

REX N EFFECTS

Street-eating in one of NZ's most powerful road-registered Subaru Impreza's

The original bug-eyed Impreza WRX gained somewhat of an unfriendly welcome upon its release on our shores, but after a few months of everybody looking sideways at the new Subaru the general consensus was that it wasn't such a bad looker after all. As this article goes to print a very special Version 7 2001 STI waits patiently on the car yard at Collins Autos, in Penrose, for one lucky owner to take it home. Collins Autos only just took ownership of the STI after purchasing it off a young lad returning to his homeland China, and upon discovery of the number of modifications this Subaru was packing, the decision was made to make the car just that little more special with the help of a little ECU fettling.

Almost every aspect of this bright blue Sub had already been catered for, with Chee Lam at Dynamic Automotive responsible for most of the of exceptionally tidy work in the confines of the engine bay.

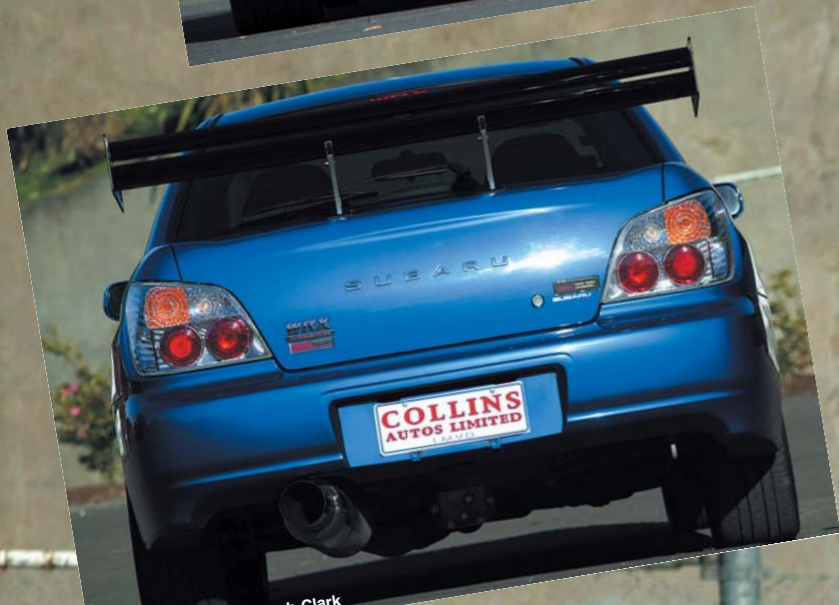
It's pretty obvious that the main attraction would have to be the monstrous top-mounted Garrett GT40 running around 18psi of boost, with a polished compressor housing and thermo-wrapped exhaust housing. The rest of the intake system has been altered to suit the size of the turbo, with a

100mm polished alloy intake pipe, HKS pod filter and a 75mm polished return pipe back to the intake plenum. The old top-mounted intercooler has sensibly been ditched, and replaced with a huge front-mounted unit complete with two water sprayers. There is little risk of

this engine ever over boosting, because a huge Tial 46mm external wastegate has been plumbed in to vent back into the exhaust, as well as a Blitz blow-off valve which vents excess boost straight back into the atmosphere. A Blitz electronic boost controller resides in the cabin, and in the end has the final say anyway.

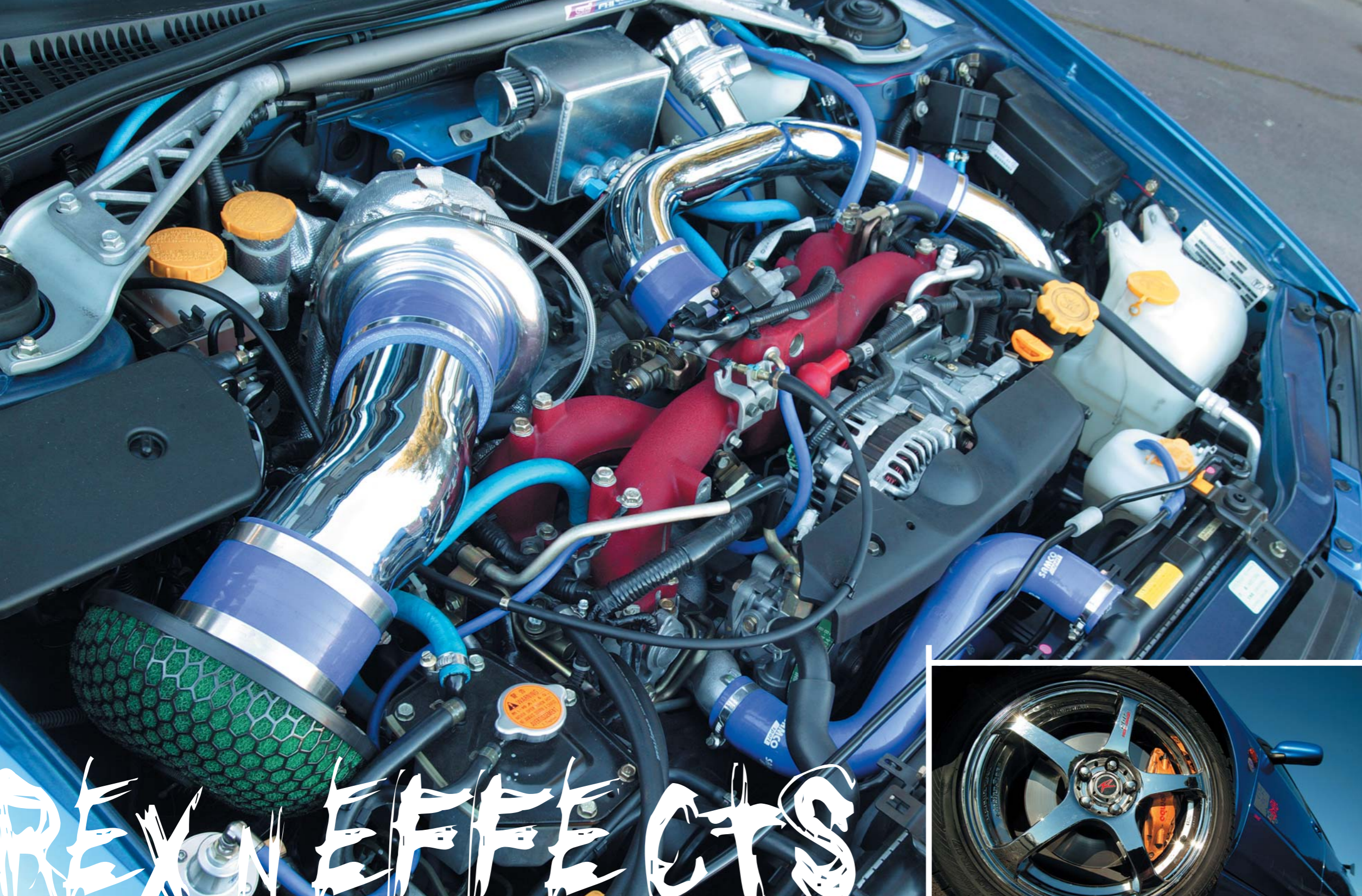
When combined with a custom polished alloy oil catch-can, the monster turbo, the factory STI strut brace and red intake runners, the under-bonnet view of this Subaru is a sight for sore eyes indeed!

STI internals are factory-strong to begin with. They already include forged pistons and a closed-deck block, and a cylinder head that flows well, so there wasn't really any need to strip the EJ20 down and carry out a full rebuild. Instead, the fuelling system was attacked with an oversupply of parts including a Sard-



Words: Rob D Pics: Clutch Clark





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adjustable fuel pressure regulator, a Bosch high-pressure fuel pump, and four cylinder-drenching Bosch 720cc injectors. This type of set-up will prevent any chance of detonation occurring, so it's done as much for piece of mind as performance. Rather than settling on a run-of-the-mill three-inch system, the previous owner opted to upsize and fit a three-and-a-half inch-diameter pipe, with an N1-style angled stainless rear muffler. Combined with the size of the turbo, the wastegate chatter and the thumping boxer configuration, this STI is noticeably louder than your average Subaru with a big bore. With the combination of the jumbo turbo and the larger-than-average exhaust this version 7 doesn't develop significant boost until 5000rpm, which is not too unusual considering a standard STI has the same problem until about 4000rpm, but this type of power delivery has to be remembered when driving the car in the city. Ultimately the car would be suited to a race track environment where high rpm is normal, but driving the car in traffic would probably be a little frustrating. All I can say is that when the boost does arrive it arrives in a very big way. It's not like normal turbocharged cars that commonly boost from 3000rpm upwards, and tail off above 6500rpm. No, this STI has power to burn to the red-line and beyond, and is only handicapped by the rev limiter. There is so much top-end punch in reserve that to realise the potential of the turbo, a full engine blueprint and balance would have to be carried out to allow the engine to rev higher.

The driveline hasn't escaped featuring on the list of mods. It includes an STI quick-shifter for lightning changes, and an HKS twin-plate clutch to tame the abundance of power transferring through the gearbox. Believe me when I say this clutch is not just for any old Granny. The standard Version 7 suspension is still in place, but considering the amount of engineering that has gone into this factory set-up it's unlikely many owners would press the car to its limits anyway, unless on the track, that is. The same goes for the brakes, although braided lines have found their way under the wheel arches for improved pedal feel and response. The callipers were revealed in their full golden glory while the car was on the dyno, and it's good to see that Subaru has finally followed Mitsubishi's >



TUNING IT

The WRX had massive potential with the list of ancillaries it had on board, but its full potential could never be realised without the appropriate command centre controlling the fuelling, ignition and boost.

Collins Autos' Bryan Millar took charge of the situation, and contacted renowned rally ace and Subaru genius Brett Middleton, from Sydney, Australia. Brett's company, MRT Performance, recently took control of the Australian and New Zealand distribution of EcuTeK tuning products – a revolution in automotive ECU control. EcuTeK is a UK-based company that has focussed its efforts on developing a unique programme for Subarus, one which allows access to the factory-set code for the ECU and alters the settings according to the requirements and demands of both engine and owner. Once inside the ECU, total tune-ability is possible, including fuel maps, Lambda, ignition timing, boost pressure, injector size, wastegate duty map, VVT timing for late model WRXs, rev limits and a host of other zones. The interface for the tuner is incredibly simple, and after only a short amount of tuition most people can master it. Make no mistake about it – this is not an ECU piggyback, a replacement ECU or replacement chip. The standard computer is 100 per cent retained, and it is impossible to tell whether any alterations have taken place.

A separate bonus is Subaru owners of any car from 1999 onwards (including non-turbo) can purchase EcuTek Delta Dash. This software allows the user to plug their laptop into the car's ECU and make small changes, as well as log important information.

Probably the most common complaint from STI owners is lack of response during the transition from off-boost throttle to on-boost acceleration. There is usually too much lag, even on low factory boost settings. EcuTek software allows the tuner to eliminate this flat spot, so when the accelerator is planted to the floor from an off-boost position the turbo instantly responds without lag, even on higher boost levels or with bigger turbochargers. Not only does EcuTeK improve this part of the car's performance, other important aspects often overlooked when modifying a car are retained, such as idle quality, cold start smoothness and hot running reliability. There will always be somebody with a more powerful engine, but whether or not it idles smoothly and starts properly on a cold morning is another story altogether.

Brett and his expert tuner, Paul Fisher, were flown in from Australia. Together they set to work on the STI with the intention of making the most of the modifications already performed on the car, while still leaving it driveable on an everyday basis. "The brief from Collins Autos was simple – make the car powerful, drivable and with a 100 per cent reliable tune," Brett said. The opinion on the day was that the engine would quite easily be capable of producing in excess of 373kW (500hp) at the flywheel, but for the sake of driveability and reliability the intention was to tune the car to approximately 220kW (295hp) at the wheels.

All the testing and tuning on the dyno was carried out at Bob Homewood Motorsport, based in Pukekohe. Bob's workshop is home to no less than six New Zealand developed and built Dynapack chassis dynamometers, which are widely regarded in the industry as the most accurate and reliable dyno available, so along with Bob's vast knowledge of twin cam engines and Brett and Paul's expertise, there was little hesitation in using his facilities. As testament to the effectiveness of EcuTeK and the skill of Paul Fisher, within the space of a few hours the kilowatt-at-the-wheel rating of the STI soared from 207 (277.4hp) to a reliable 266.7kW (357.4hp)! Remember, this was achieved through the factory computer and the existing bolt-ons. Most of the improvements came courtesy of boost, fuelling and ignition alterations, which were all still left at a fairly conservative setting for reasons of driveability, and more importantly, saleability. Collins Autos does not have any intention of selling a time bomb waiting to happen, after all!





lead and fitted front and rear callipers from Brembo, the best in the business. Polished Advanti Racing SDF lightweight wheels measuring 17 by 7.5-inches grace the Subaru, and are fitted with ultra-grippy Bridgestone RE040 W-rated rubber in 225/45/17. This should be plenty of tyre for any enthusiastic road driver out there, but were you to take this beast to Pukekohe or Taupo it would certainly look the part with a set of full slicks, especially when combined with a new set of adjustable platforms.

Body-wise this STI has had a work over in the form of a GT wing and clear taillight lenses. The look is effective enough to let any onlookers know this is not an everyday model – that is if the thundering exhaust hasn't already given the game away. Trust and HKS get a plug as well, with decals on the front doors, door handles and bonnet, and overall the car looks subtle enough not to gain unwanted attention but still unique enough to stand out from the crowd.

Inside, the factory STI seats and steering wheel remain as they are more than up to the task for both looks and function, but the same can't be said for the sound system. A new JVC MP3 player replaces the factory CD, and inside the boot you will find two Alpine Type-R 12-inch subs, an Alpine MRV-F407 amp for the front components, and a Calsonic POP90.4-360 amp for the two subwoofers. And don't forget the battery, which has been mounted in the boot to facilitate the mammoth top-side turbo.

So there you have it! With Chee's mechanical handiwork and a recent dyno session under the watchful eye of one of Australasia's most skilled Subaru tuners, this Version 7 has to rate as one of the most powerful Impreza STI's on Kiwi roads. Over 350hp has been measured at the wheels and that equates to around 450hp at the flywheel. Scary thing is... there's still more to go! Gulp. •

SPEC

Vehicle: 2001 Subaru Impreza WRX STI Version 7

Engine: EJ20T quad-cam 24-valve, standard block, internals and cylinder head, Garrett GT40 turbocharger (18psi), thermo-wrapped exhaust housing, polished compressor housing, 100mm polished alloy turbo intake pipe, HKS pod filter, 75mm plenum intake pipe, custom front-mounted intercooler with water sprayers, Tial 46mm external wastegate venting to exhaust, Blitz blow-off valve, Bosch 720cc injectors, Bosch high-flow fuel pump, Sard adjustable fuel pressure regulator, battery mounted in boot, Samcosport water and turbo hoses, Blitz electronic boost controller, 3.5-inch exhaust with stainless rear muffler, oil catch-can with breather

Driveline: Standard STI Version 7 five-speed, STI quick-shift kit, HKS twin-plate heavy-duty clutch

Suspension: Standard STI Version 7 springs, dampers and front strut brace

Brakes: Standard STI Version 7 Brembo gold callipers, standard rotors, braided lines

Wheels/Tyres: Advanti Racing SDF 17x7.5 lightweight polished alloys fitted with Bridgestone RE040 W-rated 225/45/17 tyres

Exterior: GT style adjustable rear wing, clear taillight lenses, HKS and Trust decals

Interior: Standard STI Version 7, APEXi boost gauge, Sard fuel pressure gauge with warning light

ICE: JVC KD-SH99R MP3 player, 2 x Alpine type R 12-inch subwoofers, front components, boot-mounted Alpine MRV-F407 amplifier (components), boot-mounted Calsonic POP90.4-360 amplifier (subwoofers)

Performance: 266.7 kilowatts (357 horsepower) at wheels / 346 kilowatts (465 horsepower) at flywheel

THANKS: Collins Autos [Any serious interest in the car should be forwarded to Bryan Millar at Collins Autos by phoning 027 579 3409, or 09 579 5759]

Brett Middleton (MRT Performance) and his Subaru tuning ace Paul Fisher www.mrtrally.com.au, www.ecutek.com.au, Bob at Bob Homewood Motorsport, 8 Crosby St, Pukekohe, 09 238 8754



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