

Vancer builds rail industry maintenance-of-way equipment such as this CHX35 hi-rail machine. It is based on a Caterpillar excavator platform with a 200 hp Cat C7.1 ACERT diesel engine. Vancer recently began installing a custom-designed VMAC hydraulic air compressor.

VMAC's OEM division ready to develop air compressors for unique applications.

By **Chad Elmore**

CUSTOM COMPRESSORS

When an off-the-shelf product doesn't work for an end user's application, specialty equipment manufacturers are often asked to help develop a machine that can handle the task safely and efficiently. Recently, when one of those manufacturers faced its own challenge with the hydraulic air compressors it was installing, VMAC was ready to come up with an answer.

Located in Galesburg, Ill., Vancer engineers, builds and distributes maintenance-of-way equipment for the rail industry. The company's product line typically starts with a foundation sourced from Caterpillar's OEM

Solutions, such as wheel loaders and excavators. Its offering includes hi-rail equipment such as the CHX25 hi-rail excavator (it has a top speed of 25 mph when riding the rails), on-track cranes for placing ties, on-track power units and related attachments. The company uses hydraulic air compressors to run tools and air brakes but was running into challenges during the assembly of its excavator-based equipment.

Traditionally, installers use a converter kit to make 12 V air compressors compatible with 24 V electrical systems. The kits are placed between the air compressor and the

power source to modify the voltage. On an excavator, however, installing voltage regulators was complicated as the machines have multiple pivot points and long wire runs that must be overcome during design and assembly.

THE ISSUE WITH STATUS QUO

"Vancer inspired us to innovate. They pointed out an issue with the status quo and our team was eager to find a way to overcome it," said Rick Duifhuis, OEM Development manager for VMAC. Located in British Columbia, Canada, the company has been dedicated to mobile compressed air

for more than 30 years. It designs and manufactures air compressors and multi-power systems that are often found on maintenance trucks.

For Vancer, VMAC's engineers swapped the 12 V fan in the integrated hydraulic/compressor oil cooler with a 24 V fan and used a small internal converter for the 12 V control box to eliminate the customer's problems. Typically painted white, the air compressor enclosures were also given a black powder coat to match the branding of the finished machine.

"The new hydraulic air compressor was built for 24 V electrical systems, completely >

eliminating the need to install a converter kit,” said Duifhuis. “It’s a simple improvement but it will save countless hours of work on future excavator installs.”

The VMAC H40 is a rotary screw air compressor powered by a hydraulic system that the company said will fit on equipment with limited available space. The H40 can free up to 6 cu.ft. and reduce weight by up to 260 lb, compared to competitive models, while providing up to 40 cfm of continuous air, said the company. The 24 V variation of the H40 hydraulic air compressor is now available to original equipment manufacturers (OEMs).

“A lot of up-fitters and OEMs are used to buying standard air compressors that are not exactly what they want and then finding a way to integrate it into their equipment,” said Peter Dahle, senior OEM sales engineer for VMAC. “For a job shop doing one-off conversions that might be OK, but

when you’re talking about an OEM faced with pricing and assembly line realities that’s different. We can adjust our components – often within quite a range of flexibility – to meet exactly what they need. We’ll often visit a customer and, after seeing what they’re doing, find ways to help them by changing our design.”

In many cases it had not occurred to the OEM customer that they could have it another way, he said.

ALL THE CORE COMPONENTS

“VMAC is a vertically integrated company that

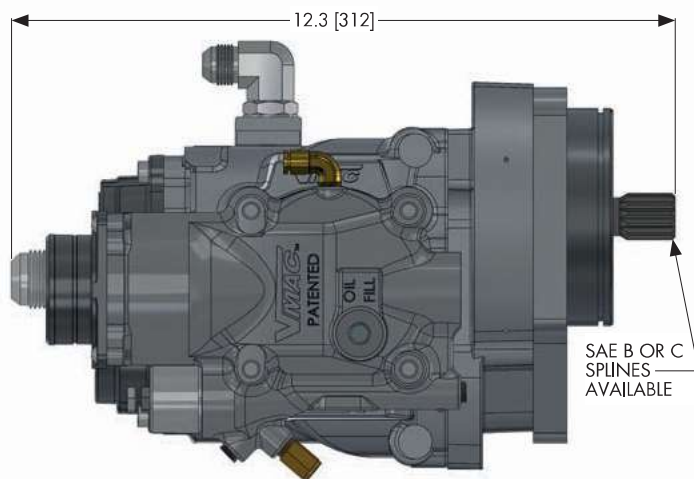
handles all of the core components of an air compressor, across the board,” said Dahle. “We have a foundry on-site. We manufacture rotors on-site. We do the assembly on-site. We also do the design work, testing, validation – all that happens here, which makes it very easy to make changes when needed.”

VMAC began working directly with manufacturers early in its history, when it started shipping air compressors to the assembly line of a major producer of mobile welders. The partnership continues to this day.

Duifhuis said VMAC does get a lot of calls from customers that want something special – even as its catalog of readily available air compressors expands.

The company is perhaps best known for its belt-driven rotary screw air compressors that fit under truck hoods. That business now includes industrial engine applications, for which the company works directly with several large diesel engine distributors and manufacturers, including

The VMAC H40 rotary screw air compressor is powered by the machine’s hydraulic system.



VMAC can work directly with OEMs that need a unique solution for an application. A drawing of one of the company’s compact spline-drive rotary screw air compressors is shown.

Cummins, John Deere Power Systems and Deutz.

“One of our big design challenges for the Underhood compressors was around 2012,” said Dahle. “We were seeing a decrease in available space on work trucks, so we challenged the team to come up with a compressor that would fit within the envelope of an alternator. On most vehicles there are provisions for a second alternator, so we thought if we could fit the compressor there our integration problems would be much simpler. Today that work is available as our Underhood 40 series air compressors. It’s a compressor with an output to size ratio that’s vastly better than anything else out there. To get there, we looked at saving fractions of an inch and we optimized our castings to save weight. All of that was possible because our in-house design team controls every single part of the compressor.”

The Truck Series of the Underhood 40 air compressor is designed for Ford, General Motors and Ram truck applications and is commonly used for spinning impact wrenches or fixing tires on a jobsite. The VR40 oil-injected rotary screw weighs around 14 lb (62 lb for the complete system including the oil cooler, oil separator and compressor) and puts out up to 40 cfm at 100 psi.

About four years ago, the

company created a division that works directly with OEMs. "We can handle relatively low-volume custom work quickly, sending out beta units to customers so they can do their own test and validation work before going into production with the final product," said Dahle.

The H40 hydraulic rotary screw air compressor used in Vancer's maintenance-of-way machinery is a direct-driven unit that puts out 25 to 40 cfm at 100 psi and runs on 9 to 12 gpm of hydraulic flow. It is typically mounted on medium-duty trucks to operate air tools.

"On the hydraulic side of things, developing a solution for a customer is usually more of a configuration management question. It's not so much a redesign," said Dahle. "We can add some components here or there or change the colors because, again, we do all that in-house. When it comes to a belt drive, almost every application is different. Sometimes we can adapt the same kits we use on an Underhood model for industrial engines, but it's often not the same. We'll do new belt drive designs for a particular application's needs."

APPLICATION REVIEWS

To begin a new project, a manufacturer's engineering team fills out VMAC's application review form which covers the key points of the application, such as how the compressed air is used and what the

environmental conditions are, along with duty cycles and size restrictions. The engine type is also recorded. From that document, VMAC's engineering team can choose from components that are already in stock or make modifications to suit the customer's application.

"Most companies send us a CAD image of their engine and the enclosure and VMAC's OEM team can fit it all in there and send it back. Based on that we'll have some conversations over the next several weeks before we finalize the solution," said Duifhuis. "We'll then send the prototype to the customer so they can fit it up. At that point, if they discover some issues or want to make further changes, we can do that. Having 3-D printers and a foundry on-site makes it all pretty slick."

The company's OEM team has developed solutions for a wide range of applications, including gen-sets, cement plants, spray foam and water jet cutting machinery. Lately, Duifhuis has been particularly interested in railroad maintenance of way equipment.

"A lot of those guys aren't familiar with rotary screw air compressors and they're looking for reliable options," said Duifhuis. "They need something that can withstand the 100% duty cycle their equipment is subjected to, and now that we're getting into that market with our compressors, they've been amazed at how smooth they run and how long they last. Their eyes are open." ■



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