

# Installation manual MCX turbo kit SeaDoo ACE 900 spark *-Supreme of the extreme!*



The power increase after turbo installation is surprisingly high!  
Take it easy in the beginning until you get used to how the water craft acts with turbo!



# *MCX Spark turbo kit:*

Thank you for choosing the MC Xpress turbo kit to your SeaDoo ACE 900 spark watercraft. The turbo kit is designed for racing use only.

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

Read this manual before you start with the installation.

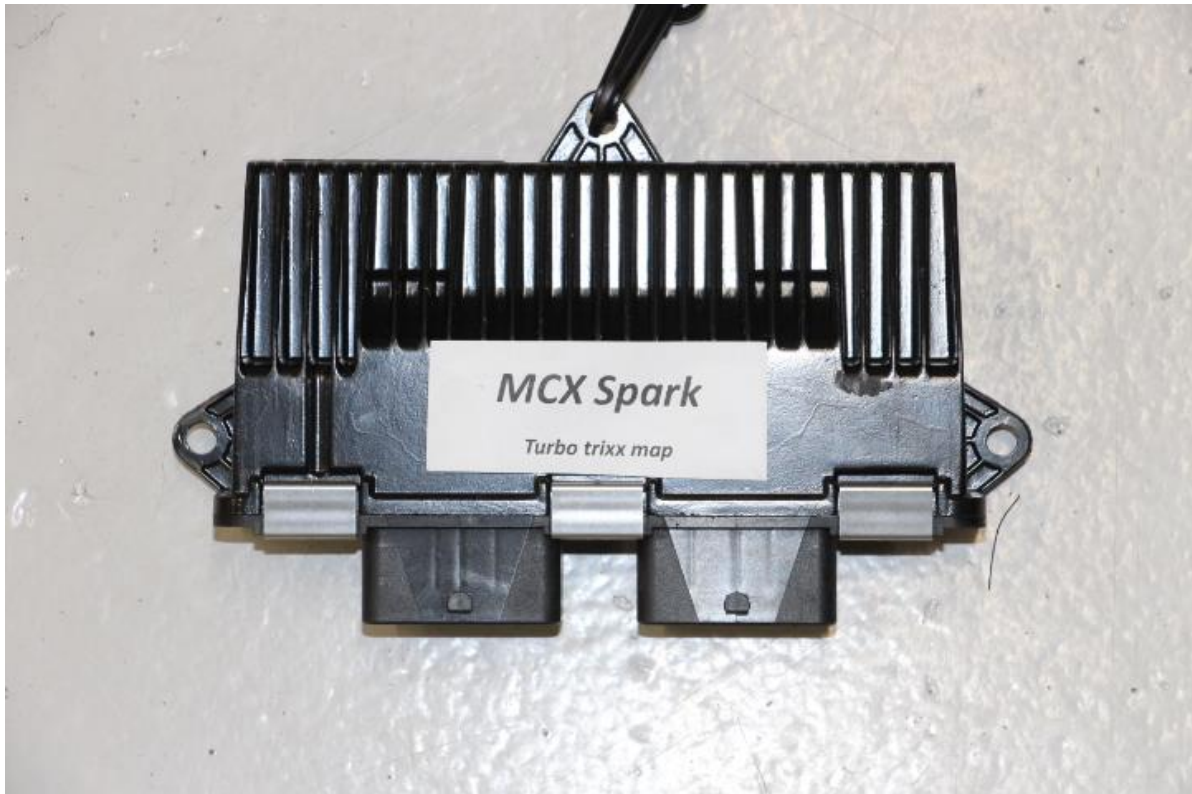
We hope you will get much joy with your new investment.

The turbo watercraft 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.
- V-tech tuning, 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.





First of all: The ECU must be re-programmed.

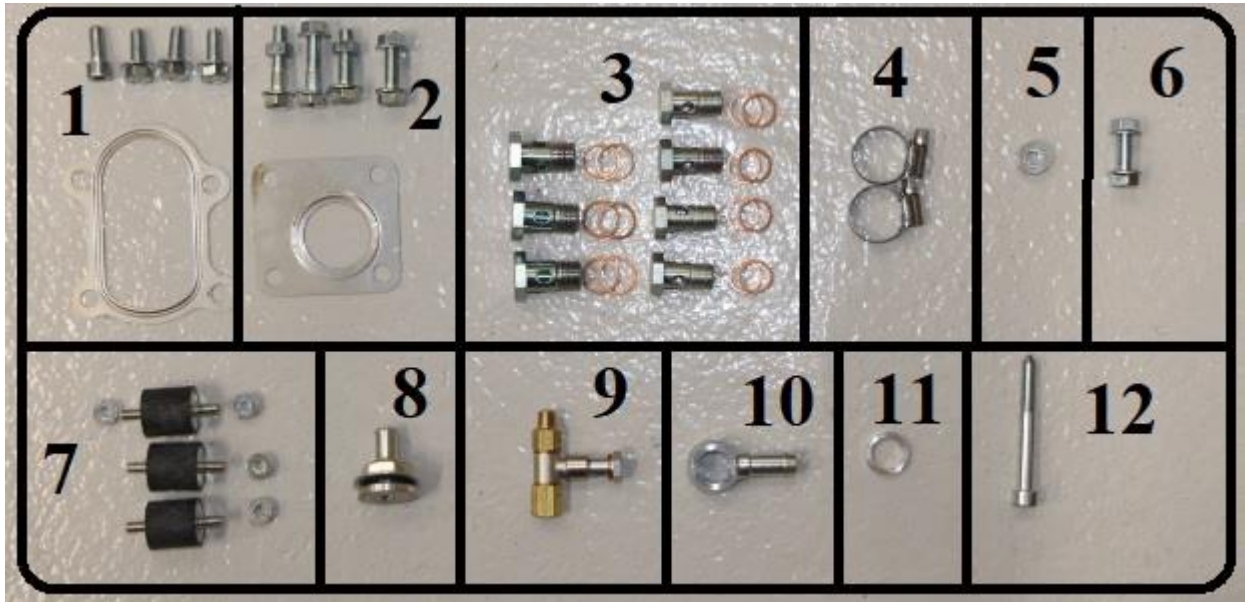
Please send the ECU to MC Xpress AB.

The reason is that the fuel map is changed a lot due to the bigger injectors that is needed with turbo. And the stock MAP-sensor is replaced to a sensor that can read turbo pressure.

The ignition map is also changed, and the rpm limiter is rised + many other things are also changed to make the engine to work excellent with turbo.

# *Small parts SeaDoo*

## *ACE 900 spark turbo kit*



- |     |       |  |
|-----|-------|--|
| 1.  | 1 pc  | Gasket exhaust out of turbo                            |
|     | 3 pc  | M8x20 flange bolt                                      |
|     | 1 pc  | M8x20 hex bolt   |
| 2.  | 1 pc  | Gasket exhaust in to turbo                             |
|     | 2 pc  | M8x35 flange bolt                                      |
|     | 2 pc  | M8x30 flange bolt                                      |
|     | 2 pc  | M8 flange nut  |
|     | 2 pc  | M8 normal nut  |
| 3.  | 3 pc  | Banjo bolt M16 for water hoses + 6 copper washers      |
|     | 4 pc  | Banjo bolt M14 for water hoses + 8 copper washers      |
| 4.  | 2 pc  | Hose clamps 16-25 for water hose                       |
| 5.  | 1 pc  | M8 flange nut for intercooler stay                     |
| 6.  | 1 pc  | M8x25 flange bolt + M8 flange nut for muffler clamp    |
| 7.  | 3 pc  | Rubber mount +4 M6 nuts for cooler above the turbo     |
| 8.  | 1 set | Nipple + O-ring + nut for oil return inlet on oil tank |
| 9.  | 1 set | Oil outlet on engine for turbo lubrication             |
| 10. | 1 pc  | M16 banjo nipple (connects under intercooler)          |
| 11. | 1 set | Spacer for cam chain tensioner Di16, Dy22, L4          |
| 12. | 1 pc  | Crankshaft locking tool (from M8x70 bolt)              |

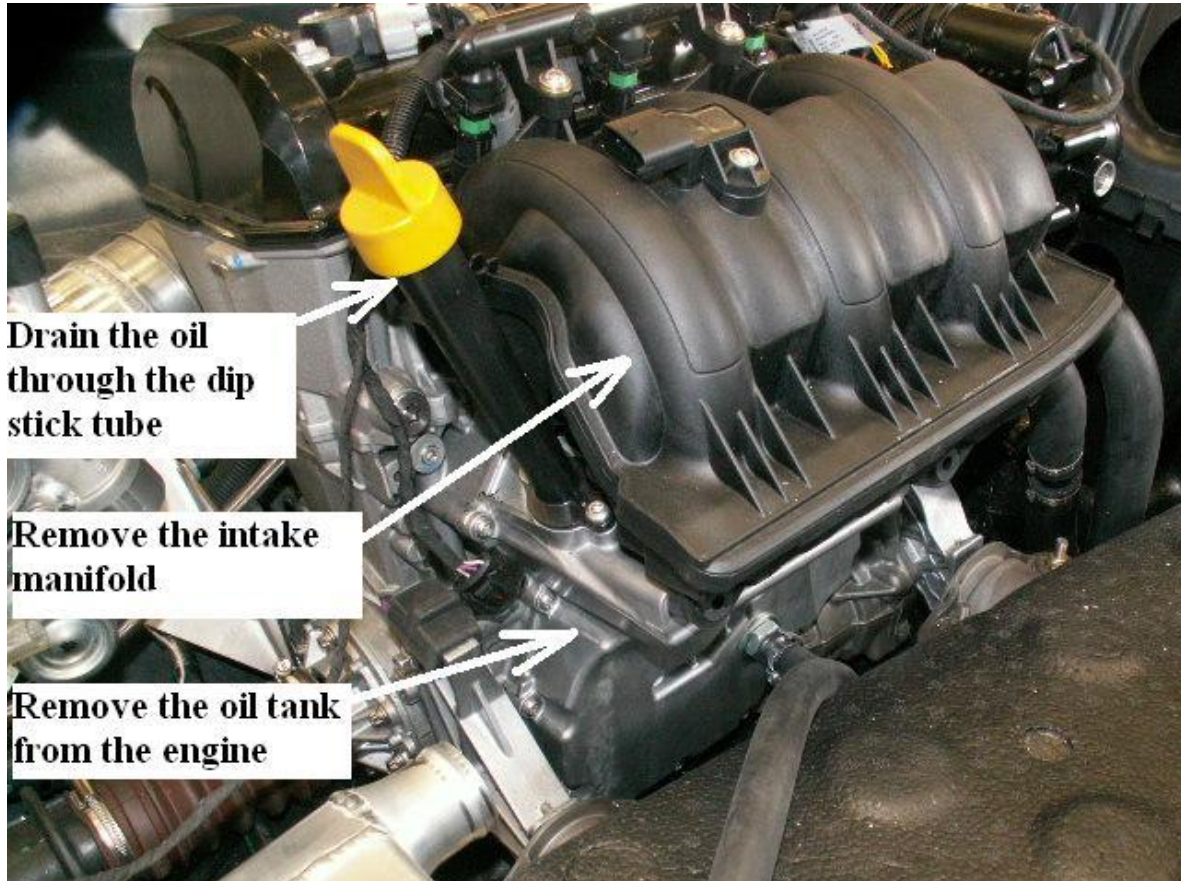
## ***Begin the installation by demounting parts:***

Begin the installation by demounting the upper plastic of the vehicle.

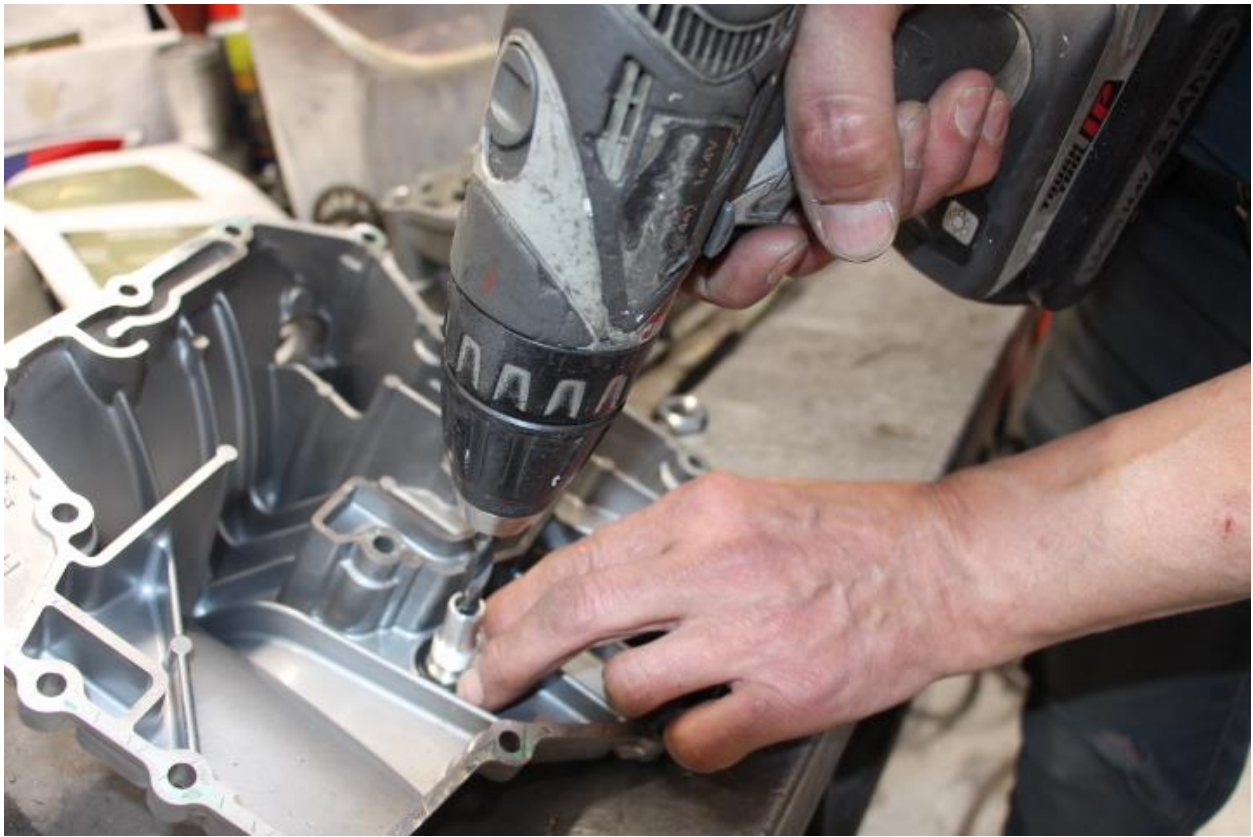
Then take off the complete stock exhaust system including the exhaust manifold.

Demount the plastic intake manifold .

Drain the oil tank on the right side of the engine by pumping out the oil through the dip stick tube. Then demount the oil tank.



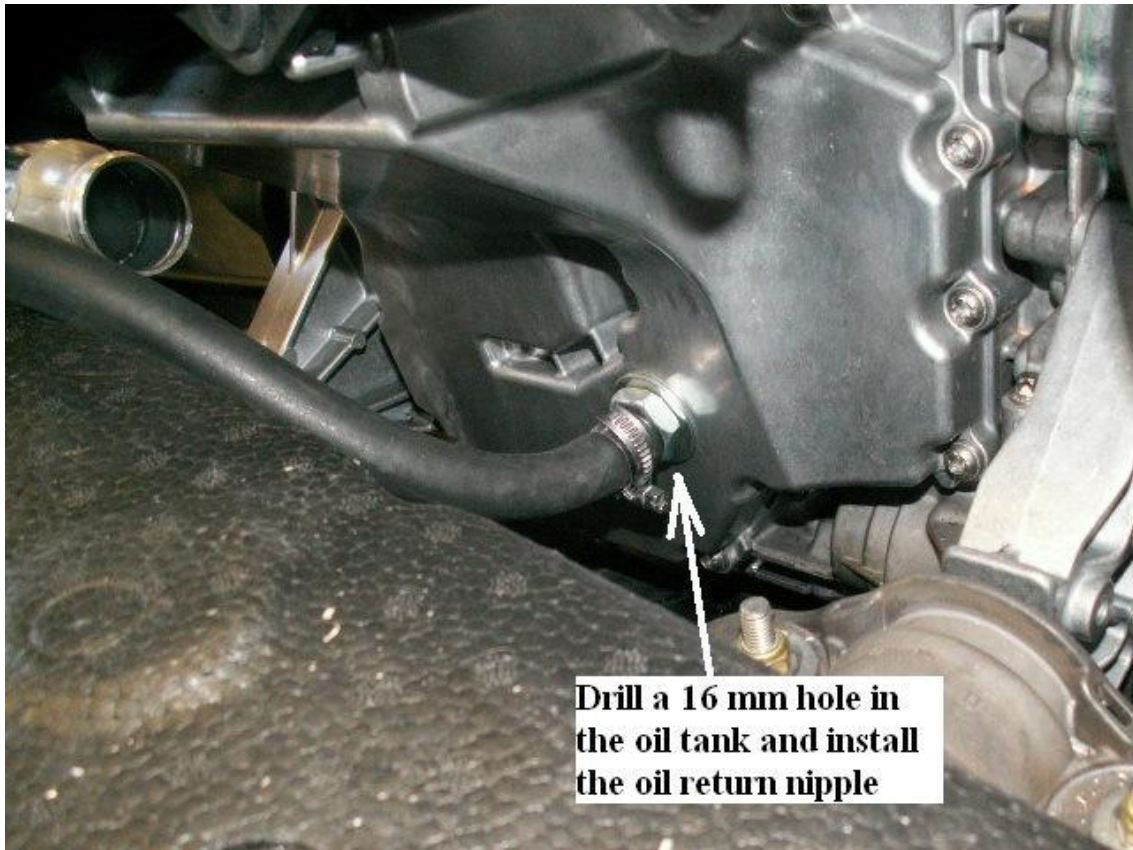
The reason why the oil tank must be removed is because a nipple for the oil return from the turbo shall be installed on the side of this tank.



Inside of the tank. You can use the nipple to locate and check so it fits.



Find a plane surface for the nipple and drill a 16 mm hole.  
Install the oil return nipple + O-ring from the inside of the tank and tighten the nut from the outside. Use thread lock to secure the nut.

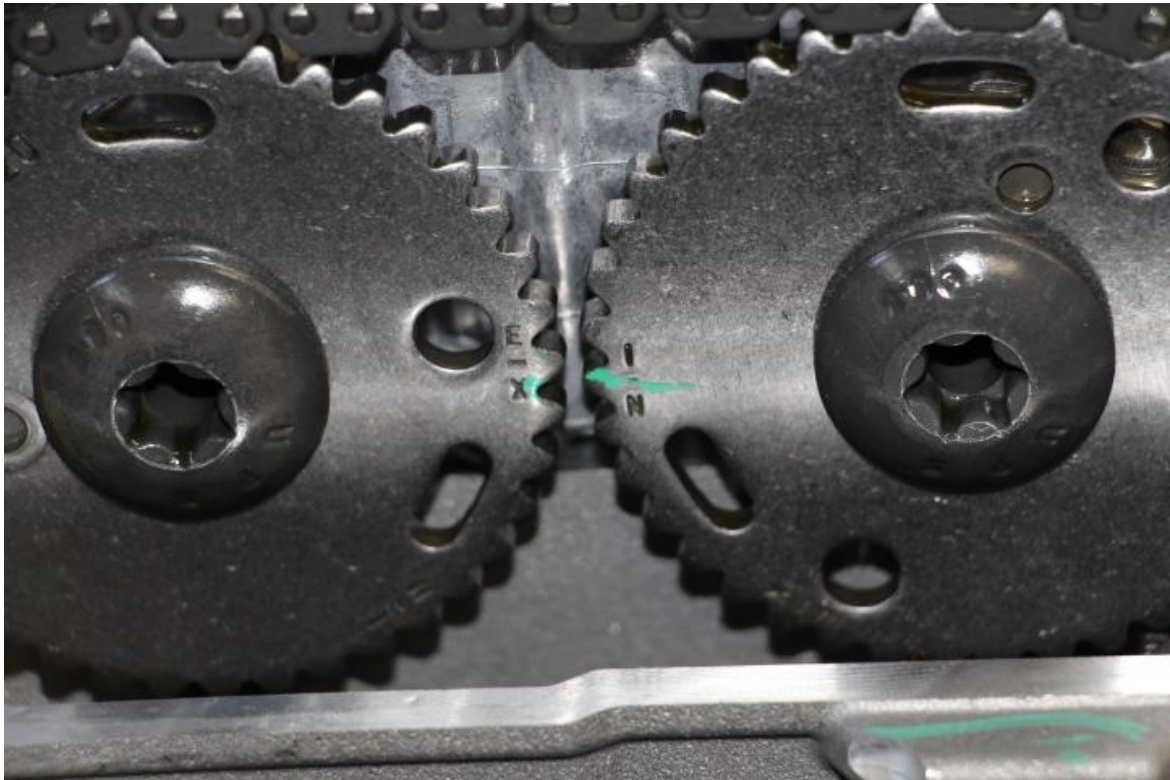


Install the 800 mm long oil return hose to the nipple. Secure with a hose clamp.

## *Lower the compression ratio*

The compression ratio must be lowered by installing a new thicker head gasket. The reason is to avoid detonation and keep the reliability of the engine after the turbo installation.

Take off the cylinder head cover. And take out the spark plugs too.

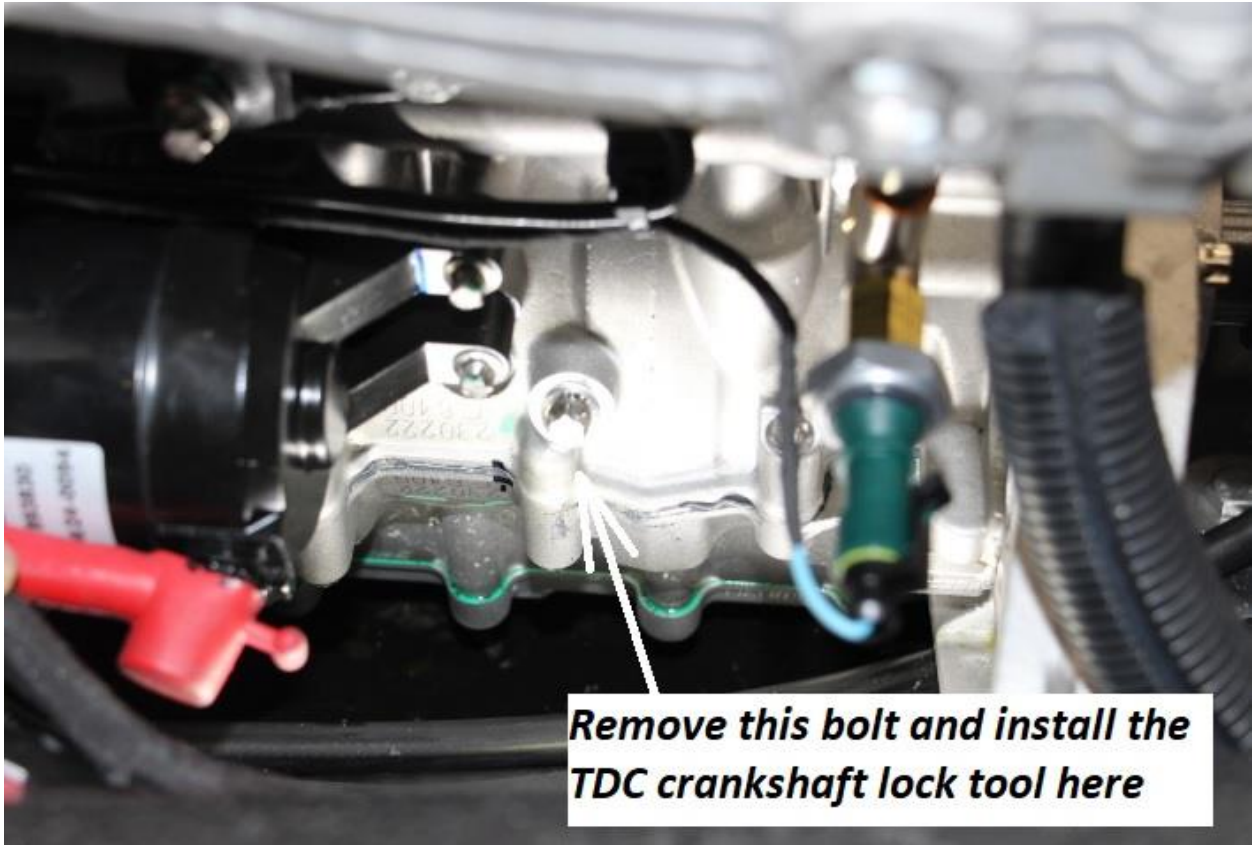


Rotate the crankshaft until piston number 2 is at top (=TDC) and the cams are positioned like the picture above.

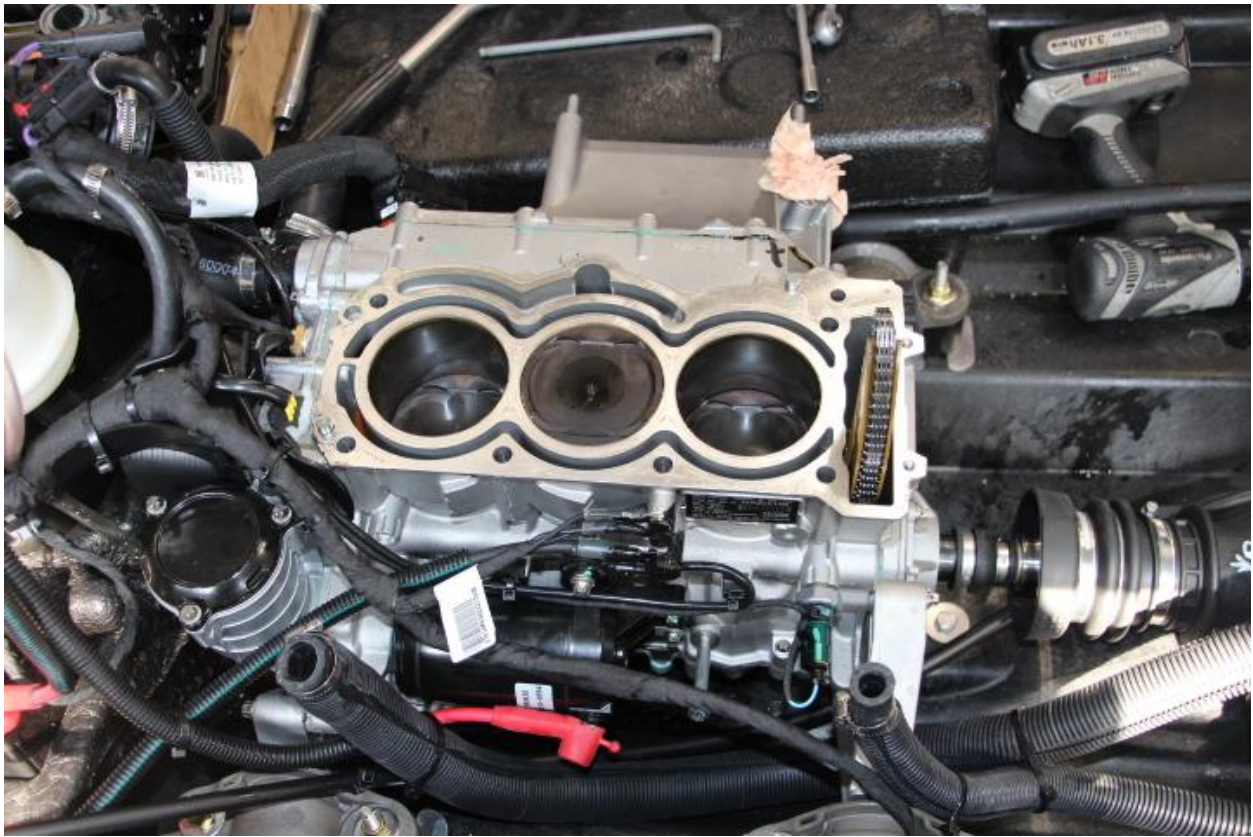
Now you can lock the crankshaft from moving by installing a TDC crankshaft lockin tool supplied with the kit.



# ***TDC crankshaft locking tool***

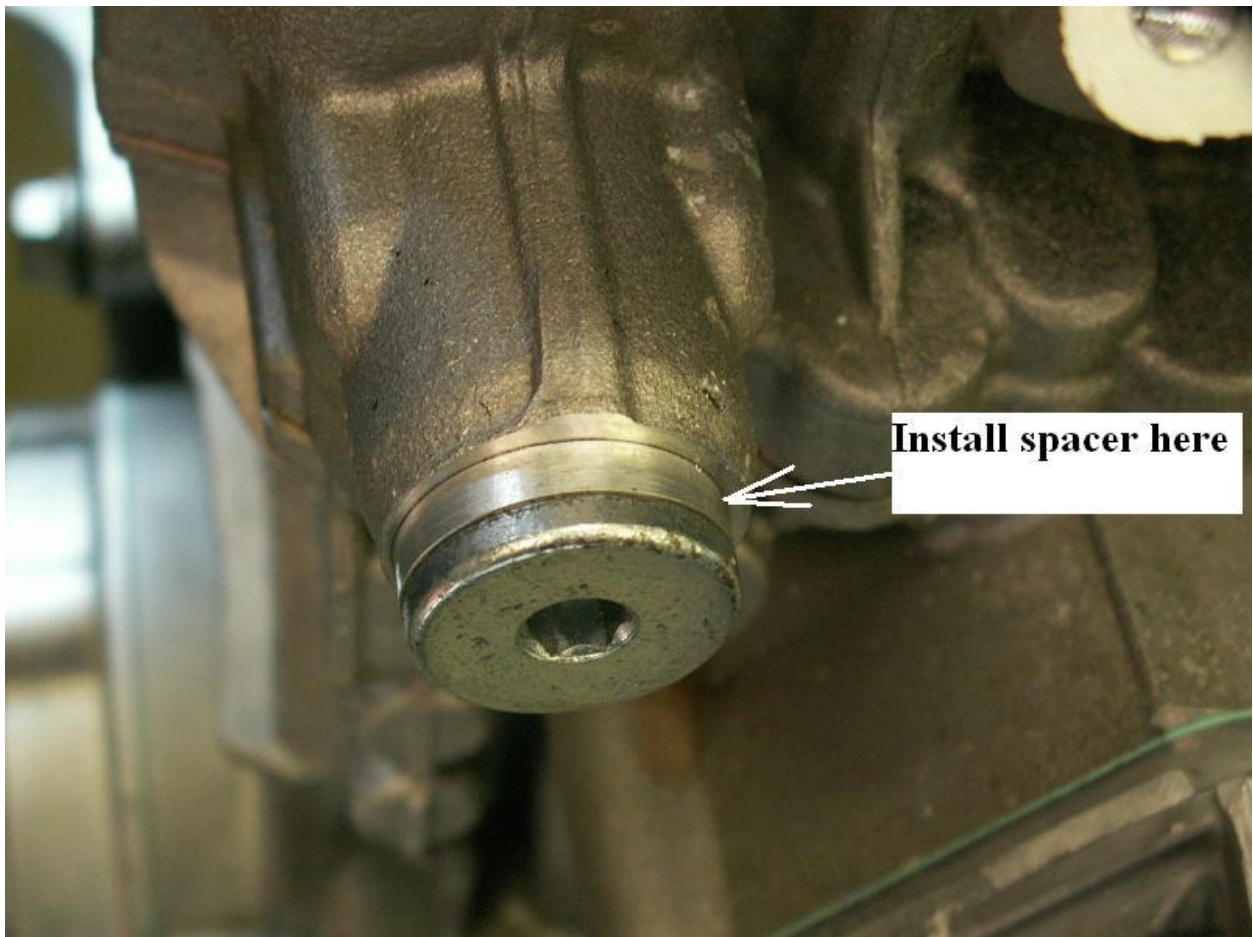


Now demount the camshafts and the cylinder head.  
Do it in this order:  
First remove the cam chain tensioner.  
Then remove the camshafts and the cylinder head.



When the cylinder head is off, clean all the surfaces before you install the new, thicker head gasket.

Install the cylinder head. Re-use the stock head bolts.  
Tighten the head bolts 20 Nm. Start from the centre and out.  
Final tighten the head bolts in a 120 degree angle.  
Install the camshafts in the same position as before.



Install the cam chain tensioner.

But replace the stock washer with a spacer supplied with the kit. (See picture) The reason is to avoid that the cam chain is getting too tight when the cylinder head is located higher due to the thicker head gasket.

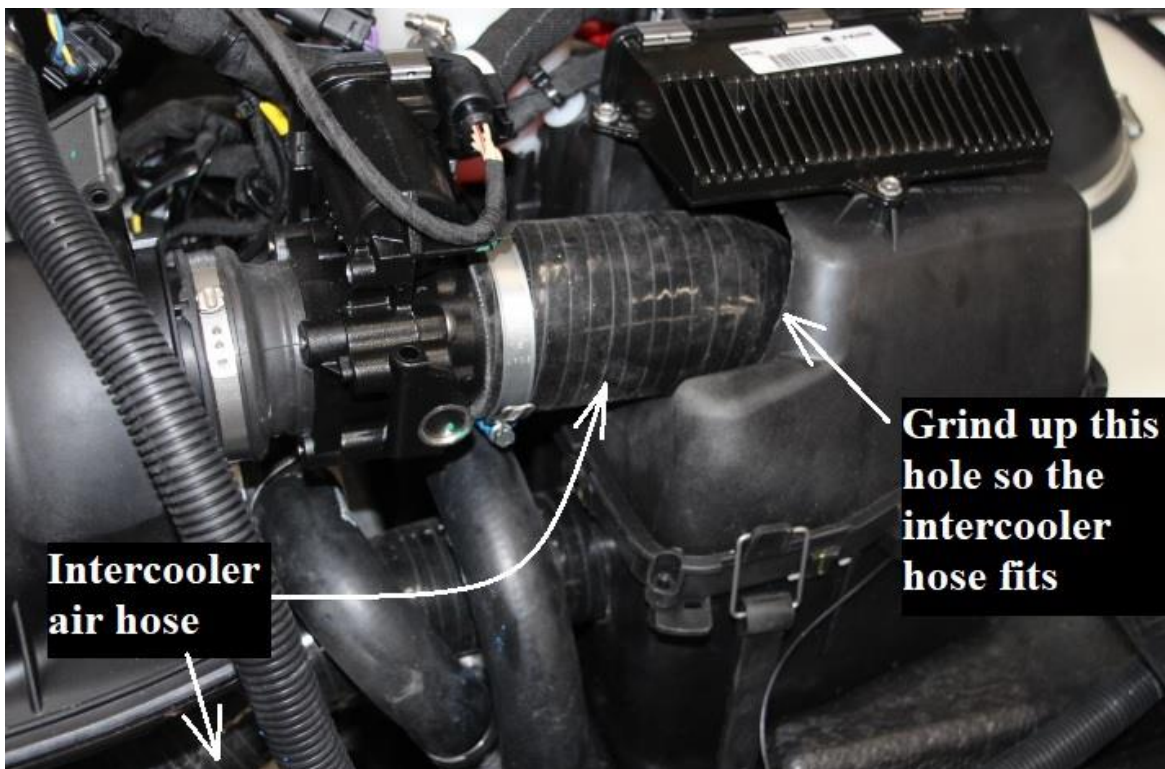
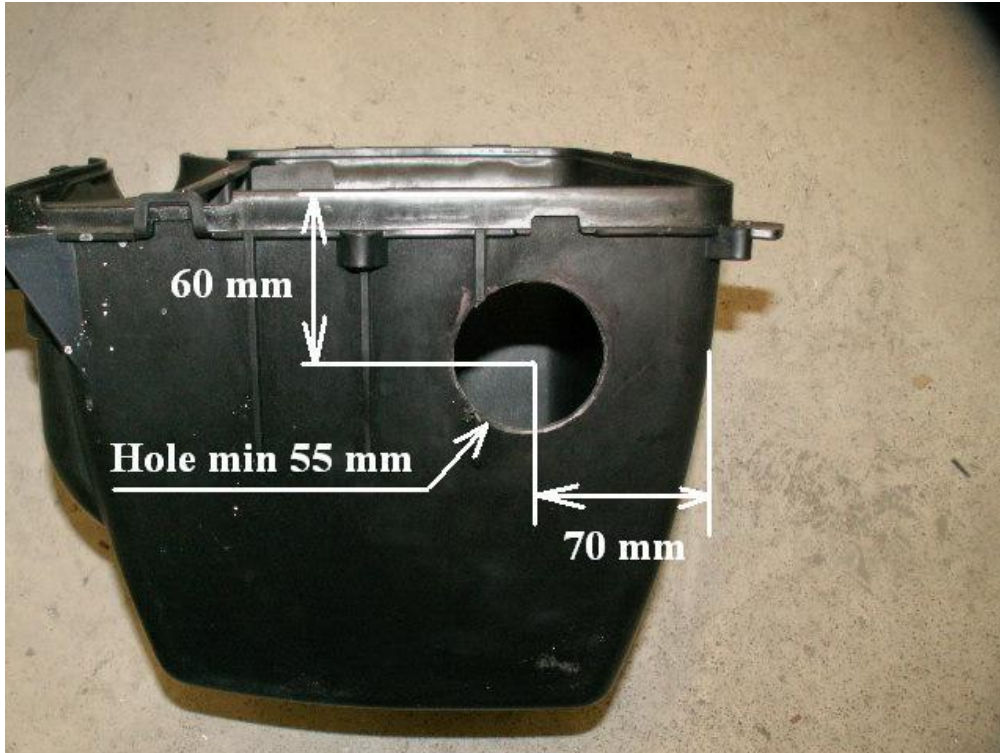
Take away the crankshaft locking tool, and check the cam timing by turning the engine two turns and check so the cam position is right.

(The cams will be slightly different in timing due to the thicker head gasket, but not much)

# *Air box modification*

Demount the plastic air box in front of the engine.

Drill a hole minimum diameter 55 in the location like the picture.



Install the U-shaped air hose going from the intercooler to the throttle body  
.The hole in the upper air box must be modified to make space for the air hose.

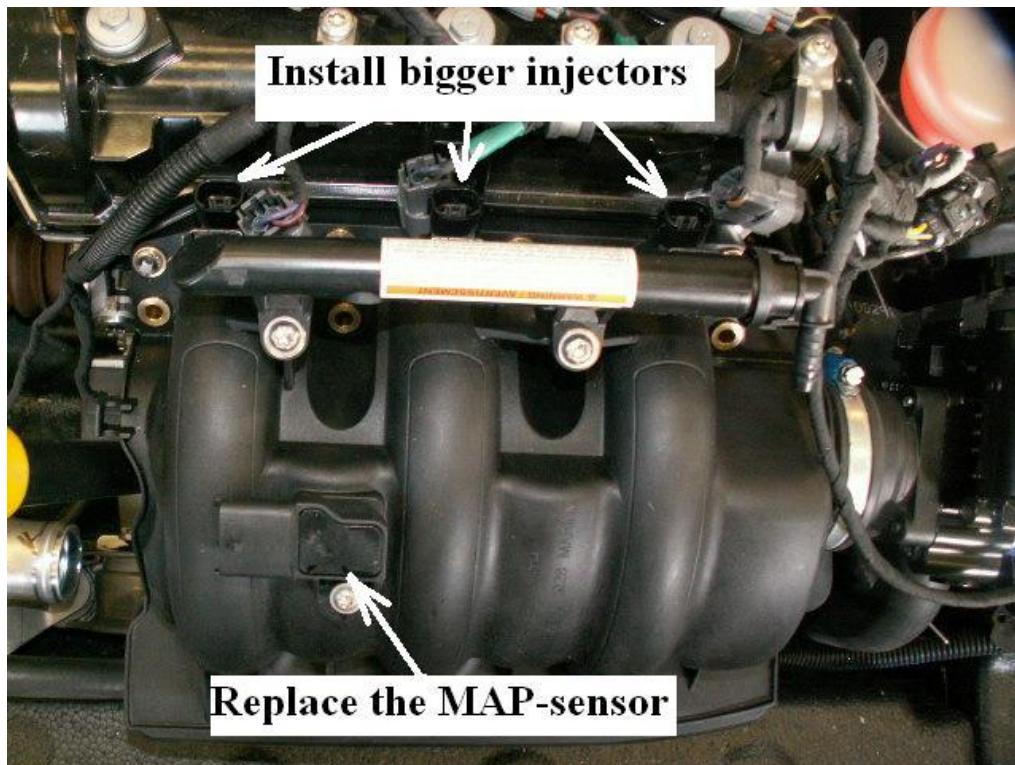
# *Install bigger injectors and turbo MAP sensor*

The stock map sensor is not designed to read turbo pressure.

Replace it by installing a new turbo MAP sensor to the plenum.

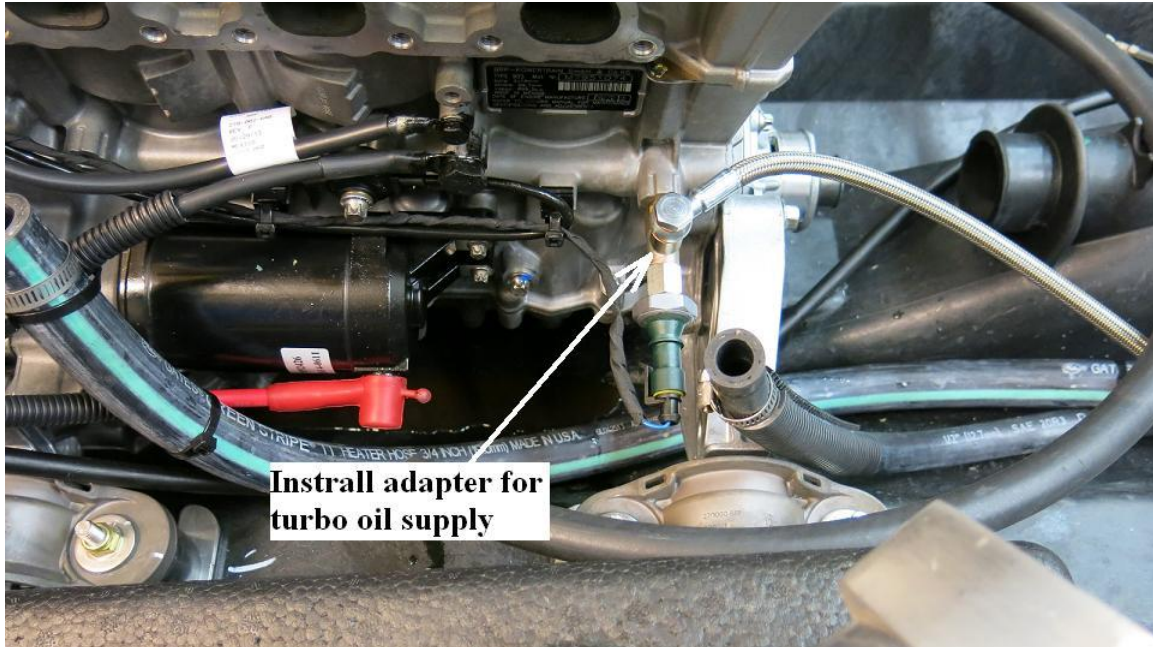
Replace the stock fuel injectors to new injectors with higher flow capacity supplied with the kit.

Install the plenum to the engine.

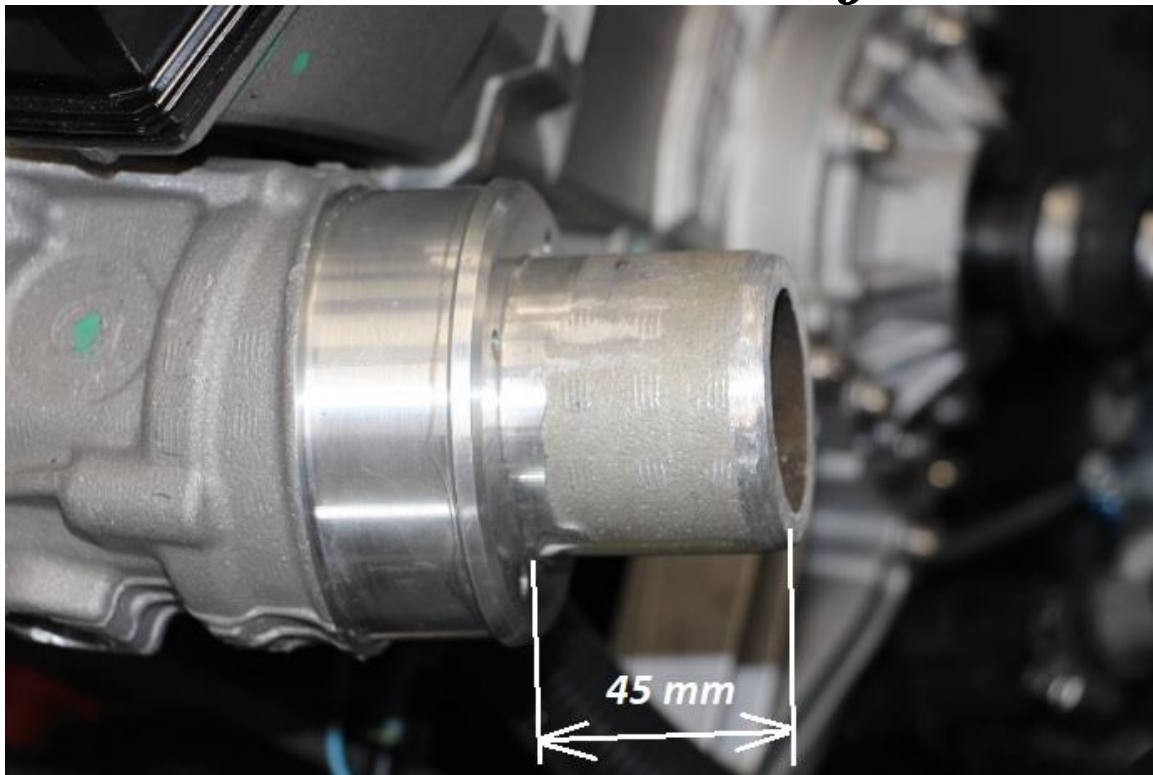


# *Oil supply to the turbo*

Demount the oil pressure sensor. Install the oil supply adapter. Use Loc-tite thread sealant. Install the oil pressure sensor on the adapter. Install the turbo oil supply hose to the adapter.



# *Exhaust header modification:*



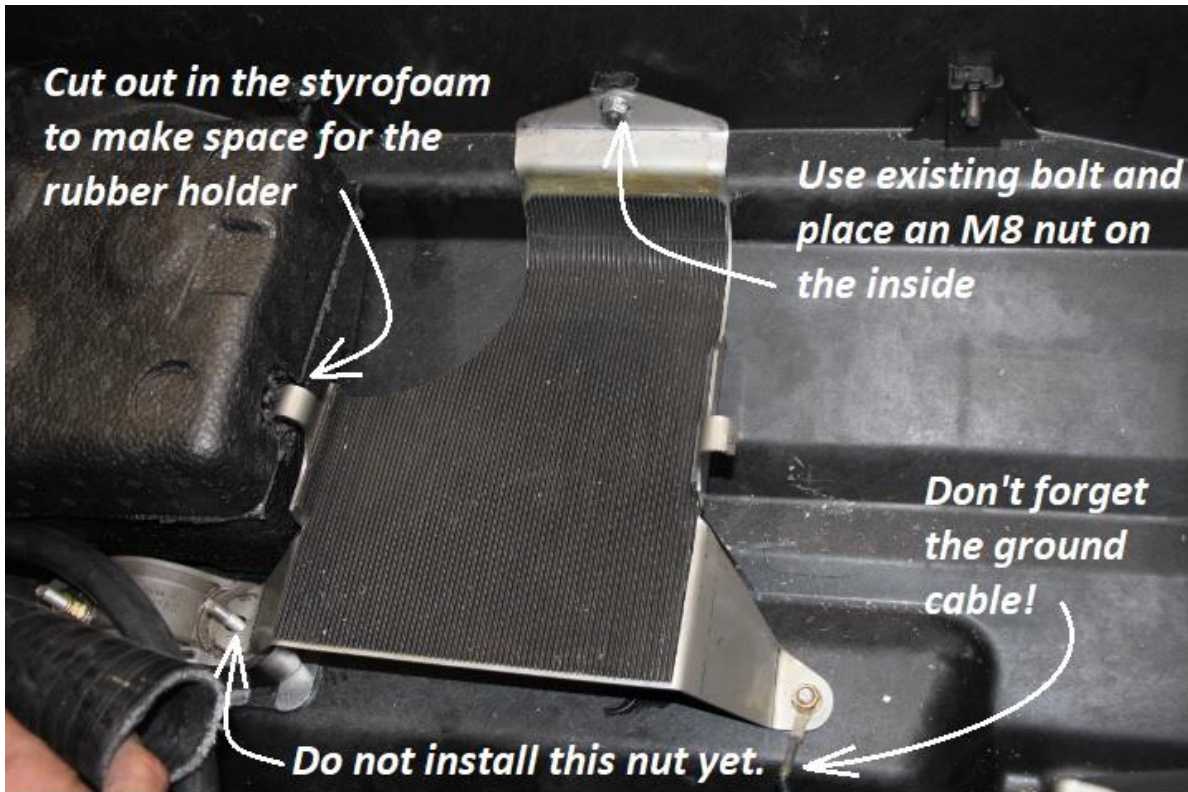
Before installing the exhaust headers, cut the end of the header so it remains 45 mm like the picture.



Try on the flexi pipe on the exhaust manifold and check so it fits.  
If it is too tight, adjust the end pipe of the alu-headers by grinding until it fits fine.

# *Intercooler installation*

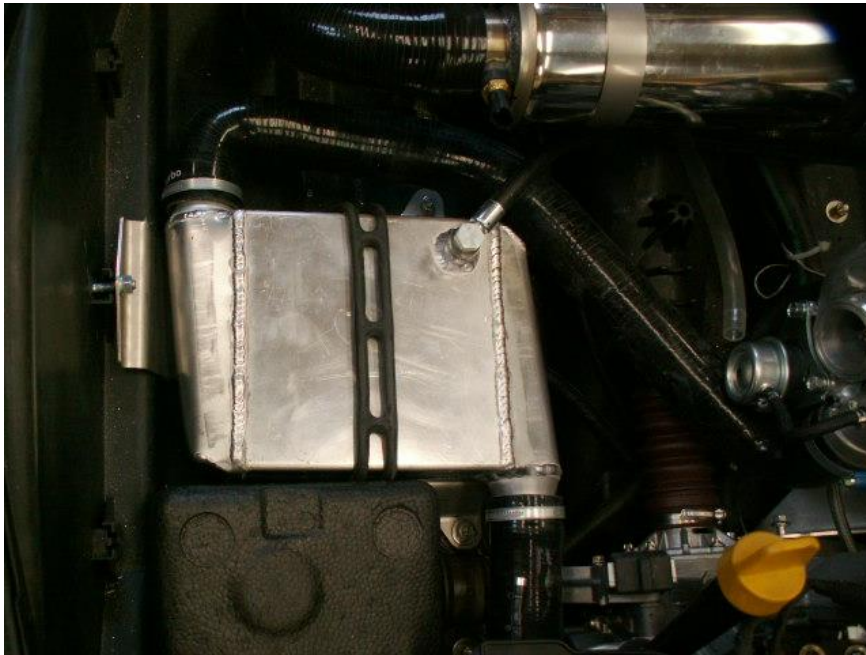
Install the bracket that shall hold the intercooler.



Before you put the intercooler in place, install the water on the lower side of the intercooler.

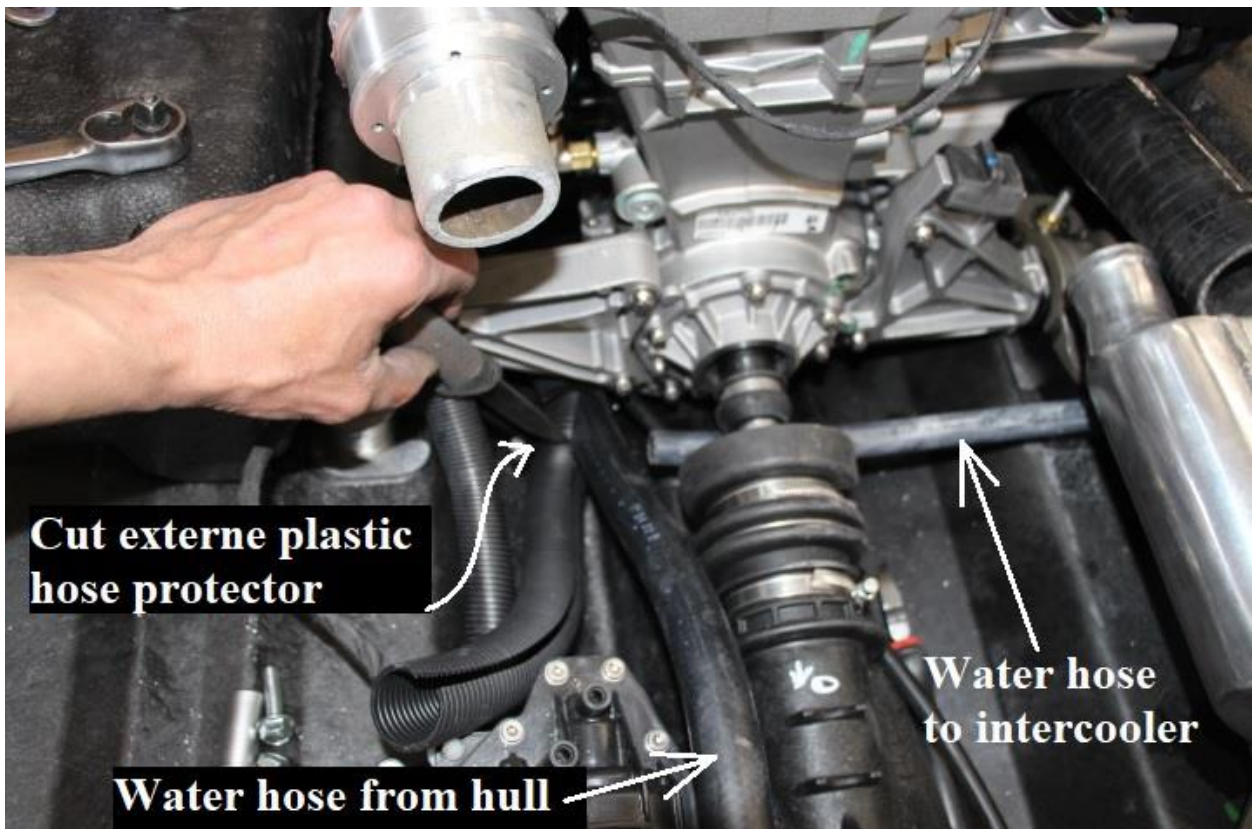


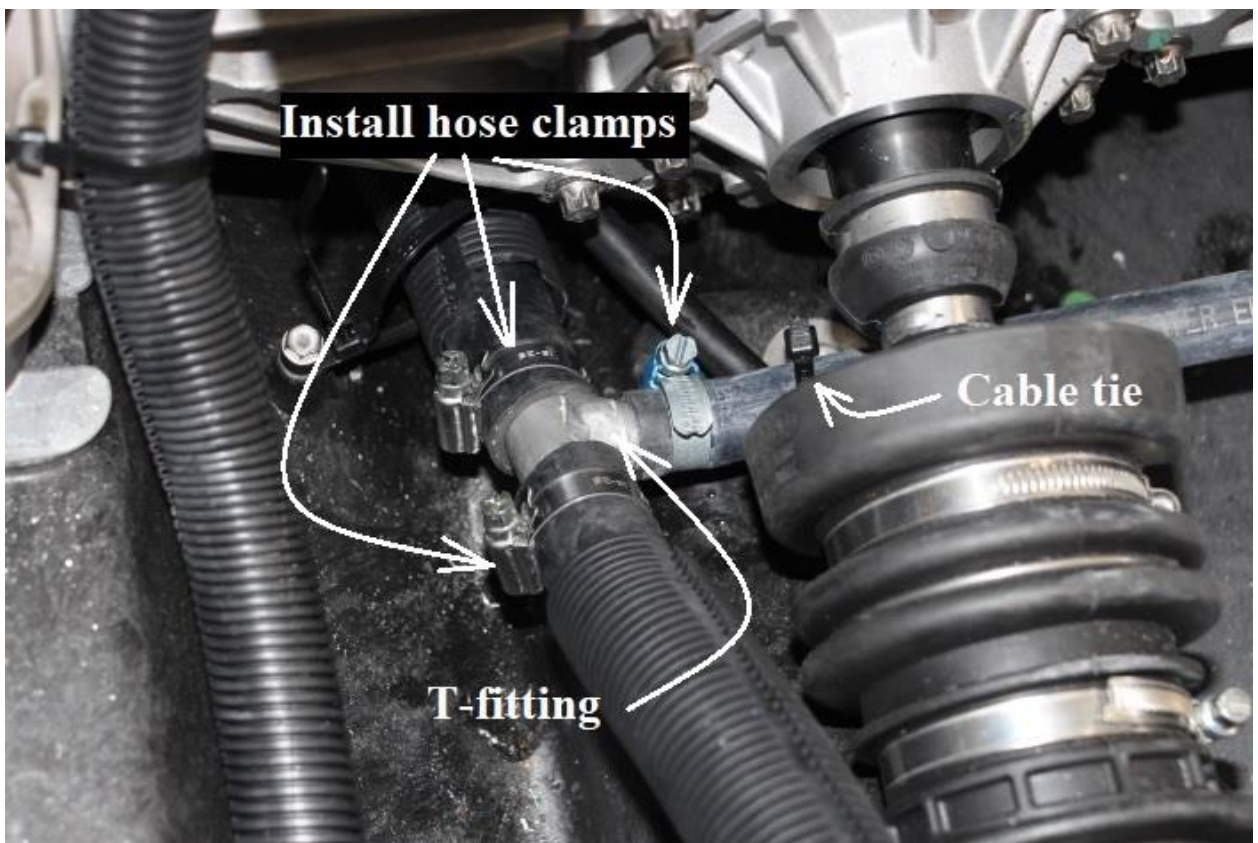
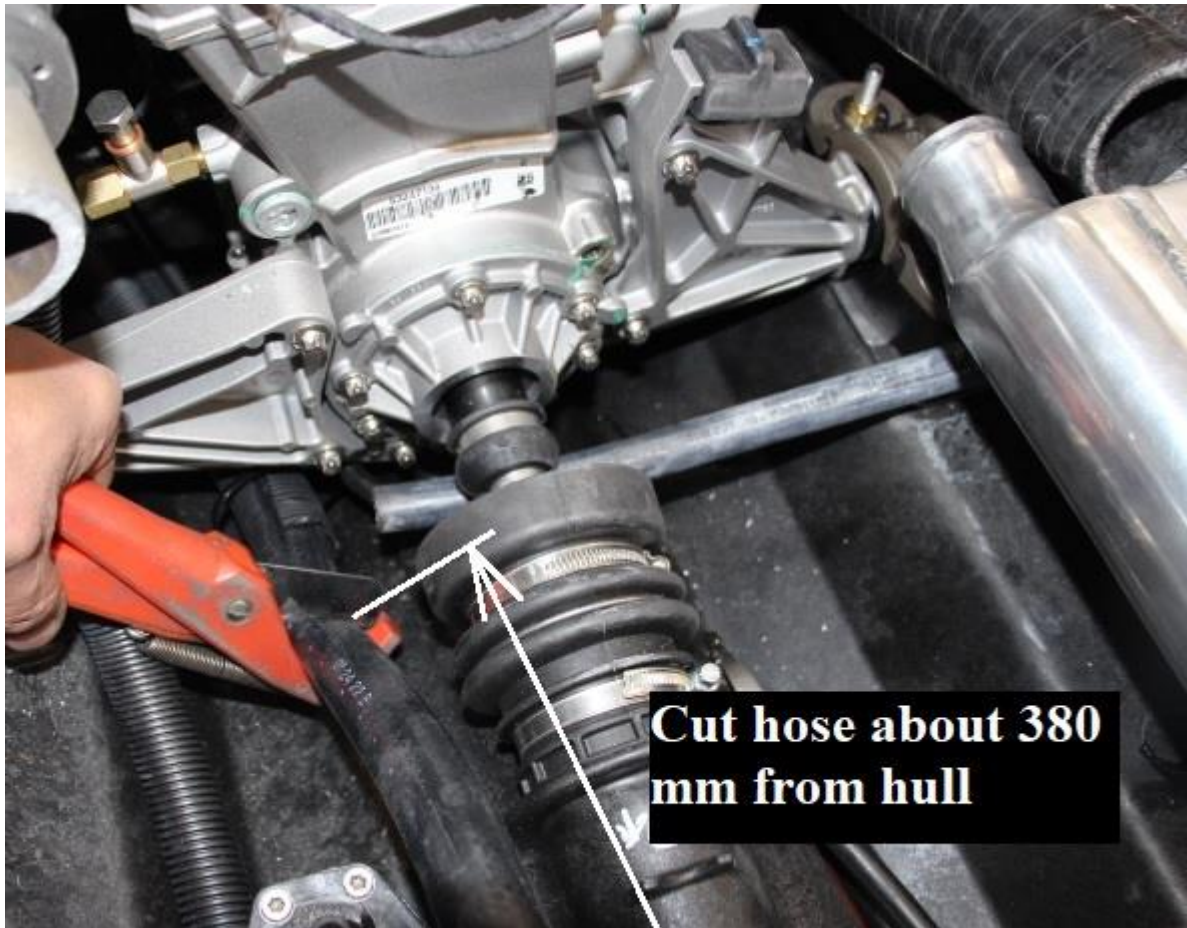
Also install the elastic rubber holder in the front hook of the intercooler bracket.  
You might have to cut out some foam to make it fit.



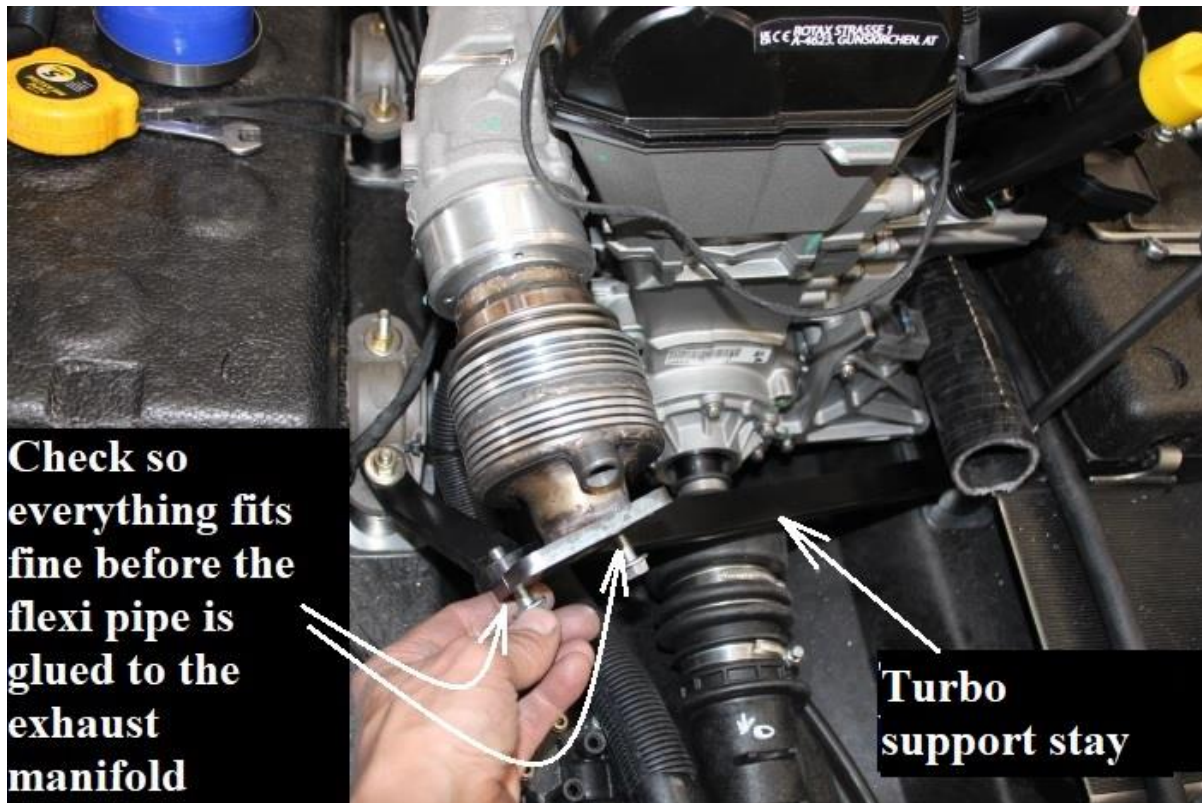
Install the intercooler to the intercooler bracket.  
Strap it down with the elastic rubber holder.

## *Modify the water hose*





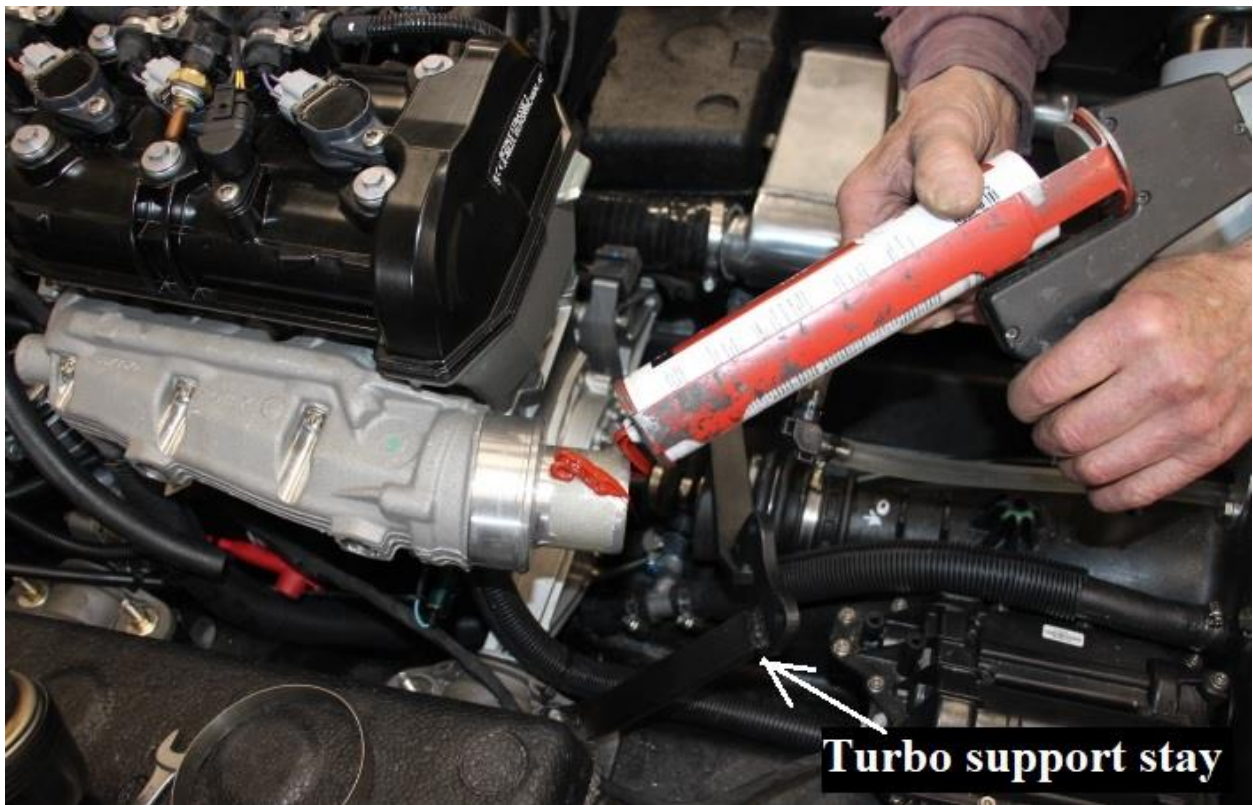
## *Installing the flexi pipe and turbo*



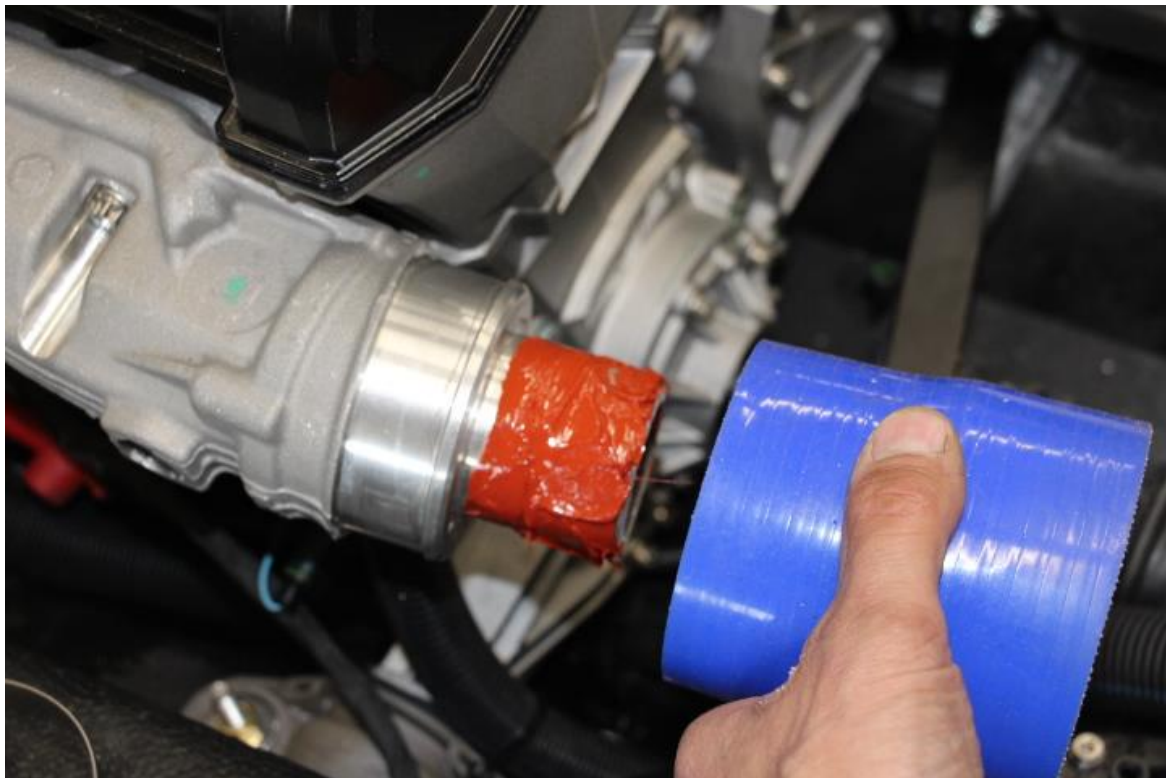
Remove the rear nuts from the rear engine mounting clamps.  
Put on the turbo support stay and check so the flexi pipe fits fine, and the bolts align between the flexi pipe and turbo stay before you apply the silicone glue.



The flexi pipe shall be glued to the exhaust manifold.  
Use heat resistant silicone glue.



Apply the glue on the tip of the exhaust manifold.



Put on the new hose to the exhaust manifold. And put on the original hose clamps.



Put on the flexi pipe.



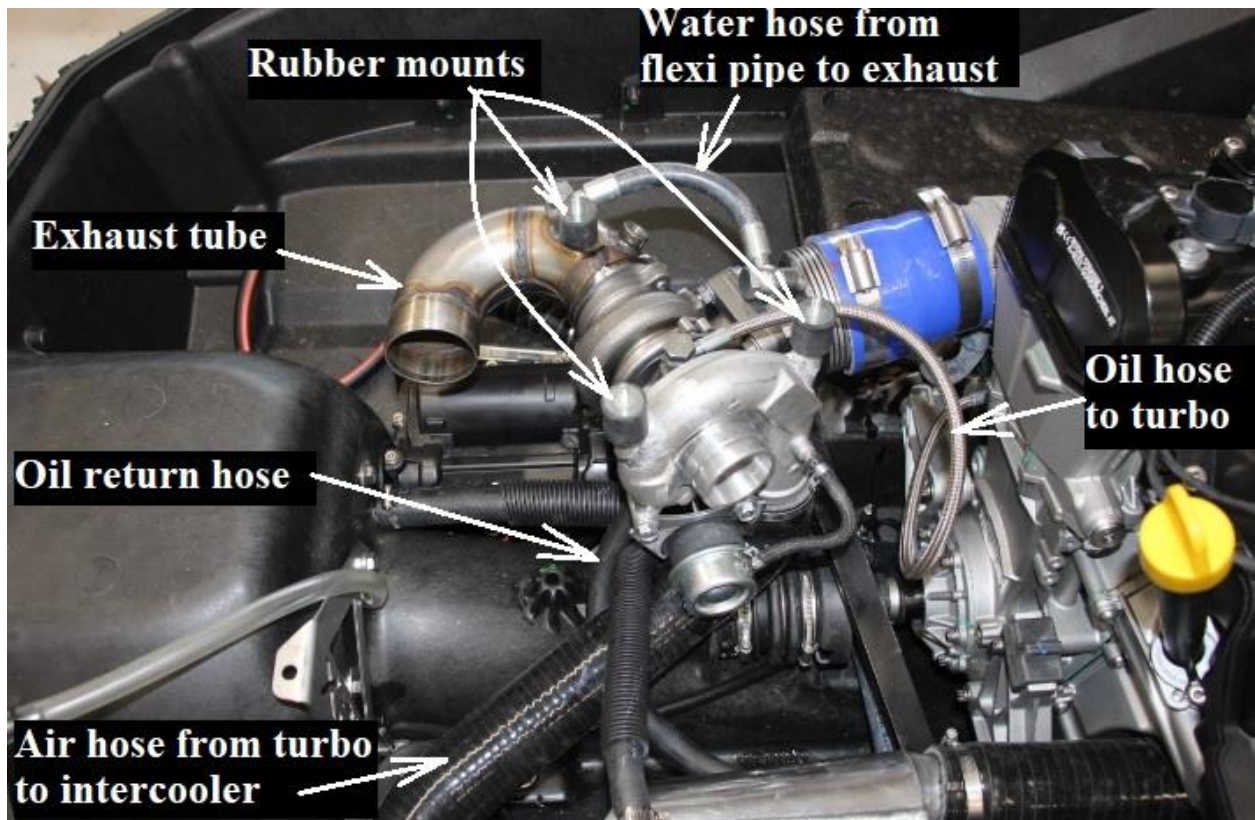
Tighten the nuts to the turbo support stay.



Now the turbo shall be installed. Check so the gasket is placed right before you install the turbo.



Mount the turbo to the flexi pipe.  
Tighten the hose clamps. Make sure the turbo is pressed forward when tightening the clamps.  
Note: The glue must dry at least 8 hours before you start the engine.



Install the exhaust tube going out from the turbo. (Don't forget the gasket)

Install the water hose from the flexi pipe to the exhaust tube.

(It is possible to adjust and rotate the banjo fittings between each other)

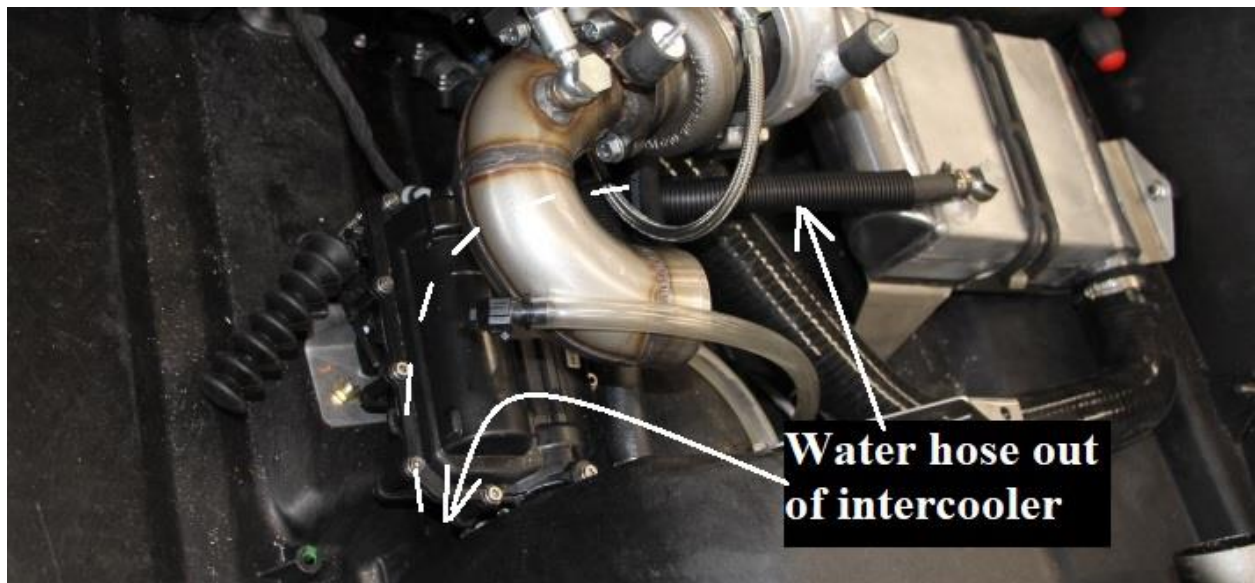
Install the oil inlet hose to the turbo. But before you install this hose, lubricate the oil inlet of the turbo with motor oil.

And then install the oil outlet hose to the turbo.

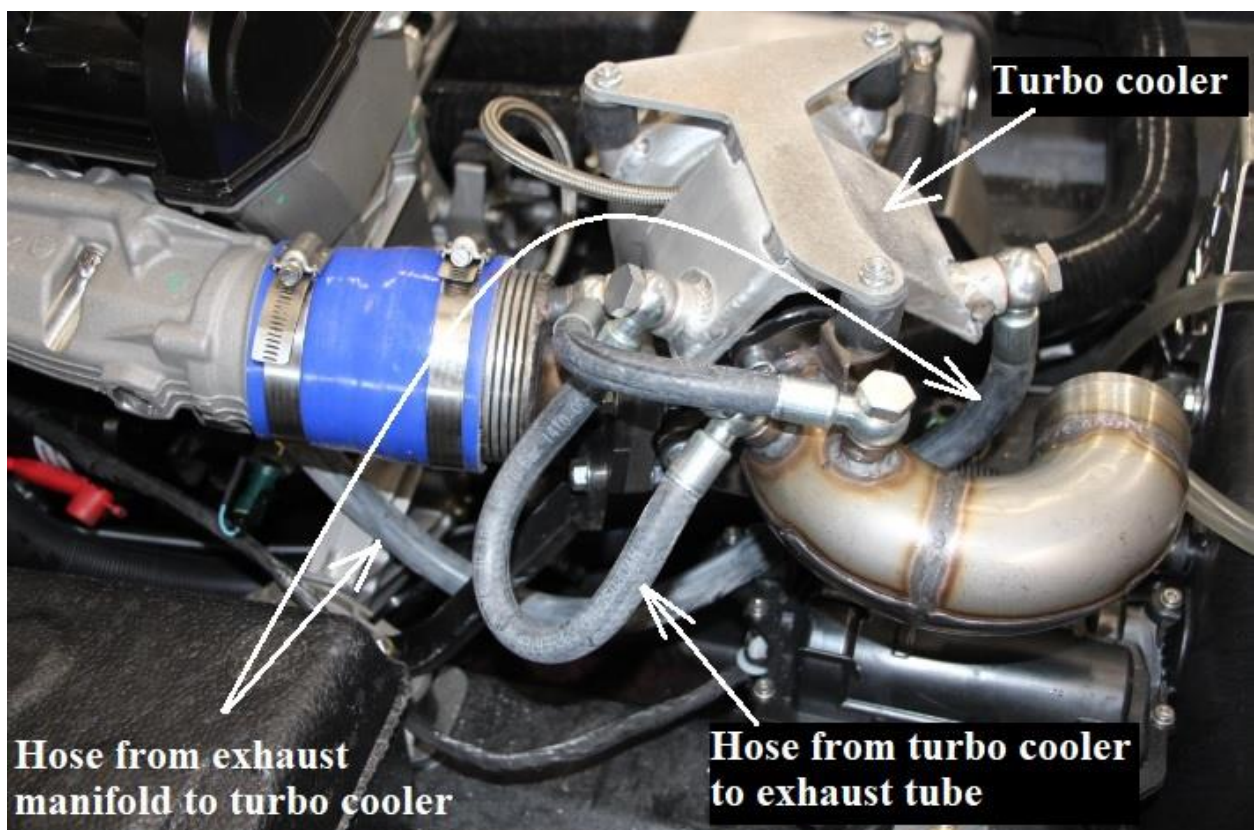
Install the air hose between the turbo and the intercooler

And install the rubber mounts for the turbo cooler.

# *Water hoses routing*



Demount the hose going out from the exhaust manifold and re-route it to the water outlet of the intercooler. Use banjo bolt + banjo fitting + 2 copper washers supplied with the kit. Re-use the stock hose clamp.



Install the turbo cooler on top of the turbo.  
Install the hoses going in and out of the cooler. (see picture)

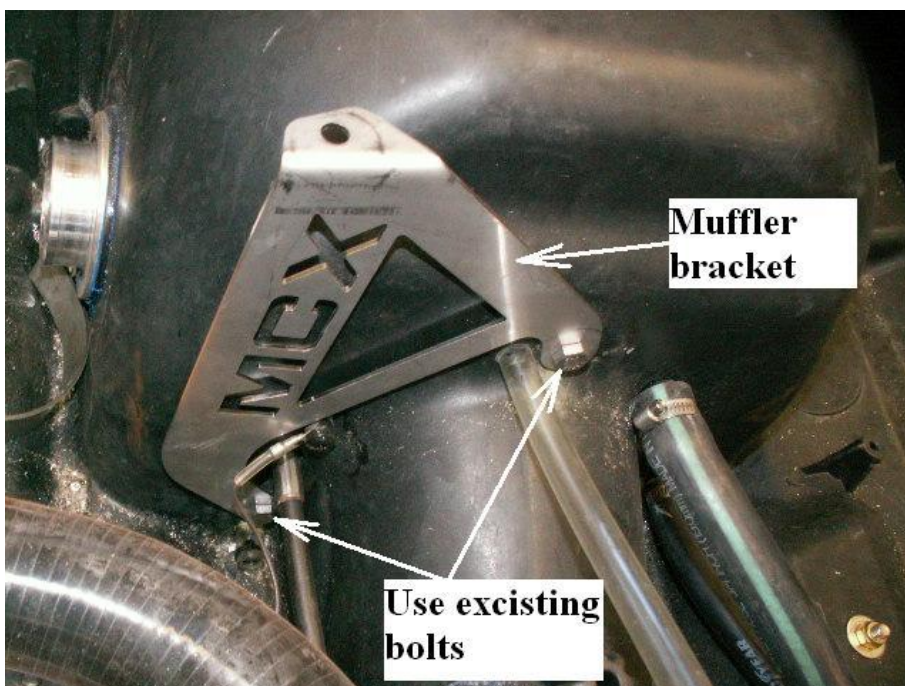


# *Muffler installation*

Install the aluminium exhaust outlet through the existing hole through the hull.  
Use the stock rubber gasket on the inside and the stock plastic nut on the outside.  
Use sealant glue on both the inside and the outside.



Install the muffler bracket to the existing bolts like the picture below.

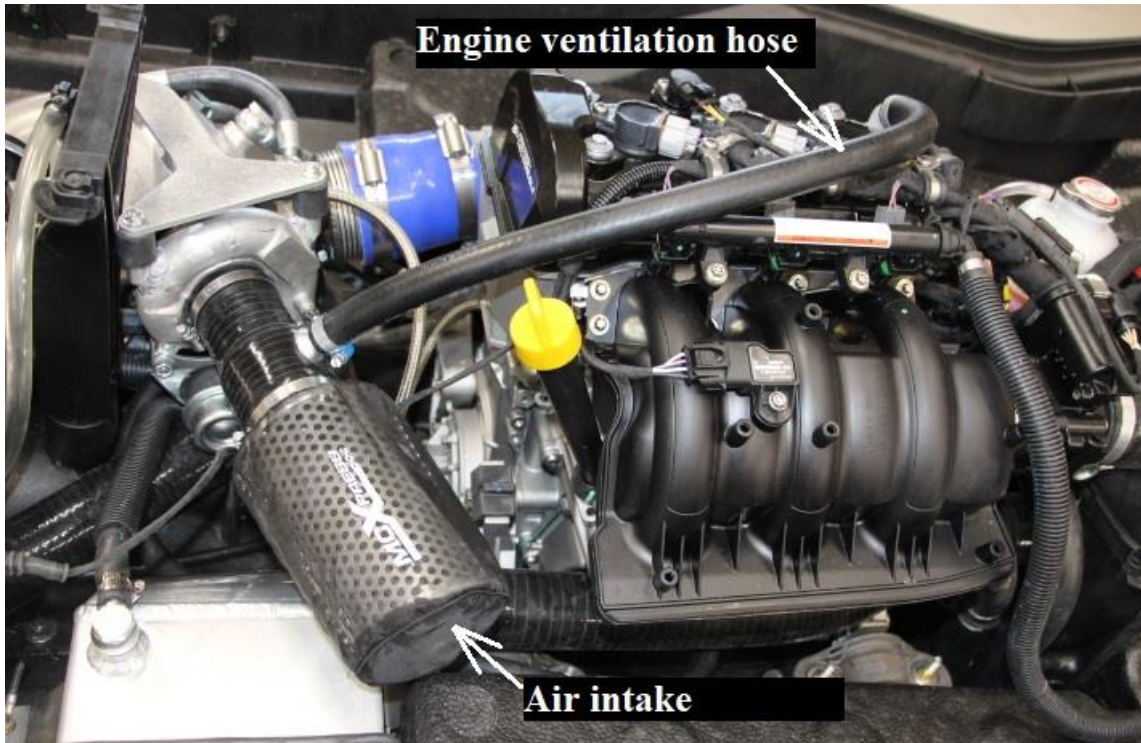
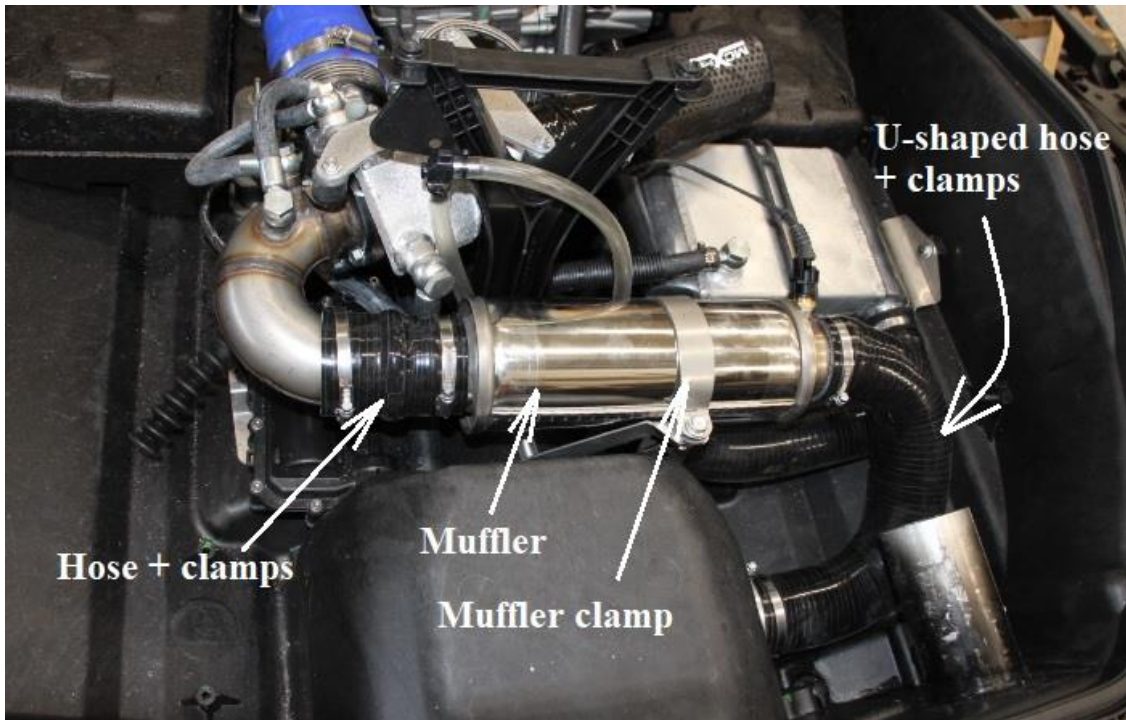


Install the muffler to the muffler bracket.

Install hoses in and out of the muffler like the picture.

Use hose clamps.

The temp sensor from the stock exhaust system shall be installed after the muffler like the picture.



Install the air intake hose to the turbo inlet.

Turn the hose so the engine ventilation nipple is facing forward/upper so it fits the new engine ventilation hose that you can install now.

Use hose clamps to all joints.

Install the air intake aluminium basket and the pre-charger air filter. Fill up the engine cooling system with anti freeze.  
And fill up the oil tank with motor oil.  
Install the turbo re-mapped ECU.

## *Start the engine.*

Check water level in the cooling system.  
Check oil level.

Start the engine before you put on the upper plastic fairing.  
Check for leaks.

**Caution:** We recommend loosening the oil inlet M12 banjo-screw on the turbo for a second just after you started the engine, just to make sure the engine and turbo get lubricated.  
If everything seems to be working fine, install the upper plastic fairing.

## *Test-driving*

**OBS:** For best performance, we recommend changing the turbine to a model that can handle the extra power better than the stock turbine.

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

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

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

Check for water and oil leaks and control so everything seems normal

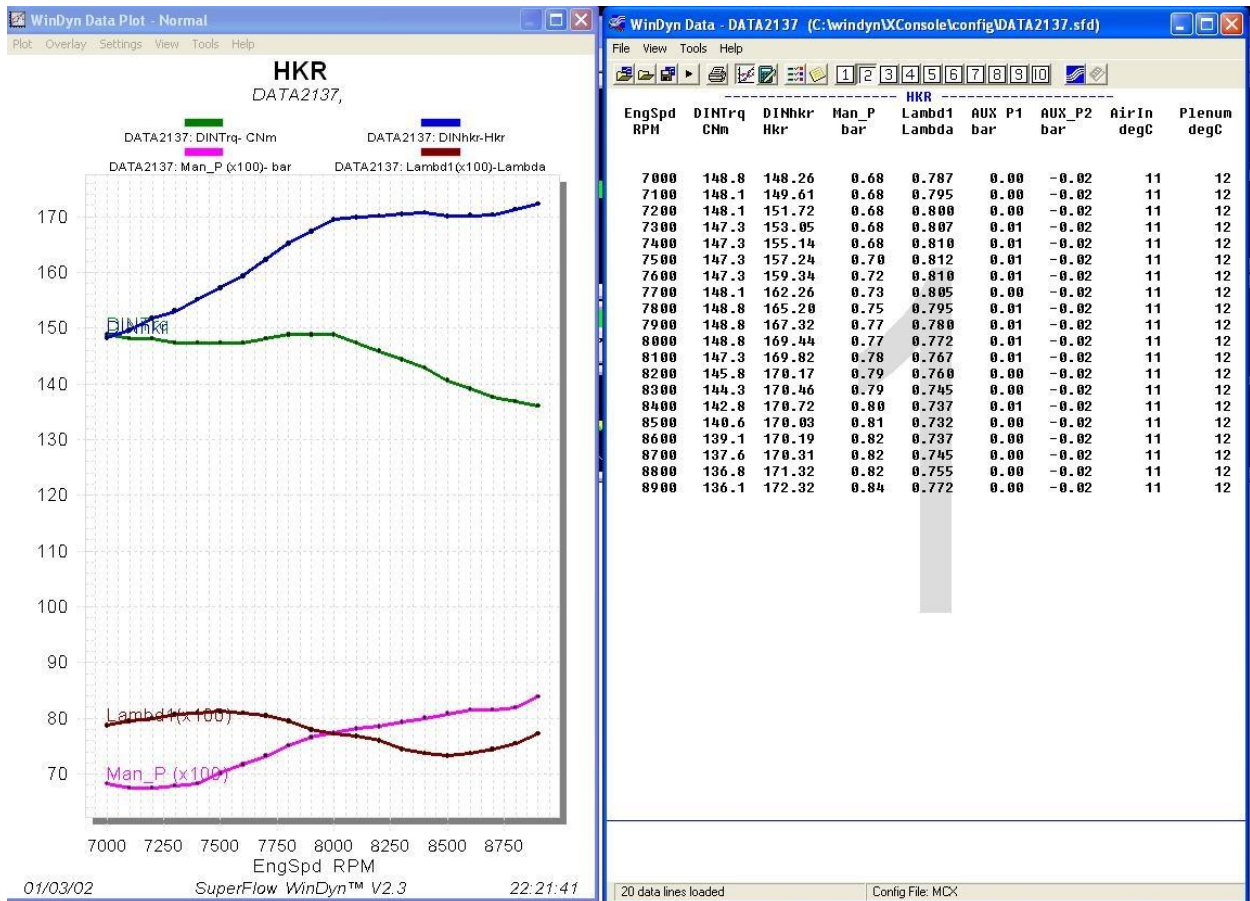
The recommended turbo pressure is 80 kPa. (12 psi at sea level)

At the turbo pressure 80 kPa, the power is about 170 hp.

Always use high quality fuel.

98 octane or better (Europe)

Premium only or higher (USA/Canada)



Using higher turbo pressure than 80 kPa may cause engine damages.

**IMPORTANT:**

The maximum turbo pressure must be tested.

The test shall be made at full throttle for at least a couple of seconds.

The water jet must have the right settings so the engine reach the right rpm.

The jet ski must always be in water when the engine is running.

If not, the exhaust gases will melt the hoses in the exhaust system, and the alu exhaust manifold will get damaged.

MC Xpress AB  
 Norra Altervägen 821  
 94592 Altersbruk  
 Sweden  
[info@mcx.se](mailto:info@mcx.se)  
 +46 911 202005