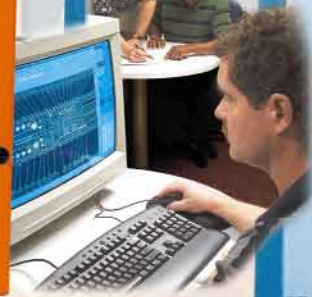
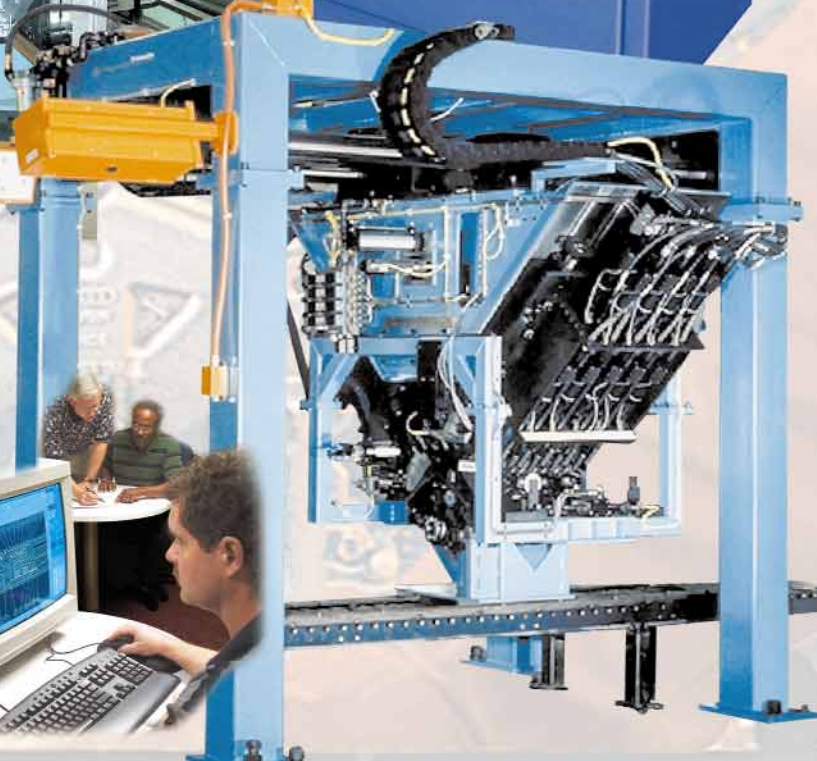
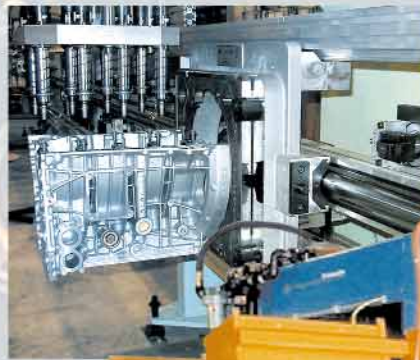
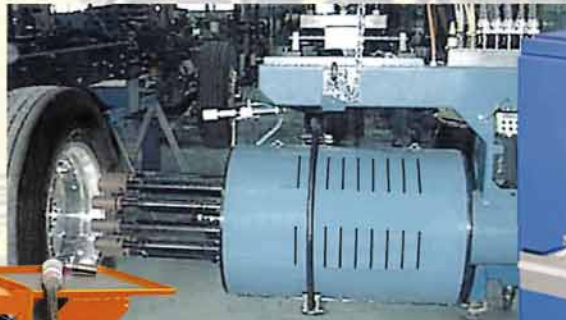


**Automated
Systems**

Automated Systems. Your Global Automation Solutions Partner.



COOPER PowerTools

Automated Systems Is Your Single-Source For Total Automation Solutions.

We are Automated Systems, part of Cooper Power Tools, a Division of Cooper Industries, which is a global multi-billion dollar corporation. Automated Systems, located in Auburn Hills, Michigan, provides custom solutions for the automated fastening of threaded joints.

Our global customers span the entire vehicle assembly market, including passenger cars and trucks, powertrain assembly, off-road vehicles, and agricultural machines. We support machine

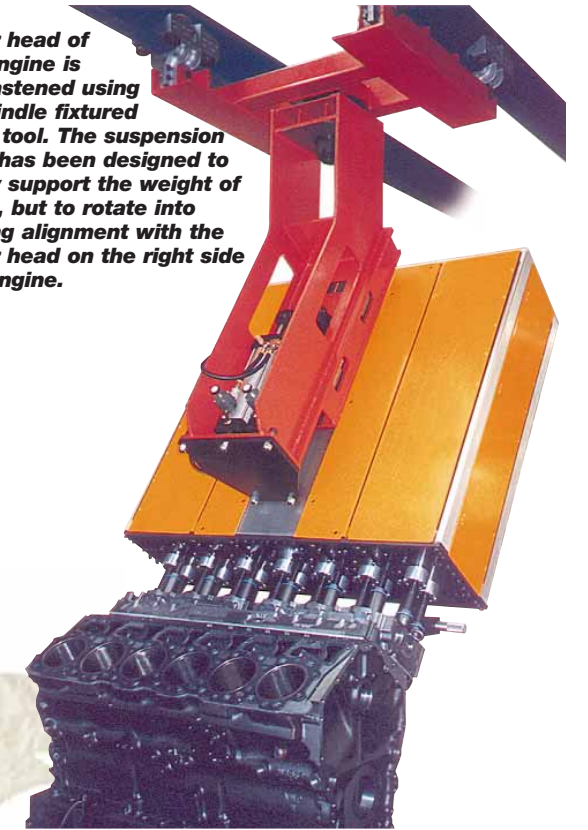
tool builders in the vehicle and industrial markets with custom fastening system designs based on proven fastening product building modules.

Over the past twenty years, Automated Systems has been providing customized solutions with training, service, and support. From single hand-held nutrunners to multiple spindle machines, our custom designed systems are used around the world in an interesting variety of applications.

This multiple has been designed with lateral and radial movable spindles which can fasten 4 or 5 bolts on two different wheel products.



The left cylinder head of a V12 engine is being fastened using a 26 spindle fixtured electric tool. The suspension system has been designed to not only support the weight of the tool, but to rotate into fastening alignment with the cylinder head on the right side of the engine.



Automated Systems european facility located in Westhausen, Germany. 240,000 sq. ft. manufacturing facility.



Metronix electronics facility located in Braunschweig, Germany.



Cooper facility located in Shanghai, China.



Recoules facility located in Ozoir-la-Ferrière, France.



Manufacturing facility located in Győr, Hungary.



Cooper Power Tools Division headquarters and manufacturing facility, Lexington, SC.



Automated Systems North American facility located in Auburn Hills, Michigan from which we provide full design and manufacturing capability.



Cooper Power Tools de Mexico located in Naucalpan.



Cooper Tools Industrial Ltda. facility located in Sorocaba, Brazil.

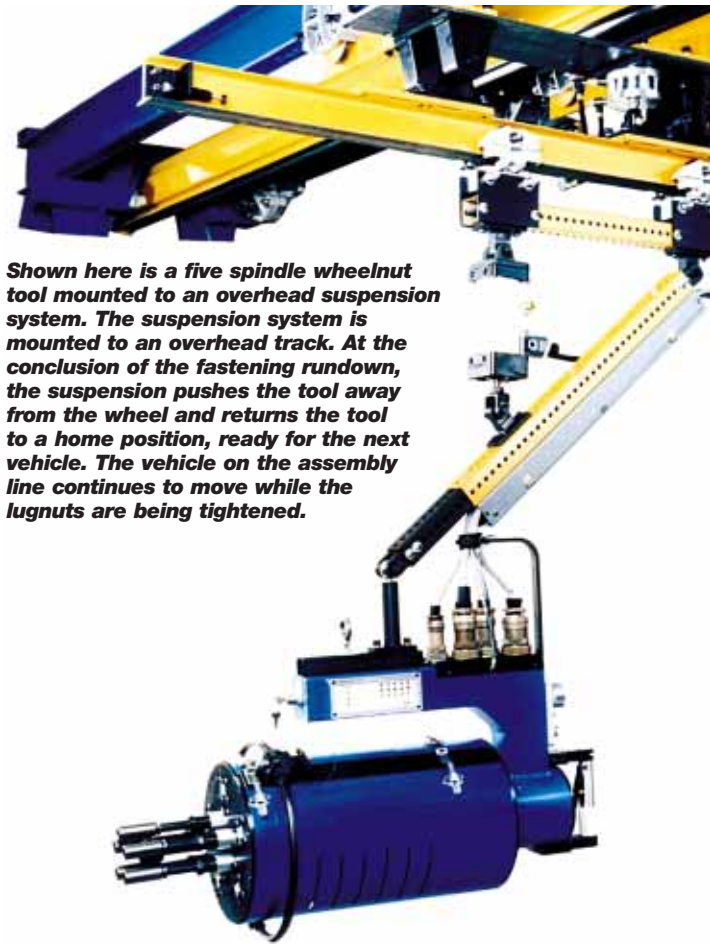


Repair bay operator is using a two spindle fixtured tool to fasten components of a wheel hub assembly.

Customized Automation Solutions

The custom designed equipment Automated Systems creates can be configured in either vertical or horizontal or orientations depending on the application and customer requirements. Designs may incorporate operator input or be fully automated dependent on the needs of the customer.

Automated Systems' products use high-efficiency electric motors manufactured by Cooper Power Tools specifically for this application. Available motor torques range from 2 Nm to 6,000 Nm. Motor spindles can be mounted and arranged to match any pattern using standard in-line, special offset, and 90° angle electric motors.



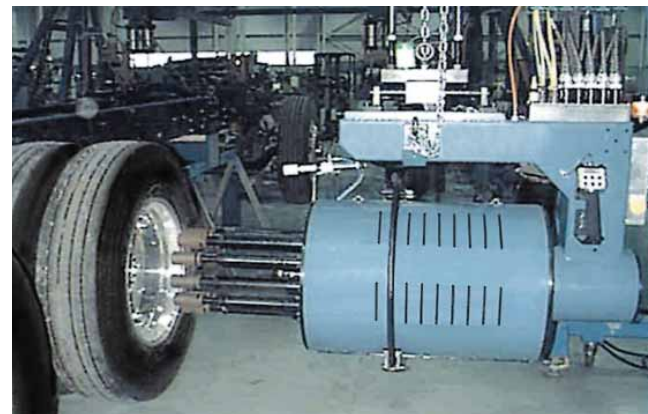
Shown here is a five spindle wheelnut tool mounted to an overhead suspension system. The suspension system is mounted to an overhead track. At the conclusion of the fastening rundown, the suspension pushes the tool away from the wheel and returns the tool to a home position, ready for the next vehicle. The vehicle on the assembly line continues to move while the lugnuts are being tightened.



Shown below is a semi-automated water-pump subassembly fastening station. This station design includes a safety light curtain and a 4 spindle fixtured electric tool.



Shown above is a semi-automated multiple for flywheel assembly application.



On top, a wheel lugnut tool prepares to fasten wheels to a commercial truck. Wheel lugnut tools are distinguished from standard horizontally aligned systems by their cylindrical shape because rotation is required for proper alignment with the wheel lugs. In addition, it has the ability to fasten alternate lugnuts with two successive rundowns. The equipment above is an alternative design for truck dual wheels. The system can automatically determine if the wheels are aluminum or steel and change the fastening parameters automatically.



An automatic station on an engine assembly line uses two opposing electric power heads, each having 8 spindles, and a center power head of 6 spindles.



Application Specific Assembly Solutions

Automated Systems' fastening controllers have been supplied from one to thirty-six spindles. The fastening controllers utilize the latest in Pentium CPU technology, supporting EtherNet and FieldBus communication protocols as specified by our users. Our controllers can provide a wide range of torque from 2 to 6,000 Nm with high accuracy and low scatter. The single and double-bay control panels shown can support up to 12 spindles within the single door panel and up to 36 spindles within the double door panel.

The new mid-six control panel is a wall mount design for up to 6 spindles with all of the same features as the larger panels.

All automated system controllers including the new single channel **Tork-Trak™** (T3M) utilize the proven **TM Multi-Trak** software set and are capable of operating all Cooper Power Tools DC electric product lines.



The new Mid-Six controller is a wallmount design capable of handling up to six spindles and has all of the features as the larger panels.



Our 3 channel fastening cart provides the same fastening functionality as our multi-spindle stationary designs. This unit is packaged as a very compact and mobile fastening cart and is used in pilot plants, repair bays, and on-line station repair.



The Tork-Trak™ controller is capable of handling a broad array of tooling from Cooper Power Tools. In fact, it will control all fixtured and portable DC electric tools offered by Cooper - covering a torque range of 2 to 4000 Nm.

In order to apply our powerhead designs, we also design custom suspension systems to provide support and movement. In addition to custom built stations fitted with fixtured nutrunner powerheads, Automated Systems designs, builds, installs, and provides service and support for complete fastening assembly lines.



This GardoTrans installation shows a vertical system for floor level transport on the DaimlerChrysler Stuttgart 4 cylinder engine assembly line.



The GardoTrans 3 rail horizontal transport system shown at left is a typical engine assembly application.



The single spindle and double bay control panels shown above have a capacity of up to 36 spindles. This controller is air conditioned, and supports EtherNet and FieldBus communications using Pentium-4 CPU technology. Also pictured above right is a single bay fastening control panel with capacity up to 12 spindles.

Training & Service Solutions

Automated Systems provides complete training and support services at your plant or ours. Additionally, Cooper Power Tools provides these services on its complete line of assembly tools.

In our demonstration and fastening training rooms, focus is on hands-on training of handtool and multi-spindle fixtured electric tools.

Our staff of highly trained field service technicians supply prompt on-site customer support, start-up and commissioning for all of our systems and products. Our staff is always available for short-notice service, support and to assist with on-site application studies.



ISO 14001: 1996



QS-9000:1998 TE Supplement

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