CNC MACHINING

VOLUME 2
NUMBER 6
SUMMER '98

COVERSTORY

Canadians ride steel to gold

FEATURES

Insight and investment pay off for Wieland

Jackson stays on top by staying local

Weiss Racing leads the pack with CNC

Building it the Haas way

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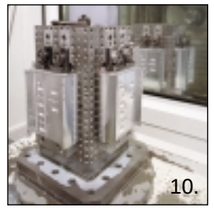
COVERSTORY

Photo: AP/Wide World Photos

With victories determined by the hundredth of a second, a good "push" is critical in Olympic bobsled competition. Canadians Pierre Lueders, front, and Dave MacEachern, known for their explosive starts, took the gold and made history at the XVIII Olympic Winter Games in Nagano, Japan.

FEATURES



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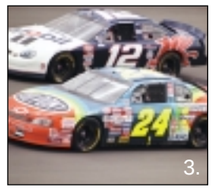

SHOPTALK

EDITORIAL

THE MASTHEAD

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On the Cover

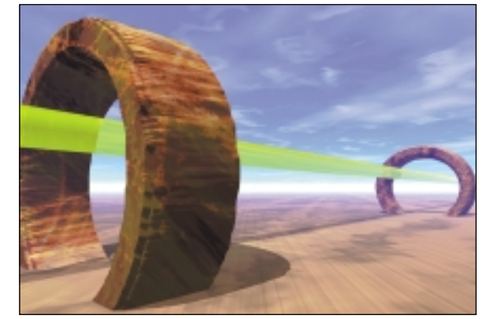
Driver Pierre Lueders and brakeman Dave MacEachern pilot Canada 1 to a gold medal in the Olympic two man bobsled competition in Nagano, Japan. The Canadians tied Italy for the gold medal to make Olympic history.

Photo: Canapress Photo Service (Frank Gunn)

> EDITORIAL

Denis Dupuis General Manager, Haas Automation

Assessment and Follow Through



At the beginning of the year, we talked about coming up with a budget or some kind of plan for what we want to achieve this year. Our business' New Year's resolution as it were. Well, three months have gone by, and how are we doing? On target? Are these resolutions suffering the same malaise as our personal resolutions? By now, we're smoking again, we put back all that weight (and maybe a little more) and the rest of our resolutions are in that top drawer – to be trotted out again next January.

If we are on target, is it by accident? Have we been following some path to keep on target? What can we do to ensure that we stay on target?

If we are not on target, so what? It was just an outline anyway. We'll make it up next quarter. If we just keep plugging along, we'll come around to meeting our target. Not a problem. Hmmm. Does this sound familiar or what?

Over the years, I have found a simple method for developing the plan, budget or target that helps to prepare the organization for achieving the goals I set. As I said in a past article, when designing my budget, the "hows" sort of jump out at me. By using the following simple process, I prepare the questions. Once I have the questions, I can concentrate on finding solutions to problems that may throw me off track.

Step 1. Where do I want to be at the end of the year? (We did this step in January)

Step 2. Where am I today?

Step 3. What is the difference between today and my plan?

Step 4. What do I need to do to reach this goal?

Step 5. Do it.

An example for the start of this process would be looking at the sales goal. At the end of the year we want our sales to be $1 million. Let's say that last year's sales were $750,000. We compare today with the plan to see if it is realistic or not. Setting unrealistic goals is not much better than having no goals at all. Goals should be achievable, but challenging. In this case, $250,000 might sound easy in today's dollars, but that's a 33% increase over the previous year, and a hefty goal. But let's go for it.

Step 4 – Where are these additional sales going to come from? Are customers going to beat down our doors to give us more business? If yes, great, relax, this is easy. If not, do we need to hire a salesman to promote our company? Should we do some more advertising, or marketing? What/where are the best places to advertise? Do we have the money to invest in any of these?

This is a short list of some of the questions that flow from these simple steps. I have not listed all of the alternatives (or questions) that might come from sitting down and doing this exercise for your company. But I have found that with some thought, you can come up with all of the alternatives that would best suit your business.

The key to this process is to list all of the alternatives you can think of – a brainstorming session. Don't be afraid to have a group of people openly share ideas, ensuring that none of the ideas is discounted until all possibilities are exhausted. Then, one by one, eliminate those that are not feasible or practical. Finally, prioritize or rank the remaining ideas so you can begin implementing the "best" ones first. The process should be kept relaxed and easy.

Finally, do it. Implement the best ideas and monitor them for their effectiveness. If one of the ideas is working well, push it. If one is not, stop and try the next one on the list. I know this all sounds simple – and it can be.

At a seminar I attended recently, one of the presenters, Mr. Tony Lucarelli, opened with: "It's sales, stupid!" I sat up and listened, because his message was clear, simple and effective – everyone listened. Many of the management books I have read contain formal models to describe the processes I've written about here. But I have found that, if you keep the goal, the process, and the implementation process simple (easy for everyone in your organization to understand), you will have more success.

The Greatest Show

The Greatest Show On Earth? No, that distinction belongs to the famous circus of P.T. Barnum. But it is the Greatest Machine Tool Show in the Americas.

On September 9, the International Manufacturing Technology Show, IMTS, blows into Chicago for its biennial 8-day run. This year's exhibition, billed as "The Show of the Century," promises to be the largest concentration of the world's newest manufacturing technology ever seen in America.

IMTS 98 is expected to draw more than 125,000 attendees from 80 different nations to Chicago's McCormick Place, the nation's largest exhibition complex. Manufacturers from all over the world will fill 1.3 million square feet of display space with the latest machine tools, automation, tooling, controls, computers, software, systems and processes.

Haas Automation will descend upon the windy city in force with their entire line of products on display in a brand-new 10,000-square-foot booth. Expect to see new products in every category – VMCs, HMCs, Lathes and Rotary Tables – as well as a complete selection of current machines. Exciting new products planned for IMTS include:

- **The Haas VB-1 bridge mill with 200" x 66" x 40" travels and 5-axis spindle**
- **The Haas HS-3R HMC with 150" x 50" x 60" travels, 50-taper spindle and built-in 4th axis**
- **The massive Haas HL-6 Big Bore lathe with 25" x 44" capacity, A2-11 spindle and 6" bar capacity**
- **The Haas Bar Feeder for HL-1 and HL-2 turning centers**

You will find Haas Automation in booth A1-8232 in the new South Building exhibition hall of McCormick Place.

For more information about IMTS, please see the free show planner attached to page 5 of this issue, or call Haas at 800-331-6746.

MACH 98 Builds On British-American Alliance

by Matt Bailey, Haas Automation UK

NORWICH, NORFOLK, UK – Haas Automation UK is celebrating an extremely successful visit to MACH 98, the country's biennial machine tool and manufacturing exhibition held at Birmingham's National Exhibition Centre the last week of April. Not only did Haas UK receive orders for 15 machines during the five day show, but the company's 11-strong sales team bagged an amazing 200 high-quality enquiries.

On a stand occupying some 1800 square feet, 4 VMCs, 3 turning centres, an HS-lRP and a wide range of rotary products gave continuous demonstrations to an international crowd of some 46,000+ visitors.

A particularly exciting order secured during the exhibition was from the newly formed Formula 1 racing team British American Racing. British American's CEO, Mr. Adrian Reynard, is also President of Reynard Racing Cars, the world's largest producer of single seater chassis.

It's no accident that Mr. Reynard chose a Haas VF-3 for his first machine investment in the new team, Reynard racing cars are already built using a Haas VF-OE and a VF-3.

Lending his support to the largest-ever Haas booth at a UK machine tool show was Haas Automation's president, Mr. Gene Haas. For the first three days of the show Mr. Haas had the opportunity to soak up the unique atmosphere of the UK precision engineering and machine tool industry, meeting many future and existing Haas users as they dropped by for some refreshment and a chat.

As is tradition, the first and second evenings of the show are reserved for commendation of the industry's "great and good." On Monday night, guests at the 1998 Machinery Awards were treated to speeches from a number of witty and eminent personalities, including an awe inspiring account of the successful Thrust Supersonic Car land speed record attempt by the project's chief aerodynamicist, Mr. Ron Ayers.

At the prestigious Metalworking 1998 Awards, held Tuesday evening, Haas Automation was official sponsor of the sub-contractor category "Best Partnership Development." As if the considerable publicity generated by the sponsorship wasn't enough, the award to the winning company was made by Mr. Gene Haas, helping to send a clear message to the UK machine tool fraternity regarding Haas' commitment to its British customers.

All-in-all MACH 98 turned out to be an unmitigated commercial success, and established the tempo for the next stage of growth for Haas products in the UK. MACH 2000 will be the next major UK exhibition, by which time, if the past is anything to go by, Haas UK will have almost doubled its machine installations and will be consolidating its position as market leader for affordable CNC machine tools.

For more information about Haas products in the UK, contact Andrew Stevens or Matt Bailey at +44 1603 760539.

New Race Partner

Ilmor Engineering Inc. – the race engine, design-and-build arm of Mercedes-Benz – joins the growing list of Haas racing partnerships with the delivery of three Haas machining centers to the new Ilmor Tech Center in Plymouth, Michigan. This new location will be the home of Mercedes-Benz Motorsports operations in North America.

By joining Haas as a technology partner, Ilmor gains access to the latest CNC technology, while at the same time providing Haas with a showcase for their products in the Great Lakes region. Ilmor will use the new machines to manufacture and maintain their CART racing engines.

New for 1998 is the Ilmor IC108E engine. Introduced at the North American International Automobile Show in Detroit, the new 2.65-litre turbocharged V-8 is significantly lighter, and more compact, powerful and fuel efficient than the championship-winning 1997 engine.

CART teams using the new Mercedes-Ilmor engine include PacWest Racing, Team Penske, Players / Forsythe Racing, Hogan Racing and Bettenhausen Motorsports.

Hauling Haas

Drivers Dig in For Consistency

Cutting-edge technology wins races. Maybe that's why more and more racing teams are turning to Haas machining centers for the winner's edge. In fact it's getting hard to find a competitive racecar that hasn't been touched in some way by a Haas CNC machine.

NASCAR/Winston Cup

Hendrick Motorsports recently took delivery of a Haas HL-2 lathe at their Harrisburg, North Carolina, facility. This new addition to the Hendrick machine stable will join the four existing Haas machines in performing critical machining jobs on heads, pulleys and vital suspension components.

At press time, Jeff Gordon (#24) and Terry Labonte (#5) were in 1st and 5th place respectively following the Coca-Cola 600. Their consistent top-10 finishes have kept them in the top five slots in seasonal point standings. Even Randy Lajoie (#50), who has taken over for a recovering Ricky Craven, has come across with several top-ten finishes.

CART

PacWest entries started the year off with last year's Mercedes-Ilmor engines, but recently switched over to the new, more compact and more powerful IC108E series powerplants following the Long Beach Grand Prix, where Mark Blundell and Mauricio "Big Mo" Gugelmin finished 7th and 10th respectively.

In the Indy Lights series, drivers Didiér André and Greg Morris are running hard in their 425-hp, Buick V-6 powered Lola T97-20 chassis. André earned his first podium finish (2nd) at the Nazareth race.

SCRA

Troy Cline and C&C Motorsports are currently running in 5th place in the SCRA championship points series. With 87 teams battling for the top slot as "Mud Master," the C&C team is looking for traction in the "El Niño" bogs that are currently serving as racetracks for the Southern California racing series. "The season is young, and we are in a full contact sport," says Joe Custer of the C&C team. "Optimism is ours!"

IMTS • Chicago • September 9-16 • Booth 8232

See the Haas: VR-11, 5-axis profiling VMC • VB-1, 200" bridge mill • HS-3R, 150" horizontal boring mill • NEW, side-mount tool changers • live tooling • bar feeder • pallet changers • robot parts loaders

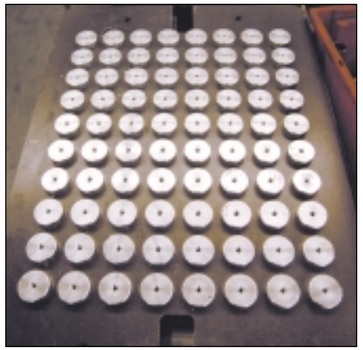
The very latest Haas machines and technology.

Register to win one of four Lista® tool boxes, and check out the latest productivity advances from America's premier machine tool builder.

Live Tooling Opens the Door

Story
Clint Crowell

Photos
Gerard Burkhart



These end caps used to require a second setup on another machine to drill a pair of off center holes. Now, Jackson performs all operations in a single setup.

Succeeding in business means producing top quality products at competitive prices. Unfortunately, these two characteristics don't always go hand-in-hand. While some companies resort to low-paid, Third World labor to make the equation work, others choose to stay at home and utilize technology to work smarter and more economically. Jackson Corporation of Los Angeles, California, has chosen to stay at home and prove this philosophy is effective for stimulating growth and remaining at the top of their industry.

Anyone who has walked through the doors of a mini-mall, convenience store, bank or other commercial building is familiar with Jackson Corporation's products. For more than fifty years, Jackson has manufactured the highest quality door hardware for the aluminum and tempered glass door industry. Its Overhead Concealed Closer, patented more than 35 years ago, remains the leader in the aluminum store front industry.

"Business is getting more challenging everyday," commented Mark Warden, Jackson Corporation's operations manager, "and companies are faced with making hard decisions in order to survive. Not long ago, our main US competitor decided to cut production costs by subcontracting to factories overseas to make their products. This gave them a distinct advantage over us as far as labor costs, which, in turn, made us rethink our operations."

"Manufacturing offshore to reduce production costs was never an option we considered," added Sidney Cap, Jackson's director of operations. "The owner of our company believes so strongly in supporting the local economy, that he has established a corporate policy mandating that we buy locally. Finding what we need at an affordable price domestically is difficult at times, but worth the effort."

Douglas Aldaro, CNC setup man, carries a batch of completed end caps for Jackson Corporation's Overhead Concealed Closer. Jackson currently produces 500 closers a day, requiring 1000 end caps.

Instead of going offshore to remain competitive, Jackson opted to modernize and streamline their operations. "We decided to apply intelligence rather than just cheap labor," said Warden. "It is the only way to compete against wages of fifty-cents a day. Keeping production in-house also enables us to control the manufacturing process in order to make sure the quality of our products remains high."

The first steps of Jackson's modernization were consolidating the machining processes into a single area and purchasing two machining centers, a new Haas VF-1 vertical machining center and a used VF-0 unit. Before the upgrade, Jackson was manually machining components in four different buildings, and the only CNC machine in use was an old Miyano lathe.

When the Haas machines were brought on-line, Jackson immediately realized a tremendous jump in production. "Since the Haas machines arrived, our production has increased by sixty to seventy percent," Cap explained. "Before bringing in the new machines, we were producing 300 to 350 complete Overhead Concealed Closers a day. Now we average 500 a day. By the end of the year, we project our output will reach 900 units a day."

Warden added, "The CNC equipment is letting us rethink how we manufacture. It is allowing us to grow the business without having to substantially increase manpower, which allows us to be more competitive and win more market share.

"The operators can handle the increased volume, and the learning curve is almost nil. Some of our operators were semi-experienced programmers and were able to pick right up and go. We have two programmers and setup guys and the rest just man the machines and keep them loaded."

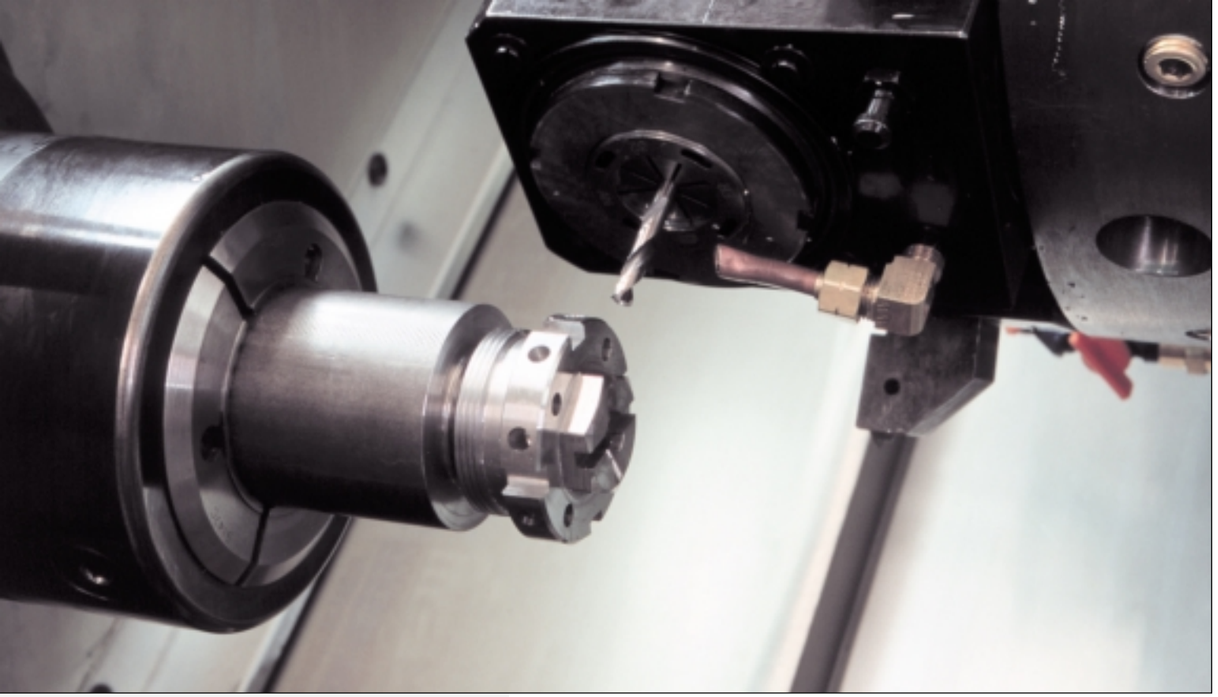
When the first two Haas machines were installed, Jackson was still using their old Miyano lathe to produce end caps for the Overhead Concealed Closer, which accounts for sixty percent of sales. The machine couldn't keep up with production, so they decided to replace it with a Haas HL-1 CNC lathe.

"The CNC lathe we replaced was old and dirty," said Cap. "Our operators were suffering because they had to breath the fumes, and there wasn't a path through the system for the chips. Our guys had to work much harder and the accuracy was much lower. You can not make good quality parts on old machinery."

The HL-1 helped solve the problem, but completing the end caps still required a secondary process on a mill to drill two offset holes into each cap, which took extra time to setup and run.

"We had been running on the lathe for several months when we realized live tooling would completely solve our problem," said Warden. "About the same time, our Haas representative asked us if we had a need for live tooling. We said yes, and the rest is

Sydney Cap, Jackson's director of operations, displays completed end caps for their Overhead Concealed Closer. Jackson has reduced the cycle time for two caps from two minutes to 95 seconds.



Using live tooling on a Haas HL-1 lathe, Jackson Corp. is able to face, turn the O.D., thread, groove, drill offset holes, tap and cut off a pair of parts in 95 seconds. The ability to perform all operations in a single setup has allowed Jackson Corp. to increase their production by sixty to seventy percent.

history. Haas came out to our facility and added live tooling to our existing lathe. I think we were one of the first companies to have the opportunity to use live tooling from Haas."

"It worked great. With the live tooling option, we eliminated one operation and all the additional handling," said Cap. "Each overhead closer needs two end caps, which used to take two minutes of machine time and two operations. Now both operations are done in ninety-five seconds on a single HL-1 lathe. We face it, turn the O.D., thread, groove, drill offset holes, tap and cut off. It goes in as an aluminum bar and comes out as a finished component."

Warden said the HL-1 lathe equipped with the live tooling function is giving them the potential to grow. In order to reach their goal of 900 Overhead Concealed Closers a day, they will have to produce 1,800 end caps per day, which translates into 600 per shift with a three shift schedule. To meet the challenge, the HL-1 is equipped with a chip conveyor, and has been teamed with a CNC Enhancements automatic bar feeder with a rack capable of holding 12-hours of stock.

Jackson's programmers utilize the customizable macros on the Haas control to program tool life and the number of pieces to run through the bar feeder, both necessary for running unattended on the third shift. In accordance with their ISO 9000 guidelines, they program to run 500 parts between tool changes. Tolerances are held in the ten-thousandths of an inch, and they have minimal component waste.

"Following our corporate policy of buying American hasn't always been easy," Warden reiterated. "For instance, finding hats with our logo that were made in the states took quite awhile, but the mandate has taught us how to work smarter, which is improving our products. With the changes we made in the layout of our facility and with our automation, we are now in position to go after a Grade I classification for our overhead closer. Instead of being rated for 1 million cycles over a 5 year period, they will be rated for 2 million cycles."

"Made in America still means something, especially to our international clients, which include South America, Central America, Europe, Asia, Australia and others," Cap explains. "We are proud to say Jackson Corporation sells American products manufactured by American equipment. We expect the same commitment from our vendors and equipment suppliers, which is why we returned to Haas for two more units. A VF-4 and another lathe have been ordered and are on their way."

Automation is keeping Jackson Corporation growing and in synch with their commitment to support their local economy. They are already talking about robotics and pallet systems as their next step in the never ending battle to remain ahead of the competition and loyal to their company credo.

Jackson Corporation
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Up and Running 1,000 Days a Year.

Machines that buy themselves!

Story
Preston Gratiot

Photos
courtesy Wieland Precision Machine, Inc.

"I started with one Haas in a small shop, and I want to tell you, it really was tough getting that first machine," says Charles Wieland, owner of Wieland Precision Machine, Inc., of Lake Elsinore, California. "But the dealer was most cooperative and I got that first one in. And I still have it."

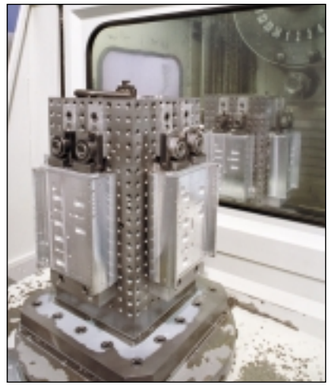
It only took a few years for that small shop to grow into a corporation with production earnings doubling on a yearly basis. Today, Wieland Precision Machine, Inc., designs and manufactures components for the electronics, telecommunications and aerospace industries, specializing in heatsink fabrication and tooling design. All it took was a healthy dose of insight – and intelligent investment in machinery that quickly pays for itself.

Building for Success

"As a fifth-generation tool and die maker, I grew up in my dad's shop and got a real 'European-style' apprenticeship. But now that I was stepping out on my own, I wanted to make sure I could leave a few successful footsteps of my own on the road to success," explains Wieland.

"I took Harold Stephens, my current general manager, with me and we started this shop back in 1992. We were a tool & die shop; that's what our expertise was. Through that, we started to venture into production, and that's when we first got the Haas. It was a VF-2, and it was kind of one of those middle-of-the-line machines: not too small, not too big – just right, you know! That Haas opened up a whole array of possibilities.

"That was the best move we ever made, because the controls were so user friendly. Today, my workers are capable of doing so much more on the Haas, because the machine allows them to do it. That's the intangible factor that I think people have a hard time identifying when people ask them why they stick with Haas."



By switching a part run from a VMC to a new Haas HS-1RP with tombstone, Wieland was able to save enough production time to basically pay for the new machine.

Wieland Precision Machine is a "Haas" shop with eight machines on the floor. Specializing in heatsink machining, the company looks to $10M in sales for 1998.

Tool & Die Eye for Details

Wieland and Stephens had that "tool & die" eye, paying careful attention to detail. Because this trait carried over into their production work, their quality was very good.

"The standard production house may not take the time to improve a product," says Wieland. "But we would go beyond the print requirements and incorporate our own production improvements. Because of that, we had to pretty much give up the tool & die shop aspect of the company. We were getting overwhelmed with production work. We bought the second Haas inside of six months. The third Haas followed a few months later, and soon we were buying another mill every six months.

"We started off on the smaller machines and saw the advantages of buying the Haas and what they could do for us. Then we moved into the horizontal, and that machine never stops! We're loading parts on one side with that tombstone changer and it's constantly ready to go. It never gets a chance to cool down; it's working all the time!"

It took a lot of reinvesting and beating the pavement to develop a customer base they could depend on, but Wieland Precision Machine, Inc., is finally a company that produces, "and I don't care about anything else," says Wieland. "What I do care about is that we run 24 hours a day now, and if we don't have the reliability or service to keep running, I lose the equivalent of at least two normal workdays, if not three, because of my 24-hour scheduling."

Parts Parity a Plus

One of the design factors at Haas is the use of "like parts" on different machine models. This practice allows support departments to stock fewer items, yet still be fully equipped to service the user's needs. The advantage to both Haas and the shop owner is that the service truck can arrive on the scene with a full assortment of parts on board, including motors, gears, electrical servos and boards, so problems can be fixed on the spot.

"I've noticed the uniformity of parts used in our Haas machines time and time again," says Wieland. "My shop isn't big enough for me to have my own maintenance mechanic here, but my guys can usually jump right in there and get it back in working condition."

"I am constantly asked why I like Haas so much. My guys aren't going to like to hear what I say, but it's kind of true: That machine makes them better machinists than they really are."

— Charles Wieland

Charles Wieland, owner, at the control of his first Haas VMC. He expects the machines in his shop to produce 24-hours a day, every day of the week, and says this first machine is still one of the most accurate verticals in his shop.

Growing Pains

The new customer base at Wieland Precision Machine is starting to ramp up now, and that's one of the reasons Wieland is planning on a $10-million year in sales. "And that's double what we did last year," beams Wieland. "I'm happy, but I just don't know when to stop."

Wieland recently published a new brochure to lure even more new customers into the base, and it has proven to be a huge sales success. "We walked into a customer's office, showed the brochure and the customer signed a $67,000 order right then and there! We're also ISO certified, so that helped too, but just being able to

look at that brochure... What a difference that makes," says Wieland. "It's a marketing tool that adds to the customer's perception of our ability to perform in a professional manner.

"We've been in business six years now, and we added some 40 people this last year," explains Wieland. "But this new business has brought about growing pains. As a matter of fact, we're negotiating right now for another 25,000 square feet right next door to the existing building. We're at 13,000 square feet right now, so I imagine there will be quite a few more Haas machines in here.

Wieland Precision Machining is always looking for ways to improve customer products and reduce actual production time. This extra attention to quality service has helped the company double profits every year.

"This company has never held back as far as investing is concerned, and that's probably why we have those eight Haas machines out on the floor now. There's close to a million dollars worth of investment out there, and it continues to pay off. I've come to realize that machinery is not your real expense, it's the machines that are going to make you money."

Vertical vs. HS-1RP w/Tombstone

Wieland was running a heatsink that required a lot of pocketing and drilling on the vertical machining center, and there was a tremendous amount of setup time. Then they tried running the same part on the new HS-1RP horizontal with a four-sided tombstone on a rotating pallet. The time savings were amazing.

"We saved around ten minutes a load," says Wieland, "and we ran 20,000 pieces last year – at four pieces per load. That worked out to 5,000 loads, so we're looking at more than 900 hours in cost savings just in going from the Haas vertical to the horizontal pallet changer.

"But there were actually more cost savings than that, because we had them in vices on the vertical, so the machine could rip through all of them and then come back to pocket them." But there were also side-ops [side-operations] and end-ops that needed to be done, requiring additional re-fixturing on the vertical. "So when we got the HS-1RP with the tombstone, we were able to do the face, plus we could do the sides," explained Wieland. "That eliminated the previously required flip-flop of the part, a step that sometimes allowed the operator to mistakenly stick one in backwards. Well, maybe not just one, but more like a couple, because once you do one you can get mixed up in your mind on how to properly rotate the part and continue sticking them in wrong, because now it looks right!"

Wieland figures they probably saved another 10 minutes per part by not having to flip and re-fixture the piece. "So figure in an additional savings multiplied by a 20,000 part run, you're looking at a fairly hefty savings total well in excess of 4,200 hours," says Wieland. "It probably paid for the machine with just that one part, and that's how you justify the purchase."

Tracking Trails

Wieland also started engraving serial numbers on a lot of parts using the Haas serializing function, not only to satisfy customers' demands, but to give the company a tracking system to monitor production control efforts.

Continued on page 32

Wieland presently concentrates on servicing the aerospace and communications heatsink market, a rapidly growing segment of the electronics industry. By providing 24-hour production services and developmental design capability, the company continues to build its customer base.

CHANGING STEEL INTO GOLD

story by Scott Rathburn **shop photos** by Paul Wodehouse

Photo: Canapress Photo Service (Frank Gunn)

Pierre Lueders, left, and Dave MacEachern show off their gold at Nagano, Japan.

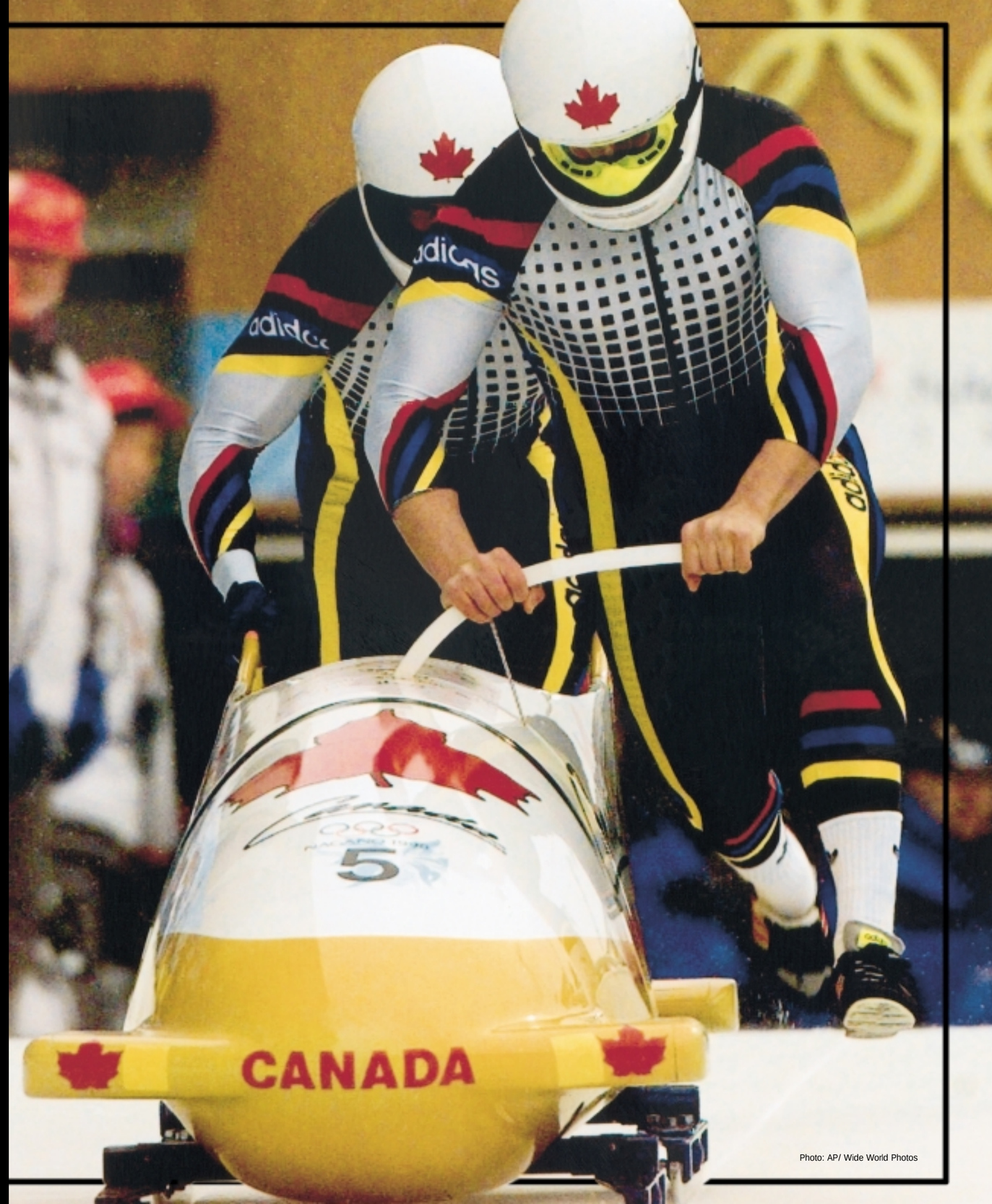
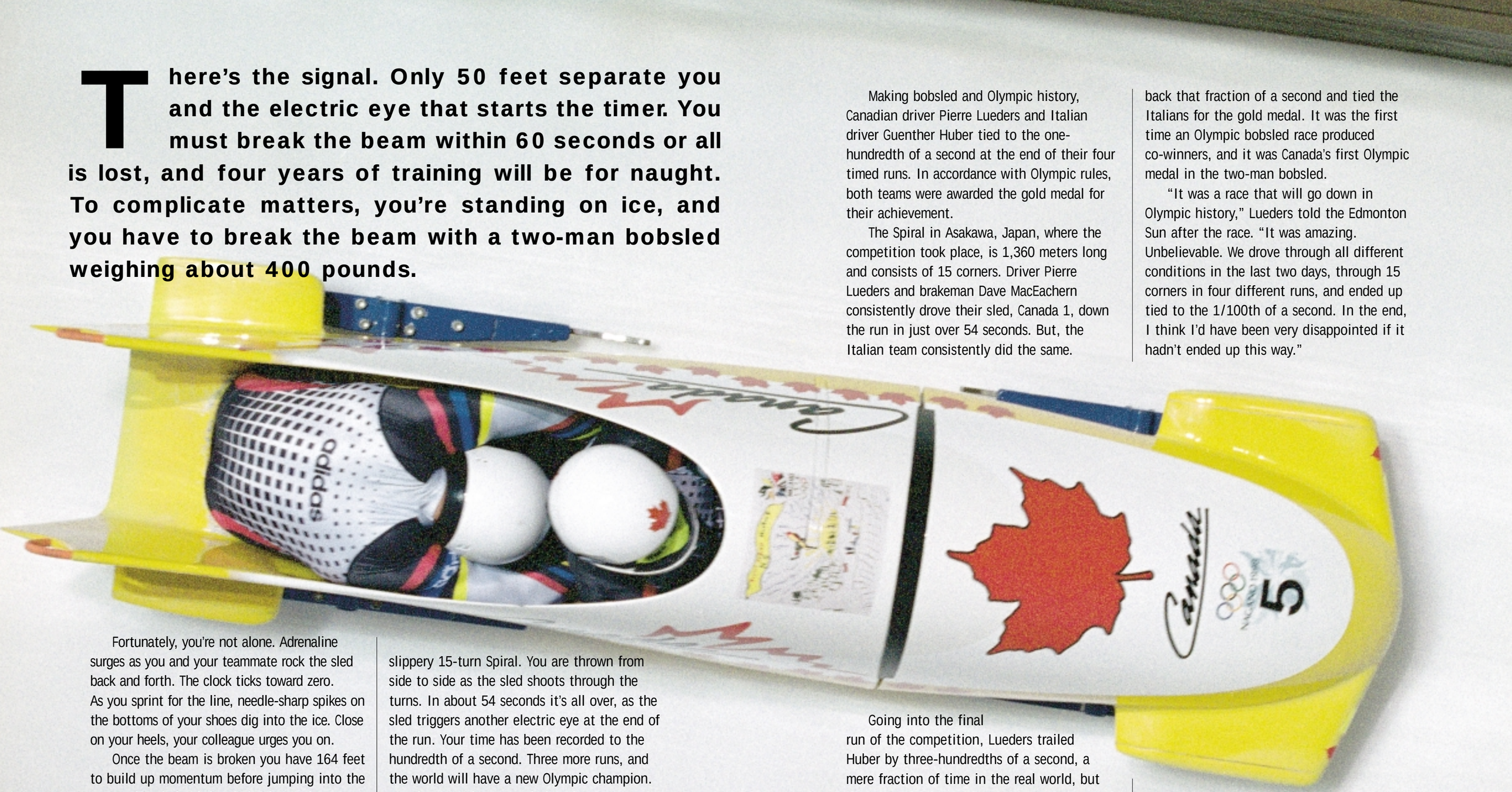


Photo: AP/ Wide World Photos

There's the signal. Only 50 feet separate you and the electric eye that starts the timer. You must break the beam within 60 seconds or all is lost, and four years of training will be for naught. To complicate matters, you're standing on ice, and you have to break the beam with a two-man bobsled weighing about 400 pounds.



Fortunately, you're not alone. Adrenaline surges as you and your teammate rock the sled back and forth. The clock ticks toward zero. As you sprint for the line, needle-sharp spikes on the bottoms of your shoes dig into the ice. Close on your heels, your colleague urges you on.

Once the beam is broken you have 164 feet to build up momentum before jumping into the cramped cockpit of the sled. After a short sprint, you dive in and grab the steering ropes. Your colleague follows quickly and tucks in behind, almost invisible to those looking on.

The world is a blur as you rocket down the slippery 15-turn Spiral. You are thrown from side to side as the sled shoots through the turns. In about 54 seconds it's all over, as the sled triggers another electric eye at the end of the run. Your time has been recorded to the hundredth of a second. Three more runs, and the world will have a new Olympic champion.

That was the scene during the two-man bobsled competition at the XVIII Olympic Winter Games in Nagano, Japan. And at the end of four runs there was indeed a new Olympic champion. In fact, there were two.

Making bobsled and Olympic history, Canadian driver Pierre Lueders and Italian driver Guenther Huber tied to the one-hundredth of a second at the end of their four timed runs. In accordance with Olympic rules, both teams were awarded the gold medal for their achievement.

The Spiral in Asakawa, Japan, where the competition took place, is 1,360 meters long and consists of 15 corners. Driver Pierre Lueders and brakeman Dave MacEachern consistently drove their sled, Canada 1, down the run in just over 54 seconds. But, the Italian team consistently did the same.

Going into the final run of the competition, Lueders trailed Huber by three-hundredths of a second, a mere fraction of time in the real world, but an eternity in the world of bobsledding.

Noted for their fast starts, Lueders and MacEachern got a good push to launch Canada 1 on its final run... and into history. By the time they reached the bottom they had earned back that fraction of a second and tied the Italians for the gold medal. It was the first time an Olympic bobsled race produced co-winners, and it was Canada's first Olympic medal in the two-man bobsled.

"It was a race that will go down in Olympic history," Lueders told the Edmonton Sun after the race. "It was amazing. Unbelievable. We drove through all different conditions in the last two days, through 15 corners in four different runs, and ended up tied to the 1/100th of a second. In the end, I think I'd have been very disappointed if it hadn't ended up this way."

Brakeman Dave MacEachern agreed, "Just being part of history is an incredible feeling. I knew we were going to win, but I didn't know we were going to tie!"

Photo: Jamie Squire/Allsport

Driving nearly 680 pounds of sled, driver and brakeman down a chute of ice at nearly 80 miles per hour is no mean fete. Everything is riding on two pairs of metal runners only millimeters wide, and much of the time they're not even touching the ice. "The runner is always moving vertically," explains Lueders. "It's never really gliding; it's always jumping on the ice. It's not a constant, continual gliding, like tires on the road. It's more like when your car is jumping through pot holes."

To the uninitiated, the runners are just curved pieces of metal. But to the bobsled drivers they are as valuable – and as highly guarded – as gold. The right runners can mean the difference between going home with the gold medal, or just going home.

Drivers experiment with different types of steel and different shapes to gain even the slightest advantage. And what works on one track may not work on the next. "Every track is different," said Lueders, "much like in race car driving. You go to a different track every weekend and you race. No two tracks are alike, and every track has its own characteristics." Also, "The ice is influenced by the temperature of the air.

"The general atmospheric conditions determine what kind of ice you'll have," Lueders continued. And different ice requires different runners. "Ideally, you'll use something different when it's colder and the ice is harder, as opposed to when it's warmer and the ice is softer."

Drivers try to determine the condition of the ice before selecting a particular set of runners for the race. Lueders, who has been competing since 1990, says he takes temperatures of the track every day during the track walk before the run. He determines which runners to use based mostly on ice temperature. "Once you're in a race, you basically have to stick with the runners you have on for the whole race. You hope you have enough background over the years that you can determine which ones to use based on the conditions," he said.

With so much riding on them – both figuratively and literally – it's no wonder bobsled teams guard the design and composition of their runners so closely.

"If you find a particular steel that you think is working well for you," said Lueders, "you try to keep it quiet, and you don't let anybody know what it is. You're looking for something that polishes well and has a low coefficient of friction, something that will help you glide better over the ice. And, ideally, you're looking for something that will retain its heat toward the surface of the runner on the contact area."

Theoretically, a runner that retains heat at the surface will melt the ice quicker, forming a thin layer of water that allows the sled to glide faster. For this very reason, teams are not allowed to heat their runners. To prevent violations, competitors' runners are checked against a test runner that has been left outside for one hour prior to the competition.

And teams are not allowed to cover their runners while competing, so they are out in plain view for the world, and the competition, to see. "Everyone is always trying to see which ones you have on," said Lueders. "It's a game that all the drivers play. But if you have all your runners identical, then no one can tell what you have on. I have about three different sets for the two-man that all look the same, so no one really knows which materials I'm using, or which set I'm using."

Pierre Lueders inspects his newest set of runners machined by Stamco.

Lueders has been designing his own runners since 1992, when he purchased a set from a fellow Canadian driver that worked very well. "I analyzed the steel and subsequently decided to make copies of those runners, because they were very good."

Lueders modified the runners and experimented with different materials until the design became his own. "I've done research," he explained. "I've tried runners with materials that I heard other athletes were using. Generally, bobsledding is a small, little community, and a lot of information gets leaked out. So I get a lot of information in terms of who's using what."

Lueders says there are two basic kinds of steel being used for the runners. "You can use plain, normal carbon steels, like 4140 or 4340; and then you can also get into the stainless steels, which seems to be a trend of a lot of teams. I have various sets of both."

The key is to make a runner that is strong, but flexible, so it will stay in contact with the ice. "You're looking for a material that is quite flexible and will not jump as much," Lueders said. "The more gliding you get, the better off you are.

"I tend to use pretty simple steels that you can just get off the rack. They seem to work very well. They're very inexpensive and they work."

Unlike many sports, where the goal is to make the vehicle as light as possible, bobsledding is a sport that relies on weight. "You can be as light as you want," Lueders said, "but it's a gravity sport, so you want to have as much weight as you can."

Including the driver and brakeman, the two-man bobsled is allowed a maximum weight of 390 kilograms, or about 680 pounds. If a sled is under the maximum, teams are allowed to add ballast to bring up the weight.

Most aspects of the bobsled are closely regulated, and thus not open to much modification. The sleds themselves are typically purchased from a select few builders in Germany and Italy. The runners are regulated also, as far as size, basic shape and construction, but within those regulations there is some room to play.

"There are certain parameters, dimensions, that are minimums," Lueders explains. "You have to be within those regulations, otherwise the runner isn't legal." But, stay within those rules, and you're free to redesign the runners to gain any advantage.

With the runners being such a closely guarded secret, it's imperative to have a machine shop you can trust. Lueders chose to

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Machining a Piece of History

story by Scott Rathburn **shop photos by** Paul Wodehouse

Ask Olympic gold medalist Pierre Lueders about the runners on his two-man bobsled and he'll probably change the subject. Ask his machine shop about his runners and you'll get pretty much the same thing. This type of relationship is one of the reasons Lueders selected Specialty Tool and Manufacturing Co. (Stamco) of Edmonton, Alberta, to machine the runners for his gold medal-winning two-man bobsled.

For bobsled teams, the design of their runners and the material they're made out of is a closely guarded secret. As one of the few areas where they can make slight modifications to gain the competitive edge, teams keep the details to themselves.

When Lueders needed to copy an existing runner design into a new material, he looked around for a competent shop that he could trust to do the job right – and keep the details quiet. As the only shop in Edmonton at that time with tracing capabilities, Stamco became the shop of choice.

Dave Smith, CNC programmer, inspects one of the runners he machined for Pierre Lueders.

Stamco is primarily a tool & die shop, making plastic injection molds, blow molds and compression molds, as well as extrusion dies, punching dies, blanking dies and bending dies. They have several plastic injection machines, a punch press department and a standard machine shop where they do custom work.

Machining a Piece of History > CONTINUED

It would seem that machining bobsled runners would be a little out of the ordinary for a shop of this sort. But, according to Alfred Ruefli, Stamco's senior manufacturing engineer, that's not the case.

The 50"x20"x25" travels of Stamco's Haas VF-4 allows them to machine runners for Pierre Lueders' bobsleds without refixturing.

"We have a lot of customers who come in and have special needs," he said, "and we try to fulfill all their needs." This type of custom work accounts for about fifty percent of Stamco's business.

Stamco's shop consists of about 30 machines, including four CNC milling centers and two CNC lathes. Among the CNC machines are an HL-4 lathe and two vertical machining centers (VF-2 and VF-4) from Haas Automation.

According to Ruefli, "A lot of work is actually for the molds. That's the major area where we use all the CNC machines."

Rob Edge, one of Stamco's CNC programmers, agreed. "The majority of our work is plastic injection molds. We make them out of steel, like P20, and we also use 7075 aluminum. The majority of the stuff we do is very fancy shapes." (Edge has since left Stamco and moved to Ontario.)

Which, according to Giuseppe (Joe) Franco, Stamco's co-owner, is why they purchased their first Haas, the VF-2. "We needed to add a machining center with tracing capabilities and a 4th axis to do mold making and die making. At that time, the VF-2, for the cost, was the best choice for us. As a matter of fact," he continued, "that's where we did the first few sets of runners for Pierre."

Aside from the secrecy, Lueders runners are actually a fairly simple part to machine. "The job itself is fairly straight forward," said Edge "It looks pretty fancy when it's going down the hill, and they look pretty fancy when they go out of here, but it's a pretty straight forward job when you have the equipment to do it."

Cut out of steel plate, Stamco currently machines each side of the runners in one setup on their VF-4. Runners for the two-man sled are 36" and 42" long, and the four-man runners are 40" and 48" inches long. According to Ruefli, it takes about eight hours to machine one side of each runner. Then it is flipped over and the other side is machined.

Prior to their purchase of the VF-4 last year, Stamco previously machined Lueders' runners on their smaller VF-2. Since the length of the runners exceeded the travels of the smaller machine, they had to shift the part in the fixture to machine the entire length. "Too many times we did not have long enough travel," Franco explained, "so we bought a larger machine."

To date, Stamco has machined seven sets of runners for Lueders, including the set he and brakeman Dave MacEachern rode to a gold medal at Nagano.

So, how does it feel to be a part of history?

Edge summed it up like this: "We were pretty proud. A lot of the stuff we do you never see or really hear about it. Pierre is one of the few customers we have that you can actually say, 'Hey, I did that.'

"Yeah, we were all pretty proud, especially when he came in and showed us the medal – very impressive."

Stamco – Specialty Tool
Manufacturing Company
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Turning Corners to Corner the Market

Frank Weiss Racing Components Runs CNCs To Catch the Checkered Flag

When machining this fitting for a Cosworth V-8 racing engine on a manual mill, output was two units per day. On the Haas VF-1, production jumped to 55 per day.

Story
Preston Gratiot

Photos
Steve McManus

Racing used to be a sport ruled by good ol' boys with big right feet and nerves of steel. Today's star drivers, however, are more likely just another member of a team of specialists working to get their car across the finish line first. Gone are the days when winning was purely the result of driver skill and a generous dose of bravado.

To be sure, driver skill still wins races. But as cars become increasingly sophisticated, having the best vehicle and the best parts are often equally important. Race teams use the latest technology to eke out every possible bit of performance and gain the competitive edge. But quality parts are worthless if they aren't ready on time.

Tony Stewart's winning IRL racer features many parts machined on FWRC Haas machines, incuding the oil pump shown on page 25.

Automobile racing has always generated a demand for quality, close-tolerance parts. The recent explosion in the popularity of motorsports has only increased that demand. Today there are more races and more teams competing than ever. Intense schedules and extensive testing programs have put a severe strain on the in-house machining resources of many teams, so they often turn to outside suppliers to supplement their internal resources.

These suppliers are as performance driven as the drivers to finish their task on time and in front of the rest of the pack. In fact, people in the racing game have a saying: If it's not on the truck when the truck leaves, they don't need it. In other words, if a supplier can't deliver the parts on time, the customer doesn't need those parts... at least not from that supplier!

Life On Gasoline Alley

Frank Weiss Racing Components (FWRC) has produced specialized parts for the racing industry since 1980. Frank Weiss, president and founder, began fabricating parts for Indy car teams after a debilitating accident at the Indianapolis Motor Speedway ended his own racing career.

Frank Weiss Racing Components is a clean shop – a necessity demanded by both the racing customers and Weiss himself. The 8,000-square-foot produces parts for some of the most competitive racers around.

"I started this business 18 years ago with a little conventional lathe and mill," says Frank Weiss. As the business grew, Frank and his son Wade added digital read-outs, sliding head attachments and other tooling, enabling them to make more complex parts.

FWRC still spends most of its time producing parts for the automotive racing market. Of course, with a street address of 140 N. Gasoline Alley in Indianapolis, it only seems fitting that high-performance tooling be the nature of their trade.

Initial contracts were in the market they were most familiar with – Indy cars. The business has since grown to include customers from a variety of racing series, including the Indy Racing League (IRL), Championship Auto Racing Teams (CART), the National Association for Stock Car Auto Racing (NASCAR), the International Motor Sports Association (IMSA), now known as the Professional Sportscar Racing, Inc. (Sportscar), and even offshore racing boats.

Today, FWRC is an integral part of the research & development team helping expand the envelope of today's race cars and teams. Frank's operation does this by making sure his shop team can produce the parts to the exact specifications the designers require. And he depends on Haas CNC machines to give him this ability with the consistency the sport demands.

It's generally accepted that a good reputation brings good business, and with Frank Weiss Racing, this meant growth. No longer able to meet demand as just a "father & son" shop, Frank expanded his facility to 8,000 square feet, and expanded his payroll to include 11 machinists and support personnel.

A Knee To Grow On

In 1991, FWRC teamed with Brayton Engineering, an engine builder in Cold Water, Michigan, to produce a seven-butterfly injection system for the Buick racing engine. Frank realized that the quality and quantity requirements for the project would require CNC capabilities, so he purchased his first piece of CNC equipment: a knee mill retrofit with a Bandit control. He ran all of the prototype components for the Buick injection system on the retrofit. After successful testing, there was a great demand for parts.

"As soon as that happened, we knew we wouldn't be able to meet production demands with our retrofit knee mill," reasoned Frank. "So my son and I started looking for an American-made machining center. The more we looked, the more the Haas name came up."

Frank contacted Technical Equipment

Frank Weiss Racing Components parts are found on any number of championship-calibre cars, including current NASCAR champion Jeff Gordon's #24 Chevrolet Monte Carlo. We can't tell you what the part is... but it helps to put the car in the "Winner's Circle."

(the local Haas distributor) and described the type of machine he was looking for. Haas made a machine that fit the bill perfectly.

Dealer Runs Parts

"We got in touch with Technical Equipment and they took us down to Cincinnati and ran a Haas for us. They were good enough to take some of the parts we were making on the Bandit and show us what the Haas could do," explained Frank. "Consequently, we bought our first Haas, a VF-1, in 1992. The machine exceeded all of our expectations and was very reasonably priced."

When the first VF-1 was delivered, Frank and his son were too busy to take time off to go to the programming classes in Cincinnati, so they sent Wade's wife down to the school to learn the system. "She went down to that school in Cincinnati, came back and programmed all of those injector parts and ran them," beamed the proud father-in-law. "She can go out into the shop and program any one of these Haas machines."

Why Haas?

Another Haas quality favored by Frank is the inherent cleanliness of the machine. "My shop is like a hospital room," says Frank. "The industry basically calls for that, and I do too. We spend a lot of time keeping a nice shop... no clutter and there isn't any oil or grease on the floor. They've [the Haas machines] got a good enclosure and they're really clean and quiet."

Performance Review

"That thing hasn't shut off since we bought it," beams Frank. "We've been really happy with it and haven't had any trouble. We put a 4th axis on it after about a year or so and turn a lot of jobs on it. In fact, anything that has to have work done on more than one side, we fixture it up so we can do it on the 4th axis."

Frank also credits the control as being very powerful while remaining user-friendly. "These things are easy to set up and they're quick to use. That's what this industry demands."

Because of the high-precision requirements of racing parts, Frank has found his Haas machines to be invaluable in delivering accurate parts within a competitive time frame. "There was one real complex fitting I built for Cosworth V8 racing engines that I had to do by hand," says Frank. "I could do two of those a day on my old mill. When I machined them on my VF-1, I was doing 55 a day!" FWRC has since added two VF-2s, a VF-3 and a VF-4.

Size And Performance Count

The expansion of FWRC's machining capabilities have allowed them to produce larger parts, such as wing plates and skid plates for race car bottoms. "Some of the suspension point pickup beams are small pieces, but they're long. To go down a 30" to 40" piece pocket milling without having to relocate the part to do the other half is a pretty handy deal."

Frank says that the parts made on his Haas machines just couldn't be done on a conventional mill. "Ninety percent of my trick pickup points and suspension units require concave/convex surface machining. I couldn't do that on a conventional machine–period. I've still got four of my original 12 conventional machines, but we only do the occasional secondary operation on them. They'll go for months on end without even making a chip. We even do most of our tooling and fixturing right in the Haas."

Since FWRC purchased their first Haas six years ago, business has continued to grow. With the added capabilities, such as 4th-axis machining and three-dimensional surfacing, they have been able to build more complex parts than ever. In 1997 FWRC purchased a new CAD/CAM system to speed the design and programming of the more complex parts. "We were pleased with the compatibility between the Haas and the CAM programs we chose. Haas is widely accepted and recognized in the software community, and post-processors are readily available."

Because of the high-precision requirements of racing parts, Frank has found his Haas machines invaluable for delivering safe, accurate products. "We do a lot of pocket milling and mirror imaging," he says. "And these things are fantastic for doing that. The racing industry is really weight conscious, so you've got a lot of beamed and pocketed parts to cut down on the weight."

As it is, Frank says it's common for his parts to run in the half-thousandth accuracy range all of the time. "We've done several hundred hubs for Indy cars, and they're a real tricky piece," he says. "It's something you have to make sure is just

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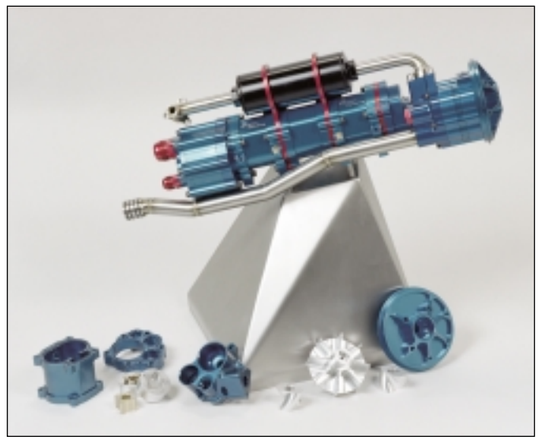


Winner of the Excellence in Design Engineering award for 1997, this high-performance oil pump for the Oldsmobile Aurora racing engine is comprised of more than 50 parts, all machined by a Haas CNC.

Build it the Haas Way. . .

From the floor to the field, the proof is in the product.

Personal pride plays a big part in building CNCs the Haas way. Every employee is charged with responsibility for their own work, but ingrained consistency is the hallmark of accountability.

Story and Photos
Preston Gratiot

At Haas Automation, pride and product go hand in hand. Building a machine the Haas way means much more than just meeting production goals and passing the inspection tests. A Haas CNC machine has to be ready to produce in the real world before it leaves the facility, and the proof is in the cutting...

"We will hold a machine until it is correct," says Sheldon Khougaz, production department manager. "Of course we're trying to build them as quickly as possible to meet production schedules and satisfy customers, but if the machines are not quite right, we won't ship them until they are. They'll be right no matter what it takes."

However, this quest for perfection is dependent on the ongoing dedication of all employed in the design and fabrication of Haas products, from the outside suppliers to the after-sale support groups.

"With every product we build, our engineers develop improvements that are then incorporated directly into the Haas line," says Sheldon. "In addition, constant feedback from customers in the field provides even more information on how to further improve products."

This close developmental relationship between Engineering, Manufacturing and operators in the field yields the most efficient designs, reducing the number of components while improving accuracy and simplifying service.

The most important characteristic of the assembly teams is their attention to personal pride. "Everyone is responsible for their own performance, and they check their own work," says Sheldon. "That's a lot better than 100 or so inspectors running around the floor looking over somebody's shoulder. We depend on our people to be professionals, and to build the product right the first time."

In addition to this personal approach to quality control, Haas maintains computerized production controls that provide for easy accountability and across-the-board problem solving.

"We try to get our individual assemblers to be consistent so all of the machines are made the same," explains Sheldon. "This way, if there is a problem, we have an established baseline we can work with, and we can address the problem without having a lot of variables to deal with. In simple terms, it makes for a more consistent product that is easier to troubleshoot and get right."

With current production levels in excess of 500 CNCs per month, computerized production controls keep track of every machine on the floor... Though most machines are out the door in a matter of days.

New Hires

To further improve assembly line efficiency, new employees are trained in the Haas-way of building, no matter what their prior experience. "When someone new is hired, we don't even let them out on the shop floor for two weeks," says Sheldon. "Every new hire goes into the service department, where a group of instructors trains them in all the basics. At the end of this program, they are tested and graded to see if they've mastered the material.

"In the beginning, it's not how quick they can do the job, but how well. The quality of the work is probably the biggest thing that we look at," continues Sheldon. Once the new hire earns a place on the shop floor, the "lead" man on the crew will take him under his wing and bring him up to speed.

"We've found that when your lead is actually helping you as a mentor, you tend to learn quicker," explains Sheldon. "And you don't get the impression that your boss is hovering over your shoulder. You take that feeling out of the equation, and replace it with a feeling of learning with your peers in each individual area, and you build a successful team. You can also get a pretty good idea of their enthusiasm level when you're working together."

Engineering Quality

"We have two basic sections of engineers," says Sheldon. "We have the design group and we have manufacturing engineers. The designers do just that, they specialize in new products, improvements to existing products and adaptations for old machines. The manufacturing engineers work with the existing products to try to figure out a better way to make them.

"When a worker on the floor has a question, problem or ongoing difficulty with a certain assembly procedure or part, they can work with the manufacturing engineers to improve the part or create new tooling," says Sheldon. "By working with ideas from the people on the floor, the inspectors or management, they find solutions and come up with better ways

With nearly 300 quality control tests on every CNC Haas manufactures, there are few parameters that don't carry a signed paper record verifying accuracy and proper operational capability.

to build or do something."

The same philosophy exists in the CNC control group. Haas designs and develops its own dedicated hardware and software based on the real-world needs of the operator. This integration of control and machine has resulted in one of the easiest to use and most reliable controls ever developed.

Field Input

As mentioned earlier, operators in the field are instrumental in reporting any weak points in a machine subjected to extended service. This is a very valuable indicator of long-term trends, and leads to design modifications that improve reliability and operational performance.

Testing

Before leaving the plant, the typical Haas machine is subjected to a never-ending series of more than 300 quality control tests, including a test cut that proves the operational cutting capabilities of the machine in a real, working-world environment.

In addition to the formal testing, the machines also run whenever someone isn't directly working on them. "We have a minimum of 48 hours run time on every machine, and usually they run quite a bit more than that," says Sheldon. "In fact, the machines run all night to make sure they don't have a problem when they leave here."

Considering the short amount of time it takes to move a machine down through the assembly process, it's amazing how many tests actually take place in addition to the attention the individual employees put into their own workmanship.

"From the time the machine enters the Castings Area, travels to Sheetmetal and Final Assembly, the larger machines are only in-house five days, with only three to four days required for the smaller models. If it spends more than a week on the floor, something is wrong!"

Field Service = Satisfaction

But no machine capable of working 24-hour days can be considered fully reliable unless after-sale support is 100% behind the product. Backing up the high-tech design and manufacturing operation is the Haas Service department. This group of 25 dedicated technicians and 16 applications and training engineers is prepared to help with all service, applications and training needs.

Haas recognizes that there is more to selling machines than product delivery. Operators can attend certified training classes that cover all aspects of Haas machines, from control basics to the latest updates

This dedication to quality service continues in the field. To keep their skills and troubleshooting abilities sharp, all Haas dealers are required to send their service personnel to the factory at least once a year for hands-on training. Intensive courses in maintaining Haas machines, combined with thorough testing, ensure the utmost competency of every technician.

To ensure prompt service and minimize downtime, each dealer is required to maintain a large stock of service parts. With a network of dealers worldwide, operators can be assured of a prompt response, supporting the commitment to the exclusive Haas 98% Up-Time Guarantee.

BOBSLED Continued from page 19

trust Specialty Tool & Manufacturing Co. (Stamco) of Edmonton with his runners, and his Olympic hopes.

Lueders had an existing runner that he wanted to copy in a new type of material. Alfred Ruefli, senior manufacturing engineer at Stamco, was Lueders' first contact at the shop. "He had a new material," Ruefli said, "and we have a tracer (a Renishaw system on their Haas VMC used to digitize an existing part for machining), so we basically can copy any shape. After we have the program in the machine, we can change the shape and re-machine a new part."

Stamco traced the runner on their Haas VF-2 vertical machining center to get the machining program. Lueders made some changes to the design and provided the material. Stamco then cut the new set of runners.

"When I make my designs for the runner," Lueders explained, "I basically give them a one-to-one scale drawing. I take the existing runner that I have, draw it out on paper – that's where I write on my dimensions – and then draw the curvature on the bottom, and they trace it with the machine. They get an exact, to the thousandth, tracing of the rock, as we call it, on the bottom."

The rock, or the curvature of the bottom of the runner, is one of the parameters sledders are allowed to modify. "The changes that are made to the runners are basically changes that I want done, " Lueders said. "The two-man runners that I make, particularly, are very good. The design is very good; the shape on the rock, or the running surface, is very good. And it's a unique design. There's not anyone else that has that particular shape of runner or look. They're very close to all the minimum requirements of dimension, and they're very good.

"Bobsledding is a very high-tech sport," said Lueders, "and I think to be on the top of this sport you need to invest a lot of time and a lot of money. And you need to have, obviously, good machining capabilities of a company that knows what they're doing. You can't afford to have any mistakes, your material ruined, or the machine program screwing up and all of a sudden you have a runner that's three inches too short and an inch-and-a-half too narrow. You have to have a lot of trust in the people that are making them, and you have to make sure they know how to work the machines. Obviously the people at Stamco have been doing a very good job, because they've made seven sets for me now. And they'll be making more"

For Pierre Lueders, the combination of efficient designs, proper materials and the machining capabilities of Stamco have paid off, allowing him to change steel into gold.

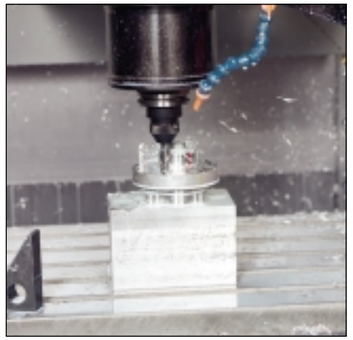
WEISS Continued from page 25

right, because if you lose one, you've lost a car!"

Hubs require extra care. Frank says the shapes and internal work on the bores are really hard. "The outer profiles are not too bad," he explains. "They have a big roller bearing that runs on one surface and the other end runs on a ball bearing. To make them light you've got to go in and cut the inside shape similar to the outside shape. So there's a lot of deep work. They're pretty tricky!"

Quality Control

FWRC has teamed once again with Brayton Engineering to produce an oil pump for the IRL Aurora engines. The entire assembly involves more than 50 machined parts and won the Excellence in Design Engineering Award for 1997. The pump has been dyno- and race-tested, and has shown significant increases in horsepower and reliability. The machining capabilities of the Haas make it possible to produce the components from billet instead of castings. This eliminates the problem of chasing core shift, and makes it possible to use a greater variety of materials to meet the individual requirements of each component.



Multiple fixtures are used when machining many of the 50-plus parts used in the Aurora V-8 oil pump. Perfection is a must.

The IRL pump is just one example of the many assemblies FWRC has produced with Haas machines. The ability to produce high-quality, lightweight billet components is vital to the racing industry. The time frame from design to prototype to production is so short that often forged or cast parts cannot be utilized. The capabilities of the Haas make it possible to machine a billet part that is stronger yet just as light as a comparable casting.

FWRC has been teamed with winners since its inception. They've had parts on several cars that have sat on the pole or won great races like the Daytona 500, the 24 Hours of Daytona and Le Mans. In fact, FWRC parts have been on the last six winners of the Indianapolis 500. They've been able to work with teams that have won IRL, CART, NASCAR and the World Sports Car championships.

They've been teamed up with winners in the racing industry and they teamed up with a winner with Haas machines.

It's all part of the racing component business – you have to be able to produce consistently accurate parts on time and "get them on the truck," or you'll never be a part of the winning team.

Frank Weiss Racing
140 N. Gasoline Alley
Indianapolis, IN 46222 • 317-243-9585

Compact Rotary Table

Fit a large peg into a small hole? Absolutely, with the new Haas HRT 310-SP.

The HRT 310-SP is a specially designed rotary table with a wrap-around motor enclosure to provide a substantially shorter overall length. Based on the shop-proven HRT 310, the 310-SP delivers the same performance as the standard model, but in a more compact package.

With an operational length of just 16.26 inches, the new HRT 310-SP saves more than 8-inches of valuable space when compared to the 24.30-inch-long standard model. Available in either brush or brushless* configurations, this 310 mm (12.2-inch) rotary table is easily adaptable to existing shop requirements. Additional features include an ample 200 ft-lb of torque, accuracy of ±15 arc-sec and repeatability of 10 arc-sec.

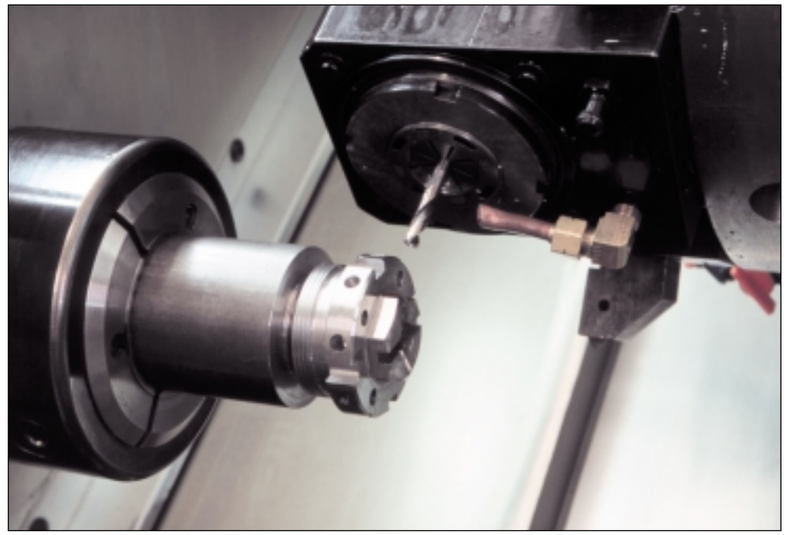
*Contact Haas for brushless specifications and availability.

Haas Unveils New 600 MM Rotary Table, a Giant From the Giant

Size really can make a difference, especially when you're talking big production. The new Haas HRT 600 rotary table is a formidable tool designed to position and rotate large, heavy loads like engine blocks, aircraft parts and bulky castings with precision. Platter size on the new table is a generous 600 mm (23.62 inches) across the face with six equally-spaced T-slots for mounting parts and fixtures.

Designed to function best with large-sized machining centers like the VF-9,10,11 VMCs or the HS-3 HMC, the HRT 600 is a big table – and it's very precise, with indexing accuracy of ±15 arc-seconds and repeatability of 10 arc-seconds. *Contact Haas for brushless specifications and availability.

Live Tooling Reduces Setups, Increases Productivity



The ability to perform secondary operations without moving parts to another machine is a sure way to boost productivity, increase accuracy and reduce labor costs.

The new live tooling option for Haas lathes allows you to drive standard VDI axial or radial tools to perform such operations as milling, drilling or slotting – both on the face of the part and around the diameter. The lathe's main spindle allows synchronous motion for milling flats, hexes and flutes, and is indexable in one degree increments for precise part positioning and repeatability. A powerful hydraulic brake locks the spindle during secondary operations, yet fully disengages for turning and synchronous motion.

The live tooling option may be ordered with a VDI turret (configured for standard 40 mm shank VDI tools), or the standard Haas turret may be used in conjunction with Haas VDI adapters.

Combined, these new capabilities make Haas lathes even more productive, and will help you turn bigger profits.

WIELAND Continued from page 12

"We had some tolerance problems coming back to us from one customer stating that a corner on one of our heatsinks would occasionally come in too tight and the component would not slide into place," says Wieland. "By checking our serial numbers and following some parts through the cycle, we were able to pinpoint the problem back to a shipping/receiving dock problem caused by a worker dropping fully-loaded boxes of parts on the dock, thus bending one of the heatsink corners. It wasn't a tolerance problem, but a handling problem that we were then able to correct to the customer's satisfaction."

Heatsinks Are Hot

One of the reasons the shop is so successful is that it adds new talents as it grows. But the real goal is to stay on the cutting edge of technology. "We've concentrated on the higher end of aerospace heatsinks, which we've identified as a $225-million market," says Wieland. "However, there's going to have to be a new revolution in heatsink design. The amount of heat that is being generated right now has to go somewhere, and I don't know if aluminum is going to continue to be the key."

Wieland explains that the present technology can't advance much further until a way is found to dissipate this additional heat. "We're working with a couple of companies that, with our combined abilities, should be innovative enough to come up with something new. And when this happens, we will be ready to take advantage of these possibilities and market that ability."

Veteran Verticals

"With the Haas VF-2 being the first milling machine we had in the shop, it's kind of hard to make any comparisons," explains Wieland. "But that machine has got to be one of the best machines we have, as far as accuracy is concerned. That machine is four years old; but since it runs 24 hours a day, it has a real-world lifetime of 12 years, and it's still in really good shape. And that's what you need.

"But the oldest Haas I have – even though there have been a load of major improvements over the years – is still cutting accurate parts right next to my newer Haas machines. It may be cutting marginally slower, but it is still accurate and very dependable. I have a lot of confidence in it.

"Like I said, we sure got lucky when we picked this machine. This is what we wanted. We'll be with Haas forever. We've been real fortunate this way."

Wieland Precision Machine, Inc.
570 B Central Avenue
Lake Elsinore, CA 92530
909-471-1393

Diversification keeps the machines running and profits up. While Wieland holds a competitive edge when it comes to cutting extruded aluminum, plastics are now providing an ever-growing percentage of the company's production profits.

Fundamentals and Originality

They say that imitation is the sincerest form of flattery. I might add that the more obvious the imitator is, the easier it is to distinguish the original. For those of us who can tell the difference, the decision to own only the original is that much easier.

These were some of my thoughts as I walked this year's WESTEC trade show. Each year, SME's Los Angeles tradition gets bigger, better and, I can only assume, more influential. It's where all the major manufacturers show off their latest and greatest wares. WESTEC '98 followed this pattern with one notable exception, the art of imitation was everywhere.

As a Haas representative, I was filled with a sense of pride as I checked out each and every new imitation. It seemed that every Haas competitor had their own version of a classic "Haas" machine.

For some manufacturers it must seem as simple as resizing, reshaping or changing the placement of their logo. For others, it was the color, texture and shape of the sheetmetal. Or, how about a change in the color of the sliding door, or the handle design. This was all so transparent, as if simply copying the machine's external look would guarantee the same popularity with customers that Haas now enjoys.

I don't want to give away too much here, but there is more to Haas' popularity than two-tone gray sheetmetal. If you're a Haas owner, then you know what this loyalty is all about. It is the unbeatable combination of rugged design, reliable operation and affordable pricing. In simple terms, it's the classic, can-do product with true individuality.

Haas machines are designed and built by the same type of people who own and operate them. Haas believes in straight-forward engineering and design principles. They use their own machines, every day, in their own machine shop. A Haas is built to perform for its owner – it's that simple.

From the beginning, Haas CNC machines have succeeded, in part, because of dedication by the company to constant improvement. Haas machines get reevaluated, literally, every day. Feedback from customers, combined with an engineer's quest for perfection, sees actual design changes implemented as a routine. No one at Haas ever says it's good enough.

To give you an idea of how this works in practice, here's a sample of machine upgrades and new features released by Haas during the last few months alone: Live tooling is now available on select lathe models; a big bore option is now available for HL-5 and HL-6 lathes; the Haas bar feeder became available for certain turning centers; direct-drive VMCs and lathes now feature a Haas dual-drive motor with wye-delta switching; Haas HMCs now come standard with a new triple-chip auger system and all-new pallet clamping system for the HS-1RP and HS-2RP models; a new sidemount tool changer option is available for select VMC models; and the Haas control has a new "ETC" (electronic thermal compensation) feature and a Zip™ Drive option for fast data transfer. Remember, this is just a sampling...

As for that external appeal, let's face it, the "Haas" look is more a result of function then of aesthetics. What you see is there because it works, not just because someone thought it was pretty. Now, I've given away too much. . .

As a loyal Haas owner, or a soon-to-be loyal Haas owner, you should take pride in your decision to buy only the original. Don't settle for anything less – it's not worth it. When it comes to machine tools, Haas truly is an American original. If you need proof, just look at all the imitators.

Haas Productivity Solutions.

Increase productivity and run your new Haas VMCs unattended with our high-output APC package.

Haas APC Specifications:

Pallet size:
X . . . . . .40" 1016 mm
Y . . . . . .19" 483 mm

Max. Pallet Load: . . . . . 1,000 lb 453.6 kg

Pallet Hole Pattern: . . . . . .½"-13 on 5" centers

Clamping Force:. . . . . .14,900 lb @ 85 psi
. . . . . .6759 kg @ 5.86 bar

APC Approximate Footprint: . . . . . .60"x50"
. . . . . .1524 x 1270 mm

Pallet Change Time: . . . . . 30 sec

Vertical Work Envelope: . . . . . 20" 508 mm
(top of pallet to bottom of door)

COMPLETE PACKAGE UNDER $99,000

The new Haas APC is a side-loading pallet changer featuring twin 19"x40" steel pallets. The heavy-duty, cast-iron base of the APC is secured directly to the VMC, eliminating the need for further anchoring; and a three-point leveling system provides stability and prevents rocking. The Haas APC allows non-machining tasks, such as fixture setups and part changeovers, to be performed off-line on one pallet, while parts are being machined on the other pallet. With both pallets loaded, the VMC may be run unattended. This integrated system requires minimal training and runs seamlessly from the VMC's control.

Haas APC option available with new VF-3 or VF-4 VMCs only. All prices USA dollars, international prices may vary.

The High-Output Package Includes:

- Haas VF-3D (40"x20"x25") dual drive VMC
- Haas Automatic Pallet Changer 40"x19" pallet size
- Automatic chip auger system
- Programmable coolant
- 1 MB program memory
- QuikCode™ programming
- 3.5" floppy disk drive
- Rigid tapping

Designed and Manufactured by Haas