

# AST Test Car Update October 2009

## 2008 Mitsubishi Evo X MR

October 4, 2009

*Project Objective: Provide a test bed for products and relay feedback to dealers and customers.*

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*Vehicle Mileage: 17,000 (daily driven)*

### **Update**

We took the Evo to the NASA Time Trial event this weekend at Eagles Canyon Raceway, north of Dallas. ECR is a great track, 2.5 miles long with challenging braking zones, several off camber turns, and elevation change (for Texas). A good mix of turns makes for setup challenges and a chance to test your skills.

Last time the Evo challenged ECR was October, 2008. We ran it bone stock two weekends in a row with NASA and the local BMW club. I was able to go from a 2:15 the first weekend to a 2:13 the second weekend. With several sessions under my belt, I was comfortable with the track.

Due to schedules, this weekend was the first time that the Evo would be on this track again. There has been a year of changes to the Evo (listed on next page). The Evo has more power, fully developed suspension, and slightly wider tires. All in all, it is not a radical setup in the least and is driven daily.

Piet Kreeft, founder of AST, was in town last week and we decided to try a new softer setup. The Evo was setup for very high low speed rebound and compression mainly to work with the high spring rates 700/1000 tried for autocrossing.

Autocrossing rewards setups that work well in slaloms. Now that the Evo is retired from autocross duty, the focus will be comfortable daily driving AND track performance. High low speed rebound and compression allows for very little fluid flow (through the shim stack) at very low

displacements. For instance, driving on the highway has displacements under 0.5", the large force required to open the shims at low displacement might work well on the track, but isn't comfortable for a dual purpose car. The new setup is more comfortable yet still controls the suspension in both environments.

With Piet's suggestion, I set the shocks all at half settings. This weekend only allowed for 3 sessions. I mainly worked on tire pressures and adjusting ride height between sessions. The Evo's AYC is very sensitive to F/R ride height changes.

*First session: 2:05.7*

Tire pressures climbed to 45/40. Pressures were obviously too high as the tires became greasy several laps in the the session. Certainly a nice improvement over last year's 2:13.

*Second session: 2:04.4*

Lowered tire pressures to 35/33 hot. While the lap times dropped, the car developed more push so I raised tire pressure back to 42/35. The car developed slight oversteer, but it was manageable, no change required in my opinion. The settings seemed to work very well. The Evo works so well on turn-in and power-on corner exit. I raised front ride height 3/8" at the fender to try to equalize the F/R balance.

The mid corner push is the only area of work needed on the vehicle. Some of that is always going to be there with full tread street tires. 285mm Hoosiers might help here. Any time you accelerate, the push disappears. Key note, don't stay steady state long and the car is fast.

*Last session: 2:03.7*

Dropping 10 seconds from a stock setup still on street tires? I'd say that's something worth talking about. Again, this car is all suspension and some

horsepower. There's not much to it! If that doesn't say something about the suspension, I don't know what to say. As a few data points, the BMW club raced at ECR last year. The fastest lap of two of the race winners was 2:03.2 and 2:03.5. The Evo with street tires is capable of laps nearing prepped race cars that weigh 800-1000 pounds less!

Here's a lap from the session, click [here](#).

### **Conclusions**

Certainly we're excited to be able to take a bone stock car and drop 10 seconds a lap. Again, this wasn't a back to back test, but it shows what you can do with a little suspension, some power, and a good setup.

### **Future Projects**

This week we will be trying a dual spring rear setup on the Evo. All wheel drive cars like the Evo have a poor front/rear distribution. We've all seen or rode in an Evo or Subaru with high rear spring rates. While it might handle well, it is never what I'd call a "Cadillac" ride. The low weight on the rear axle and high spring rates never provides a smooth setup except when you're going the exact speed to match the springs' frequencies with the wheel base, I.E. it can't do everything.

With a dual spring setup, we're hoping to achieve a plush 200 lb/in rate rising almost immediately to 570 lb/in in a turn. While progressive springs are frowned upon in racing, this vehicle is a dual purpose test platform. If we can achieve a smooth street setup and a 2:03 at Eagles Canyon, we'll have something no one else can equal.

Also, AST will be sending several test pistons for testing with the 5300 fronts and 4200 rears. Each varies in low speed bleed so we can test ride quality on North American roadways versus the standard piston we currently use. There will be some updates we're testing. Stay tuned!

If the Evo continues to run in NASA's TTA class, we might install 5100s and prove a single adjustable shock can be competitive as well.

Once we've reviewed the data logs from this track day, we'll publish them if anything interesting comes up.

## **Current Modifications**

### **Suspension:**

- **Front:**
  - AST 5300s (custom valving)
  - 80kg springs, 180mm length
  - Cobb sway bar, (2 holes, 1 hole)
  - Shock settings R6, LC6, HC6
  - Vorshlag camber plates
  - Camber: 3.0 deg
  - Caster: 6.4 deg
  - Toe: 0"
- **Rear:**
  - AST 4200s (custom valving)
  - 90kg springs, 180mm length
  - Cobb sway bar (full hard)
  - Shock settings R6, C6
  - Camber: 1.5 deg
  - Toe: 1/8" total toe-in

### **Engine:**

- Cobb cat pipe
- Vorshlag muffler delete
- Custom tuning by Cobb Plano
- 320 whp on 93 octane

### **Tires:**

- Yokohama AD07 - 265/35-18 (full tread)
- Front: 42 psi
- Rear: 35 psi

### **Brakes:**

- GiroDisc rotors
- Hawk DTC-70 front pads
- Stock calipers

**Weight:** 3700 pounds (with driver)



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