



WRX Enhancement - Exhausts

Part 1 of the most complete WRX parts buyers guide - EVER!

By Michael Knowling

If you had to pick a cult car from the modern Australian era it would be Subaru's Impreza WRX.

Over the mighty Rex's life, there have been quite a few subtle updates to its hereditary DOHC, 16-valve EJ20 motor. Bursting onto the scene in '94, the first WRX came equipped with a large TD05 turbo, a top-mount air-to-air intercooler and an air intake very similar to the old Liberty RS. Updated in October '96, models then came up-spec'd with a slightly improved intercooler, revised blow-off valve (which apparently leaked!) an "under-pass" air intake system and - most importantly - a smaller and quicker-to-boost TD04 turbocharger.

Despite these running tweaks, however, there are a lot of mechanical similarities over the whole WRX range - which makes finding an aftermarket bolt-on part to suit a lot easier. Over this - our brand new Buyers' Guide series - we'll bring you the most comprehensive WRX parts guide **ever seen anywhere**. Note - at the time of compilation, products for the MY01 had not yet been released.

Now let's get that flat four started with some bolt-on basics - exhausts.

The Standard WRX Exhaust System...

The exhaust of the WRX is a typical car manufacturer's compromise between power, durability, emissions and noise. This means you can easily score more power by fitting a free-flowing system that puts out a bit more of the flat four's distinctive beat. Three inch has become the usual pipe diameter of choice - however, note that the standard dump pipe on the Rex is a big key to unlocking more power. Half of the standard turbo dump exit is fronted up against a flat metal plate, while the other half bustles gasses into a 2.25 inch diameter single outlet. Once on their way, EJ20 fumes pass through a front cat converter, a central cat converter (some say resonator) and a rear muffler box. MY99 onward models score an additional small cat converter (again, some say resonator!).

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The workshop of **MRT** offers three stages of exhaust upgrades for the WRX. Replacement of the rear muffler only, a new exhaust from the turbo-back, or a total upgrade from the engine-back. MRT's overall focus has been on maximum power - but with a good, muted sound. "The note without the headache" as they put it.



The MRT handmade rear muffler - of which there are two models available - will bolt straight onto the back of a factory system. There's also the choice of 3-inch, 4-inch or twin 2-inch outlets. Heading forward, their 3-inch mandrel stainless steel modular replacement pipe - incorporating a centre muffler - uses flanged gas-proof joints and a double-layer stainless flex join. The collector from the turbine is a fairly recent development. Using a split-pipe design (that reaches right into the outlet of the turbocharger), gasses between the turbine and wastegate are kept separate for around 150mm, until they merge into the hi-flow 3-inch cat.

Another variation of the separate wastegate configuration is available for motorsport use only (as no cat converter is used). The complete system all hangs straight off the factory chassis mounts.



Middleton also sells Tuned Length Turbo Engine Pipes. Apparently, "the standard cast collectors that bolt to the heads are a very poor match". In fact, the exhaust port is said to be around 3-4mm smaller in diameter. The MRT stainless steel fabricated replacement gives correctly matched port diameters with MRT's own equal-length pipe design from both banks of exhaust ports. This is claimed to give improved exhaust flow, a noticeable power gain and great looks. Note - MRT recommend that "this part should only be considered for people who either want the maximum HP from externally fitted performance parts OR those planning to do major engine upgrades".

MRT are in Sydney.



APS - Air Power Systems - sell a complete turbo-back aluminised/stainless steel hi-flow exhaust, which offers smooth radius mandrel bends, careful attention to tube diameter and muffler design. A lot of effort has also been put into a balance of noise and performance, while legalities are met thanks to an APS high-flow cat. The exhaust kit suits all model WRXs and there is also an extensive choice of dual 2½-inch tips to suit your tastes. Options include a high-performance mono-outlet rear muffler assembly and even - in extreme cases (of 500hp-plus) - a dual 2½-inch system for competition use only.



Again - getting a little more extreme - APS also have a High Flow Turbo Discharge Housing. This housing is designed to deliver optimum gas flow and the ability to cope with sky-high EGTs. It is made from high temp ductile iron and is available to bolt directly onto TD04, VF22, VF23, VF24 and VF28 IHI turbochargers (as fitted to MY97 - 00 WRX, STi 2-door Version 5 and STi 4-door Version 6).

The APS headquarters is in Melbourne and there are agents Australia-wide.



Power Engineering in the UK offer a number of WRX exhaust upgrades - all compliant with noise and emission requirements (when the optional cat is fitted). Their modestly priced bolt-on T65 front pipe is "a useful addition to standard cars". It yields noticeable improvements in low-down torque and the turbo will also spin up a lot quicker. A little more serious is the 3-inch T75 front pipe, which is said to be "the best system on the market". After trying a long, high-flow cat built into the front pipe, Power Engineering discarded this idea in favour of a twin dump pipe with a centrally located higher flow cat. This performed beautifully, and this is what is being marketed - together with a delete-cat option.



Eight different internal designs of rear mufflers were then tested - each assessed on sound, power and torque criteria. The end result is this UK-sourced Magnex box with a twin 3-inch tailpipes (or an optional single oval tip). Points to consider are - any part of the system (rear box, centre section or front pipe) will fit straight-up to any otherwise standard system, the silencers are filled with stainless steel wool and the pipework is all T304 grade. All brackets are made of stainless and welding is performed in SS MIG. All cladding and brackets are stainless steel.

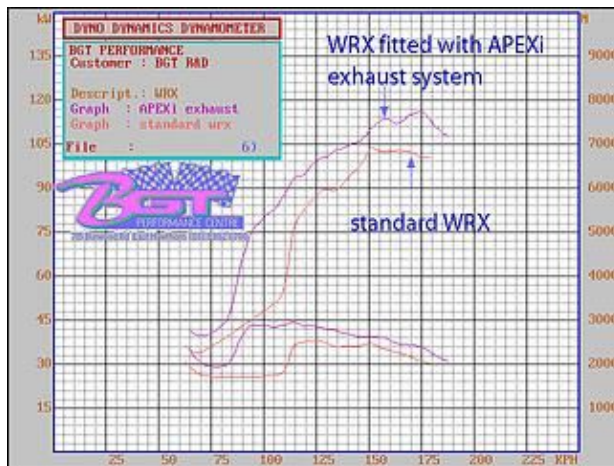
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The A'PEXi N1 was the very first productionised angled muffler in Japan. Engineered from feedback data of the A'PEXi N-1 series race car, this system is a straight-through system with the absolute minimal amount of bends. An angled SUS304 stainless steel rear canister (with a big 4.5-inch outlet!) performs muffling duties. Thanks to its extra high-performance design characteristics, the A'PEXi N1 boasts the most power and throttle response improvement of any of its cousins.

Like MRT, Power Engineering also offer a Power Manifold - for "the ultimate show and power increase". PE claim that "this work of art gives 25hp every time".

Contact Power Engineering in the UK.



Originating from Japan, A'PEXi exhaust systems are amongst the very best on the market. You only need to consider that - it's claimed - many car companies rely on A'PEXi quality to produce their own OEM exhaust systems. Robotic TIG welds are used, all canisters use aircraft quality SUS304 stainless steel and the pipes are protected by a titanium particle based high temperature paint. Note that these systems are all sold as cat-back - you'll need to find your own dump pipe...

The A'PEXi GT-spec system is a more street-legal system, using the same N-1 series exhaust configuration (with its minimal number of bends). The rear box is again made from that wonderful SUS304 stainless steel, while an additional stainless steel centre muffler allows the system to meet most street-legal requirements. Like all A'PEXi WRX systems, this is a cat-back unit only.

The RS exhaust is the most refined of all WRX-compatible A'PEXi systems. With a big rear muffler and central muffler, this is the quietest of the bunch. It too, features SUS304 grade mufflers and is a cat-back design.

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Note that if you're not after a complete cat-back system, you can opt for just an A'PEXi rear muffler. Universal boxes (complete with those humungous tips!) are available in Dunk, N1 and RS models. Note that N1 and GT-spec rear mufflers can also be equipped with an A'PEXi Super Silencer. This slot-in canister reduces SPL by up to 7dB.

All A'PEXi exhausts available through BEL Performance in NSW, the [AutoSpeed Shop](#) plus BGT and G-Tech in Melbourne.



At **DMA Motorsport** you can pick up one of their custom 3-inch mandrel bent stainless steel systems or treated mild steel systems. These 3-piece kits (which can be separated) suit all models and are mounted off the standard points. Starting off at the back of the turbo, the DMA system uses a 5-inch oval dump tapering into a 3-inch (enlarged) Subaru cat. A 3-inch exit from the cat continues on to a mandrel 3-inch centre pipe (with flexible joint) and - finally - a 3-inch stainless steel muffler with a Prodrive-style tip.

Note that MY99 WRX systems also come with an enlarged secondary cat converter.

DMA Motorsport is located in Melbourne.

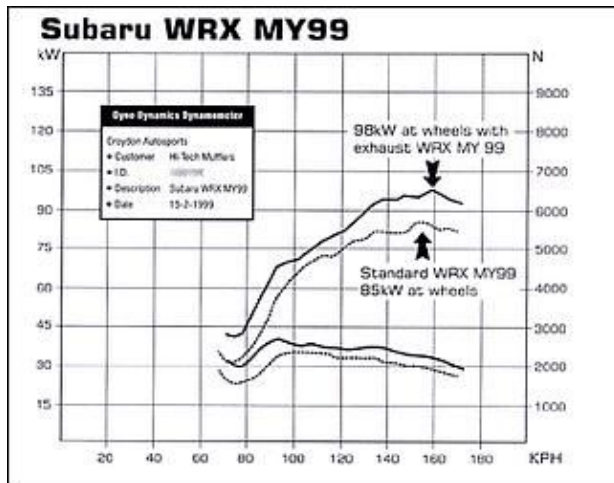


BPM offer another extremely elegant exhaust system upgrade. Starting from the front, their in-house dual dump pipe matches the turbo/wastegate outlet precisely and keeps gasses from the turbine and wastegate separated for maximum efficiency. The whole shebang is HPC'd for corrosion and temperature protection, maximum aesthetics and - of course - maximum hp. This dump bolts straight up to normal WRX turbochargers, and another S-version (with a VF separator) is available to suit STi turbochargers.



BPM's full GT exhaust system continues on from the dual dump pipe with a high-flow cat, Viper resonator, mandrel mid section (all HPC'd) and a stainless steel GT muffler (which is also available for a bolt-on to a standard system). The GT muffler features a 3-inch pipe with a tapered 4-inch tip. A Twister variant to the GT-system uses a very special Twister muffler. This muffler creates an inner vortex to maximise the extraction of gasses - "through a push-pull action". The Twister muffler is also offered separately.

BPM are in Brisbane.



HiTech Mufflers are specialists in WRX exhausts - after all, they have a full jig set-up that allows them to construct an identical system to suit time after time. A system that's typically good for a claimed additional 13kW at the wheels... The Hi-Tech WRX exhaust features 3-inch 304 stainless steel mandrel bent pipe with a single dump from the turbo back. A 3-inch high-flow cat converter is used on road cars and customers have the choice of single or twin tailpipe outlets. HiTech also manufacture their ultra-high performance and high-quality Bazooka muffler, which features a fat 7-inch round barrel.

Hi-Tech systems are situated in Sydney.



Blitz offers the Nur-spec exhaust system to suit the WRX. This incorporates the same technology as the Blitz Supra Twin Turbo - which holds the outright lap record of the Nurburgring for modified road cars! Of course, Blitz's uniquely designed silencer and large diameter mandrel bent piping greatly cutback on backpressure.

On the other side of the coin, it also delivers low noise under cruise conditions - but a distinctly sporty note when you really want it. There are two configurations of this particular exhaust available. A rear section from the standard cat-back, and a complete system from the downpipe back (removing the catalyst). And - as always - the quality of the Blitz stainless steel exhaust is superb.

Blitz systems can be bought from Race Logic in the UK.



Advanced Vehicle Operations - AVO - were one of the first companies in Australia to offer a 3-inch system to suit the WRX. Their current off-the-turbo system uses stainless steel 3-inch mandrel piping, a modified standard cat (or the choice of a US aftermarket item), high-flow pre-silencer and a polished rear muffler with the choice of either a 3½- or 4-inch tip. This simple bolt-on system also complies with noise and emission requirements. Tried and tested.

AVO is situated in Melbourne.



ScoobyMania have just recently released their 3-inch exhaust for the Rex. It features a 3-inch straight-through muffler, polished T304-grade stainless steel construction, and a highly efficient twin dump pipe off the turbo. "Designed to increase power and add stylish looks to your rear end". Oh, and just listen to it...

ScoobyMania are in the UK.



The flagship sports exhaust in the **HKS** line-up is the Super Drager system. Finished in fully polished stainless steel, the Super Drager emits a deep, burbling growl. Due to its lack of a cat in the front section, however, companies such as BD4s generally sell HKS systems as cat-back. Note that the Super Drager exhaust system is available as a single system or the Dual Drager, which utilises two parallel running exhausts ending with twin Super Drager mufflers.

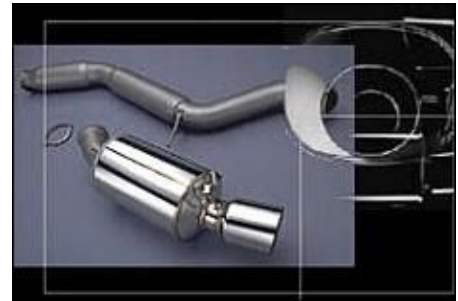
A little more refined, though, is the HKS Hiper system. "The true high performance street fighter or race car muffler with its combination of deep sound and aggressive styling. This HKS exhaust system has developed what can only be described as a 'cult' following".

HKS available from BR Developments (UK), WAR Motorsport (NZ) and BD4s in NSW.



From the people who live and breath WRX motorsport, the **Possum Bourne** workshop retail this mandrel bent exhaust system in either 3 or 2.5-inch diameter. Both feature a high-flow muffler and a "cobra neck" front pipe off the turbo (as used in Group A and WRC). Fits to the factory floor mounts of all model WRXs. Note - no cat converter supplied.

Possum Bourne Motorsport is in NZ.



You can trust **TRUST**...Imported from Japan, the BL Extreme cat-back only systems are street-legal and feature a highly polished high-grade stainless steel muffler. Optimum sized mandrel bent piping is utilised and exhaust flow is maintained with straight-through design rear box. With a diameter of 80mm, this system suits all MY WRXs.

Trust systems are distributed through Evolution R.

Note: If you are a manufacturer of high performance exhaust systems for the WRX - and you're not listed here - we'd be delighted to add your products to the guide, free of charge. Contact Michael at michael@autospeed.com

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Contacts:

APS (Vic)
+61 3 9720 9170

www.airpowersystems.com.au

MRT (NSW)
+61 2 9809 2110

<http://www.mrtrally.com.au/>

BGT (Vic)
+61 3 9874 8866

www.bgtperformance.com.au

G-Tech (Vic)
+61 3 9813 0722

www.gtech.com.au

ScoobyMania (UK)
www.scoobymania.co.uk

AVO (Vic)
+61 3 9584 4499

<http://www.avoturbo.com/>

Hi-Tech Mufflers (NSW)
+61 2 9332 3524

www.hitechmufflers.com.au

BPM (QLD)
+61 7 3272 8885

www.bpmports.com/wrx.htm

BR Developments (UK)
<http://www.brdevelopments.com>

WAR Motorsport (NZ)
www.warmotorsport.com

DMA Motorsport (Vic)
+61 3 9545 0338
<http://www.dmamotorsport.com.au/>

Jap Trading (Vic)
+61 3 9879 7799

www.jap-trading.com.au

Race Logic (UK)
www.racelogic.co.uk

BEL Performance (NSW)
0412 262888

www.belpformance.com.au

Possum Bourne Motorsport (NZ)
<http://www.possumbourne.co.nz/>

Evolution R (VIC)
+61 3 9543 6255
www.evo-r.com

BD4s (NSW)
+61 2 9879 3322

www.bd4s.com.au

Power Engineering (UK)
www.powerengineering.co.uk

Zorsted?

A new exhaust can improve power and responsiveness. It does this by posing less backpressure on the turbo (and so engine) resulting in the turbo coming on boost more quickly and the engine developing more power. Measuring the actual backpressure of an exhaust is easy - just temporarily remove the oxygen sensor and screw in a fitting attached to a hose leading to a pressure gauge. The lower the backpressure, the better, with peak readings normally achieved at maximum rpm in first gear.

When selecting an exhaust, you should aim to buy an exhaust with these features:

- **A large diameter dump pipe off the turbo**

Cat-back exhausts, while they will still give some improvement, won't be nearly as effective as a new pipe that starts from the turbo. A dump that incorporates a separate wastegate pipe may give further benefit.

- **A new, large diameter cat converter**

In most car exhaust systems, the cat converter is the single most restrictive part of the system - exhausts that retain the standard cat therefore flow much more poorly than is possible. Make sure that the new cat is designed to match the pipe size of the system - usually 3-inch.

- **Straight-through mufflers**

Straight-thru mufflers are easily the least restrictive of all muffler designs. A system that uses two mufflers (sometimes one is called a resonator) will usually give far less noise than a single muffler system, with almost no flow penalty.

- **Mandrel bends**

A mandrel-bent exhaust will retain full internal diameter on the bends, whereas a press-bent exhaust will have reduced diameter at these points. It is also best if the exhaust sections are made in one continuous length, rather than being welded together from a box of bends.

- **Stainless steel**

A stainless exhaust will last a very long time and can also be polished if appearance is a priority.

Julian Edgar

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