FAQs

12-01-2009

I heard long ago that MR fluids involved with this process are pretty abrasive. Is it a problem?

A major part of our research has been reducing the effects of this abrasiveness.
We now have wear comparable to regular shocks.

I also heard that the iron settles out of the fluid over time. Is this true and is it a problem?

The iron & solids will settle out over time. However, the ingredients will not allow the particles to compact so it is not a problem.
The particles lay loosely until the shock is actuated and then they remix in just a few strokes.

How do MR shocks react to temp compared to normal fluids?

Damping is significantly less affected by heat. There is a lot less fade.

Can the valving be done separately- compression and rebound all the way up and down via electronics? When a change is done will it only affect 1 side?

Yes, you have complete individual control of Rebound & Compression - separate from each other. There are some very minor effects when it transitions from one direction to the other but only at high velocities (it takes a few milliseconds to fully react).

What about gas pressure, shaft pressure etc.

Our design is a gas-shock with a floating piston - no different from the Carrera[tm] GP shocks.
We usually use around 125 psi - depending on applications.

What about dumping? What is it? How can I avoid it? Can I calculate when it will happen?

It is IMPORTANT to not have DUMPING. If you adjust your gas shocks (MagneShocks or any other kind) too stiff on compression you can get dumping! This is when the pressure drop through the piston (on compression only) is greater than the gas pressure.
TAKE CARE when "dynoing" a MagneShock that you don't exceed the DUMPING POINT (see more below).
When this happens, all the fluid will NOT flow through the piston; it will pull a vacuum above the piston & force the floating piston down much faster than usual – compressing the gas even farther than normal so as to equalize/raise the gas pressure up to the "hydraulic" pressure below the piston. In some cases this will allow gas to escape by the floating piston seals out of the gas chamber into the fluid. This will adversely affect performance and require rebuilding the shock to get the gas back where it belongs.
(do not try to rebuild MagneShocks your self – they''re not serviceable without a lot of special equipment we only have at the factory – we will do it quickly at a reasonable cost).
You can easily detect dumping on a dyno – it will start making a "squishing" sound when it approaches the maximum damping force (dumping point), which is also called the dumping speed or dumping force.
In a MagneShock, this is easily calculated by: MAX-comp-damping = 2.55 x PSI.
Ex: if you have 125 PSI then the most damping you can safely tolerate is (125 x 2.55 =) 319 lb.
Usually, the damping force goes up with piston velocity so, if you don't exceed the velocity at which your shock produced 319 lb of compression damping you won't have a dumping problem.
The simple solution is give it more gas pressure – until you have a safety margin.
If you know that you will need so much compression damping that it will take a really high PSI pressure to avoid dumping you can consider getting a remote reservoir installed on the shock. We can upgrade your shocks at reasonable cost.

What happens when the power is shut off?

When a shock has been energized (made stiff) and is then shut off, there will be some residual magnetism in the piston, which means the shock will not remain in its softest "condition". As soon as the controller goes on, it again regulates it to be whatever is should be.
There is a minor problem, however: If you turn off a really stiff shock when it was stiff it will remain quite stiff - even without any current.
This can make the shock difficult to put on or off a chassis (in some cases, it could require a few hundred lb. of force just to move it!).
So, we have a "Minimize" switch on the Controller.
If you flip this switch for a moment (it has a spring loaded return) it will restore all 4 shocks to their minimum possible damping.
This makes even the stiffest of MagneShocks easier to work with than conventional shocks!

Do MagneShocks incorporate a base valve design?

Not normally. But they are available as an option.

Why would I want a base valve?

We offer a remote reservoir for:

More stroke in a given shock body length (gives approx. 1" more).

OR: For a reduced gas pressure requirement in a shock that uses very high compression damping (this would have a base valve - to produce a pressure drop between the piston & the gas chamber but we do not have or need any "electronic" control of the damping there - only in the piston).

How does the weight of MagneShocks compare to a normal shock of this body size?

The shocks weigh nearly a lb more due to the iron content in the MR fluid.

How does hysteresis compare to a normal shock?

Hysteresis is similar - less at low piston velocities & more at higher piston velocities – again because it takes the magnetic circuits a few milliseconds to fully react.

NOTE: At this time we cannot shed any meaningful light on the actual "handling" effects of shock damping hysteresis.

Many of us have seen cases, in the past, where two shocks that "dyno'd" the same did not, in fact, handle the same.

In some cases the shocks had greatly different hystereses. But, it worked both ways - just as often the shock with more hysteresis handled better! As a result, we have not been able to identify any good or bad effects.

We will continue to research this subject, hopefully, to identify the "real" variables and/or formulate some meaningful conclusions.

If any of you DO know anything about this subject, we would love to find out more.

How can we see the hysteresis on MagneShocks?

Of course, you need a sophisticated shock dyno to see the true damping characteristics and hysteresis.

However, we are posting many Force-Velocity curves for typical and unusually “set” MagneShocks.

These are screen-shots taken of our Roehrig dyno (the same type that most professional teams use).

These will show ALL the characteristics, including the actual PROGRAMMER settings.

In some cases we also show Force-Time graphs so you can see how long an “event” actually takes.

You say the sustem uses 2 amps?

The average 4-shock system usage is around 1 amp. The maximum, when all 4 are full-stiff is about 2 amps.

When the shocks are at their minimum damping, the whole system only takes about ½ amp.

What about voltage? My racecar uses a 16V system. Is this a problem?

No problem. Our MagneShock Controller will accept anywhere from 10 to 24 Volts. It doesn’t care.

You say that MagneShocks have integral sensors. Can we get the data from these sensors?

We are developing a very simple & low cost “add-on” DAQ system for MagneShocks that will use a laptop.

It will record the absolute position and the piston velocity of each shock over time.

You will be able to instantly view the data after a race. This will allow you to see the wheel travel, effects of bumps etc.

Your standard configuration is ½” spherical bearings. Are there other options?

Most of our customers use 1/2" diameter bolts but many use larger or smaller sizes. We offer Teflon lined spherical bearings, 5/8” ID spherical bearings and we also can supply step-sleeves that reduce the bearing ID for smaller bolts.