



Jet pipe installation

Dear Customer

The GRUMANIA JETS jet pipes are made from high quality materials and made after the latest technologies based on over 15 years of experience. The GRUMANIA pipes are known to be reliable, high efficient and cool in operation. We can proudly look back on many years of successful pipe design and satisfied customers all over the globe. However - for a safe and efficient use of your pipe, we suggest to read the following installation guide carefully.

Choosing the right pipe for your particular jet engine is the first important step to do. Please follow the turbine manufacturers/ jet kit manufacturers advice regarding the jet pipe size or contact us if you need help. You will find our pipes in the shop and these are divided into thrust classes in which typical engines operate. It is an issue of safety to use a pipe that works within its limits, if any concerns regarding max. admissible throughput come out, it is wise to select the next higher thrust class pipe.

Example:

You are planning the use of a 80N turbine and want to order pipe in the thrust class 40-80 N.

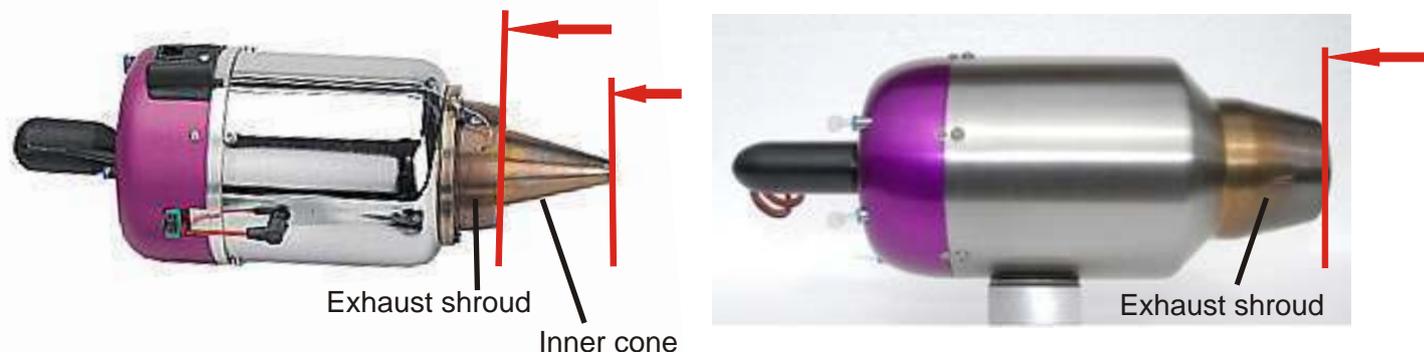
But your engine is able to provide even more thrust, your jet pipe will be relatively long, or it is likely that your jet requires your engine to run flat out all the time - this is a situation where the next higher thrust class has to be chosen (80-160N).

Another important point is the correct mounting position of jet engine AND jet pipe - especially the distance to each other - this is an issue that does not allow slackness. We will describe this in detail later.

Choosing the correct pipe length

As the correct distance of engine/ pipe is important, but the structural shapes of different engines are varying, it is important to know that only the end of the exhaust shroud (where the engine blows out) has to be taken into account ! The engine casing or a possible inner cone (left picture) is of limited importance* when calculating the correct pipe length.

Examples:



***Very important :users of Frank turbines -ask the manufacturer for the correct installation !**



Calculating the pipe length

Measure the distance of the exhaust shroud to the end of your plane (nozzle) as shown in the graph. Add the measure that is given for the particular thrust class of the pipe (these measures are shown in our shop). This add on is due to the fact that the inlet of the pipe is surrounding the exhaust shroud.

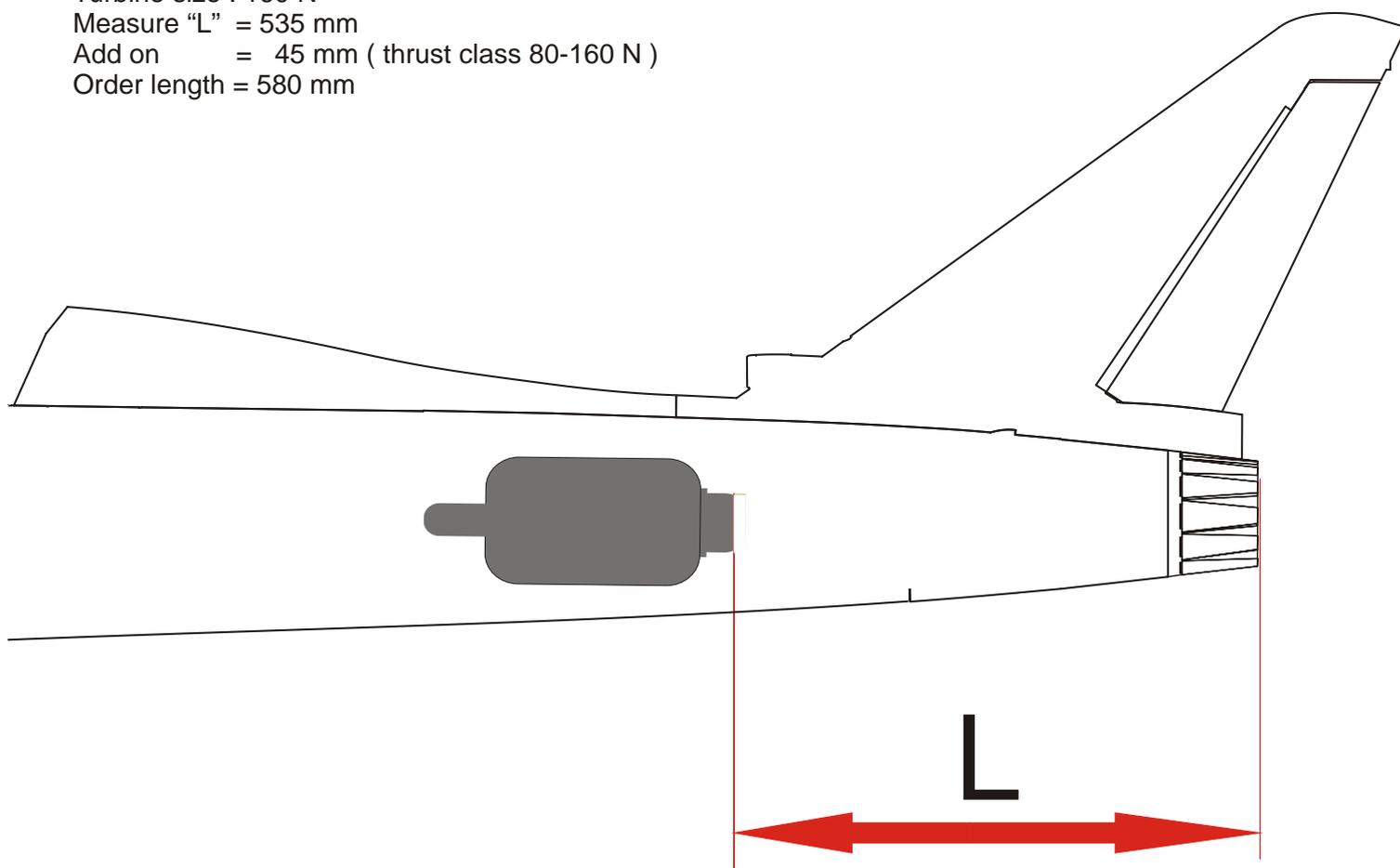
Example:

Turbine size : 160 N

Measure "L" = 535 mm

Add on = 45 mm (thrust class 80-160 N)

Order length = 580 mm



Installation of the jet pipe

All our pipes are delivered with a set of fixing materials. This consists of aluminium strips, rivets and self tappers. Mounting the pipe on a nearby former is very easy, using these materials. We can deliver other fixing materials if so wished at no extra cost. Another fixing version is introduced later in these manuals

The aluminium strips are cut to length and drilled with 3 mm holes at both ends. One end is riveted to the inlet of the pipe. It is recommended to rivet the strips rather than screwing as a riveted fixing is more reliable than a screwed mounting on long terms. However, if you prefer a screwed version, it is strongly recommended to use self locking nuts or Loctite on the threads.

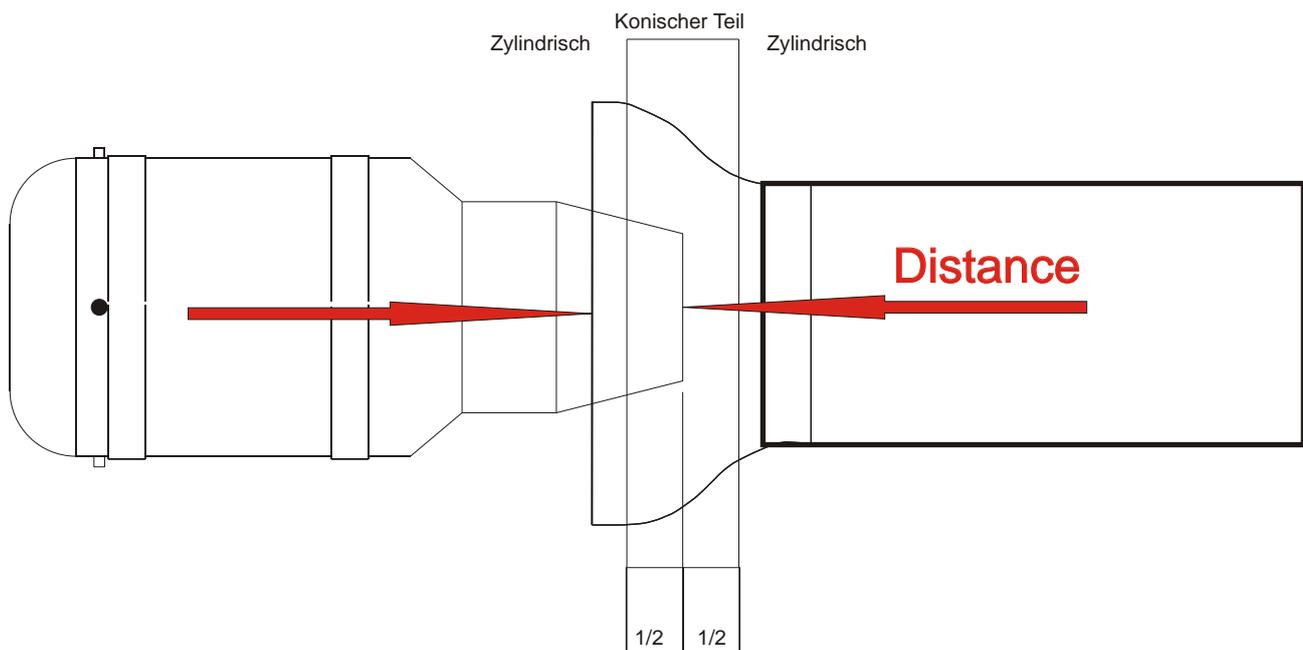
For a proper alignment of the pipe, cut three or four strips of the aluminium (side-cutting pliers), don't make the strips too long.

By the way - it is a common misbelief, that the jet blast pushes the pipe back wards. Therefore we have often seen "strange" versions of fixing a pipe..... A jet pipe is always pulled towards the turbine, so the goal is to make the fixing in a way that the strips will be loaded with tensile stress in use, rather than compressive stress (see graph next page)

When the latches are attached to the inlet, put the pipe in the model and adjust its position. Note the graph below, showing that the end of the turbine nozzle is half way in the tapered section of the inlet. The exact distance is depending on the pipe size. Please use the following distances:

For 15-30N pipes	20 mm
For 40-80N pipes	40 mm
For 80-160N pipes	45 mm
For 160-250N pipes	45 mm

Fix the pipe loosely and recheck. Bend latches if required.



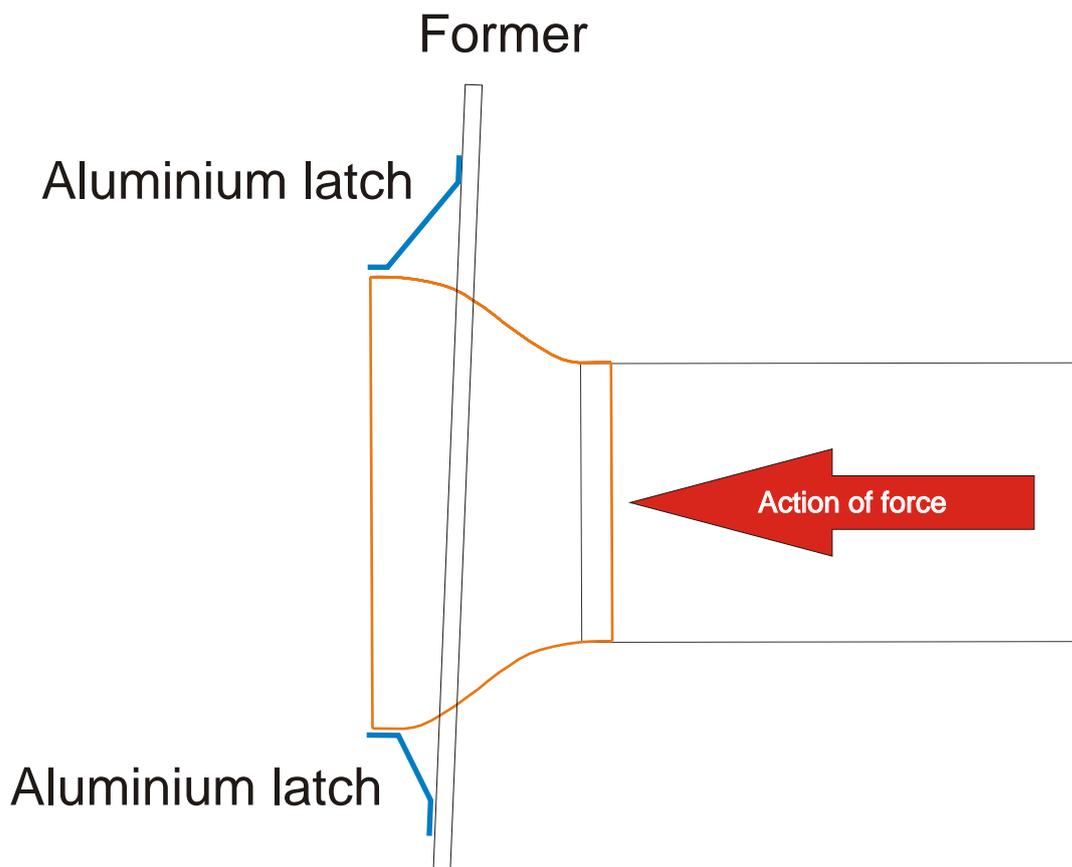


Installation of the jet pipe

Adjust the turbine and pipe carefully by looking through the pipe end and from the top. A disalignment will not only result in an unwanted thrust vector, but also involves the danger of overheating the pipe, if the blast is not centered inside (such a disalignment will show up in form of discolouring the steel of the pipe)

When the position is satisfying, transfer the holes in the latches to the former and drill 2.5 mm holes. Use the supplied 3x16 self tappers to fix the pipe. Secure the screws with a drop of epoxy finally. The back end of the pipe can be fixed if so wanted by little servo screws through the outer wrapper of the pipe.

Please note that the overhang of the outer wrapper against the inner tube is a vital design feature of our pipes that is responsible for the cooling airflow over the inner pipe. This aluminium outer wrapper must not be shortened in any way!

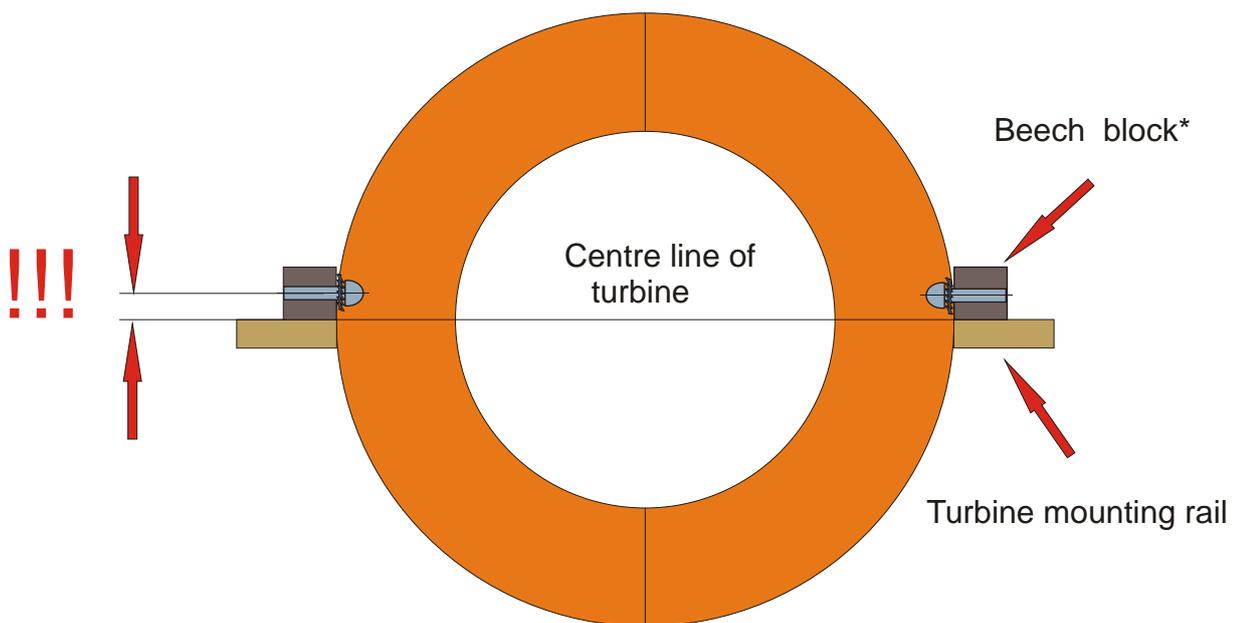




Side Mount System

Many jets feature a turbine mount in form of mounting rails on either side of the turbine. If these rails are long enough (behind the turbine), there is an even better mounting method of the pipe recommended. The inlet only needs to be drilled at both sides and then fixed on beech blocks that are glued to the rails. The graph below shows the principle. Please note the offset centre line !

Front view inside the inlet



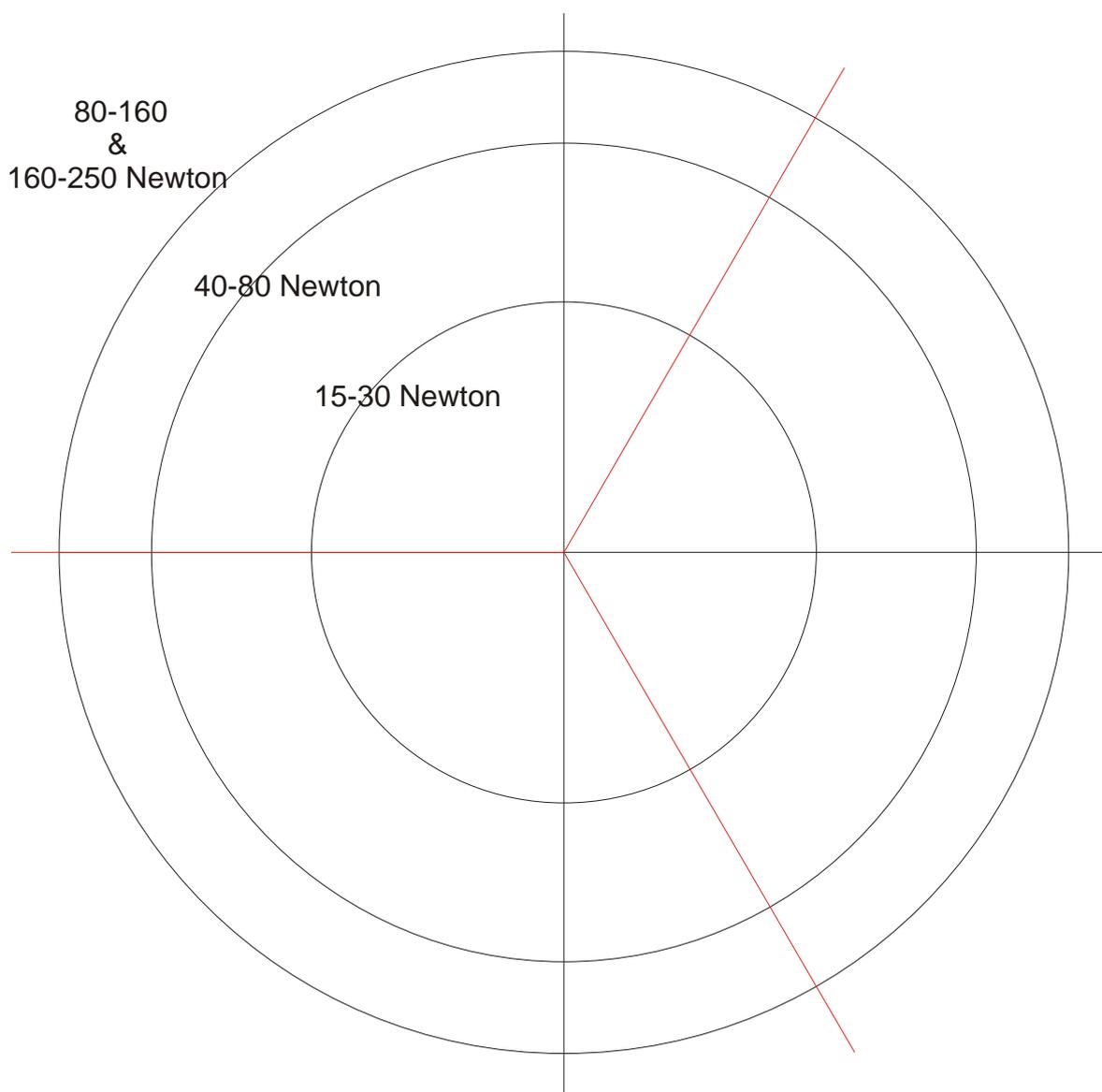
Please use the template on the following page to mark holes on your inlet. The template can be used for all types of GRUMANIA inlets.

* 12x12 mm blocks are perfect, a complete Side Mount System is available through the GRUMANIA JETS shop.



Template for drill markings on the inlets

Print out this PDF-file at 100 %





Schablone zum Anzeichnen von Befestigungsbohrungen bei

SIDE MOUNT SYSTEM

80-160 & 160-250 Newton

Beech block 12 x 12 mm
Buchenholzleiste 12 x 12 mm

40-80 Newton

1530 Newton

Drill inlet on this line
Bohren des Trüchtes auf dieser Linie

Mounting platform in model
Montagefläche im Modell

Beim Ausdruck der PDF Datei die Druckgröße auf 100 % setzen!

This template is a PDF file that needs to be set at 100 % when printing !



Important note

Please note that there are several - if not countless- possible sources of errors, that can lead to trouble, when operating a turbine model. Wrong installation*, faulty turbines, the use of so called "smokers", failed kero starts or explosions with older gas start engines, too small inlets, ect. Are just a few to be named here.

As the installation and correct operation of a jet pipe is out of our control, we hereby remind you on your own authority. Grumania Jets assumes no responsibility and we exclude liability on damage of the jet pipe / model that results from inappropriate use.

Therefore, we strongly recommend to seek the assistance of an experienced jet pilot, if any question arises.

Ilija Grum

GRUMANIA JETS

*If you are using a Frank turbine, please ask the manufacturer for the proper installation, i.e. Distance from exhaust cone to inlet of jet pipe !