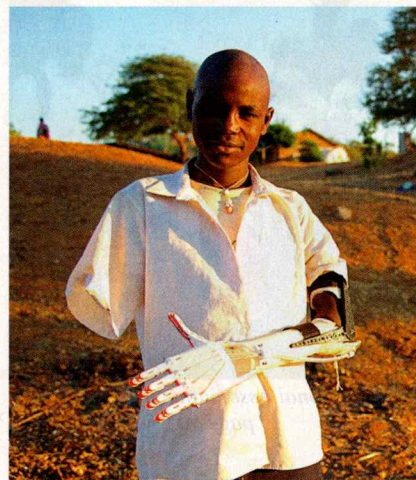
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# Riding high

*How a father and son are combining their skills to bring a motor repair shop in California to new heights*



Larry Lightman (left) and his son Dillon have turned Vallejo Electric Motors into an efficient, data-driven shop in less than a year.

By Bill O'Leary, EA Associate Editor

VALLEJO, CALIF.—This is a story of a father and a son. Say hello to Larry Lightman, a seasoned Silicon Valley transplant with a vast knowledge of software development and management. Enter Dillon Lightman, son of Larry, an expert in all things electrical.

Together they run Vallejo Electric Motors, an electric motor repair and sales shop based in sunny Vallejo, Calif. Larry is the general manager and Dillon is the operations manager, and together they are able to fuse their unique skill sets to grow a business they have managed for only eight months.

But wait. This is also a story of finding your passion in an unlikely place and doggedly pursuing that passion amidst life's many challenges. Let's start there.

"Everything was incidental in the way it happened. Nothing was deliberate," said Larry of how he and Dillon came to Vallejo. Larry raised his family in tech-Mecca Silicon Valley and would share his love of hands-on repair with his son.

Larry, who did carpentry and handyman construction work to pay for school, bought an old automobile that was going to be Dillon's first car and

planned to do a complete renovation—strip it down to the frame, remove the engine, and rebuild it. Dillon loved working on the engine. It was fun for him. But once they got the car running and needed to do all of the body work, he lost interest.

In those early years, it was difficult for Dillon to find something he was fully interested in. Not just a hobby but a true passion that could provide a gateway to a successful and fulfilling career.

"My daughter went the traditional college route—got a degree, a job, etc.," said Larry. "Dillon was never all that interested in school and really didn't know what he wanted to do. He definitely was not interested in going to college."

Then Larry had a light bulb moment. His cousin, Jerry Kramer, owned a variety of businesses, including construction, real estate, insurance, travel agency, and a wholesale distributorship in the Marshall Islands and Guam. Larry approached his cousin and told him, "Dillon doesn't know what he wants to do but, if he decides he is interested in coming out to the island to look for direction, would it be okay if he lived with you for a while?" Jerry said absolutely.

Larry mentioned the possibility to Dillon, and Dillon accepted, seeing it as an interesting opportunity that could provide some direction. Off he went to the Marshall Islands, a chain of volcanic islands and coral atolls in the central Pacific Ocean between the Philippines and Hawaii. Jerry said right from the beginning that Dillon was going to be treated like every other employee. He'll get the prevailing wage and any work that's available, Jerry said. Dillon was first put on a masonry crew doing heavy-duty concrete work.

After about a month, Jerry called Larry with some bad news. Larry recalled, "He said, 'Don't worry'—which is of course the first thing that is going to cause a parent to worry—but Dillon has appendicitis and he's in the clinic here."

The medical facilities in Majuro, the capital and largest city of the Marshall Islands, are quite primitive, so Dillon needed to be removed immediately. He was flown to Honolulu—the insurance company got him two seats so he could lie down because he was in such excruciating pain—so he could have an emergency appendectomy.

"I didn't even remember the flight because I was in so much pain," Dillon said. After having his appendix removed, Dillon returned to Majuro but was not physically capable of doing the heavy lifting that his masonry work required. Jerry gave him the option of working in the office—which was never Dillon's thing—or working with a journeyman electrician, which was something he had never done before. He chose door #2.

## Stumbling upon motor repair

But hey, it wasn't all bad out there on the islands. Here's where one of those incidental moments that Larry mentioned came into play. Dillon started work as an electrician, repairing generators and motor controls on ships from the islands. Jerry's company managed many facilities there, and Dillon would do electrician work at these locations.

Jerry also had a small motor shop with one man working there. He would rewind the motors needed to power the various facilities throughout the islands. It was here that Dillon was first exposed to electric motor work. What followed was something similar to those love-at-first-sight moments that are fixtures of romantic comedies.

Dillon fell in love with electric motors. It was only a couple months into

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The shop operates in a 7,000-square-foot facility where its thirteen employees perform extensive electric motor repairs.

### VALLEJO ELECTRIC continued

his time overseas and he had found his passion. He almost immediately began repairing motors.

"There are many rural areas throughout the Marshall Islands, so repairing motors and generators is very critical," Dillon said. "You're up all night working on them because they are so badly needed."

The electrician, the solitary man working in the shop, didn't speak a lick of English, so Dillon had to learn Marshallese to understand what he was doing.

### Vallejo Electric Motors in brief

**Primary Customers:** Sixty percent of Vallejo's revenue comes from oil refineries. Those customers were very loyal to the shop but were probably giving about only 30% of their market share. Dillon was able to boost that 30% to about 90%, leading to a significant revenue increase. Municipalities (water processing) are the company's second-largest customer base.

**Secondary customers:** Food processing plants and wineries in Napa. The wineries are moving a lot of liquid and crushing grapes, so liquid and air need to be pumped and powered by electric motors.

**Equipment:** A large portion of Vallejo's profit is going into new equipment for the shop and for field service testing and alignment. Dillon and Larry recently bought a new balancer and an overhead crane for the shop that they plan to install before December.

**Field service work:** Vallejo performs field service, but it's a small percentage of the business compared to in-house repairs. They see this as a significant growth opportunity.

**Building:** Vallejo operates in a 7,000-square-foot structure built on one-half of

"It's actually a pretty easy language to learn," he said. "One sound can cover a large portion of a sentence."

But it was that passion for something new and exciting that kept Dillon going. "I just kind of fell in love with it," he said. "I had a prior interest in hands-on work, and I was good with my hands. Fixing electric motors is like surgery. There are a lot of small components in there and you have to be really precise with your actions. I liked the idea of this really technical, hands-on surgery on equipment. I felt like that was my calling."

a double lot. The other lot was not being used at all, so Larry and Dillon are making the most of it by moving equipment to the space outside. For example, on that lot is a large burnout oven housed in a shed built by Larry. Also, there was a need for more storage, so they bought a 40-foot shipping container and placed it on the secondary lot.

**Employees:** Vallejo currently has thirteen employees. All "hands-on motor guys," and everyone stayed on after the business transitioned to the Lightmans. Two of the longest-term employees have been with the shop for 25 years. One of these mainstays has two sons who also work at Vallejo and a third son who was employed for a short period of time. Total number of employees has increased by a third since Dillon and Larry took over. One of those additions is the grandson of the previous owners. Vallejo Electric is currently looking for a full-time machinist, field service technicians, and an office manager.

**Work size:** Largest size of apparatus the company services is 1,000 hp and the smallest is fractional. Among the many tasks Vallejo performs for its customers, vibration analysis is considered its "crown jewel" and a critical part of the business.—BO'L

Dillon expanded his new-found interest by heavily researching the subject. "That meant a lot, because it's almost impossible to get me to read something for an extended period of time," he said. "All of a sudden I was like, 'Wait a second—I really like reading all of this technical stuff.' I liked reading about how I'm going to do this or that with an electric motor or generator. It was hard to get me to do that before. I had no path. I didn't like burying my nose in a book. Now all of a sudden you give me a book and I was willing to read about of this super-technical content, and I became good at it. All of a sudden the fire was lit."

Larry added, "Mark Twain said that the two most important days in your life are the day you are born and the day you find out why. That second day for Dillon was when he was introduced to motors and electricity."

Larry also believes that learning this trade in a rather remote and tiny locale was of great benefit to Dillon. "If he had followed the more traditional path in the U.S., which would be to serve as an apprentice electrician, there's no way he would've been exposed to all of the equipment and opportunity he was exposed to on the Marshall Islands," he said. "There you basically just raise your hand and say, 'I want to do that,' and you're going to get a shot."

Dillon admits that he was always a creative and strong-willed person, perhaps a little stubborn, but until then he didn't have a way to direct any of that force. Once he found it . . . off to the races.

### Back to the States

While Dillon threw himself into electric motors, Larry had just sold his interest in a software company he had co-founded in Silicon Valley. Jerry had called with another opportunity, this time for Larry. He had a construction technology company he owned in Hayes, Kan., that was in trouble—the man in charge was mismanaging the company and it was basically hemorrhaging cash. He wanted Larry to go there and sort things out. It was the least he could do after Jerry took on Dillon. Larry moved out to Kansas and assumed the role of interim general manager of the business to get things under control.

During this time, Dillon was telling his father that he was totally hooked on everything electrical and wanted to pursue it as a career. He took a couple classes at the only tech school in Guam, but he wanted more. There were not



many outlets to learn this type of work in the area.

“When I heard that he wanted to have a career in that field, I did a little investigating in Hayes and found that there was a really good vo-tech school, North Central Kansas Technical College, which had a specialty in electrical technology,” said Larry. “I met with the teacher and was impressed with him and the program. It all aligned pretty perfectly. So I signed him up.”

After spending a little more than a year in the Marshall Islands, Dillon was back in the states and ready to learn. “I had such a passion for the program that it motivated me to also take accounting classes,” he said. “I was motivated by the belief that I’m going to have a future in this because I’m good at it.”

He still hungered for hands-on experience, especially in rewind work, so he found a small mom-and-pop rewind shop in Hayes. It was located in a Quonset hut, a steel, bunker-like structure—think of one half of a barrel turned on one side. The owner was named Butch.

“He had been working by himself since he started the business in this little Quonset, and he was hemming and hawing saying he wasn’t sure he could take me on,” Dillon said. “He seemed somewhat interested in teaching somebody, but he was probably like, ‘Who is this random kid knocking on my door?’”

Finally, Larry essentially paid Butch to train Dillon. The construction company Larry was overseeing had a burned motor that had been sitting in a shed for years.

So Larry, Dillon, and the motor went over to Butch’s shop. Larry said, “I’m happy to pay you for rewinding this motor as long as you let my son work on it too.” The whole encounter was pretty much just an excuse to get Dillon’s foot in the door.

“He did end up really liking me,” Dillon said. “It was him and I working out of that small Quonset. I was dealing with customers, working on motors, the whole thing. Eventually we moved out of that Quonset and built a brand new building across the road. I learned so much from him. We would take in all sorts of work—pretty much anything with a coil in it. I think he recognized how into it I was, so he let me do whatever I wanted. I was seeking out and bringing in customers too.”

Then Dillon bounced around the industry, seeing the potential in this niche electric motor market and hoping one

day to own his own shop. He joined a rewind company in North Dakota during the oil boom and couldn’t get his own shop started after an investor backed out.

Dillon then moved back to Kansas, became a journeyman electrician, and after failing to start his own concrete company decided to move back to California to work at a large motor shop. He was hired by a shop in the Bay Area, but he was still relentlessly pursuing the dream of owning his own company. And he was not discouraged by the various bumps in the road along the way.

That dogged hunt to master every aspect of his trade often put Dillon at odds with coworkers and management. “I’m such a fiery person in general that at times I would have trouble taking

orders from people,” he said. “There would be one guy telling me to do something a certain way because he’s been doing it that way forever and I’m like, ‘Actually, I think I know of a better way.’”

The reality was simply that Dillon was a young guy in his 20s with a lot of ideas. His vast knowledge base, which included not only hands-on technical learning but also physics and theory, would cause higher-ups to bristle at the idea of a younger employee who could potentially know more than them.

“They were much more concerned with continuing to do things the way they had been done for years and years,” Dillon said. “I wanted to bring a different perspective. I was thinking big picture.”

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Vallejo currently uses a monorail crane but plans to install a bridge crane that will cover the entire facility and increase lifting capacity.



## VALLEJO ELECTRIC *continued*

And then . . . another one of those incidental moments: The owner of the shop Dillon was working for mentioned to him in passing that he had received a call from a shop owner in Vallejo looking for a buyer. Dillon's boss turned the caller down.

Soon after the conversation, Dillon called the Vallejo owner and entered into negotiations to buy the shop. He wanted his father in on the deal.

Larry remembers when Dillon first called him about Vallejo. "He said, 'I want to buy this business.' I was actually reluctant initially because we both have strong personalities. I love my son and have a great relationship with him and I was concerned that a business could really change that relationship because it can be so stressful. And we're doing this backwards! Normally it's the father who's bringing the son into the business."

He was also worried about the pressing concerns that come along with running a business—that vast interwoven world of profits, losses, margins, productivity, growth, and costs.

"Dillon—who I consider to be a genius when it comes to electrical technology and motors—didn't really have any business background," Larry said. "I was concerned with investing my money into a business where there really wasn't any experience or savvy. I know from my own experience how potentially costly business mistakes can be. You can have a great opportunity for a business in a great market, but if you don't know anything about business, you can end up squandering that opportunity. So I said, 'Okay, I think this is something that is going to be great for his career, it's a great business opportunity and the price is right. I'm going to invest but I'm also going to run the business. He's going to run the shop.' That was the deal we struck."

Dillon was relieved. "It wouldn't have worked out if I was by myself," he said. "There are so many legal considerations and financial management tasks, like balancing all of the money and monitoring cash flows, managing the investments . . . I would've never been able to handle all of that myself. My dad has run a lot of businesses and

has been involved in mergers and acquisitions. He knows money."

With the roles established, Larry and Dillon closed the deal.

## Vallejo family history

Pre-Lightmans, Vallejo Electric was a three-generation, family-run business. The founder, LaVerne Rond, was self-taught, and the shop received a large amount of business from what once was the largest naval ship yard in the country, located on Mare Island. Eventually Rond passed the shop on to his son, Conrad Rond. Conrad and his wife Meredith wanted to sell the shop and retire, so last year they passed the company over to another family, the Lightmans. Dillon and Larry "job shadowed" at the shop in November, learning how the business was running, customer relationships, and so forth. On Dec. 5, they officially took over Vallejo Electric Motors.

"We knew that what we were getting was a diamond in the rough," said Larry. "We were getting loyal customers because the quality of the workmanship coming out of there was good. That was far and away our most important consideration before buying: what was the reputation of this company?"

With that said, Larry and Dillon recognized that the shop was not reaching its full potential as its previous owners stopped investing in the business about ten years ago.

"The key was that they weren't doing anything fast," said Dillon. "So they weren't able to capitalize on the full market potential of customers like refineries, currently our largest customer base. They could only get a part of that market. There was little operational efficiency."

Another example of inefficiency was requiring that motor parts be cleaned even if the motor was going to be completely replaced, which cost time and money that can never be recouped. Soon after uncovering these weak spots, Dillon, Larry, and the rest of the Vallejo team moved to implement a variety of improvements. And these improvements appear to have paid off. Although the Lightmans have been running the company for less than a year, revenue is up 40%, according to Larry.

One of the most significant improvements has been the automation of business tasks. The shift from paper forms and disorganization to centralized, software management was right in Larry's wheelhouse. He had worked



Vallejo's largest customer base is the oil and gas industry, but there are growth opportunities to repair motors for wind turbines in the area.



in Silicon Valley for 30 years, having served at Apple as the director of worldwide MacOS licensing. He had also worked at a variety of startups.

“This was a very manual, paper-based business when we bought it, so there was a lot of inefficiency,” Larry said. “There was one computer. Now we have approximately seven computers spread across the facility.”

The shop is using a shop management software system specifically designed for the electric motor repair industry, which they consider to be their first major acquisition. The learning curve was steep, and it was stressful to implement such a company-wide change period, but ultimately, Larry and Dillon believe it was worth it. According to Larry, there was no inventory system before they implemented the program. The company would do job tracking on a huge white board, and it was always out of date or barely legible. Now job tracking is automated.

Originally Larry was going to design his own software for the company from scratch, but today they are too busy maximizing the potential of Vallejo Motors.

“Motor management software is on the rise,” Dillon said. “There is so much data that goes into motor repair—there are different horsepower, RPMs, frames, and enclosures, and it would be extremely enticing to capture what is being consumed—because the motor manufacturers don’t know. They’re not tracking it.”

Data management and analytics are crucial for business decisions as well. “In general, having access to your data and then being able to understand at a very detailed level what’s happening with your business—looking at trends and identifying inefficiencies—is critical. There is still a lot of untapped potential there,” Larry said.

Other elements of the business were digitized. They moved from paper time cards to digital time cards. Now Vallejo has a system where every job has a bar code and every employee has one too. When employees are working on a job, they scan their bar code, which is entered into the system. They are assigned to that job, and Dillon and Larry are able to track their progress throughout the repair process.

The Lightmans also created a digital repair report. When repair technicians are performing initial inspection of the motor and taking it apart, they answer questions on the report such as whether there’s water in the motor, what type



Vallejo has an extensive job tracking process where a job and an employee are entered into a digital system that tracks the job’s progress.

of bearings are in the motor, etc. They also take digital pictures of each motor that are entered into the system so all employees can take a look at the motor in its original form during repairs.

“We are digitizing this process and trying to simplify it for our guys, who are great mechanics but are not really thrilled with filling out a lot of paperwork,” Dillon said.

Everyone is getting their own laptop to fill out these reports, which guide technicians through the process and provide a much easier framework to collect valuable information. This streamlining of tasks through digital means has allowed Vallejo to add a modern framework to an oftentimes old-school industry.

“One of the first things we did when we took over the company was

to identify bottlenecks,” Dillon said. “We needed to streamline operations throughout to increase workflow. There were a lot of ancillary elements which were just getting in the way.”

#### A perfect partnership

While Vallejo Electric has been able to identify and correct inefficiencies to improve workflow and ultimately profit, its biggest short-term challenge is replacing its monorail crane that goes down the center of the shop. They plan to replace it with a bridge crane covering the entire floor area, which will maximize flexibility and space. Currently the shop can move large equipment only with a monorail crane in a straight line across the shop. Larry and Dillon feel that is going to improve the

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### Intro to the Marshall Islands

Dillon Lightman spent over a year in the Marshall Islands, where he first came into contact with electric motor work. Here are some fun facts about this little-known collection of islands:

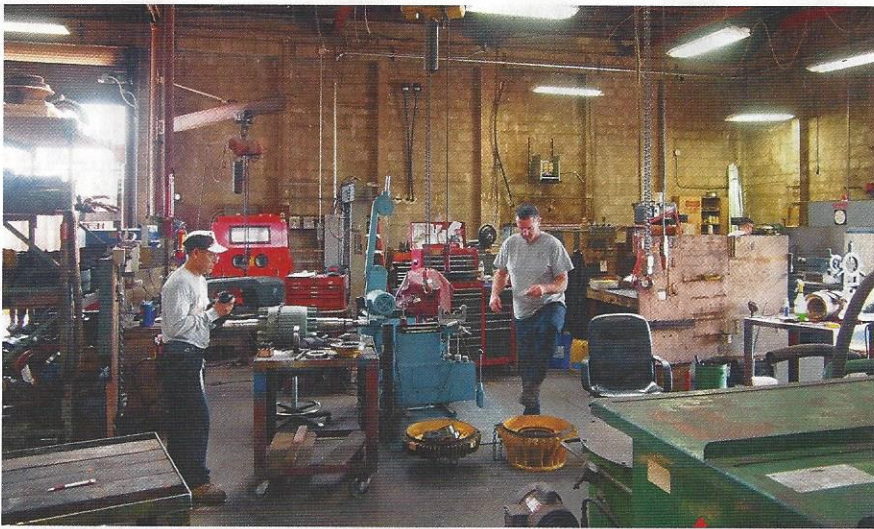
- The Marshall Islands, located near the equator in the Pacific Ocean, includes 29 coral atolls comprising 1,156 individual islands and islets.
- Data from the United Nations indicates an estimated population in 2017 of 53,134.
- The islands were a World War II battleground. They were initially home to the Japanese army, but during the Gilbert and Marshall Islands campaign in 1944, the U.S. invaded and occupied the islands.
- From 1946 to 1958, the U.S. tested 67 nuclear weapons at its Pacific Proving Grounds located in the Marshall Islands. This included Castle Bravo, the largest atmospheric nuclear test ever conducted by the U.S.

• Due to the vast number of nuclear weapons tests, in 1956 the U.S. Atomic Energy Commission regarded the Marshall Islands as “by far the most contaminated place in the world.” Even though Bikini Atoll of the Marshall Islands, which experienced numerous nuclear tests, is still not inhabitable by humans due to radioactive contamination, a 2017 report from Stanford University indicates there is abundant fish and plant-life in the surrounding coral reefs.

• The islands were controlled by the U.S. until 1979, when the government of the Marshall Islands was officially established and the country became self-governing. The U.S. still commits \$62.7 million per year through 2023 to the islands’ economy, which has few natural resources.

- It is home to the world’s largest shark sanctuary covering 772,000 square miles.
- The only indigenous land mammal in the islands is the Polynesian rat.—BO’L





*When Larry and Dillon bought the business, every employee remained with the company. They hope to hire more employees in the near future.*

**VALLEJO ELECTRIC continued**

workflow dramatically and increase their lifting capacity so they can work on bigger motors. It is also going to free up more space so repair techs can work on more motors, which will increase volume.

“Right now, getting new business is not our problem,” Larry said. “It’s supporting the new business so we don’t lose them.”

Renewable energy is a potential new sector for growth. Currently the shop does not perform repairs in that area, but they’re interested. Wind turbines line portions of the highways between San Francisco and Vallejo. Although renewable energy is definitely on their radar, Dillon and Larry feel they do not need to go in that direction just yet, because there is more than enough business from existing customers.

“Just because of where we’re starting right now, there is tremendous growth potential just going after the more traditional businesses,” Larry said. “The electric motor market is not really a growth market. It’s roughly static, so for us to grow our business, the only way to do that is to take business away from competitors, which we’re succeeding at now, but we’re going to hit a wall at some point. We’re all fighting over the same limited market. It’s much easier to expand your business if you’re going after a growth market like wind turbines.”

Wherever the work leads, Larry and Dillon will be there to take it on together. “This ended up being a really good partnership between Dillon and me because we were able to combine our different skill sets,” Larry said.

Dillon is the electrical technology and motor guy and Larry is the busi-

ness and finance guy. Dillon is focused on applying technology to improve operational efficiency and Larry is focused on implementing software to improve management tasks—a match made in heaven.

“I wasn’t going to be able to do it unless I had him,” Dillon said.

**How father and son get along**

But enough of this kumbaya stuff. Do they ever butt heads?

“Never,” Larry laughed. “I got to say, we’ve definitely had our tense moments in the eight months we’ve been together doing this. But one thing that I’ve learned about Dillon, because I’ve never had this kind of relationship with him before, that has really increased my respect for him is that when I get upset at something he did, I need to let him vent after reacting to my anger. But then he’s always willing to sit

down and listen and talk about it, and he’s very open to my input. I really feel like that has made the difference. That ability to calm down, talk it out, and look at things in a different way is a real asset.”

Dillon added, “We butt heads, but I’ll just flat-out never let it get to a bad level. I respect him too much to let that happen.”

So there you have it. The story of a father and a son and the motor shop they run together. By combining their specialized skill sets, Larry and Dillon have been able to seize the opportunity of owning an electric motor shop and deliver it to new heights with a fresh approach. Each has motivated and supported the other both before and after the purchase of the Vallejo Electric, and together they have been able to assume vital roles in terms of business and family. While Dillon has now realized his dream of owning a motor shop and is able to exercise his passion every day, Larry sees himself as a special combination of manager and father.

“I’m not going to be doing this forever, so I’m really focused on making sure he is developing the foundation to be able to use his judgment and run this business without me looking over his shoulder,” Larry said. “I may let him get away with certain things, because I feel like it might be a good learning experience. So there are times when I bite my tongue and I’ll let him make mistakes. It’s like I’m switching to ‘dad mode’ while we’re in a professional setting. I sort of feel responsible for helping groom him to completely take over this business one day. It’s one of my most important objectives here.” **EA**



*Vallejo’s facility sits on one-part of a double lot. The rest of the space is devoted to storage and excess machinery.*