ROAD TESTS: PONTIAC FIERO AND ISUZU IMPULSE
DRIVING THE NEW BMW 524td DIESEL & TOYOTA VAN WAGON

ROAD & TRACK

SEPTEMBER 1983 UK £1.15 $2.50

PONTIAC FIERO

America's first mid-engine sports car—Affordable & Terrific

0 09
27100 06416

MISCELLANEOUS RAMBLINGS

R&T

At R&T we have always advocated small, entertaining, fuel-efficient cars, although we have also enjoyed reporting on and testing cars such as Ferraris, Aston Martins, Rolls-Royces and other cars with exotic appeal. As a matter of interest, recently I went through the "Road Test Summary," which appears in the magazine each month, and averaged out the fuel consumption figures for the 73 cars listed. The average worked out to 22.0 mpg. I then took out seven exotics such as Rolls-Royce, Ferrari and Aston Martin, on the grounds that the fuel used by all of them in the course of a year wouldn't keep one OPEC sheik in London for a weekend of dining, gambling and wenching. Interestingly, the result came out to 23.2 mpg.

What this indicates to me is that the EPA should either get its hands off the whole matter, or come up with a system of testing that has at least something to do with the real world. In any case, it seems that the time has come for a review of the regulations and a new limit introduced that reflects the current fuel situation and encourages the revival of the automobile industry.

Happy Days

I HAD the opportunity recently of driving a perfectly restored MG TD, and it brought back many happy memories. Many years ago when racing was not too serious, the big events in the U.S. were those such as Watkins Glen, Pebble Beach and Torrey Pines. Also, but almost unheard of, was Put-in-Bay and, believe me, it was a good spot to put into on race day.

Put-in-Bay is a small town on tiny Little Bass Island in Lake Erie, and it is so called because Commodore Perry ("We have met the enemy and they are ours") put in there. Access in the summer is by ferry or by about the only Ford Trimotor still flying (the ferry is probably quicker). In winter you can drive across the ice at your peril or take the Trimotor accompanied, probably, by anything from cows to pianos. I was on the Trimotor once and I pointed out to the pilot that the right engine was leaking gasoline. He said, "Yes, it's been doing that all day."

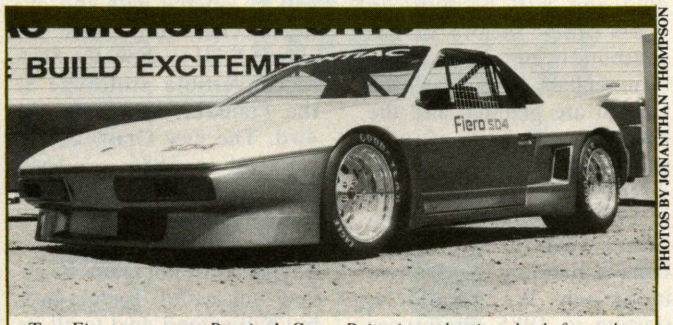
I raced an MG TD at Put-in-Bay in 1954. The car was fast, mainly because of a gas-flowed head, high compression ratio, devious camshaft timing and considerable lightening of the whole car. The course was 3.1 miles and it started in the main street, took a 90-degree turn to the right, passed through a kink to the left, climbed up to another 90-degree to the right, went through a section that was so narrow and rough it was declared a no-passing zone, turned right at Cemetery Corner, went down a long hill with dips in it through a kink to the left, and then to a right-hander back onto the main street. It was a good course for those who liked that sort of thing.

My recollections of the race are that I shared a room in an old hotel with a friend (male) and for some reason there was a toilet right beside the bed. Also, I got arrested the night before the race for making a hell of a noise descending the hill into town (an MG TD engine with high compression and a straight pipe makes a hell of a noise on the overrun).

We got it all sorted out one way or another and race day dawned as it inevitably does. I was in about the middle of the pack of some 25 cars. We had a rolling start led by a Bugatti and I picked up a few places by passing people in the no-passing zone, and I remember coming down the hill over the dips in top gear with the rear wheels off the ground. The valves were bouncing so I could smell the gasoline being blown back through the carburetors. This must have been near 100 mph because the valves bounced at 6200 rpm. Not a bad speed for an MG TD.

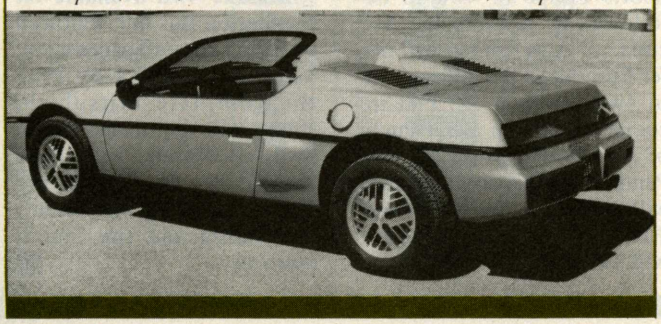
Apart from not ending up in the cemetery when coming down the hill, it was also important not to end up in the window of Snchorr & Fuchs hardware store on the outside of the kink leading back into town at the bottom of the hill. I didn't. What happened was that I dropped a valve in the main street on about the 14th lap. It made a dreadful noise and, as the cylinder head was the work of many hours of a good friend in his home workshop, I was most concerned about compensation. Fortunately, just the tip of the valve had snapped off and the valve itself bounced up and down on the piston inside the guide so no damage was done.

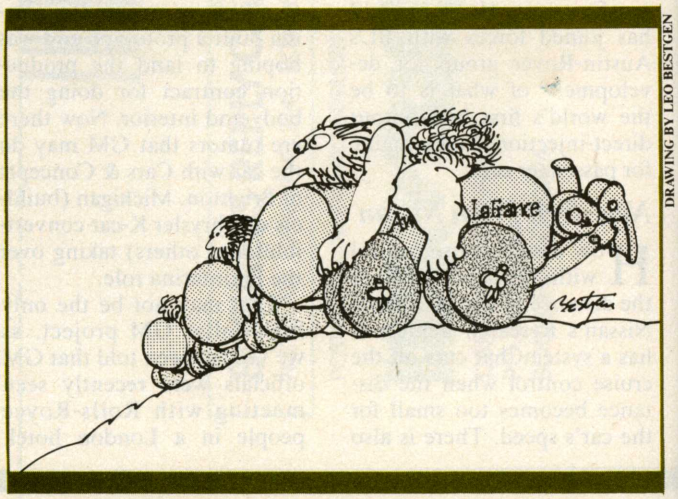
I never have been back to Put-in-Bay, but I enjoyed it enormously and I have flown over it occasionally during the course of my travels and seen the memorial to Commodore Perry from the air. I hope he had as good a time there as I did, but I bet he didn't get arrested.



PHOTOS BY JONANTHAN THOMPSON

Two Fiero teasers at Pontiac's Sears Point introduction, both from the division's design studio under John Schinella: Silhouette racer, above, was engineered by John Callies' team, with tube frame and fiberglass shell resembling Fiero but hardly any production pieces. Wonderful little spider, below, had cut-down windshield, headrest, no top at all.





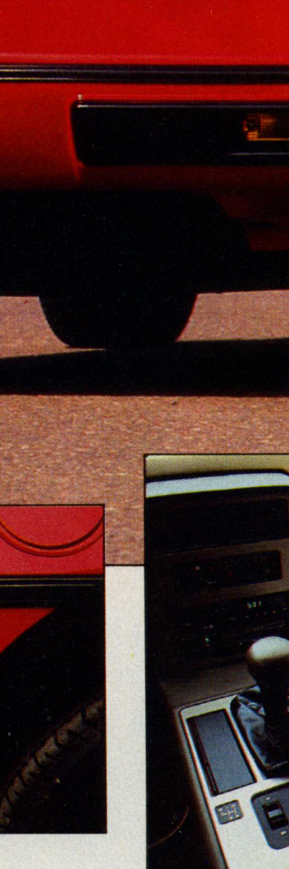
DRAWING BY LEO BESTGEN

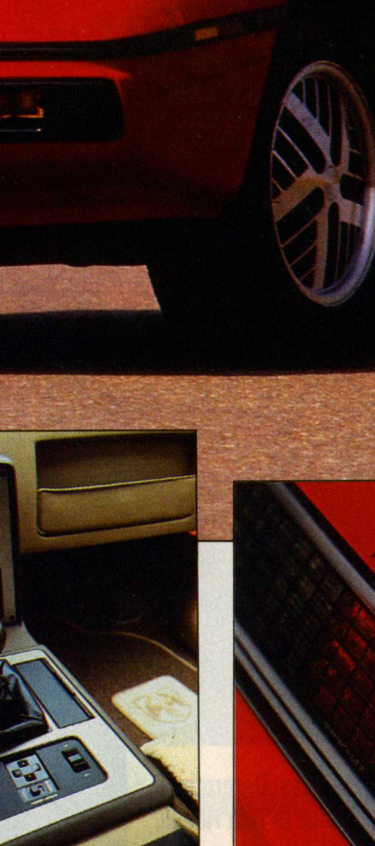
PONTIAC FIERO INTRODUCTION

The new kid on the block really wants to make friends

BY JONATHAN THOMPSON

PHOTO BY RICHARD M. BARON





PHOTOS BY JEFFREY R. ZWART

PHOTOS BY RICHARD SPARKS

PHOTOS BY JEFFREY R. ZWART

THE FIERO, PONTIAC'S P-car, has arrived. After a 5-year development period in which the only major problems were temporary cutbacks in project funding (twice), Hulki Aldikacti's team has brought the 2-seat mid-engine coupe in as a 1984 model, available in mid-September. And—enthusiasts give three cheers—the car is pretty much what its 49-year-old, Turkish-born creator had in mind from the beginning.

Something of a maverick at General Motors, Aldikacti (whose name is pronounced almost like it's spelled, but with the "c" sounded as a "ch") worked at Packard before joining John DeLorean's advanced project engineering group at Pontiac in 1956. The P-car project began in the late Seventies as a high-fuel-economy commuter car (to mollify GM executives during that critical period), but Aldikacti's design staff had sports car handling and performance in mind all along.

Working without interference, the P-car staff concentrated on the car's structure and manufacturing process. After deciding that it *had* to be mid-engine, for reasons of handling and (for later!) the application of high power outputs, the engineers developed an independently driveable all-steel space frame chassis, an extremely rigid structure with excellent crash-barrier characteristics. Believing that a car's success must depend upon the effectiveness of the manufacturing process, what he calls "productionizing," Aldikacti conceived a unique assembly method. Using plastic body panels of different weights and flexibility, he ensured their tight fit on the space frame by employing a large "mill and drill" machine on the assembly line. As each space frame passed under it, the huge Gilman-built machine would simultaneously mill 39 different body attachment points to the correct height and then drill them precisely. This would ensure that the molded plastic skins aligned with a tolerance of 1/64 in., despite any minor discrepancies in the welding of the basic space frame, assembled from six modular units.

The body panels were molded from two basic types of plastic. Those requiring great rigidity, such as the horizontal pieces—hood, roof, upper rear quarter panels and rear deck—were made of sheet molded compound (SMC), while those subject to frequent contact—bumpers, front fenders, doors and lower rear quarter panel—used the reaction injection molded urethane (RIM) process, also called RRIM when reinforced with fiberglass for greater strength. The entire space frame-cum-plastic body system has been seen as economic for 100,000 units annually, possibly 150,000.

While the concepts for the structure and manufacturing process were being refined, the mechanical components were under consideration. In its original guise as a commuter, the P-car had to be an economic proposition, using an existing drivetrain. The X-car's "Iron Duke" 2.5-liter 4-cylinder transverse package was chosen for the initial P-car series, although the engine compartment was designed from the outset with room for larger units of Vee configuration. The X-car axle shafts dictated the P-car's rear track at 58.7 in., while the engine and passenger accommodation called for a fairly long wheelbase at 93.4 in.

The first space frame was built by a 4-man crew at Entec, a special Pontiac facility in Troy, Michigan, beginning in October 1979. The prototype bodywork, conceived by the Pontiac advanced studio under Ron Hill, was built of fiberglass, with proportions ultimately retained on the production model but differing in many details. This first running car, of which the purpose was to convince GM executives of its viability, was completed on March 15, 1980, only five months from inception.

Followed by 16 pre-prototypes with plastic skins (also using the original body design, as seen in R&T's preview in the May 1981 issue), the original car demonstrated its promise and the package was approved on April 16, 1980 and turned over to the Pontiac production design studio under John Schinella for styling refinement on April 24. Pontiac's older Plant 8, being used for Grand Prix production, was selected as the site for P-car manufacture, requiring a complete renovation (including robot welding as well as the mill and drill machine), while detail engineering continued at the Entec facility under Jay Wetzel and, later, Ron Rogers.

Still known as the P-car within Pontiac, the car also received the code designation 2M4 (2-seat, mid-engine, 4-cylinder) and the temporary name Pegasus. The emblem, based on the Pegasus theme and barely discernable as a winged horse, was first sketched in the Pontiac interior studio by Jon Albert.

Because of the X-car track dimension, the Fiero had a wide structure and this allowed the engineers to position the 10-gal. fuel tank in the middle of the car, between the two passengers, where it would have the best protection and affect the weight distribution the least. To keep the car as short as possible, the tail was designed to house only a moderate amount of luggage. In front, T-car suspension arms were employed, using a different crossmember, of course, while disc brakes were fitted all around, a favorable result of moving the X-car front-drive layout to the back. Most of the nose was taken up by radiator and spare tire, with some room around the edges for incidental parcels.

Once the majority of production details were pinned down, 30 additional pre-pilot prototypes were assembled before pilot cars were started directly from production tooling. Full-scale manufacture began in July 1983 for a September 14 introduction.

As a product, the Fiero is still the high-mileage commuter it was intended to be, but the improving economic climate has permitted Pontiac to stress its sporting characteristics by referring to it in press material as a driver's car. As the following full road test shows, this description is completely justified.

Although the 92-bhp 4-cylinder engine doesn't propel the 2500-lb car at a startling rate, Pontiac is making modification information and part numbers available for customers wanting to bring the four up to a super-duty configuration of over 140 bhp. Three transmission options are offered: a 4-speed manual with a 4.10:1 final drive ratio, the same gearbox with the high-mileage ratio of 3.32:1 (for which Pontiac claims a highway consumption figure of 50 mpg), and a 3-speed automatic with a 3.18 ratio. The all-independent base suspension includes 13-in. slotted steel wheels, with finned cast aluminum wheels as an option, while the WS6 handling package, comprising different springs and shock absorbers front and rear, is mated with extremely handsome 14-in. cast aluminum wheels and P215/60R Goodyear Eagle GT tires.

With the stock 4-cylinder engine, the only one available on production cars for the 1984 model year, the Fiero is a 105-mph car with 0–60 mph acceleration in the 11-second class (see road test). For 1985 the 2.9-liter V-6 engine will be available, including a turbocharged version with 180 bhp, nearly double the base output, and expected 0–60 times around 6 sec. That will please the high performance enthusiast, but for now Pontiac is understandably concentrating on getting the basic car right. Considering that probably 80 percent of the estimated first-year market of 75,000–85,000 units will be composed of less performance-oriented customers, this would seem to be a good priority. The potential market for the Fiero is vast; with an expected price tag of $9000–$10,000 it should appeal to a wide spectrum of buyers wanting unique styling, good handling and a luxury interior, for commuter or pleasure driving.

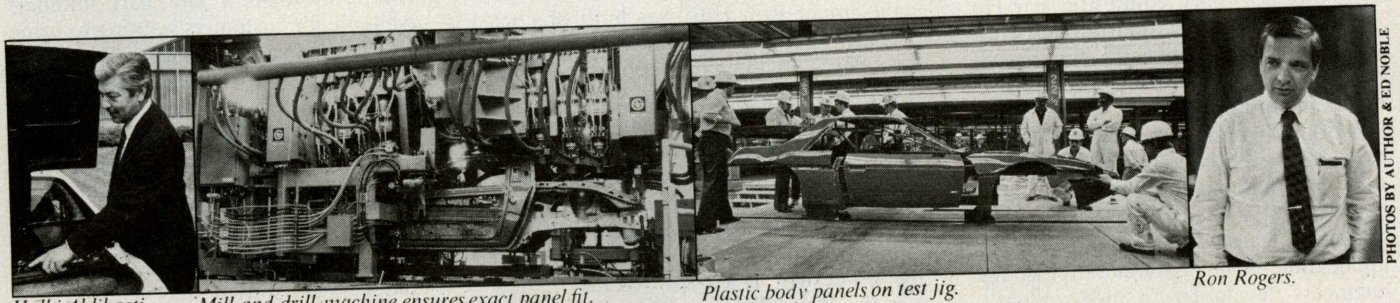
After the attractive exterior, the wide, comfortable and extensively equipped interior may be the key to the car's ultimate acceptance. This comes in two configurations, the base Fiero (or entry-level, as Pontiac calls it), and the much better appointed Fiero S/E version, with 3-spoke padded urethane steering wheel, →

INTRODUCTION

electric release for the rear compartment, better sun visors, tinted windshield glass and radio as standard equipment. Interior upholstery is either tan and brown or a combination of grays; for 1984 the only exterior colors are red, white, black and silver.

The Fiero is a complete breakaway from previous Pontiac—or GM—technology and marketing. It is the first mid-engine mass production car from the U.S. industry, the first with all-plastic body (as distinct from fiberglass), only the second 2-seater from GM (after the Corvette) and after the Corvair the only non-front engine car. Beyond the obvious motive of opening up a new market and making money for Pontiac, its purpose is to raise public consciousness for the division's technical expertise and to develop new manufacturing methods that combine quality improvement with increased worker morale. A visit to the Fiero plant when the first pilot cars were being built showed that the latter objectives were off to a good start; under plant superintendent Ernie Schaefer assembly-line efficiency was of a high order and the employees seemed as excited about their new product as any sports car enthusiast.

Pontiac made its first press showing to a group of 30 journalists in northern California, handing over the keys to 15 Fieros for a 100-mile run on winding roads from Burlingame, across the Golden Gate Bridge, through Marin County and then to Napa. The following day the cars were put through their paces on the Sears Point race track after instruction on the characteristics of cars and course by Bill Cooper (chief instructor for the Bob Bondurant school) and Phil Hill. Present as teasers were two Fiero specials produced by Pontiac designers, one a spider with a low windshield and headrest fairings but lacking a top of any kind, the other a full race car chassis based quite freely on the Fiero layout. Although neither is a direct precursor of a production model, Pontiac wants the public to know that even more interesting Fieros are on the way.



PHOTOS BY AUTHOR & ED NOBLE

Hulki Aldikacti. *Mill-and-drill machine ensures exact panel fit.* *Plastic body panels on test jig.* *Ron Rogers.*

PONTIAC FIERO

TECHNICAL ANALYSIS

PONTIAC ENGINEERS MUST have had a lot of fun with this project, which appears to have been put together in the same spirit as other American 2-seaters such as the original Corvette and the original T-bird. It's as though a bunch of engineer/enthusiasts got together and said, "Okay, let's see what existing parts we've got in the bin, and how we can rearrange them into a real sports car." This is the same procedure used for building such historical favorites as MGs, Triumphs, and others. They take an existing driveline/suspension (the hard parts) and incorporate them in a more interesting package.

In an engineering analysis I find myself comparing the Fiero to the new Corvette—not because of any similarity in size or market, but because that is America's only other sports car and they share corporate heritage. In a full road test, of course, comparative cars might be the Mazda RX-7, Porsche 944, Datsun 280ZX or even the Bertone X1/9.

A consideration of the packaging of the Fiero raises the immediate question: "Why *mid*-engine, after Chevrolet just convinced us that *front* engine was proper for the Corvette?" Because the two are aimed at different markets. The Fiero was justified in the corporation largely as a mass production economy commuter/sports car. This meant that an existing unitary driveline package was required. Then, for an aerodynamic hoodline, the low seating position, short wheelbase and light chassis, the mid engine location was justified. The fact that this creates a potentially better handling competition car may or may not have been incidental.

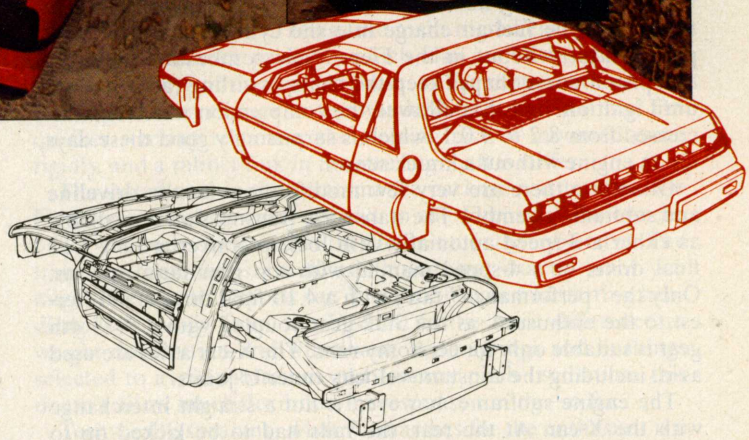
The Fiero is very wide and short. It has almost a 2-in. greater track than other sports cars in its class, and is about 10 in. shorter in overall length. The existing X-car driveline dictated the width (this gives us another generation of "wide-track" Pontiacs). But this makes roll and handling development easier. Given a 2-seater limitation, the width also allows room for the fuel tank beneath the console, right at the center of gravity. The mid-engine design gives a moderate 56-percent rear weight bias, partly because of a relatively short rear overhang. When the proposed V-6 becomes available, however, approximately 100 extra pounds at the tail will increase the rear bias.

The 600-lb stamped-steel and spot-welded space frame is being highly touted, although it is only a slight deviation from conventional unit construction. The primary difference is that none of the steel panels makes up the exterior bodyshell. This is comprised of easily fitted plastic outer panels, as described in the main story. The concept is very similar to the Corvette's, except for the precision-fit, mill-and-drill process. The percentage of plastic in the body structure is likewise similar to Corvette with about 175 lb of sheet molded compound and reinforced reaction injection molded (fiberglass) exterior panels.

You can't get Detroit engineers to talk about chassis beaming or torsional rigidity these days. Instead they like to refer to vibration *frequencies*, which are problems perceived by comfort-minded tourists. Still, for enthusiast drivers this chassis is solid enough. The fixed steel top (no T-top is planned) provides an efficient stiffness-per-pound structure that can't be approached by any convertible sports car made. Finite element analysis and high strength steels were used extensively to produce just about the minimum acceptable mass—from a ride comfort standpoint. So it doesn't look like there will be any major weight reduction

PHOTOS BY JEFFREY R. ZWART

PHOTOS BY AUTHOR & ED NOBLE



from the base 2500 lb in the future unless some costly exotic materials are used. As for impact safety, we don't have to worry about whether the engine is up front or in back, because Big Brother's standards apply equally to all designs.

Aerodynamics may not have been a high priority consideration in the original Fiero design. With a relatively low weight and small frontal area (by American standards), good EPA mileage figures were possible without going for the ultimate in low drag coefficient. The reported C_X is 0.377, which is not bad for such a short car, but not too strong an advertising point either. One obvious problem is the notchback rear window, which is almost a necessary evil in a mid-engine car. Although it allows easy engine access and ventilation, it really disturbs the upper airflow and increases drag while reducing potential downforce from any rear spoiler. The Fiero's other problem is the nose-up leading edge of the front bumper. This design allows a good ramp angle and radiator inlet, but it also rams a lot of air down under the nose. Not only does this usually increase drag, but it also generates a lot of lift, in spite of the bottom-breather radiator inlet. Reported front lift figures were about 120 lb at 100 mph, which can be significant when the static front weight is just over 1100 lb. It also appears that the opened headlight buckets were not as well researched in the wind tunnel as the Corvette's, as they raise the C_X to 0.417. Be that as it may, the pop-off plastic body panel concept means that better aerodynamics can be incorporated easily in the future.

The engine/driveline package doesn't provide much of a story this year. Basically it is GM's transverse 2.5-liter 4-cylinder sitting on a subframe just as it does in the X-car. The cast iron overhead valve engine still puts out an everyday 92 bhp, even →

PONTIAC FIERO STYLING ANALYSIS

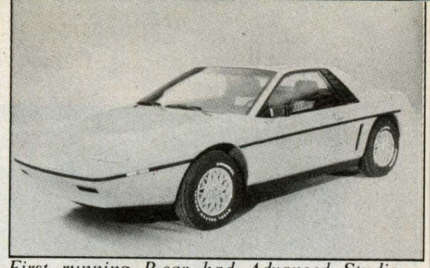
UNLIKE THE CORVETTE, which had a 30-year tradition to live up to when it was redesigned for 1984, the Pontiac Fiero is an all-new car with a personality to establish. Actually, its personality—that of a simple, efficient, slightly aggressive but very friendly and accommodating machine—was set early in the design process. Using the prevailing GM philosophy of clean, carefully controlled surfaces, Ron Hill's GM Advanced Studio spent just less than one year—December 1978 to October 1979—coming up with a tight, disarmingly simple form that expressed Hulki Aldikacti's mid-engine concept in no uncertain terms.

The concept of separate plastic panels bolted to the space frame structure was the basis for the surface treatment—using body contour lines for the panel joins. This treatment is similar to that employed on the Corvette, with the strong horizontal break line (actually a rising line from nose to tail) used as the meeting point for all the upper and lower surfaces.

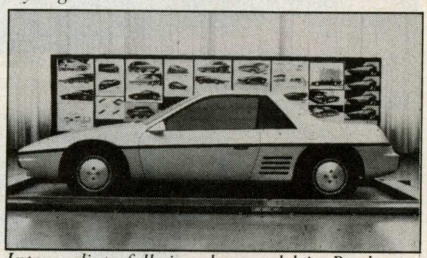
A full-size clay model, covered in red Di-noc film to simulate a painted surface, was completed on May 7 and established the direction for all future development. With only detail changes to such items as headlight doors, wheel openings, rear quarter panels and taillights, this form was refined until it was ready to be released to the Production Studio on April 24, 1980. The form developed by the Advanced Studio had already been built in fiberglass and attached to a running chassis in March.

Although the proportions of the car were unlike those of the Corvette, the nose was too similar in character and the design lacked a clear Pontiac identity. When the project was turned over to John Schinella's team in Production, several basic changes were made: The windshield was moved forward, the nose shortened and twin black "bumper" pads added to the front and rear facias.

In the center of the car, attention was given to the quarter-panel detailing just behind the door glass. The Advanced design had this part of the space frame covered with black louvered panels; the Production Studio decided to give this area the appearance of window glass, an esthetic solution but perhaps the one part of the design that was not completely honest in its expression of the structure underneath. Various engine intakes were tried in the lower quarter panels, but these disappeared as the design approached its final configuration. (A much smaller intake reappeared on the left flank as the car neared production.)



First running P-car had Advanced Studio styling.



Intermediate full-size clay model in Production Studio.

In much the same way that the exterior lost its long-nosed sharpness along the path to production, the P-car interior went from a very mechanical, squared-off concept (similar to that used on recent Trans Ams) to a friendlier environment with softer radii on all components. But the modular concept first sketched by Marvin Fisher in 1979 was retained on the final interior design,

John Schi

Bill Scott

albeit ir
main ins
just abo
gertip co
at both
required
terior c
high to

In Ap
Studio
Pontiac
Furey. F
unifying
bly the
the enti
over dir

TECHNICAL ANALYSIS

with an interesting new iron head casting. A swirl-port intake that brings the fuel-air charge into the cylinder along a spiral path makes its debut in the Fiero. New combustion chamber and piston dome shapes keep the charge swirling (and mixing) until ignition. This has allowed the compression ratio to be increased from 8.2 to 9.0:1, which is surprisingly good these days for an engine without a knock sensor.

Otherwise there are very few modifications to the driveline and subframe assembly. The transverse transmission is available as either a 3-speed automatic with lockup converter and 3.18 final drive, or a 4-speed manual with top gear ratio options. Only the "performance" ratio with a 4.10 final drive is of interest to the enthusiast, as the 3.32 gear coupled with a 0.73 4th gear is suitable only for economy runs. The X-car axles are used as-is, including the constant-velocity outer U-joints.

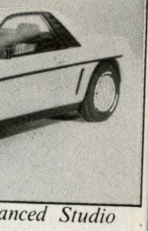
The engine subframe, however, is not a straight interchange with the X-car. At the rear, the rails had to be kicked up to provide a better rear ramp angle. (In the front-drive X-car these rails connect to the floor pan at the firewall.) And the front rails have had the mount bushings rotated from a horizontal plane to a vertical plane. This allows the subframe to pivot downward about the front mount bolts for easier engine removal. To absorb engine torque reactions, an upper strut connects the cylinder head with a sheet metal bracket on the right rear shock tower. All of these subframe and strut mounts are well insulated with rubber bushings, which are great for isolating road and engine vibrations from the passengers, but don't do a lot for handling.

The front suspension is taken almost *in toto* from the Pontiac T-1000. Although not originally designed for a sports car, this particular short- and long-arm configuration is not too bad for this application. The major modifications were to widen the interconnecting subframe to give a 2-in. wider track and to relocate the shock absorber mounts. On the T-car, the shock mounts to the upper arm and stands very high in the wheel well. But to lower the Fiero's hoodline, the shock now mounts to an otherwise standard lower arm. Basically, this is a good design, especially with the contemporary practice of leading steer arms. But somewhere in the translation a little too much bump steer seems to have been allowed, causing more steering wheel feedback than we are used to.

Part of the feedback can be attributed to non-assisted steering—which I prefer. Early in the design it was decided that the low front weight made assisted steering unnecessary in most circumstances. The worst situation is parallel parking with the optional wide tires. In this case the effort is noticeable though not unreasonable.

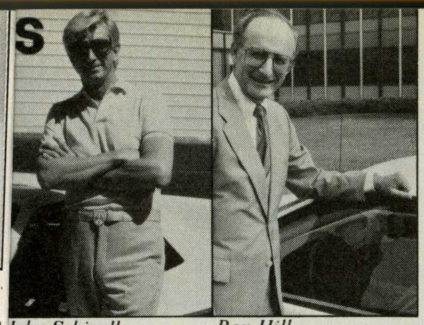
At the rear, the suspension is essentially indistinguishable from the X-car's front layout. Even the trailing steer arms are there, although in the Fiero they are anchored to the subframe via tie rods that can still be adjusted for toe-in. The combination of leading front steer arms and trailing rear non-steer arms should give excellent cornering compliance understeer properties. Only a couple of really finicky evaluators have perceived a slight yaw overshoot, which could be because of lateral bushing compliance in the engine/suspension subframe. Otherwise, the handling properties are excellent, with an easily correctable drop-throttle oversteer when cornering at the limit. The reported roll angle of 3.5 degrees per g is reasonable, considering the front anti-roll bar is only 23.0 mm and there is none at the rear.

A wide t
ter of gra
A new
Fiero. Po
to the fr
4-wheel
gency br
new sin
front an
slight va
tional p
the Fiero
braking.
cg/wheel
an excel
Fiero are
gage cap
the optir
In a li
one mig
explana
necessar
pected "
up too
eventua
quicker
The
P185/80
vide low
base pri
their Fi
wheels.

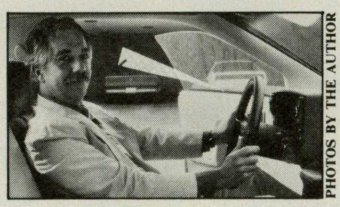


anced Studio

l in Produc-



John Schinella. Ron Hill.



Bill Scott.

PHOTOS BY THE AUTHOR

albeit in a much less severe form. The main instruments were grouped in a pod just above the steering wheel, with fingertip controls extending toward the rim at both sides. With a very wide tunnel required for the central fuel tank, the interior console was made deliberately high to provide proper armrest height.

In April 1980 the Interior Concept Studio transferred the project to the Pontiac Interior team, then led by Pat Furey. Fisher stayed with the project as a unifying influence and was thus probably the man most directly involved with the entire development. Bill Scott took over direction of the Interior Studio in 1981, his important contributions being the previously mentioned softening of all the component edges, improved seat contouring (admittedly Porsche inspired), new door panel and grab handle design, and the replacement of the dark charcoal interior color with fresher, contrasting tones in either gray or saddle combinations.

Analyzing the production Fiero's exterior and interior design, and their contributions to the car as a market entity, one can see that a fine balance has been struck between an aggressive sports car look and a more relaxed, inviting appearance that promises comfort and convenience. The car is not brutal in any way but it nevertheless looks purposeful and efficient. It doesn't directly resemble any other car on the market and therefore doesn't rely on arbitrary details for personality. (Bertone's X1/9 is an obvious choice for comparison, but the similarity is confined to the basic proportions inherent in the transverse mid-engine layout; the basically excellent Italian design, now nine years old, is sharp-edged and narrow, with many tacked-on details, while the Fiero has a wide, almost squat look with much smoother surfaces.)

Perhaps to avoid too heavy a look, the Fiero has extremely large wheel openings, which can only partly be explained as providing room for larger tires in the future. I feel that these openings are important in giving the car its agile appearance, enhanced by the extremely attractive pattern of the special-equipment 14-in. aluminum wheels. The 13-in. base wheel, with a hubcap and 18 slots around the perimeter, is just too tame, while the 13-in. aluminum wheel has a slightly dated appearance.

Obviously, the system of bolting the plastic body panels to the space frame allows almost complete freedom in incorporating future changes, whether they are detail modifications to distinguish additions to the Fiero range (such as the V-6 promised for 1985) or completely new body contours for the future. The dual nature of the car, as mentioned before, can be taken to Jekyll and Hyde extremes if the designers are given carte blanche in developing specialized versions. An example is the one-off spider produced in only four weeks by the studio as a teaser to the journalists who attended the Fiero preview at Sears Point in June. Pontiac engineers have said they don't intend to cut the top off the rigid space frame for any production models, but that won't prevent the aftermarket shops from doing it. The 1984 Fiero is a fairly basic design with immediate appeal—and all the ingredients for a long romance with enthusiasts of widely differing intentions.

—Jonathan Thompson

ngine intakes
arter panels,
e design ap-
uration. (A
eared on the
production.)
at the exteri-
pness along
-car interior
al, squared-
used on re-
friendlier
adii on all
lar concept
her in 1979
rior design,

the Pontiac
rts car, this
oo bad for
den the in-
nd to relo-
ck mounts
ell. But to
an other-
sign, espe-
arms. But
teer seems
feedback

ted steer-
d that the
most cir-
th the op-
hough not

guishable
arms are
subframe
nbination
eer arms
r proper-
rceived a
l bushing
wise, the
rrectable
e report-
ering the
the rear.

A wide track helps, naturally, but not the reported 19.5-in. center of gravity, which seems high for a car this size.

A new disc brake system also appears for the first time on the Fiero. Pontiac's adapting two existing front suspension systems to the front and rear of this car results in 4-wheel discs, but not 4-wheel calipers. Because the rear requires a mechanical emergency brake, a standard front caliper could not be used. These new single-piston aluminum calipers are essentially identical front and rear, except for the rear emergency brake clamp, and a slight variation in piston bore size for brake balance. A conventional proportioning valve limits rear wheel lockup, although the Fiero may have almost the ultimate configuration for ideal braking. Given the static rear weight bias, and the reported cg/wheelbase ratio, the forward weight shift in braking will give an excellent dynamic balance. Other braking advantages in the Fiero are the central fuel tank, central seating and minimal luggage capacity. This means that no matter how the car is loaded, the optimum brake balance will hardly vary.

In a lightweight car without a power assisted steering option, one might ask why power assisted brakes are standard. The first explanation given was a lack of space in the pedal area for the necessary mechanical leverage. A second reason was an unexpected "knock-back" problem with the 4-wheel discs, which use up too much pedal travel. One hopes this will be sorted out eventually, allowing a non-boosted system and the resultant quicker response.

The standard wheels and tires are fairly conventional P185/80R-13 steel radials on 5½-in. wide steel rims. These provide low rolling drag for fuel economy and contribute to a low base price. However, those hoping to upgrade the appearance of their Fiero will opt for the same-size turbo-finned aluminum wheels. And true enthusiasts will demand the "high-tech" 14 x 6 in. aluminum wheels with P215/60R-14 Eagle GTs. There appears to be plenty of room for expansion in the wheel wells. Pontiac engineers present at the introduction confessed that they hope to have a 50-section tire option available next year. Of course, even if the extra-wide wheels didn't fit, it wouldn't be difficult to add optional flared fender panels.

The optional Eagle GTs are the main ingredient in the WS6 special performance package, which also includes stiffer front springs, stiffer front and rear shocks, stiffer rubber mounts and bushings but no change in the standard front anti-roll bar. For quicker steering response, the steering rack is mounted more rigidly, and a rubber link in the steering shaft is stiffer.

The stated goal in the performance package was to make the Fiero equivalent in every respect to the Firebird WS6 option, but it was fairly obvious that they hadn't met that objective. The transient response is excellent, though not exactly what you might like in a true sports car. The problem in transferring handling technology from the Firebird is the basic difference in weight distribution and wheelbase. With springs and bushings selected to avoid vibrations and freeway pitch oscillation, this doesn't allow much flexibility for response tuning—so far.

Technically speaking, what Pontiac has for the enthusiast is a diamond in the rough with microscopic flaws. Remember, the stated justification for the Fiero was that it be a relatively high-volume, economical commuter car. At that, they have succeeded admirably. Now they can spend a couple of years tuning it with option packages to satisfy the closet racer. The potential is exciting. They have all the pieces in the right places, so now someone just has to come along with slightly better pieces. If there are a lot of people out there who regret not having bought (and kept) one of the first 1953 Corvettes, this is a second chance.—*Paul Van Valkenburgh*