



TURBO RZR

BY CHRIS RADEMACHER

We go to Sweden to see how to build an 80 hp turbo for the Polaris RZR with MCX-USA

THE ULTIMATE SPORT UTV

When I got the email from Trey Lokey of MCX-USA (formerly OHV Turbos) inviting me to Sweden to meet the MCXpress factory owners and designers, I originally thought he was kidding.

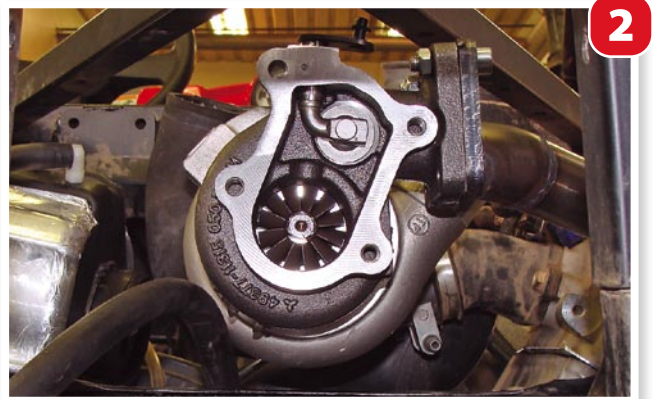
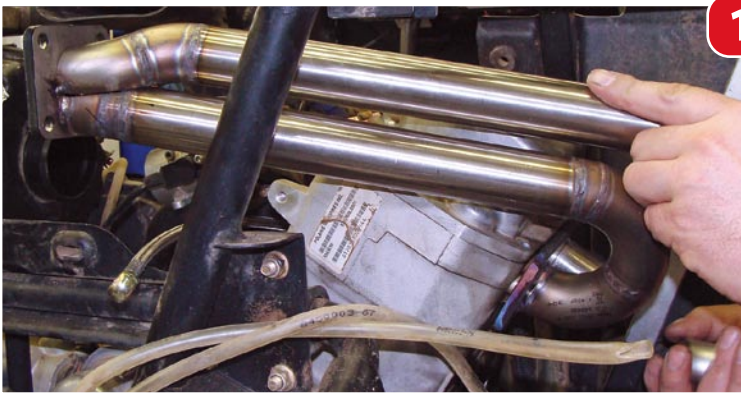
But, after talking with him, I realized that MCX-USA was very serious about developing a Polaris RZR turbo kit similar to their already successful Yamaha Rhino 660 and 700 EFI turbo kits. What they wanted to do is take a bone stock RZR and do an entire development article highlighting what it takes to put one of these kits together and make it work harmoniously with the RZR's engine management system. Sound simple? Well, we'll show you exactly what it takes for the most successful snowmobile turbo company to develop a turbo kit for the Polaris RZR. Oh, and did I mention that we have before and after wheel dyno numbers, as well? Do you wish you had the fastest UTV around, period? Well, read on, as we've found the answer to your quest for the ultimate sport UTV, bar none.

To start off, we arrived in Sweden and were soon on our way to the little town of Pitea to meet the MCXpress staff. We sure didn't waste any time tearing down the RZR to begin mocking up what the kit would look like. But, before we could break into the motor, we wanted to get baseline dyno numbers so we could gauge the performance enhancement of the turbo kit. So, luckily for us, MCXpress had their own wheel dyno in their shop to gauge whether their kits

are worth producing. And, do you want to know what their minimum requirement is for producing a kit? It has to double the engine's stock rear wheel horsepower (rwhp) to even be produced. So, needless to say, being an owner of a RZR myself, I was curious just to see what the heck a RZR with double the HP would be like to drive, that's for sure. But, before I jump the gun, we put the stock RZR on the dyno and achieved 37 rear wheel horsepower (rwhp) average after numerous pulls.



So, now that we had our baseline HP numbers it was back to the shop to begin breaking down the RZR to mock up what they needed to figure out first: the exhaust manifold. So, Alf, their head fabricator, got to work on mocking up the exhaust manifold. What was figured out rather soon, was it was possible to make the header tubes nearly equal length and not converge till nearly the middle of the RZR, which is the ideal situation for maximum power. But, don't get me wrong, it took a few versions of the header tubing to make it fit perfectly, which is what Erik Marklund, the owner of MCXpress, would expect: perfection (Photo 1). If you're not familiar with them, they've been the leader in making high end plug and play turbo kits for virtually every 4-stroke snowmobile in existence. And, with

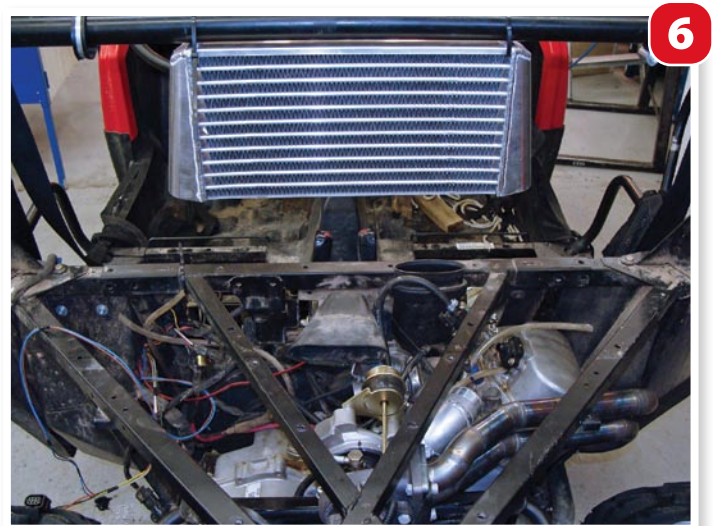


the wildfire-like growth of the UTV market, they realized this market is here to stay and can benefit drastically from their turbo kits.

Once the header was in place, it was time to mount the turbo to the header (Photo 2). But, before we could make final adjustments to the header and turbo location, we pulled the head off the motor to install the 1.5mm base shim (Photo 3). The base shim reduces the compression of the motor, so the added boost of the turbo won't detonate the motor. Nobody else in the industry does this, and this is one item you don't want to leave out. With it in place, it was now time to make a bracket to go from the outlet of the turbo to the muffler (Photo 4). It was rather simple to make, especially considering it was a straight shot out the back of the RZR due to where they placed the turbo. The muffler is a straight flow through packed design that fit perfectly in the RZR and provides an awesome exhaust note, as well.

From here, they had to find a good location to mount the extra injector to supply the extra fuel needed by the motor while under boost. To our surprise, there was a perfect location right on the stock throttle body housing (Photo 5). The purpose of the extra injector is to be able to add precisely the correct amount of fuel at every boost level. If someone tried to add the extra fuel through the stock injectors, they would need more than the stock injector duty cycle can provide, therefore running a lean condition which will blow the motor. In this case, instead and one of the keys to this kit, they leave the stock fuel system alone and provide all additional fuel through their pre-programmed fuel management system.

Next, it was time to design the intake tubing and placement for the intercooler (Photo 6). This is another distinct advantage of a MCXpress



turbo kit. The reason is quite simple, actually. The cooler the intake air is, the more safe power they can create with less boost pressure = safe and reliable HP. So, to leave it out of the design is stupid, really. Why would you want to raise the intake temps and need more boost to provide the same level of power all while risking your engine's life. It doesn't make any sense to MCXpress, and they sure sold me on it, as well. And, after installed and during the testing, the intercooler reduced the air temps by at least 30 degrees. In certain situations, we've seen even higher differences between intake and output of the intercooler. So, while trying to decide on the optimum intake setup, we opted to remove the lousy stock canister from the equation and design a snorkeled intake that not only functions very

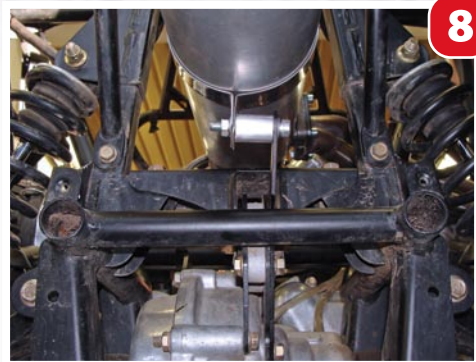
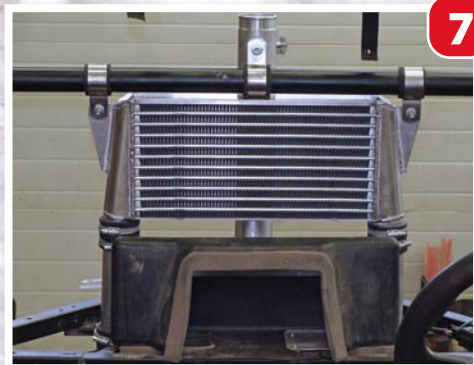
well, but looks sweet, too! In addition, this allowed them enough room to mount the intercooler directly behind the driver and passenger with the intake tube coming right up behind it. By taking the stock canister out of the intake, this definitely raised the intake noise some, but the added performance of this style intake is well worth it, not to mention it's already snorkeled for those that like water and mud (Photo 7).

From here, Roland began working on the oil return and supply lines to the Turbo. It was very crucial that we tested the RZR's capability of producing enough oil pressure to properly supply the Turbo. And, luckily for us, it had plenty of pressure to keep the Turbo well lubed from idle to wide open throttle.

From here, it was obvious that we needed to design a bracket to hold both the muffler and the turbo and still allow for the drastic amount of flex that the motor had when under throttle. In short time, Alf and Roland figured out a way to mount it to the rear diff mount which made the entire assembly very sturdy and flex in the same directions as the motor (Photo 8).

Now, with the entire system in place, it was time to wire up the proprietary fuel management system that controls the extra fueling needs to the 3rd injector. Once completed, it was time to start the RZR. And, to my surprise, it started just like normal. This was surprising to me, because I've installed third-party engine management systems on 3 different vehicles, and in each case it took a while to get it just right to start. But, this is a testament to how well their system works right out of the box. Nobody wants to constantly be tinkering with their vehicle to dial it in. I think most people want a system that's easy to install, runs flawlessly, and doesn't jeopardize their vehicle's warranty unless proven to be a direct correlation to the turbo. And, the MCXpress kit does exactly that!

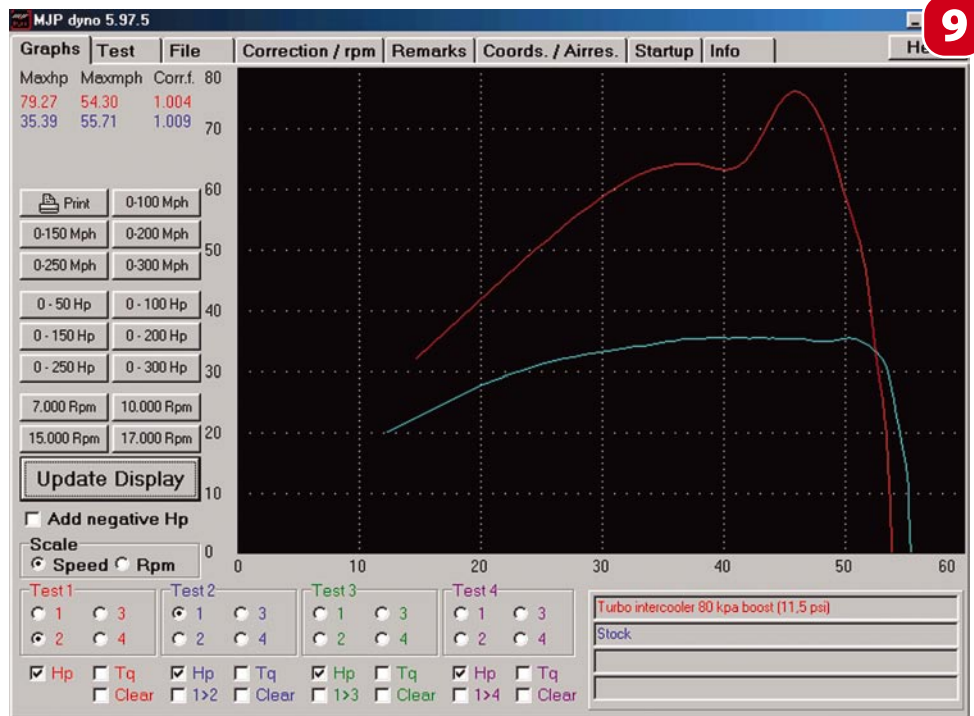
Now that we had it started, it was time to get the fuel curves close by testing it on the dyno. And...drum roll, please...after some fuel tuning to get it close and adding some drastic weight to the clutch, the average HP was just under 80HP to the rear wheels. Do you realize this is over 100HP at the crank? Here's one of our conservative dyno runs (Photo 9). I was dumbfounded watching the dyno run, and the numbers kept increasing. And, that's at less than 1 bar of boost, which is simply amazing. This means this engine accepts the boost very well, because some engines require a lot more boost to create that big of increase in power. You realize that's over double the HP, right? And, for all those folks living at higher altitudes, MXC-USA's kit is the only one in existence that has a Turbo Control Valve that automatically compensates for elevation. What does this mean, you ask? Well, as you rise in altitude and the air thins out, the turbo automatically maintains the same level of boost (i.e. power) at any given altitude. So, you'll always be producing 80+HP at your rear wheels!



So, you're probably wondering how it drove, right? Well, the first things that come to mind are rocket ship, dragster, hang on for dear life, and OMG I can't wipe the smile off my face. The other thing I immediately thought was how sweet it would be to race this thing against other UTVs, because there wouldn't be anything that could touch it, that's for sure. Now, keep in mind, because of the arctic temperatures in Sweden while I was there, the only testing ground we had was 1-2' deep snow. But, I've ridden in snow before on many occasions and no UTV I've ever driven was this much fun. What I also realized is that even as deep as the snow was, there were sections we were hitting top speed for extended periods of time, which is totally crazy. A stock RZR, let alone any of the other UTVs out there would never be able to achieve this. Plus, the acceleration was insane. Check out the photo on the next page of the finished product.

Keep in mind, I drove their Rhino 660 and Rhino 700 kits a while back at the dunes, and don't get me wrong when I say they're equally as impressive power gains and performance, but there's something about having 80+ HP available instantly to you in a RZR. We all know how sporty they are in stock form, but now imagine it with over double the power. All I can say is I can't wait to do some additional testing. And watch for events, because they're going to have all three machines for demo rides to show folks just how amazing a 60+ HP Rhino and an 80+ HP RZR really feel. Trey told me that it's hard to keep your foot in it, because it would peel out all the way to the rev limiter on dirt roads. So, how do you think your friends would feel if they couldn't keep up with you in the dunes anymore?

Overall, I'm very impressed with the level of time, expertise, and desire for perfection that MCXpress takes to design/build their turbo kits. They don't skimp on any parts, make sure everything fits perfectly with the least amount of fabrication needed, and from what I can tell, provide excellent customer service to boot. While there, there were multiple conversations about their snowmobile kits, customers that had some trouble, etc, and both Erik and Trey were on top of it immediately. It was nice to meet the brains behind the operation, like Alf, Roland, Erik and the rest of the MCXpress team. I have no doubt the reason for their success is that they are such a great team of enthusiasts that have a true desire to take care of their customers first. If you're truly looking for a way to double the HP of your Rhino or RZR, MCXpress is the only way to go, in my opinion. There are other options, too, obviously, but I've yet to find a system for this amount of money produce this much power. Dollar for dollar, there's nothing on the market



Double your Horsepower. Guaranteed.

MCX USA
RELIABLE PERFORMANCE

Powered by **MCXPRESS**

www.mcx-usa.com

Dealer inquires welcome 719 539-3989 info@mcx-usa.com

SOURCE:

MCX-USA (Formerly OHV Turbos)
719-539-3989



that can touch it, period. Seem like a lot of money...well, how much do folks spend on long travel kits to realize their stock motor can't even take full advantage of it? In fact, in our Project Rhino with MCX-USA's kit installed, it now can use the full potential of the long travel by having enough power to get the Rhino up to the tops of the whoops instead of falling into them and providing a rough ride. Honestly, if I had the money for another play unit for the dunes or normal trail riding, I'd install a long travel kit and MCXpress's Turbo and be done with it. You wouldn't need anything else to have the fastest and most enjoyable UTV around. And, if you've heard about folks having problems with turbos or superchargers on their UTVs, I think you'll be hard pressed to find any with MCX-USA's kits on them with trouble. They build them right from the beginning with nothing spared in quality. Don't believe me? Well, contact Trey and see for yourself, but be prepared to open your wallet, because their machines are nothing short of amazing!