



# 3<sup>rd</sup> Gen MagneShocks™ for DRAG-RACING

*The SHOCKING future!*

**MagneShocks will make your car faster!**

**Our System will not only give you TOTAL CONTROL over the “Launch”**

**It will ALSO:** Give you complete control over what happens immediately AFTER the Launch.  
REDUCE or ELIMINATE wheel-spin on the top end, which will increase MPH  
and ELIMINATE the major cause of top-end accidents.

Make your car run straighter, and improve STABILITY - everywhere.

In addition: Increase STABILITY & PREDICTABILITY during Shut-down,  
And, even make your burnouts easier & SAFER (less throttle & less “darting”),

## **Drag Shocks have always been a Big COMPROMISE!**

**What you SET, is what you GET!** (for Burnout, Launch, Mid-track, Down-track & Shut-down !)

What are the CHANCES that ONE Setting is “PERFECT” for ALL conditions? - ZERO ! - NONE !

You will have completely different shock settings (that come “automatically” with user-adjustable timers) for:

1. **Burnouts,**
2. **Launch,**
3. **Mid-track,**
4. **Down-track,**
5. **Shut-down**

PLUS, you'll have another selection for a different lane - available “*at a flip of the switch*” (**Launch, Mid-track & Down-track**)

**Don't be WORRIED!**

1. **You won't lose your BASELINE.** We will PRESET the Controller to YOUR baseline – the SAME as your present shock settings.
2. **We will DE-MYSTIFY the “Electronic Box”.** We will SHOW YOU how to adjust it to:  
A. Improve your PRESENT setup, gain EVERYWHERE on the track. B. COMPENSATE for track conditions & run MORE CONSISTENTLY.

**When you purchase a MagneShock System, if you like, we will pre-set your new Controller for you.**

You can do any of the following – FREE OF CHARGE:

- A. Tell us what shocks you run and your settings. Sometimes we already have dyno'd that type of shock and know what the damping is at the various settings.
- B. If you already dyno sheets on your shocks & present settings - Send us the specs.
- C. Send us BOTH your shocks, set at your baseline. We will dyno test them (FREE OF CHARGE).

We will then Pre-set your new Controller to “LAUNCH” at the SAME damping. And, we will also be happy to set ALL the other Setups as we BOTH agree will help your times, stability, consistency & SAFETY.



## **When in doubt – GIVE US A CALL.**

### **What is a 3<sup>rd</sup> Gen DRAG MagneShock™?**

The MagneShock™ is an “intelligent *Computer Controlled* ULTRA-adjustable” complete shock absorber system that uses Magneto-Rheological (M-R) fluid (instead of oil)... it is MUCH MORE than any double, triple or even six-way adjustable shock!

**MagneShock™ allows “tailoring” the shape of the Force-Velocity curve –  
- Merely input the damping you want at three (3) different velocities.**

You can set the ENTIRE damping curve on one or all SHOCKS to settings YOU determine and save it all as a “SETUP”.

### **The driver has a 3-position switch: Burnouts, Race-1 & Race-2.**

- One damping “SETUP” (#0) is special - just for BURNOUTS.
- After your burnout you simply select either Race-1 or Race-2 - each have 3 different SETUPS that are used in each race and a 4<sup>th</sup> one (#7) for shut-down/braking.  
The 1<sup>st</sup> timer will wait for your “Launch signal” (you set the TIMER for how long each SETUP lasts).
- Race-1 starts in SETUP #1. When it times out it goes to SETUP #2. When this times out it goes to the SETUP #3. Then, when you cross the line it changes to another special SETUP (#7) just for deceleration.
- Race-2 uses SETUPS #4, #5, #6 & #7. – you are READY for lane or track changes – with another complete combination - even at the last second!

### **The MagneShock™ SYSTEM has UNIQUE “damping bump-stops” for both Rebound & Compression.**

You program the points, near the limits of travel, where the damping will increase to FULL-STIFF to help prevent Bottoming-out & Topping-out.

This is a SERIOUS chassis-tuning device that has NEVER been offered before – NEVER EVER!

### **The MagneShock SYSTEM is composed of 4 basic components (& the cables in between).**

1. The CONTROLLER box is the “Brains” - it tells each shock what damping to have at all times.
2. The SHOCKS look conventional (except for the cable coming out on top).
3. The PROGRAMMER box is used to: A. Display all the settings, B. Define the Force-Velocity “curve” of each shock in each of the 8 “Setups”, C. Set the TIMER for each SETUP (how long it lasts), D. Define the damping-bump-stop positions & some other shock parameters. NOTE: The Programmer is not actually needed during the run – can be disconnected while racing.
4. The SELECTOR SWITCH mounts in the cockpit for use in the race: It's really quite simple - You set it for: 1. Your Burn-out. 2. Then, Choose RACE-1 or RACE-2 before you launch (different settings).





## Additional Features:

- Response curves that are IMPOSSIBLE on conventional shocks are easy on MagneShocks.
- The Programmer can be easily read in bright sunlight or at night.
- Very low current draw (averages about 1 amp for the entire system – MAX is 2 amps for 4 shocks).
- Operates on standard 12 & 16V systems - Simply connect the Controller to the accessory or ignition switch so it is ON during the race & also during the SHUT-DOWN (braking and/or chute deceleration).
- Programmer is easily connected & removed in between races (actually required only to view or change settings).
- MINIMIZE – Very stiff shocks are difficult to install or remove – simply press the MINIMIZE switch down and all the shocks will instantly go to their softest possible setting. This can save a lot of time & “heartburn”!
- Software development is “continuous” - updates for the Programmer will be available to all for a modest cost.



## What are the Advantages of 3<sup>rd</sup> Gen MagneShocks?

- You need buy only one set of MagneShocks - No need to “re-valve” shocks or buy specially valved shocks., YOU program each shock - the Controller adjusts them to any desired damping at any point on the track - over a wide range..
- No waiting, research or extra money for specially valved shocks.
- You can PROGRAM & try curves you’d never dream of BUYING. Curves that are simply IMPOSSIBLE to attain on conventional shocks simple, cost no more and are programmed in seconds.
- Re-programming a shock takes only seconds.
- Instead of hours of tedious re-valving work (that can only be confirmed with a shock dyno).
- There is no need for a “shock-man”
- You don’t need to take apart any shocks – just “program” them. And, you can do it over & over again.
- There is no need for a shock dyno.
- Each shock WILL BE whatever you set it to be – every time.
- There is no need for a lot of expensive re-valving/rebuilding parts.
- Only “electrons” are changed (by the Controller) – and they cost nothing.
- Testing time can be reduced dramatically. And, your testing will be more effective.
- You learn more in ANY test session - you know EXACTLY what you have - WITHOUT a shock-man or a dyno in your trailer.
- The RACE-1 or RACE-2 positions ALSO gives an extra Setup – used ONLY for SHUT-DOWN/Braking. SETUP #7 is triggered by the Setup #3 timer OR by the Chute switch at the END of each race – whichever comes first. (Setup #7 is used for both the Race-1 & Race-2 sequences.)
- Setup #7 gives PROPER CONTROL of the racecar under deceleration especially when the chute comes out – MUCH SAFER ! The SETUP for SHUT-DOWN can be triggered by a switch on the Chute-Release, Brake, steering wheel or whatever you have.
- You can be READY for a fast change in the track –OR: difference in LANE “choice”.
- You can have Race-2 configured in advance (with SETUPS #4, 5 & 6) - ready to compensate for lane OR traction differences. When everyone else is “worried & praying” you can be WIDE OPEN!
- You can make last-minute changes.
- When the track changes quickly you are usually OUT OF LUCK!..... Not with MagneShocks!
- An ENTIRE “setup” can be changed with a “flick of the switch” - AT THE LINE! Or: re-programmed in SECONDS.
- Overall costs are far lower.
- MagneShocks cost no more than top-end shocks that do not even come close to MagneShock performance.
- You will save THOUSAND\$\$ each year (sometimes every RACE).
- Purchase of the Controller, Programmer, Selector, Switch, Cables & Shocks is a 1-time “event”.
- MagneShocks will make you MORE MONEY!
- Think about the TENS\$, or HUNDRED\$\$ of THOUSAND\$\$ of dollar\$\$ you “COULD” have made IF you had EXACTLY the shocks you needed WHEN you needed them!

## Think about the CRASHES you can AVOID if your tires are NOT spinning on the top-end!

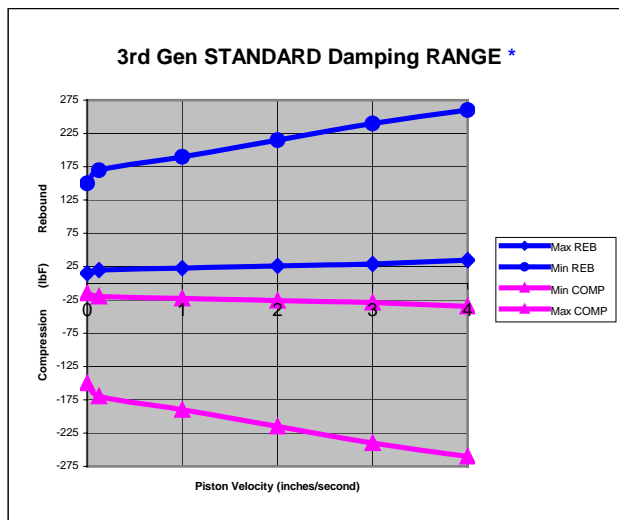
### Force-Velocity Curves:

The damping can be adjusted at three velocities: 0, 1 & 3 inches/second.  
 The Controller linearly interpolates the damping in between these velocities.  
 The slope of the curve above 3 in/sec is fixed (how fast damping increases with velocity).  
 Rebound & Compression damping ranges are the same — about 10:1 at lower velocities.

Several “Shock Damping RANGES” available: -20 -13 -10.  
 Typically, damping at 0 in/sec can range from 17 to 170 25 to 280 50 to 450 lb,  
 damping at 1 in/sec can range from 19 to 190 35 to 340 60 to 520 lb.  
 damping at 3 in/sec can range from 26 to 240 50 to 450 100 to 710 lb.  
 damping at 6 in/sec can range from 45 to 310 90 to 600 200 to 950 lb.

The “-13” is the most popular rear Damping-Range for most Drag Cars.  
 Shocks with different damping ranges than those listed here are also available.

This chart is typical (although for a softer “-20” range).  
 It shows the MAX & MIN dampings possible with a MagneShock.  
ANY damping IN-BETWEEN these limits is possible.  
 (in-between the BLUE REB lines or the FUCHSIA COMP lines)  
 This even includes SOFTER damping at HIGHER speeds! ---  
 --- an IMPOSSIBILITY with regular shocks!!!





**MOST IMPORTANT** – Don't be afraid of converting to the MagneShock System – You WON'T LOSE your BASELINE!

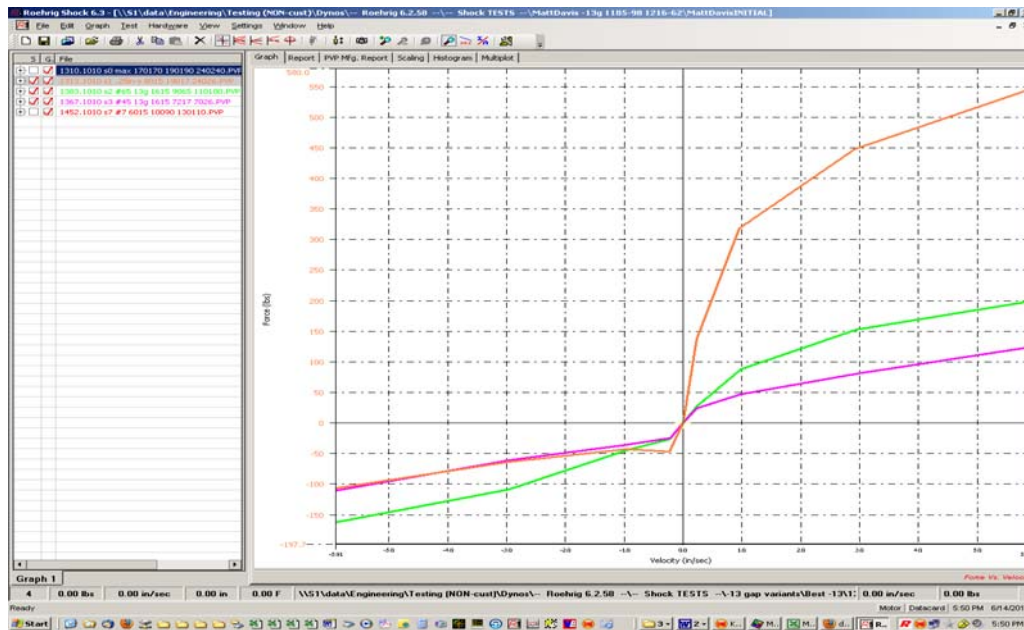
When you buy a MagneShock system we will **PRE-PROGRAM** your Launch to be **THE SAME** as you presently run. And, we will be happy to pre-program all the other Setups in a manner we BOTH agree will help your car **RIGHT FROM THE START**. We will help you get started and we will continue to help you as you progress. We want to help you find the right settings for all your Setups. ALSO, we will be happy to help you figure out how to configure your "Launch" & "Chute-pulled" signals. Call us on the telephone. Our TECHS are always there for you.

Typical charts for LAUNCH (Setup #1), MID\_TRACK (Setup #2) & DOWN-TRACK (Setup #3)

LAUNCH often has very stiff REBOUND & relatively soft COMPRESSION.

MID-TRACK has greatly reduced REB & increased COMP.

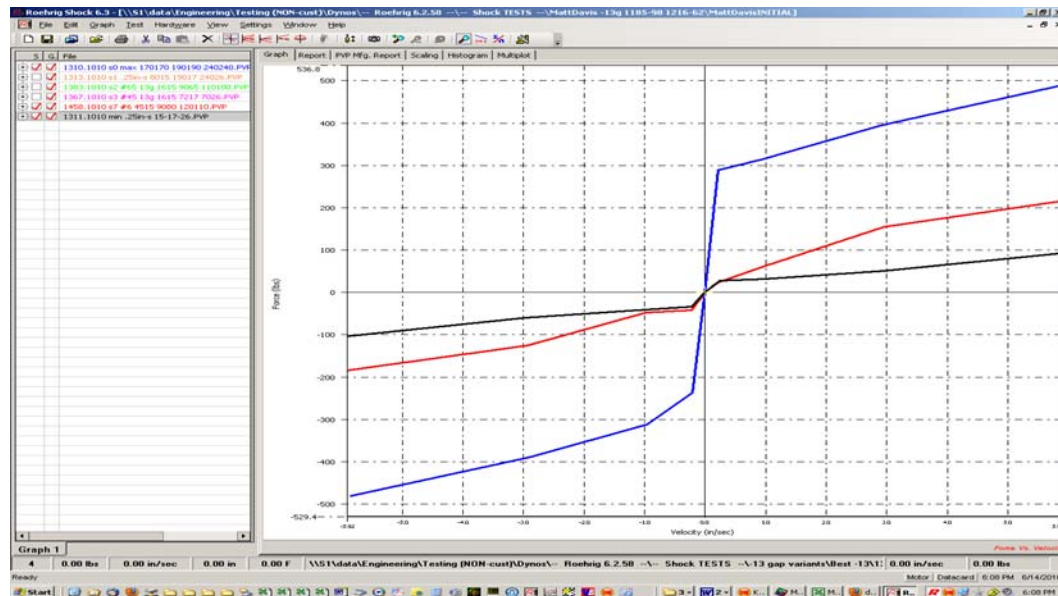
DOWN-TRACK has REB & COMP reduced greatly so the tire can follow the track on the top-end (high speeds).



Typical charts for BURN-OUT (Setup #0=MAX), SHUT-DOWN (Setup #7) and for comparison only: MINIMUM damping (BLACK)

BURN-OUT is very stiff – this makes it easy to break the tires loose, keeps them spinning & is more stable when you back off the gas.

SHUT-DOWN is a "50/50" type #6 valving for HANDLING & STABILITY – good on braking or particularly if CHUTE opens violently.



The above charts are for "-13" MagneShocks – the most common damping range for the rear of Drag Cars. Stiffer or Softer ranges are also available.



## HOW IT WORKS



### 3rd Generation

Each shock is controlled by a computer and each shock contains a very fast and accurate position sensor. Each sensor tells the controller the absolute position of the shock's piston (4000 times per second). The computer's MCU then uses this data to calculate the direction of travel and actual piston velocity of each shock.

The MCU then controls the damping force "automatically" in response to this data.

It updates the damping force 4000 times/second for each shock.

It is a little bit velocity sensitive, but damping can be programmed to be nearly anything you want at any velocity.

It can also be position sensitive. Our programmable "bump & rebound stops" know when the suspension is about to bottom out or top out & automatically increase damping force to alter response or prevent component damage.

This improves handling and minimizes stress on everything – which reduces failures of suspension components.

The Force–Velocity curve is programmed BY YOU into the controller.

### M-R Fluid

The M-R fluid is basically composed of micron size particles of iron suspended in an oil base.

In the presence of a magnetic field these iron particles want to form chains & stick together.

The stronger the field - the harder these particles stick together making the fluid "stiffer" or "thicker".

This changes the apparent viscosity of the M-R fluid, which, in turn, changes the damping force of the shock.

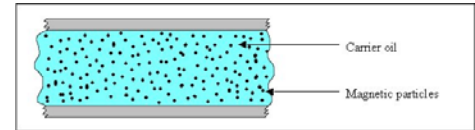
M-R fluid's viscosity can be changed continuously; actually as fast as the magnetic field changes.

The piston contains an orifice, through which the M-R fluid passes, and an electromagnet.

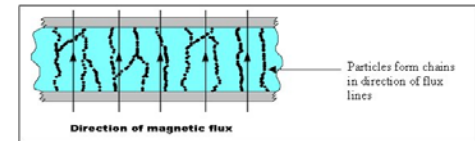
The controller varies the magnetic field of the electromagnet and the damping force varies proportionally.

The MagneShock™ has NO moving parts (like valves, springs, etc.) other than the piston and the rod itself.

Reaction time is very fast (usually only a few milliseconds from Min to Max or vice-versa).



Current OFF



Current ON

### TYPICAL Shock Dimensions & Uses:

(NOTE: We do not have STRUTS at this time)

Part No.	Description	Mountings*	Ext	Comp	Stroke
5243-13	Older cars with short shocks; Cars with IFS & IRS suspensions	1/2" ID Brgs	15.51	11.23	4.28
5252-13	Shorter REARS of "Stock Suspension" class DRAG cars	1/2" ID Brgs	17.43	12.23	5.20
5261-10	Like 5261-13 but for cars that require VERY STIFF shocks	1/2" ID Brgs	19.35	13.24	6.11
<b>5261-13</b>	<b>REAR of MOST Drag cars; Front of many tube frame cars</b>	<b>1/2" ID Brgs</b>	<b>19.35</b>	<b>13.24</b>	<b>6.11</b>
5239-15SB	Front of lowered/racing GM & Ford type suspensions	stud/barpin	14.21	10.30	3.91
5267-20BE	Rear of lowered/racing most GM (Monte Carlo etc) suspensions	barpin/eye	19.35	13.24	6.11
5267-20BS	Rear of lowered/racing 70-82 Camaro suspensions	barpin/stud	18.82	12.71	6.11
5267-20SE	Rear of lowered/racing 67-69 Camaro, big Ford suspensions	stud/eye	18.82	12.71	6.11

Many other lengths, damping ranges and special mounting ends, for nearly any application, are available.

**Shock Absorber:** Piston, Rod & Floating-piston are the ONLY moving parts - no valves, springs, discs, needles, knobs, checks or other moving parts.

- Bore: 48mm
- Rod: 14mm (high strength 303 stainless steel)
- Shock Body: 54mm OD (6061-T6 aluminum)
- Gas pressure: As required for damping range - usually 100 - 150 psi
- Threaded body: Accepts old Carrera & ARS coil-over kits (very fast threads - 1/4" pitch)
- Mono-tube: Gas-Pressure design with floating piston
- Mounting ends: \* Drag-Race mountings are 1/2" ID spherical bearings with 1.00" wide ball on both ends (1/2" & 5/8" ID with 5/8" wide ball also available).

**Controller:** Aluminum box (1.5 lb) is 8-1/2 x 4-3/4 x 3-1/4", can be mounted anywhere In the car - MUST be grounded to the chassis.

**Programmer:** Plastic box is 6-3/4 x 4-3/4 x 2-1/4", need not be mounted in the car, Ground not needed.

**Cables:** Each shock cable is usually about 9' and the others are shorter. Other lengths are available upon request.

**Connectors:** Gold plated contact - high quality, light plastic, water resistant, twist-lock type.

Any type of shock length or mounting is available on special order. Shocks with a stiffer or softer damping range are also available.

NOTE: We have coil-overs kits and some special mounting hardware is available. At this time we do NOT have front struts – they will come later & the Controller is already configured for them.

We will be offering a Data Acquisition System add-on, which will record suspension position & velocity data on a Laptop – with instant-analysis software. MagneShocks have built-in sensors. We will record all movements of the suspension (position & velocity). You will be able to completely analyze the movements of your suspension along with the effects of each damping change you make. It will simply require a Laptop be connected to the system during the run. Afterwards our software can give instant read-outs for your analysis.

