

DRAG RACE Test - Chattanooga's Brainerd Optimist Club Dragway

This 1/8 mile track has a lot of bumps, cracks, patches and variations in traction & camber. It was felt that this would be great for testing as it is always the most difficult to find the best settings when conditions are marginal.

4.70 Index Camaro No. 1997 – owner Steve Nichols, driver Blake Wilder.

Both this car and the driver are known to be very consistent everywhere they run and Blake has made over a THOUSAND runs on this track. Steve always keeps his team “up to date” and never stops looking for the next “advantage”.



Wilder-Nichols “Reddy Racing” 1997 Camaro
(4.70 index) with 632 Nitrous Motor



MagneShocks on rear suspension of Wilder “Reddy Racing” #1997

Drag Shocks have always been a Big COMPROMISE!

What you SET is what you GET – for Burnout, Launch, Mid-track, Down-track & Shutdown.

We believe that, in fact, each of these conditions IS DIFFERENT and will require very different shock settings for maximum performance. The MagneShock System will allow us to tune the shock to the exact settings we need for MAX Performance in each condition – NO COMPROMISES.

This was the “Maiden Voyage” for 3rd Generation MagneShocks™ on a Drag Car.

For this test we used two rear 5261-10 MagneShocks (set @200 psi gas pressure). A “-10” suffix MagneShock can develop:
from 80 up to 490 lb of damping force at 1 inch/second piston velocity,
from 120 up to 690 lb at 3 in/s and
from 200 up to 830 lb at 6 in/s.

The car was previously equipped with Strange™ double-adjustable shocks set close to what Strange™ recommended for this type of car.

We dyno'd both shocks so we could duplicate the “baseline” damping during Launch.

For the “Launch”, we set the REBOUND about the same and the compression with about 20% more damping.

Our intent was to soften the REBOUND damping and slightly increase COMPRESSION damping at mid-track & down-track so that the tire could follow the track as speed increased.

We also expected to use “50-50” type damping during the Shut-Off/deceleration portion of the run for maximum STABILITY, (this could be very important if the chute tried to really yank the car when pulled).

The MagneShock DRAG System has a total of 8 different setups (the damping settings of all the shocks), 5 of which will be called during any race:

Setup “0” is used for all BURNOUTS,

When Selector Switch is set to “RACE-1”:

Setup #1 is used for LAUNCH.

Setup #2 is used for MID-TRACK damping.

Setup #3 is used for DOWN-TRACK damping.

Setup #7 is always used during SHUT-DOWN/deceleration.

As an alternative: The Selector Switch can be set to “RACE-2”.

In this case it Launches in Setup #4, Mid-Track is #5 & Down-Track is #6, while Deceleration uses the same #7 Setup.

RACE-2 is commonly used when the two lanes require different shock setups or when a different shock combination may be anticipated.



The FORCE-VELOCITY curve can be set by the Driver/Owner with the Programmer at 0, 1 & 3 inches per second piston velocity.

The settings at "0" in/sec represent the force required to START THE SHOCK MOVING in either Rebound or Compression.

The Controller & Programmer modules will run any 3rd Gen MagneShock, which are available in many different damping ranges (the "dash# suffix).

The displayed numbers on the Programmer Module (settings) are "relative damping force" – a higher number is a stiffer shock.

Settings here are roughly 1/3 the actual damping force with the "-10" MagneShocks used here (a setting of 150 gives about 450 lb of damping).

A "-20" MagneShocks will read pretty much directly ("150" = about 150 lb of damping). Its highest & lowest values would be about 1/3 that of a "-10"



The "Programmer Module" plugs into the

Controller Box (in the 2 "empty" connectors in the photo below). It is only needed when you want to see or change any of the setting.



Selector Switch (3-Positions: Burnout, Race-1 & Race-2) mounted on tunnel (and relay used of "LAUNCH" signal)



Magneshocks Logic control box in Reddy Racing Camaro mounted on cockpit floor, just to right of fire bottle (Sorry! We hadn't mounted the Controller I.D. label yet)

Setup #0 (BURN-OUT) was programmed at:

(MAX damping)	(Vel	0	1	3)
(About 2/3 of MAX)	(REB	170	190	240)
	(COMP	100	130	160)

NOTE: We set the Compression a bit softer than Rebound as we didn't want to take a chance of "dumping" (if you assume piston velocity never exceeds 6 in/s then "160" is about the maximum COMP damping setting that should be set for a -10 shock with 200 psi gas pressure).

Setup #1 (LAUNCH) was programmed at:

(REB approx. same, COMP +20% compared to prior Strange™ shocks. GAINED .02 sec.)	(Vel	0	1	3)	TIMER: 1.27 seconds
	(REB	15	55	150)	(Right Rear 15 60 160)
	(COMP	15	32	50)	

Setup #2 (MID-TRACK) was set at:

(in between #1 & #3) (GAINED .04 sec.)	(Vel	0	1	3)	TIMER: 1.00 seconds
	(REB	15	32	60)	
	(COMP	15	17	26)	

Setup #3 (DOWN-TRACK) was set at:

(50-50 full soft, in this case) (GAINED .05 sec.)	(Vel	0	1	3)	TIMER: 2.63 seconds
	(REB	15	17	26)	
	(COMP	15	17	26)	

Setup #7 (SHUT-DOWN) was set at:

(also 50-50 but about 30% stiffer than Setup #3)	(Vel	0	1	3)	TOTAL: 4.90 seconds
	(REB	15	72	46)	
	(COMP	15	72	46)	



RESULTS:

BURNOUT (Setup #0): The very stiff settings made it easy to break the tires loose and he didn't have to run the motor hard. More importantly, *"they didn't try to hook up as hard"* during the burnout so it was more controllable, especially when you backed off the gas.

LAUNCH (Setup #1): This car has a tendency to pull a bit to the left in the first 60 feet, so we started out with a little bit stiffer REB settings on the Right-Rear shock (ONLY on Launch). The car launched virtually identically to how it did with the prior Strange™ shocks but it ran perfectly straight with NO pull to the side. We set the TIMER at 1.27 seconds so the car was well past the 60 foot light when it shifted to Setup #2.

We did not get to test any variations of this timing.

60 foot times improved immediately by .02 sec (from 1.08 to 1.06) but we broke out (4.68) so we de-tuned the engine back to 1.08 to run right on 4.70

We did try some stiffer REB settings but they made the tires spin from the start.

We did not get to try any softer REB settings or any different COMP settings as we decided to work on the 330 foot & 2nd half times and STABILITY.

MID-TRACK (Setup #2): We accidentally tried some stiffer REB settings at first but the driver felt a "kick" when it this Setup (#2) started and the DAQ showed the tires were spinning. We reduced the REB settings in subsequent tests – the kick (and tire spinning) went away and the car settled down.

Our 330 foot times decreased by .04 sec. (prior 330 foot times were about 3.05 while we now consistently ran 3.01 seconds).

We had to de-tune the engine nearly every run as our adjustments kept making the car faster and we didn't want to break out of our 4.70 index.

The timer for this Setup was set at 1.00 seconds so this portion shifted to Setup #3 at 2.27 seconds out. We did not mess with this timing.

DOWN-TRACK (Setup #3): We only tried the softest possible setting (50-50, about a #5 in valving jargon).

In every run, right from the beginning, the car went straight & smooth and settled down with virtually no wheel-spin.

The high gear graph was straighter than it has ever been. We picked up .05 seconds in the last half.

The driver said *"When #3 kicked in it just laid back smooth - I felt like I could just lay back & pour myself a cup of coffee. There was none of the tire spinning and motor surging that we used to have."* The tires were following the track and not breaking loose over each bump as the speed increased.

And, we expect we will be able to back some angle out of the rear wing and gain even more MPH.

The timer for this Setup was set at 2.63 seconds so the computer shifted to Setup #7 at 4.90 seconds after the Launch.

This allowed about 0.20 seconds after the ET light until it shifted to the STABILITY/DECELERATION mode.

The MagneShock system will shift to Setup #7 whenever the chute is pulled, regardless of the timer or the Setup number it is currently running, so the timer acts as a "safety" if you don't pull the chute or it comes late.

SHUT-OFF (Setup #7): We only tried one setting (also 50-50 but about 20% stiffer than Setup #3 - a #6-1/2 in valving jargon).

In every run the car was much more STABLE than ever before during deceleration.

We never used the chute – it wasn't necessary as braking traction was greatly improved and the car did not have any significant pitch or roll.

Blake said *"I never felt any of the bumps that used to bounce me around a lot – shutdown was a cake-walk"*.

We actually got all the way through to the final even though we were doing a lot of experimenting.

Unfortunately, for the final our car was so much faster that we had made a ton of "de-tuning" adjustments and the air-temp had dropped by 30 degrees!

It was just a little too much for us to compensate for - having no prior experience with this much de-tuning.

We had a big lead as we approached the eyes and figured we might break out so Blake "burped" the throttle a bit.

It was too much – the car was de-tuned so much that it lost tons, went 0.15 sec slower than we had run all day & we lost by 0.008 seconds (ran a 4.86).

Oh well, 2nd overall wasn't too bad – especially when we knew we had learned a lot, improved the car tremendously and were ready for the next one.

SUMMARY:

LAUNCH: We didn't have time to fully test this mode but we improved the 60 foot time by .02 second with no essential change to damping.

We felt we can probably do a lot more here in the future when we are not worried about "breaking out" of the Index.

MID-TRACK: 330 ft times were improved .04 second by Setup #2 and the car was a lot more predictable. This was probably because of less wheel-spin.

Even 1.27 seconds out the car is running about 100 MPH at the start of Setup #2 and stiff rebound damping doesn't let the tire follow the track very well.

DOWN-TRACK: (from 330 ft to 660 ft) 2nd half times were improved .05 second by Setup #3 and the car was much easier to drive at speed.

"Motoring" was virtually eliminated (wheel-spin as the tires loose traction over each bump or undulation in the track – due to super stiff rebound damping) by going to a relatively soft 50-50 type "valving". The tires could now follow the track.

We ran faster here, at the end, than the car had ever run before.

Once we had settled on our final settings Blake said *"it was a perfectly uneventful run"* – everything was smooth, fast & predictable.

BURNOUT: Tires were less "hooked up" which made it easier and SAFER. It also required less power/throttle.

SHUTDOWN: Even the shutdown was improved. The bumps & jerks, due to the super stiff damping previously run, were gone!

The car did not "dart" anymore when it went over bumps or when the gas was released.

Steering corrections were easier to make as there was less "body roll" (that tends to unload the inside tire and make the car "over-correct").

Blake said, *"You don't feel the left and right 'walking', especially in the 1st 330."*

In the 2nd half he felt more confident in making corrections as it was more STABLE at all times.

Corrections didn't yank the inside tire off the track so it was *"extremely predictable"*. MagneShocks did a great job of keeping the tires on the ground.

Almost every time we made an adjustment the car got faster.

Blake said, *"The car feels like it's on a cushion – not on the shocks. The ride is not as harsh – anywhere on the track."*

And, *"I have tested dozens of new products in my 30 years of racing – not one ever worked so well the first time out!"*

Because we were running a 4.70 index we were "chasing our tail" as we had to continuously de-tune the motor to keep from breaking out.

If we had been running heads up we would have made some significant reductions in ET - and increased MPH too.

Overall, we feel we gained more than a TENTH (0.11 second).

As it was, running a 4.70 index, we made the car run a lot straighter, SAFER and more consistent.

We can't wait to try a smooth track and someplace where we won't have to consider breaking out of our index so we can truly measure our gains.

Drag Shocks have always been a Big COMPROMISE!

What you SET is what you GET – for Burnout, Launch, Mid-track, Big End & Shut-down.

What are the chances that all these very different conditions would require the EXACT SAME setting??? – ZERO !

The MagneShock System gives you exactly what you need under each & every condition – NO Compromises.

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MagneShock
770-451-8694

5412 new Peachtree Rd.
www.magnEshocks.com

Atlanta, GA 30341
dick@magnEshocks.com