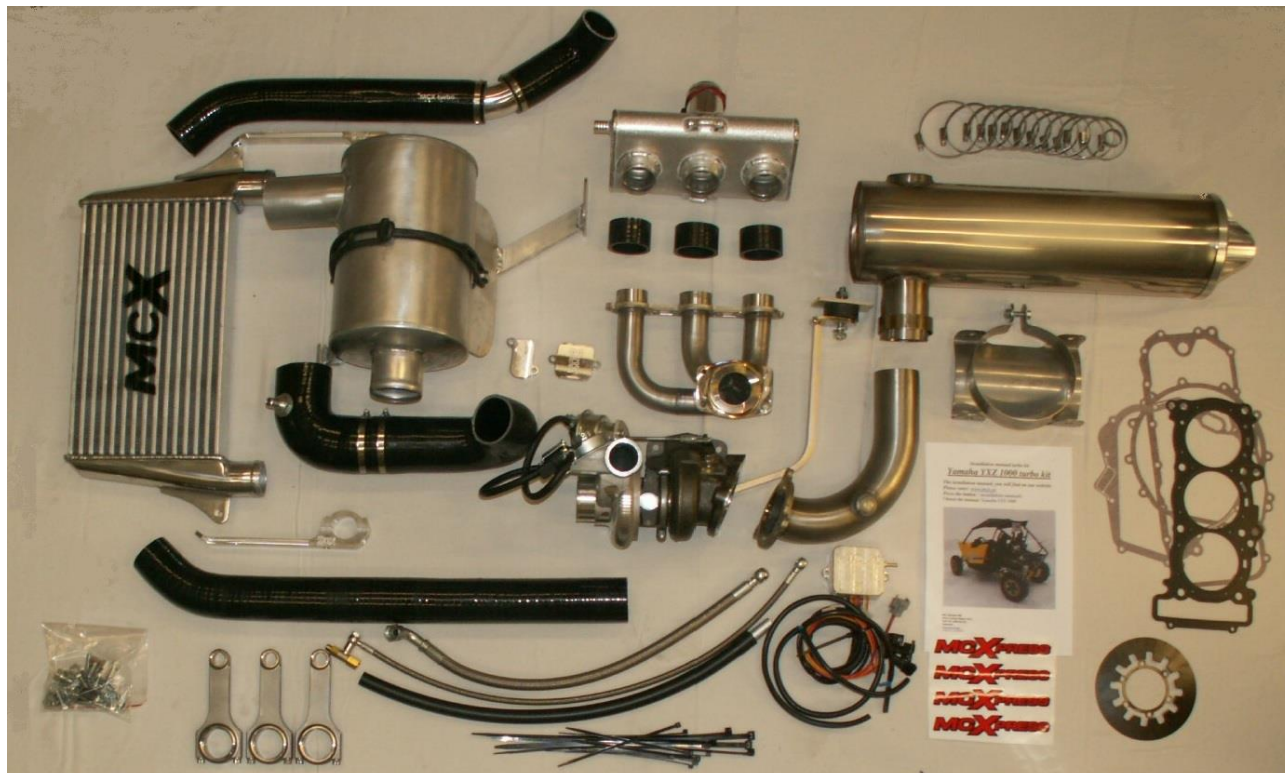


*Installation manual turbo kit*

# **Yamaha YXZ 1000 turbo kit**



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*Supreme of the extreme !*

# *Yamaha*

## *YZZ 1000 turbo kit*

Thank you for choosing the MC Xpress turbo kit to your Yamaha YZZ 1000 UTV.

The turbo kit is designed for racing use only.

The turbo kit is designed to give you the best performance possible together with reliability.

During the development work we have tried to keep the vehicle as stock as possible to make the installation easy and to keep the UTV as untouched as possible.

Read this manual carefully before you start with the installation.

We hope you will get much joy with your new investment.

The turbo UTV is only recommended to be used by experienced riders and for racing use only.

- This turbo kit greatly enhances the performance of the vehicle it is installed upon!
- Professional training should be received by anyone that operates this modified vehicle.
- Installation of this turbo kit may void any warranty that is provided by the vehicle manufacturer.
- A one (1) year warranty is provided on the kit parts only. This warranty does not cover any other parts even if the damage is caused by the installation of the turbo kit.
- MCXpress AB, its distributors, dealers, nor installers will not be held liable for any personal or physical damaged obtained in association with the installation or use of this product.

By installation or purchase of this product, the end user and or installer agree that the end user has been informed of this information.

# *Small parts included in the kit*



1. 3 pc      M8x20 bolts and washers to connect exhaust pipe to the turbo
2. 2 pc      M12x1,5 -70 bolts, washers to connect turbo steel stay
3. 1 pc      Clamp between the exhaust pipe and the muffler
4. 1 pc      Oil pressure outlet / oil pressure switch adapter on the engine
5. 1 pc      Attachment on engine for cable tie that holds the plenum and M6x25 bolt
6. 4 pc      M12x1,5 nuts to be used with stock bolts that holds the muffler console.
7. 4 pc      M8x25 bolts and washers to hold the turbo to the exhaust manifold
8. 2 pc      M8x25 bolts, nuts and washers to hold the intercooler to the intercooler stays.
9. 1 pc      Rubber mount and M6 nuts to hold the top of the intercooler to the chassis.
10. 1 pc      M14 banjo bolt and copper washers for oil return hose going into the generator cover on engine
11. 1 set      Bolts for the air filter console. 1 pc M6x45, washers and nut. M6x16 + nut
12. 1 pc      Fuel hose between fuel rails, double banjo bolt, 8 mm clamp, 3 copper washers, banjo fitting for stock fuel hose

# *Before the installation*

## **Important to know:**

*This turbo kit is designed for 260 hp and 200 kPa (=29 psi) absolute pressure.*

*(This is 100 kPa (14 psi) turbo pressure at sea level)*

*If higher pressure is used, the risk of engine damages will rise rapidly.*

*Premium fuel or higher octane shall be used (98 octane pump gas for Europe)*

To make the installation as efficient as possible, we recommend you to follow these instructions.

The cylinder head shall be removed and a thicker head gasket must be installed.

The con rods must be changed.

The engine must be removed from the chassis.

Begin with removing the plastic rear side fairings, the upper roller bar, the bed, air filter, muffler and exhaust system and so on until you can lift out the engine from the chassis.

# *Install new rods*

The YXZ engine is very strong and reliable, but the stock rods are weak.

The can't handle much more than the stock performance.

The rods must be changed.

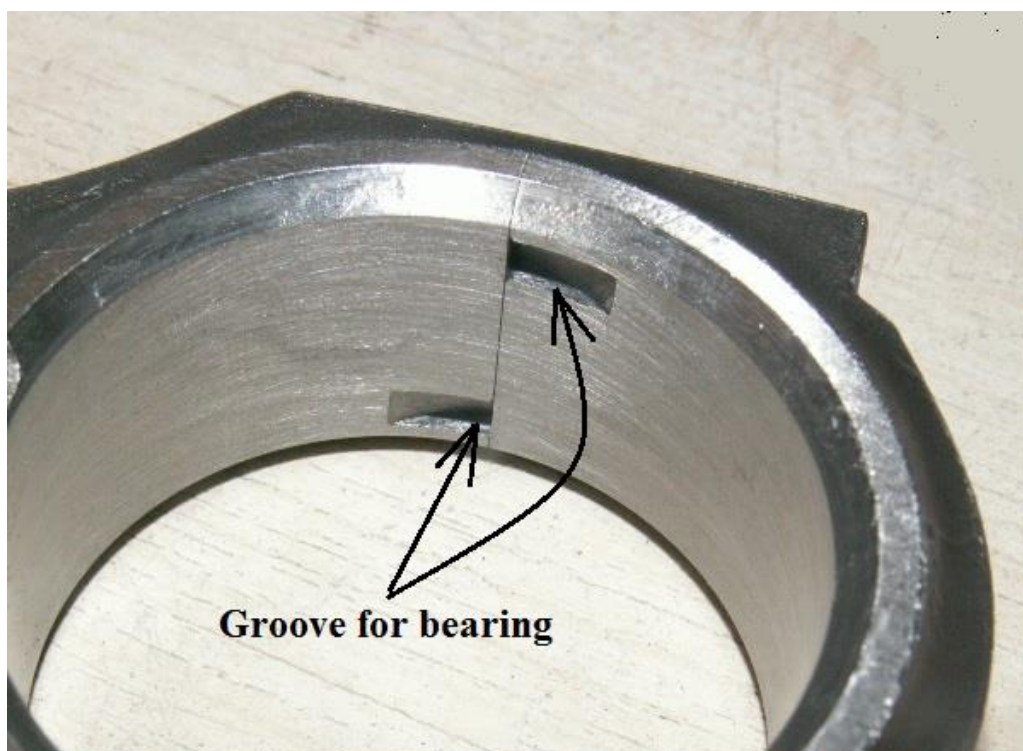
The new rods are 2 mm shorter than stock. This will give lower compression to avoid detonation.

Take apart the engine and replace the rods to the new ones supplied with the kit.

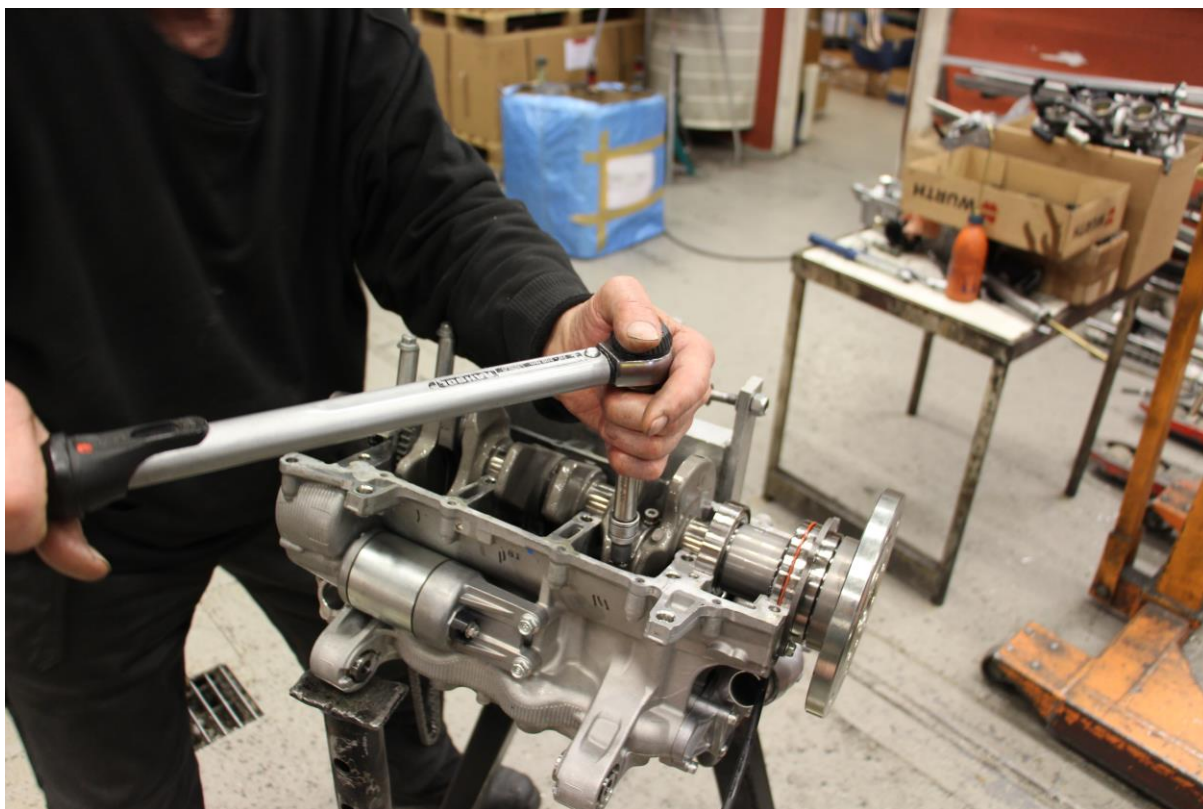
The stock bearings can be re-used.

Install the bearings in the same place as before. (= same cylinder)

Turn the rods so the groove for the bearings will be pointing as the same direction as before.







Tighten the MCX rod bolts 47 Nm. (35 lbf)

Lubricate the threads and under the bolt head before you tighten them.

## *Lower the compression ratio*

To compression ratio has to be lowered by two reasons.

1. When the turbo is producing pressure, the compression pressure in the cylinder and combustion chamber will be much higher than on a natural aspirated engine. This can cause detonation and serious engine damage.
2. It is possible to let the turbo produce more turbo pressure when the compression ratio of the engine is lower.

The compression ratio is lowered to make the engine both reliable and more powerful.

Take off the valve train cover. Now, you have a nice opportunity to check the valve clearance before removing the camshafts. The clearance shall be 0, 11-0,20mm on intake and 0, 20-0, 26 mm on exhaust.



*Two marks on the flywheel = TDC*



*Exhaust cam*



*Intake cam*

Rotate the crankshaft until piston number one reaches TDC (See upper photo)

(Two marks on the flywheels =TDC)

Remove the valve cover. Note how the marks on the camshafts are located on both intake and exhaust before you remove them.

First, start by removing the cam chain tensioner. Then remove the camshafts.

**CAUTION:** Remove the bolts “all together” so you don’t damage the camshafts. Note how the upper camshaft bearings are located before you lift them away

If the valve clearance has to be adjusted, do it now.

Remove the cylinder head. Do not turn it upside down to remain the valve lifters and shims in their positions.

# *Install the cylinder head*

Clean the surfaces carefully before installing the new head gasket.

The cylinder head nuts (M10) shall be tightened in three steps, first 20Nm, then 40 Nm and finally torque the bolts with a 60 degrees angle. Start from the centre of the cylinder head and move towards the ends.

The M6 bolts shall be tightened 10-12 Nm.



(This picture is from a snowmobile engine)

Make sure piston number one is at TDC before installing the camshafts again.

Install the cam bearing bolts “all together” to avoid the camshafts to be damaged.

Apply engine oil on the bearing surfaces. Make sure the cams are installed after the right marks. The torque shall be 10-12 Nm on the M6 bolts. Make sure the cam chain doesn't jump during the installation. Use cable ties like the upper right picture to avoid this.

Install the cam chain tensioner.



## *Prepare the cam chain tensioner for installation.*

After the cam chain tensioner has been removed from the cylinder head, it looks like this



Move the spring to this location



Keep this spring together. Then press in rod until this spring makes a click noise



You shall then not have to use much force to press it in.

Note: Make sure you install the cam chain tensioner with the right side up.

When the tensioner has been installed rotate the engine a couple of turns.



Check the cam timing again and make sure everything is right.

**CAUTION: Check valve clearance again to make sure all the valve adjusting shims are in their right positions.**

(If one shim has moved from its position in the upper valve spring retainer when the cylinder head has been off, **engine failure will follow if you start it.**)

Install the valve train cover.



Replace the two small lids on the valve cover with the two new ones marked “MCX” supplied with the kit.

# *Oil hose to turbo*

Close to the oil filter, you will find the oil pressure switch.

Here is where the oil pressure to the turbo is supposed to be installed.

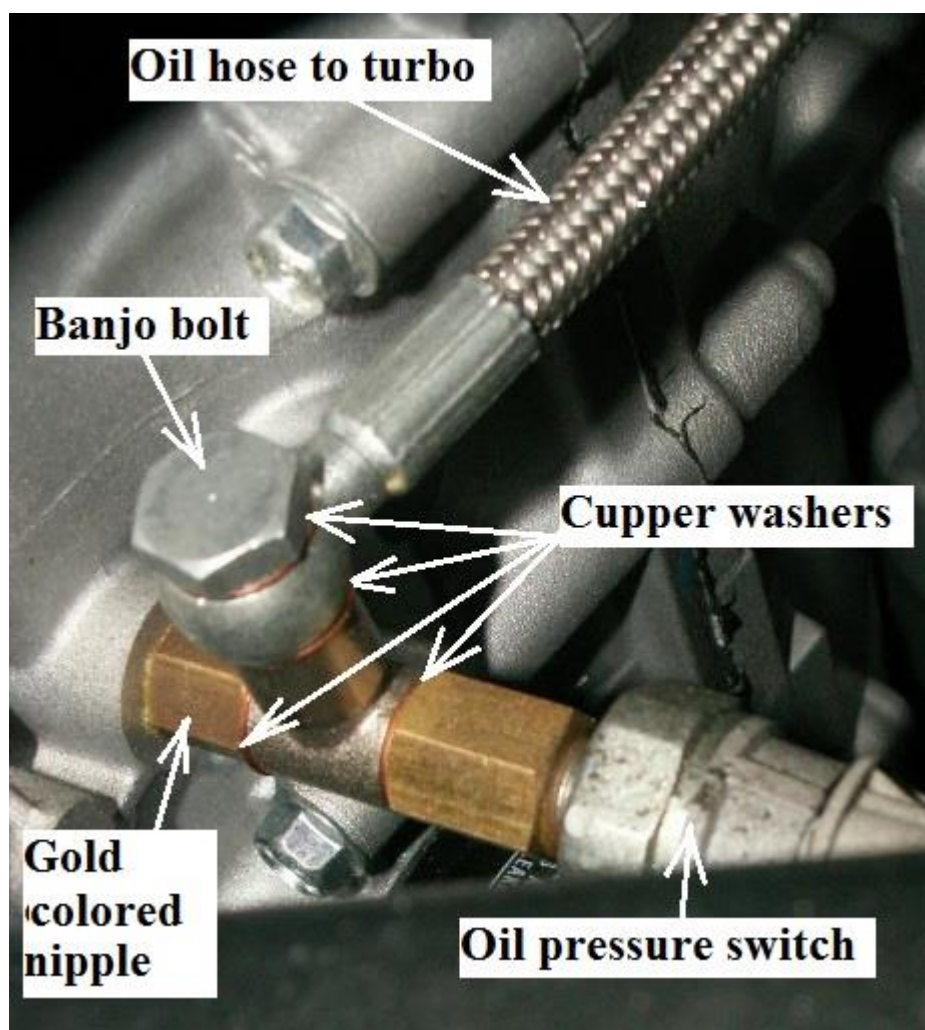
Remove the oil pressure switch.

Install the gold colored nipple on the engine where the switch was located.

Install the oil hose to the turbo (=the hose with 10 mm banjo on one side and 12 mm banjo on the other) the T-fitting like the picture.

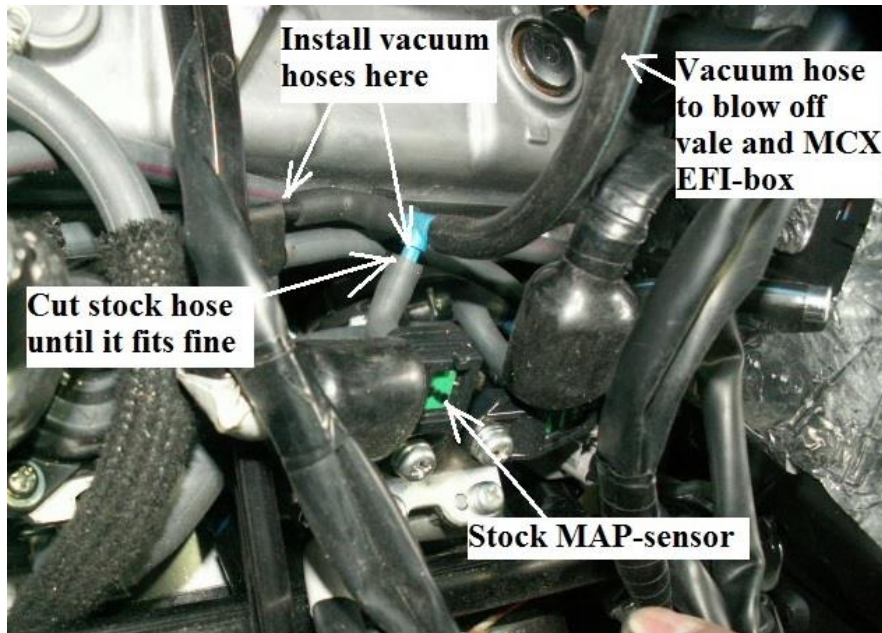
Use copper washers between each item.

We recommend not to install the oil pressure switch yet. Wait until the engine is in place in the chassis



# ***Vacuum hose to blow off valve and to MCX EFI-box***

Install the vacuum hoses to the throttle body.

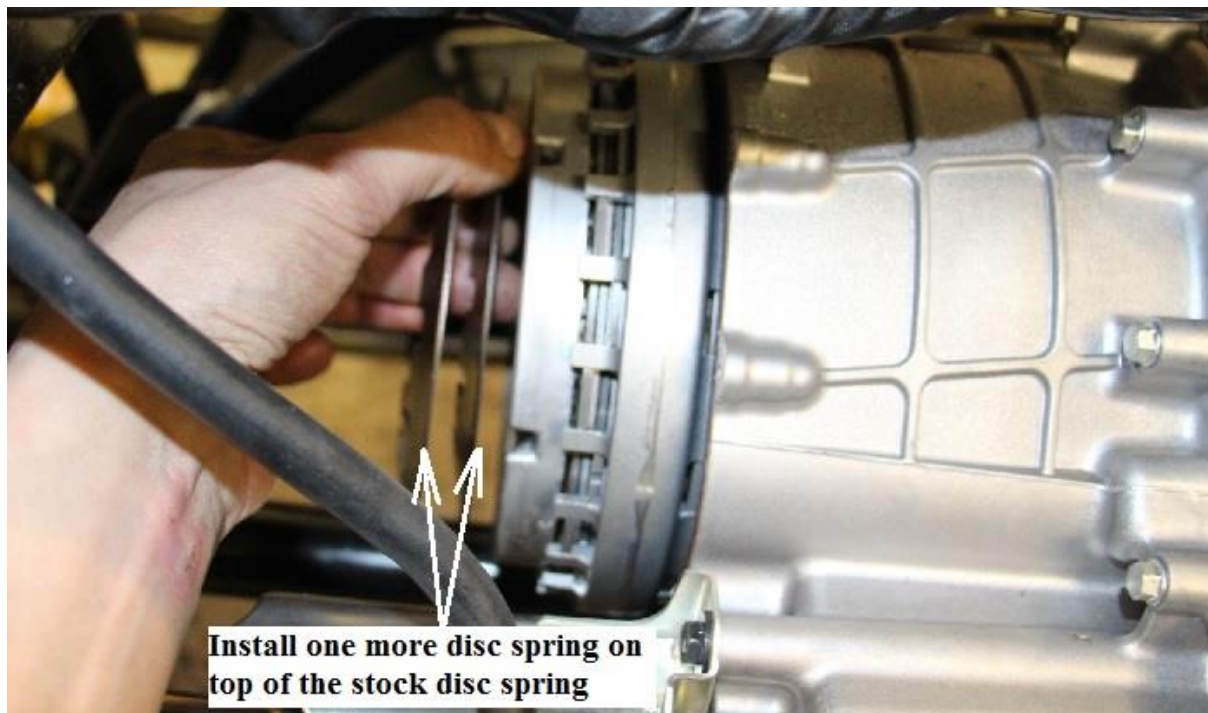




# *Clutch modification:*

Remove the clutch cover from the gear box.

Remove the 6 bolts that holds the disc spring seat.

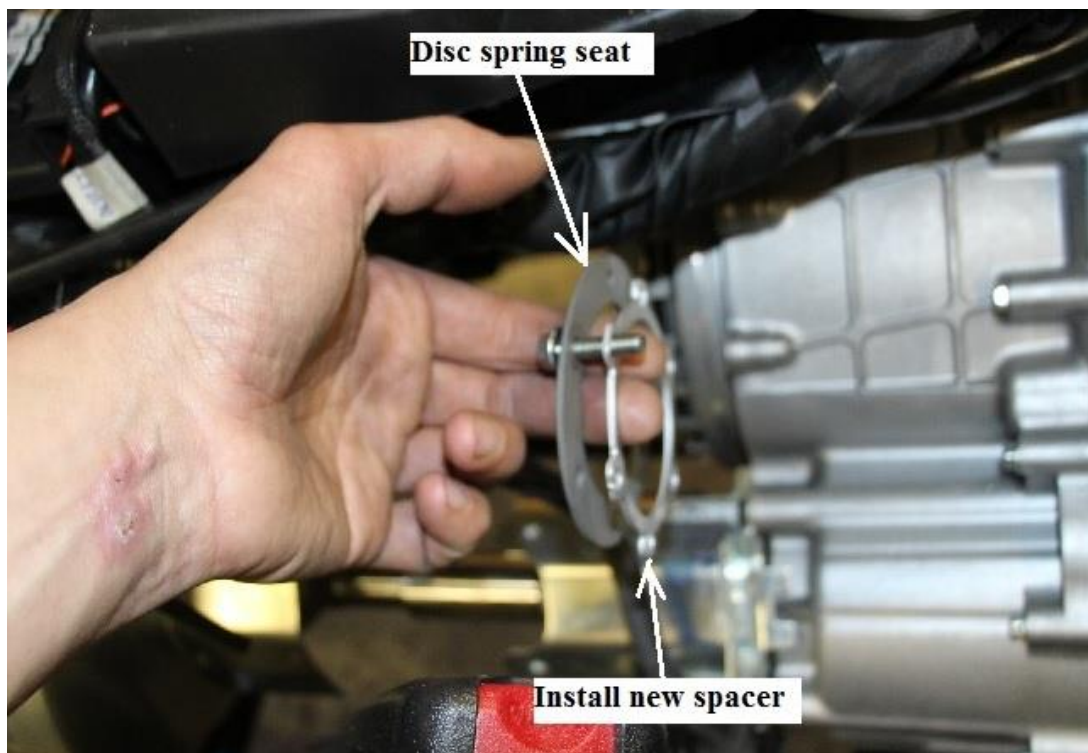


Install a second disc spring on top of the stock disc spring.

Install a spacer under the disc spring seat.

Tighten the bolts 12 Nm.

If the clutch cover gasket is damaged, install a new one supplied with the kit.





## *Speed limiter removal unit.*

After a certain speed, the power is reduced by leaner air/fuel mixture on the stock YXZ 1000. And we don't want the YXZ turbo to be running lean at top speed on top gear.

That is why we include an electric unit that will let the speedometer show maximum 117 km/h (73 mph) even if the speed is higher.

Install it like this:

Make sure the ignition key is turned off.

Cut the 3 wires about 50 mm from the connector going to the speed sensor located on the left side of the gear box.

The black with blue tracer (sensor ground) shall be connected to the black wires.

The blue (sensor +5 volt) shall be connected to the red wires.

The purple wire shall be connected to the white wire facing towards the sensor.

The green wire shall be connected to the white, but facing towards the ECU.

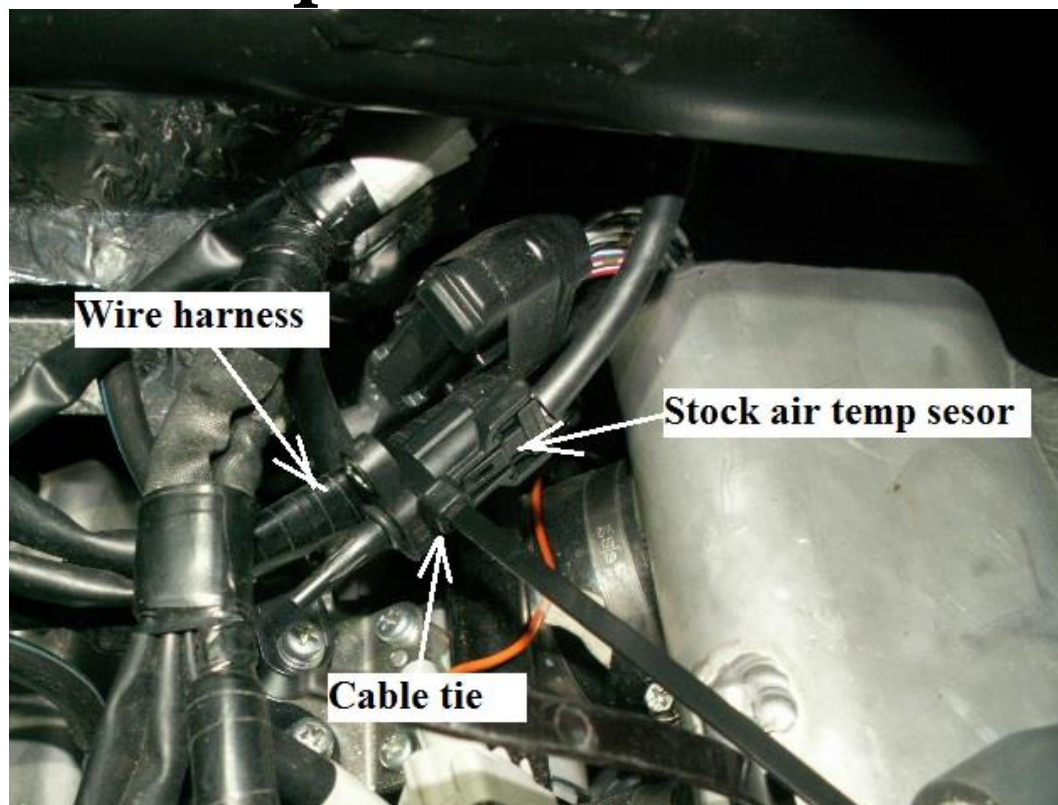
## *Install engine to the chassis*

Now it is time to install the engine to the chassis

Connect all the wire connections.

Fill the oil tank and fill the glycol water in the cooling system.

## *Air temp sensor*



Remove the air temp sensor from the stock air box, and strap it with a cable tie towards a wire harness like the picture.

# *Installing the exhaust manifold and turbo*

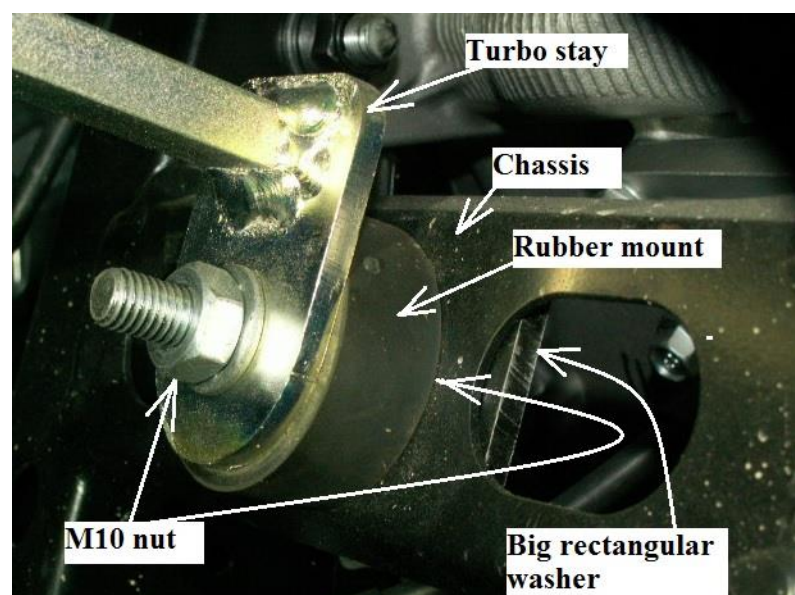
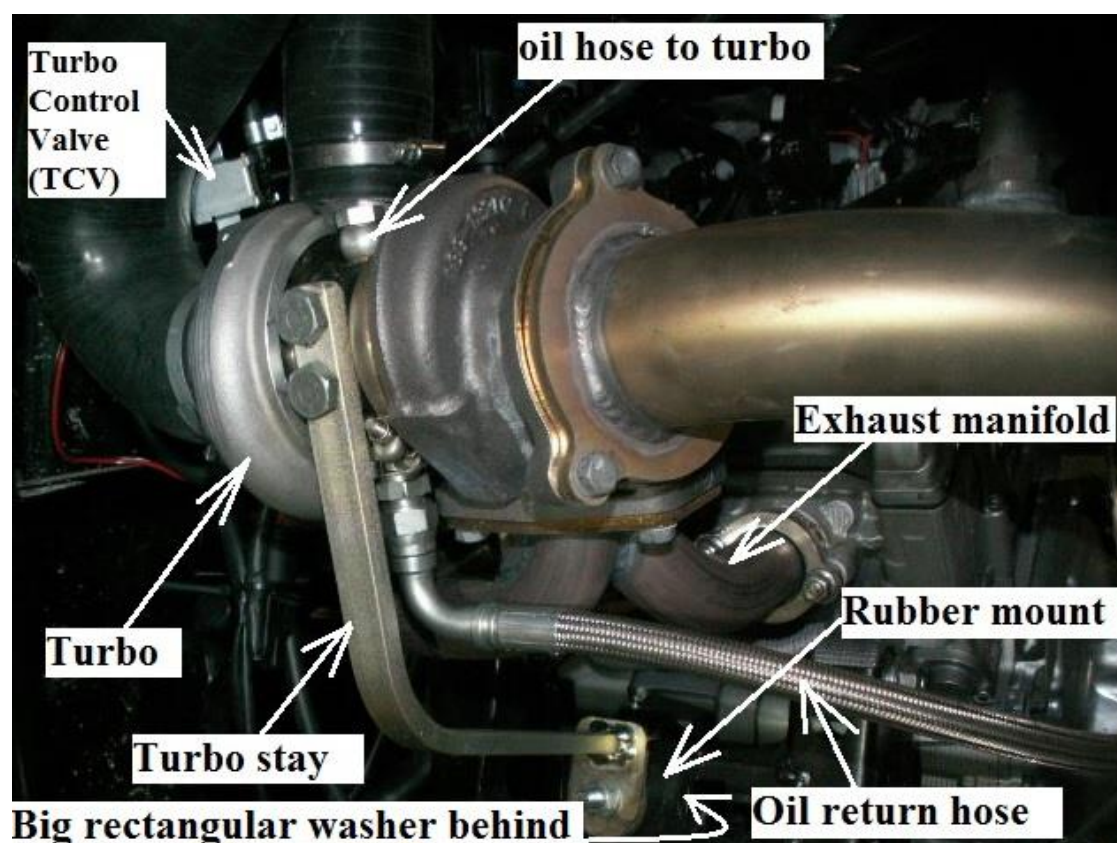
Install the turbo exhaust manifold to the cylinder head.  
Use the stock exhaust gaskets and the stock nuts.

Install the turbo to the exhaust manifold.

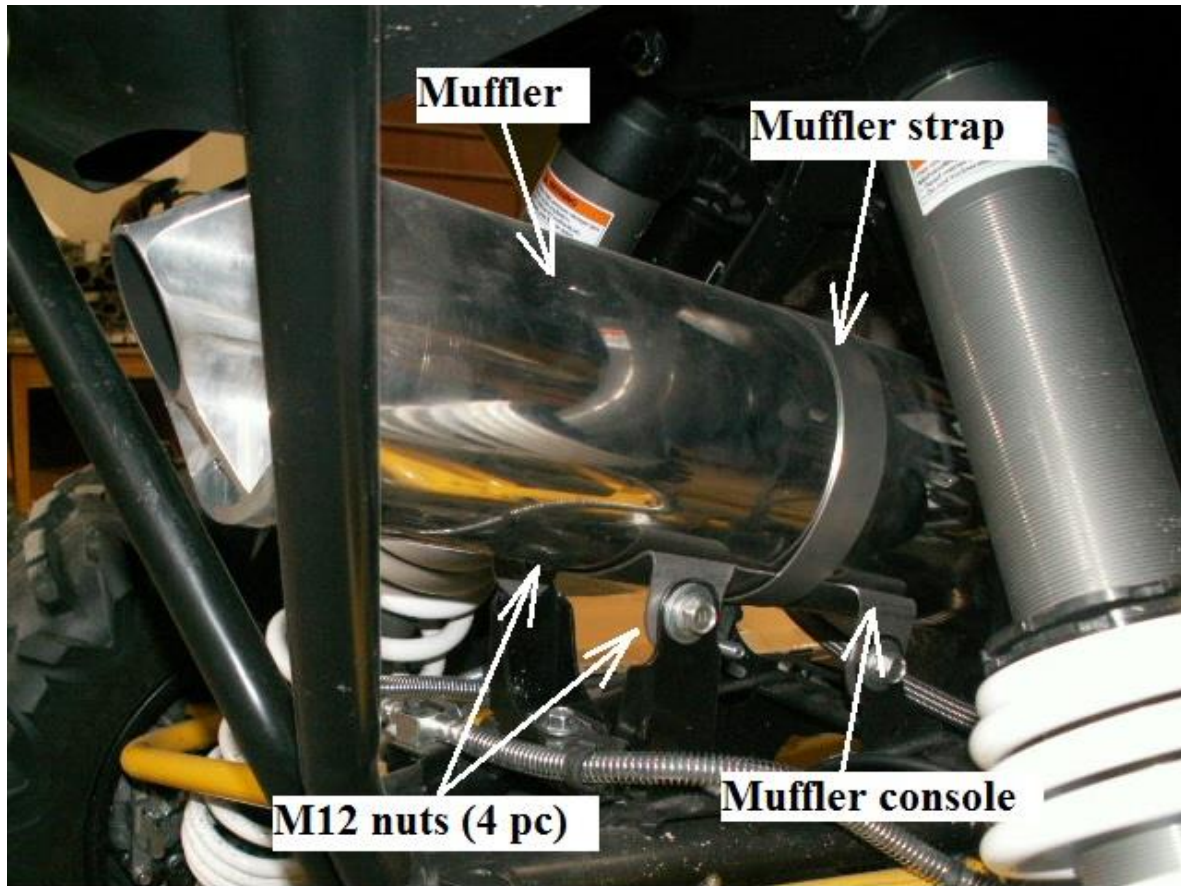
Install the turbo stay between the chassis and the engine. (see picture below)

Install the oil hose on top of the turbo.

But first lubricate the turbo oil inlet with some oil.



# *Muffler and exhaust pipe installation*

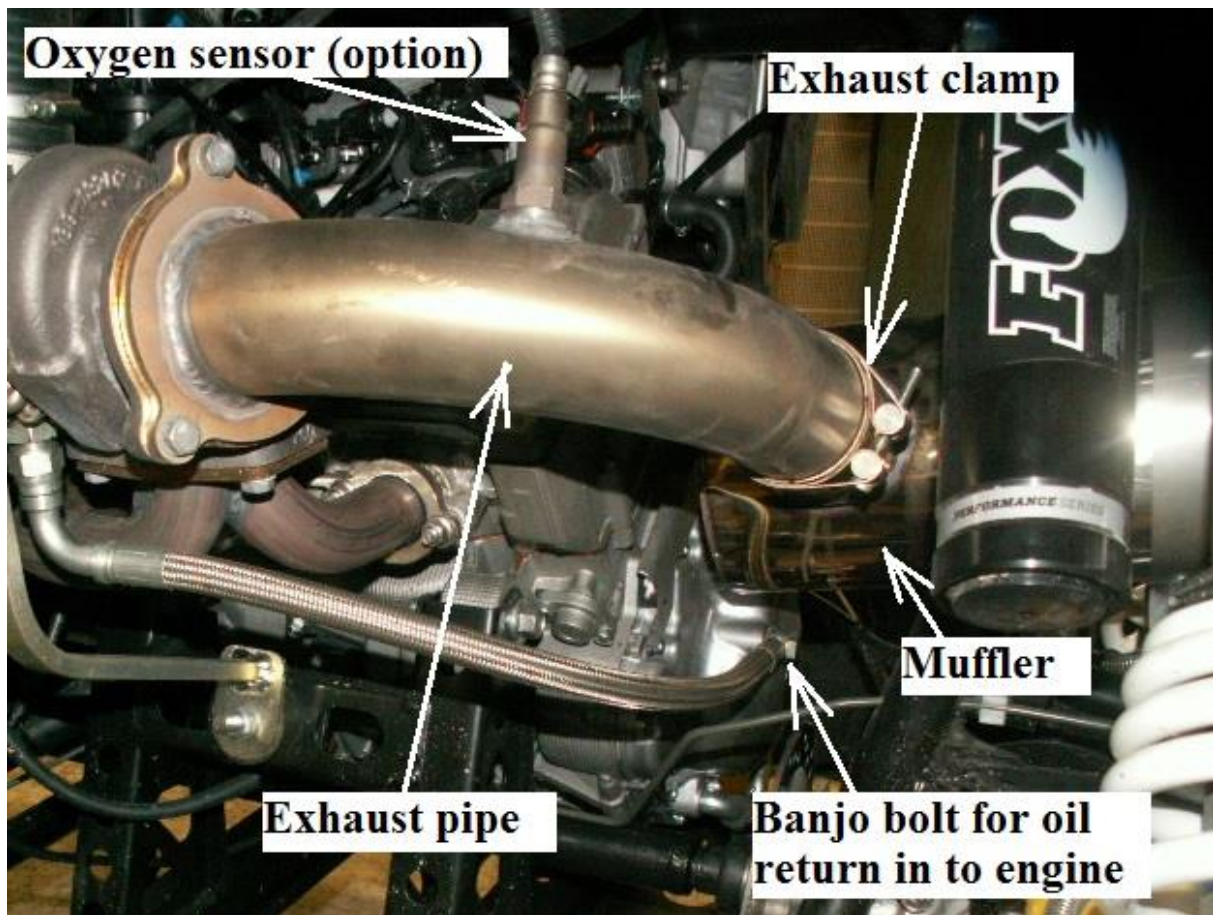


Install the muffler console to the chassis.

Use the stock bolts, and 4 M12 nuts included with the kit.

Install the muffler on top of the console and tighten the muffler strap loose.





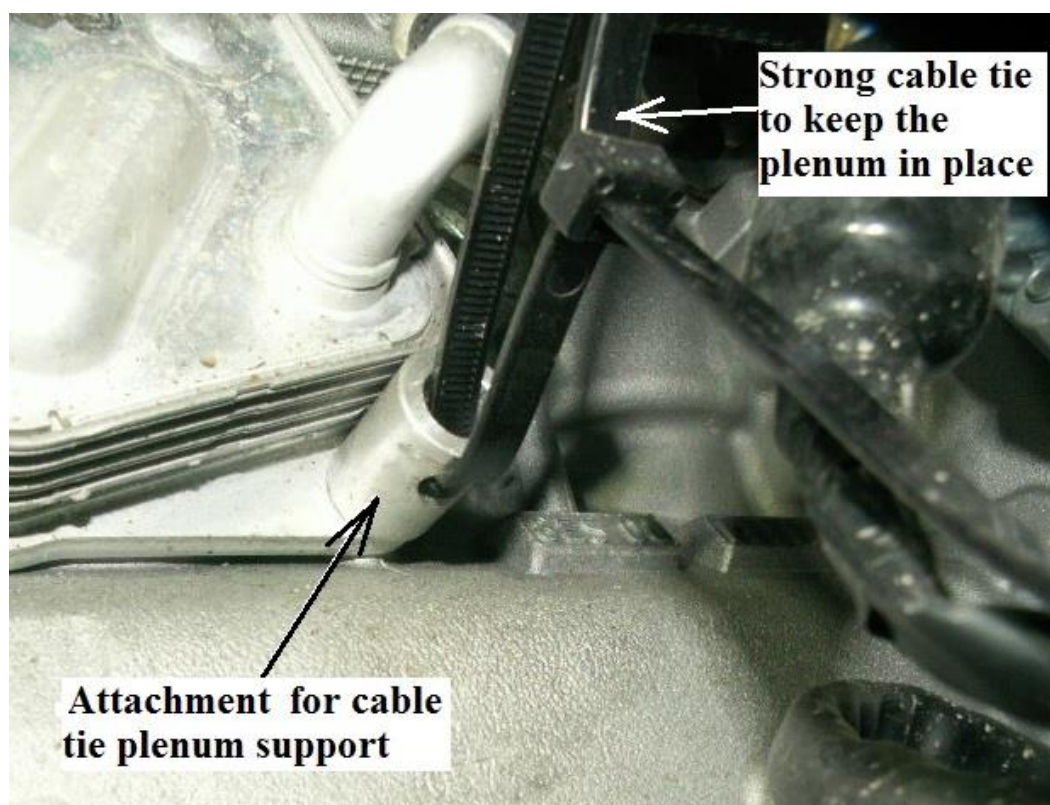
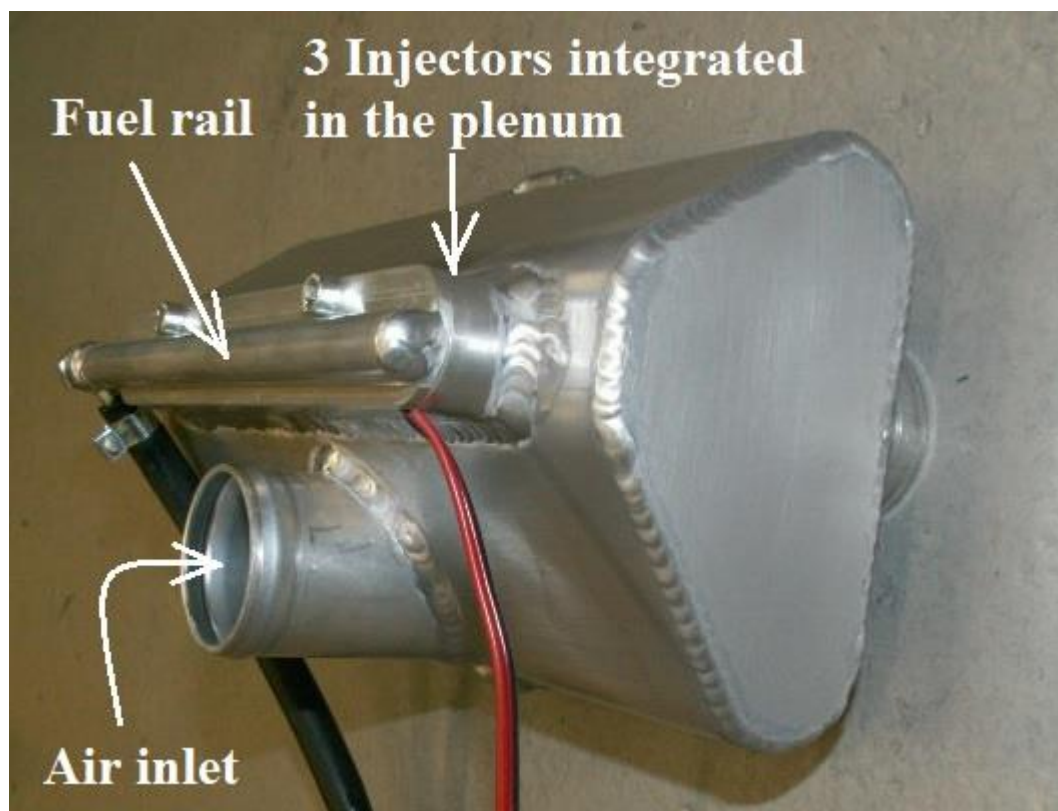
Install the exhaust pipe between the turbo and the muffler.  
When everything is in place, tighten the muffler clamp and the exhaust clamp.

Also install the oil return hose to the engine.  
Use a M14 banjo bolt and two copper washers.



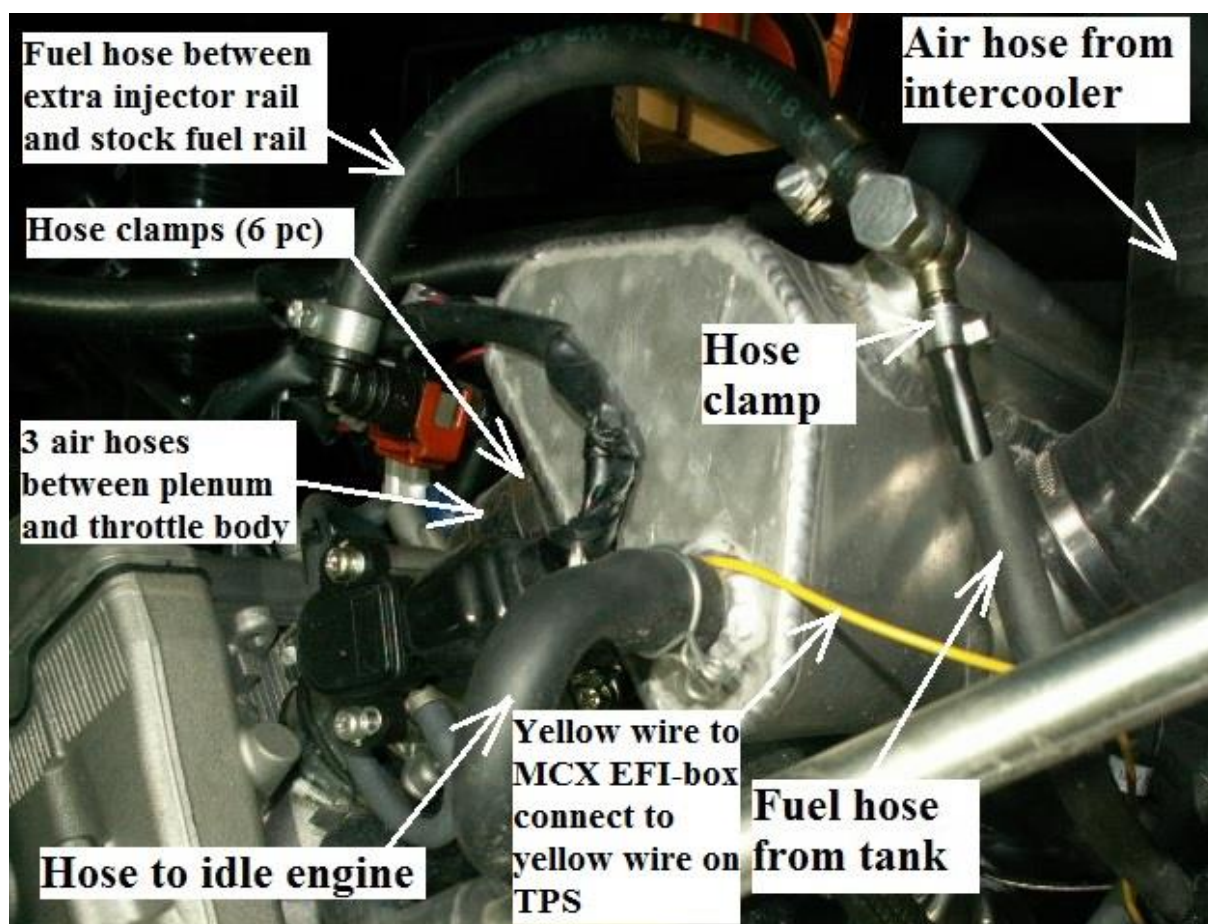
# *Install the plenum*

Install the plenum on top of the throttle body.



Begin with installing an attachment on the engine (see upper picture) for the right plenum support.

Replace the stock cooler bolt with a longer one supplied with the kit.



Install the plenum on top of the throttle body.

Use 3 silicone hoses diameter 50.

Install the hose from idle engine on the throttle body to the nipple on the side of the plenum

Use the stock clamp.

Cut off the stock fuel hose just before the fuel quick connector.

Install the hose to the banjo fitting.

To make it possible, heat up the plastic fuel hose gently with a heat gun.

**Caution: Beware so no fuel reach the heat gun.**

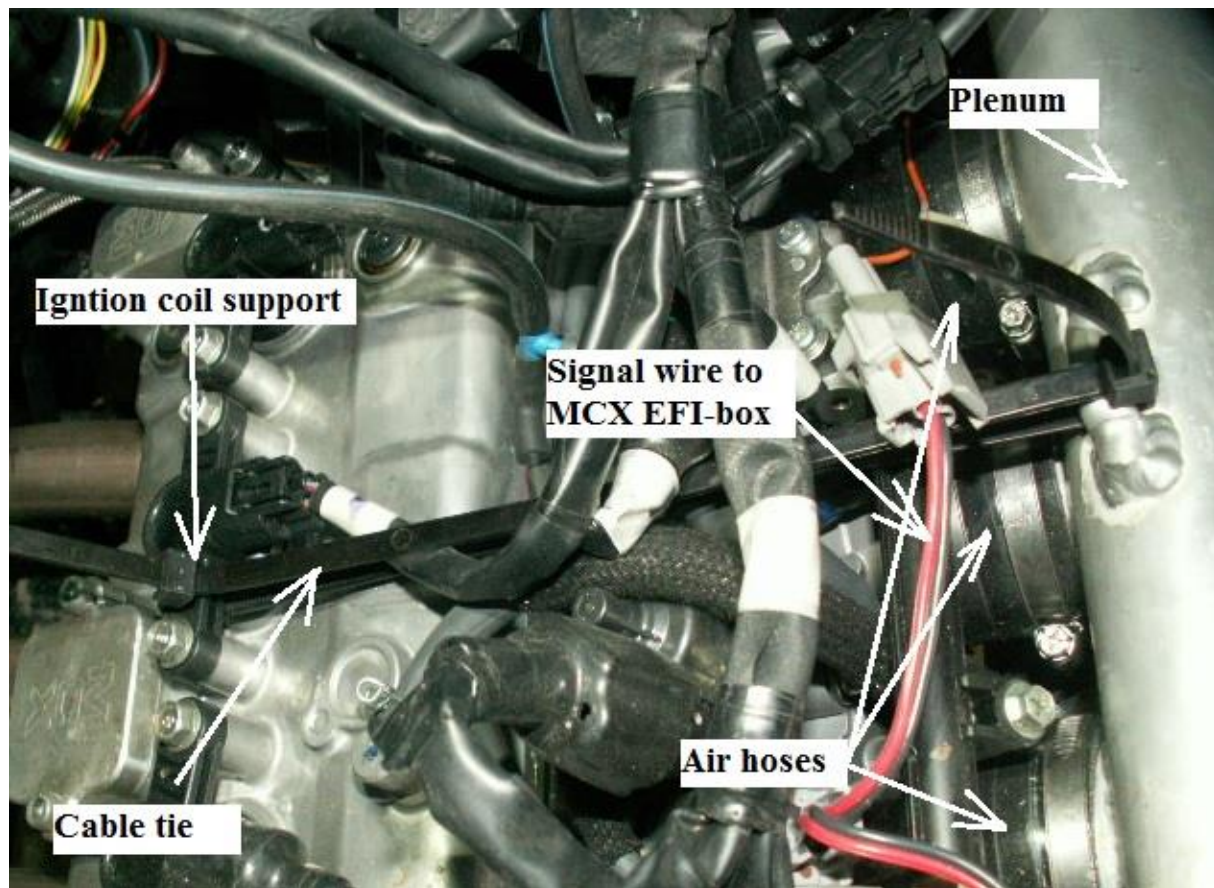
Remove the remaining plastic hose from the stock fuel quick connector as you just cut.

Install the short fuel hose between fuel rail for the extra injectors and the stock fuel rail.

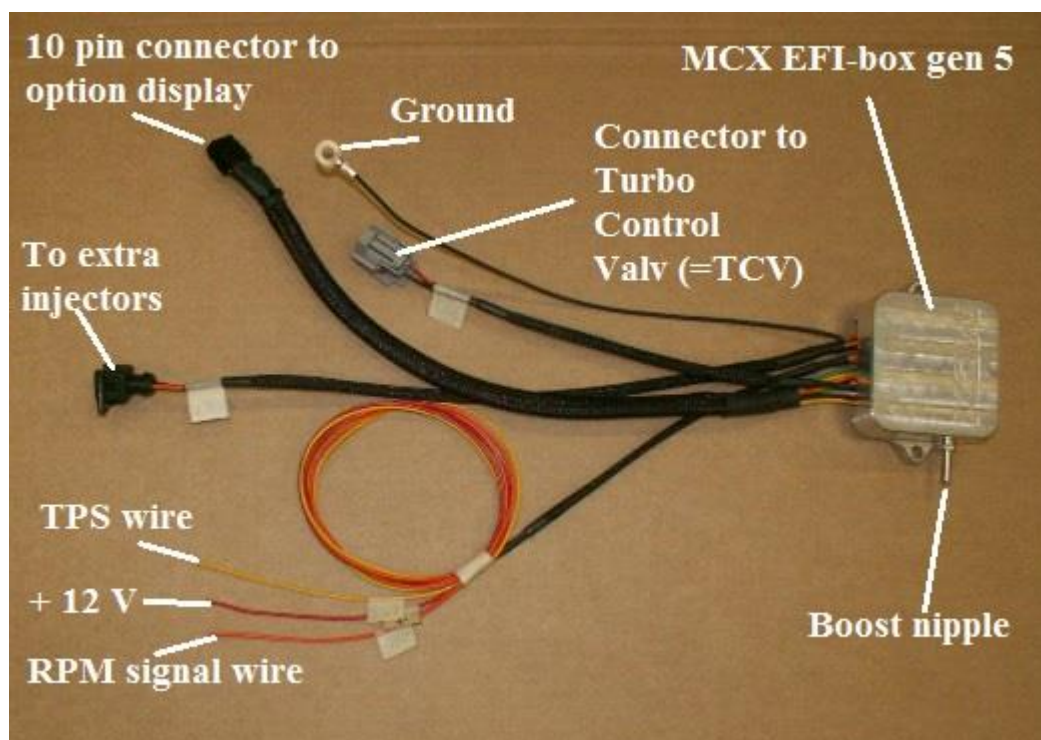
Use the stock fuel quick connector. Secure with hose clamps.

To prevent the plenum from blowing off, install strong cable ties between the plenum and the attachment you installed on the engine and between the plenum and the ignition coil on the other side on the plenum. (see picture below)

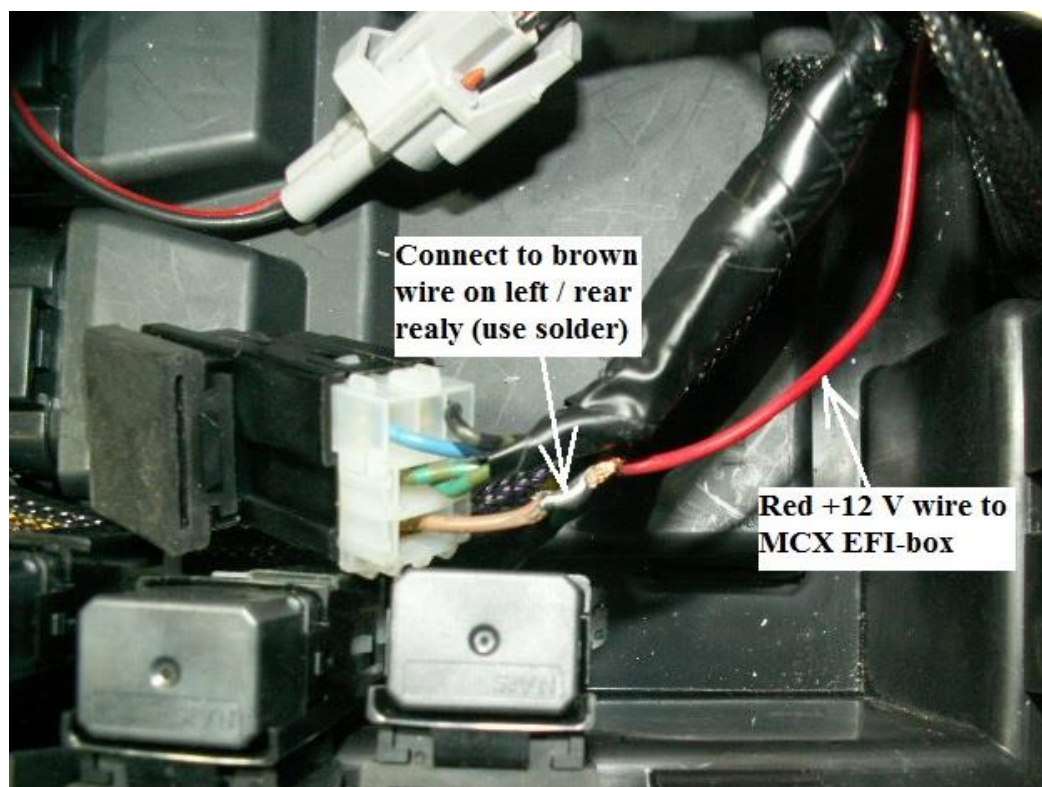




# *Install MCX EFI-box*

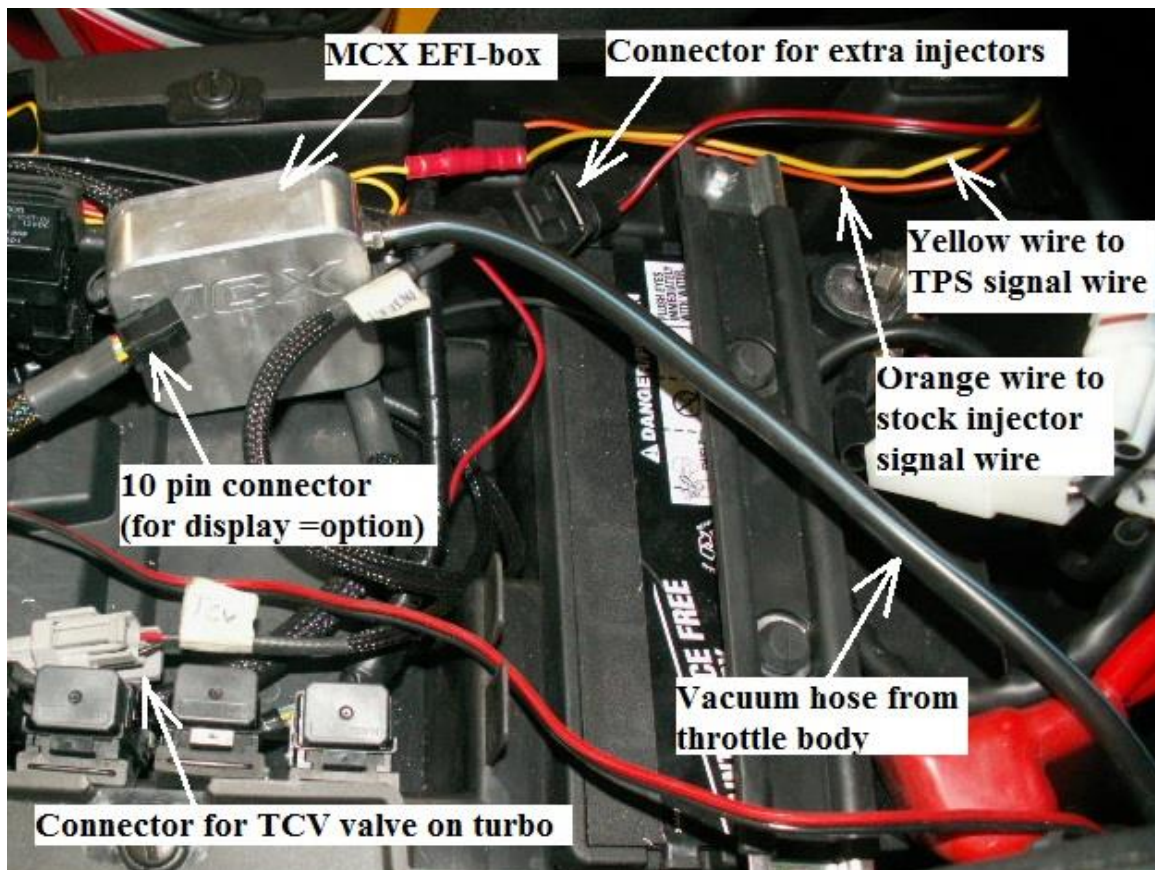


Place the MCX EFI-box in front of the battery between the seats.  
Strap it with cable ties.



Connect the red +12 V wire to the brown wire on the left / rear relay.  
Insulate properly.  
Connect the black ground wire from MCX EFI-box to the ground on battery.





Plug in the wire between the extra injectors in the plenum and the MCX EFI-box.

Plug in the TCV valve on the turbo to the EFI-box.

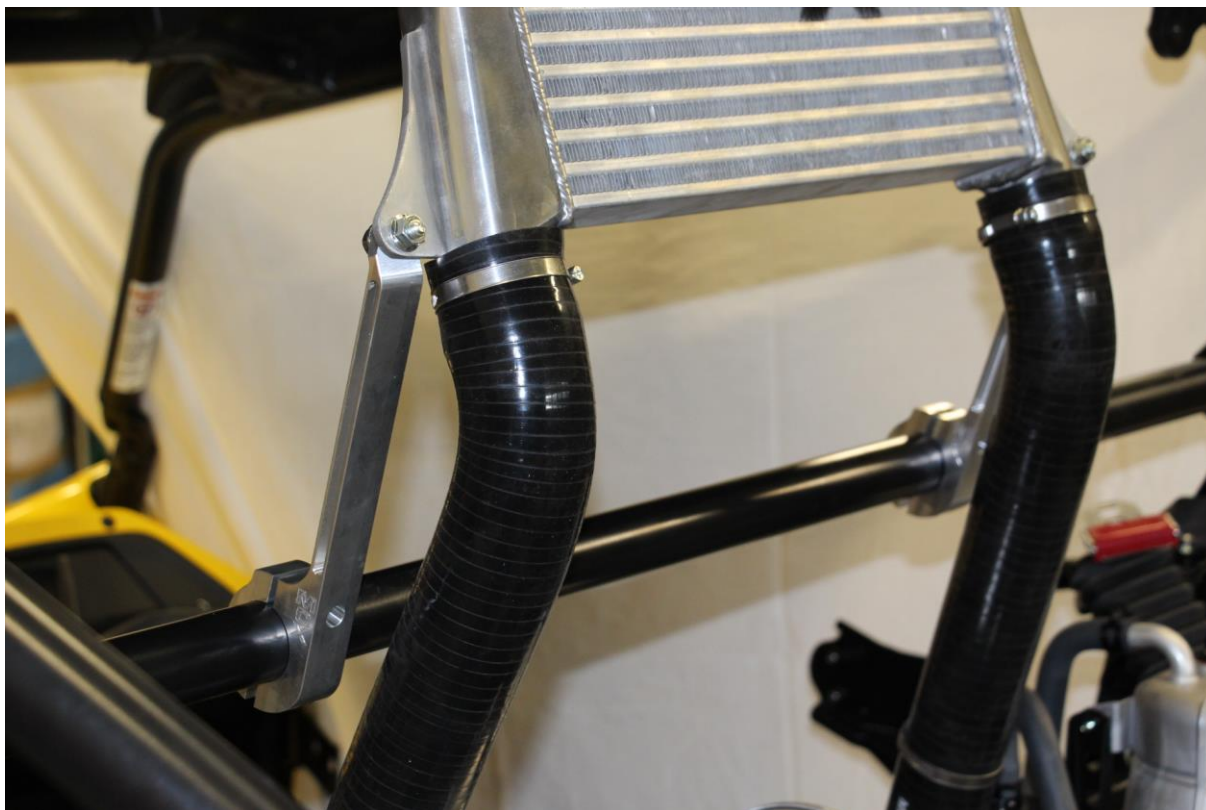
Plug in the orange signal wire to one of the stock injectors. (see picture on chapter „install the plenum)

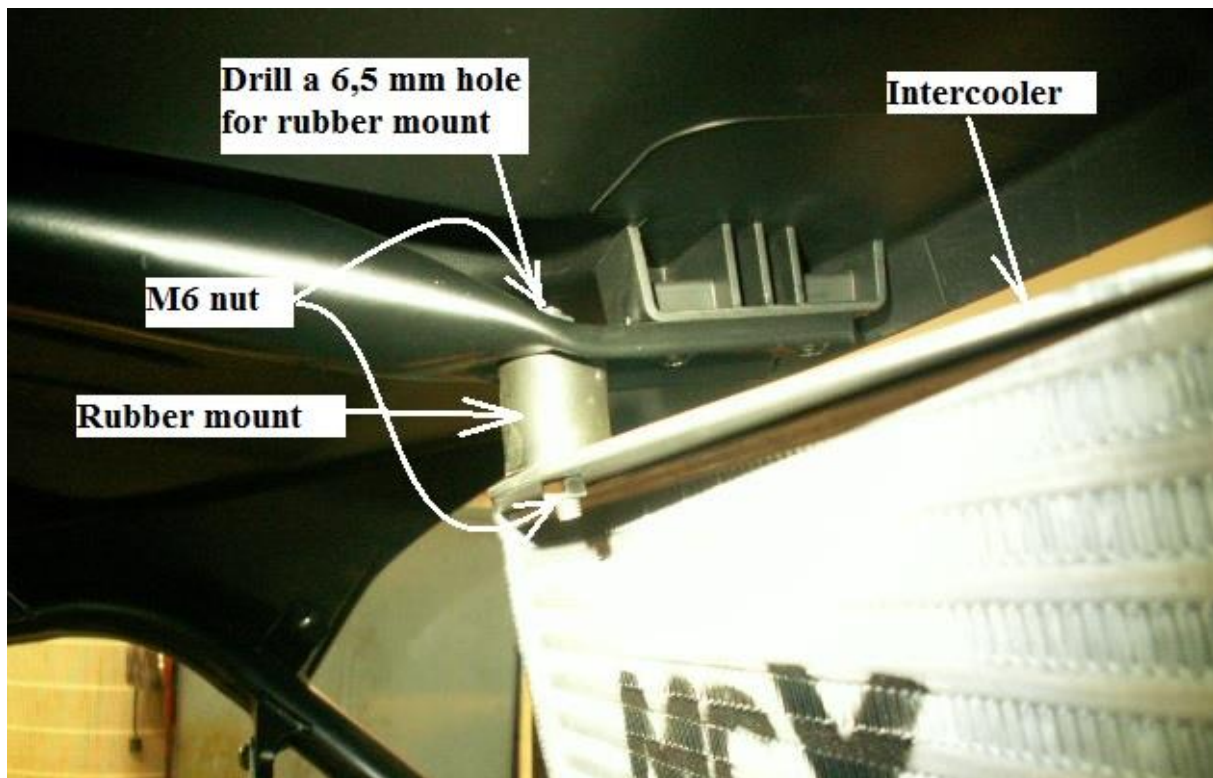
Install the yellow TPS wire to the yellow signal wire from the stock TPS on throttle body (see picture on chapter „install the plenum)

# *Intercooler installation*

The intercooler shall be installed like the pictures below.

Install the intercooler stays to the tube behind the driver and passenger.





### Upper intercooler mount:

Drill a 6,5 mm hole like the picture.

Install the rubber mount between the intercooler and the steel tube.

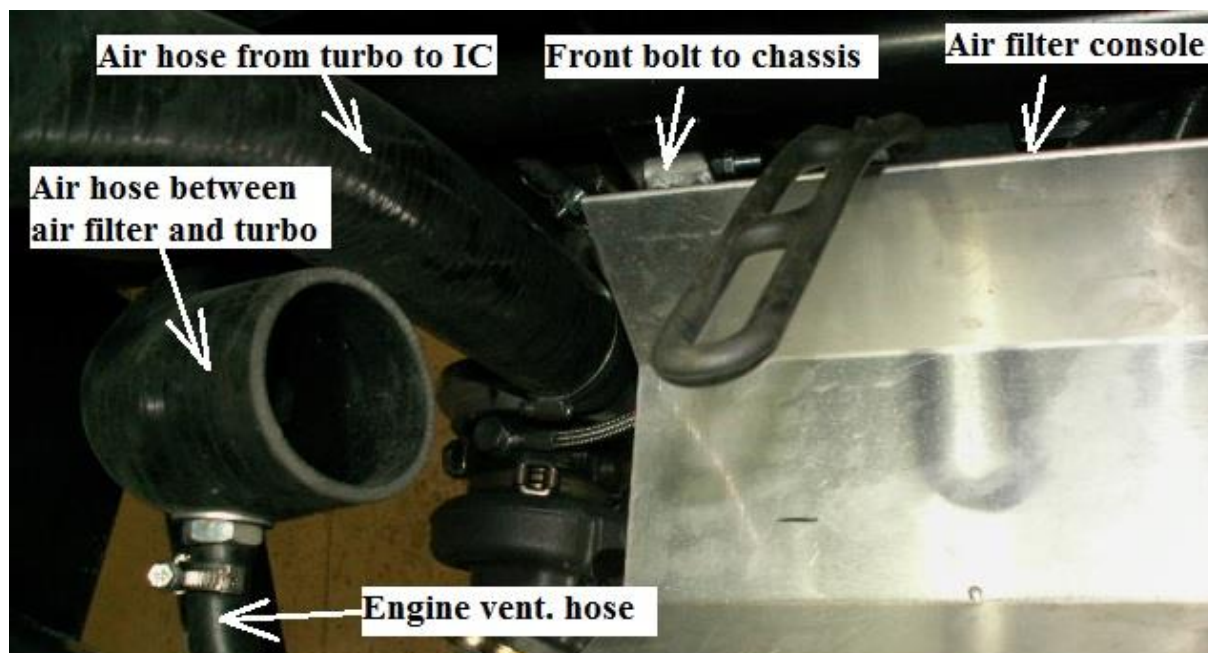
Install the air hose between the turbo and the intercooler.

Install the air hose between the intercooler and the plenum.



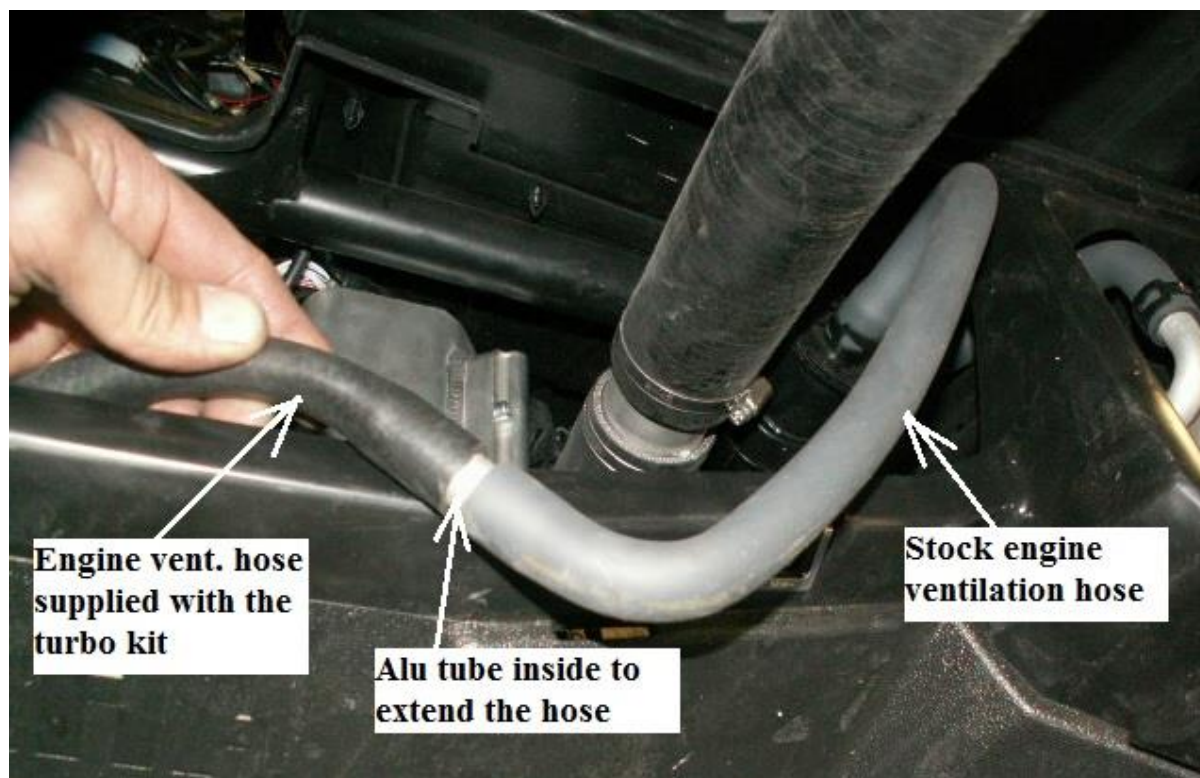
# *Air filter installation:*

First of all install the air filter console to the chassis.

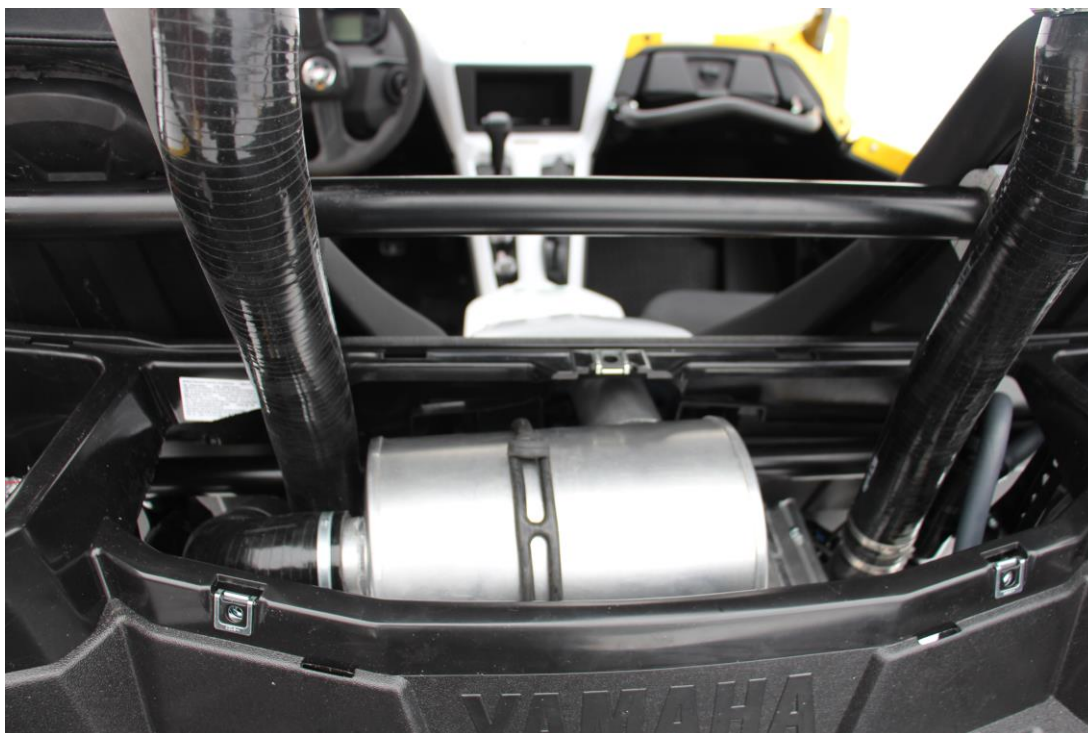


Then install the air hose between the filter and the turbo air inlet.

Install the engine ventilation hose between the stock ventilation hose and the air intake hose.







Install the air filter. Strap it against the air filter console with the rubber straps.

## *Start the engine*

Be sure the glycol water is filled and that the freezing temperature is high enough.  
Check oil level.

Start the engine before you put on the bed and rear side fairings.  
Check for leaks.

**Caution:** We recommend loosening the oil inlet M12 banjo-bolt on the turbo for a second just after you started the engine, just to make sure the engine and turbo get lubricated.

If no oil comes to the turbo, stop and check the reason.

Let the engine be heated up and make sure the water is circulating through the radiator.

Install the remaining parts.

# *Test-driving*

**CAUTION:** Always use high octane pump gas or race gas. Low octane may cause engine damages. Test-drive the snowmobile.

**CAUTION:** Be very careful when you drive in the beginning.

Check water level and oil level once again after the engine has been running

Check for leaks and control so everything seems normal. It is very important that it is no air left in the water cooling system.

The max recommended turbo pressure is 100 kPa. (14 psi) at sea level The maximum power will then be 260 hp.

Using higher turbo pressure may cause engine damages.

If higher performance is requested, we recommend low compression pistons or that you use race gas. The air/fuel ratio shall also be recorded to avoid the engine from running lean.

## **IMPORTANT:**

The maximum turbo pressure must be tested.

When testing turbo pressure, we recommend connecting a gauge via a T-connector on the same hose as to the blow off valve/MCX EFI box.

The test shall be made at full throttle for at least 2-3 seconds

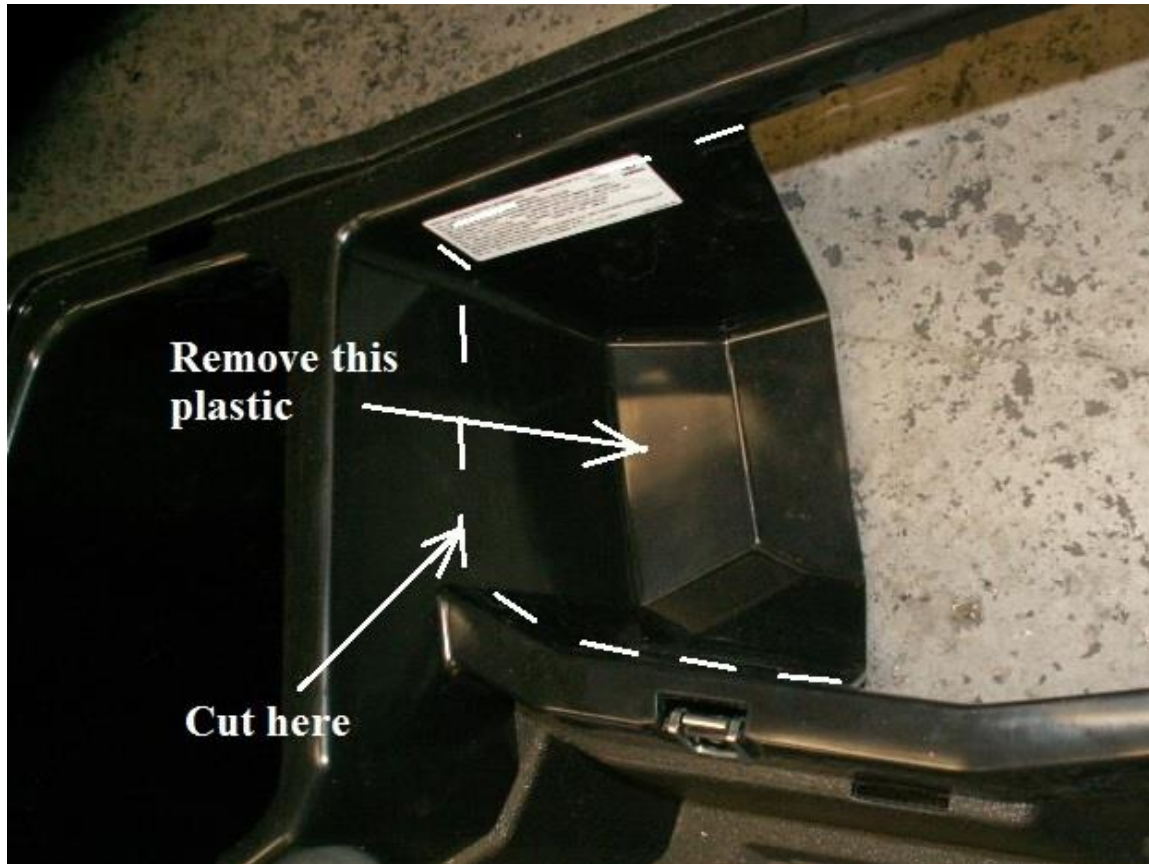
We recommend being careful when doing this.



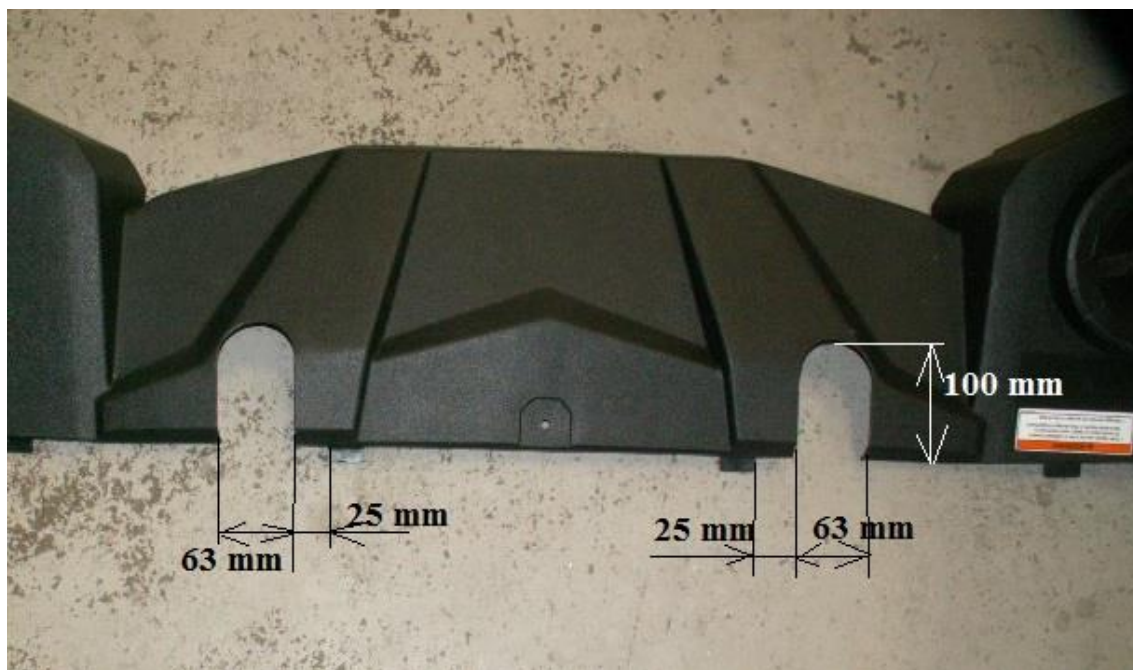
The turbo pressure can be adjusted by changing the spring pressure of the waste gate actuator. This is done by adjusting the length of the rod on top of the turbo. Shorter rod=higher turbo pressure.

When the turbo pressure is tested and everything seems to work fine install the bed and rear side fairings.

# *Modification of the bed:*



The plastic bed needs to be slightly modified to make space for the new air filter. Cut the plastic like the dotted lines.



The plastic cover behind the driver/passenger must be modified to the air hoses to and from the intercooler. Modify like the picture above.



# Good to know:

When you start: Turn the key and start it without touching the throttle.

Let the engine idle for a while before you drive away.

Drive gently before the engine has reached proper temperature.

Before you intend to stop, drive slowly and gently the last minute.

Let the engine idle, but maybe just for about 10 seconds.

The YXZ 1000 engine is very reliable.

But at the same time, with turbo this is an extremely powerful vehicle and must be treated right and with care.

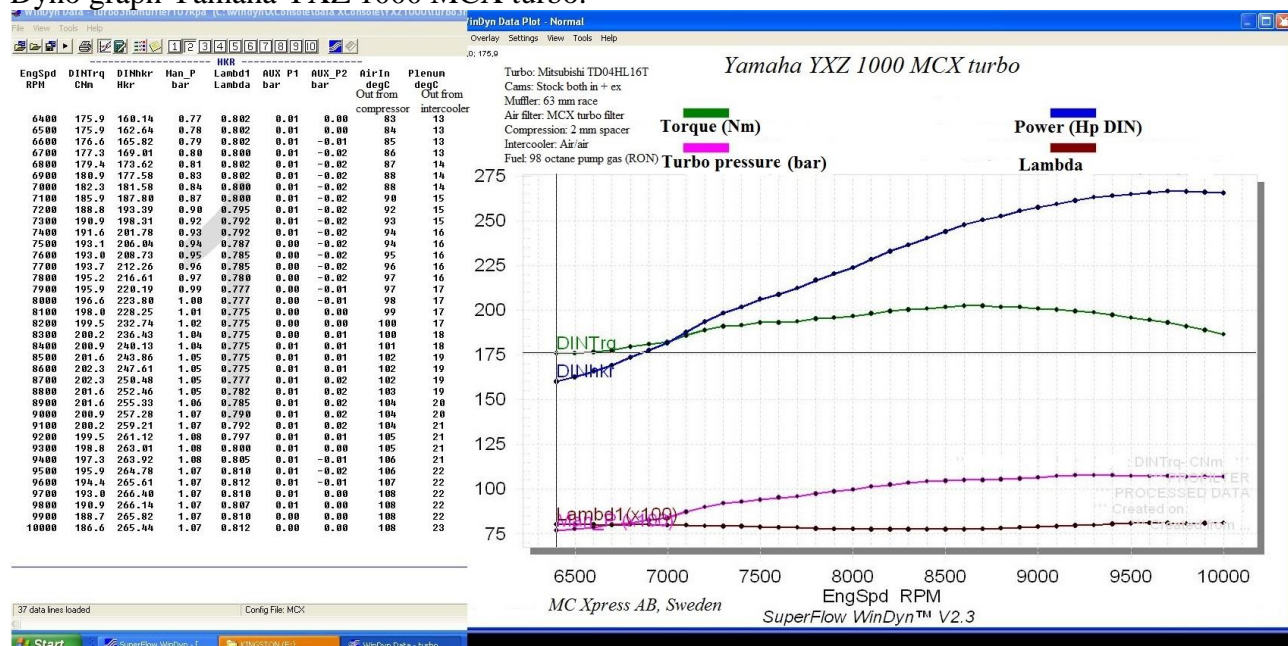
If something happens with the engine there is usually something else that has caused the problem. Here is some tip that is good to know:

Don't use full power if the fuel level in the fuel tank is low, especially in steep hills.

This can cause fuel starvation and engine damages.

Avoid the engine to hit the RPM-limiter.

## Dyno graph Yamaha YXZ 1000 MCX turbo.



# *Options:*

## *Display and log unit.(option)*



This display can show pressure, lambda or air fuel ratio, rpm, baro pressure, etc.

It can also sample data 10 times each second.

This info, you can be downloaded via the USB cable to your PC.

The MCX EFI-box is prepared with a connector, so it is just “plug and play”

A Bosch wide range oxygen sensor is included.