Project: Top Gas Busa

It all started back in 2000 when I bought a new Hayabusa to use as a test bed for new MPS products. It spent lots of time on the dyno and some time at the track. Everyone who owns one of these bikes knows that you can't go for a ride without going 120 …errr 150+ mph at least once while you are out. I'm smart enough to know that this behavior is not conducive to my health and well-being. Since I like all my limbs, and I don't like to sleep next to where I pee, it didn't get street ridden very often. It was my first foray into street bike racing since the old H-2 days. I was trying to go elevens back then. Now I had high hopes of going two seconds better than that on my Busa. After all, how hard can it be? The answer: pretty damn hard! With a 10.05 best, I never did make it. I could use the 240-pound rider excuse, but the reality is that I pretty much suck at racing street bikes and have gained much admiration for guys and girls who do this well. It's really hard to launch one of these beasts correctly. With 60 footers in the 1.60s and 1.70s I wasn't setting the world on fire that's for sure. There was no way I could win with inconsistent short times like I had. I missed the shot out of a cannon feeling, and consistency of a slick and bar bike. I did however really like the way it started with a button and how nice it was to ride it back.

Now I had a dilemma. I wanted to continue development of more parts for the Hayabusa but wasn't really into racing a street bike or hiring a rider. I had seen Rob Bush, Dave Page and Chuck Wilburn's Hayabusa powered drag bikes and was intrigued with the idea of a push button start, ride it back Hayabusa powered Top Gas bike. Now here was something I could get excited about.

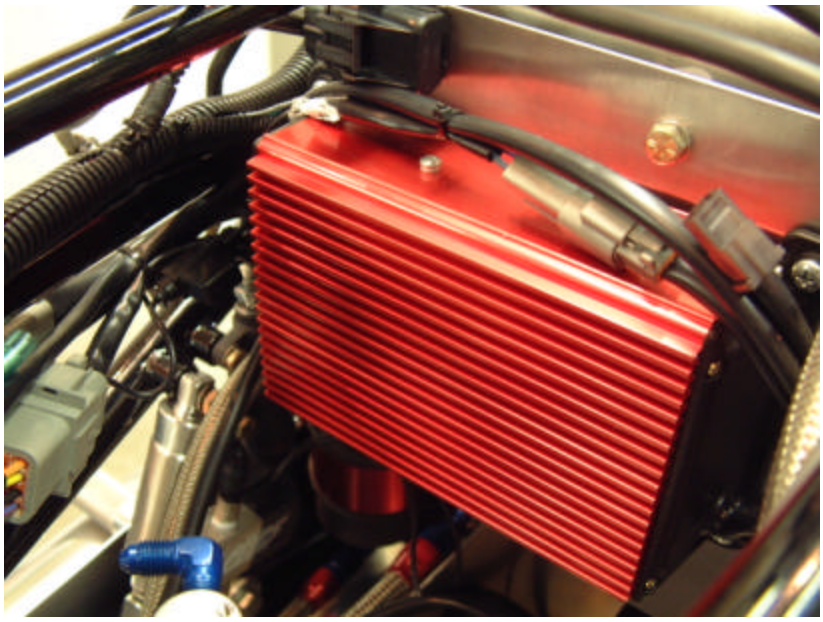
Since my Busa only had 500 or so original miles I decided to put it back to showroom stock condition and sell it. Then I called Doug Frierson, the king of used performance parts here in the South and put in an order for a used Busa motor. He told me they

were hard to find and expensive. Undaunted, I told him to get one for me anyway. Then I rang Dave Skaggs at D&G Chassis to see if he was interested in taking on project Top Gas Busa. He had a million questions that I didn't have answers to. I guess I hadn't totally thought out my project yet. At this point I decided to formulate a build plan. I knew I wanted to use the 10"wide Mickey Thompson rear tire, 70 inch wheelbase, Pro Stock Busa body with a Pro Mod fairing, PMFR Wheels, PMFR front end, and Grimeca brakes.

Meanwhile Doug called and had a motor for me. I bought it and another basket case motor for parts and to be used to mock up the chassis. I drove over to D&G on December 16, 2004 with the mock up motor and a deposit. It was mid December and he explained that he had a couple of Pro Harleys to build ahead of my Busa project. I decided that was OK, all the chassis builders are busy in the winter and I had a couple of bikes I could ride this season anyway. We ordered all the aforementioned parts to get a jump on the project.

An MSP sidewinder pipe and an MSP low profile oil pan were placed on order from Joe Marasco at MSP. The pipe is a beautiful stainless steel work of art with a bung already welded in for the O2 sensor. I shipped my trans and cylinder to Kevin at FBG for boring, plating and a set of 2mm over 12:1 Wiseco pistons. They also put together a 1-2 auto transmission with a Robinson Industries heavy-duty output shaft. These will be my only engine modifications to start with.

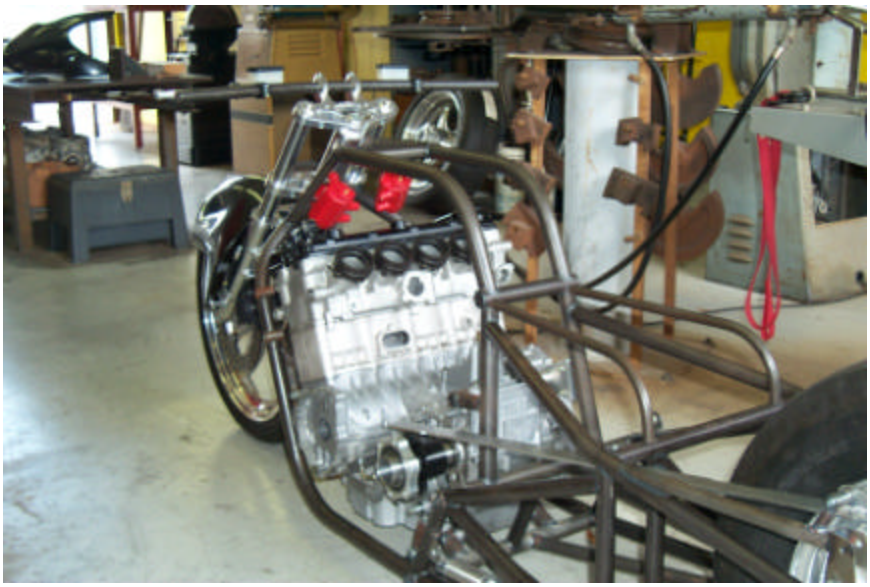
I also ordered a few other goodies including all my injection parts. I chose a Holley Commander 950 universal 4-cylinder EFI kit and a wide band oxygen



sensor upgrade to round out the fuel system. I decided to start out with the stock busa throttle bodies and injectors so I could develop a map for the Commander 950 that will work well on stock motors. I will be using an MSD MC-4 ignition to control all ignition functions. To trigger the MC-4 an FBG ignition cover and pickup are used. Dry nitrous is in the cards and this fuel system should be self-adjusting to the correct air fuel ratio no matter how the Schnitz Racing 2 dial progressive is set to progress the nitrous. I chose a K&R Pro Cube delay box with three timers to

control all the starting line and nitrous functions. I didn't want to use a slider clutch for several reasons. First, I wanted to ride it back and second I think a air - hydraulic clutch is faster reacting than a slider. I chose the MTC multi-stage lock-up clutch with a billet hub, FBG plates and a billet basket to start with. I had wanted to try the air – hydraulic clutch for a long time, so this finally gave me the motivation to finish the design and project. Now I have a large pile of parts at D&G and a mounting pile of parts here at MPS.

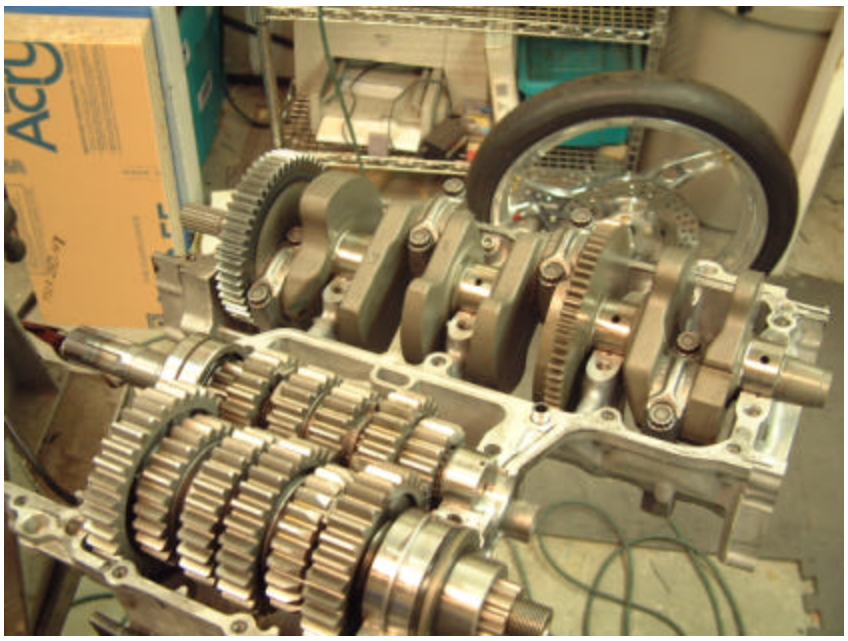
Dave Scaggs called me this morning to ask if anyone has used one of the MSP Sidewinders on a race chassis. The pipe hangs below the bottom frame tube, which is only 2.5 inches off the ground and should be the lowest part of the bike. So much for being able to use the finely crafted stainless steel pipe from Mr. Marasco. I called Rob Bush at Fish's Customs and had him send D&G a Murray pipe like the one he uses on the world's quickest and fastest Hayabusa. With the Murray pipe in hand Dave went back to work on the chassis. Finally, the call I had been waiting for, come pick up your chassis. On August 25, 2005 I picked it up my new bike!



Now I have all the parts in one place for the first time and the ball is in my court. I make a goal of running the bike at the SEMDRA Finals in Jackson, SC on October 22. I start to work mounting all the new parts. I have to get all the fab work done before I can take it all back apart to get the frame and bodywork painted. Mounting all those parts took longer than I had expected. It was very hard to find the time to work on it. Nights and weekends started to be the norm. With all the mounting done

the bike was disassembled for paint. R&D Autoworks in Debary, FL handled the paint work on the frame and the Pearl White paint on the body.

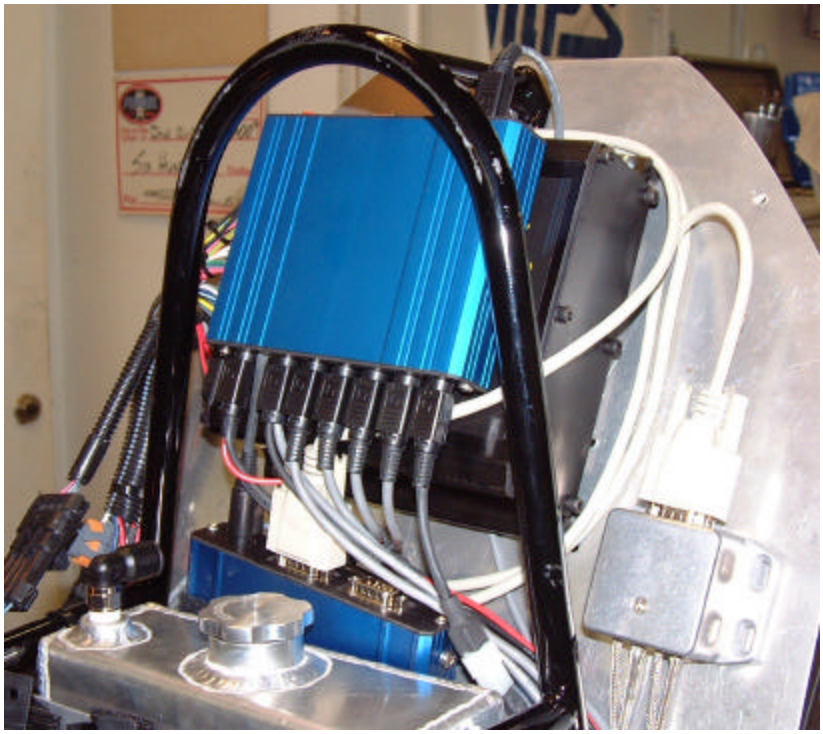
I started to put the motor back together while the bike was at paint. I also realized that there was no way I was going to have this bike done and running for the SEMDRA race. The Kawasaki had been a little slow for Super Comp all year and I was tired of getting worn out by all those guys because I couldn't run the number. I cleared my work area of Busa parts and put the Kaw on the lift to put in an FBG 1-2 auto trans and a little bigger NOS jet that I figured would give me the extra I needed to run 5.60. I finished the day before the race and went out 1st round anyway.



Now I'm even further behind on the Busa and the new goal is the Prostar World Finals in Gainesville on November 11-13, 2005. I am pretty much working on the bike every waking hour and finally get it running on the Sunday night before the race. It idles but won't rev cleanly. The Commander 950 needs a correct map and I don't have time to get to a dyno before the race. I worked on the map

for the 3 days I had before the race and still the bike wouldn't run clean. I decided to take it to Gainesville and not race it in hopes one of the mapping gurus could help figure it out there. No such luck, and the bike stays in the trailer for the weekend.

After getting home from Gainesville I went to the dyno and got it to rev cleanly, but encountered a problem with the throttle position sensor. I had been doing some research on other fuel injection control systems and had decided that the Accel DFI was a better unit for my application, so I contacted them and got one on the way. Meanwhile I found an awesome new data logger from RPM Performance at the PRI show. I spent the next several days removing all the Holley Commander 950 FI and the Computech data logger stuff I had just installed.



The RPM Datalogger is a very nice, and best of all, affordable piece. I really like the cabling. Cool locking connectors at the unit for analog and digital channels. I did need to turn down the countershaft sprocket slightly and bore the magnet collar to get it to fit correctly. I sent them both off to Dave at D&G to handle. The exhaust gas temperature would need an extra EGT module for the 4 exhaust gas temps. I got the accelerometer installed in a level place in the fairing. Now all the analog channels needed wired to their respective sensors. The air fuel ratio was wired

right into the wide band O2 sensor for the fuel injection. The nitrous pressure, fuel pressure, and oil pressure required installing pressure sensors. I wired the 3 digital channels to the transbrake, clutch switch, and the nitrous solenoid.

The Accel DFI was pretty easy to install since I had previously installed the Holley Commander 950. It was a matter of switching out the sensors and running the Accel wire harness to the sensors. I did use the wide band O2 sensor from Accel also to rule out any calibration issues. The Accel software utility used to create a base map is pretty involved. It asks for bore, stroke, cam lift, intake port sizes, valve sizes, etc. This had me measuring a bunch of parts and inputting the numbers in the software. In the end you push the button and it uploads the new map to the ECU. I was pretty nervous that this was going to be like the Holley unit and take me 3 or 4 hours just to get it to idle. I pushed the starter button and I had an instant idle. Wow, that was really cool and totally unexpected! It's idling clean and I haven't had to do anything yet. I let it warm up idling and then blip the throttle. It sounds pretty good free revving. I can go home very happy that night. The next day I do a burnout beside the shop and everything seems to be working.

I can't wait to get to the track. Orlando Speed World has someone renting the track on Sunday so I can get out there and make the first laps on the Busa. I had sold both the Suzuki and Kawasaki bikes the week before and their new owners wanted to go out as well, so we all went to the track to make first laps on our new bikes. Joe Marasco had warned me about revving the motor before it is warmed up when using the pressure relief valve and the high-pressure oil pump together. Well, I thought it was pretty warm and blipped the throttle a little. The oil came pouring out around the filter, ran down the motor, filled up the diaper and ran all over the trailer floor. That should have told me what kind of day this was going to be. The first pass it wouldn't even rev to the shift point. Looking at the air fuel ratio it was extremely lean. I richened up the fuel map and made another lap. It ran to the shift point and beyond, bouncing off the rev limiter. I pushed the button and it still wouldn't shift. Went back and checked everything, made another pass – same thing. Meanwhile the teaching was going well, Buddy "The Kid" Tomkins eventually went 9.17 on the Suzuki. Pretty good for someone who had never ridden a race bike. My best was 9.50; I guess 120 extra pounds does hurt performance. Local hot shoe Donald Black made a few good laps on the

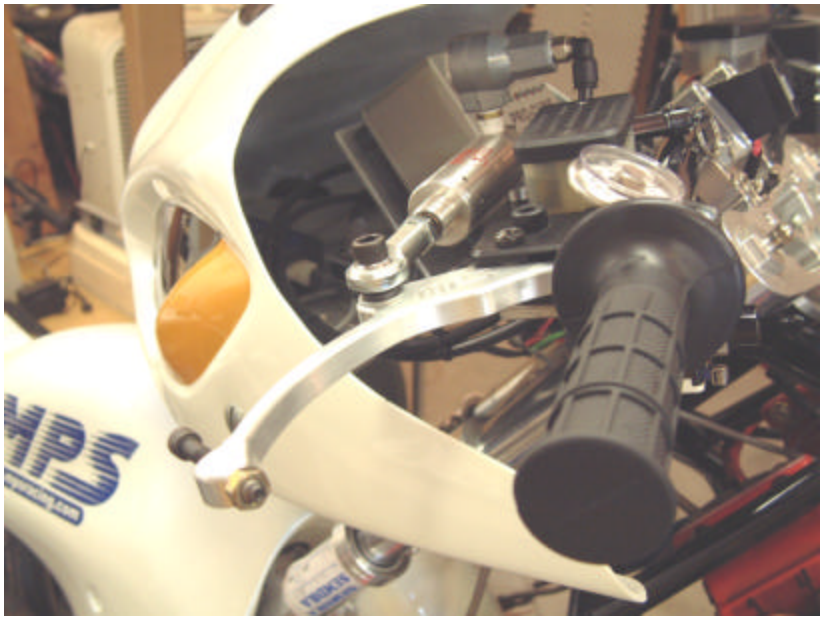
Kawasaki and everyone went home happy but me! The next month was an absolute nightmare trying to figure out why this bike will not shift. I won't bore you with the details of the next 2 times out to the track making terrible no shift passes.

Now it's already January 27th. Dave at D&G had set up the shift cylinder to push, but with the Busa it needed to pull. This caused the shift cylinder to be at the very end of its stroke limiting the power it could provide. After the first no shift pass, I drilled a new hole above the original hole effectively reducing the travel needed to shift the bike. It shifted for the first time and ran its first single digit time! It went 9.33 on the 3rd and last pass at Speed World. That was about as fast as I thought it would be with no nitrous, so I packed it up and went to Moroso for their Cycle Palooza event the next day. I figured I would make 1 lap there to make sure everything was okay then spray it. I couldn't get the nitrous to come on. I decided I would just run ET until I could talk to tech support at Accel and find out why the nitrous wouldn't come on. I made it past the 1st round with a lucky .000 light on the Busa's first competition lap. Good omen I thought.

The Accel DFI has provisions to spray 3 stages of dry nitrous, adding the additional fuel for each stage via the injectors. Turns out I had it wired wrong. It takes a positive signal to activate and outputs a ground to the nitrous. I had thought it sent positive. Great, I found the problem. Back out to the track. Still no juice! I'm back on the phone to Accel tech support. We go through everything on the phone and finally find a software safety feature that is preventing the nitrous from coming on. Back out to the track. Still no juice! This is becoming very, very frustrating. The nitrous will work on the bench but not out on the track. Now I am 2 weeks from the first Prostar race at Valdosta, GA and I have a Top Gas bike that has been a best of 9.33. This sucks! I have to abandon the dry nitrous and go with what I know will work. I wire and plumb the bike for wet nitrous and install .018 nitrous and .021 fuel jets. We head back to the track. I go 9.04 @ 150 with nitrous at 3.0 seconds. It's still nowhere near Top Gas times. I go back out with bigger jets .025- .028 and nitrous timer at 1.5 seconds and it won't shift 2nd gear. Now I'm a week from Valdosta with a bike

that hasn't run anywhere close to Top Gas number and won't shift. Gee, I'm scaring the hell out of those Top Gas guys!

I went back to work on the bike and eventually found a combination of things that were preventing the bike from shifting. The shift shaft was able to be moved back and forth and could actually pull away from the shift drum not allowing it to rotate the drum. The linkage on the shifter wasn't quite in proper geometry either. I shortened the boss on the shifter, which reduced the travel needed from the shift cylinder and installed a stop to prevent the shift shaft from moving out of contact with the shift drum. Hopefully this will fix the shift problem for good. I heard Barry Henson was renting the track at Valdosta on Thursday before the race, so I called him and booked a spot for me to test then also. Thinking I would have two days to find all my bugs. We packed it all up and headed to Valdosta.



First pass in Valdosta, I decide to see if it shifts before spraying it. It runs 9.98 but shifts every gear. I'm happy that it shifted, but still concerned because it shifted before with no nitrous. I put .026 nitrous jets in and turn it on in 3 seconds and it goes 9.21 @151 and shifted! Now I'm pretty happy. But, I am going to need to spray it a lot sooner to get anywhere near 8.20. Next lap I turned the nitrous on at 2.25 seconds out and ran out of nitrous. Left everything the same and made the last lap of the test session. It went 8.85 at 154, its first 8-second lap. I feel like it's a small victory, but I still have a little better than 6 tenths to pick up. Tomorrow it will be time to turn the juice on a little sooner and get the clutch set up correctly.

First pass I decide on 1.0 seconds for the nitrous. The bike drives to the left pretty badly and I have to lift. George Bryce comes over and tells which way and exactly how much to adjust the wheelie bar. Next lap is straight as a string. Thanks George! It runs 8.61. Now .6 for nitrous and it goes 8.52. It's time for bigger nitrous jets. .028 nitrous jets with .032 fuel jets go in and we leave it coming on at .6 seconds out. There has been a 10-15 mph head/crosswind all day long. Before this run I didn't really pay attention to the wind, but I should have. It had become more of a crosswind. Valdosta has solid concrete

bleachers so it was masking the wind until after the 1/8th mile where you get hit with a 10-15 mph wind where there was none before. This caught me totally unprepared. After going 5.33 @129 in the 1/8th I made a right turn from the left lane. Tried to roll off the throttle and pull it back but it wouldn't come back. Watching the 1000-foot block coming at me fast I shut off completely and took out the block with my left foot. Those blocks are only Styrofoam but they hurt at 130 MPH. I have never crossed the centerline, the carnal sin of drag racing, in my entire racing career until now. That was the last lap of the day and I had it to think about the entire night. And think I did. I was rethinking the whole Top Gas deal. Fact of the matter is that I hadn't paid enough attention to the wind and the racetrack and took the jump from Super Comp to Top Gas way to lightly. The bikes are definitely very different and I hadn't given the Top Gas bike the respect it deserved. After some pep talks from my old pals Butch Schwartz and Pete Barnhart, I decided I was up to the task and would attack it tomorrow with some newfound focus and respect.

It's a beautiful morning in South Georgia and I am ready to make my first ET time run. I have backed off the nitrous to 2.25 seconds for ET and I go an 8.95. First Top Gas qualifier is an 8.35, my best lap ever so far. I go 8.37 on the next one. Still not quite fast enough to be a threat. Sunday, in the 1st rd of ET it runs 8.23, now that's pretty close, but unfortunately I was dialed 8.35. I go an 8.47 in the first round of Top Gas to come in second.

I learned a lot at Valdosta. Hayabusas have a very tall low gear. This is necessary for a high horsepower street bike to keep it from wheelying, but not the ticket for a 10-inch tire with a wheelie bar. I will need to change it to the Robinson Industries low gear before Atlanta. The next big thing is the nitrous hits too hard. I was originally planning 2 stages of nitrous to soften the blow, but since I couldn't make that happen I had one big stage that was too much to handle. A Schnitz 2 dial progressive nitrous controller should help that situation. I also need better access to tune the clutch. I called Jason at RPM Cycle Performance and had him send me one of their trick quick access clutch covers. It's March so my time is extremely limited for working on my bike. The business is booming and demands at least 12 hours a day. This only leaves weekends to work on it. I managed to get these mods done before going to Atlanta.

We had an exciting trip to Atlanta. The motor home stopped moving forward on I-85 just outside of I-285 at rush hour on Thursday. We thought the transmission had gone south with trans fluid boiling out of it and a red river reaching the back of the trailer. I rode the pit scooter to the next exit looking for a trans repair shop at 4:45 PM. Found 2 that said they could get to it on Monday. Wow, this is just great I thought. I purchased 6 quarts of ATF and headed back to the disabled coach. I let it cool off and added the fluid. Started it up and it moved. Carefully we drove to the next exit where we topped it off and waited for traffic to die down. All was good with the travel gods as we drove to the track without further incident.

First pass on Friday's test and tune I looked up after the burnout to see Bruce Sauer watching. He doesn't even know how happy I was to see him there to watch my lap. I got back and there was Bruce at the trailer saying it drove through the clutch, shifted second early then looked pretty good. It went 8.26. I looked at the computer and he was dead on. I tightened the clutch up and made another lap. It went 8.12 this time initiated by a best ever 1.21, 60 footer. Now I finally had a Top Gas Bike! I tried to soften it up a little bit by extending the progressive from 25% to 100% in 3 seconds to 6 seconds and went another 8.12 @158. There is still a ton of R&D to do on this bike. When business slows down I will get to try a lot of the ideas I have for it. It is such a different combination than any other Top Gasser out there. That's what makes it so cool and at the same time frustrating. I do love push button starting, making the turn at the far end and riding past all my competitors. After all, it's the only place I have passed any of them so far! But, I'm working on that!