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GC8 SUBARU IMPREZA WRX STI IV TYPE R

Parts Master

JUST WHEN YOU THOUGHT EVERY POSSIBLE MODIFICATION
HAD ALREADY BEEN CARRIED OUT IN THE SUBARU WORLD, JAP
PERFORMANCE PARTS PRESENTS A WORLD FIRST – ITS NISSAN RB25-
POWERED, REAR-WHEEL DRIVE AND WIDE-BODIED IMPREZA DRIFT CAR!

WORDS: JOE CLIFFORD PHOTOS: PHIL STEINHARDT





Imagine you had the task of convincing a line-up of *Dragons' Den*-type experts that inserting a Skyline engine into an Impreza was an idea worth investing a lot of time and energy accomplishing. They'd probably come up with all sorts of reasons why it was implausible – the length and weight of the new engine block, the alliance of two possibly incompatible brands, the untested market for future conversions of this type – and laugh the originator of the idea out of the room with a resounding “we’re out”!

But for Sajid Moghal, proprietor of second-hand car parts specialist Jap Performance Parts (JPP) in Crawley, West Sussex, it was those supposed issues that made the thought of this conversion so attractive, irrespective of the difficulties involved. Nobody had ever tried something like this before, and for a company looking to make a name for itself with an exciting new entry in the competitive drift arena, the element of surprise should not be underestimated. If successful it would be a marketing dream; and if not... well, the general public need never know.

So it was with a feeling of nervous bravado that Sajid and his team of dismantling experts began stripping the front ends of a 1998 GC8 Impreza and 1994 R33 Skyline GTS in preparation for their hopeful hybridisation. The Impreza was a sound and sought-after STI IV Type R coupé that, for some unknown reason, had been hanging around unsold, while the Nissan was a visually tatty drifter with a monster engine setup.

Sajid was aware of his team's limitations and knew that external help would be needed to progress the project at a decent pace. So once the Impreza's engine had been removed and the front crossmember and suspension reinstated, the rolling chassis accompanied a van full of Skyline running gear to Dennis and Paul Randle of PR Developments (PRD) in Leicestershire. This father and son team specialises in all things Subaru, and was apparently the first outfit of its kind to install New Age running gear into a Classic Impreza shell – knowledge that would prove invaluable later on. It was now the Randles' unenviable task to elevate the project to a stage where the Nissan engine was installed and could be fired up.

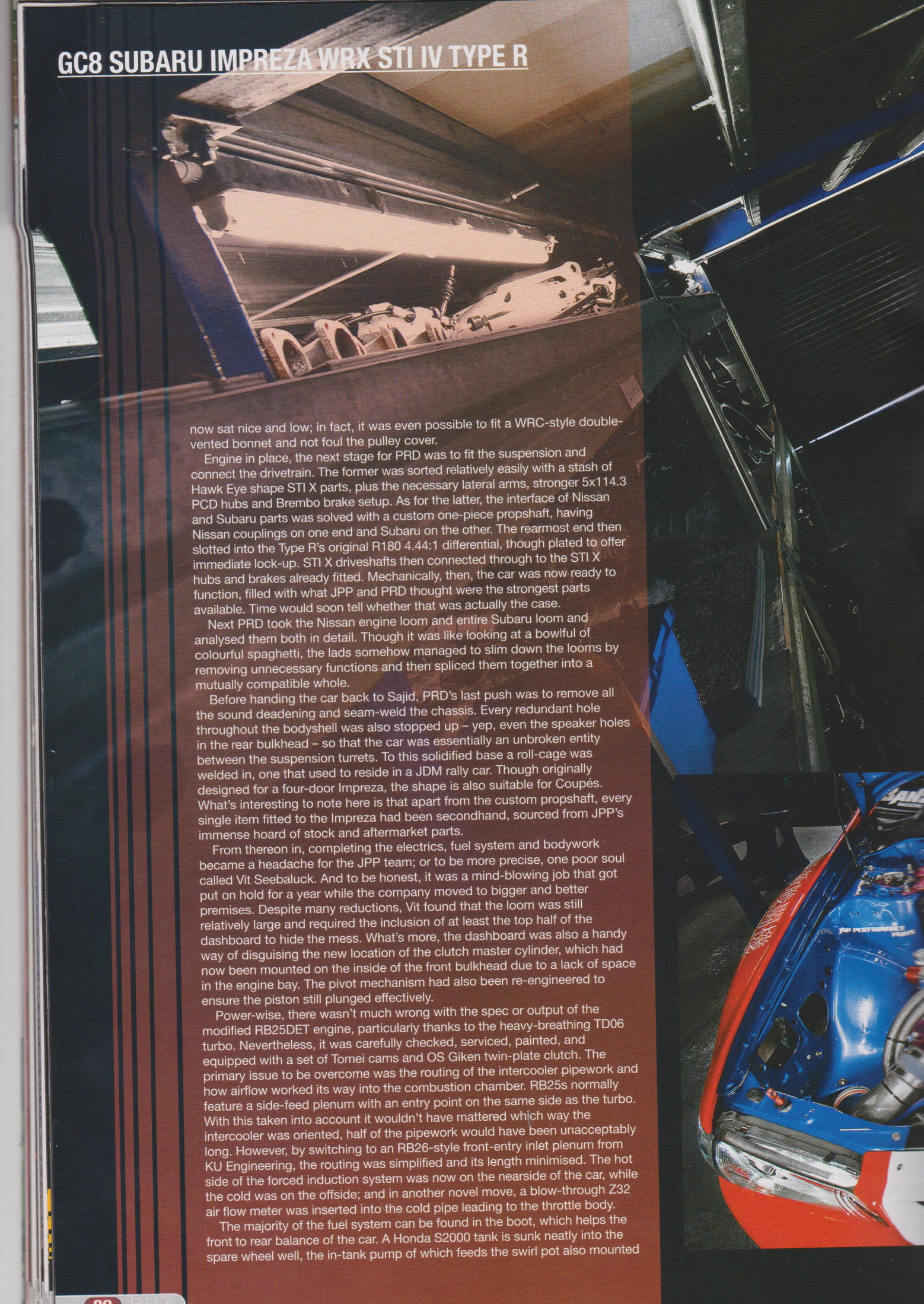
Physically hanging a different engine and gearbox in the vacant bay of a host vehicle is quite simple; it is the successful positioning and mounting that normally poses problems. Fortunately, aligning the Nissan's gear lever with the respective hole in the Subaru's transmission tunnel located the new engine slap-bang in the middle of the bay. But such was the length of the RB that it couldn't be squeezed between the Impreza's front slam panel and bulkhead, at least not without removing the original top gearbox mount and clutch servo. Similarly, the transmission tunnel was too tight to frame the Nissan gearbox.

However, with the redundant Subaru gearbox mount taken out of the equation, some of the tunnel's supporting framework removed, and the front slam panel turned into an easily removable section, a little persuasion was all it took to drop the straight six in with sufficient clearance all round... until its descent was abruptly stopped by the sump hitting the front crossmember, that is. Resting here, the engine stood so far proud of the bonnet line that it looked like a deployed jack-in-the-box.

It was essential to retain the Subaru crossmember in some form, as it is a structural component that is also used to support the lower suspension arms. A huge, sump-shaped swathe was therefore cut through the centre portion of the member, and then reinforced in such a way so that the sump poked through like a key in a lock. The strength of this cut-and-shut member had to be incontrovertible, as it also needed to provide location points for the two engine mounts.

Nissan's practice for hanging RB engines is surprisingly simple, involving just two mounts on the front subframe and a third mount further back that is more of a supporting prop for the gearbox. The two foremost points are angled to stop side-to-side and twisting movements by the engine, while the rear limits fore/aft shifting. So with a mixture of custom and modified Nissan mounts added to the Subaru's revised architecture, the tall new powerplant

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now sat nice and low; in fact, it was even possible to fit a WRC-style double-vented bonnet and not foul the pulley cover.

Engine in place, the next stage for PRD was to fit the suspension and connect the drivetrain. The former was sorted relatively easily with a stash of Hawk Eye shape STI X parts, plus the necessary lateral arms, stronger 5x114.3 PCD hubs and Brembo brake setup. As for the latter, the interface of Nissan and Subaru parts was solved with a custom one-piece propshaft, having Nissan couplings on one end and Subaru on the other. The rearmost end then slotted into the Type R's original R180 4.44:1 differential, though plated to offer immediate lock-up. STI X driveshafts then connected through to the STI X hubs and brakes already fitted. Mechanically, then, the car was now ready to function, filled with what JPP and PRD thought were the strongest parts available. Time would soon tell whether that was actually the case.

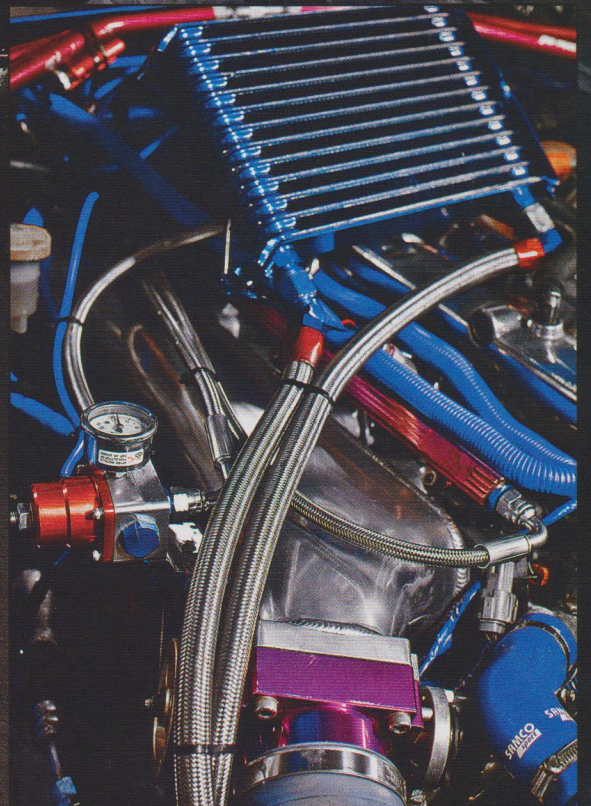
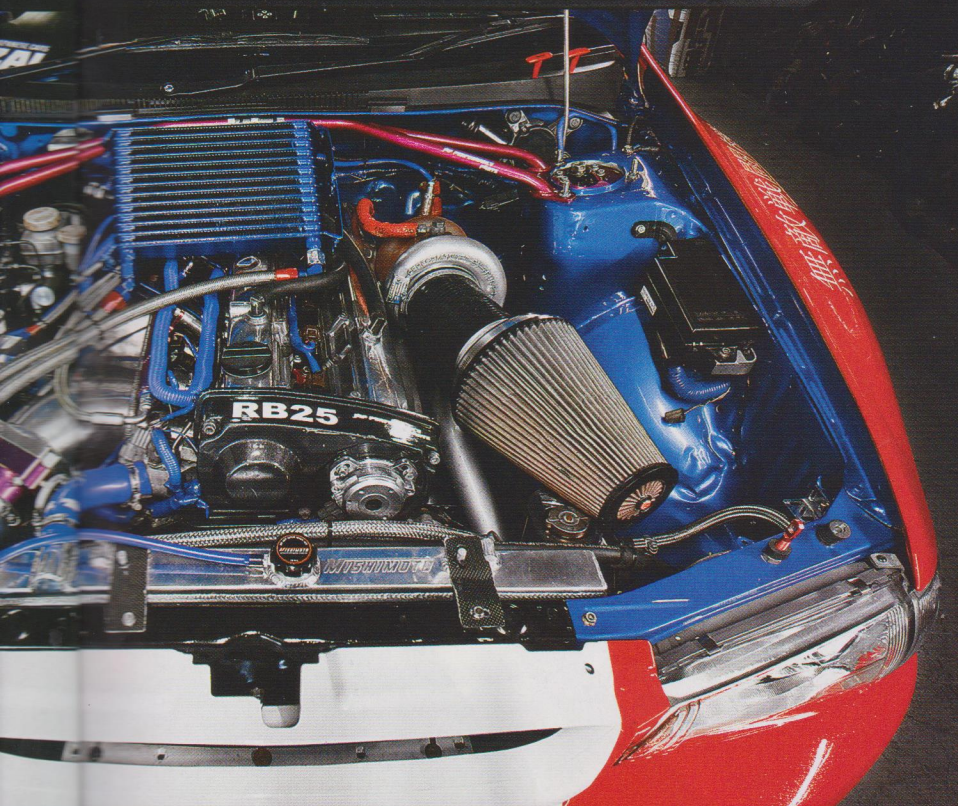
Next PRD took the Nissan engine loom and entire Subaru loom and analysed them both in detail. Though it was like looking at a bowlful of colourful spaghetti, the lads somehow managed to slim down the looms by removing unnecessary functions and then spliced them together into a mutually compatible whole.

Before handing the car back to Sajid, PRD's last push was to remove all the sound deadening and seam-weld the chassis. Every redundant hole throughout the bodyshell was also stopped up – yep, even the speaker holes in the rear bulkhead – so that the car was essentially an unbroken entity between the suspension turrets. To this solidified base a roll-cage was welded in, one that used to reside in a JDM rally car. Though originally designed for a four-door Impreza, the shape is also suitable for Coupés. What's interesting to note here is that apart from the custom propshaft, every single item fitted to the Impreza had been secondhand, sourced from JPP's immense hoard of stock and aftermarket parts.

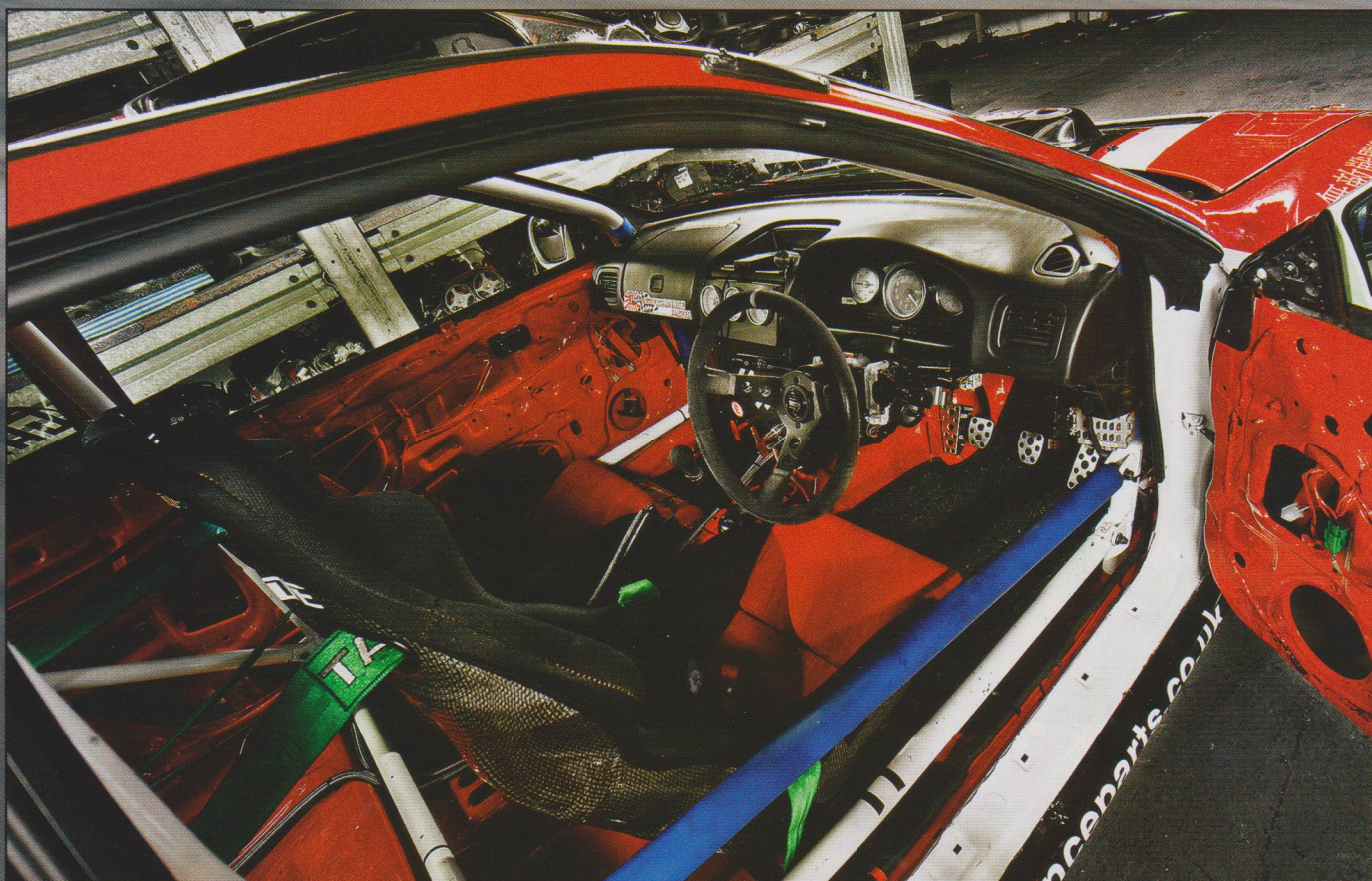
From thereon in, completing the electrics, fuel system and bodywork became a headache for the JPP team; or to be more precise, one poor soul called Vit Seebaluck. And to be honest, it was a mind-blowing job that got put on hold for a year while the company moved to bigger and better premises. Despite many reductions, Vit found that the loom was still relatively large and required the inclusion of at least the top half of the dashboard to hide the mess. What's more, the dashboard was also a handy way of disguising the new location of the clutch master cylinder, which had now been mounted on the inside of the front bulkhead due to a lack of space in the engine bay. The pivot mechanism had also been re-engineered to ensure the piston still plunged effectively.

Power-wise, there wasn't much wrong with the spec or output of the modified RB25DET engine, particularly thanks to the heavy-breathing TD06 turbo. Nevertheless, it was carefully checked, serviced, painted, and equipped with a set of Tomei cams and OS Giken twin-plate clutch. The primary issue to be overcome was the routing of the intercooler pipework and how airflow worked its way into the combustion chamber. RB25s normally feature a side-feed plenum with an entry point on the same side as the turbo. With this taken into account it wouldn't have mattered which way the intercooler was oriented, half of the pipework would have been unacceptably long. However, by switching to an RB26-style front-entry inlet plenum from KU Engineering, the routing was simplified and its length minimised. The hot side of the forced induction system was now on the nearside of the car, while the cold was on the offside; and in another novel move, a blow-through Z32 air flow meter was inserted into the cold pipe leading to the throttle body.

The majority of the fuel system can be found in the boot, which helps the front to rear balance of the car. A Honda S2000 tank is sunk neatly into the spare wheel well, the in-tank pump of which feeds the swirl pot also mounted



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in the boot. From here, twin Walbro pumps supply both ends of an HKS fuel rail, which guarantees against surging and future-proofs the engine in case further tuning is required. Meanwhile, the lines have made their way inside the car and switched to the nearside to facilitate a more direct route into the HKS rail. The other braided lines you can see criss-crossing the bay relate to the oil cooler, which is cleverly mounted at an angle on top of the engine to make full use of the airflow being rammed through the high-level STI VII bonnet scoop.

The intention was always to build this car for drifting, and apart from the obvious need for big power and rear-wheel drive, the finer aspects of geometry setups, Ackerman angles and steering lock was also beyond the experience of the JPP team. So when the organisers of the JDM Allstars drift championship started pushing for a completion date for the project, Sajid knew that expert assistance was needed to bring the car to a working, if not immediately competitive, state. An experienced driver who could analyse the car's performance and accurately verbalise his findings would also be essential.

Walton Smith's name was mentioned as the ideal man for the job. Why? Firstly, because he's a darn good drifter but also happens to be the younger brother of drift specialist Julian Smith of Garage-D. Their technical expertise and driving experience made them another ideal partnership for JPP. The Smiths were up for the challenge, bringing the beast to their workshop in Watford to immediately get to grips with this unusual Impreza.

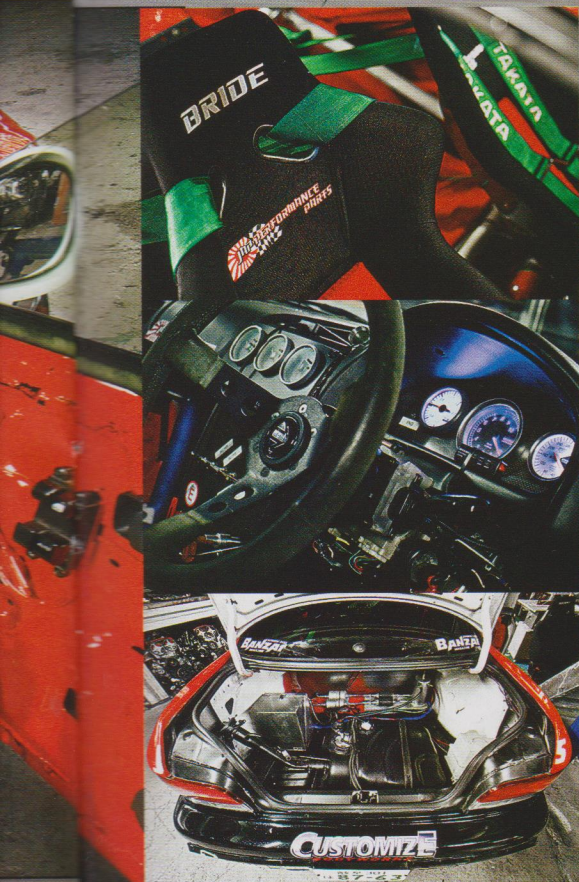
The pair soon discovered that there was nowhere near enough steering lock available. What's more, the incline of the steering arms in relation to the lower wishbones due to the dropped rack would produce terrible bump steer. So dramatic was this that just bouncing the car with their bodyweight caused huge geometry changes, especially toe angle. Imagine what effect that would have had if you hit a mid-corner bump during a precise twin-drift!

The only way to address this bump steer issue was to move the engine upwards and build a new crossmember that brought the steering arms back into alignment with the lower wishbones. Yes, that meant redoing PRD's sterling work in that area but the Smiths decided that it was a necessary evil to improve the steering geometry. The new crossmember was taken from an STI X and once again cut to clear the Skyline sump and modified to carry the necessary engine mounts.

Raising the engine the small amount needed to clear the steering rack meant that the bonnet had to be cut to clear the RB cam cover. However, isn't there actually something cool about having an engine too big to fit under the bonnet? An STI X quick rack was fitted to reduce the amount of turns between full lock, while extended Evo VIII inner tie rods and Zero Sports track rod ends connect the rack to the hubs, which were modified to increase steering lock and decrease the Ackerman angle. Custom longer lower wishbones were then made to give the car the caster angle and negative camber needed to make it handle while drifting.

As for the rear end, the geometry was found to be favourable but doubts were cast over the strength of the Subaru differential. Normally used to handling just 50% of the Impreza's standard power figure, it was likely to explode when the dyno proven output of 458bhp and 400lb ft was unleashed with an unsympathetic clutch kick. Instead, Garage-D decided to use an R200 diff, as found in many cars within the Nissan range. A heavily modified rear subframe was therefore made to mount the diff and provide increased lateral strength to handle the loading associated with drifting. Some hub machining was required to take the Nissan half shafts but the additional advantage of all this work was that the final drive could be easily adjusted depending on the circuit. Three different ratios are normally carried – from 3.6:1 to 4.3:1 – and these make a huge difference to the car's on-track performance.

Thanks to Garage-D's input, the chassis was now theoretically ready for drifting, but there was nothing particularly special about the car's plain white exterior. It desperately needed to look dramatic for its public debut and to offer a visual statement that echoed the effort that had gone into the running gear. In terms of Subaru bodywork, nothing quite hits the spot like the widened arches of the Impreza 22B. A fibreglass replica kit was sourced from



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tech spec

ENGINE: RB25DET 2498cc DOHC 24v straight-six turbo, Tomei cams, adjustable exhaust cam pulley, GReddy top-mounted oil cooler, Z32 air flow meter, RB26-style KU Engineering front-feed inlet plenum, 80mm throttle body, HKS fuel rail, 600cc Sard injectors, Japspeed fuel pressure regulator, GT-R fuel resistor, braided fuel lines, twin Walbro 255 fuel pumps, custom swirl pot, twin Cosworth fuel filters, top-mounted exhaust manifold, GReddy TD06 25G turbo, external wastegate, manual boost controller, modified Blitz Nur Spec exhaust system, Apexi Power FC ECU, Evo IV steering cooler, Mishimoto R32 Skyline GTS-spec alloy radiator with twin Evo VI air conditioning fans, custom engine mounts on modified OE subframe

TRANSMISSION: RB25 five-speed gearbox on custom mount, OS Giken twin-plate clutch, custom internally-mounted clutch master cylinder, extended OE lower front arms, custom one-piece propshaft, custom front and rear subframes, Nissan R200 rear diff, S14 rear shafts, STI X quick steering rack, Evo VIII steering arms, Zero Sports track rod ends and lower ball joints, STI X lower rear arms

CHASSIS: 9.5x17" (ET15) CST Hyper Zero 1 alloys with 215/45 (front) Bridgestone Potenza and 225/45 (rear) Autoguard SA802 tyres (or whatever is cheap and performs), HKS coilovers, STI X 5x114.3 PCD hubs, STI X Brembo brakes all-round

EXTERIOR: HT Autos 22B-style wide-body front and rear arches, front wings spaced out, HT Autos 22B-style side skirts, modified Evo V front bumper, WRC-style fibreglass bonnet, STI VII high-level bonnet scoop, Subaru S201 door mirrors, WRC roof scoop, OE rear bumper with Evo X rear diffuser, GT-style carbon fibre rear wing, resprayed corporate colours with Sonic blue engine bay

INTERIOR: Bride carbon/Kevlar bucket seats retrimmed with JPP logo, Takata harnesses, six-point roll-cage, cut-down and simplified dashboard, GReddy gauges, custom instrument cluster, plumbed-in fire extinguisher, Honda S2000 fuel tank in boot, battery relocated to boot

CONTACTS: Jap Performance Parts (01293 520090 or www.japperformanceparts.co.uk), PR Developments (07888 699894), Garage-D (01923 251588 or www.garage-d.com), HT Autos (0161 351 0000 or www.htautos.co.uk), Customize Bodyworkz (01293 550570 or www.customizebodyworkz.com), JDM Allstars (www.jdmallstars.com)



HT Autos, and even these arches barely cover the widened track produced by the hybrid Subaru/Nissan/Mitsubishi running gear. You may notice that the lower section of the front wings has been mounted on the outside of the skirts, a clever little trick that has given the hot air within the wheel well an easy escape route, not to mention a handy bit of extra width for steering lock and to cover the aggressively offset CST alloys. While it would have been easy to specify 22B-style bumpers, JPP didn't want the external appearance to be too Subaru-centric. Hence the reason why the OE rear end has been toughened-up with an Evo X diffuser, and the front aspect completely altered with a modified Evo V bumper. Its design was more conducive to the front-mounted location of the intercooler, and it only needed minor trimming, primarily around the grille area, to sit happily on the Impreza.

As for the paintwork applied by local bodyshop Customize Bodyworkz, inspiration was partly drawn from a soon-to-be-released touring car Sajid has supplied parts for, as well as the corporate colours of the firm itself. It really works, too, with an additional surprise and delight feature found in the Sonic blue paintwork under the bonnet. And if you're thinking that black or white alloys would have looked better on a drift car, you're probably right. The thing is, white alloys are difficult to keep clean, and from a judging perspective it is not easy to see how much steering angle is dialled in. No, bronze works just fine, thank you very much, plus it's about as JDM as you can get.

The JPP Impreza made its first public outing at round three of the JDM Allstars 2010 championship. It was a tentative toe dip, to be honest, with JPP and Walton feeling their way in a brand-new and completely untested car. They didn't really expect much but the Impreza performed faultlessly, carrying Walton to a surprise eighth qualifying position – an amazing accomplishment for a project that up until then had only been tuned with the use of theories and previous experience. That brief showing did highlight a few more areas for improvement, and by the time you read this the car and driver will have shown their mettle for a second time by competing in round four at Wembley.

What of the supposed implausible points brought up by our imaginary *Dragons' Den* investors? Yes, the RB engine is longer and heavier than the outgoing flat-four but with a bit of jiggling it went in okay and that extra weight is easily counteracted by the lack of transmission components running to the front wheels. The few incompatibility issues were easily solved with a mix of custom parts and good old-fashioned brainpower. And as for the untested market for future conversions, well, that's likely to change when people see just how well this howling, rear-wheel drive Impreza performs. We certainly know what company to call to supply the parts!

For me, however, I'm most impressed with the fact that 99% of the components fitted to this project were second-hand and therefore more accessible to us as cash-strapped enthusiasts. Just as a gourmet meal is essentially a collection of relatively normal ingredients treated respectfully and in the right quantities, this car uses components we've all seen in other projects countless times before. But compiling these with skill and ingenuity into an Impreza-shaped recipe hasn't half produced something tasty 🍽️