Installation manual turbo kit

SkiDoo/Lynx ACE 600

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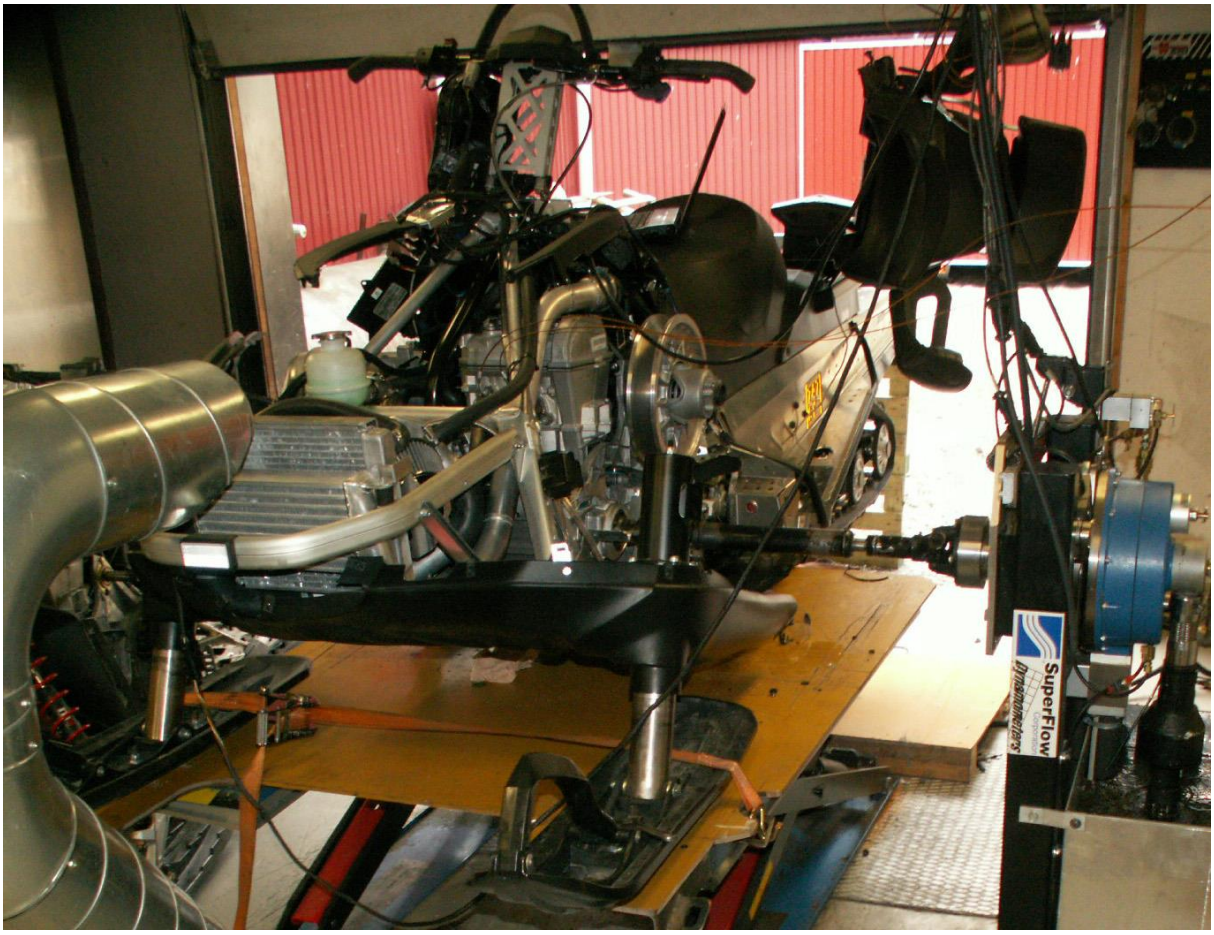


Supreme of the extreme !

Thank you for choosing the MC Xpress turbo kit to your ACE 600 snowmobile
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 developement work we have tried to keep the snowmobile as stock as possible to make the installation easy and to keep the sled 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 snowmobile 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.

Before the installation

Very important to know:

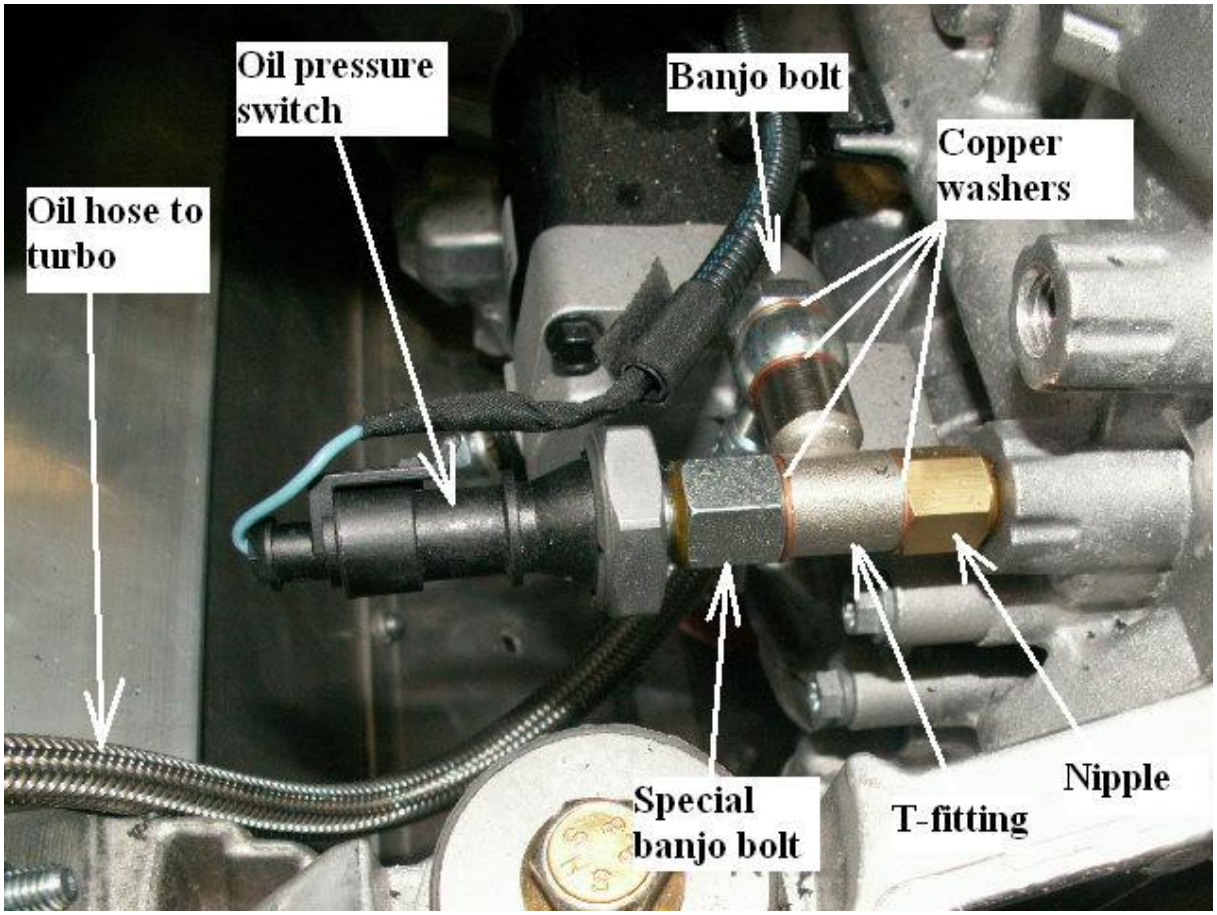
This turbo kit is designed for 90 hp / 45 kPa (6 psi) turbo pressure at sea level
Premium fuel or higher octane shall be used (98 octane pump gas for Europe)
If higher pressure is used, the risk of engine damages will rise rapidly.

To make the installation as efficient as possible, we recommend you to follow these instructions.
There are many different models of ACE 600. Most parts in the turbo kit are the same between the models
The pictures in this manual are from the wide track model.
The intercooler is different on the Renegade model, so we have some info about this too in this manual.

To begin with, we recommend to:
Remove the plastic side fairings and the hood.
Remove the stock air box, the muffler and the exhaust pipes.

Oil hose to turbo

Install the nipple supplied with the kit where the oil pressure sensor was located.
Use Loc-tite thread sealant (or similar) on the threads of the gold coloured nipple.
Install the sensor to the special banjo bolt.
Use thread sealant on the sensor threads. (But not to much)
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 cupper washers between each item.

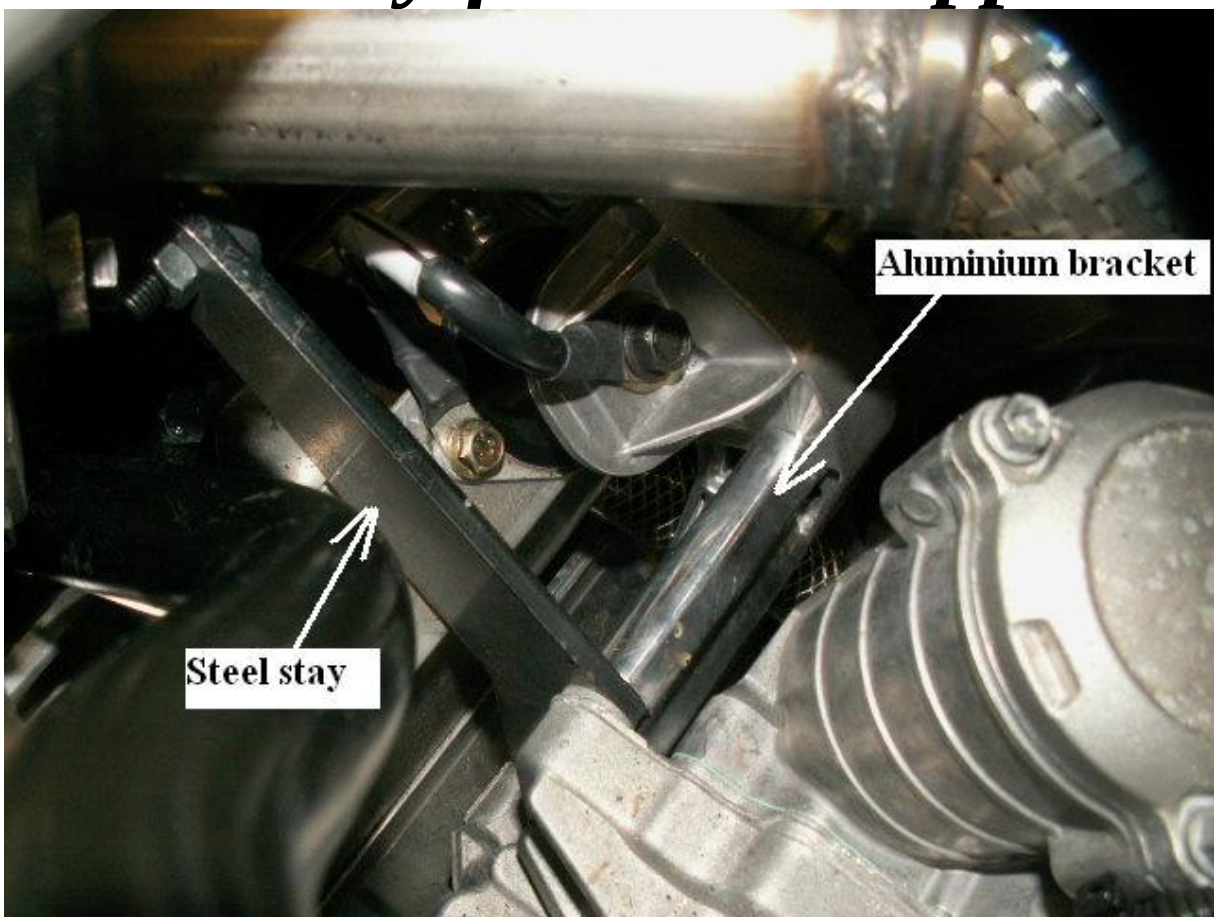


Oil return hose

Remove the oil plug under the engine. You first have to take away a small cover under the chassis to find the oil plug.
When you remove this plug, the oil inside the dry-sump tank behind the engine will be drained, so be prepared with a clean pan to catch the oil that is coming.

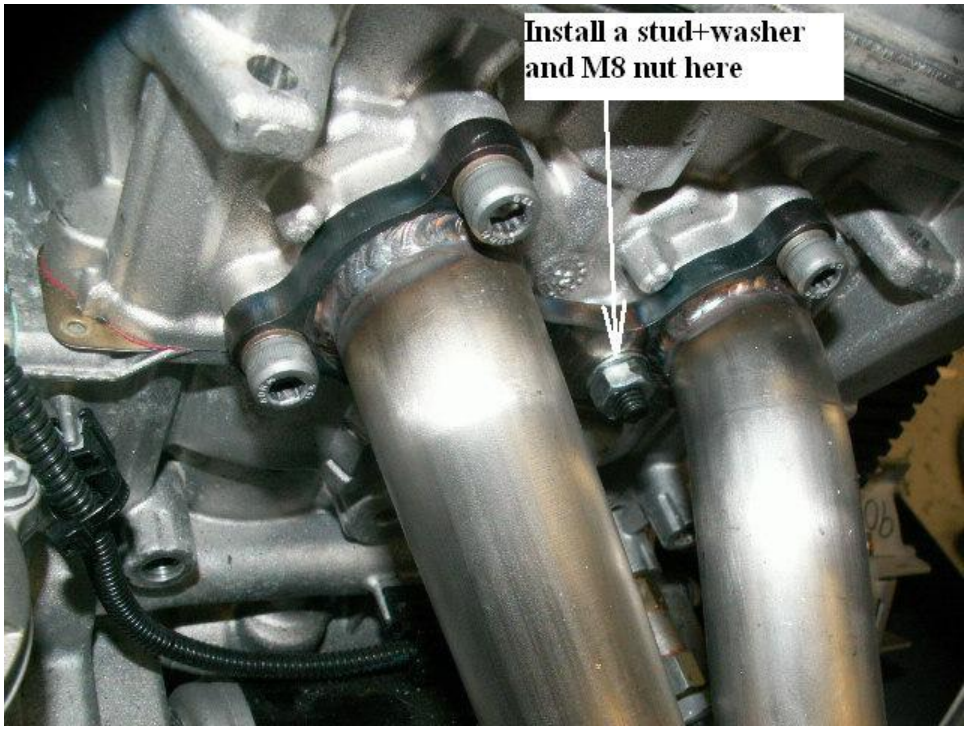
Install the L-curved oil tube and the special banjo bolt + copper washers to where the oil plug has been located.
The oil tube shall be pointing to the right (seen from the drivers view)
This special banjo bolt is rather fragile, so tighten just 15 Nm.

Steel stay for turbo support

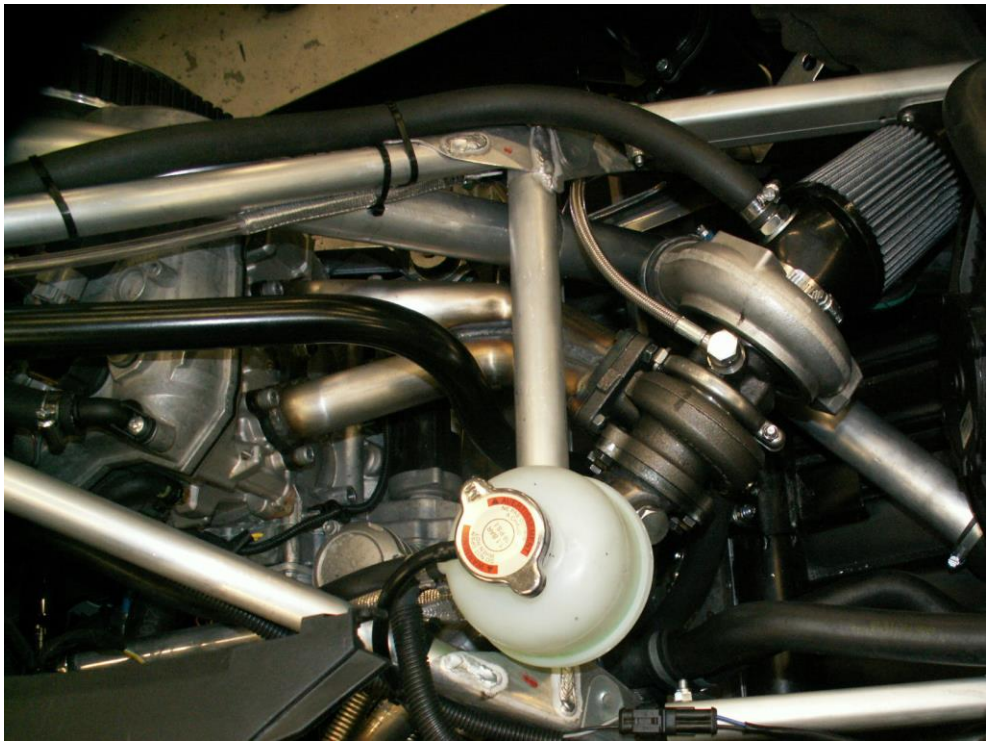


A steel stay shall be installed between the engine and the turbo to support the turbo. Remove the front/right engine mounting aluminium bracket, and install a new bracket and steel stay like the picture.

Installing the turbo

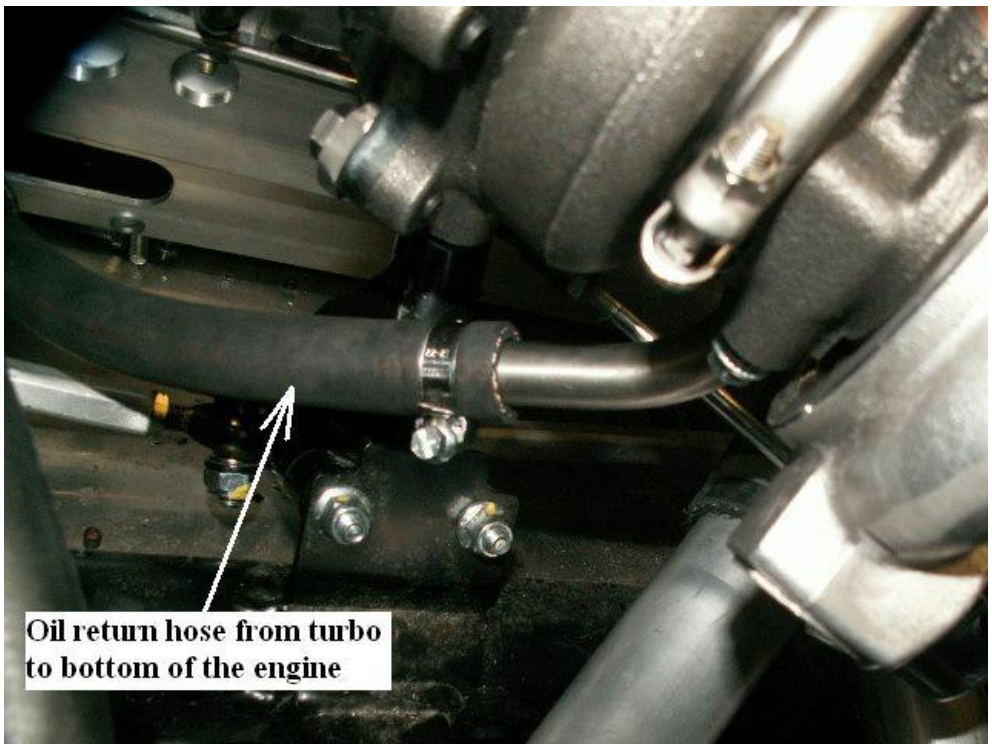


Install the new exhaust header to the exhaust outlet of the cylinder head.
Use the stock exhaust gaskets.
At one place, a stud shall be installed (see picture)



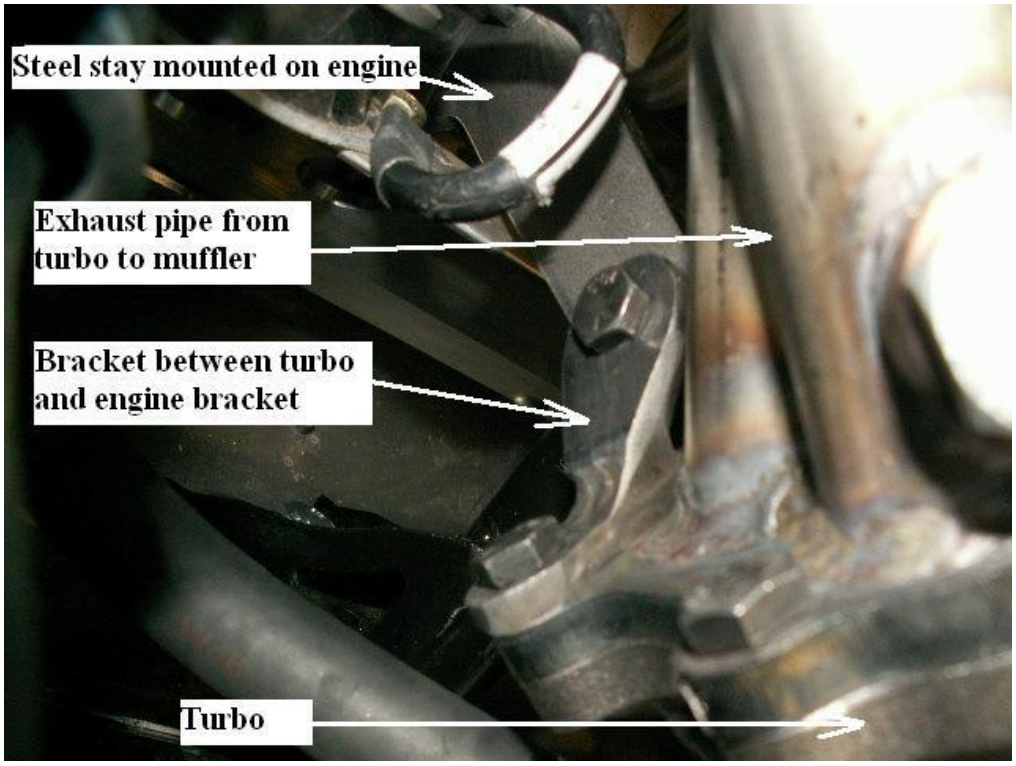
Install the turbo to the exhaust headers. No gasket is required.

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



Connect the oil return hose to the turbo.

Install the exhaust tube out of the turbo.

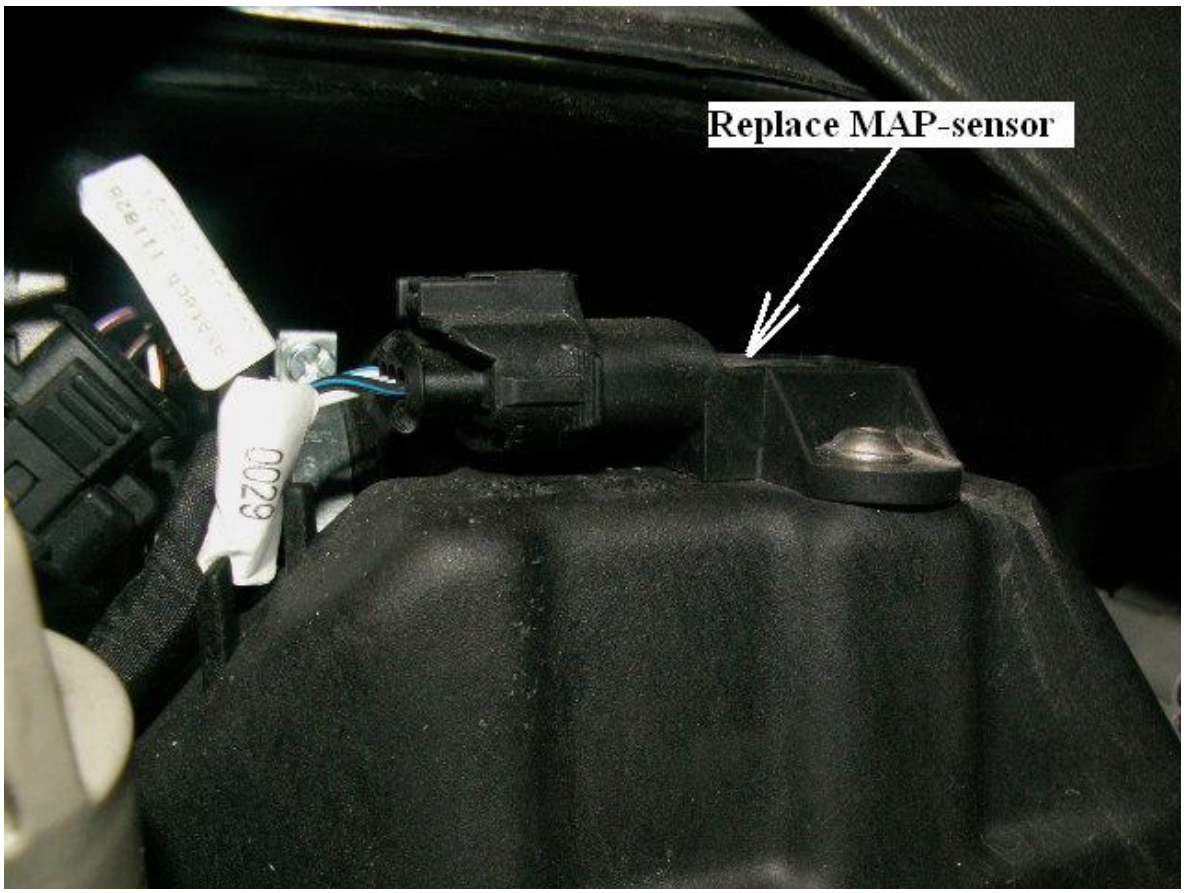


On the two lower bolts, a bracket shall be installed between the steel stay from the engine and the turbo.

Install the stock muffler. Use the existing springs and exhaust gaskets.

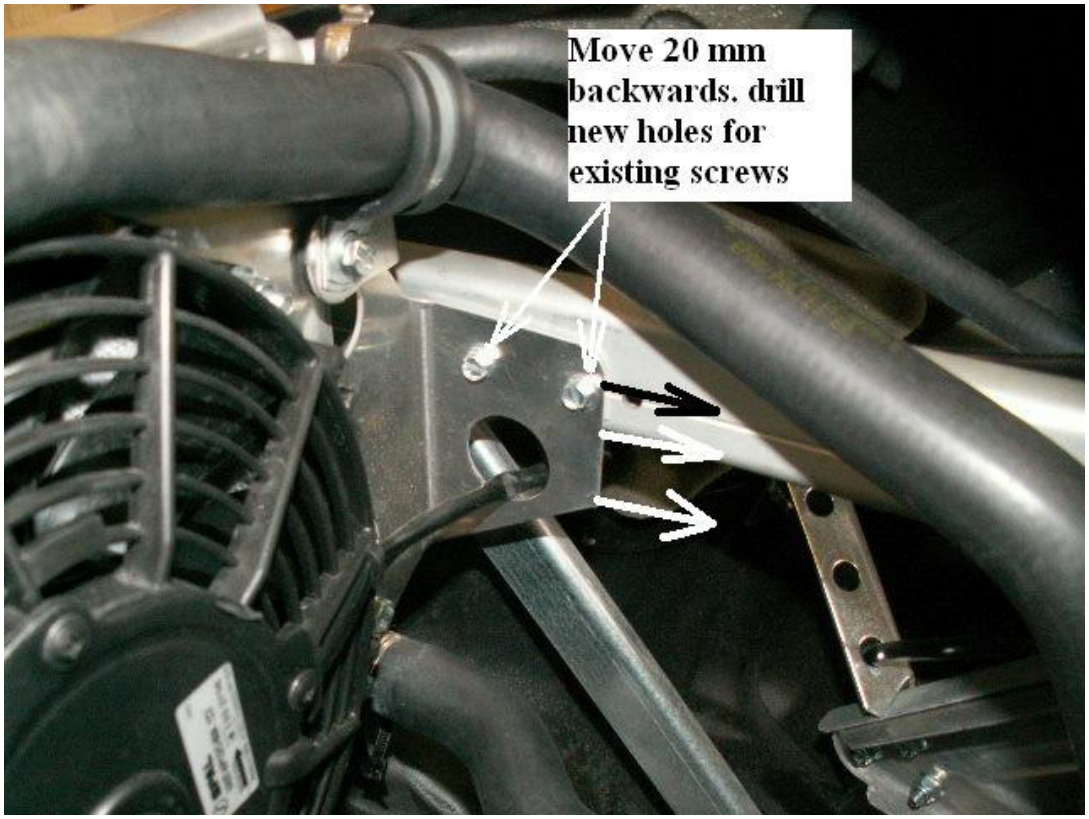
Replace the ECU, MAP-sensor and fuel injectors

The ECU must be replaced by a new ECU that is programmed for turbo use.
The ECU is located between the fuel tank and the engine.
The DESS-key shall also be replaced because it is related with the ECU.
The stock MAP (=Manifold Air Pressure) sensor located on top of the air plenum behind the engine must be replaced by a new sensor that is made to read turbo pressure.
The fuel injectors on the intake manifold shall be replaced with injectors with higher flow capacity.



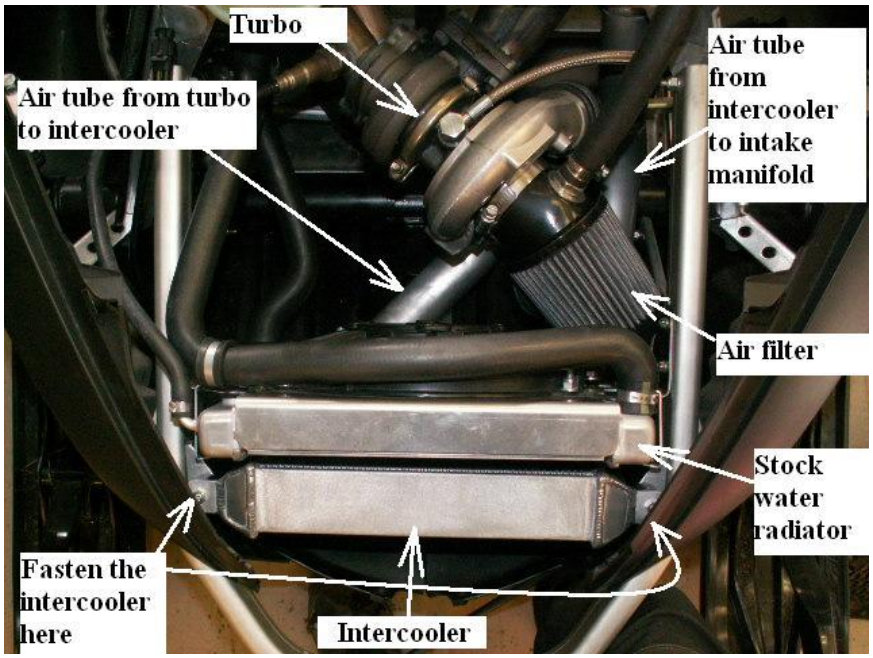
Intercooler installation

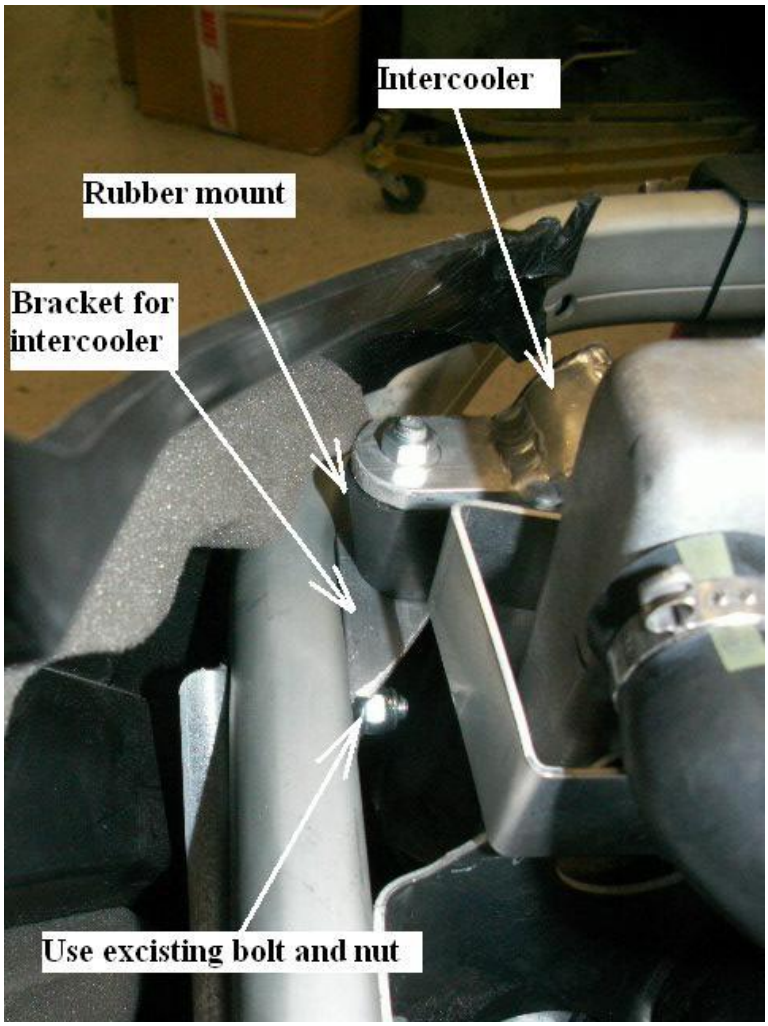
(Some models of ACE 600 don't have a water radiator in the front, see next chapter)



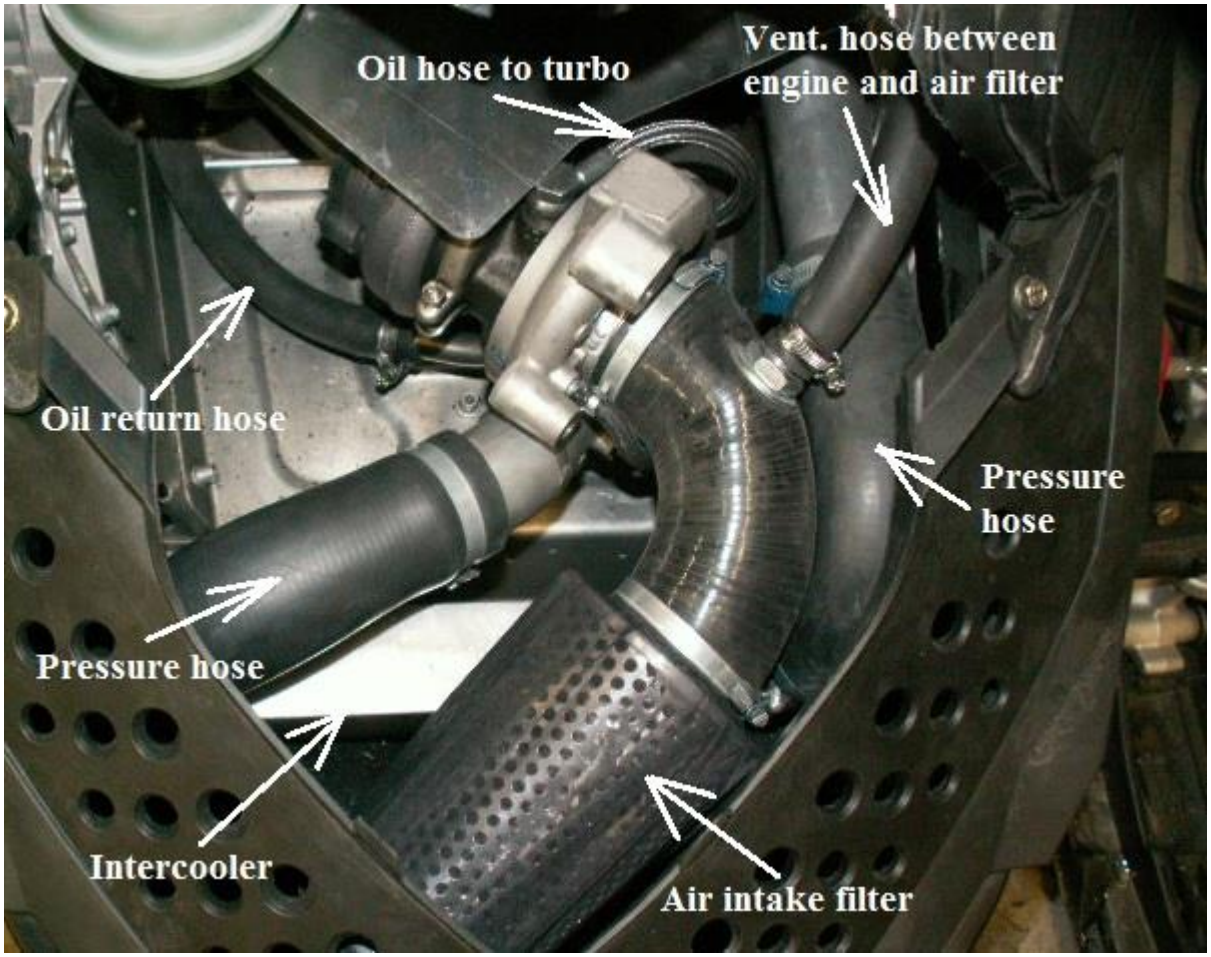
The intercooler shall be placed in front of the water radiator.

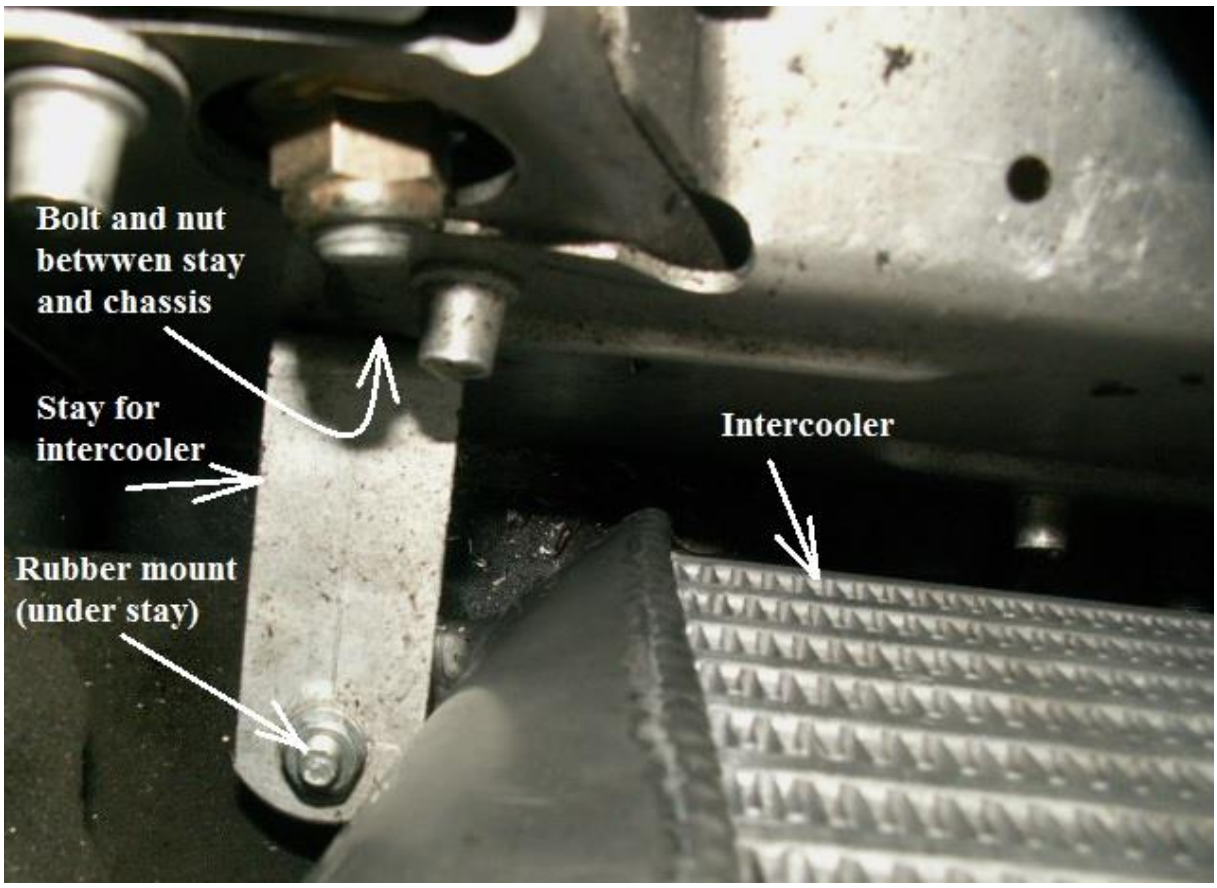
But to get enough space, the water radiator/fan must be moved backwards 20 mm.
Drill new holes in the aluminium bar and use the existing screws.





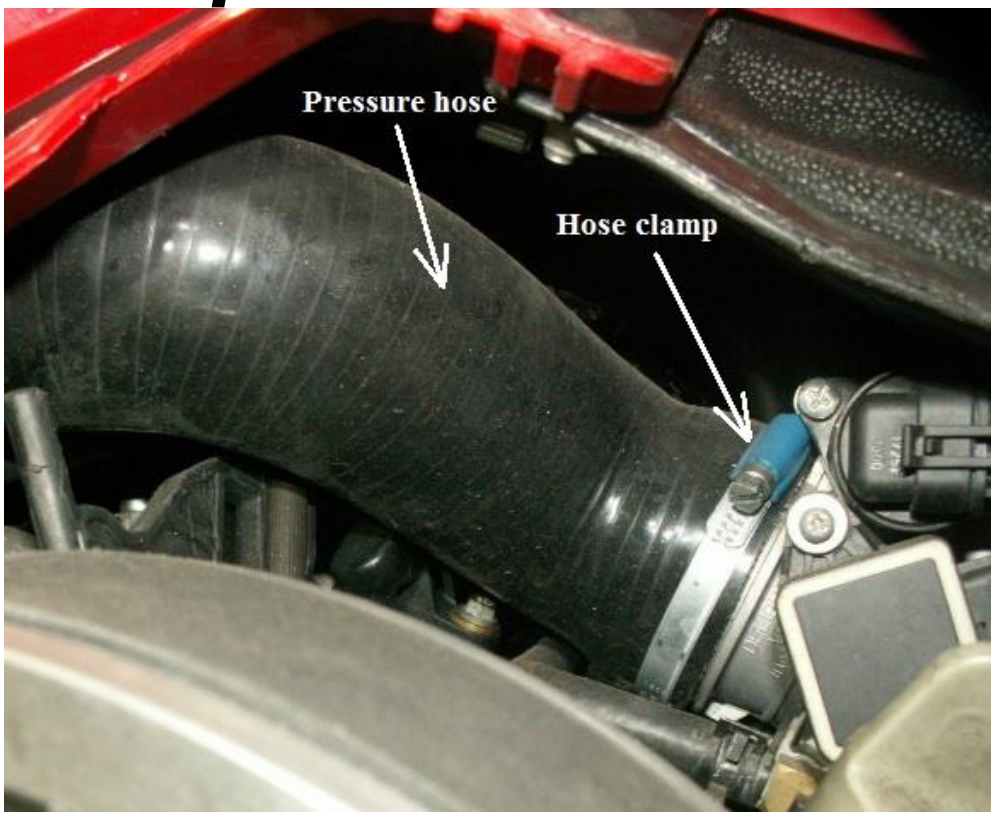
Intercooler on ACE 600 without water intercooler



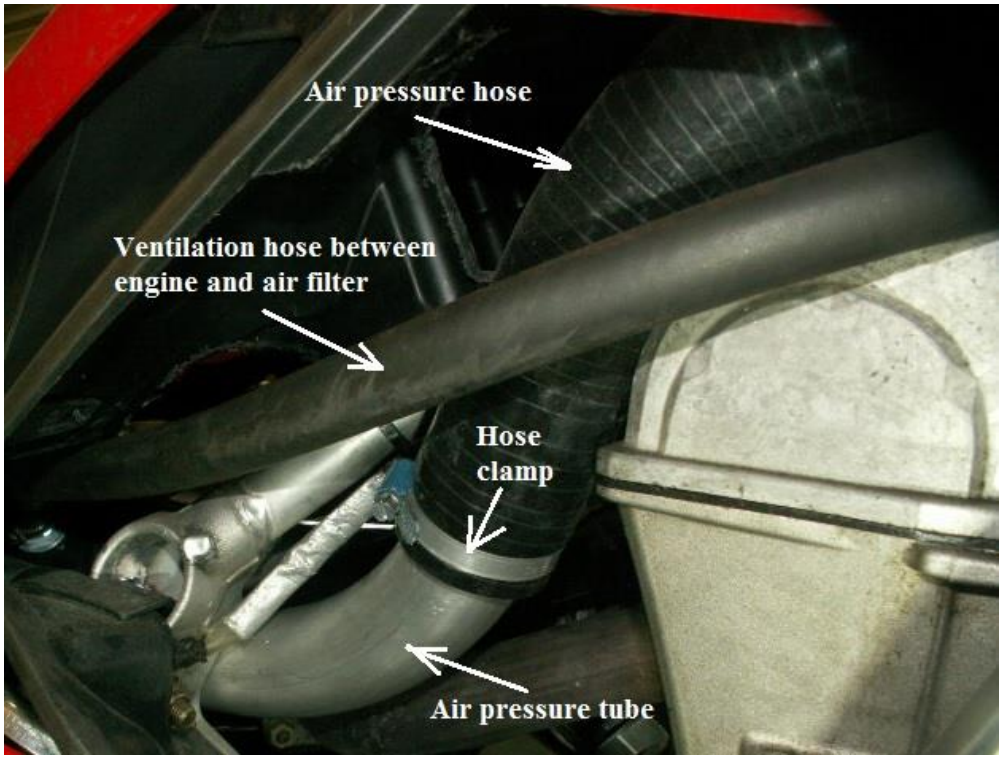

Bolt and nut
betwwen stay
and chassis
Stay for
intercooler
Rubber mount
(under stay)
Intercooler


Bolt / nut / washer for
intercooler stay

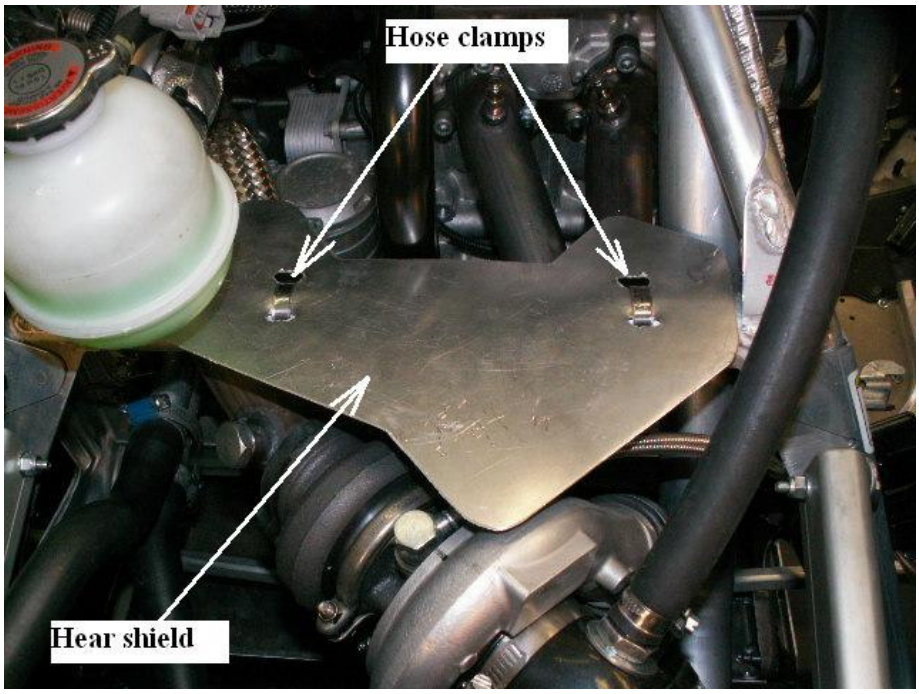
Pressure tube and hose to and from the intercooler



Install the air pressure hose to the throttle body.

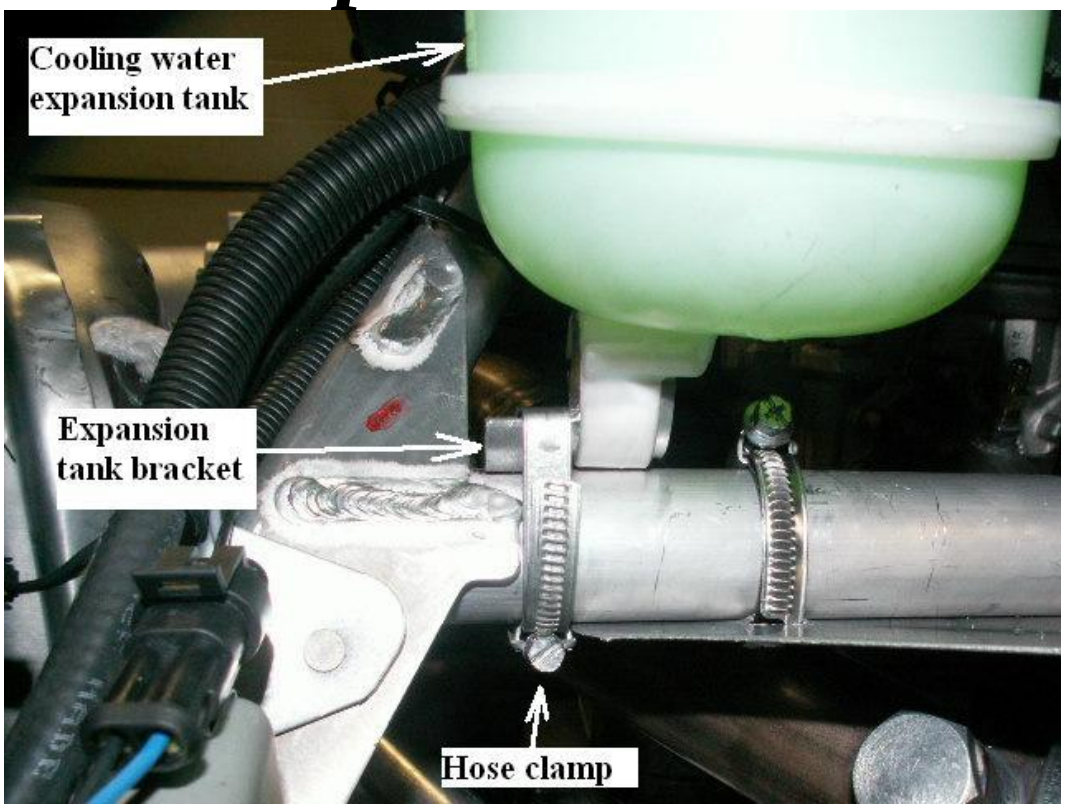


Heat shield



Install a heat shield above the turbo.
Use hose clamps around the alu-frame.

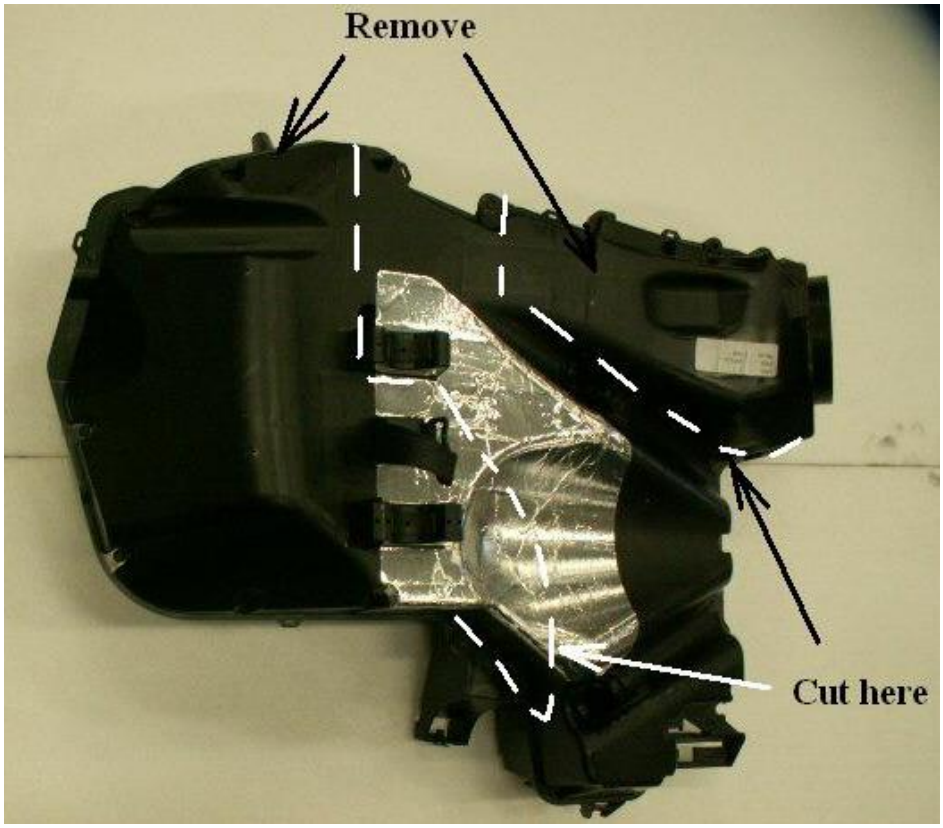
Move expansion tank

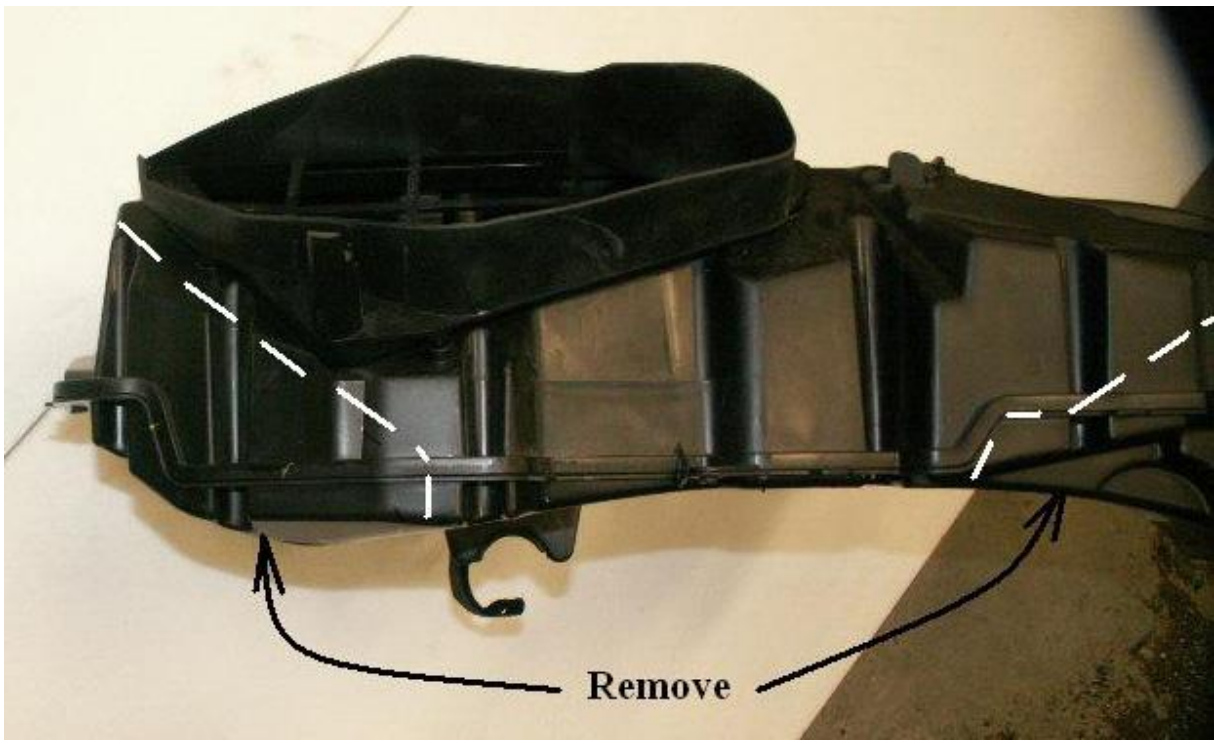


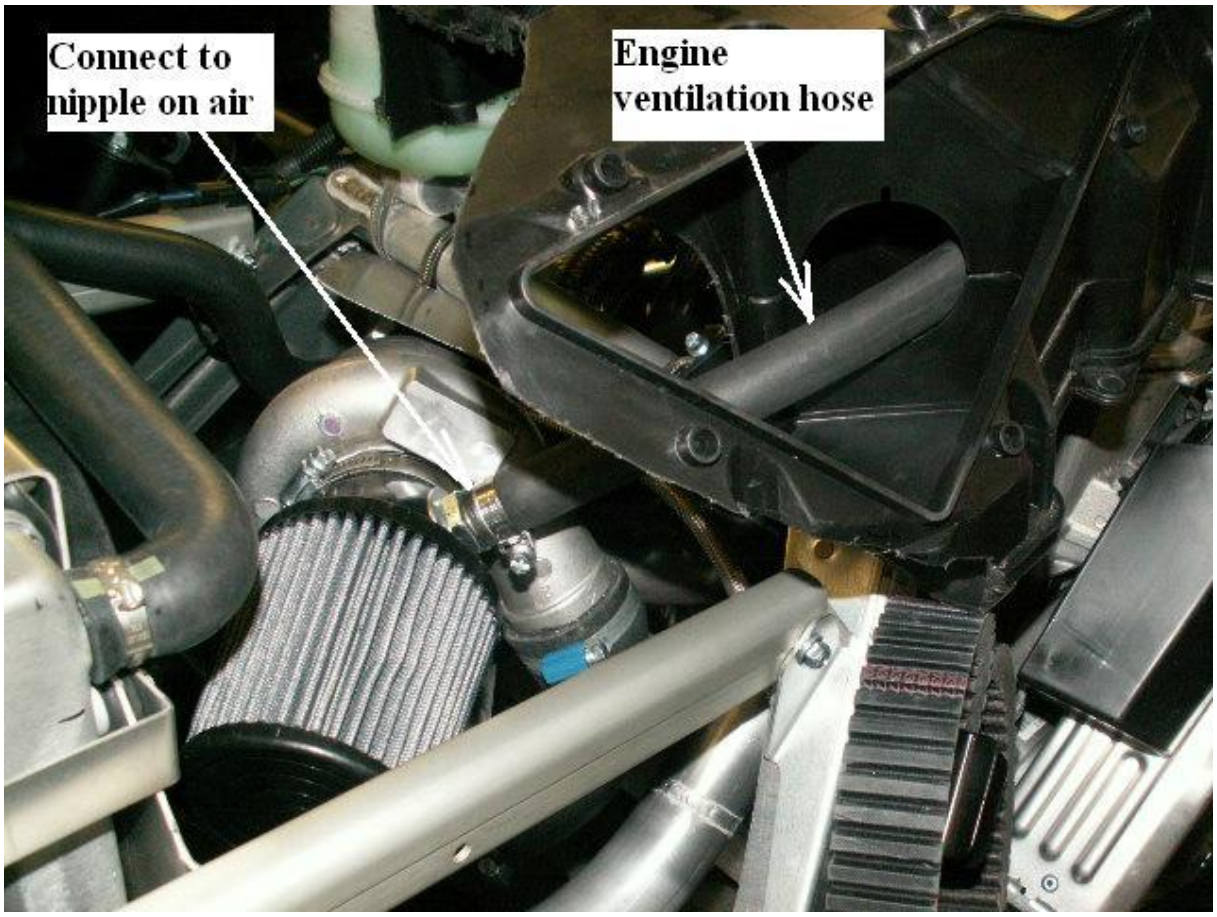
To prevent the water expansion tank from heat, it shall be moved upwards.
Install the expansion tank bracket like the picture.

Air box modification:

The stock air box must be cut and modified.
Cut as the marked white dotted lines. Try it on the snowmobile and make some small adjustments if necessary.



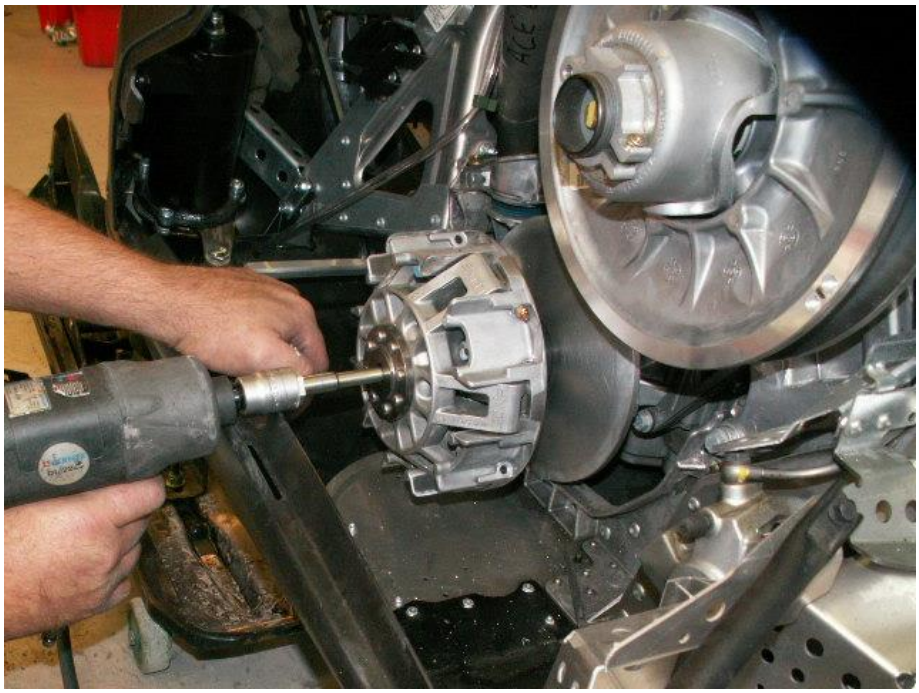




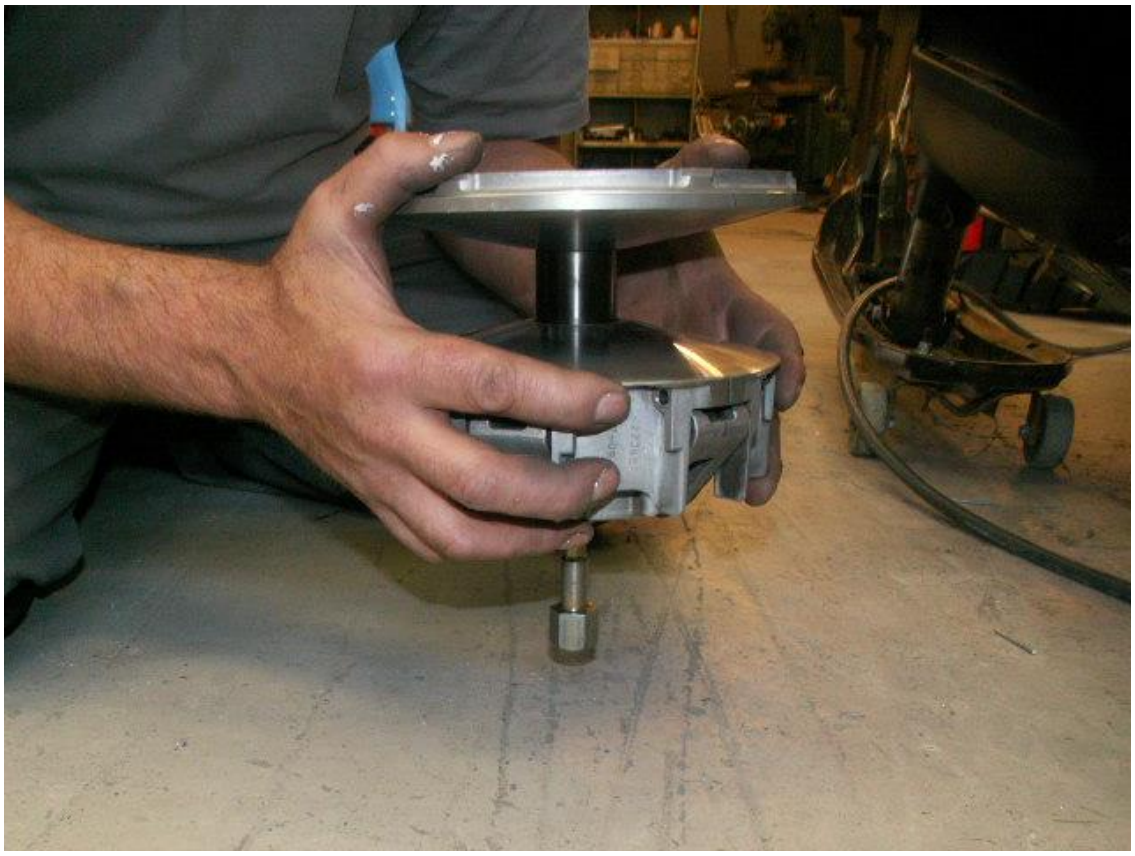
Install the modified air box on the sled. Make sure it fits fine.
Install an extended engine ventilation hose to the nipple on the air filter on the turbo.

Clutch modification

The clutch must be re-calibrated to handle the extra power from the engine.

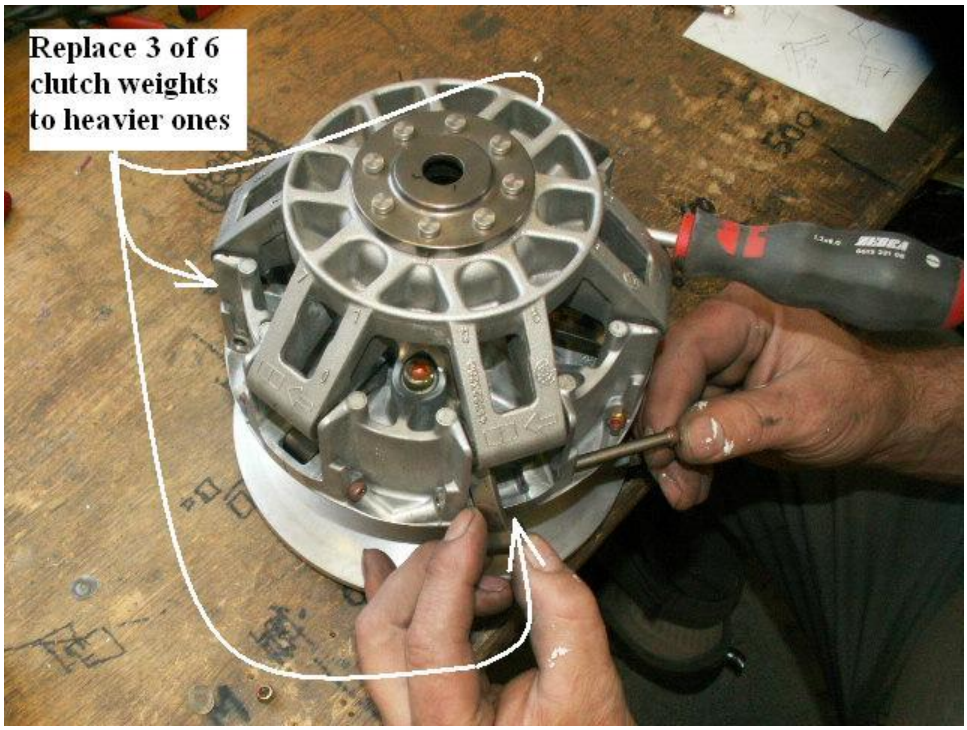


Remove the primary clutch from the engine.
Use a puller made for the purpose. BRP Part number 529000064



Now the clutch must be taken apart. Turn in the puller about 20 mm into the clutch.

Turn it upside down, and knock it into a concrete floor or similar until it comes apart. (see picture)



Replace every second clutch weight to a heavier one.
We recommend the clutching rpm to be 7600 +/- 100 at full throttle.
We recommend not lifting up the upper lid completely when changing the clutch weights. Some buttons can come loose, and they are hard to install. Lift it up as much as possible and secure it with a screw driver or similar.

The outer part of the clutch shall be pressed together with the rest of the clutch.
Make sure you get a perfect seat under the steel part of the clutch before you start to press it together.

Press the clutch together with about 5 tons pressure before you install the clutch on the engine.
Tighten the centre bolt of the clutch 115-125 Nm.

Start the engine

Check water level in the cooling system.
Fill oil into the oil tank behind the engine. Check oil level.

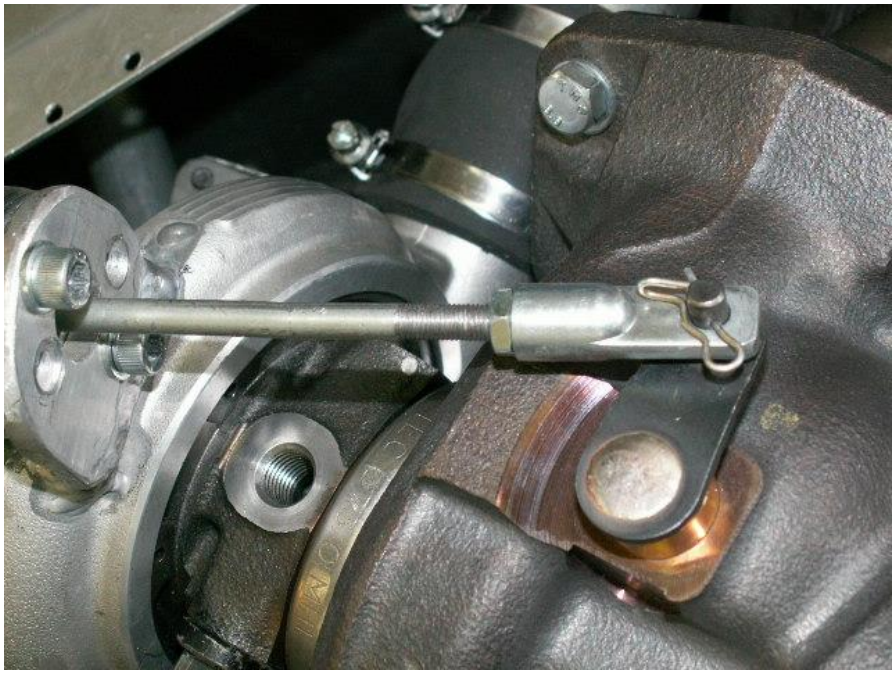
Start the engine before you put on the fairings.
Check for leaks.
Caution: We recommend loosening the oil inlet M12 banjo-screw on the turbo for a second just after you started the engine, just to make sure the engine and turbo get lubricated.
If everything seems to be working fine, install the heat shield. 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 recommended turbo pressure is 43 kPa. (6psi) at sea level The maximum power will then be 90 hp.
Using higher turbo pressure may cause engine damages.

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 waste gate actuator.
The test shall be made at full throttle for at least 2-3 seconds. And the clutching must be right when doing this.
We recommend being careful when doing this.



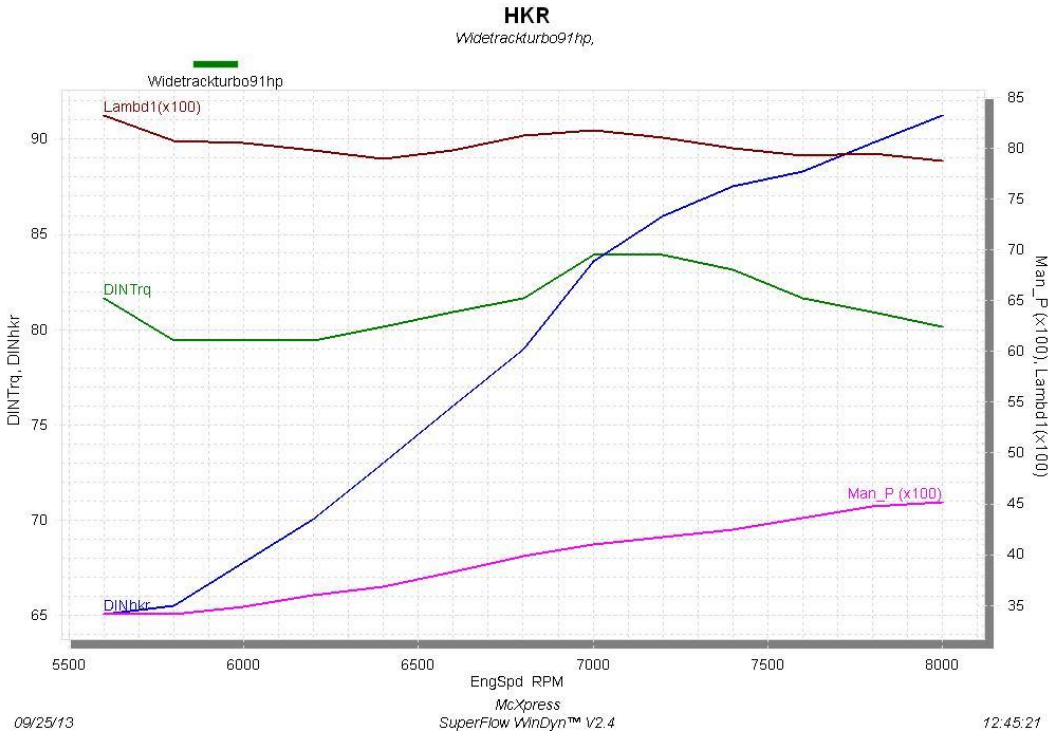
The turbo pressure can be adjusted by changing the spring pressure of the waste gate actuator. This is done by adjusting the length of the rod on top of the turbo. Shorter rod=higher turbo pressure.
When the turbo pressure is tested and everything seems to work fine, install the side cover and enjoy your turbo sled.

Good to know:

When you start: Turn the key and start it without touching the throttle.
Let the engine idle for a while.
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 ACE 600 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.
Always avoid the engine to hit the RPM-limiter. This can cause the valve adjusting shim to jump out of its position on the exhaust side.
(It can happen if the clutch drive belt suddenly breaks during a full throttle run or if the clutching rpm is set to high)
If one shim jumps out, the valve will not be able to close completely, and the engine will not run properly on this cylinder. Stop the engine at once if you suspect that this has happened.
If you continue to drive, the valve will drop down in the cylinder and this can cause major damage.
The shifting RPM is changing with the engine power. If the rpm suddenly rise, the power has for some reason been higher. Find the cause before you run into problems.
Maybe something has happened with the wastegate system?



Dyno graph Lynx ACE 59 Yeti

Put the sticker "98 octane" (Europe) or "Premium only" (USA/Canada) close to the fuel cap as a reminder of the recommended fuel quality.