

Opening the Door to Big Part Production

Bergeron Machine Shop (BMS), located near Lafayette, LA, manufactures components for industries that include deep sea and offshore oilfield applications. As local demand increased for large machine work, many customers were forced to send work out of state. BMS took on the challenge of increasing its current production while also opening the doors for new, bigger part production.

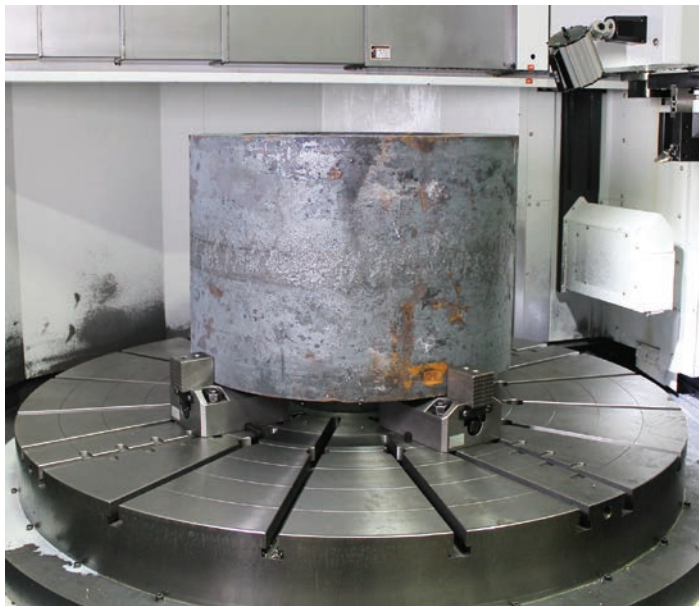
To meet current and future work requirements, BMS needed a machine with enough power to rough heavy weldments and forgings, in addition to holding tight tolerances and creating smooth surface finishes. Furthermore, an existing job required them to run long, large diameter parts. For this job they needed a big bore lathe with front and rear chucks to eliminate the need for steady resting the parts.

For the first challenge, BMS selected the Yama Seiki GV1600 CNC VTL. "With its 78 inch swing, it has the ability to rough and finish in one set-up," said Ryan Bergeron, General Manager, BMS. "It offers a true geared spindle (no belts), which supplies plenty of torque for the roughing operations. In addition, the vertical orientation is safer when setting up and indicating large, heavy parts.

"We were so pleased with the GV1600 that we decided to purchase a new Yama Seiki GS6800L big bore lathe with front and rear chucks, which allow us to machine parts without the need of a steady rest," continued Bergeron. "This significantly reduced our set-up time. What impressed us about the GS6800L was that it had a very large turret and large cervic coupling, which makes it a very rigid machine for boring applications. For such a large turret, tool-to-tool index time



(l-r) Ryan Bergeron, Jarrod Bergeron, Randy Bergeron, Leo Bergeron, all of Bergeron Machine Shop, with the Yama Seiki GV1600 CNC VTL. The part is a 4330 forging, 63" in diameter, 25" tall and weighing 16,000 lbs. They held a 63 surface finish in the I.D. of this part. Forgings of this size require a lot of torque for cutting, which was why a direct gear drive spindle was needed.



Rough stock 1018 manifold forging is 32" O.D. x 20" I.D. x 21.0" long and weighs approximately 2,800 lbs.

is extremely fast and smooth."

Machines were also in stock in the U.S.A., which was another deciding factor in the choice of machine tools. The machines were purchased through Hillary Machinery, the exclusive distributor for Yama Seiki in Louisiana and Texas. Service was also very important. "Yama Seiki has factory service techs, based out of Houston, TX, who are very knowledgeable," said Bergeron. "They get here very quickly, usually within one day if a machine is down, and fix any issues immediately. Most machine companies use contracted service mechanics who work on many different machine tools. These Yama Seiki techs only work on Yama Seiki machines and have direct contact with the factory, so they know these

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This part, called a mandrel, is 20" O.D. x 65" long 4140 HT. "The Yama Seiki GS6800L CNC horizontal lathe can easily hold +/- .001 tolerance and a 63 finish along the entire length of the part," said Ryan Bergeron, BMS.

machines inside and out."

According to Bergeron, process time, quality and surface finishes have all been greatly improved. "On some parts, manufacturing times have been cut in half," he said. "It also opened the doors for new customers with larger, more complex parts that could not even be attempted on older manual machines."

Typical component material machined at BMS includes 4340, 4330, 1018, 1026, 4130, 4140 forgings and bars, A36, A516-70 and A514-T1 plates.

Features of the GV1600 CNC VTL include:

- 63" chuck
- 78.7" swing
- 70.86 turning diameter
- 51.18" max turning height
- 17,600 lbs. on the table
- 60 HP - geared spindle.

Features of the GS6800L CNC horizontal lathe include:

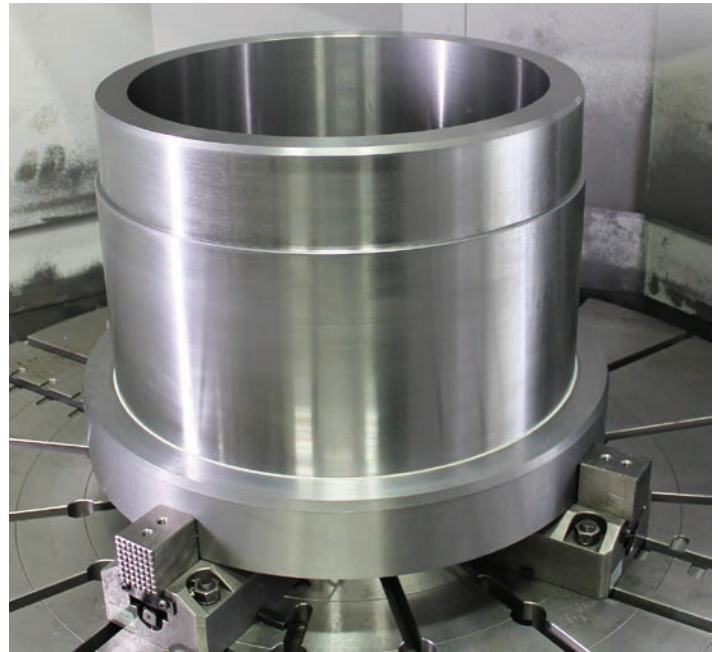
- Front and rear chucks with 10.02" bore
- 38.58" swing
- 34.64" turning diameter
- 77.95 max turning length
- 60 HP - geared spindle.

"With the old process, we would rough forgings on a horizontal manual lathe (2 ops, 6 hours) to within 1/8 inch, and then move it to an older CNC lathe (2 ops) and do the final machining (4 hours) using a bull nose on the tail stock to ensure the part would not come out of the chuck," said Bergeron. "The final lathe process was dangerous and slow because the part was really too big for that machine. Now we run the rough and finish operations to O.D. on the GV1600, flip and run the I.D. (rough and finish). The entire

part is processed in 6 hours, saving 4 hours on each piece. Also, it is much safer to set the part in a vertical position while indicating than in a horizontal. When indicating in the horizontal position you always have to worry about the part falling out of the chuck."

BMS is a family run business that was founded in 1984 by Randy Bergeron and his father, Leo. Randy, who began machining in 1978 for a valve repair company, opened the business in an old tractor barn behind his house. By 1991 the company was operating full time and focusing on large valve machining. A new building was constructed in 2004, around the time Ryan (son) graduated from the College of Engineering. At that point BMS purchased its first small CNC lathe and mill. The company now operates 12 CNC machines with mill travels ranging from 40" to 200" and lathes with 12" to

63" chucks. Jarrod (Randy's oldest son) recently joined the team, helping with machine programming and part fixturing.



The finished machined manifold shown after the second operation, which is now the last operation. Finished weight 1,925 lbs., 32 finish on O.D. Cycle time is cut nearly in half because of the rigidity and torque of the Yama Seiki GV1600 CNC VTL.

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With almost 30 machine tools (both manual and CNC), BMS offers small to large machining capabilities. The smallest lathe has a 12" chuck and the largest, a vertical, has a 72" chuck and 92" swing. The mills range from 40" x 16" x 16" to the largest, a CNC, having 200" x 124" x 90" under spindle and a 50,000 lb. table load. The facility sits on 20 acres, has 20,000 sq. ft. under roof, contains four overhead cranes with up to 15 ton capacities and four forklifts with up to 18,000 lbs. capacity.

"Over the last 31 years, Bergeron Machine has set itself apart from its competitors by providing exceptional customer satisfaction through quality parts and friendly service," said Bergeron. "With a wide variety of equipment coupled with some of the best and most experienced machinists, BMS can assist in manufacturing an extensive array of parts. Whether it is for the petroleum industry, heavy equipment or local farm needs, Bergeron Machine Shop can provide a cost effective way to get the job done accurately, safely and on time. We just try to be an honest down to earth shop that takes pride in our parts and works hard for our customers. Business can still be done with a handshake at Bergeron Machine."

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