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## World Cars

BY STEVE ZWICK/DUSSELDORF

When it was unveiled at auto shows in 1988, the Magna Torrero's hybrid design turned heads in auto-company boardrooms from Detroit to Tokyo. But it never got a chance to tear up pavement like a Lotus Elise. Instead, parts of the Canadian company's prototype car are quietly helping Ford Contours, Volkswagen Golfs and Audi A8s roll comfortably down driveways around the world. "People keep asking us when Magna is going to manufacture our own car," company spokesman Paul Pivato says, "and the answer is never. We are not a carmaker."

Instead, Magna is something called a systems supplier. With more than 40,000 employees scattered across Europe, the U.S., Canada, Mexico, China and Brazil, it is one of a growing number of companies making ever larger and more complex parts of cars--like the metal-body exterior of BMW Z3 roadsters manufactured in the U.S., the instrument panel on the Jaguar XK8 and the passenger cell for the cute little Smart Car that German consumer Cerstin Stadler was eyeing disapprovingly in Bonn. "It looks like one of those kid's toys that come in chocolate eggs," she says. "You know, the ones you snap together."

That playful look--dreamed up by DaimlerChrysler and the folks who brought you the Swatch watch--is part of a "visible technology" motif that tries to make a fashion statement out of one of the biggest changes to hit the auto industry since Henry Ford started making flywheel magnetos on a moving assembly line in 1913. The car industry, like the computer and consumer-electronics industries before it, is going modular, and the percentage of a car that is actually manufactured by traditional car companies is getting smaller and smaller as a result. More and more of the cars of the well-known brands are composed of whole sections that instead come from specialized upstarts like Magna and from established engineering giants like Bosch in Germany and TRW in the U.S. These systems-manufacturing firms provide large chunks of car across the entire range of established auto companies and are taking on their own global role alongside the global auto assemblers. The advantages for the major carmakers include faster delivery times, more flexibility and more manageable inventories, as well as redefined labor arrangements. Another effect, as Magna's case illustrates, is a blurring of the distinction between parts supplier and automaker.

### Evolution in Language

Indeed, within the car industry, executives have taken to using the words car assembler and car developer in place of the old term carmaker. The evolution in

language mirrors the development of Magna, whose success Frank Stronach couldn't even have begun to dream about in 1954, when, at age 22, he left his native Austria for Canada with \$200 in his pocket and about the same number of English words in his vocabulary. Three years later he managed to start up a tool-and-die shop in a rented garage in downtown Toronto, and in 1960 he signed a contract with General Motors to produce sun-visor brackets for Chevrolets and Pontiacs. Over the following decade, Stronach pulled together a team of mostly German and Austrian tool-and-die workers to make more parts for more cars, and in 1970 he and some partners took over an aerospace-parts company called Magna Electronics Corp.

The new company was focused on the ground: it gradually began offering more and more components to the auto industry, from visor brackets to complete roof systems. As the order books bulged, so did Stronach's paycheck--by 1987 he had become Canada's highest-paid executive. Around that time, Magna's engineers developed the Torrero from the company's components inventory to drive home a point: it's not the parts that matter; it's how they fit together that counts. Dennis Blommers, a plant manager for Magna's Decoma division, which specializes in exterior systems, has been along for much of the company's ride to success; he now oversees 300 employees who engineer and make high-tech plastic bumper covers and grilles for Chrysler, GM and Honda at a plant near the company's headquarters in Aurora, Ont., about 20 miles north of Toronto. "Each year we get more and more into what the customers are asking for," he yells over the roar and hiss of 15 molding machines. "In the old days, a customer would have one supplier that shipped grilles from Idaho, and the fog lamps came from somewhere else. Now the whole piece is made here."

The trend toward comprehensive component systems had been gathering steam for decades, but it was the recession of the early 1990s that got things boiling, especially in Europe. With profit margins pushed beyond the agony point, companies began letting their suppliers do more of the engineering and preassembly of integrated systems in increasingly complex cars. Air-bag makers like Sweden's Autoliv, for example, started buying up or forging partnerships with companies that make sensors, steering wheels and other related products and offering car companies complete, preassembled safety systems.

That was only the start. Suppliers began making complete prefabricated front ends, back ends and middles of vehicles, and automakers began outsourcing the entire design, development and manufacture of certain car models like the Lincoln Navigator. The results of this shift can be seen in Magna's order book. Although European and American auto production inched up only slightly during fiscal 1998, the company's sales topped \$6 billion--a 19% jump over 1997. "Systems suppliers are getting a bigger piece of the pie," says Anders Franzen, vice president for strategic sourcing at Sweden's Volvo, which is now in the process of being purchased by Ford.

In fact, one of the reasons Volvo, which makes only 400,000 cars a year, was able to survive as an independent car assembler until this year was its innovative and extensive use of systems suppliers in previous years. A few years back, Volvo's engineers teamed up with Autoliv to develop safety systems that incorporated side air bags, and safety-minded Volvo got a one-year exclusive deal to use the systems. Going modular helped Volvo offer more flexibility on a limited range of basic models. "With the traditional assembly process, you can usually manufacture just one car per assembly line," Franzen says. "In our case, being one of the smaller players, we don't have the volume to justify setting up multiple assembly lines, so we have to use one line for all the varieties of a

model."

### **Outsourced Assembly Lines**

Micro Compact Car (MCC), the DaimlerChrysler subsidiary that assembles the Smart Car, has taken that idea further than any other company. Its plant in Hambach, France, is really seven separate factories, each occupied by a different systems partner. The chassis is shuffled off to a subfactory run by the German firm of Krupp Hoesch Automotive, where the power module is installed. Bosch plunks down the front end, which includes the cooler, headlights and crash box. German plastics, chemical and industrial-ceramics company Dynamit Nobel snaps on plastic body panels and the whole vehicle is done in four hours--down from the 20 or so it takes a traditional car manufacturer. "It's an admirable experiment," says Volvo's Franzen. "They've gone and outsourced the assembly line itself. The entire industry is looking at it with interest and, I must admit, skepticism because assembly is also a core competency."

With outside providers supplying more and more of the finished product, auto assemblers talk a lot about core competencies these days, which essentially means defining what a company does best and then focusing energy on that activity. For the Smart Car, Mercedes made sure it kept the engine design to itself, while the chassis is that of a Mercedes A-class sedan. The car's styling comes largely from SMH Automotive, the Swiss company that uses modular design to make Longines and Swatch watches (Smart, in fact, stands for Swatch-Mercedes art). SMH owned 19% of MCC until Daimler-Benz bought its stake in MCC before merging with Chrysler in October. "Basically, you could say the Smart's design, engine and chassis platform were all done by the assembler, because Swatch was an owner at the time," Franzen says. "These three things will always be done by assemblers themselves, but it's up to each developer to define its own core competencies and then outsource the competencies it feels can better be handled by a more specialized provider."

Even such proprietary items as engines and overall design may be up for grabs. Volvo and Renault supply each other with engines for some models, and the high-performance British motorcar company Lotus says 10% of new cars made in Europe will carry engines of Lotus design next year. Lotus spokesman Alastair Florance says the company's new modular V-8 motor can be dismantled, reconfigured, expanded or contracted to fit virtually any car. Lotus, which is owned by Malaysian carmaker Proton, earned more money advising other carmakers last year than it did selling its own legendary road burners.

### **Shared Platforms**

So what do car assemblers actually make these days? "Car assemblers have cornered the market on chassis platforms, and no modular provider wants to start making those, at least not in Europe," says Jurgen Kruschwitz, head of SMH Automotive. "Outside engineering consultants like Lotus may play a larger part in certain functional situations, but the car companies know how to protect their own design and competence."

Udo Liesenfeld, Magna's European spokesman, agrees. "The manufacturers are using shared platforms to bring more and more niche vehicles to the market. Those platforms are what everything else is based on. We design a module to fit an existing platform, but it's the carmakers who define the platform." Assemblers usually settle on one or two preferred suppliers for each model, but there is always another supplier ready to jump in if one or more of the chosen stumble. "If Magna doesn't provide the best price, GM can go down the street to somebody else," Magna's Blommers explains.

Outsourcing of entire systems does more than save money. It gives customers unprecedented freedom of choice. "The new S80 is built 100% to customer order, and virtually every car is different," says Volvo's Franzen, who credits systems suppliers, and their willingness to provide finished modules in sequence, with making that practicable. "Just think of something as simple as door panels," says Franzen. "There are four to five basic colors per car line, plus various internal surfaces such as textile, leather or wood trim, and then there are electric and mechanical mirrors. For just one car model, 3,000 variants of door panels exist." That's far too many for an assembler to handle. Explains Franzen: "The systems partners chop the elephant into more manageable chunks."

One key is that the chopping happens close to home, which reduces outsourcing costs and keeps jobs nearby. Volvo, based in Goteborg, Sweden, has turned an old shipyard in the nearby town of Arendal into a supplier village, where nine supplier partners construct components and subsystems and line them up in the proper order before shipping them to the assembly plant. It all happens in double-quick time. "We give them eight days' notice to get the quantities together, and then we give them four hours' notice to do the sequencing," Franzen says.

"Think of those 3,000 varieties of door panel," he continues. "If you assembled those in southern Germany, you can imagine what kind of pipeline you'd need to deliver them in sequence. The number of manufacturing jobs associated with Volvo has gone up 300 in the past year, but our own head count has gone down."

The company that is buying Volvo's carmaking division is no slouch at sequencing either. In Saarlouis, Germany, Ford representatives show off a 3,000-foot-long ski-lift contraption that feeds 58,000 sequenced components daily into the company's assembly flow, replacing 3 million miles' worth of truck travel over the course of the year. The modular scheme will enable the company to offer the same diversity of car models on just 16 different chassis by next year, down from 32 platforms in 1998, as part of an overall plan to trim yearly costs \$1 billion worldwide.

### **New Designs**

Systems providers also change the way cars are designed. "First, the existence of these suppliers speeds up the development of the components themselves," Franzen says. "If you are a car manufacturer and design your own seats, you will probably have a new generation of seats every 10 or 15 years. But if you go to a megasupplier, it will probably have eight seat generations in parallel development at any given time. This leads to the second big advantage: it frees up engineers to concentrate on the things that make the designs unique because they don't have to do a lot of detailed engineering work."

Ford purchasing boss Hans-Peter Kunze says his company intends to work even more closely with suppliers in the future. That will mean assigning more and more work to a smaller number of systems partners, who will in turn contract the work with more outsiders. As a result, the number of suppliers dealing directly with Ford is expected to continue dropping. "For the Escort, we worked with about 700 suppliers directly, and for the new Focus it's only 210," he says, talking about Ford's European models. "For the car we're planning as a replacement for the Fiesta, it will be 100 maximum."

As a result, competition among suppliers is kicking into overdrive. In Europe, the myriad small companies that have traditionally fed the industry are

...many of the smaller companies that have traditionally led the industry are clumping together in consortiums or getting bought by bigger companies. Dynamit Nobel is part of Germany's Metallgesellschaft. Budd Automotive, which introduced the all-steel body in 1914, is now part of Thyssen Budd Automotive, which will soon be folded into emerging industrial conglomerate Thyssen Krupp AG. Carmakers themselves are also creating new players. Both Ford and GM have turned their component divisions into distinct profit centers with fancy names like Visteon and Delphi, and Renault and Fiat recently announced they were blending their foundry activities into a \$2 billion-a-year systems supplier.

German auto-industry analyst Michael Schickling predicts that soon "there will be 10 to 15 assemblers worldwide, with a corresponding number of major systems suppliers, and the systems suppliers will keep buying and selling divisions as they define and redefine themselves." In the welter of change, the so-called systems partners are finally emerging from the shadows to become significant names in their own right. Perhaps one day they will start pitching their product directly to the public. Who knows, maybe "Auto by Magna" will replace old rubrics like "Body by Fisher."