2003 Corvette: Technical Article: Magnetic Selective Ride Control - First Ride

Magnetic Selective Ride Control---First Drive

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I finally had a chance to drive a six-speed, 50th Anniversary Corvette yesterday (Wed. 7/31) at a GM regional media event in Hollister, California. The venue was a 20-or-so-mile long "loop" of secondary highways and local roads GM had mapped-out for writers to evaluate various products. There also was a off-road course, on the near-by Hollister Off-Road Vehicle Park, on which I tested the new Hummer H2, but that's a story for a different list.

Like all 50th cars, the one I drove had the revolutionary Magnetic Selective Ride Control (MSRC) option. MSRC was developed by Delphi Automotive Systems from technology invented by the GM Research Laboratories then transferred to Delphi when GM spun-off many of its components operations. While I'd been to a previous 50th Anniversary Corvette press show back in May, no one was allowed to drive the cars there and I wasn't big enough on GM Communications' radar screen to get an invitation to the full-line media preview held in Michigan a month ago; so yesterday was the first time I had a chance to test MSRC...and one hell of a test it was.

On the first run around this loop, I took it kind of easy 1) because I didn't know the road and 2) I had a GM executive riding with me. The second time around the loop, I went alone and broke most of the safety rules by which the GM PR folks request we media types to honor, that is...I ran this car just as hard and as fast as I could go on these roads.

Back in May, when I first saw the 50th car, a source on the engineering side at GM very familiar with Corvettes told me he thought that Magnetic Selective Ride control was the first adjustable suspension that was truly effective in improving the car's handling. I filed that tidbit away for a time I could try MSRC out myself. Yesterday, I realized the guy wasn't lying!

A little history: the grandaddy of MSRC was the original Selective Ride Control (RPO FX3) which was on Corvette from 1989 to 1995. While it was not a "real time" system and it did not sense ride motions, its controller did sense vehicle speed and adjusted shock valving accordingly. The user could skew the system's six valving steps up and down the car's speed range by setting a center-console-mounted selector switch in one of three positions. In 1989, SRC was revolutionary. Only one other sports car in the world had such a system and it was the Porsche 959, hardly an affordable car. One great feature of SRC was a wide bandwidth of available damping. The system not only could improve ride but it could also improve handling over either of the two fixed valve Bilstein shocks (base or Z51) which were available back then.

Next came the first generation of Real Time Damping (RPO F45) in 1996. This system was not much more than a way marketing folks could separate Corvette customers from their money. It was a bi-state system (ie: it only had two, discrete levels of damping) and lacked the bandwidth to be even a good ride enhancement, much less anything valuable for performance driving. Coupled with the 96 car's soft spring and stabilizer bars, it gave the Corvette a nice ride and its owner a $1700 hit in the wallet. What it also did is showcased some pretty interesting technology that allowed the shocks to change damping states in near real-time.

In 1997, "RTD" was upgraded to a continuously-variable system which didn't have much more bandwidth, but was, at least, capable of more than two levels of damping. While the C5's vastly improved suspension gave RTD-equipped cars good handling, damping of F45 still lacked enough bandwidth to both offer improved ride, over base shocks, and more aggressive damping, over Z51 shocks. RTD remained a ride enhancement that offered little to the

performance driver but, at least, it was now continuously-variable. Was it worth the 1700 bucks? Waxers, cruisers and other C5ers with soft behinds got their money's worth. But, aggressive drivers? Well....if they opted for it, they spent a lot of money for little benefit. They'd have been better to save the 1700 bucks and buy Z51.

Fast forward to MY03 and Magnetic Selective Ride Control. Fortunately the march of technology was headed in the right direction (it was just slow in getting there) and near-real-time, "ride adaptive," shock absorber systems have finally come of age.

In the past, Corvette shocks, be they traditional fixed valve base shocks, the old SRC shocks or either of the RTD shocks, relied on a piston forcing shock fluid though specifically-sized orifices for the damping action. MSRC is something totally new and different. The shock is filled with a "miracle" liquid called "magneto-rheological fluid". This fluid was the result of a decade long development project undertaken by the GM Research Laboratory and Delphi. In short, when a magnetic field is applied to magneto-rheological fluid, its flow characteristics change dramatically and do so almost instantaneously. When you use a fluid which can substantially change its flow characteristics you end up with a shock absorber with very wide bandwidth. When you use a fluid that can be affected by a magnetic fluid, you, also, end-up with a shock that can change it's damping rate almost instantly---five times faster than could the 97-02 RTD, in fact. To be honest, I am not too familiar with all the technical aspects of MSRC hardware, yet, however, in an upcoming issue of C5 Registry Magazine, I'll publish an in-depth technical article on the system that will tell you all there is to know about MSRC and magneto-rheological fluid.

For now, here's a brief impression of how the system performed in my real-world test.

On my second trip around this impromptu test loop near Hollister, California, one of the first things I noticed is Magnetic Selective Ride Control has

bandwidth. Man, does it have bandwidth....enough that it both enhances ride, perhaps, even better than did RTD, but also enhances handling such that you almost feel like your driving a Z51. The only places I could feel that the car still has base springs and bars is in some max. lat. maneuvers that also had pretty significant ride movement, like hitting a bump in a turn. I could get the suspension to bottom there...a sign that even MSRC has its limits for the performance driver in a car with soft springs and bars. The good news is: those limits are significantly extended.

I drove that car very hard through a number of different types of turns, combinations of turns and over different road surfaces. MSRC reacted with the right amount of damping and did so noticeably quicker than did the RTD used from MY97-02. Even when set in the "tour" mode the system still was pretty good in damping the car as it was being driven hard, but the mode to be in when your running hard is "sport". The system is a hell of an improvement over RTD in an aggressive driving environment.

In short, the system flat kicks butt and is well worth the money to the sporting driver who's got the extra 1700 bucks. For the first time since 1995, I can honestly say that I'd buy a Corvette with adjustable suspension. If you're an aggressive driver, you need these MSRC shocks. If you can't hack the price, borrow the money.

I'll close this brief impression with a question for the Corvette folks at GM: Geezzzzzz people, why can't we have this on the Z06??? I'd trade the HUD, the memory package, dual-zone air and all that other fluffy BS for a set of those shocks!!!