TESTS: MERCEDES 6.9, LOTUS ESPRIT,
DIESEL RABBIT, FORD FIESTA & PEUGEOT 604

ROAD & TRACK

JULY 1977 UK 65p $1.25

Volvo's Elegant New $14,000 Bertone Coupe

CHEVETTE – THE AMERICAN MINI AFTER 24,000 MILES

DeLorean

Rear-Engine Giugiaro Design with Stainless Steel Skin on a Plastic Chassis

THE DELOREAN CAR

A rear-engine, plastic body/chassis, stainless steel, gullwing, 2-seat sports car from the man who brought you the original Pontiac GTO **BY JOHN DINKEL**

JOHN Z. DELOREAN digs cars. You have only to glance down a list of some of the projects he was involved with while at General Motors—the original Pontiac GTO, the 1967 Pontiac Firebird, the Chevrolet Monte Carlo—to appreciate his feeling for things automotive. Since his self-imposed exile from General Motors four years ago, DeLorean has been quietly formulating plans to build his own car. Having witnessed DeLorean's free-style way of doing things while at General Motors, it's no surprise that his sports GT—from the rear-engine design to the plastic body/chassis with stainless steel outer panels—is totally at odds with GM's ultra conservative corporate structure. He's even planning to build the car in Puerto Rico!

But let's back up to the beginning, to the summer of 1974 when plans for the DeLorean were first being formulated. One of the first people to join DeLorean was Bill Collins, as Chief Engineer, after 16 years at Pontiac. "I joined John in October 1974," Collins said, "coming off the 1977 GM B-car program (a corporate description of General Motors' full-size cars). It was obvious to us that the place to start with a new automotive company was in a market where being unique is a virtue. That way you're not going up against the Chevettes and VWs of the world.

"We started out with John saying he wanted a mid-engine/rear-engine 2-passenger car with outstanding styling, including gullwing doors, that combined advanced safety features with good performance and good fuel economy. The other side of the equation was that the car was to use the plastic processes for which John had acquired a number of U.S. licenses from Shell, Dow and Freeman Chemical companies. No dimensions had been picked, so before going to a stylist we sat down and decided what we wanted for such things as minimum ground clearance with the suspension fully deflected, ride travel and head room, and then we built up a people package based on what was acceptable for a person who is 6 ft 4 in. tall." (Collins is 6 ft 3 in. and DeLorean is 6 ft 4 in. tall.)

In December 1974, Collins and DeLorean went to Italy for the Turin Auto Show and met and talked to the big four designers—Bertone, Michelotti, Pininfarina and Giugiaro of Ital Design—looked at all the cars they had done and asked each for a formal quotation to do the styling. "We decided we liked Giugiaro best," Collins said, "and we turned him loose with the basic package in March 1975. By that time we had picked a width and a wheelbase, though the latter has floated a bit as we looked at various powertrains. The relationship with Giugiaro was great," Collins continued, "because when I told him I wanted a particular clearance, he provided it.

"There were only a few little areas where we had minor disagreements with Giugiaro. The first rendering of the car had completely blind quarters and my instincts told me I wouldn't be able to see out of that area. I wanted to look at louvers like the Pontiac Grand Am had, but Giugiaro and John preferred putting glass in that area. Then, Giugiaro was having a hell of a time with the knee restraint system. I suggested he integrate the knee restraint into the door armrests so it looks like a styling feature similar to the dash-armrest treatment used in the Lancia Scorpion, and that worked out well.

"Some of Giugiaro's early sketches had hidden headlamps and John decided, and I agreed, that we didn't want hidden headlights on the car. They're just a pain in the neck and most of the time they don't work very well. In retrospect, when I saw the Lotus Esprit and the Porsche 924 I was really glad we made that decision because the front ends of those cars are all getting to look pretty much alike. The finished styling model was shipped to us in July 1975 and I think Giugiaro did an incredible job, having to face up to knee restraints and 10-mph bumpers."

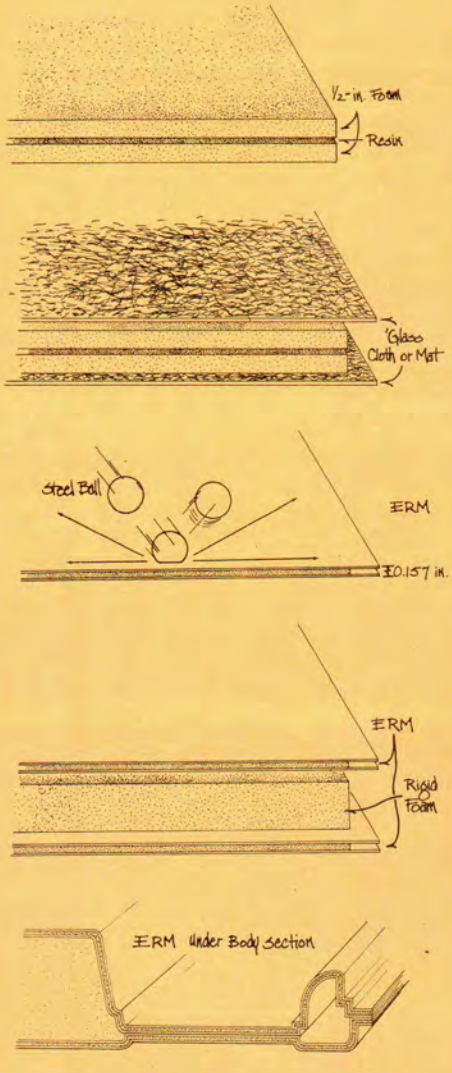
The first running prototype was finished in October 1976 and one of DeLorean's objectives was spending enough time to make sure the engineering was right. "We're going through a second set of wind tunnel tests at Cal Tech, with a fifth scale model," Collins said, "and it's the only car I'm aware of in the world that will have a perfectly flat bottom. The drag coefficient is around 0.30–0.35 and we also did some work with the front air dam configuration and the basic attitude of the car."

➟

PHOTOS BY JOHN LAMM

DeLorean has only about five engineering people working for the company, including Peter Giacobbi, Director of Engineering, who lived in Italy for 12 years and built his own one-of-a-kind sports car there. Much of the engineering work and drawings is being done by subcontractors. Mike Pocobello at Triad, who worked for Chevrolet Research and Development, was Chief Engineer for Jim Hall and now runs his own engineering service, worked on the first prototype. Creative Industries in Detroit is doing the detail drawings for the second prototype which will be on the road around the end of July 1977.

In addition to the first two prototypes, Collins' intention is to build 10 more starting at the end of this year. These cars will be used for durability work, for crash testing and for proving out the unique plastic construction. "What I'll do first is a basic 5000-mile accelerated durability test over a course like GM's Belgian blocks and then a 50,000-mile general durability run," Collins said. "Durability testing will continue right up to production with



ERM plastic sandwich starts (top to bottom) with resin placed between two ½-in. thick pieces of open-cell foam. Fiberglass or cloth mat is placed on either side and pressure is applied, compressing the laminate to about 4 mm thickness. ERM is very energy absorbent because foam core spreads out the impact forces. For thicker sections, layers of ERM can be placed on either side of high-density urethane of the proper shape and thickness to form such things as the underbody section.

PHOTO BY DEAN KOGA

the first car scheduled to roll off the assembly line in late 1978."

As the photos show, the DeLorean is a modern closed 2-seater. The styling is crisp, clean and handsome and Giugiaro has done a remarkable job of integrating 10-mph safety bumpers into the overall styling. The rear quarter treatment reminds me of the Maserati Merak and Bora and the front end is a little reminiscent of the Lancia Scorpion. For an expert's opinion I refer you to Werner Bührer's excellent styling analysis which accompanies this article.

Curb weight of the first hand-built prototype is 2340 lb but Collins expects a production DeLorean to tip the scales at just about 2200 lb. Here's how it compares dimensionally to some current sports and GT cars:

	Wheelbase, in.	Length, in.	Width, in.	Height, in.	Curb Weight, lb
DeLorean	94.9	165.4	72.8	46.0	2200
Chevrolet Corvette	98.0	185.2	69.0	48.0	3540
Datsun 280Z	90.7	173.2	65.0	51.4	2875
Ferrari 308 GTB	92.1	166.5	67.7	44.1	3085
Lancia Scorpion	90.6	156.1	66.8	46.9	2375
Lotus Esprit	96.0	165.0	73.2	43.8	2350
Maserati Merak	100.4	169.3	71.0	46.5	3260
M-B 450SL	96.9	182.3	70.5	50.8	3780
Porsche 911S	89.4	168.9	63.4	52.0	2475
Porsche 924	94.5	170.1	66.3	50.0	2415

It's interesting to note that the car closest to the DeLorean is the Lotus Esprit. Collins expresses a lot of admiration for Chapman's Esprit, citing only a lack of head room for his 6 ft 3 in. frame as a major drawback. (Chapman is only 5 ft 8 in., which probably explains the limited head room.) Collins is impressed with the Esprit's ride, handling and performance and it's interesting to note that both cars were styled by Giugiaro and are of lightweight plastic construction.

Bill Collins, Chief Engineer, explains ERM's composite structure.

Construction

TECHNICALLY THE most interesting aspect of the DeLorean is the structure. The most appropriate names for the chassis-body construction would be "plastic sandwich" or "plastic laminate" and in this respect it's quite similar to the XP-898, Chevrolet's radical Vega-based sports car (R&T January 1973). Essentially the process starts out with two ½-in. thick pieces of open-cell urethane foam forming the core of the laminate. Epoxy resin is placed between the foam and then whatever else you want—a layer of fiberglass mat, cloth mat or a combination of fiberglass and cloth—is placed on each side of the foam. Then the whole sandwich is put into a press and compressed. In effect you are squeezing a sponge—the open-cell foam—forcing the resin through the foam into the fiberglass mat and out against the surfaces of the mold. It's a low pressure process requiring only 50–150 psi, and when you're finished you end up with the resin and the fiberglass mat out on the surface on either side of a densified rigid foam core about 0.1 in. thick, which is what's left over from the open-cell foam after you've squeezed down on it. DeLorean calls the process Elastic Reservoir Molding or ERM—reservoir because the foam is a reservoir for the resin.

Plans are for the basic structure of the car to be made from ERM. The underbody will be built of upper and lower halves bonded together with a flange running all the way around it. So bonded, there remain voids between the plastic panels. If necessary, urethane of various densities can be foamed through holes in the body for localized strengthening or sound deadening. A 15-gal. bladder-type fuel cell will be pushed into the tunnel area after the two halves of the lower body-chassis have been joined. When you stop to think about it, this is probably the most rigid and best protected area on the car. The upper part of the roof, the rollbar, windshield pillars and probably the top of the plenum will be molded in one big part, again in two halves that will be molded or glued to the lower body. Conduits will run the length of the lower body allowing the wiring loom, clutch and throttle cables and radiator tubes to be installed.

For such things as the front deck lid, the ERM process is taken one step further. In the center of the mold you place high-density urethane of the proper shape and thickness. On either side you place layers of open-cell foam, resin and fiberglass mat. On one side of this sandwich you place a pre-stamped stainless steel panel and on the other a vinyl material. Apply pressure and, *voilá*, out of the mold pops a finished deck-lid panel. The engine cover will be ERM without a stainless outer shell. The front fenders and rear quarter panels will be of 0.035-in. stainless without ERM inner panels and will be mechanically fastened to the body, not bonded on. This was done for the sake of repair and also because of draft angle considerations.

"One of the things I like about ERM," Collins says, "is the weight factor. The steel normally used for car bodies is 0.035 in. thick and weighs around 1.5 lb/ft²; 0.035-in. aluminum, which really isn't suitable for body panels, weighs about 0.5 lb/ft²." The 4-mm (0.157 in.) thick ERM used for the DeLorean is down around the range of 0.9–1.0 lb/ft² so Collins can approach the weight of an all-aluminum car in plastic.

The first prototype is hand laid-up and isn't made of ERM because this requires at least making matched molds. "I'm not going to make matched molds until my next set of prototypes," Collins said, "but the nice thing is that because ERM is a low pressure process we can make epoxy molds and build parts. We won't have to wait for steel dies which would be true if we were using sheet molding compound (SMC). Another thing, if I discover a weakness in some area of the car during the development program, I can throw in extra fiberglass or carbon fibers or Kevlar to increase the rigidity without changing the mold. We'll use steel dies for production tooling, however," Collins continued. "That will allow us to make the car in SMC if for some reason we find there's a problem with ERM."

Why stainless steel for the outer surfaces? According to Collins, one of the primary reasons is that the companies which developed ERM haven't solved the paint finish problem. "So with a whole new process, rather than trying to address the painting problem John decided to use stainless skins. From a cost standpoint, the use of stainless can be justified," Collins felt. "There are less than 100 lb on the outside of the car and while normal steel costs about 10¢/lb and stainless costs 80¢, that $70 price disadvantage can actually become an advantage after you subtract the normal costs of painting a car. Someday we'll have to address the problem of painting the cars. You can't paint stainless but the way the car is constructed you could make stamped steel panels, paint them and hang them on the same way as the stainless panels.

"Our experience with how the stainless will wear or weather is based on the Allegheny Ludlum cars. That 1936 Ford they built looks super," Collins said. "That's one of the reasons we're not using aluminum. The aluminum companies were interested in ⟶

doing the car, but I asked them if the exterior would look like the outside of a Boeing 747 at all times. Even the aluminum people admitted it's a good thing 747s don't drive around on salted roads." To clean the DeLorean's brushed stainless finish, Jerry Williamson, Special Projects Manager, recommends either Scotch Bright Barbecue Grille Cleaner or a strong detergent such as 409 (honest!).

The DeLorean is being designed for 40-mph barrier impact occupant survivability. One of the ways this is achieved is by using ERM. "ERM absorbs a great deal more energy than SMC," Collins explained. "If you drop a steel ball on a sheet of SMC it breaks through the back side in about two hits. We have panels of ERM that have been hit 250 times, and while you can see a little distress at the back side, it doesn't break through because that rigid core can't transmit the forces to the inner panels. The forces spread out inside the core which is super from an energy-absorbing standpoint. Also, putting the engine at the rear allowed us to design the front end to crush at a controlled rate in a crash. Of course, in a frontal crash of a rear-engine car there's a tendency for the engine to go forward, but we feel the DeLorean's structure is strong enough to take care of that.

"For 40-mph survivability, you've got to have an air bag," Collins continued, "and we're testing bags with Eaton. The crash tests will be run without seatbelts but the production cars will have belts because I'm a firm believer in them. Shoulder belts will be optional because in Europe you have to have them. We think the car is marketable worldwide and when Giugiaro designed it he took into account the lighting and safety rules that exist in Europe." Collins also expects to achieve 10-mph bumper protection on the DeLorean by using a soft elastomer material similar to what Pontiac uses, backing up the soft bumper with reinforced body structure.

Unlike the XP-898, the DeLorean's body doesn't use metal as a local reinforcement, but the major mechanical components are attached to either a steel front crossmember or a steel rear subframe assembly. In the first prototype, both assemblies are stainless, but whether or not this cost can be justified in production hasn't been decided. The front crossmember and the rear subframe attach to the body via rubber donuts which also aid road isolation.

The first DeLorean prototype has a remarkable chassis stiffness of about 8000 lb-ft/degree of twist. This compares to only 3900 lb-ft/degree for the XP-898, 3076 for the Porsche 914 and 7500 for the TR7's monocoque body. "This is about where we'd like it to be," Collins said. "If you can get the basic beaming and torsional stiffness high enough, you don't spend the rest of your time engineering out all the little things that shake, rattle and squeak or are excited by the wheel-hop frequencies."

Engine & Drivetrain

ALTHOUGH DELOREAN initially thought about installing a Ford V-6 in his car, the first prototype is powered by a 2.2-liter Citroën CX 4-cylinder engine and transaxle and future cars will be fitted with the Renault 30 powertrain, featuring the aluminum V-6 shared with Volvo in the 264 and Peugeot in the 604. The advantages of using an existing developed drivetrain are many. First, it eliminates having to design castings to mate the engine to the transaxle and devising a system to transmit power from the engine to the wheels. Second, and even more important, as long as DeLorean retains the same emission controls as the engine already certified in the Renault 30, and as long as the car's inertia weight is equal to or less than the Renault 30, the DeLorean can ride on the coattails of the Renault's durability deterioration factor. All DeLorean has to do is run a 4000-mile emission certification test, instead of the 50,000 miles Renault has to cover.

In the Renault 30 the engine sits ahead of the transaxle. By shifting the whole powertrain rearward you could have a mid-engine car, but the problem with that, according to Collins, is that servicing the front engine accessories becomes a nightmare and the engine intrudes into the passenger space. "We really like the idea of having someplace for a driver to stow a briefcase or an overcoat," Collins said. "In a Lotus Esprit or a Fiat X1/9, for example, you have no place to put things. By turning the drivetrain around and making the DeLorean a rear-engine car we are able to provide stowage space behind the seats. And there's no real problem with engine rotation. All you do is flip the ring gear over on the other side of the pinion and everything turns in the right direction. The R30 powertrain weighs about the same as the Citroën's and by moving the radiator up front we maintain the 38 percent/62 percent front/rear weight distribution of the first prototype. We'll offer the same 4-speed manual gearbox and 3-speed automatic available in the Renault 30. Computer runs using the 4-speed indicate a 0–60 mph time of less than 8.0 sec and EPA fuel economy is estimated at 22 mpg in the city and 29 mpg on the highway assuming an inertia weight of 2500 lb.

Steering, Suspension & Brakes

"I SAT down with Mike Pocobello, a super chassis designer, and we talked about the kind of handling we both like," Collins said. "Then I let him pick the basic geometry. The first prototype has a Pinto upper control arm and knuckle and an elongated Pinto lower control arm. The independent rear suspension consists of upper and lower A-arms and coil springs and is a DeLorean Motor Corporation design. The rear geometry is designed for almost zero static camber with minimal camber change during wheel travel and a negative scrub radius (like VW uses at the front of the Rabbit). This reduces the power-on power-off steer problems you have with a rear-engine car. We've used existing production parts wherever possible because it allows a considerable cost savings. And we tried to integrate production parts in the rear suspension, too, but that's really tough." Steering is by Pinto rack and pinion and in the second prototype the car will have the power gear ratio in the manual box. Disc brakes without vacuum assist are fitted front and rear and Collins is currently using Bendix European calipers.

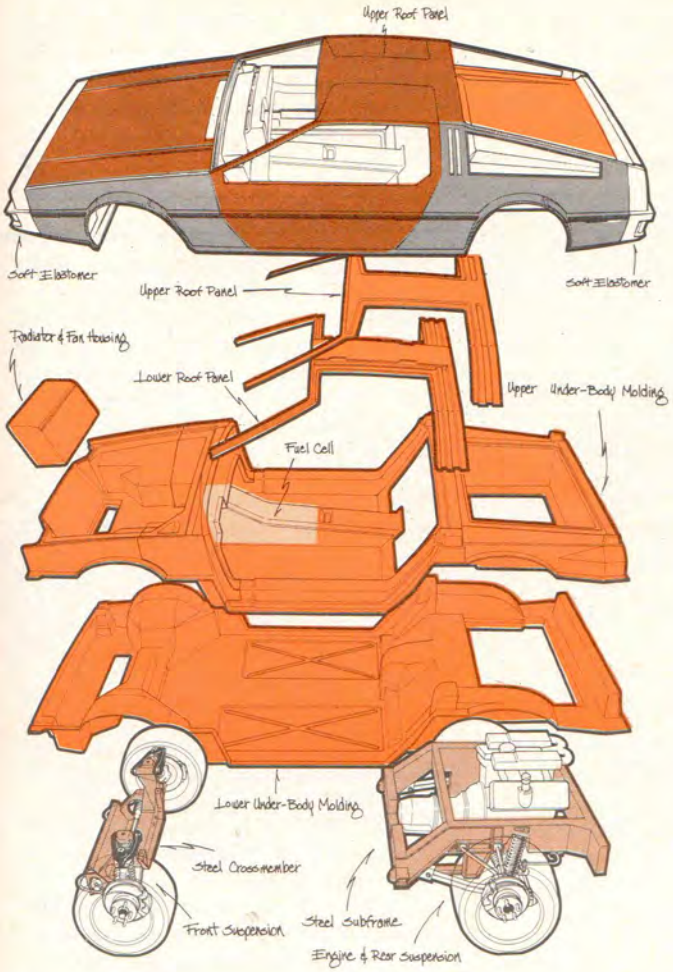
The car was designed around Pirelli P7 radials—195/50VR15 on 6 x 15 in. cast alloy wheels up front and super wide 265/50VR-16s on 8 x 16 in. wheels at the rear. "John has always had a leadership role in the area of tires," Collins said. "The first time Detroit really started doing something with tires was those redline tires on the 1964 GTO and at Pontiac we always tended to put fatter-looking tires on our cars. The tires are biased in size rather than pressure to handle the difference in weight front to rear.

"Our goal," Collins continued, "is to achieve a lateral acceleration figure above 0.9g in a car with basic mild understeer because that's really what the guy who's driving around in the real world is comfortable with. I really think balanced transitional handling is more important than setting the car up for some race driver. The Firebird and the Grand Am are the types of cars I'm talking about, not as far as ultimate cornering power is concerned, but for normal street driving. Handling is a very subjective thing but, personally, I don't like cars that roll, so I've fitted anti-roll bars front and rear."

Ride is also a major consideration and I think Collins has provided what would seem to be quite generous wheel travel, a total of 7.0 in. up front and 7.3 in. at the rear. "It's our intention to provide high quality shock absorbers, probably gas filled," Collins added.

Interior & Trunk

ALTHOUGH I wasn't allowed to drive the first prototype because of insurance reasons, I spent some time in the cockpit which allowed me to form some general impressions. Lifting the gullwing doors is easy as they are light and supported by gas-filled struts. However, they don't open far enough and I was told later that the doors on the first prototype don't open to design specifications. Stepping over the wide structural sills I slipped behind the padded small-diameter steering wheel with a hub designed to house an air bag, settled into the contoured and angled 1-piece bucket seat and reached up and closed the door. The prototype has plastic sliding windows that were a bit sticky to open or close. Collins is aware of this and concedes that fitting windows in gullwing doors is tough because of problems with



ERM Stainless ERM & Stainless Steel

Underbody of the DeLorean consists of upper and lower halves of ERM that are bonded together. The upper body structure is molded as one part, again in two halves, and is bonded to the lower body. Front deck lid is stainless steel bonded to ERM; doors may be of this construction also. The front fenders and the rear quarter panels are made of stainless without ERM inner panels and the engine cover is ERM without a stainless outer shell. Running gear attaches to either the front crossmember or the rear subframe assembly.

DELOREAN DMC SPECIFICATIONS

GENERAL

Curb weight, lb	2200
Wheelbase, in.	94.9
Track, front/rear	63.5/59.8
Length	165.4
Width	72.8
Height	46.0
Fuel capacity, U.S. gal.	15.0

ENGINE

Type	sohc V-6
Bore x stroke, mm	88.0 x 73.0
Displacement, cc/cu in.	2673/163
Compression ratio	8.2:1
Bhp @ rpm, net	est 120 @ 5500
Torque @ rpm, lb-ft	est 150 @ 2750
Fuel injection	Bosch K-Jetronic

DRIVETRAIN

Transmission	4-sp manual
Gear ratios: 4th (0.93)	3.62:1
3rd (1.32)	5.13:1
2nd (2.06)	8.01:1
1st (3.36)	13.07:1
Final drive ratio	3.89:1

CHASSIS & BODY

Body/frame	plastic/foam composite
Brake system	11.5-in. discs front, 11.1-in. discs rear
Wheels	cast alloy; 6 x 15 front, 8 x 16 rear
Tires	Pirelli P7; 195/50VR-15 front, 265/50VR-16 rear
Steering type	rack & pinion
Overall ratio	17.0:1
Turns, lock-to-lock	3.4
Front suspension: unequal-length A-arms, coil springs, tube shocks, anti-roll bar	
Rear suspension: unequal-length A-arms, coil springs, tube shocks, anti-roll bar	

curvature and counterbalancing. "I'm happy with sliding windows in a revised version of what's on the prototype," Collins said. "On the second prototype the windows will be glass instead of plastic and we're fitting a better-looking and sturdier latch. Also we've cut down the width at the top so that at the bottom the rear piece of glass slides forward clear of the front piece of glass."

The seats are leather with body-hugging velour inserts and this same velour material covers the flat portion of the knee bar. There's the usual fore-aft adjustment plus a front pivot allowing the angle of the whole seat to be varied. The doors are thick and trimmed in vinyl and a long sloping armrest butts up against the dash-panel knee bar. Handsome Stewart-Warner gauges with black backgrounds and white pointers cluster behind the steering wheel with the larger tachometer and speedometer in the center and the voltmeter, coolant temperature, oil pressure and fuel-level gauges on either side. With the seat adjusted for my height the steering wheel blocked the top portion of some of the gauges; Collins says this isn't a problem because the wheel is about an inch lower than it will be in production cars. The steering column is a conventional GM Saginaw item with neither tilt nor telescopic adjustments. On the left side of the column is a very Chevette-looking stalk combining directional turn indicators, high beam and wiper/washer functions.

This first prototype has a central warning system monitoring critical fluid levels, temperatures and brake pad wear similar to the system on the BMW 630CSi and the Porsche 928, but for the sake of cost and simplicity the first production cars may not have this feature. Air conditioning will be standard and on this prototype there were two central adjustable vents and an additional duct on the passenger side. Production DeLoreans will have another dash vent outboard on the driver's side. In looking around I was impressed with several things. First, the interior is very spacious and the dash treatment is clean and uncluttered. There's good rear quarter vision past and through the buttresses and the windshield wipers aren't hidden (hurrah!). The windshield, as in the Lancia Scorpion and the Lotus Esprit, is glued in and its flush installation should reduce turbulence, resulting in less wind noise and lower drag. Push buttons on the console control the ventilation, air conditioning and heat/defrost modes and there are two slide levers for varying fan speed and temperature. This was an expensive design exercise," Collins concedes. "On the production cars we'll probably go to conventional vacuum controls and cables." What seems to be a cover for a console stowage bin is actually a cleverly disguised handbrake that pulls up the same way as the more common grip-type lever. A terrific sounding Audio Mobile AM/FM/tape system featuring six speakers was installed in the prototype but whether this system is the one that will be installed in production DeLoreans hasn't been decided at this time.

The interior is nicely finished and detailed and this is also true of the carpeted front trunk. A spare tire is conspicuous by its absence ("I haven't solved that problem yet"—Bill Collins) and on production cars a portion of the now generous trunk will be consumed by the radiator.

Neither Collins nor DeLorean is a strong believer in market research ("If you know the car's right you don't need to spend hundreds of thousands of dollars having people tell you about it"—Bill Collins) but two product clinics were conducted, one in Detroit using the styling model and a second in California with the first prototype. The results would seem to suggest that the car is right on target. When asked what they thought of the DeLorean, an overwhelming number of respondents said they liked everything about it. When pressed for weak points the only negative feature was the sliding windows.

"An interesting thing happened in the Detroit clinic where we had the DeLorean lined up against a Datsun 280Z, a Porsche 911 and a Chevrolet Corvette," Collins said. "We split the participants into two groups, asking one group the question: If the DeLorean cost X number of dollars would you buy it? Then we raised the price and asked the second group the same question. Raising the price increased the DeLorean's purchase desirability for Datsun and Porsche owners so there's a certain amount of →

prestige there. Overall the median estimated price was around $13,000," Collins added.

Is the DeLorean just another automotive pipe dream? Based upon John Z. DeLorean's past performance, his vast automotive experience and the caliber of people he's surrounded himself with, I feel his car has an excellent chance of reaching production. The question of financing is always a volatile problem, but DeLorean seems to have made a realistic assessment of what it takes to get a new automotive company off the ground, and, even more importantly, what it takes to keep it going. His first design makes sense, as does his long-term goal of building a luxury sedan. You can't walk into a dealer and order a DeLorean sports car yet, but if you're a prospective buyer it's probably not too early to be thinking about reserving space on a flight to Puerto Rico late in 1978 to watch America's newest sports car actually roll down an assembly line.

GOT A SPARE $90 MILLION?

BY JOHN LAMM

WHEN THE AUTOMOTIVE world last checked in on John Z. DeLorean, he was checking out of General Motors. After a career that had him in such illustrious positions as Chief Engineer and later General Manager at Pontiac, General Manager at Chevrolet and finally (and here's a gold-plated title for you) Vice President and Group Executive in charge of North American Car and Truck Operations, DeLorean resigned from GM in April 1973. He spent a year as President of the National Alliance of Businessmen, then established the John Z. DeLorean Company, doing some management consulting, but mainly putting the footings under his ultimate goal: producing a sports car.

DeLorean had already approached General Motors with the thought of buying rights and pieces to the mid-engine Corvette and producing that, but the energy crisis made it fairly evident that the world didn't need another large-displacement sports car. DeLorean fell back on the design he originally meant to be the second-generation car he would produce, a slimmer, lighter-weight mid-engine model. He started with his own money and then added a few investors in a limited partnership to work up preliminary studies and a prototype, the DMC-12. By the end of 1976 that meant an investment of $2.3 million, which is a tidy sum indeed until you compare it to the projected $90 million it will require to get the cars to the showrooms.

The next step in establishing the business is approval from the Securities and Exchange Commission to sell stock in the company—a process that should be completed by the time you read this. The stock, by the way, goes hand-in-hand with a dealership and only established dealers need apply. By now they should have also received permission from the individual states' "blue sky commissioners" to sell stock locally and after months of chomping at the bit, the DeLorean company should be rolling full tilt toward the late 1978 first-delivery date. The goal is 400 dealers and before the stock and dealerships were for sale, there were 1100 serious inquiries. The production target is 20,000 cars the first year and DeLorean estimates they will sell 85 percent in the U.S., 10 percent overseas and 5 percent in Canada.

At this writing it is about 90 percent sure the car will be built in Puerto Rico at the abandoned Ramey Air Force base. While the site is said to be picturesque, perched atop a cliff over sandy beaches, the local economy is suffering from a 30-percent unemployment rate. DeLorean says they have received good recommendations from other companies, General Electric being one, with factories in the area who claim the workers produce high quality items and put a lot of effort into their work. There are nearby harbors for necessary shipping, though DeLorean would like to put the ex-Strategic Air Command runways to good use by flying many of his cars to the states. The runways could also serve as a test ground. There is one other thing DeLorean hopes to receive: $64.75 million in financing from the Puerto Rican and U.S. governments.

As the doomsayers point out, DeLorean is attempting to do something that hasn't been achieved in the U.S. in decades and, in fact, failed recently with the Bricklin. DeLorean notes the pessimism and then points out that while no one has been able to start a continuing automotive firm since Walter Chrysler, Honda is a recent arrival on the scene and is doing quite nicely, thank you. What DeLorean wants to do, with BMW as a model, is fill the little gaps in the product lines of the American manufacturers, supplementing their offerings rather than taking them on head-to-head.

He talks of his sports car as part of a "new standard of morality in automobiles," claiming it not only conserves fuel during its use by being lightweight, but saves 1.5 barrels of oil during production compared to its contemporaries. Then there are the safety features of the car, the passive restraints and controlled crush of the body.

And if all goes well, there's another gap in GM's line that DeLorean would like to fill, that of a small luxury sedan . . . but that is a way off.

BEAUTIFUL! I CONSIDER it one of the best-looking cars I have seen. This is the way I would style a sports car. All the proportions are so beautifully done. Giugiaro is not the type of man who does crazy things; he is concerned with a theme. He is heading toward the most perfect design—a total design.

I think Giugiaro's integrated 10-mph bumpers are the best solution to that problem I have ever seen. And there's no reason why the headlights should be hidden when you have a good design. I can't name one car with retracting headlights that has solved that styling problem satisfactorily.

The taillight treatment is good, very good. I think the square pattern is very interesting. Whenever Giugiaro starts to do something he takes the rear part into the whole concept.

The side windows are beautiful as well. When you look from the side, the car looks like a fastback.

There could be problems with proper sealing and fitting of the gullwing doors. Also, in several European countries they could not be sold because of regulations. I see no problems with sliding windows as air conditioning is part of the design.

The glued-in windshield is a styling advantage, giving nice sharp edges where the glass is glued to the metal and flush lines like an airplane.

Designing a car around a tire like the Pirelli P7 is definitely a trend . . . big wheels and big tires like Porsche has on the 928. The wheels are not bad (they aren't a Giugiaro design.—Editor) but I'd prefer something more like the Citroën CX wheel cover—flush, flat without any decoration on it. Except the wheel could have an additional function by incorporating very small slots or vanes around the circumference for brake cooling.

I don't like the steering wheel with the air bag in the massive hub. I think one could do that a better way . . . a small tube integrated into the steering column and the dashboard for example. I like that flat lower dash where you can put little things. It also gives you protection, especially for the knees.

The DeLorean is a direct nephew of the Lotus Esprit. Giugiaro cars are very similar to each other but each one is a special adaption to a respective problem. Giugiaro is always trying to find the very best compromise. I can imagine that the car will be a sensation in America.

DeLorean DMC
Styling Analysis

BY WERNER BÜHRER