

## SERVICE LEVELS

There are 3 options for revision:

### Option 1 STANDARD OVERHAUL

### Option 2 STANDARD OVERHAUL WITH UPGRADE

Bearings, KKK motorsport seals and VSR high speed balanced to race specification. This is ideal when you plan to drive (in future) with increased boost pressure.

### Option 3 OPTION 2 + AN EXTRA POWER INCREASE

Approx 400HP, for the 3LDZ Turbo (P930 74-89) and K27 variants (P965 Turbo) and approx. 650HP for the K16 variants (P993 & P996 Turbo).

## IMPORTANT NOTICE

For all options, an undamaged turbo must be sent in first as an exchange or if you want your own part to be done. Please understand: If it is damaged, additional costs will be charged. These costs cannot be estimated in advance.



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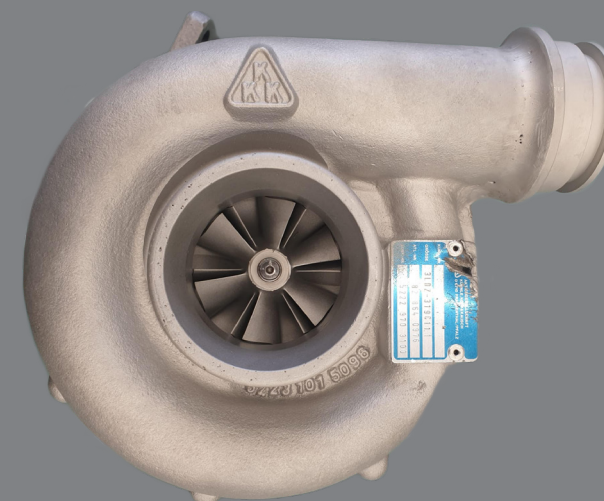
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## TURBOCHARGER REFURBISHMENT AND UPGRADES

### FOR PORSCHE

**P930 3.0 | P930 3.3 | P930 3.3 1986**  
**P993 TT | P996 TT**

## TURBOCHARGER REFURBISHMENT PROCESS

### Step 1 START

After the turbo has been received, the turbo is disassembled and analysed. Then the parts are thoroughly cleaned. Then the parts are sandblasted.

### Step 2 SURFACE TREATMENT

The cast iron parts are blasted with a strong blasting grain. For the aluminum parts, a different blasting machine is used, which works with a ceramic glass bead. The bearing housings are washed after blasting with the coarse blasting grain and also with the ceramic glass bead. The bearing housings are then ultrasonically cleaned to ensure that no blasting sand or dirt is left behind. Finally, all parts are greased to prevent rusting.

### STEP 3 CHECKING

First of all, the turbine shaft is checked for straightness. For this, use is made of a straightness meter bench with a dial indicator down to 1.0 micrometer. The bearing locations of the turbine shaft and the bearing housing of the turbo are checked with the aid of micrometers to see if they do indeed fall within the permitted tolerances. The compressor wheel is blasted with glass beads and checked for hairline cracks with metal check. If all parts are technically in order, the balancing process can be started.

### Step 4 BALANCING

Balancing is one of the most important process steps in the overhaul of a turbo. The reason for this is simple, since the speeds achieved by a modern turbo now exceed 220,000 rpm. Any form of imbalance at these speeds will eventually or immediately lead to major damage inside the turbo. For balancing turbos, it is very important to dynamically balance the wheels. That is, balancing with two correction planes. Each component is balanced separately. After all components have been individually balanced, the rotor is assembled. This rotor is also dynamically balanced again. For this we use a Schenck balancing machine. The parts must then be mounted in such a way that the turbo has become a rotating whole.

Because not all parts can be balanced individually, such as the thrust washer etc, the rotating part as a whole must be balanced again using a VSR balancing machine. For this we again use a Schenck balancing machine, the Schenck 110MBRS VSR balancing machine, the number 1 and is required and approved by all turbo manufacturers. This balancing step is performed at the speeds as they are also achieved on the engine. This is an ideal final test before mounting the remanufactured turbo on the engine. If a turbo passes the final check, it is perfectly fine. In particular, the extremely precise balancing processes ensure that no detail is overlooked.

### Step 5 FINAL ADJUSTMENT

After balancing, the space on the bearings of the interior is then checked and this space is verified with the data from the turbo manufacturer, after which the turbo is further phased out. Finally, the actuator is adjusted to the factory value

