

THE REVOLUTIONARY COMPRESSED AIR SYSTEM



Quiet • Clean • Efficient

THE E.A.R.S STORY

Innovation is often born of necessity, and sometimes the result is spectacular. Such is the case of this revolutionary new system: “Exhausted Air Recycling System” or E.A.R.S.

The E.A.R.S System was created out of frustration by Chris Bosua in Australia. As he tried to make a pneumatic manufacturing machine work with an air compressor that was simply too small for the job, Chris realised that the problem was waste. With a background in mechanical engineering and a bit of Aussie common sense, he saw that the energy used to create the compressed air was wasted in the exhaust air from the pneumatic tool.

“Why not create a closed loop system and just send that air right back to the compressor just like a hydraulic tool works?” he asked himself. After a few tries assembling a few bits in his workshop and creating a special manifold, Chris hit it just right, making a system that converted an ordinary compressor into a compressor capable of almost double the capacity, and E.A.R.S was born.

Imagine an invention that literally doubles the capacity of an ordinary air compressor? This alone is spectacular, but the benefits did not stop there. With the whole system up and working, the unforeseen benefits started to reveal themselves. The first and most obvious was a dramatic reduction in noise. The pneumatic drills used in the machine had a decibel level of 89 db prior to E.A.R.S. After the conversion the drills were virtually silent, with a decibel level of just 67db, or the difference* between a common lawnmower and a sewing machine!

As testing and use continued, other benefits became quite clear as well:

1. The return of pressurised air into the inlet of the compressor had a dramatic effect on energy use. Under continuous use, energy consumption dropped over 40%, not only was this invention functional, it would pay for itself over time in the shop energy bills.
2. The closed loop air was much drier (up to 70% as the compressor no longer needed to pull in ambient air) and cooler; this extended the life of the tools, hoses and the air compressor.
3. No longer did the air tools emit oil vapour and other harmful exhaust into the atmosphere of the shop. Since the tool exhaust was returning via a hose to the compressor, there was no longer the dust and debris blown about the shop from the exhaust of the tools.

These results were so spectacular that the next step was to develop simple retrofit kits for all common air tools and air compressors. Chris then arranged for the appropriate patents and began to share his invention with the world. As the word spread, so did the recognition and acknowledgement of the potential for this invention. In the past two years, there have been many awards and articles written. The inside back cover of this brochure highlights a few of them.

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A NEW TECHNOLOGY



The time is right for an efficient compressed air system

Most companies in the world today, from manufacturing to service, use compressed air to drive tools and equipment. With current compressed air technology, a compressor has to work hard to provide the air required. Valuable energy is wasted as the tool's exhausted air can't be reused. Exhausted air is a problem due to the high level of noise and air pollution that is also created. It is the ingenious solution to these issues that led to the invention of the E.A.R.S system.

Worldwide support for EARS from the compressed air industries

It is no wonder that leading compressed air tool manufacturers have supported E.A.R.S right from the start, providing "E.A.R.S ready" pneumatic tools for most applications. They have also made it possible for many existing air tools to be easily retrofitted using a specially developed adapter. Air compressor companies have also joined the "E.A.R.S Revolution" by providing a complete line of "E.A.R.S ready" compressors from small to large. And, the leading global manufacturer of couplings, tubing and fittings has joined the E.A.R.S team. These are very compelling reasons to invest in this patented exhausted air recycling system.

E.A.R.S resolves the challenges with increased performance

When air compressors and air tools equipped with E.A.R.S are compared to the same non-E.A.R.S System, extensive testing has shown that the E.A.R.S System:

- Uses up to 40% less energy
- Generates up to 80% more air volume
- Reduces tool exhaust noise
- Reduces airborne contaminants
- Promotes a longer life cycle for the tool and air compressor



E.A.R.S makes us more competitive because we spend less to do business in our conservative way of saving energy. It's been one of the best things that we've done in business. I'd probably use two words: buy it. It'll be the best thing you ever did." Bob Goff, (Goff Collision Repair Centers of Wisconsin).



"This is a very interesting project on so many levels. It isn't every day you come across an invention in the compressed air field that you just know will have the possibility to change the entire industry. Being part of it is an exciting feeling..." Peter Damgren, (Product Manager CEJN, Sweden).



THE SIMPLE IDEA

The manifold solution

Chris Bosua, the inventor of the E.A.R.S system, had a trendsetting vision – to recycle the exhausted air from compressed air tools. He was curious and persistent enough to carry through with his idea despite the opposition and reservations of others. The result of his tenacity is the heart of the E.A.R.S system - the manifold.

Spectacular results

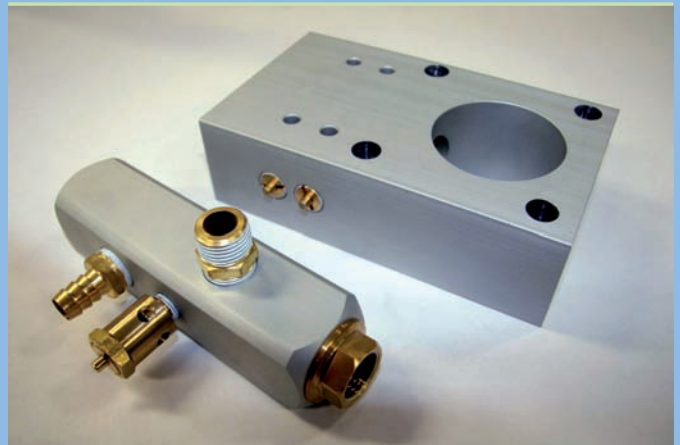
The manifold is a key piece of the E.A.R.S system as it allows the exhausted air from the air tool to flow into the compressor, forming a closed loop system. Circulation, therefore is practically closed as the compressor recompresses the air vented by the tool before returning it back.

It is this principle, therefore, that generates a wide range of advantages in contrast to more conventional compressed air methods.

In short: E.A.R.S and the E.A.R.S manifold set new standards in the entire compressed air technology...

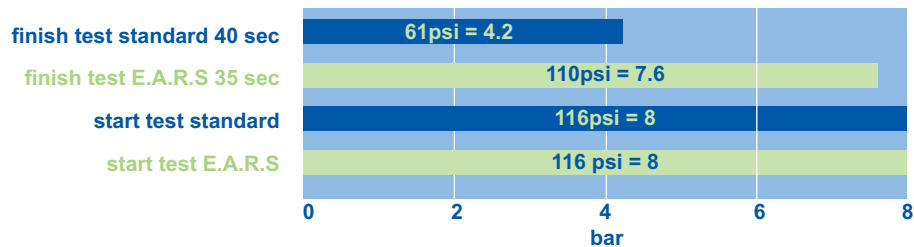


Installed E.A.R.S manifold



E.A.R.S manifolds for retrofitting

Tank pressure in bar (conversions listed), drilling 1" (25mm) brass*.



■ 3 HP E.A.R.S piston compressor
 ■ 3 HP standard piston compressor
 *as per manufacturers' instruction

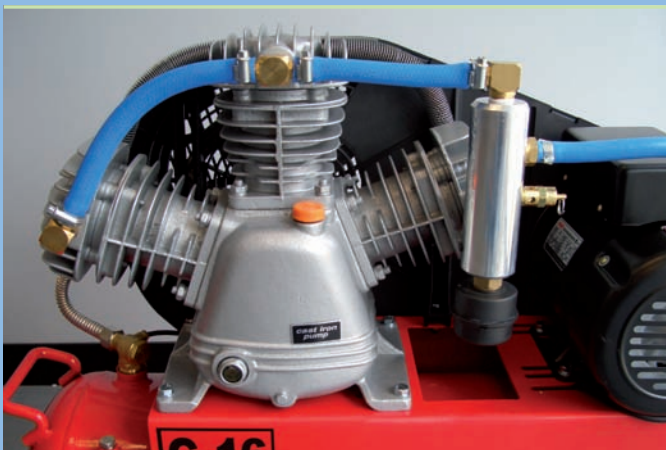


POWERFUL & LONG LASTING

Full constant power, low energy consumption

As it has already been compressed, the air re-circulated to the compressor is at a higher pressure than atmospheric pressure. The compressor therefore does not need to work as hard to maintain the pressure required. Within this closed loop system, the pressure and the volumetric flow remain almost constant. This helps shorten the re-loading time that the compressor needs to return to working pressure.

An E.A.R.S compressor works faster than a conventional compressor to maintain the air volume that is required. This fast attainment and maintenance of the required air volume reduces the compressor's power consumption and drives down the system's running cost.



Increased air volume, reduced running costs

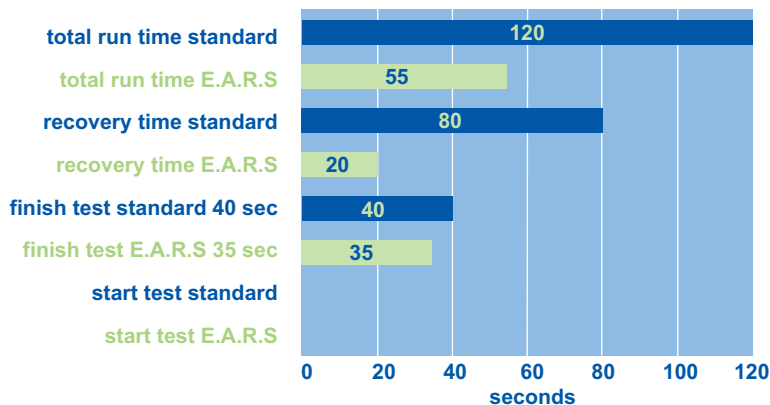
An E.A.R.S fitted air compressor delivers an air volume that could only otherwise be achieved by using a conventional compressor with a larger motor. Larger units are more costly and demand more energy when these costs are high. By retro-fitting a current compressor with E.A.R.S, you can save up to 40% in energy costs alone.

With E.A.R.S technology, an 11 kW compressor can generate the same air volume as a conventionally operated 18.5 kW compressor.

These two features alone allow you to save money on equipment purchases and save money on energy. Another added benefit is that your tools and equipment will last longer with the efficiency of the E.A.R.S system. Your system will work faster and more efficient with E.A.R.S.

With the wide range of benefits and savings that an E.A.R.S compressed air system provides, inventor Chris Bosua believes that, "with the rising cost of energy, the modest investment in new tools and retrofit kits will show an extremely attractive ROI."

Total Runtime in seconds of the compressor when drilling 1" or 25mm brass*



■ 3 HP E.A.R.S piston compressor
 ■ 3 HP standard piston compressor
*as per manufacturers' instruction

Compressor runtime vs. tank filling time:

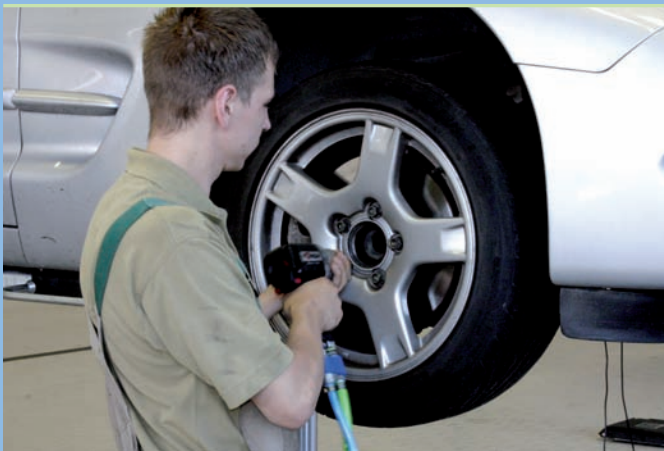
- Piston compressor using 240 V 2.2kW and delivers 11cfm (310 l/m)
- 3/8" DL-drill at 1,800 rpm consuming 20cfm (566 l/m)
- The blue line is without E.A.R.S, the green line is with E.A.R.S

E.A.R.S means higher performance with the same energy requirements!

QUIET, CLEAN & EFFICIENT

Heat and humidity kept to a minimum

E.A.R.S is a closed loop system, only drawing in ambient air when there is insufficient return air available. By recycling cooler and dryer air from the pneumatic tools (under pressure), the compressor runs cooler, and run times are shorter, decreasing wear and tear. This closed loop operation drastically reduces the moisture content in the compressed air supply. The more you use your pneumatic tools, the cleaner and dryer the air becomes.



Your tools will last longer

Clean air with less noise

With conventional compressed air systems, contaminants infiltrate exhausted air and considerable noise is emitted from the air tools. Even when filters and silencers are installed, noise levels can still exceed 120 decibels, levels that are hazardous to the operator as well as others in the vicinity. Studies have shown hearing loss at these noise levels can occur after only a few hours.

More than 4 million people employed worldwide are subjected to dangerous sound levels in the workplace. It has been shown that nearly 10,000 people employed suffer annually from noise induced hearing loss*. Noise reduction in the workplace should be a top priority, and to begin, you need to go to the source of the emission - the exhaust of conventional pneumatic tools.

The contaminants emitted from the air tool are a health and safety risk. Inhaling the exhaust air from the tools can mean breathing in rust, oil, mold, chemicals and fine particles from the compressed air tank and the wear of pneumatic tools.

The closed loop nature of E.A.R.S changes this equation decisively. Because the exhaust air is fed back to the compressor, emissions of dirty air and noise are eliminated. This dramatically improves the working environment and becomes a cleaner, quieter place.

**Test details: 1/2" impact wrench (38 cfm or 1080 l/m)
Variable speed drive compressor.
10 bar equals approximately 150 psi**

	without E.A.R.S	with E.A.R.S
10.0 BAR	85°C	78°C
2.0 HRS	AUTOMATIC	AUTOMATIC
ENERGY SAVINGS	0 %	35%
MTR1 POWER	12.9 KW	6.9 KW

This direct test comparison clearly illustrates that E.A.R.S gives you dramatic energy savings and a much reduced temperature at the air compressor pump.

Results of an independent noise test*

	Impact Wrench	with E.A.R.S	without E.A.R.S	with E.A.R.S	without E.A.R.S	with E.A.R.S	without E.A.R.S
		L Aeq dB(A)	SPLF max. dB(A)	C Peak dB(A)	L Aeq dB(A)	SPLF max. dB(A)	C Peak dB(A)
Free Running	At operator's ear	69.1	93.1	74.4	97.0	84.2	105.8
	3 ft or about 1 mtr away from operator's hand	68.1	96.8	70.2	99.7	82.6	111.9
Working	Tightening wheel nuts - at operator's ear	88.2	92.7	97.5	99.9	119.2	120.5
	Tightening wheel nuts - 3 ft or about 1 mtr from operator's hand	80.4	86.9	91.6	95.5	108.0	112.4

NOTE: Decibel ratings are logarithmic. A ten (10)db increase is 10 times louder. A twenty (20)db increase is one hundred times louder.

Example: A pneumatic tool that changes from 67 db to 89 db is 120 times louder.

* Acoustics PTY Ltd, Victoria 3165 Australia, July 2006



E.A.R.S System advantages

A comprehensive range of tests have proven the following benefits:

- Up to 80% more air volume at identical energy consumption
- Faster work, reduced start-up times
- Increased lifetime of compressor and tools
- Cleaner ambient air, less noise and improved working environment.

The advantages gained by E.A.R.S are easily recognised: Physically by the operator in the workplace due to productivity gains, financially due to reduced energy costs for the company, and environmentally by all.

Volumetric flow

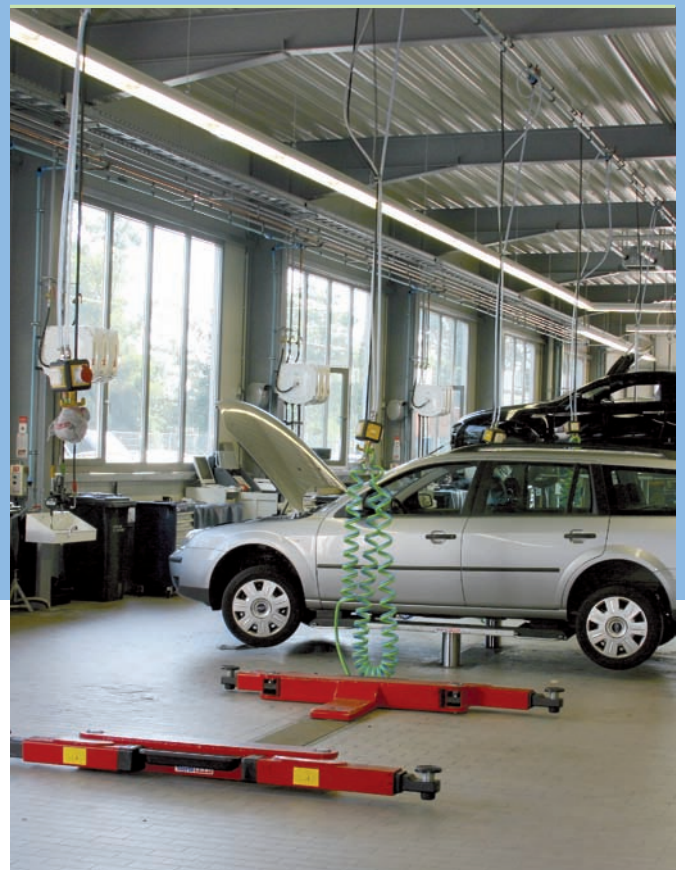
Due to consistent feedback of the exhaust air, E.A.R.S keeps the volumetric flow rate high – without E.A.R.S, there is a “break” in the flow after just 9 seconds.

The bottom line: increased efficiency all-round

There has not been such a change to compressed air technology in decades. Today, users of compressed air technology no longer have to settle for the status quo:

- The E.A.R.S system provides the answer to the most urgent questions of energy efficiency, climate protection and environmentally friendly working conditions.
- The E.A.R.S system is an investment for the future that pays for itself today and has clear competitive advantages of conventional compressed air systems.
- The E.A.R.S system provides solutions for both piston and rotary screw compressors.

Whether you invest in an E.A.R.S ready compressor, or have an E.A.R.S retrofit kit installed on your existing compressor, there is an E.A.R.S system to fit your needs.



E.A.R.S COMPRESSORS

E.A.R.S offers a complete range of compressors for every conceivable application. Sizes vary from 0.8 to 160 kW, from mobile 240-volt piston compressors to stationary screw compressors with inverter drive and frequency control.

EARS Compressor advantages

No matter which compressor you choose, you have significant advantages over conventional air compressors.

- E.A.R.S compressors are characterised by their high rates of delivery and low running and re-filling times, resulting in reduced power consumption.
- On average, 85% of the costs of producing compressed air within 5 years are for power consumption (9% equipment, 6% maintenance). When the compressor is at its optimal capacity, the integrated E.A.R.S system reduces the power consumption by up to 40%, thereby reducing operating costs.
- E.A.R.S compressors (and connected tools) have longer lives because they work at cooler temperatures with less moisture, thereby returning the dryer and cooler air to the compressor.
- E.A.R.S compressors are attractively priced both to acquire and to operate.



E.A.R.S Screw Compressor:
7.5kW, 145 psi, with max. 61.6 cfm (1745 l/m).

E.A.R.S TOOLS

E.A.R.S has the tools needed to do any task

E.A.R.S air tools are equipped with an integrated exhaust air adaptor that feeds the compressed air back to the compressor.

Many existing conventional air tools can be retrofitted with special adaptors by the E.A.R.S specialist. The range of compressed air adaptors is continuously updated in order to cover the varied range of compressed air tool manufacturers. This minimises the requirement to invest in new tools when retrofitting with E.A.R.S.

Spray guns and blow guns

Not all tools can be used for the E.A.R.S system because either the exhaust air does not run parallel to the drive air in the handle or the process air can not be fed back, for example, spray guns or blow guns. These devices can be connected to the normal pressure line and operated as before without limitations.

Robust and quiet, the range of E.A.R.S ready tools is broad enough to cover the general requirements for repair shop and industry. The range of E.A.R.S tools includes the following and much more. For more information, contact your E.A.R.S distributor.

- Impact wrenches
- Air ratchets
- Sanders and polishers
- Drills
- Screwdrivers
- Belt sanders
- Angle grinders
- Rod sanders



COUPLINGS, NIPPLES & FITTINGS

Success is all about good connections

High quality, reliable and easy handling – these criteria must be met by each and every component within the E.A.R.S system.

For all of your return and high pressure needs, E.A.R.S is proud to use state of the art compressed air piping systems. Made of durable PE (polyethylene), E.A.R.S piping is incredibly easy to install and is flexible for future changes or modifications. The PE piping provides maximum air flow to your tool.



Plastic – durable and flexible

The plastic couplings and a complete range of PE-100-SDR9 tubing, are completely airtight, UV stable and practical. The pipe system is easy to assemble and flexible enough to change for future needs. An installation wrench allows the coupling nuts to be easily tightened or quickly released.

For the Best connection throughout

E.A.R.S thrives on high volume air flow and using CEJN couplings and nipples, we have made no compromise in quality.

The twin-coupling especially developed for E.A.R.S flows up to 64 cfm (2,100 l/m).



E.A.R.S Couplings

Standard, safety and specially developed E.A.R.S twin-couplings are easy to handle while also being robust and durable.

HOSES & TUBING

Polyethylene Tubing PE-100 SDR9

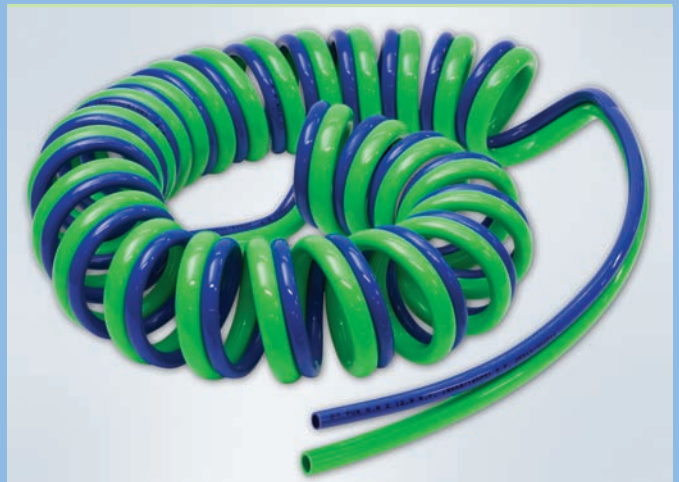
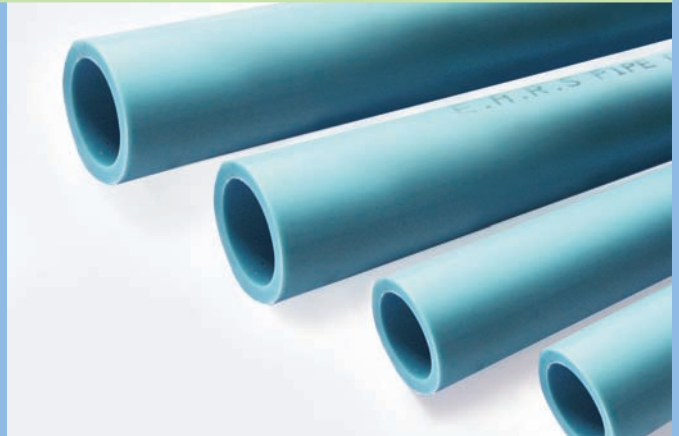
The polyethylene tubes are chemical resistant, abrasion resistant and resistant to UV light, with an extremely low expansion coefficient. The tubing is light and can be easily welded; it can be installed quickly and is ideal for clamping. Available in diameters from 25 to 110 mm (0.98 to 4.33 inches).

Aluminium Profile Pipes

The E.A.R.S aluminium profile combines the advantages of steel, plastic or copper. The aluminium tubing is corrosion resistant and has remarkably good flow characteristics. It is fast to assemble and any changes can be made quickly and easily, saving up to 50% of the time required in contrast to previously used systems. Available in four standard sizes from 20mm to 50mm.

Polyurethane Dual Hose Sets by CEJN

- Lightweight and durable, these ready-assembled dual hose sets are available in both straight and coiled versions.
- Coiled hose sets come in various lengths from 13' to 33' (4m to 10m) in total length.
- Straight dual hose sets are available in lengths from 10' to 39' (3m to 12m) in total length.
- Both hose sets are available in metric and fractional lengths.



AWARDS & RECOGNITION

The E.A.R.S system was first released in Australia with remarkable results and has already achieved a wide range of prestigious awards.

Awards In 2008

- Professional Tools and Equipment News “Innovation Award”

Awards In 2007

- E.A.R.S received the High Commendation among 2500 entrants at the prestigious Victorian Engineering Excellence Awards competition
- E.A.R.S has won the National OHS WorkSafe awards competition in Australia as the “Best Solution to a Health and Safety Risk”

Awards In 2006

- On the Australian ABC New Inventors TV Show, the E.A.R.S system won the first prize and was chosen as “Invention of the year 2006”, and on the New Inventors segment, E.A.R.S was the Episode Winner.
- The E.A.R.S System was a finalist for the “Innovic Next Big Thing Award”
- Motor Magazine awarded E.A.R.S the “Top 20 Tool Award”

Key Magazine Feature Articles

- Hot Auto Products in the USA
- Collision Repair in Canada
- Professional Tools and Equipment in the USA
- Aviation Maintenance in the USA
- Undercar Digest in the USA
- Woodworker in Australia
- Hire and Rental in Australia
- APA in Australia
- Hydraulics and Pneumatics in the UK
- Aftermarket in the UK
- * Body Magazine in the UK
- Machinery Market in the UK
- Engineering Magazine in the UK



E.A.R.S - Exhausted Air Recycling System

- Reduces power consumption
- Reduces tool noise
- Reduces airborne contaminants
- Closed air circulation
- Reduces the heat at the air compressed pump
- Less condensate
- Warmer compressed air tools
- Reduced compressor runtimes
- Increases air volumes
- Reduces the overall cost of compressed air systems

For information about E.A.R.S, please contact:

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