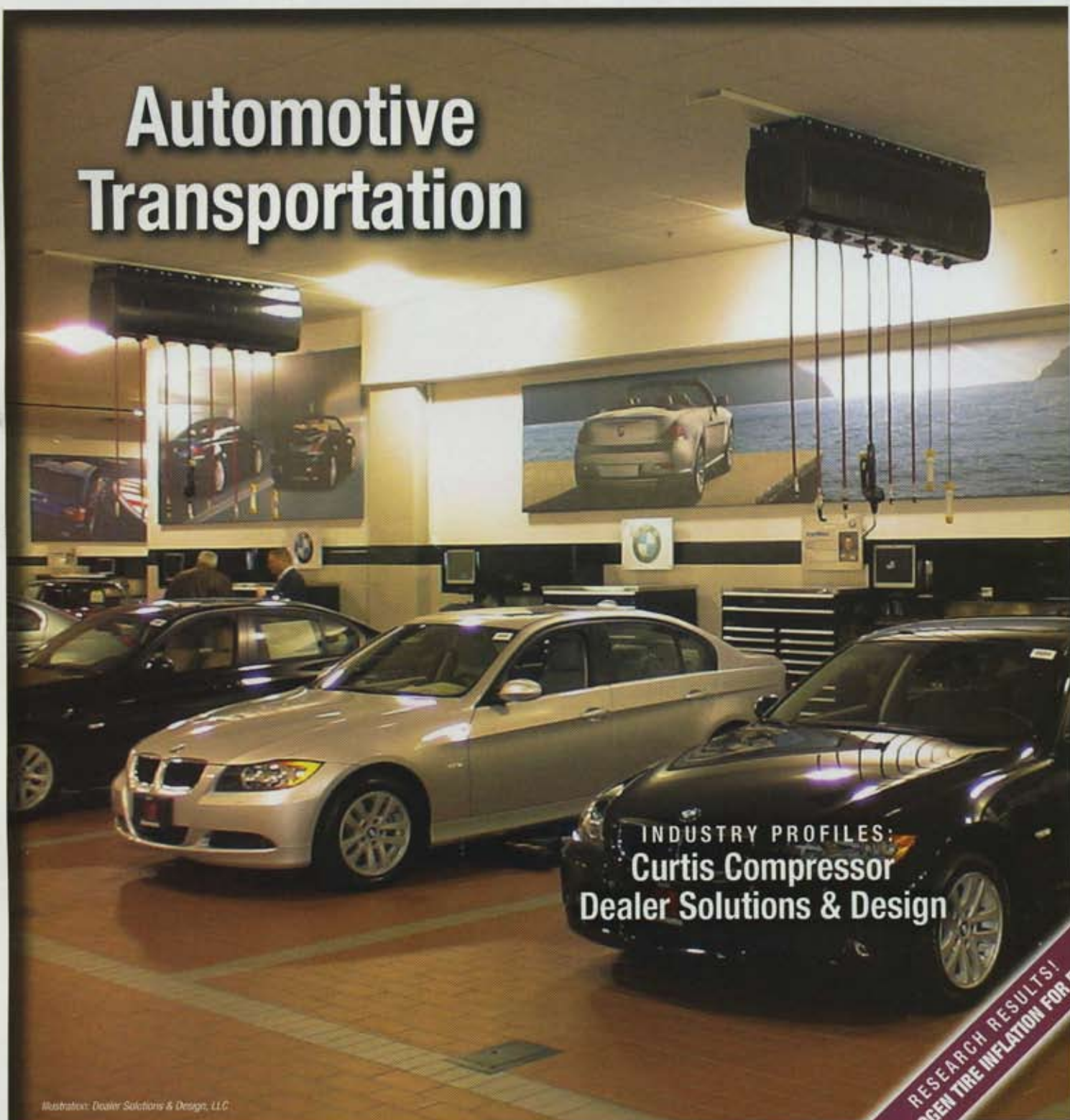


September 2007

## COMPRESSED AIR

# BEST PRACTICES

## Automotive Transportation



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# WHEN COMPRESSED AIR IS CRUCIAL

*Air compressors are the heart of the automotive repair shop. Without the optimum air compressor technology, these shops face costly rework, high maintenance and replacement costs, exorbitant downtime — and very unhappy customers.*

BY ED SULLIVAN

Given the technological age in which we live, the preferences for a specific air compressor design might seem a bit argumentative. Yet, for businesses that are highly dependent on compressed air, especially those with demanding applications, choosing the right compressor technology may be crucial.

In the automotive collision repair business, for example, the continuous availability of unfaltering, high-volume compressed air is vital to support various tools as well as the filtered breathing air system.

“When the air goes down, we’re dead in the water,” says Sandy Muir, vice president of facility management at Caliber Collision Centers, a chain of 65 shops throughout Southern California and Texas, specializing in automotive structural, mechanical body and refinish work. “Until we got the right compressor technology, I would get a call that one or two shops were down every day, waiting for service technicians to get them back up and running.”

With first-class operations running 24/7, having air compressor problems was unacceptable for Caliber. Ultimately, it was also unacceptable to customers, including car owners and insurance companies. Both wanted high quality but timely repairs to get the cars restored to OEM standards and avoid the expense and inconvenience of rental cars. Since collision work is a continuous flow, air system downtime often delayed deliveries of a whole chain of technicians, processes and cars.

“This situation was intensified by our need for clean air, including providing a pure supply to our paint systems and tools as well as the breathing system that delivers fresh air via masks to our paint spray technicians,” explains Muir.

### *Choosing the right technology*

Over the years, Caliber had used or evaluated several types of air compressor systems, including piston-driven models and rotary screw designs.

“Everybody is familiar with the old piston-style compressor,” says Muir, “It’s a fairly simple concept, a piston running up and down and turning a crankshaft. But of course that motor also relies on intake and exhaust valves, which tend to wear and then leak. Once that happens, oil and sometimes fuel can get into the air system. That is definitely a drawback to the purity of the system and causes maintenance headaches.”



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Caliber has also used rotary screw compressors but was disappointed with the inherent volumetric and efficiency problems due to the “blow hole” and air leakage (back to the intake) of those compressors. Moreover, in order to make up for inefficiencies and keep up air volume, designers of rotary screw compressors incorporate higher speed, which is detrimental to service life.

“Also, the pressure build-up at the end of the screws is so high and so hot, it burns out the bearings,” says Muir. “Plus, they could never keep the back end of the screws together because of the axial thrust, so they just kept adding more and bigger bearings. We’ve had screw compressors blow up because of the extreme pressure point at the end of the screws.”

Most recently, Caliber changed over to rotary vane compressors, a more sophisticated technology with only one major moving part. The rotary vane design is far more efficient and cleaner than piston or rotary screw technologies. Also, the vanes (or blades) are held outwardly by centrifugal force. A film of oil between the blades and the stator (housing) wall forms a practically perfect seal. Importantly, the performance of a rotary vane compressor does not degrade over time, because the vanes slide on an oil film during rotation, preventing direct contact with the internal surface of the stator. This means there is virtually no wear on the vanes.

Caliber purchased their rotary vane compressors from Lans Company (Glendora, CA), a major distributor of compressed air systems. While Lans provides a selection of compressor technologies, brands and accessories, when it comes to rotary vane compressors, the firm recommends the Mattei line.



“One problem with rotary vane compressors was the use of Bakelite vanes,” explains Lans Co. President Stuart Silverman. “But the Mattei models are cast iron, and because of the oil system, there is virtually no wear. I would say they last three times longer than the rotary screw models. Also, the Mattei rotary vane compressors use no bearings, but instead use a bushing, so they last much longer than other models.”

Silverman adds that the volumetric efficiency of these compressors is approximately 90%, supplying a reliable continuous volume of air while also providing a substantial savings in energy, wear-life and maintenance costs.

### *Wide-ranging improvements*

Since installing the rotary vane compressors at every location, Caliber has experienced very few problems. “I may get a call once a month,” says Muir, “which is music to my ears, compared with the two calls I used to get on the average day.”

He adds that the new compressors not only meet the reliability requirement, but also reduce cycle time, which is an important advantage from both an operational and a competitive standpoint.

Having continuously available and consistently clean compressed air provides other advantages to those in the auto body repair business.

"Customers are driving more expensive cars with more expensive finishes in recent years," Muir explains. "For that reason our industry receives continuous scrutiny from customers, as well as stringent guidelines from agencies such as insurance organizations and California's Bureau of Automotive Repair. The whole industry has become very high tech; every car has to have electronic read-outs, and we use electronic measuring systems for our frame-alignment equipment. Paints have become very exotic and expensive. You don't want to have to paint a car twice because of an air pressure problem. Not only will it cost the time to remove and redo the paint, but the material itself is now very expensive."

Muir adds that his firm is currently converting to water-based paints to comply with California state safety requirements. That means a whole new paint system for Caliber's 30+ California shops in 2007. Muir feels that the advanced compressor system will help protect that major investment.

### *Simplifying service*

Rotary vane compressors such as the Mattei are easier to maintain and service, requiring fewer repairs and longer intervals than their piston or rotary screw counterparts. The compressor can be assembled and dismantled quickly with standard tools. Easy dismantling of the machine into subassemblies also makes fault diagnosis easy.

"We don't normally perform any service on these compressors," Muir says. "We have Lans handle all service throughout the air system, including air dryers and our breathing system. We know air is the heart of our business. When we call and say we have an air problem, we need quick response and knowledgeable service."

Muir says he's learned that his firm requires a partner when it comes to air systems. He says it is utterly frustrating to deal with multiple vendors on multiple systems that are integrated. "They can give you a runaround," he explains. "Like when we might have an air dryer down and the air dryer technician points to the air compressor and says that's where the problem is. We don't want anybody passing the buck like that. So we want a partner who is an air specialist to take care of it all. And having that kind of relationship has really paid off."

### *Plus savings*

While the cost of electric power needed to drive compressors is not a major issue with some users, excessive use of power may be a significant cost that is often swept under the rug. For example, older models of compressors often cause a spike in the electric power load during peak usage periods, resulting in a demand profile that could cost many thousands of dollars per year.

"In some businesses, such as body shops, the air compressor is the biggest piece of equipment," says Silverman. "Relatively speaking, it can cause a lot of expense. With the Mattei compressors, which are very efficient to begin with, we install a 'part winding start' at no extra charge. That allows the motor to ramp up to speed, which lowers the usage spike during peak periods. By making the peak smaller, we can lower a sizable electric bill. And the savings will be more than enough to justify the cost of a high-efficiency air compressor. Shops that are running 60-horsepower compressor motors could save as much as \$1,000 per month."

*For more information, contact Lans Company, 438 W. Carter Drive, Glendora, CA 91740; toll-free 888-596-5267, phone 626-963-9457, fax 626-963-5267, e-mail [mail@lanscompany.com](mailto:mail@lanscompany.com); or visit [www.lanscompany.com](http://www.lanscompany.com)*

### *About the Author*

*Ed Sullivan is a technology writer based in Hermosa Beach, California.*

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