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The home of: *MIDDLETON RALLY TEAM.*

We rally you win!

Subaru WRX Ver. 5

Australian Rally Champions.

Formula Two winners 1997 1993 1994

As at 19th Dec 2001

Information for reference purpose only

No responsibility is accepted for incorrect data

IHI turbo specifications and comparison sheet

Turbo	MRT part number	Spec	Comp Inlet dia	Comp Housing Nominal	Turbine Housing	Turbine	Approx A/R	Comp Wheel blades	Turbine Wheel blades	Waste gate Actuator	Turbine casting ID & batch
VF22	suwe037e	Roller brg	48.5	A	9.4 PZ20-H	94001	0.71	5	11	C395	H H4 15w
VF23	suwe037b	Roller brg	46.7	B	9.4 PZ20-H	94001	0.71	6	11	C395 8psi	TBA
VF24	suwe037d	Roller brg	46.7	B	9.4PZ18-H	94001	0.63	6	11	C418 8psi	H S4 66
Vf25	Tba	TBA	38.2	D	6.2PZ12	62004	0.36	TBA	TBA	TBA	TBA
VF26	suwe037g	TBA	38.2	D	6.2B14	62004	0.48	TBA	TBA	TBA	TBA
Vf27	Tba	TBA	38.2	D	6.2pZ18	62004	0.63	TBA	TBA	TBA	TBA
VF28	tba	Roller brg	46.7	B	9.4PZ18-H	94001	0.63	6	11	C395 8psi	TBA
VF29	SUWE037k	Roller Brg	46.7	B	9.4PZ18-H	94001	0.63	6	11	TBA	TBA
VF30	suwe037h	Bronze Brg	47.9	C	9.4PZ18-H	94001	0.63	6	11	C484	H S4 IC F55
Garret 450-500	suwe038a	Ball Brg	53	-	-	Outlet dia 46.9	-	7	10	14psi	
Garret 400	suwe038b	Ball Brg	53	-	-	Outlet dia 51.5	-	7	9	11psi	

Typical applications

The “VF” series of turbo’s all have straight inlet paths, so when fitting to early Legacy/Liberty and WRX’s they need major changes to the compressor housing to take the elbow inlet. OR a modified inlet manifold is required.

All VF series turbo’s are manufactured by IHI, Japan

Typically all Sti models come with a IHI turbo, and All WRX’s come with a Mitsubishi turbo.

WRX’s Ver 1,2,3 all came with TD05 turbo’s with a 90 degree elbow inlet, whilst the later Ver 4 and 5 came with a TD04 that had a straight inlet path and was slightly smaller for better bottom end performance and less lag.

All VF turbo’s and older units have built in waste gates.

Exhaust fitting and design

All VF series turbo’s feature the same bolt pattern and exhaust joints, so swapping them is relatively easy.

The critical part is the design of the splitter for the exhaust collector. As the VF turbo’s have a different depth to them when compared to the factory TD04 and TD0505. Meaning if you swap turbo’s you should adjust the length of the splitter. A Splitter made for a VF turbo will be too long for a TD04/05 (the exhaust simply wont bolt up) and a splitter made for a TD04/5 will be too short for a VF and hence allow gasses to mix too early causing an increase in lag and less power. (for more data on this exhaust feature refer MRT Performance)

If you require a turbo larger than a VF22 MRT recommend a Garret 400 – 450 roller bearing unit, if you are building a serious drag car then a larger turbo with remote waste gate will be required

General

All of these above turbo’s have a 60mm Outside Diameter inlet to suit the OE inlet pipe.

Size of Turbo should be also considered for gas flow. With high output engines and or large capacities, the physical size of the waste gate (hole) will be a restriction when added to the turbine (hole) This is like fitting a big engine with a small restrictive exhaust

Hence the need (in some cases) for remote waste gates.

A remote waste gate will flow more, because it is larger, and effectively give better boost control.

The downside is they are awkward to fit and difficult to tune with the OE ECU.

VF22

WRX Japanese domestic market

Best turbo for high output engine. Highest capacity of all IHI "STi" turbo's. OK for high boost or stroker engines. Best fitted with cars that at least have a front mount intercooler. Not recommended for really big boost stroker engines or cars that run over 25 psi boost.

Same Turbine housing and wheel as a VF23 (20) with larger Compressor housing.

Only fit this turbo if you have at least an exhaust, front mount intercooler and air inlet mods. Its good also if you plan internal engine mods.

This turbo has the most lag of all the VF series.

VF23

Sti Ver 3 June 1996

Good all round turbo with straight inlet path

Same compressor housing and wheel as a VF24 with larger Turbine housing (20)

Great turbo for mildly modified cars and those who are unsure of their plans for the future

VF24

STi ver 4, June 1997

Common for Group N rally cars and has good bottom end. Not recommended for stroker engines or engines with high boost as turbo is small and can over speed.

Same compressor housing and wheel as a VF23 with smaller Turbine housing (18)

Best turbo for Auto's and cars that want the best bottom end and least lag.

VF28

STi Ver 5, June 1998.

Basically the same as VF24

VF29

WRX Japanese domestic market

Basically the same as VF24 except has a different location for the pressure hose on the waste gate actuator

Compressor wheel is slightly different.

VF30

STi ver 7Oct 2000

A totally new design and shape "VF" series turbo

Common on Group A rally cars where more capacity is required than is possible with the VF24.

Good turbo as compromise between the VF23 and VF22, as it has the same size turbine housing as a VF24 and a compressor housing similar to a VF 22

A relatively new turbo to the market and still being "tried and tested" early indications are it will replace the VF 23, with slightly more capacity.

Garret 400 HP

Bolts to manifold ok, but requires some modifications to fit due to size of compressor housing.

Also requires minor mods to oil drains and supply lines.

Should only be fitted with at least a Electronic Boost controller and works best with a whole new ECU

Designed for cars that are going to run over 20 psi and produce over 200Kw at the wheels (4WD 4th gear)

Garret 450 – 500HP

Similar spec to 400 hp just bigger!

Bolts to manifold ok, but requires some modifications to fit due to size of compressor housing.

Also requires minor mods to oil drains and supply lines.

Should only be fitted with at least a Electronic Boost controller and best with a whole new ECU

For cars that are going to run in excess of 20 psi and over 200Kw at the wheels (4WD 4th gear), IE Stroker's, big head work and CAMs.



VF23



TD05 (left) and VF 23 (right)



TD05 (left) and VF 23 (right)

NOTE

Refer depth of castings at outlet.
VF turbo has much less cast steel at outlet of turbine blade.
A critical dimension for exhaust outlet splitter designs



TD05 (left) and VF 23 (right)



VF24 inlet, 6 blades

NOTE

Refer blade number and shape



VF22 inlet 5 blades



VF30 turbo

NOTE

Different water supply pipe to turbo bearing assy.



VF30 inlet 6 blades

MRT PERFORMANCE..

MoTeC / Haltech / Link and factory EFI Specialists