



# Turbo Charger

## Technical Spec

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**Product:** Turbo Charger

**Part # :** RHB31 VZ21

**Comment:** All data given in this document are nominal values and  
might be subject of change at all time

Index	Page	Revision	Date	Note
1	----	<b>First Edition</b>	12.10.2013	V1.3
2	----	<b>Second Edition</b>	12.16.2013	V1.3.1
3	----	<b>Third Edition</b>	1.2.2014	V1.3.2
4	----	<b>Fourth Edition</b>	4.11.2014	V1.3.3
5	----	<b>Fifth Edition</b>	6.18.2015	V1.3.4
6	----	<b>Sixth Edition</b>	12.13.2016	V1.3.5

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## General

This turbocharger is the smallest turbo in the world, very similar to the IHI RHB31 turbocharger. This turbo is ideal for turbocharging your Motorcycle, scooter, dirt bike, ATV, go kart, buggy, and snowmobiles.

**Note:** this turbo is suitable for 125cc to 600cc engines. There will not have enough air flow to push the turbo to generate meaningful boost if engine is too smaller.

The turbocharger can increase the air flow of engine intake, add the power and torque, and improve the performance of engine.

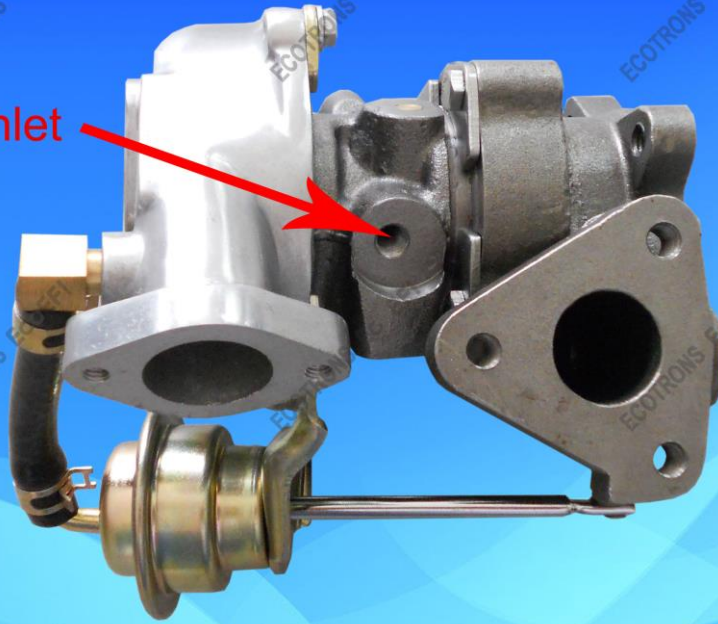
## 1 Characteristic

### 1.1 Picture of Turbo



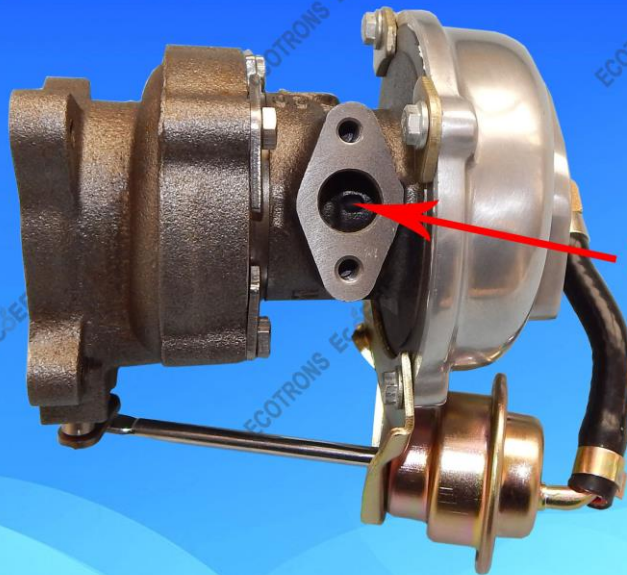
## Turo bocharger VZ21

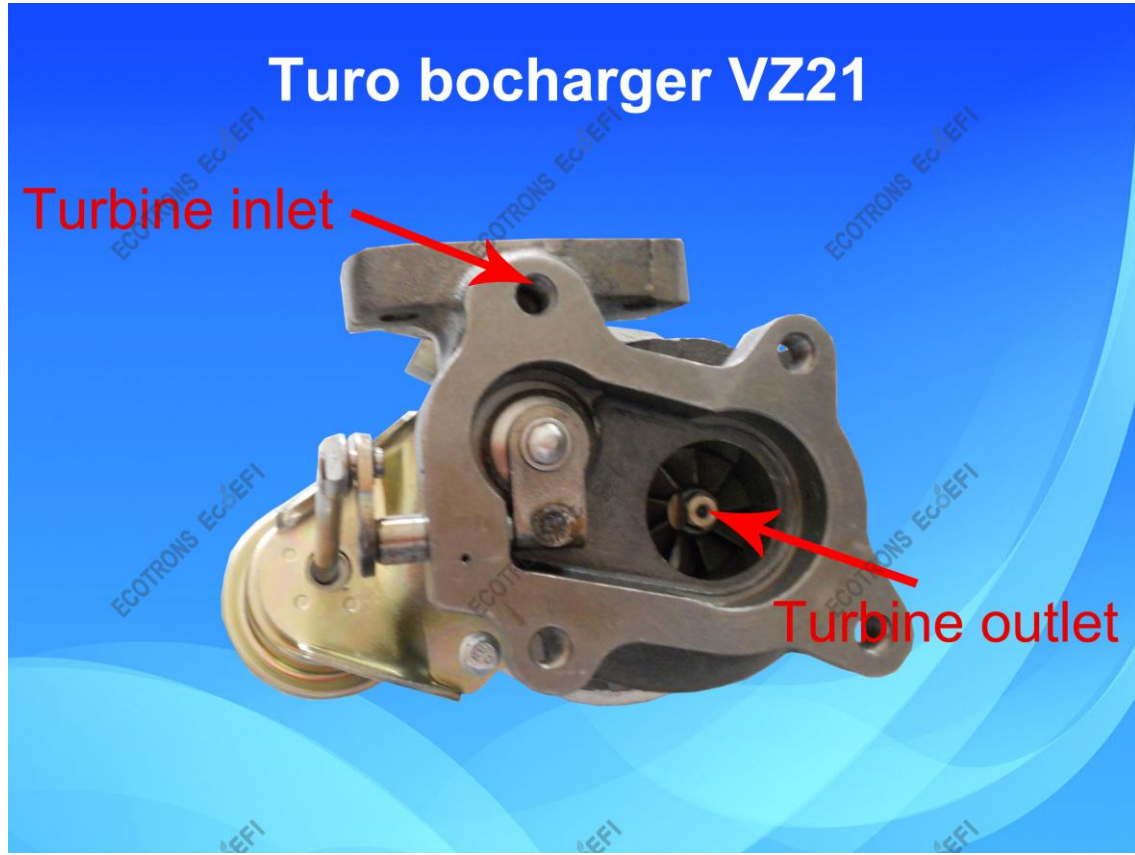
Oil inlet



## Turo bocharger VZ21

Oil outlet



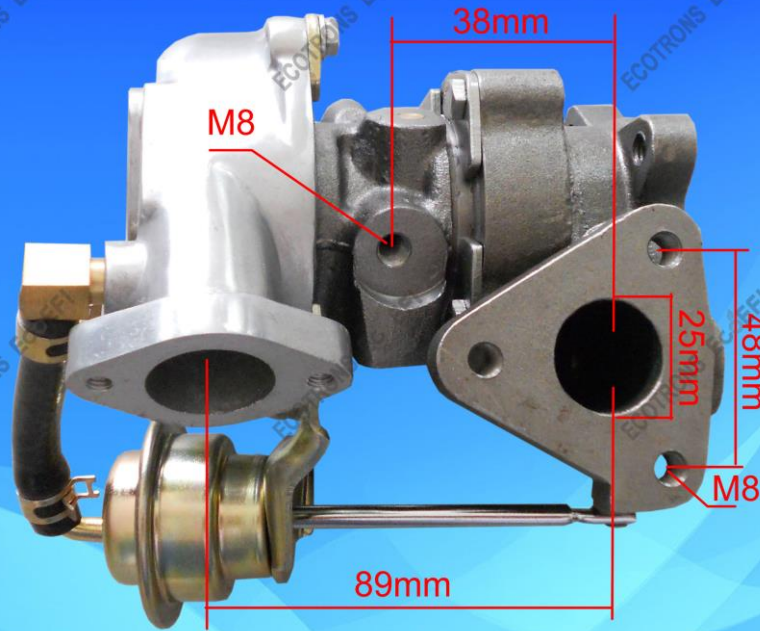




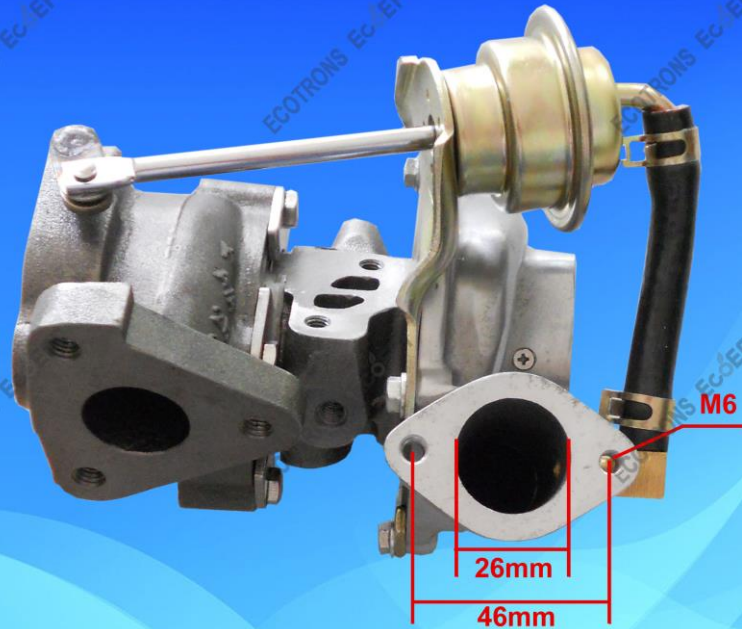
## 1.2 Mechanical dimensions



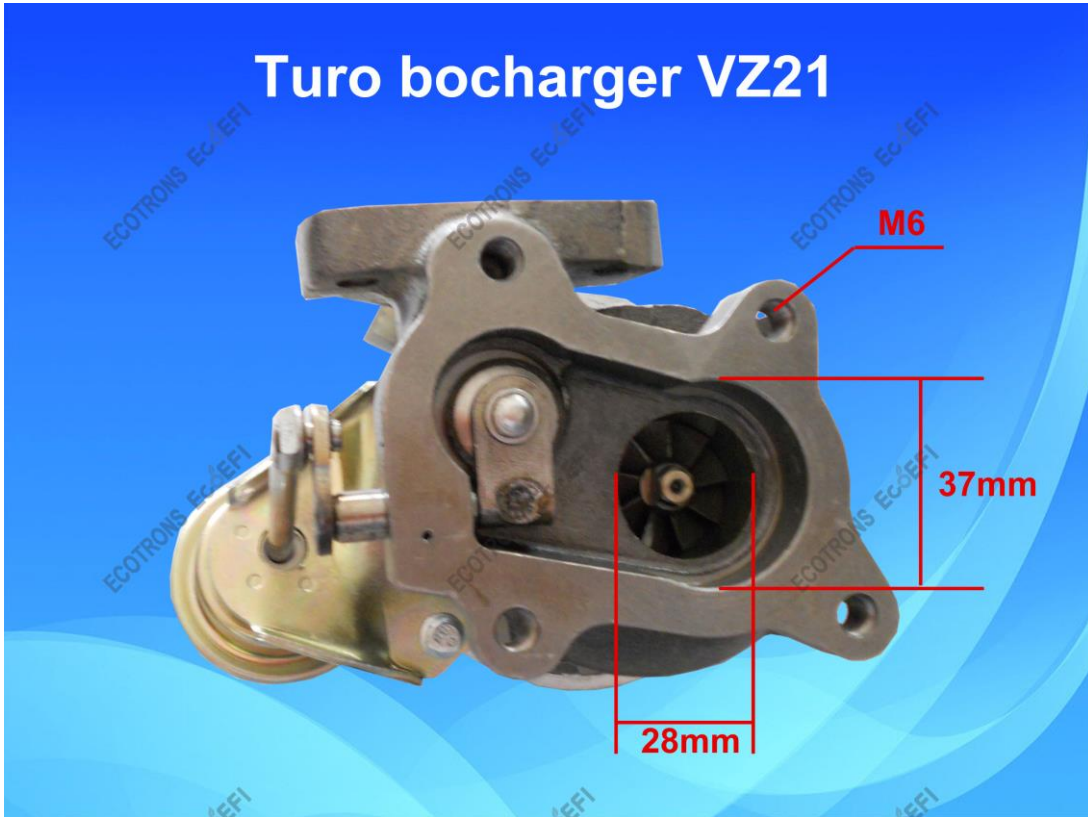
## Turo bocharger VZ21



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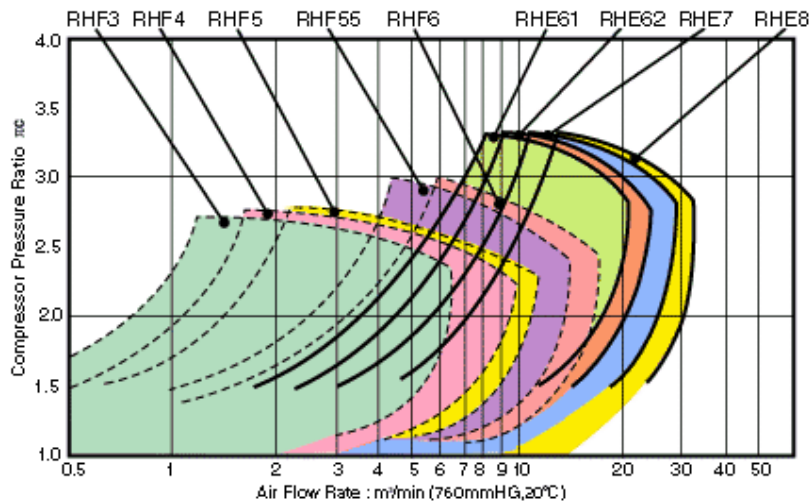


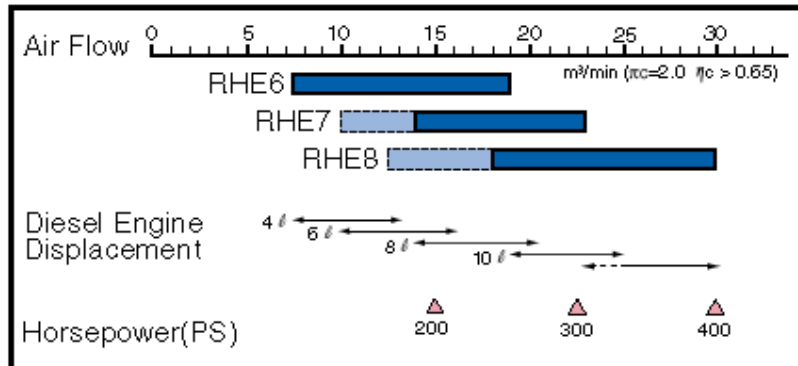
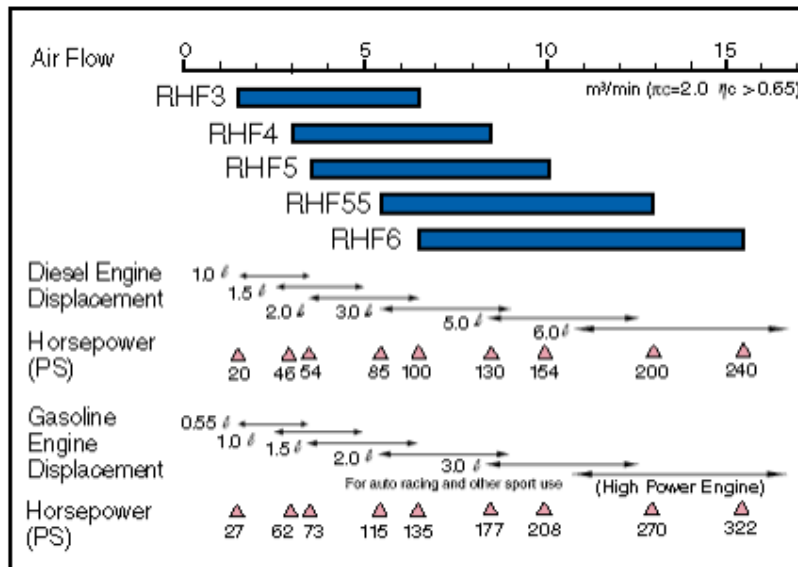
### Turo bocharger VZ21



### 1.3 Basic characteristics:

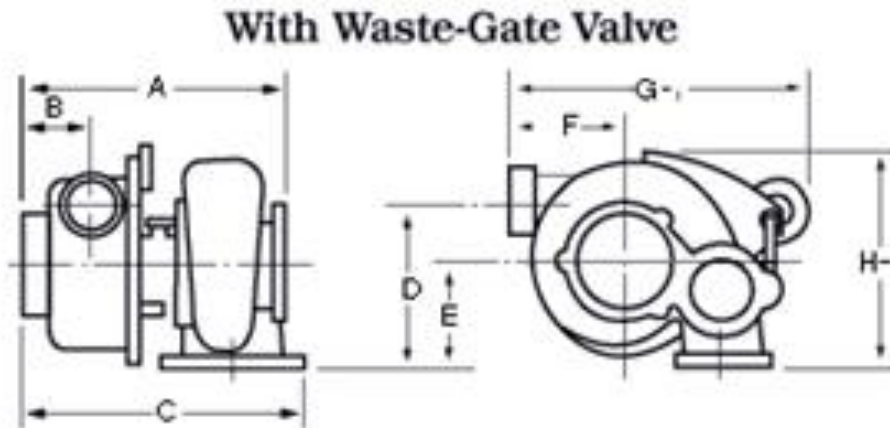
**NOTE:** the below turbo characteristics are from IHI RHF turbo series. The VZ21 turbo is very similar to IHI RHF3 turbo. The characteristics of VZ21 turbo should be very close to RHF3 turbo'. But there be some difference with RHF3 turbo. User should be aware of the possible compromise of the turbo performance with VZ21 compared to the genuine IHI turbo.





	Type	RHF3	RHF4	RHF5	RHF55	RHF6	RHE61	RHE62	RHE7	RHE8		
Item	Air Flow Rate (at: $\rho=2.0$ )	m <sup>3</sup> /min ft <sup>3</sup> /min	0.75~6.3 26.5~222.5	1.0~9.4 35.3~332.0	1.4~10.8 49.4~381.4	2.4~13.5 84.8~476.8	3.1~16.5 109.5~582.7	3.3~17.5 116.5~618.0	4.5~20.0 158.9~706.3	5.5~24.0 194.2~847.6	7.0~30.0 247.2~1089.5	
	Maximum Pressure Ratio		2.7	2.7	2.8	3.0	3.0	3.3	3.3	3.3	3.3	
	Maximum Speed	X10 <sup>3</sup> rpm	250	190	180	168	140	140	131	120	107	
	Maximum Allowable Gas Temperature	°C °E	950 1742	950	950	950	950	750	750	750	750	
	Weight (without waste-gate valve)	kg lb	(1.9) (4.2)	(2.6) (5.7)	(3.2) (7.1)	(5.1) (11.2)	(6.7) (14.8)	7.8 17.2	10.5 23.2	(11.4) (25.1)	(15.0) (33.1)	
	Diesel Engine Application	Ps	20~100	46~130	54~154	85~200	100~40	50.260	70~300	80~360	105~450	
	Gasoline Engine Application	Ps	27~135	62~177	73~208	115~270	135~322					
	External Dimensions	A	m/m	135	167	170	207	223	238	253	231	251
		B	m/m	22	37	27	43	43	47	45	50	52
		C	m/m	133	163	167	201	222	234	245	253	270
D		m/m	88	102	110	124	124	136	146	161	175	
E		m/m	58	65	70	75	75	78	76	86	95	
F		m/m	65	74	80	102	102	100	125	120	130	
G-1 with Waste-Gate Valve		m/m	162	180	211	237	237	256	291			
G-2 without Waste-Gate Valve		m/m	(136)	(155)	(167)	(200)	(196)			(246)	(265)	
H-1 with Waste-Gate Valve	m/m	135	125	138	156	156	175	186				
H-2 without Waste-Gate Valve	m/m	(127)	(125)	(138)	(156)	(156)			(195)	(215)		

( ) is the value for those without a waste-gate valve



## 2 Applications and installation Instructions

### 2.1 Typical Applications

The Turbo charger is usually used on engines for gain power. It will boost the intake air pressure, to make the engine get more air then the engine will get a better performance.

It is suitable from 125cc to 600cc engines, and usually it will increase

pressure range from 5psi to 12psi.

For turbo matched, you should confirm whether this turbo is suitable for your engine by yourself.

## 2.2 Instructions for turbocharger

**When you are preparing to install a turbocharger, there are some important pre-install items to assure that you will receive the most out of your product.**

**Note: The Installation of Turbo must be done by a professional.**

### **PRE Installation instructions - Please READ BEFORE INSTALLATION**

A. Drain off the dirty engine oil and fill in diesel (or gasoline) to the engine oil line.

B. Spin the motor over with the spark plugs wires unhooked, and start the engine for 7-8 times. This will flush your engine. Drain dirty fuel from the engine, replace oil filter.

C. Tighten all bolts firmly except compressor housing bolts. Tighten compressor bolts until snug. Do not apply glue to any of the turbo gaskets. Do not apply glue to any of the gaskets for both OIL IN and OIL RETURN Lines when sealing up.

D. Twist the cork on oil pan tightly. Pour in fresh pressure boost engine oil 5mm above oil line.

Wait for oil to begin to drip through the turbo and com out the return line fitting.

E. Hook up the spark plugs and the oil return line.

Hold compressor wheel firmly with your hand to keep the shaft from spinning (There is no oil in your turbo at this point so it is vital that it does not spin!). Start the engine and let it idle for 40 seconds (to circulate oil) before releasing the compressor wheel.

**ONCE IT'S SPINNING DO NOT TOUCH THE COMPRESSOR WHEEL!**



Install the intake tubing and air filter assembly. Keep the engines idling for 15-20 minutes to complete turbo break-in procedure. Do not Race Engine.

## 2.3 Additional Instructions

### **Fuel Delivery (Only applicable to the engines that have had no Turbo installed before)**

Note: As will all turbo systems being installed, the fuel delivery system will have to be modified to deliver the correct amount of fuel to the engine when boost is present. Make sure this is done or your motor will suffer internal damage quickly if the air/fuel mixture goes lean.

### **Oil Lines (Only applicable to the engines that have had no Turbo installed before)**

A properly installed turbocharger will include a properly installed oil lubrication system. When selecting a spot to tap into the oil system make sure it is close to the main lubricating route. The Oil IN line to the turbo should be 3ft or less. The oil return should “gravity” feed back into the oil pan, i.e. within 30 conical degrees vertical to the ground.

This means the turbo can not be placed below the oil pan. Doing so would require a sump pump to feed the oil back from the turbo into the oil pan. We always recommend using aero quip fittings and lines for turbochargers. They are race proven and will provide years of service. A-3AN or -4 AN will provide adequate flow for the OIL IN line. A -8AN or -10AN line will serve as an adequate return line. We also recommend going to synthetic oil as it has better thermal properties than conventional motor oils. A thermostatically controlled oil cooler is also good assurance that the oil temperature will not reach dangerous levels.

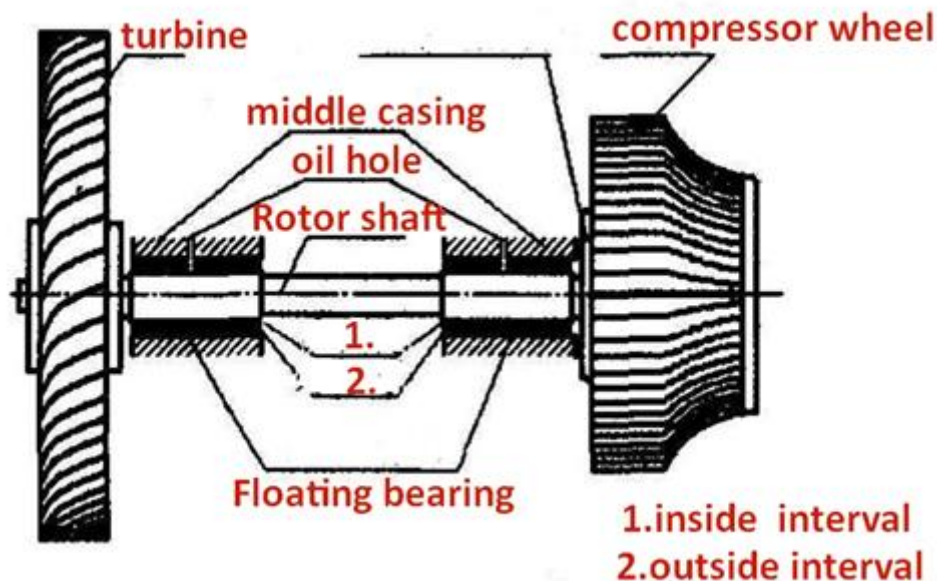
### **Gaskets**

Do not reuse the exhaust manifold gasket or the manifold to turbo stainless steel gasket. They are compression style gaskets and once compressed they will not seal again.

## 2.4 Further introductions

Turbocharger is a floating bearing structure, and the structure itself has some clearance. Because when the normal operation of the turbocharger speed is very high and can reach 80,000-100,000rpm, if it simply cannot afford conventional bearings such high temperatures and high speed, will soon wear failure. And the floating bearing structure such a structure can be, please see the below pictures, there is a clearance between floating bearing and both the middle casing and rotor shaft. The gap is filled with lubricating oil, high speed when the rotor shaft, and the floating bearing will rotate in the same direction, but the rotational speed much lower than the rotor shaft, so that the oil hole is relatively low speed to meet the oil cycle. Because of the double oil film, it can double cooling, and produce double damping, so floating bearings with reliable high-speed light load characteristics. Manufacturers said there is some clearance, so when a hand to push the impeller may hit wall, but not always encountered in normal operation. Manufacturers do homeostasis highest test speed to 120,000 rpm, after testing the product's manufacturer is of acceptable quality.

However, because of the special floating bearing structure, operation before it must ensure that oil has been filled with floating bearing turbocharger, if a user operation in the case of improper use if scare oil is very easy to damage the turbocharger bearings, which in the case of the automobile industry phenomenon turbocharger is common scrapped. Therefore, the use of turbochargers must pay attention to these circumstances; the installation needs the best professionals for assistance.



### 3 Accessory of turbo charger

#### 3.1 Pictures of accessories



Designed for VZ21

#### 3.2 Accessories

Parts Name	Material
Fixtures	Stainless steel
Oil outlet fitting	Aluminum and copper
Oil inlet fitting	copper
Flanges	Carbon steel
Gaskets	Stainless steel

## 4 Weight

Accessories Weight	555g
Turbo Weight	2675g