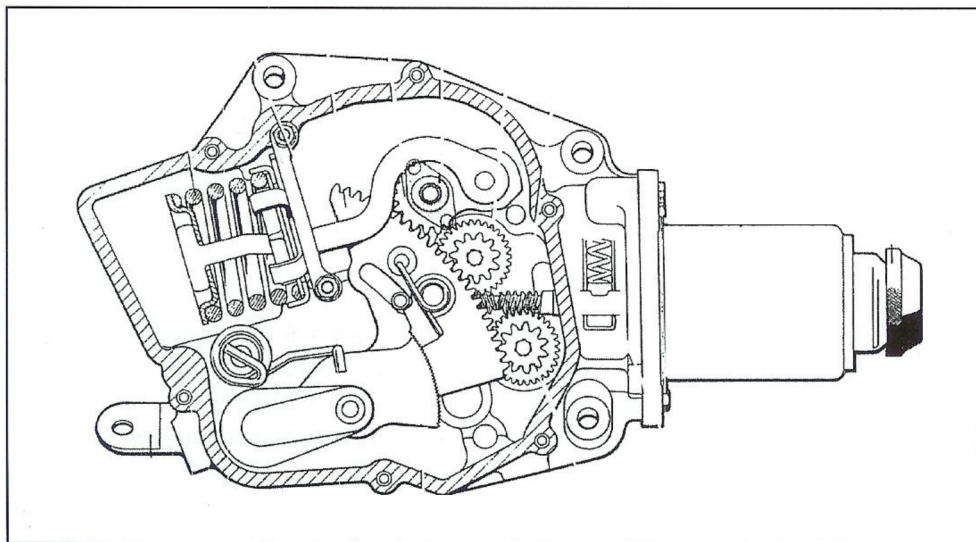
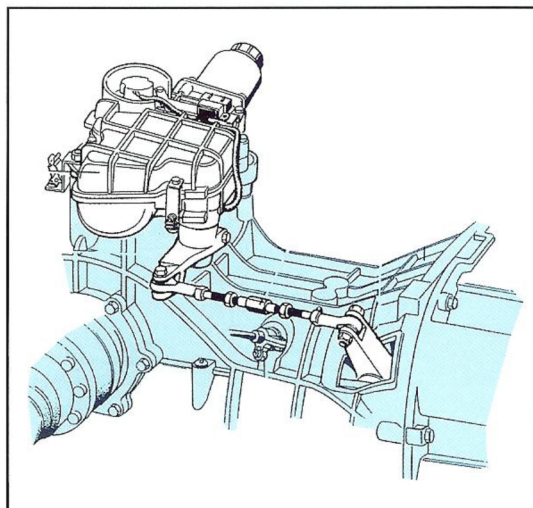


Clutch Play

Valeo's automatic clutch, the precursor to today's F1 paddleshifter system, is a unique bit of engineering that delivers a solid driving experience.

STORY AND PHOTOS BY MATT STONE



ABOVE LEFT Missing pedal is the only interior clue to this car's Valeo clutch system.

ABOVE Valeo actuator resides on top of transaxle, and moves the clutch control fork via a tie rod.

LEFT Internal schematic of actuator.

In 1989, Ferrari turned the Formula 1 world on its head by introducing the sport's first manual transmission actuated by paddleshifters. Within a couple of years every team on the grid was using the setup, and in 1997, Ferrari introduced paddleshifters to its street-car lineup on the F355. However, this wasn't Maranello's first road car to be offered with a so-called semi-automatic manual transmission. In late 1991, the company had unveiled a completely different race-derived shifting system, this one developed by Valeo and available exclusively on the Mondial t.

There's a lot of misinformation about the Valeo system out there, so let's set the record straight on what it is and where it came from. First off, it is often—incorrectly if understandably—referred to as the Valeo transmission. In fact, Valeo, a large France-based multinational industrial and technology company, developed the clutch-actuation system, *not* the gearbox itself.

Second, the Valeo setup is sometimes referred to as a clutchless manual. Once again, not so; it is actually clutch *pedal* less. The system utilizes a standard Ferrari five-speed

manual transaxle, replete with a conventional dog-leg first gear and shift gate, as well as an architecturally conventional clutch system (albeit one fitted with a single clutch plate instead of the dual-disc setup found in the non-Valeo cars).

While new to Maranello, a manual transmission without a clutch pedal was nothing new to the world of automobiles. In the late 1960s, for example, Porsche and Volkswagen had developed a philosophically similar system called Sportomatic. The Sportomatic shifter, which was also teamed with a conventional manual transmission,

contained a microswitch that directed a vacuum-actuated diaphragm to operate the clutch-release bearing. It worked, if not terribly well.

By the early '90s, onboard microcomputing technology had advanced leaps and bounds, so Valeo took another and altogether more sophisticated crack at the notion with its TEE 2000 automatic-clutch system. Instead of a single microswitch located in the shift knob, the Valeo setup employed a network of sensors all over the car. These read a range of variables, including which gear was selected, movement of the gear lever



(which would indicate the driver wanted to shift), throttle position, engine speed and transmission-shaft speed. An onboard computer crunched the data and directed an electric actuator to engage and disengage the clutch as needed.

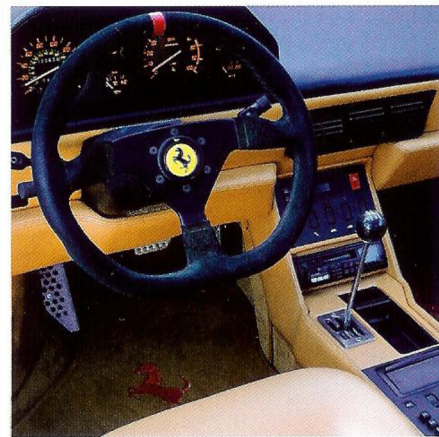
Valeo's first partner was Lancia, which installed the automated-clutch system in its Delta Integrale rally cars, winning the Greek rally championship in the process. Fiat stablemate Ferrari soon took an interest, and adopted it for the Mondial t.

If Ferrari still sold Valeo-equipped Mondials, it could find no better cheerleader and public-relations rep to promote them than Hank Garfield, the proud owner of our feature car.

"A lot of so-called experts bag on this system, but it's fantastic to drive," says Garfield. "The most important thing to remember is to keep your left foot firmly planted on the dead pedal. If you forget and stab the brake pedal on a one-two shift, you'll be hanging from the seat belts!"

This Mondial's cockpit looks like that of any other post-1989 example, with the exception of its missing clutch pedal. Peer deeply into the shift gate, and you can see bits of the microswitchgear. The actuator itself, which combines an electric motor with various gears and springs, sits atop the transaxle and is connected to the gearbox's clutch control fork by an adjustable tie rod.

Driving the Valeo-equipped Mondial feels very much like driving a non-Valeo Mondial, but of course there are a few differences. You start the engine in neutral, and with foot on brake select first gear. The clutch knows what's happening and is fully disengaged at this point, so it's a no-brainer. Next, pretend there's a raw egg in between your right foot and the gas pedal, and gently feed in some revs. You feel the clutch begin to grab at about 1,500 rpm, as if you were manually letting out a clutch pedal. By 2,000, it's



TOP Mondial t's 300-hp 3.4-liter V8 engine. ABOVE, LEFT-RIGHT 17-inch Speedline wheels noticeably improve handling compared to stock metric TRXs; Valeo-equipped Mondial utilizes classic gated shifter.

fully engaged, so you can give it more gas and pull away.

The Valeo system is somewhat adaptive, automatically adjusting the clutch-engagement point as you drive, so as you learn to read the car it's learning to read you—Garfield describes it as the early days of a new relationship. Sure enough, the longer I drive the car the smoother its launches are. But if I stab the gas in a ham-footed manner, this Prancing Horse becomes a bucking Bronco.

Once on the fly, shifting is quite normal. You accelerate, breathe the throttle a bit, shift up or down, then reapply the gas and move along. (I didn't try it, but the system reportedly

won't let you shift unless you lift off the throttle first.) You can snick up and down the shift gate all day long with nary a *graunch* of protest, and even if you think you're a pretty speedy shifter it's really tough to beat this thing; you can move the shifter quickly and crisply with no fear of crunching gears.

One thing the Valeo setup does not do, unlike Ferrari's F1 and Maserati's closely related Cambiocorsa systems, is blip the throttle on downshifts. No problem; you just do it yourself with the gas pedal, as you would during a heel-and-toe downshift. A driver with deft feet can make this thing dance—no surprise, since it was developed for use by rally-car *piloti*.

Is the Valeo system better than Ferrari's later F1 paddleshifter setup? Definitely not if you're comparing it to, say, the system found in the 430 Scuderia, with its super-smooth launches, fast and crisp upshifts and glorious Michael Schumacher-esque downshifts. (Later dual-clutch F1 systems found in the California, 458 and FF are in a whole other world of refinement.) However, the Valeo may just be smoother than the earliest F1 arrangement found in the F355.

Garfield acknowledges that the Valeo setup isn't perfect, but rightly feels it should be recognized as F1's founding father. He also thinks it gets a bad rap for reliability—he's



owned his car for nearly eight years and has had zero mechanical difficulty with it. That's a good thing, too, since very few Ferrari technicians, either at the dealer level or at independent shops, have ever worked on one. The issue is the system's rarity: The Valeo setup was offered only on the Mondial t (exact numbers are not known, but it's possible that fewer than 100 such cars in total were built) and a one-off F40 built for Fiat family doyen Gianni Agnelli.

I spent a fair bit of time behind the wheel of Garfield's immaculate 30,000-mile Mondial, and came away with a renewed appreciation for the model as a whole. Frankly, it's time for the naysayers to stop bagging on

these cars—while the original Mondial 8 was underpowered, later Mondials, particularly the 300-horsepower t, are lovely to drive, accessible, relatively affordable and definitely deserving of the Prancing Horse logo.

Garfield has made a few modest modifications along the way. The cockpit sports a carbon-fiber shift knob in place of the black plastic original, along with F355 pedals and a Momo steering wheel. Outside, sharp eyes will spot the tips of a stainless-steel, cat-back exhaust from Xhaust and handsome Speedline 17-inch modular wheels, which somewhat resemble those found on the 288 GTO, wrapped in Goodyear Eagle F1 rubber. Having driven Mondials equipped with the original

metric Michelin TRX wheels and tires, I can report that the Speedline/Goodyear combination is a huge improvement: It noticeably sharpens the car's steering and handling with no meaningful ride degradation.

I have to admit I wasn't sure what to make of this particular car's floor mats, which have the name "Rachel" embroidered in bright red. Before I could ask Garfield about being a retirement-age adult male who calls his car a woman's name, he told me that the mats are part of the Ferrari's celebrity history. You see, the Mondial's first owner was foxy blonde actress and supermodel Rachel Hunter, who owned it with her then-husband, shaggy blond megarocker Rod Stewart. Garfield has a wad of owner-

ship and service documents in Stewart and Hunter's names, but unfortunately not a single photo of either of them with it.

This Ferrari's first owners are an interesting historical footnote, and that's also what the Valeo automated clutch ultimately became. The system was never used on another road car, and disappeared from the Ferrari lineup with the demise of the Mondial t. While the Valeo system is not something I personally would seek out if I was in the market for a Mondial, it was gratifying to experience how well it works in real-world driving. Perhaps more important, it's a proper precursor to Ferrari's later paddle shifter system, an important building block in the company's never-ending quest for technological advancement. ●