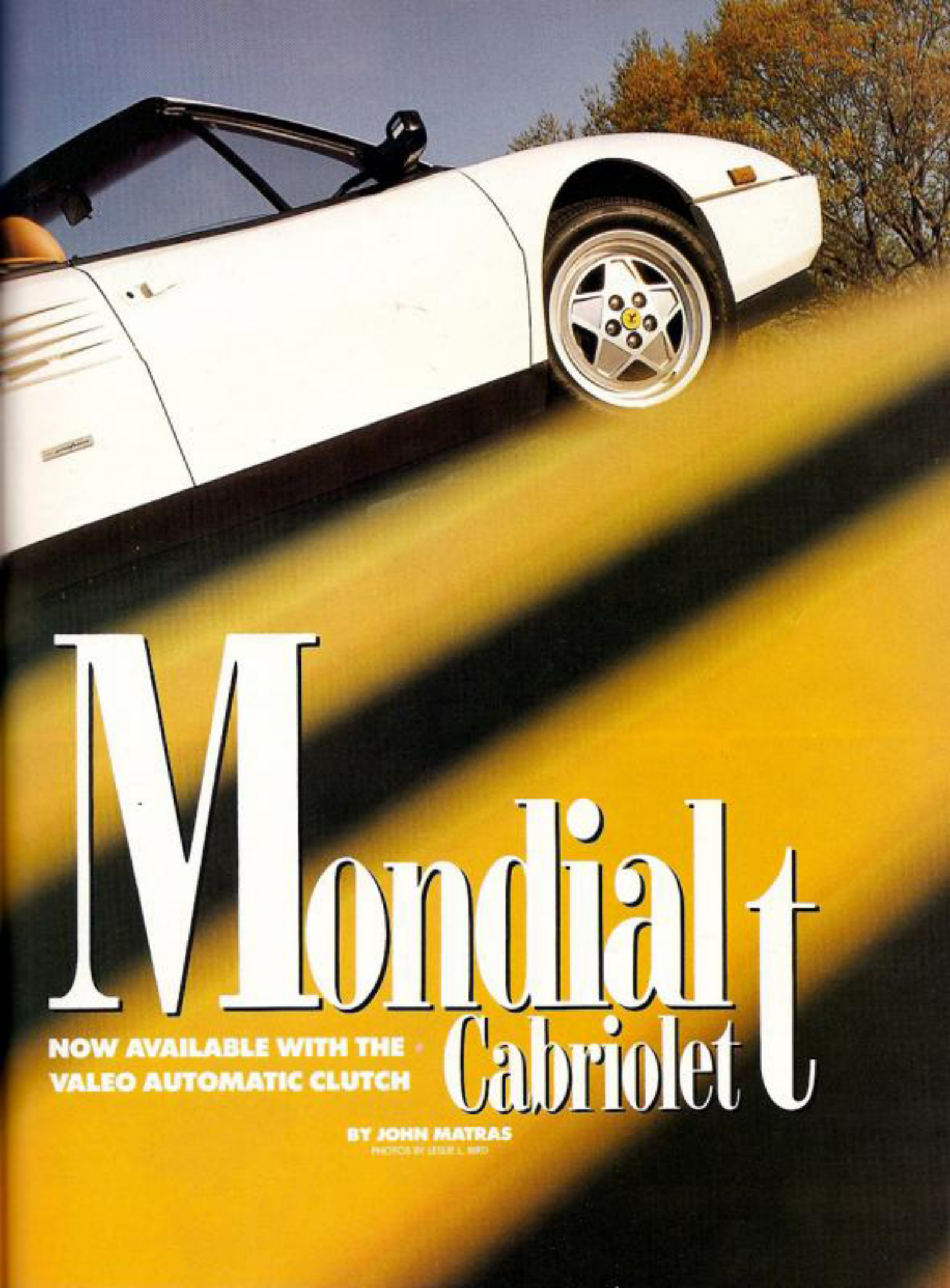


Mondial t Cabriolet

NOW AVAILABLE WITH THE VALEO AUTOMATIC CLUTCH

BY JOHN MATRAS

PHOTOS BY LESLIE L. IRD

Suspicion in Maranello is that, with no automatic transmission in the Ferrari line, the market for Ferraris may be limited. Not that it should matter, some say. Those who can't use three pedals and a shift lever aren't Ferrari people anyway.

Nevertheless, the solution proposed, and one which may be in production Mondials as soon as late 1991, is the Valeo electronic clutch. To the driver's right is the traditional black plastic ball atop the traditional chromed shift lever that protrudes from the traditional chromed gate. But in the footwell are only two pedals, throttle and brake. One simply moves the lever into 1st gear, presses the pedal and goes. When it's time to shift up, move the lever up and over into 2nd, lifting off the throttle but leaving the left foot on the dead pedal. And repeat on through 5th. Downshift as necessary in a similar manner.

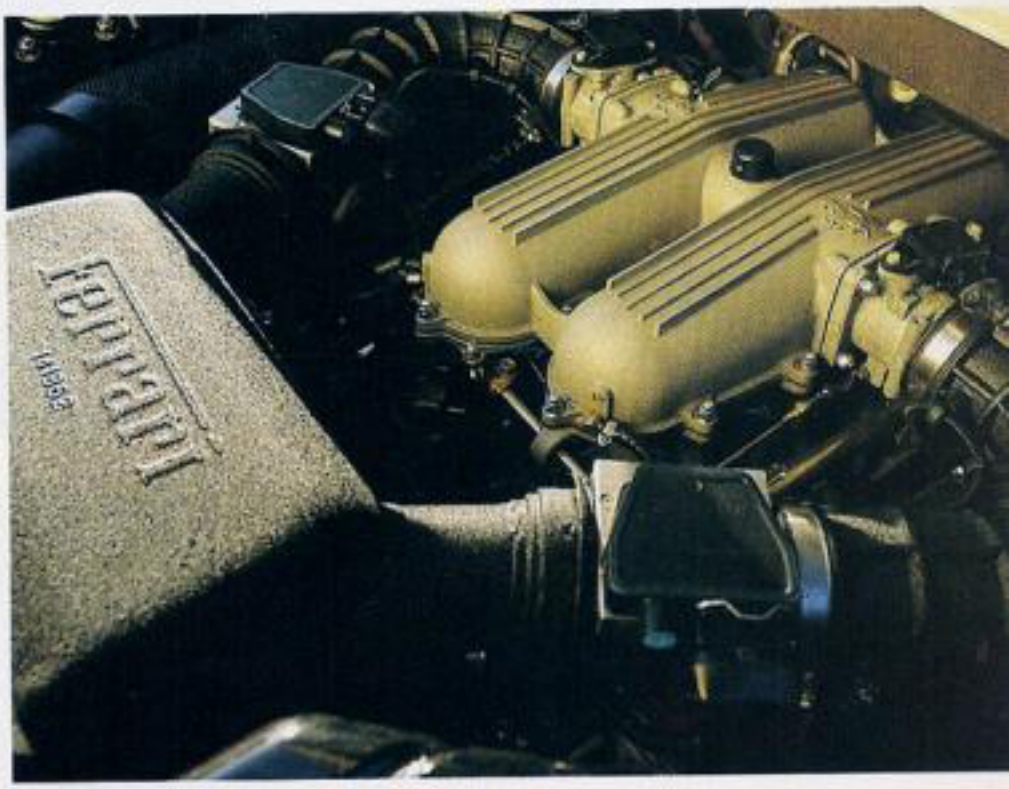
There's no clutch pedal because that's all done electronically. The Valeo system superficially resembles the Sportomatic system offered by Porsche and Volkswagen in the early Seventies to no great critical acclaim or commercial success. However, the Sportomatic declutched when hand pressure on the shift knob made an electrical contact, which is about as sophisticated as a light switch. The Valeo electronic clutch, however, benefits from 20 years of technological growth and particularly from the microchip. The Valeo electronic clutch is simply that, a clutch.

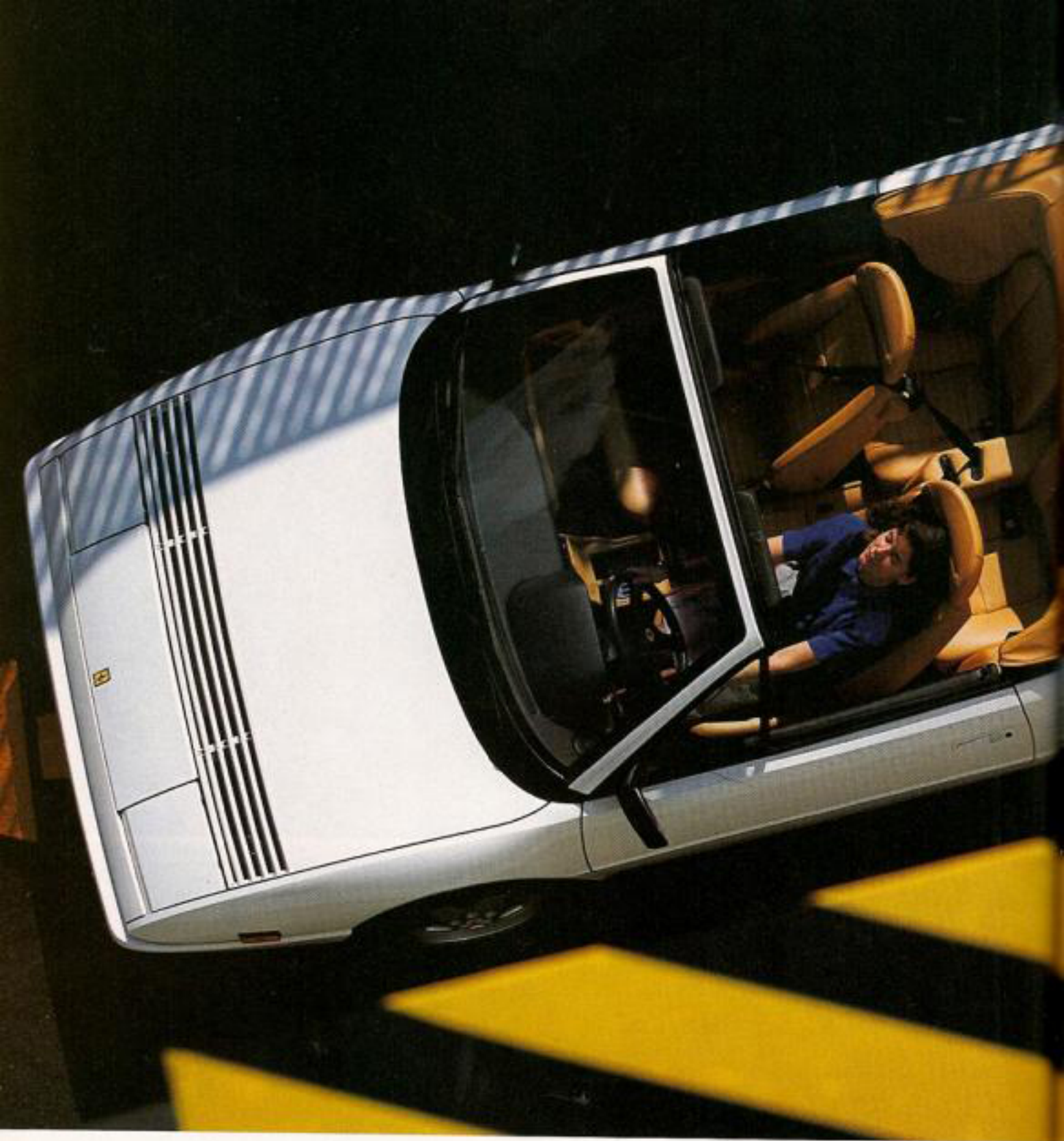
The transverse 5-speed of the Mondial t re-

Ferrari interior is familiar, but clutch pedal is missing with Valeo automatic unit. Trunk holds tool kit.

mains intact, all the way down the gear ratios. But the Valeo system uses an electric servo unit in place of muscle power to engage and release the clutch (a single disc instead of the normal double disc), controlled by a sophisticated microprocessor, better, Valeo says, than is humanly possible. Input includes engine rpm, throttle position, transmission input and output shaft speeds, an "intent to shift sensor" (a push or pull on the gearshift closes a contact), release bearing position and shifter position (in and between gears). Not only does it react to the immediate input, but also remembers previous activity and stirs that into the computational mix. The system adapts not only to the driver but the driver's actions at the time. Clutch engagement pottering about town is different from blasting through the gears.

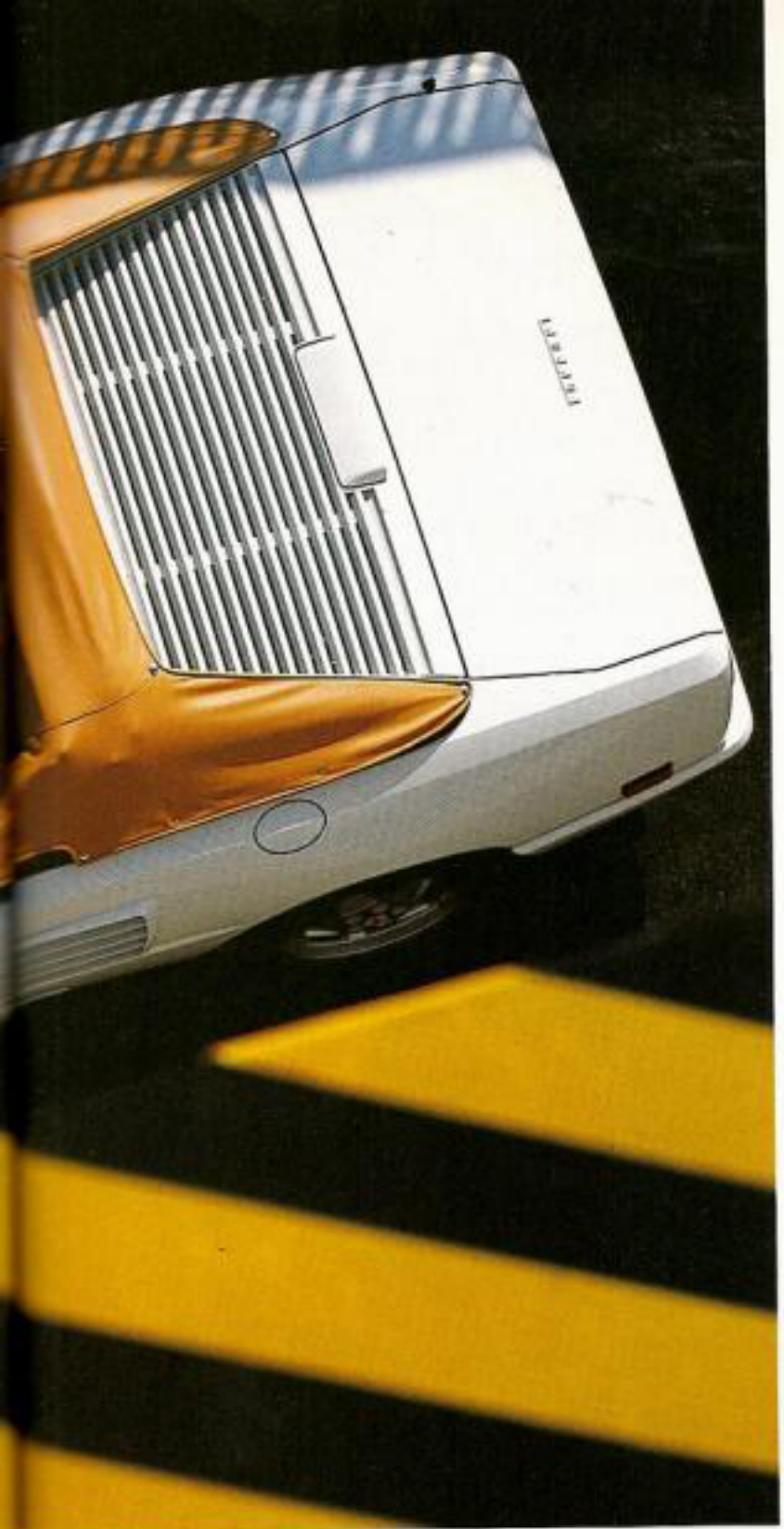
Driving the Valeo-equipped Mondial is like driving any other Mondial, only different. Other than the missing pedal, there's no indication of the Valeo clutch. Just put it in gear—resisting your left leg's impulses—and push





down the throttle pedal, just as you would an automatic. But unlike an automatic, the revs rise to maybe 1500 rpm, with no perceptible effect. The clutch then begins to engage with a distinctly mechanical sensation vaguely reminiscent of a centrifugal clutch, rather than a torque converter's fluid feel. Also unlike an automatic, the car easily rolls backward on an upslope and, although you can hold the car in place with the throttle, a beeper reminds you you're slipping the clutch to do so. You'll be similarly beeped if you try to start in 3rd gear.

Because it still has a full manual transmission, the Valeo clutch equipped car must be shifted. That's done much as it is with a regular foot-actuated clutch, except that you don't move your left foot. You still need to move the lever and lift off the throttle as you shift and



with some degree of coordination if you expect to be at all smooth. The lever is decidedly stiff going into gears, even more so than other Ferraris, particularly after restarting the car and the electronics are "relearning."

Back off on the throttle and the clutch remains engaged, giving you full engine braking, even to the point of jerking if you downshift without feathering the throttle. Just like a regular manual transmission. The clutch doesn't disengage until the car is almost stopped. The Valeo clutch is a leg saver in creepy-crawly city traffic, and the rest of the Mondial works this way as well, sauntering as happily as a saddle horse. In thoroughbred mode, however, it's even better. Not surprising, considering that the clutch was developed first for the Lancia Delta Integrale rally car.

They say you can't beat the clutch and, sure enough, I tried and couldn't. Driving on a winding sports-car road requires shifting as one normally would, including using the throttle to match engine speed to road speed on downshift—it will jerk if you don't, just like an old-fashioned clutch—and lifting between gears on upshifts. Off the line, there are three options. One is simply to motor off. This invokes full engagement by 2000 rpm or so with minimal clutch slipping. The "power launch" program is actuated by tromping on the throttle with the car in first gear: It allows enough clutch slippage to keep the engine in the power band and the tires slipping about 15 percent.

To put drama in your departure (this contradicts everything Daddy taught you about not abusing equipment), rev the engine to 6500 rpm with the gear lever in Neutral, and then pull it back into 1st. The engine comes up against redline as the car lunges forward, trailing a dohc V-8 snarl and a pair of black stripes in a gentle S-pattern on the pavement. The Ferrari folks say it won't hurt the equipment, and it does impress your Goodyear dealer, but the power launch is faster. Valeo spokesman Claude Mehnert claims that it's also 0.2–0.3 seconds quicker in the quarter mile than the typical driver is with a standard clutch, thanks to a faster launch. Valeo also asserts improved fuel economy.

The Valeo clutch is so remarkable that it's almost possible to overlook features the Mondial already has. For example, the transverse transmission, which allows the engine to be lower, significantly improving the center of gravity. The Mondial is exceptionally well balanced and in long cloverleaf-type sweepers its attitude can be set with 300 available horses as well as the subtly power-assisted rack-and-pinion steering. Additionally, the shock absorbers

adjust in three steps from soft to firm, the latter preferable for just about everything but broken and potholed streets and loopy concrete slab highways. The shocks also firm up with speed within each of the three basic settings, but "soft" begins to feel floaty at about 70 mph. The suspension is fully independent with double A-arms with anti-dive geometry. Four wheel disc brakes have aluminum calipers with twin cylinders and ABS.

There's no doubt that the Mondial is a Ferrari, suffering like the merely beautiful daughter in a family of beauty queens. Available only in cabriolet form now, the Pininfarina design has improved with age, current trendiness catching up with the distinct cab-forward look of the Mondial. Actually, every panel was changed with the 1989 debut of the Mondial t; none interchange with the earlier Mondial even though the theme was maintained. With the convertible top lowered, its unique fabric sail panels tucked under a leather boot, buffeting is minimal even into three-figure speeds. Exhaust sounds predominate over the—pardon the cliché—turbinelike whine of the engine mechanicals heard when the top is raised.

Entry is not particularly easy for either front or rear passengers, but at least the driver and front passenger will be comfortable once in. The "plus two" in back have extremely limited legroom and must take comfort only from riding in a Ferrari. Most unusual is the passive restraint system, possibly the best mouse belt around. The retractors are between the rear seats, the belts connected to mice on the doorsill that move forward to release the belts and back to snug them up. Which they do very well, thank you, even if it feels odd at first to have the belt over your right shoulder. But then, you're already adjusting to the pedals offset to clear the wheel well.

Dare I say that the Ferrari Mondial t Cabrio is at home on road and track? But whether the Valeo clutch will make it "more accessible to women" is questionable. It's a "performance" option that happens to add convenience, a boon to the autocross driver who, like the rally driver for whom the system was designed, usually has more to do than appendages to do it with. But then, how many people autocross their Mondials? On the other hand, city driving and freeway traffic jams won't produce hyperdeveloped left thighs.

The Valeo electronic clutch isn't as slick and simple as the modern automatic transmission, and to be really smooth with it will require some skill. But these days, nice girls can shift for themselves. And they'll do it faster in a Ferrari Mondial t Cabriolet with the Valeo electronic clutch.

FERRARI

Mondial t Cabriolet

PRICE

List price, all POE	$105,500
Price as tested	est $108,500

Price as tested includes std equip. (air cond, elect. window lifts, elect.adj mirrors, elect. antenna & speakers pkg, central locking, ABS, leather interior), proposed optional Valeo electronic clutch (est $3000)

GENERAL

Curb weight	3235 lb
Test weight	est 3600 lb
Wheelbase	104.3 in.
Track, f/r	59.9 in./61.4 in.
Length	178.5 in.
Width	71.2 in.
Height	48.6 in.
Fuel capacity	22.5 U.S. gal.

ENGINE

Type	dohc 4-valve V-8
Bore x stroke	85.0 x 75.0 mm
Displacement	3405 cc
Compression ratio	10.4:1
Horsepower, SAE net	300 bhp @ 7200 rpm
Torque	237 lb-ft @ 4200 rpm
Fuel injection	Bosch Motronic M2.7 electronic port
Fuel	unleaded, 91 pump oct

DRIVETRAIN

Transmission: 5-sp manual

Gear	Ratio	Overall ratio
1st	3.21:1	11.43:1
2nd	2.11:1	7.52:1
3rd	1.46:1	5.20:1
4th	1.09:1	3.88:1
5th	0.86:1	3.06:1

Final drive ratio	3.56:1
Engine rpm @ mph in 5th	2880

CALCULATED DATA

Lb/bhp (test weight)	est 12.0
Bhp/liter	88.1
Engine revs @ 60 mph in 5th gear	2880

FUEL ECONOMY

Normal driving	na
EPA city/highway	13 mpg/17 mpg

Performance data is from the 1990 Mondial t Cabriolet test.

Subjective ratings consist of excellent, very good, good, average, poor.

CHASSIS & BODY

Layout	mid-engine/rear drive
Body/frame	steel, aluminum/skeletal steel
Brake system, f/r	11.1-in. vented discs/11.0-in. vented discs, hydraulic assist, ABS
Wheels	16 x 7J f, 16 x 8J r
Tires	Goodyear Eagle ZR, 205/55ZR-16 f, 255/55ZR-16 r
Steering	rack & pinion, power assist
Turns, lock to lock	3.0[1]
Turning circle	39.4[1] ft

Suspension, f/r: upper & lower A-arms, coil springs, tube shocks, anti-roll bar/upper & lower A-arms, coil springs, tube shocks, anti-roll bar

INTERIOR NOISE

Idle in neutral	66 dBA
Maximum, 1st gear	87 dBA
Constant 70 mph	77 dBA

ACCELERATION

Time to distance	Seconds
0–100 ft	3.1
0–500 ft	8.2
0–1320 ft (¼ mi): 15.0 @ 93.2 mph	

Time to speed	Seconds
0–30 mph	2.3
0–40 mph	3.3
0–50 mph	5.1
0–60 mph	6.6
0–70 mph	8.8
0–80 mph	11.0
0–90 mph	13.2
0–100 mph	17.2

SPEEDS IN GEARS

Maximum engine rpm	7400
5th gear (rpm) mph, est	(7400) 154
4th	est 121
3rd	91
2nd	63
1st	41

HANDLING

Lateral accel., 100-ft radius: 0.89g

BRAKING

Minimum stopping distance:	
From 60 mph	147 ft
From 80 mph	258 ft
Control in panic stop	excellent
Overall brake rating	very good

[1] *Road & Track Specials Ferrari 1990.*