

# Yamaha *MCX*-Phazer turbo-07

When we first heard about the new 2 cylinder 500cc 4-stroke from Yamaha, we understood that this will be something really special

Yamaha named it Phazer after the earlier model that was relived back in 1984.

The old Phazer became a huge success, and no other snowmobile model has sold as many as this one.

And after the success with the Apex, and the heritage after the old Phazer, this must be a nice machine. The stock power was claimed to be about 80 hp and the weight very low.

Even if the stock machine is very nice to drive, more power can make it even nicer is what we thought. That's why we started to develop a turbo kit to this snowmobile.

Thanks to our close relationship to Yamaha, they let us borrow a sample of this machine very early so we could start to build some prototype turbo kits for testing.



The handling of this light machine is excellent!

We put the sled on a scale and the weight was less than all of us thought.

The power on this stock sample machine was the same as expected!



The new Phazer engine is very high tech inside.

The weight of the engine is also very low.

The compression ratio must be lowered when installing the turbo to avoid detonation.

We started to determine what model and size of turbo that was suitable.  
We made temporary exhaust pipes to make the switch between different turbos to go faster.



Fortunately we finally managed to find a perfect sized turbocharger from our favourite manufacturer Mitsubishi. Our goal was 100 kW (=136 hp) and we reached this power at 0,8 bar (12PSi). The best turbo we found is small and reacts very fast. It starts to boost at low rpm but it still doesn't create lots of backpressure in the exhaust manifold.  
If the turbo (or a badly designed exhaust header) creates too much backpressure the engine will not only produce less power. The engine will start to detonate much sooner and this may cause an engine failure.



The turbo and muffler is located under the seat. The weight is about the same as the stock muffler.

# Measured Torque and Power

Recorded,

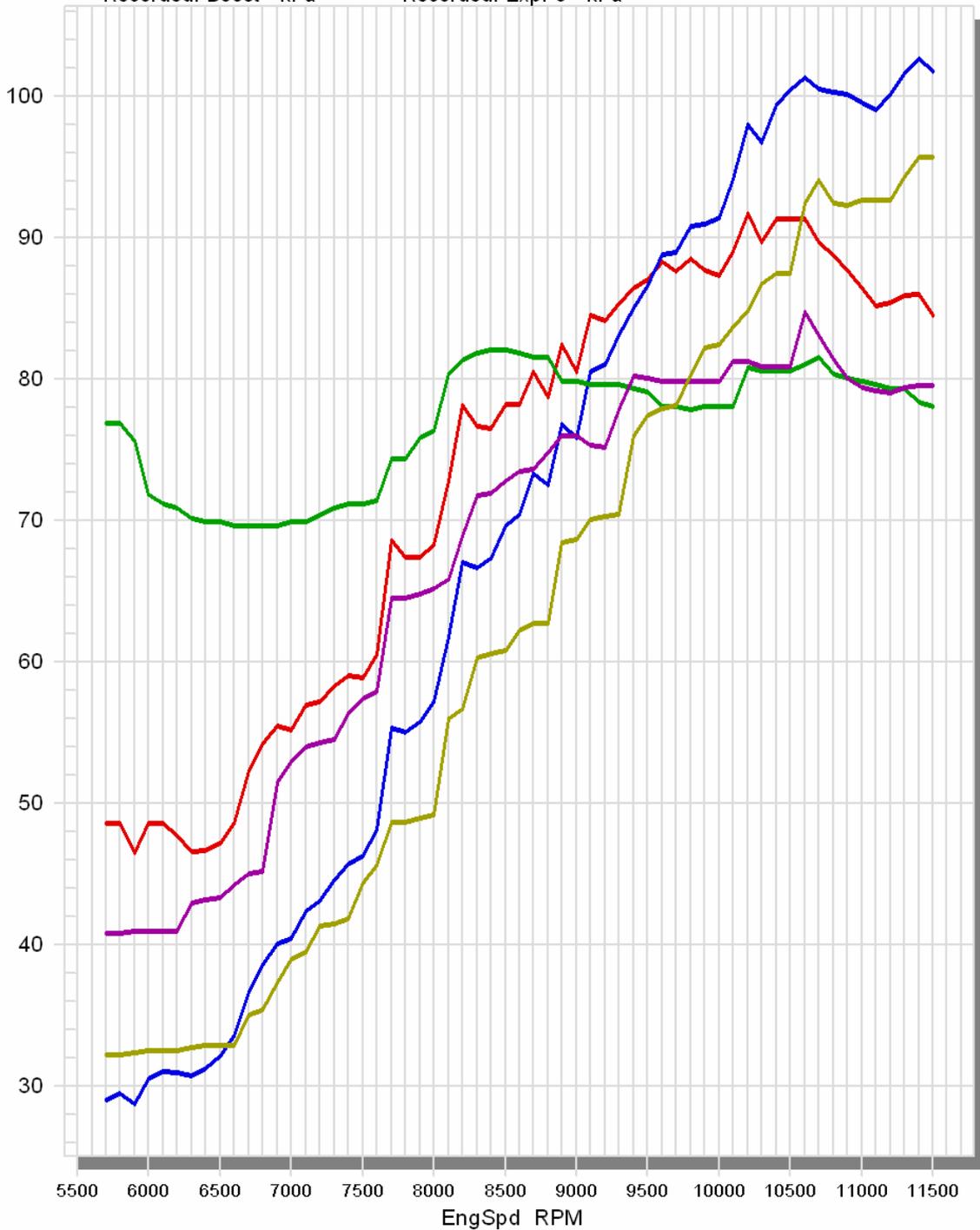
Recorded: EngTrq- Nm

Recorded: EngPwr- Kw

Recorded: Lambda(x10)-V

Recorded: Boost - kPa

Recorded: ExpP3 - kPa



We made some tests with higher pressure and power, but we think a suitable level will be a turbo pressure at about 0,8 bar (12PSI). This will give just over 100 kW (= about 140 hp).



The higher power requires a new setup in the clutch. We have tested and designed new clutch weights specially for turbo use to both the Phazer, Apex, RX1, RS, and RS Viking. We make the new weights in house with our CNC-machines.



The stock fuel injection system is not designed to deliver fuel to all the extra power that the turbo will produce.

The Phazer will be equipped with our new additional MCX EFI system.



This new system can not only deliver the exact amount of fuel at any load, temperature and altitude, but also control the turbo pressure. When you go up in altitude, the EFI-box automatically rises the turbo pressure to retain the power.

This new EFI box will also be included with the Apex turbo kits next season.

The EFI box can also be connected to a wide band oxygen sensor (=lambda sensor).

The signal from the sensor can enrich the air fuel ratio if the engine is for some reason running leaner than intended.

A display will also be available as an option until the season 2006/2007. This display can for instance show you the air/fuel ratio, (=lambda value) rpm, turbo pressure, exhaust temperature, throttle position and the engine cooling water temperature.

You shall also be able to connect the display to your computer via an USB connector.

The display has a built in memory and can sample data for about one hour back.

You can go out and drive the sled, then go home and download data from the display.

You can then study and see if the pressure, lambda, rpm and so on have been as you require.

If you like, you can by the display adjust things in the EFI box like the turbo pressure and air fuel ratio exactly how you like it.

But you have to be careful when doing this so you don't destroy your engine.



The Phazer is a very fun and easy machine to ride! The turbo makes it even nicer!  
We have manage to test the Phazer turbo a lot on snow in the late season 2005/2006.

